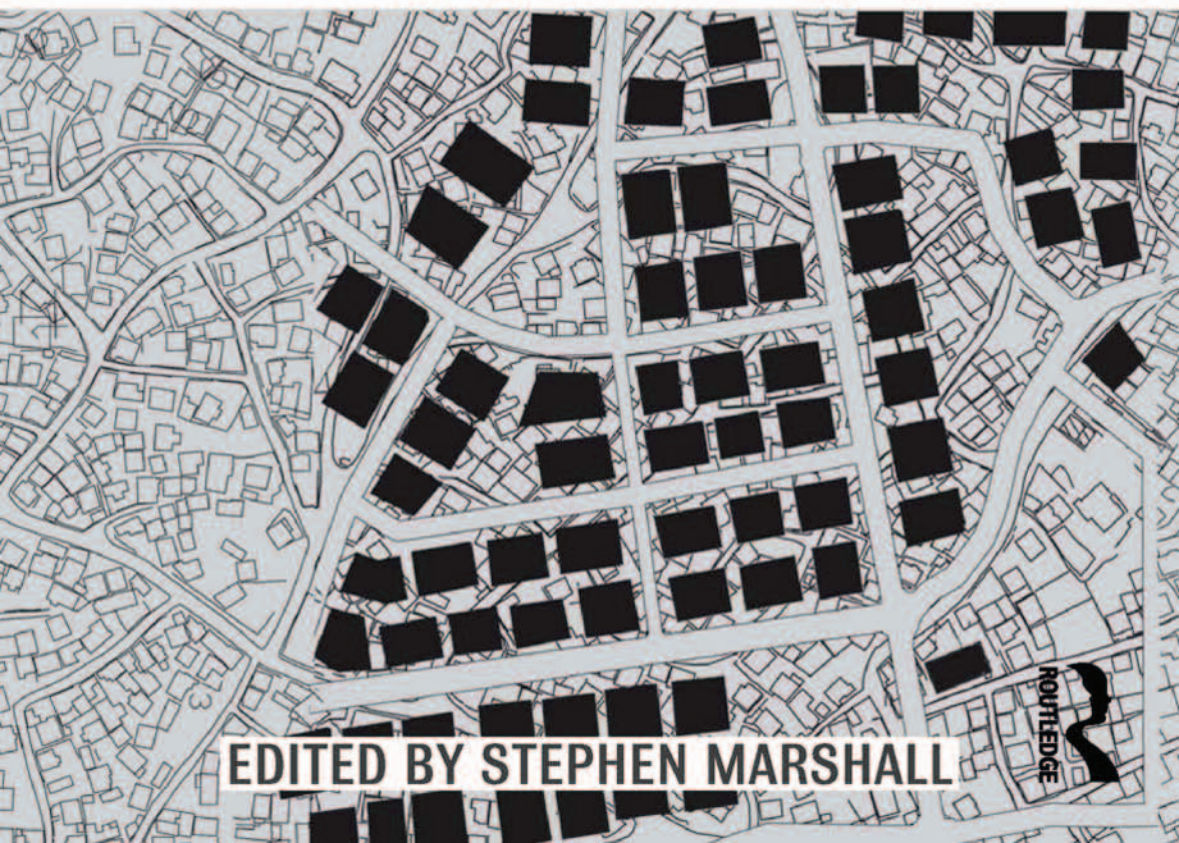




URBAN CODING AND PLANNING



EDITED BY STEPHEN MARSHALL

ROUTLEDGE

Urban Coding and Planning

Urban codes have a profound influence on urban form, affecting the design and placement of buildings, streets and public spaces. Historically, their use has helped create some of our best-loved urban environments, while recent advances in coding have been a growing focus of attention, particularly in Britain and North America. However, the full potential for the role of codes has yet to be realized.

In *Urban Coding and Planning*, Stephen Marshall and his contributors investigate the nature and scope of coding; its purposes; the kinds of environments it creates; and, perhaps most importantly, its relationship to urban planning.

By bringing together historical and ongoing traditions of coding from around the world – with chapters describing examples from the United Kingdom, France, India, China, Japan, Australia, South Africa, the United States and Latin America – this book provides lessons for today's theory and practice of place-making.

Stephen Marshall is Senior Lecturer at the Bartlett School of Planning, University College London.

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Stephen Marshall

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Chapter One

Introduction

Stephen Marshall

Cities exhibit a typical mix of order and diversity: more order than a random aggregate of architecture; more diversity than an artefact crafted by a single hand. Manhattan's classically craggy silhouette of skyscrapers can be seen as a motley agglomeration of forms, styles and materials, reflecting the idiosyncrasies of individual aspirations, location decisions, market forces and architectural flights of fancy. But this diversity is framed by a certain kind of order, or rather two kinds of order: one to do with urban plans, the other to do with urban codes (figure 1.1).

Manhattan has a spectacularly regular street grid – a relentless orthogonal plat of hundreds of rectangular blocks, following the Commissioners' grand plan of 1811.¹ Yet the orthogonal ground plan is not the only kind of order we can discern. There is also a certain kind of order to do with the height of the buildings, their materials, façades, how these relate to the street, how much of their plot is built out, and what percentage of the block continues above a certain height (see chapter 11). This is a different kind of order, one generated by urban codes.

Codes are part of the 'hidden language of place-making'. They have a direct influence on 'the structure of the ordinary' – where ordinary connotes something not insignificant, but rather something representing the vast majority of the urban fabric.² Urban codes are therefore important because they significantly shape the character of our urban areas – for better or worse.

On the one hand, some of our best-loved urban places have been created through some kind of urban codes. On the other hand, some of the problems with

Figure 1.1. (*opposite*) The physical fabric of Manhattan is ordered both by the ground plan and the use of codes. (*Source:* © Joel Sartore/joelsartore.com)

contemporary urban environments may be related to the influence of codes – such as those ‘disurban’ codes that produce use-segregated, pedestrian-unfriendly placeless landscapes. Those codes were well-intentioned, but their rationales no longer support the aspirations of today. In recent years the significance of urban codes has been brought into sharp focus, as incumbent instruments ripe for reform, or new tools for shaping the future (Talen, 2009, p. 144).³

In the United Kingdom, the government has advocated codes for their potential to assist with speed, quality and certainty in the delivery of the current generation of large-scale urban development programmes. Codes have also been advocated for promoting particular kinds of physical fabric and public realm. Codes have been used in the Prince of Wales’s model community of Poundbury and in a variety of other innovative projects in the UK (CABE, 2005; Carmona *et al.*, 2006b, p. 210; Carmona and Dann, 2007; DCLG, 2006, 2009).⁴

In the United States, New Urbanists have pioneered a new breed of urban codes that have challenged conventional kinds of zoning ordinances, to create better, more ‘liveable’ urban environments. In particular, form-based coding has emerged to establish new conventions for codes to control the form and layout of urban development through tools such as building typologies, public space standards and control of architectural components. In fact, form-based coding is not just about controlling the form of the urban fabric, but can be seen as an alternative approach to the *process* of creating the urban fabric. Elizabeth Plater-Zyberk has proclaimed form-based coding to be a ‘new city-making approach’. This takes coding directly into the realm of *planning* (Plater-Zyberk, 2008).⁵

Planning and coding have an intertwined history. Towns and cities that we think of as being planned are not just regular and orderly through their ground plan, but through their building types, heights and materials, that are controlled by codes. Indeed, codes have often been instrumental in the creation of planned towns and cities. But, since the advent of modern planning, there has often been more emphasis on individually designed buildings or wholly master-planned developments, and a rejection of the kind of interlocking street-based urban fabric with which codes have historically been associated. In a sense, there has been no modern theory of how to create street-based urbanism using codes. Further, while coding is now receiving increasing interest, it is not always clear what exactly it means, what its possible formats are, or what it can achieve in conjunction with urban planning. It therefore seems timely to investigate the topic of coding, in relation to planning: hence this book.

In this opening chapter, let us first take a look at urban codes and their relation to plans, and contemporary challenges and critiques facing coding and planning, before looking ahead to the scope and content of the rest of the book.

Seaside sets the Scene

Planning history is punctuated by landmark cases where particular urban places have either exemplified a planning concept of a particular era, or acted as a model for future development. The Miletus grid is often taken to exemplify classical Greek layout planning. Palmanova can be used to signify the geometric order of the ideal cities of the Renaissance. The workers' villages and towns of Bournville, Port Sunlight and Pullman encapsulate the combination of progress and standardization associated with the industrial revolution. Radburn, New Jersey, gives its name to any number of generic suburban layouts with a system of dedicated pedestrian and vehicular routes. Brasilia symbolizes not only new city-building but post-colonial nation-building (see, for example, Lynch, 1981; Hall, 2002a; Kostof, 1991; Morris, 1994).

The development at Seaside, Florida, seems to have acquired some of the status of these landmark set-pieces (Ellis, 1988; Duany *et al.*, 1989).⁶ The significance of Seaside is two-fold. Perhaps most prominently, Seaside is famous for being an early agenda-setting example of a particular brand of neo-traditional urbanism – which was to become New Urbanism – based on a traditional, street-gridded, mixed-use community. Figure 1.2 gives the flavour of the quasi-baroque, neo-traditional feel of the place from its artistically rendered site plan.

But secondly, Seaside is significant for its use of codes; in particular, the reinvention or revival of codes prescribing three-dimensional forms and urban components.⁷ Figure 1.3 depicts Seaside's 'urban code' that specifies standards for plot size, area and location of open space, porches, outbuildings, parking and building heights. As

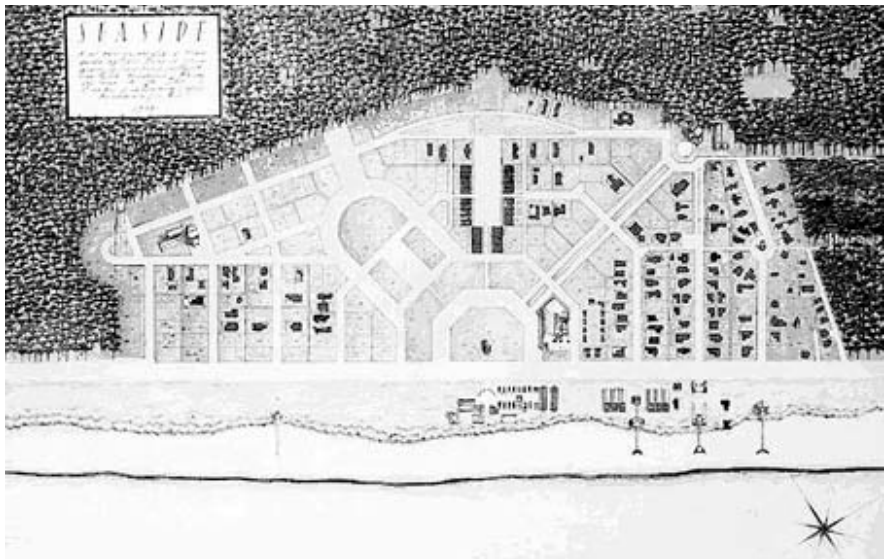


Figure 1.2. Plan of Seaside. (Source: Jean-François Lejeune)

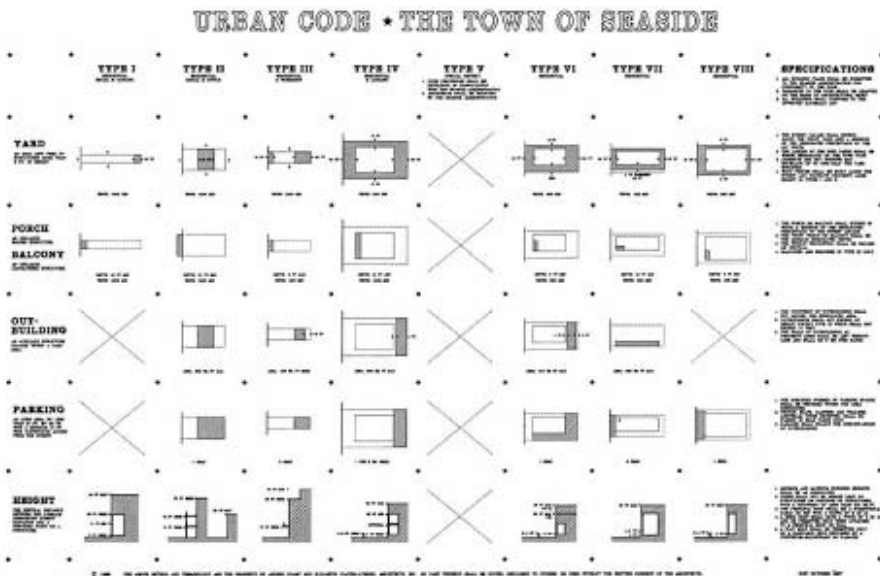


Figure 1.3. The ‘Urban Code’ of Seaside. (Source: Duany and Plater-Zyberk Architects)

John Dutton has pointed out, the Seaside urban code was remarkable for its brevity and abstraction. Like a black-and-white two-dimensional bar code for urbanism, the Seaside code can be fitted onto a single sheet of paper (Dutton, 2000, p. 78; Parolek *et al.*, 2008, p. 10).

The code features buildings and parts of buildings. But, as John Dutton relates: ‘The code, even in its architectural details, was primarily in support of an *urban* vision’ (Dutton, 2000, p. 78, original emphasis). This brings home that codes are not just about detailed design, but reach out to address the compass of town planning.

Yet, there is a crucial distinction between a code and a plan. Dutton continues:

Codes do not stipulate an entire ‘designed’ project, with each building designed in detail. Rather, the code fixes certain infrastructural aspects of the design, such as streets, blocks, platting, and open spaces, and governs the parameters of others. (Ibid., emphasis added)

So a code is not a design, but a specification of generic elements and their relationships. Dutton continues, reflecting on the use and purpose for which codes are suitable:

The establishment of the urban infrastructure, whether of small urban infill or a large new town, allows for a project’s *realization by many participants over a long duration of time*. A level of conformity to the original vision is thereby ensured through the interpretations and expression of individually designed elements. (*Ibid.*, emphasis added)

This brings in dimensions of scale, timescale and achieving coherence while involving several actors. Overall, this combination of attributes – embodied in the case

of Seaside – draws attention to several issues concerning coding that are of interest to wider concerns of planning and design.

First, coding may be part of a planning or design process but it is, in principle, a distinct means of generating urban order in its own right. The contrast between figure 1.2 and figure 1.3 is crucial to understanding the significance of coding in contradistinction to other kinds of planning, as a means of generating urban order. Figure 1.2 shows a plan depicting a finite product, where each depicted element corresponds to a unique location; figure 1.3 shows depictions of elemental types and relationships, for example relating building type to building height and specification of associated yards and out-buildings. This code could be used to create an indefinitely large urban product, and one where each individual element could refer to many different cases built out on the ground.⁸

Secondly, codes deal with different scales: the specification of building components to achieve desired building types or street types, the specification of building types or street types to generate a desired urban form overall. In effect, with an urban code, the scale of intention is urban, but the scale of intervention is at the level of buildings and streets, and indeed individual component parts of buildings.

Third, codes tend to be applied on an area-wide basis – typically being applied by several architects or developers, for example, rather than to a single site controlled by a single design team. Whereas a blueprint or master plan represents the designed product at a single targeted point in time – omitting intermediate or subsequent stages – codes are typically intended as a guide to ongoing or long-term management of a development, not just a single act of conception followed through to construction.

Fourth, because of the type and scale of element involved, codes tend to engage a range of ‘urban design professions’ – typically including architects, planners and urban designers, but also potentially including landscape architects, engineers, traffic analysts, retail and real estate analysts, environmental designers, and so on (Parolek *et al.*, 2008, p. 98; Carmona, 2009, pp. 2660–2661).

It is no surprise to find codes associated with traditional and neo-traditional urbanism, since an urban fabric of streets and squares implies a close relationship between ensembles of buildings and public spaces. However, coding does not necessarily imply traditional or neo-traditional formats; codes can promote modern formats and styles too (Carmona *et al.*, 2006b, p. 223; Marshall, 2005b).

The Seaside code can be seen as part of a ‘proactive vision’ for shaping public space. The code aimed to achieve harmony in architectural form, while leaving the design of the individual buildings to others so as to encourage variety (Duany *et al.*, 2000; Krieger and Lennertz, 1991, cited in Grant, 2006, p. 83).

This idea of harmony (or uniformity) with variety (or diversity) is a recurring theme in architecture and wider philosophy, and can be related to Enlightenment thinking. For example, Francis Hutcheson advanced the idea of beauty being founded

on ‘uniformity amidst variety’ (Hutcheson, 1725, p. 210; see also McKean, chapter 3, this volume). He applied this to geometric figures, to ‘works of nature’, and also to works of art, and all manner of objects down to the ‘meanest utensil’. So, too in architecture, across cultures:

The Chinese or Persian buildings are not like the Grecian and Roman, and yet the former has its uniformity of the various parts to each other, and to the whole, as well as the latter. (Hutcheson, 1725, p. 219)

Although Hutcheson here is addressing architecture in the context of visual appeal, the idea of uniformity amidst variety can also translate across to the public versus private realm. That is to say, the idea can relate to the extent to which society should have some sort of balance between the variety created by rampant individualism and state-imposed uniformity. Indeed, Dutton (2009, p, 79) explicitly notes that ‘These codes can therefore be seen as an attempt at a new synthetic proposal for balancing the community (unity through parameters of code) with the individual (freedom of architectural expression)’.

The concept of ‘uniformity amidst variety’ can therefore be related to at least two different aspects of urbanism: the physical design, to do with the visual effect of harmonious streetscapes and façades and buildings and ornamentation – in short, to do with aesthetics; and the ultimate social purpose to do with mediating between public and private interests (or individual versus common good). This brings together the purposes of coding with the purposes of planning.

Coding and Planning

In essence, coding generates urban order by the generic specification of allowable and necessary components and relationships. The term *urban* coding could be used in a general sense to mean the application of any kind of code used in the urban context. In this way, any design code, building code, layout code or zoning code can be described as an urban code. The term ‘urban coding’ therefore embraces a diversity of practices, traditions and formats, extending from urban scale locational regulations to prescription of architectural design details, and from abstract legalistic ordinances to illustrated examples in building manuals.⁹

Planning can also be interpreted in a variety of ways. It can, at least, have a specific sense and a general sense. The specific sense we can refer to as ‘ground planning’, or the use of a ground plan or blueprint to specify a future intended built form. The more general sense of planning is the wider package of public policy interventions, including not only ground planning but things like location policy, land-use zoning, development control, and so on.¹⁰

It follows from the above definitions of coding and planning that coding could be

seen as a subservient partner to planning; part of the apparatus of planning, and serving its goals. But from another point of view it could be seen as separate, if complementary, as in the case of the plan and code for Seaside (figures 1.2 and 1.3).

Planning and coding are almost like twins – or at least siblings – typically found hanging out together, but with slightly different temperaments. Planning has historically tended to be extrovert, heroic, visionary, innovative: concerned with the outline or big picture, the broad-brush, the clean-sweep. Coding has tended to be more introverted, more concerned with the details, more specifically concerned with formats and dimensions, specifically permissive or proscriptive, more tending to be conservative, and inclusive with what already exists. Both strive towards coherence, but one emphasizes the integrity of the whole, the other the substance of the parts.

Sometimes planning is seen as the more creative, whereas coding is more constraining: while the plan dreams of new grand axes and vistas, the code tells you that you must construct your house of brick or stone. But the converse is also true. A plan can also constrain by pre-emptively articulating a specific vision which in principle excludes all other imaginable possibilities. Conversely, a code can be used creatively to generate urban form indefinitely, for example by using generic building types and components and assembling these in a unique way for application to any number of particular locations.

In this book we focus on coding in the context of planning, where coding is in the foreground, albeit interpreted against the wider backdrop of planning. By doing so, we may allow coding to step out of the shadow of its more extrovert sibling, so we can find traditions as rich and robust as those associated with the ground-plan, street-grid and zoned master plan.

Challenges and Critiques

Planning has historically been associated with ‘improvement’ towards a desired future state (chapter 3). But in more recent decades it has sometimes seemed that planning has been part of the problem. Planning has sometimes seemed to lead to the creation of, at best, bland and, at worst, dysfunctional urban environments; while in some cases planning controls and codes have actively prohibited the creation of good quality, ‘liveable’ environments along traditional lines. As a result, ‘planned’ developments and settlements are sometimes considered less attractive and less functional than ‘unplanned’ ones (Marshall, 2009a, pp. xi, 1–2).¹¹

This raises the question as to whether urban coding could yet play a role in contemporary urbanism, by being able to capture some of the positive qualities of urban character while avoiding some of the disadvantages of conventional planning. For example, urban coding could potentially help generate the type of urban fabric whose scale, grain and character is constituted by particular kinds of building type and public

realm that was not always successfully generated by conventional zoned development. Put another way, coding could contribute to the specification and creation of places with tangible character, character that can make a real impact on people's use and appreciation of an urban area. This is in contrast to planning's conventional reliance on the somewhat abstract geometry of plan layouts or the even more abstract specification of parameters like floor area ratio.

Of course, coding also has its critics. Some of the critiques are bound up with New Urbanism in general, or Seaside in particular. For example, Seaside has specific (and perhaps atypical) issues as a resort development; while critics have expressed concern over New Urbanism as a particular kind of organization, or the typical application of this kind of design-led 'urbanism' to special kinds of suburban new-build location, without addressing the wider urban problems (see, for example, Robbins, 1998; Ellis, 2002; Marshall, 2003; Grant, 2006).

If we strip these circumstantial issues away, then we find that many criticisms of coding are similar to those applicable to any kind of planning, especially physical planning. These range from criticism of too much or too little control; of too great a concern for the physical; of criticism of attempts at social engineering or, conversely, of lack of concern for social issues. Certain aspects of architecture and planning have been accused of being privileged, paternalistic, chauvinistic, imperialist, and so on. Critics have also questioned the built environment professions' pursuit of rationalism and the Enlightenment project more generally.¹²

There is no scope here to address all these critiques, as it would become a rather general defence not only of coding, but planning, the built environment professions, rationalism, and so on.¹³ Rather, let us briefly consider more specific critiques of coding, as distinct from, say, architecture, urban design or planning more generally. These can be related to purpose, product and process.

Critics are rightly concerned with the purposes and priorities of codes. While planning was traditionally to do with promoting health and safety, Jill Grant asks what over-riding public interest codes serve. Are we simply attempting to regulate taste? In other words, Grant is questioning the need and validity of what codes seem to offer over and above the functional agenda of planning (Grant, 2006, pp. 220; 221).

Codes have been criticized for producing 'bland' or 'standardized' products (Carmona *et al.*, 2006b, p. 237; Carmona, 2009, pp. 2652, 2654). While mechanistic appliance of standards, components or dimensions may in some cases lead to what is considered monotonous effects, this is partly in the eye of the beholder. The degree of standardization may simply be the reverse side of the coin from the positive qualities of harmony, heterogeneity, uniformity.

Critics have warned of codes being 'restrictive', 'formulaic', and of having the potential to 'stifle creativity'. This is an intriguing point, since it is not strictly complaining about the end product, but the process. (But, one could ask, 'when did

the creativity and self-expression of design professionals become an over-riding public objective?'.) Codes have also been criticized for being too 'prescriptive', although this can be seen as simply the reverse side of the positive attributes of prescription – of ensuring a certain quality or character (Carmona *et al.*, 2006b, p. 237; see also Walters, 2007, pp. 93–95; Carmona, 2009, pp. 2652, 2663).

We should therefore be alert to these critiques when exploring the nature and potential of coding, and its possible contribution to the purposes of planning. Accordingly, we need to be sensitive to the professional and cultural context in which coding takes place. To do this, we need to broaden our gaze, beyond the perspective of Seaside.

Learning from History and Geography

The book *Form-Based Coding* usefully sets out a recent timeline for developments in form-based coding: this extends back less than three decades to Seaside, 1980 (Parolek *et al.*, 2008, pp. 313–315). This timeframe serves that book's purpose admirably enough, just as Seaside has also provided a convenient illustration at the outset of this book. But, Seaside's use of codes can be seen as reviving a wider and more deep-rooted tradition, and a broader sense of historical perspective would seem useful and timely. Accordingly, it seems appropriate to study the nature of coding, not only in terms of recent developments but also in terms of previous precedents.

This appeal to precedent is, of course, not new. New movements and schools of thought often draw inspiration and support from exemplars from other times and places. The 'town planning' movement of the late nineteenth and early twentieth centuries, although inherently ground-breaking and forward-looking, was conscious of the precedents provided by the planned cities of the Renaissance, Middle Ages and the ancient world. Even the Modernist architecture and planning of the 1960s and 1970s – although frequently associated with a conscious rejection of tradition – was often inspired by antecedents from traditional urbanism (Benevolo, 1980; Marshall, 2009a, p. 229).

In effect, the appeal to antecedents serves to demonstrate that new proposed visions, although innovative and radical departures from the recent past, are nevertheless rooted in (or resonant with) yet older and deeper traditions, lending them a certain degree of legitimacy, a persuasive demonstration of practicability and favourable association with successful places of the past. The historical perspective has typically been accompanied by a geographical breadth of reference – selecting a range of examples available from around the world – that would enlarge or enrich understanding of the school of thought being expounded.

The history of coding is so intertwined with the history of planning that we may hardly be able to disentangle one from the other. Historically, planned towns typically

had both planning and coding: the imposition of a ground-plan (often geometrically regular in some way) and the imposition of controlling rules to keep the buildings in a straight line, of the right size and materials, and so on. Haussmann's Paris was not just about the ground plan of grand boulevards, but also detailed control of the building forms and façades through codes. St Petersburg, though perhaps most famous for the formal geometry of its ground plan, was ordered through codification of street and house types (Kostof, 1991, pp. 256, 262, 335).¹⁴

Codes need not just refer to architectonic details. In principle a code could specify elements and relationships at a much larger scale. In Spanish America, the 'Laws of the Indies' could be interpreted as a type of code, in the sense of providing generic specifications for the location and configuration of newly founded settlements, addressing issues of settlement type, and provision for a street grid with central plaza and placement of public buildings, with reference to street width, lot size, and so on. While this refers to the configuration of the ground plan, it does not represent a plan for a specific location, but is a more generic textual specification, to be adapted and applied to any number of locations.¹⁵

Codes have been applied to create order without the use of predetermined ground plans. The apparent 'chaos' of labyrinthine cities of Islamic cultures of the Middle East and Mediterranean belies the orderly expression of consistent principles for layout associated with both cultural and religious traditions of society and space, and pragmatic concerns of climate, building structure, dimensions and so on (AlSayyad, 1991; Morris, 1994; Bianca, 2000; Hakim, 2008; Jayyusi *et al.*, 2008). Indeed, where codes have been used in the absence of overt, geometrical planned layouts, the existence of those codes – and indeed the 'planned' nature of the resulting built environment – has sometimes been overlooked. The apparently 'organic' form of Siena, rather than being unplanned, was the result of codes towards a premeditated form (Kostof, 1991, p. 335). Accordingly, the contribution and potential of urban coding, in relation to urban planning, has not always been fully realized.

Just as urban coding is not based on a single tradition so too it has many manifestations in different parts of the world. It seems natural that we can learn from different traditions in different places. If we are to learn from previous incarnations of urban coding, it will be fruitful to look beyond the immediate local antecedents of New Urbanist coding in the United States, and explore other coding traditions from around the world.

This Book

The aim of this book is to investigate urban coding in relation to urban planning, in different geographical contexts, from an historical perspective to the present day. This is in order to gain insight into a diversity of traditions and alternative approaches to

coding, to help inform today's theory and practice. The investigation is intended to help answer questions such as: What is the nature and scope of coding? What are the purposes of coding? How does coding relate to planning? Who is involved? And what are the results: what kinds of environments are created by coding, in conjunction with planning?

In this book, we explore coding and planning traditions for a variety of cases from around the world. In selecting these cases, there is no attempt to represent the overall planning history of any particular city, country or indeed continent. Rather, the net is cast widely enough to point to a range of different interpretations of what urban coding is and does, in specific places and times. These reveal a variety of relationships between coding and planning, including coding as part and parcel of planning; or specific regulations supporting planning; or coding without necessarily a plan at all. We look at different scales, from buildings and courtyards to whole towns and cities.

To do this, the book draws together a range of authors specializing in particular places and periods. Like a street whose buildings are designed by different architects, the resulting product exhibits a combination of individuality and commonality. There is a common orientation towards urban coding and planning, but within this, each contributor creates and elaborates his or her own subject matter in a way appropriate for its own time and place.

Following this introduction, ten geographically oriented chapters are organized so that, very broadly speaking, those with most emphasis on historical periods feature earlier, while those that engage more with the present and look to the future are placed later. We start and end in the Western world, travelling east and south in between.

We start with Nick Green (chapter 2) writing on the streets and squares of London, where we shall learn about the rebuilding of the city after various fires, and how large estates were laid out using codes to provide coherence and control over multiple leaseholders over time. We then explore eighteenth-century Scotland, where Charles McKean (chapter 3) addresses the use of codes in various towns and cities – notably Edinburgh and Glasgow – reflecting the Enlightenment values of their day. Shifting to the New World, Jean-François Lejeune addresses the use of codes and plans to create the cities of Latin America (chapter 4). Here, we see how modern ideas were applied on a continental scale, with a historical intertwining of universalist ideals and local realities; with particular focus on Havana and Buenos Aires.

We then shift focus to Asia. In chapter 5, Vibhuti Sachdev investigates the *Vāstu Vidya* tradition of India, demonstrating the use of codes and plans in the case of Jaipur, with reflections on the more recent cases of Vidyadhar Nagar and Gurgaon. Qinghua Guo (chapter 6) addresses the historical intertwining of planning and coding in the case of Beijing, featuring the modularity of components at the building and city scale, and the planned order of ideal cities and the local order of courtyard housing.

In the next three chapters we explore the link between historic traditions and the

influence on the way we plan and code today. Yoshihiko Baba reports on the Japanese *machizukuri* tradition of community-building as seen in the case of Kyoto, with reflections on modern applications of local codes supporting traditional architectural formats (chapter 7). Barrie Shelton traces the historical development of Adelaide, demonstrating the ‘pendular swings’ in planning theory that have influenced the shifts in the kinds of code applied and hence changes in the urban fabric (chapter 8). Karl Kropf reports on coding within the context of the development of the French planning system, exploring the use of typomorphology and street-based zoning, with reference to Paris, Rennes, Bordeaux and Asnières-sur-Oise (chapter 9).

The final two of the ten geographically focused chapters combine a historical grounding with an analysis of the current situation and explicit suggestions for future practice. Gerald Steyn reports on indigenous South African traditions, and suggests how these live on in the informal settlements of Mamelodi (in the Tshwane metropolitan area around Pretoria), and suggests how these might be adapted to form part of a new African urbanism (chapter 10). Finally, Jonathan Barnett scrutinizes the historical use of different kinds of code for zoning and subdivision within the US planning system and how they have shaped American cities (such as New York and Chicago), tracing recent developments in relation to New Urbanism (Seaside and Celebration), and suggesting ways forward for future coding (chapter 11).

The concluding chapter 12 draws out a range of themes and issues emerging from the preceding chapters, reflecting on the nature and application of urban coding in general, in terms of codes’ purposes, content, format and their relation to planning. The chapter then looks beyond existing theory and practice, to suggest future possibilities for urban coding and a kind of code-based urbanism that could operate alongside – or instead of – conventional planning.

Notes

1. The exact number of blocks depends on whether one counts all blocks depicted in the 1811 plan (some of which look purely conjectural, running straight into the water in places); or Manhattan as-built; at what date; and whether the count includes only strictly rectangular blocks or blocks forming the main grid. The answer obtained could vary from less than 1,000 to over 2,000 blocks. For a classic account of the Manhattan plan, see Reps (1965, pp. 296–299).
2. Eran Ben-Joseph’s (2005) book *The Code of the City* is subtitled *Standards and the Hidden Language of Placemaking*. Habraken’s book is called *The Structure of the Ordinary* (1998).
3. Duany *et al.* (2000, p. xi) point out that some of our best-loved places could not easily be built under today’s legislation. As Eran Ben-Joseph has shown, standards (embodied in codes) have become ‘disconnected from the original rationale for their existence’ (2005, pp. xvii; also 112–113).
4. See Hardy (2005) for the use of codes in Poundbury. See Carmona *et al.* (2006b) for a detailed account of the use of codes in an English pilot study; see also Carmona (2009) for further discussion of this in relation to actors and processes; and Carmona (2010) for a recent round-up of coding issues in the European context.
5. The advent of the new coding agenda has also been identified in terms of a ‘radical adjustment’ and ‘a conceptual change’ (Dutton, 2000, p. 78); a ‘profound departure from the land-use zoning

- of the twentieth century' (Parolek *et al.*, 2008, p. 6); a 'significant departure' (Talen, 2009, p. 144); and 'a critical juncture' (Ben-Joseph, 2009, p. 2691).
6. While Seaside is well known for being a rather exceptional, affluent resort development, this should not distract us from the historical significance of the place, any more than we should be distracted from the generic significance of the planned urban forms of Bourneville or Port Sunlight simply because of their specific remits to house workers from chocolate or soap factories.
 7. Ellis (1988) refers to the Seaside guidelines as having 'widespread recognition for their reinterpretation of the traditional American town'. In *Form-Based Coding*, Seaside is accorded the distinction of being the 'first contemporary form-based code' at the head of a timeline of form-based coding (Parolek *et al.*, 2008, p. 313).
 8. This relates to the fundamental distinction between ordering (generic specification of elements and relationships) and design (a specific assembly of such elements and relationships) made in *Cities, Design and Evolution* (Marshall, 2009a).
 9. A detailed discussion and itemization of definitions of codes and their attributes is provided by Carmona *et al.* (2006b); for further discussion see Carmona (2009, 2010).
 10. For interpretation of the meaning of planning, see Hall (2002b); and further discussion in Marshall (2009a, pp. 24–32).
 11. See also classic critiques of modernism from Alexander (1966) and more recent New Urbanist critiques such as Katz (1994) and Duany *et al.* (2000).
 12. Jill Grant is concerned that the heritage celebrated in New Urbanist forms is that of the 'winning or imperial powers', and refers to the lack of representation of women, aboriginal peoples and minorities (2006, p. 198). More generally, Grant suggests that New Urbanism 'appears to serve the interests of power' (*Ibid.*, p. 235). See also arguments relating to rationalism in Marshall (2009a, p. 44).
 13. There is no scope here to refute these arguments in detail; but four points may be made here. First, it seems unjustified to criticize the built environment professions for focusing on physical aspects, since their job is dealing with things that can be *built*. (One would not criticize a surgeon for 'only' treating the physical part of a person: that is their job. On the other hand, this does not mean that surgery is the only solution.) Second, to criticize codes because they are associated with, say, colonial-era housing is as unhelpful as criticizing cartography just because maps have been associated with colonial land-grab. Third, built environment professions seem to be 'damned if they do' have an explicit social agenda (social engineering), and 'damned if they don't'. Fourth, built environment professionals may sometimes be 'blind' to minority or disadvantaged groups when defined in social or economic terms (e.g. ethnicity, poverty) but are more naturally sensitive to those groups whose disadvantage is of direct relevance to physical design (e.g. pedestrian vulnerability or wheelchair accessibility).
 14. See also Talen (2009) for further historical examples of urban codes.
 15. Andrés Duany (2000, p.165) has described the Laws of the Indies as a kind of code. The 'Laws of the Indies' can refer to a variety of different documents; the discussion here relates to the text of the 1573 *Ordinance for the Discovery, the Population and the Pacification of the Indies* (reproduced in Mundigo and Crouch, 1977). Lemoine (2003) suggests that such codes represent retrospective descriptions of the layout of cities; Morosi (2003, pp. 24–26) suggests the model in the Laws of the Indies was a theoretical model, which subsequently evolved into a model used in practice. See also Lejeune (chapter 4, this volume).

Chapter Two

A Chronicle of Urban Codes in Pre-Industrial London's Streets and Squares

Nick Green

Tricky Problems

'In the history of London, hopeless fudges have a habit of coming good'.

(Hebbert, 1998, p. 203)

This is the story of the place-makers' codes for the capital, one of the more intriguing, and certainly confounding tales to come out of the rich planning history of pre-industrial London. For most of its history, the development of London has been driven more by pragmatism than anything else, owing less to the ideals of master planners and more to the simple and recurring message of lessons unremembered, but always rediscovered: that untrammelled development tended sooner or later to result in some sort of tragedy, whether plague, fire or the general human misery that arises from cramming large numbers of poor quality, closely-packed dwellings into a space of limited compass.

The story of what might now be called London's urban codes reflects the city's bipolar history, centred around the cities of London and Westminster, but it is more precisely to do with planning within the City of London, and planning outside it. In this chapter, we shall look at three broad examples of how urban codes were applied in particular historic circumstances, all pre-industrial (for reasons we shall come to shortly). These examples were chosen with two purposes in mind: first, they illustrate particularly well the way in which what we would now call urban coding has shaped

well-known parts of London's urban character, either instead of or in conjunction with other sorts of what we would now call master planning; second, they function as a particularly clear lens through which to view modern urban design coding practice.

To tell the story of these codes, we must look at the people behind them. The earliest of these is Henry Fitzailwyn, London's first Mayor, whose ambitions, limited as they were to basic fire-proofing of the City, appear modest almost to a fault when compared with those that came later. Fitzailwyn was the first of many to attempt, with varying degrees of success, to mitigate the worst effects of rapid growth and overcrowding. It was partly in response to the failure of some of these initiatives that those with sufficient wealth and land created new squares west of the City of London, such as Lincoln's Inn Fields and Covent Garden, in the early seventeenth century. These wealthy landowners and speculative builders used a combination of urban codes and master plans to create London's first suburban developments, but these early attempts formed the prototypes for the many squares for which London is now famous. The aim, simply, was to combine the best of town and country, and make money in the process.

Meanwhile, the City of London continued to be blighted periodically by fire, the most famous of which all but razed it to the ground in September 1666. Our next illustration, then, is the story of how grandiose master plans rapidly gave way to a rebuilding scheme that relied entirely on urban codes. Finally, we return to the squares of London for, in the eighteenth century, it is the wealthy landowner in concert with the speculative builder who, through the alliance of lofty ideals and market forces, mediated through master plans and urban codes, drove the development of central London by creating the many squares for which London remains famous.

We shall concentrate our gaze on pre-industrial London, for this is the most instructive period for the student of urban coding. By the time of industrialization, the role of urban codes had diminished as building acts took precedence in an economic environment that might best be described as *laissez faire*. Hall (2002a) called it simply 'The City of Dreadful Night'. And so it is that in the final section, we step smartly into the twenty-first century to the post-industrial era, preoccupied with sustainability, and find that urban codes remain a pragmatic solution to some tricky problems.

Coding for Basic Safety and Health

'Fitzailwyn's Assize' Gets Things Moving

London's first building ordinance came to be known as 'Fitzailwyn's Assize', after its creator, and it was introduced as a consequence of a fire in the City of London in July 1212 (Alsford, 2006). Little is known of Fitzailwyn himself. According to John Stow (1965), his full name was Henry Fitz Alwin Fitz Liefstanc; he was a goldsmith, and he

was appointed Mayor of London – its first – in 1190, a position he was to hold until he died in 1212.

The fire had broken out on the night of 12 July, according to Matthew Paris, and in the ten days over which it burned, it destroyed London Bridge, which had only recently been rebuilt of stone, and a large part of the City of London itself. The human cost was enormous: over a thousand lives taken, countless more ruined. Not surprisingly, the main point of the new regulations was to make the City less prone to fire: party walls were to be at least 3 feet (90 cm) thick and of stone; and roofs were to have gutters to carry rainwater into the streets (Weinreb and Hibbert, 1988), while thatched roofs were to be whitewashed to increase fire-resistance (Mumford, 1938).

It is here also that we see the beginnings of the uniform building line, although as we shall see, the regulations intended to curtail encroachments onto the highway were not always adhered to (Weinreb and Hibbert, 1988).

Subsequent regulations were of an equally practical nature. A building's overhanging jetties – those extensions at storeys above ground level which increased a building's floor area without increasing the size of its footprint at ground level – must be high enough to allow a man on horseback to pass beneath. Roofs were to be of tile, lead or stone, while chimneys should be faced with tile, plaster or stone. As a precaution against fire, building occupants were to keep a ladder and a barrel of water to hand at all times, but in practice these regulations were not always followed; inevitably, the problems continued (Rasmussen, 1982).

Nonetheless, these ordinances did at least seek to reduce the likelihood of problems in the future. The concept of 'planning' in the sense of 'urban planning', or 'town and country planning' was the better part of a millennium away, but the concept of 'planning' in its more general sense of forethought was clearly uppermost in Fitzailwyn's mind as through his ordinances he sought to ensure that such a devastating fire should not happen again. As we now know, he was unsuccessful in this, but the foundations had been laid: the evolution over time of a city even as wilfully independent as London could be in fact controlled, even if to only a limited extent.

Growth and Squalor in Tudor London

Just how limited became all too apparent in the centuries that followed. Mumford (1938), writing with the undoubted benefit of several centuries' hindsight, argued that over-crowding was actually a post-medieval phenomenon. London's population grew from approximately 20,000 to 25,000 at the end of the twelfth century, peaking at around 50,000 by the mid fourteenth century, and changing little in the century and half that followed (Weinreb and Hibbert, 1988, p. 613). But in the Tudor period, from 1495, when Henry VII was installed on the throne, to 1603, when Queen Elizabeth died, London's population grew fourfold (*Ibid.*). This explosive growth during the

Tudor period meant that London did indeed become increasingly overcrowded and foul; in one egregious instance, a single house was recorded as containing eleven married couples and fifteen single people (Rasmussen, 1982). As a consequence, London's residents sought more space, and so London began to spread outwards, moving beyond the walls of the City of London itself, to form new, extra-mural suburbs.

The growth of London may, in part, be attributed to the relative stability that the Tudor dynasty was able to impose. Henry VII, for example, was unusual in that the funds he borrowed from the City of London to continue his wars against the French were repaid on time (Pevsner, 1962). However, much of this growth was not due to natural expansion of the indigenous population, but to continuous immigration from the provinces, even though London's death rate was very high (Weinreb and Hibbert, 1988, p. 613).

Such unregulated expansion put enormous stress on London's fabric, and the overcrowding in the City as a consequence of this meteoric growth prompted development to spill over the City walls into those areas south and east of the City and into Westminster. Recognizing that this was clearly a problem, Elizabeth issued a Royal Proclamation in 1580 which forbade any new building within three miles (5 km) of the City. Elizabeth's Proclamation, enacted in law in 1592, also sought to control overcrowding within the City itself through the prohibition of both the sub-division of existing houses between families and the letting of rooms to lodgers (Weinreb and Hibbert, 1988).

Similar proclamations continued to be issued after Elizabeth's death, up to about 1630. These included such practical and structural matters as the regulation of brick manufacture, the thickness of walls, and the requirement that any new buildings on old foundations should be of either brick or stone.

The proclamations were ineffective though, and for two different reasons. The first was that the Stuart kings enacting them saw the fines for contravention of the regulations as a source of income. A second, more basic dilemma was that such proclamations were simply not able to solve the problems, such as overcrowding, that came with a burgeoning population (*Ibid.*).

In an early example of what would now be referred to as 'leap-frogging', private landowners simply walked away and developed outside the city walls, finding there a haven from the squalor and disease of the city centre. In the late sixteenth century, the suburbs to the west of the City were described by Stow (1965) in his *Survey of London* (first published in 1598) as salubrious places, different in character from the heavily built-up suburbs to the north and east. Indeed, in Stow's time, much of the land between the City of London and Westminster was relatively undeveloped, save for a few large houses overlooking the Thames, including Arundel House, Savoy Palace and Durham House. The church of St Martin in the Fields was true to its name then, as

was St Giles in the Fields, farther north. Westminster Abbey still had its gardens just north of the Strand, called simply the Convent Garden, while Lincoln's Inn Fields was simply an open area used primarily for recreation.

A necessary question, and a persistent one given the subject matter of this book, is this: were these proclamations examples of urban coding, urban planning, or something else entirely? Today, they would probably fall within the general compass of health and safety regulations, but we should recognize that they were regulations set down with the specific intention of creating a particular outcome that was all about making the City of London a healthier place. Had the lines been drawn on a map, we might have called it zoning, or strategic planning. With no such map, we might call it urban coding. But these are semantic distinctions, invidious in such a discussion as this. Certainly they were a form of planning, in the sense that they were intended to achieve a specific future goal, but they were also in the medieval tradition identified by Lewis Mumford whereby 'the planner made use of the irregular, the accidental, the unexpected'. But the planner 'was not averse to symmetry and regularity when, as in a frontier town, the plan could be laid out in a single step on fresh land' (Mumford, 1938, p. 53).

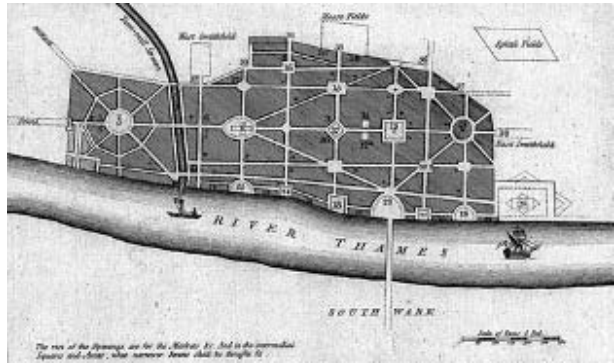
Such an approach, though admirably pragmatic, has its limits. The City's population was burgeoning, and despite various royal proclamations intended to prevent it, urban sprawl due to continued building outside the city walls carried relentlessly on. For the most part this development took the form of cottages put up on an *ad hoc* basis. Sometimes, however, grander plans were proposed: two examples – Lincoln's Inn Fields and Covent Garden – we shall look at shortly. But what really changed the face of the City was the Great Fire of 1666.

Coding for Fire-Proofing (With a Twist of Aesthetics)

The fire of 1666 was not the first fire to raze much of the City to the ground. As we have already seen, FitzAilwyn's Assize was a direct response to a much earlier fire that had exacted a far higher human price than that of 1666. But the Great Fire of 1666 hit London when it was by far the most important city in England – it had not been pre-eminent in the twelfth century – and at a time when it was a major player on the global stage. All but destroyed by the fire, the fabric of the city needed to be replaced quickly if it was not to slip into terminal decline, and King Charles II duly took charge.

Quickest to respond was Sir Christopher Wren, who presented a plan for the rebuilding of the City less than a week after the fire had been extinguished in early September 1666. Wren's plan was followed by several others, including John Evelyn and Robert Hooke, among others (figure 2.1). All were grandiose and, influenced by the fashions of the continent and the moment, envisaged the reborn City of London as a metropolis of broad streets and piazzas. But, by the end of the month, the King had

Figure 2.1. A master plan by John Evelyn for the rebuilding of the City of London after the Great Fire of 1666. Like all the plans developed for the post-fire rebuilding, Evelyn's was to all intents impossible to implement, ignoring as it did the realities of land ownership. (Source: Bodleian Library, University of Oxford)



concluded that such plans were not the best way forward, and for this simple reason: English property divisions made these plans of theoretical interest only, and the most that could be achieved in reality – admittedly still quite a lot – was some widening of streets, the creation of a few new streets and quays, and the elimination of the worst of the overcrowding (Reddaway, 1940).

Indeed, all the grand plans for London, Wren's included, were to all intents and purposes impossible to carry out. Had Wren's plan been followed, for example, every street and building in the City would have occupied a different place (Rasmussen, 1982), and any such rebuilding would have had to happen in the face of existing building lines and ownership lines, some of which remained quite clear, others of which lay hidden by debris. The clearance of this debris was itself a matter of considerable practical and administrative difficulty (Reddaway, 1940). To implement Wren's plan would thus have required the wholesale redistribution of land to the hundreds of different proprietors affected by the plan, a task for which neither the legal nor financial infrastructure then existed (Rasmussen, 1982). The deliberations of the committee that was eventually convened to consider how to proceed with the rebuilding (all the master plans having been rejected) were therefore pragmatic in tone. They resisted the temptations of grand designs in favour of a more balanced approach that sought to reconcile the needs of safety, financial expediency and practicality (*Ibid.*, p.118), but that would at the same time make the City a healthier sort of place (Reddaway, 1940).

Rules were therefore laid down to control what could realistically be controlled. Street widths were specified depending on their importance: 'Key, one hundred feet; High Streets, seventy feet; Some other Streets fifty feet and others forty two; The least Streets thirty feet or twenty five; Alleys, if any, sixteen feet' (*Ibid.*, p. 60). Houses were classed as one of four types, depending on which type of street they faced, and they ranged from four storeys for those fronting the grander streets to two storeys for those looking onto smaller streets, or more specifically, 'two storeys for bylanes, three storeys along the river and for streets and lanes of note, four storeys for high streets and

Table 2.1. The 1667 Rebuilding Act: table showing proportions of the new sorts of buildings.

<i>Sort of Building</i>	<i>Storey</i>	<i>Height of Storey</i>	<i>Thickness of Front and Rear Walls</i>	<i>Thickness of Walls between Houses</i>
First	cellar	6 ft 6 in	2 bricks	1½ bricks
	first	9 ft	1½ bricks	1½ bricks
	second	9 ft	1½ bricks	1½ bricks
	garret		1 brick	1 brick
Second	cellar	6 ft 6 in	2½ bricks	2 bricks
	first	10 ft	2 bricks	1½ bricks
	second	10 ft	2 bricks	1½ bricks
	third	9 ft	1½ bricks	1½ bricks
	garret			
Third	first	10 ft	2½ bricks	2 bricks
	second	10 ft 6 in	1½ bricks	1½ bricks
	third	9 ft	1½ bricks	1½ bricks
	fourth	8 ft 6 in	1½ bricks	1½ bricks
	garret		1 brick	1 brick

mansion houses for citizens of ‘extraordinary quality’ (Weinreb and Hibbert, 1988, p. 325). External timberwork was to be minimal in the new buildings, which would be built of either brick or stone. The City consequently took on an appearance after the fire that was completely different from its pre-fire aesthetic (figure 2.2), no longer the maze of half-timbered buildings of the type that can still be found in the Shambles of York, but a tidier, more ordered sort of place with a degree of uniformity that it had previously lacked (Kostof, 1992). The thicknesses of walls and the heights of ceilings and timber scantlings were specified too (see table 2.1). However, there was little that was genuinely new in the regulations and the Act only applied in the City. Even so, the Act was obeyed to a greater degree than previous acts and it was also used as a model outside the City.

A broad quay was built along the river bank, replacing the congested mass of small wooden dwellings that had impeded ready access to water to extinguish the fire.



Figure 2.2. Elevation of Cheapside, showing the front of St Mary-le-Bow. The houses would have been of type authorized for ‘high and principle’ streets. (Source: Reddaway, 1940)

Equally, streets were to be of sufficient width that a fire on one side of the street could not easily spread to the other side. Alleyways and narrow lanes were also prohibited where possible (Rasmussen, 1982). Crucially, however, although the necessary controls were put in place to prevent a free-for-all, the Royal Proclamation made explicit the principle that no one should 'be debarred from receiving the reasonable benefit of what ought to accrue to him from such Houses or Lands...' (cited in Rasmussen, 1982). Nonetheless, to prevent the possibility of plots of land lying vacant and unused, one provision of the 1667 Act set out the City's right of compulsory purchase at full value of any plots that remained undeveloped after three years. The City thus gained the right to sell on the plot of land for development, codifying the principle that land belongs, in effect, to the community, and that a private individual may have the right to use it for certain purposes (*Ibid.*, p. 120).

What to conclude at this stage? The planning of the City of London after the Great Fire was perhaps the most significant application of urban coding in London's history. The codes specified road widths and building heights, and linked the two together to improve significantly the urban form and safety of the City while working with, rather than against, prevailing legal and physical circumstance. That this almost total reliance on urban codes was possible rested on a single fact above all others: the ground plan – in effect a ready-made physical blueprint – already existed. But supposing the canvas is totally blank?

Coding for the Fashionably Healthy

It might be said that the development of the urban square of streets and houses surrounding a garden enclosure, which is London's principal contribution to town planning, arose from the fortuitous conjunction in time of a carefully planned piazza on the European model and an enclosure of fields which was preserved largely by accident.

(Weinreb and Hibbert, 1988, p. 602)

Palladio Comes to Town

If there is any particular urban form that is associated with London, it is surely the residential square. After the end of the Republic under Oliver Cromwell and the Restoration of the monarchy in 1660, the square became the principal unit of any major layout in developments outside the City of London. The progenitors of the London square were the piazza at Covent Garden and Lincoln's Inn Fields, but it was in Bloomsbury Square that the square first attained its typical form, followed by St James's Square, 'reaching an apogee' in the eighteenth and nineteenth centuries with Grosvenor and Belgrave Squares, and seeing the general form of the London square spread across London (*Ibid.*, p. 601).

Before we look at specific examples, it may be helpful to explore the general principles that applied, for while the layouts were not codified, they did tend to follow a pattern, influenced by current fashions in architecture that had been imported from continental Europe in general, and Italy in particular. The prevailing aesthetic drew most heavily on Palladianism, a neoclassical style of architecture that had developed from the writings of Andrea Palladio in the sixteenth century, which had its own aesthetic grammar (Mitchell, 1990). New town extensions built following neoclassical principles distinguished themselves from their medieval forerunners through the use of straight lines, deliberate symmetry and uniform dimensions; avenues radiating from a central point – an echo of the hunting lodge at the centre of the royal park – symbolized this new aesthetic. To be sure, congested slum properties could bring good returns on investment, but the rising bourgeoisie had its own pretensions, which neoclassicism fitted nicely (Mumford, 1938).

In England, the interest in Palladianism had first been ignited by Inigo Jones at the beginning of the seventeenth century, but in the eighteenth century there was a second, more intense phase. This was driven partly in response to the grandiose architecture favoured by the Stuarts, but also by the rise of the pattern book, and the autodidactic possibilities that these offered to craftsmen who knew that by training themselves as architects, they could better themselves. And so it was that with the help of pattern books, Palladian taste spread. Two pattern books stand out above the others. The first was *Vitruvius Britannicus* by Colen Campbell, a folio of engravings of the best ‘classical’ buildings in England, published in 1715. The other was an edition of Palladio’s *Four Books on Architecture* published by Giacomo Leonio. There followed over the next decade or so an ‘avalanche’ of books by authors such as Batty Langley and William Halfpenny (Summerson, 1945). An example from the mid nineteenth century can be seen in figure 2.3, which shows a plate from *Nicholson’s Dictionary of Architecture, Building and Carpentry*. Besides elevations and large-scale details of items such as balustrades, *Nicholson’s Dictionary* also includes detailed working drawings showing how different elements are constructed (Lomax and Gunyon, c. 1860).

This new fashion, combined with the fact that wealthy landowners were in a position to develop large swathes of land in a short period of time, made possible developments that were notable for both their consistency and their elegance; Bath is one such example. For these were ‘geometric achievements ... laid and built up at a stroke; if possible under the guidance of an architectural despot’ (Mumford, 1938): in modern parlance we might simply call them blueprints or master plans. In London, the obvious example of this approach is the square, which in its most mature form was typically the centrepiece of a grid-based development, embodying the classical ideals of symmetry, proportion and order, and which tended to look inwards rather than out beyond the estate’s boundaries.

This mature and enclosed form had its origins in the open spaces that surrounded

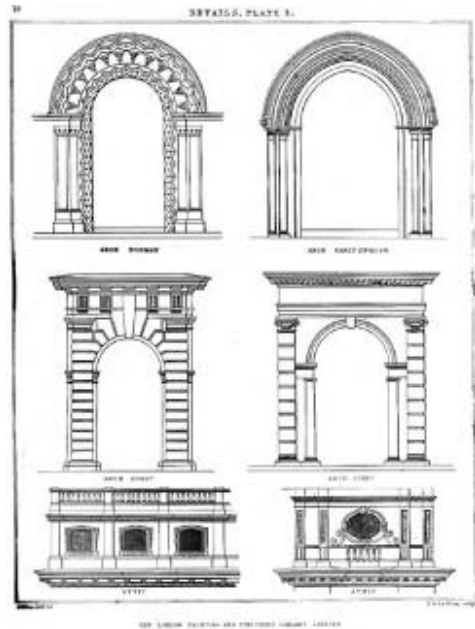


Figure 2.3. Examples of arches from Nicholson's *Dictionary*. Such illustrations, along with detailed construction drawings which such pattern books also contained, enabled artisans to teach themselves about the latest architectural fashions and techniques. (Source: Lomax and Gunyon, 1860)

the City of London. One such was Lincoln's Inn Fields which in the fourteenth century was already in frequent use by the students, clerks and apprentices studying and practising law nearby. They had long guarded their right to use it for leisure purposes, even going so far as complaining in 1376 to King Edward about the laying of traps by one Roger Leget. The King responded sympathetically to the complaint, sending Leget to the Fleet Prison, and continuing to protect Lincoln's Inn Fields from the predations of developers (Rasmussen, 1982).

Although they had originally belonged to the hospitals of St John and St Giles, the three fields that made up Lincoln's Inn Fields had been seized by Henry VIII and had remained in the ownership of the Crown ever since (*Ibid.*). By the early seventeenth century, the fields had already been developed as pleasure gardens for the general benefit of the City, and Inigo Jones was commissioned to prepare a plan for a square divided by avenues. He was followed by William Newton, a speculative builder who had acquired the lease of the fields over a period of nine years from 1629 (*Ibid.*), who successfully petitioned the king for a licence to build thirty-two houses (Weinreb and Hibbert, 1988; Rasmussen, 1982; Pevsner, 1962).

To appease the gentlemen of Lincoln's Inn, against whose wishes the development was being carried out, a compromise was negotiated whereby Newton could develop Lincoln's Inn Fields so long as a 'square peece of ground' was kept free of buildings. The current form is the result of the protracted negotiations that ensued (Weinreb and Hibbert, 1988), and by 1658, the north, south and west sides were occupied by

houses, although none of the original buildings remains: the earliest buildings around the square date to the mid-eighteenth century (Pevsner, 1962). The entire east side of the square is taken up by Lincoln's Inn itself. This was not really planning by coding; in fact it was not really planning at all, so much as developing those parts of Lincoln's Inn Fields that were not protected by restrictive covenants. But while tools even this crude worked after a fashion, the sophisticated demands of Palladian neoclassicism required sophisticated instruments of control. They took a while to come to fruition.

The Bedford Estate (1): Covent Garden

Covent Garden could reasonably claim to be the first London square. Granted to the first Earl of Bedford by Edward IV in 1553, until 1536 Covent Garden had belonged to Westminster Abbey (Woodiwiss, 1980). Most of the property was let out for grazing, although the Earl built himself a large wooden house facing the Strand. Thus for most of the sixteenth century, the appearance of Covent Garden remained more or less unchanged. By the seventeenth century, however, development had become more apparent. In 1603, small groups of houses, which were unplanned, had begun to appear, and in 1630, the fourth Earl obtained a royal licence to demolish the unplanned collections of buildings and replace them with something possessed of more substance, both structural and aesthetic (Olsen, 1982).

The licence stipulated that the new buildings should 'serve to ornament the town', and so the Earl hired Inigo Jones, King Charles's Surveyor General. Jones, whose work had been heavily influenced by the work of Andrea Palladio and a visit to Italy in 1613–1614, had already cemented his reputation with his designs for the Banqueting House in Whitehall and the New Exchange in the Strand. For the Earl of Bedford, Jones designed a square enclosed on three sides by terraced houses, while on the fourth side was St Paul's church (Weinreb and Hibbert, 1988, p. 202). The notion of the piazza had already been favourably written up by John Evelyn in his diary, following a visit to Livorno in 1644:

The piazza is very fair and commodious, and, with the church whose four columns at the portico are of black marble polished, gave the first hint to the building both of the church and piazza in Covent Garden with us, though very perfectly pursued. (cited in Rasmussen, 1982, p. 166).

Indeed, according to Pevsner (1962), the piazza at Covent Garden was actually laid out following the piazza at Livorno in Tuscany, and also with the Place des Vosges in Paris in mind. Originally designed as a single composition, of which only St Paul's church and a few houses now remain, Covent Garden piazza had Bedford House as the focal point on the south side of the piazza, St Paul's church on the west side and houses having uniform façades on the east and north sides to give the feeling of unity (*Ibid.*).

Rasmussen (1982, p. 171) likens the square to a Roman forum, governed by the temple of St Paul's church. He also points out that the portico of the church and the arcades are of the piazza, although the buildings that they front – St Paul's church and the houses – may look the other way, and exist independently of the façade (*Ibid.*, p. 172). The arcades thus became very popular in their own right, as part of the public realm, while the houses remained valuable pieces of private property (*Ibid.*).

The piazza, whose open spaces did not enjoy the protection of restrictive covenants, was only partially successful. A fruit and vegetable market grew up to the north side of the garden wall of Bedford House, and as it developed, so the piazza became less pleasant for the original residents. By the end of the century, were seeking new homes elsewhere (Olsen, 1982). The estate was not, in any case, as generously laid out as it might have been. While the piazza and some of the streets were spacious and airy, behind them lay mean and narrow streets and courts that were dark and unpleasant (*Ibid.*). Even so, Covent Garden, the first piazza in Britain, was the prototype for the London square that the Bedford Estate was subsequently instrumental in developing still further (*Ibid.*). The next time however, they did it differently.

The Bedford Estate (2): The Great Squares

London's continued expansion in size and importance in the seventeenth and eighteenth centuries greatly intensified the pressure to develop large private gardens as new suburbs, not least to provide a healthy environment for those who could afford it. The owners of those large private gardens wanted some control over who their neighbours were, and the coming together of the large private landlords with the speculative building industry ensured that the land would be developed within a tightly controlled regime, that resulted directly in the London squares (Rasmussen, 1982, p. 166). Perhaps the best example of this confluence of interests is the Bedford Estate.

The Bedford Estate provides a useful demonstration of the difficulties involved in trying to impose any sort of coherent plan on London precisely because its history is so protracted (Olsen, 1982). Beginning, as we saw above, with Covent Garden in the 1630s, the Bedford Estate came into being over the following two centuries or so in a series of separate developments, spaced out in time, and with hiatuses between (*Ibid.*). The consequence of this long, drawn-out history is that the Bedford Estate turns out to be a good illustration of the way in which parts of central London's pre-industrial urban form has come about through 'unplanned planning'.

The basic approach was simple enough. A master plan of streets and squares would be drawn up, and contractors would be invited to develop particular blocks, following more or less restrictive codes concerning building heights in relation to street widths, for example (*Ibid.*). These were not dissimilar in principle to the codes used after the Great Fire of 1666. There was a ready market for such developments amongst the



Figure 2.4. Hanover Square.
(Source: Chancellor, 1907)

middle classes, who sought city dwellings removed from the insalubrious City, but within easy access of it. The square at the centre of the development thus provided the ‘green lung’ without which the houses in the development would not sell: green space, and the clean, fresh air that it offered, was indispensable (figure 2.4). But it was not just a matter of putting physical distance between city and suburb; social distance was also imposed. In Bedford Square, for example, there were gates closing off the approaches from Oxford Street and Euston Road (they were abolished by Act of Parliament in 1893), and people with no business in Bloomsbury were not admitted (Rasmussen, 1982, p. 192).

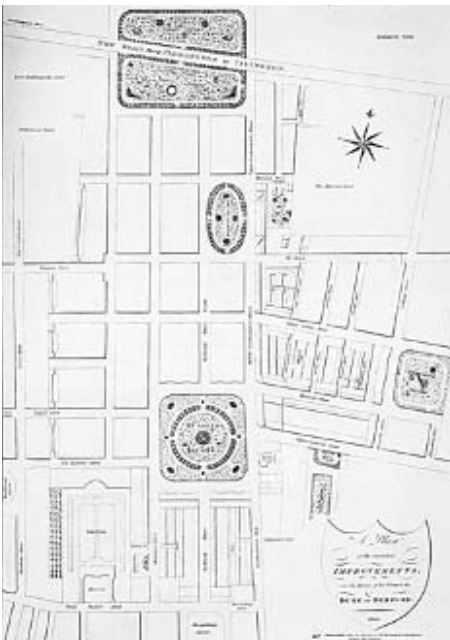


Figure 2.5. Plan of the Bloomsbury Estate, 1800. The design of each of the plots was left to the contractor (although strict control would have been wielded over what was acceptable). (Source: Reproduced by kind permission of the Duke of Bedford and the Trustees of the Bedford Estates)

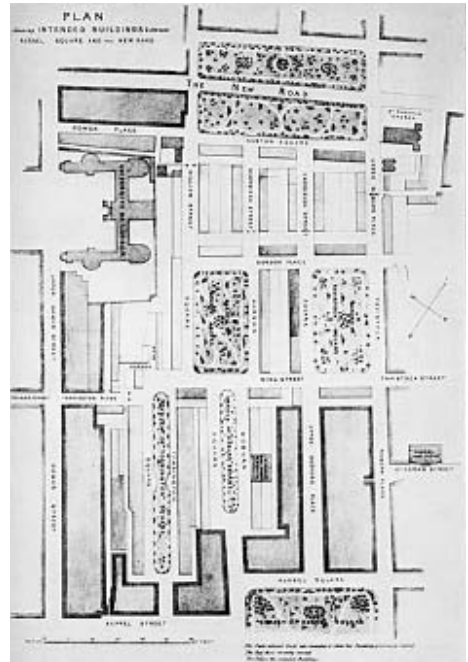


Figure 2.6. Plan of the Bloomsbury Estate c. 1830. (Source: Reproduced by kind permission of the Duke of Bedford and the Trustees of the Bedford Estates)

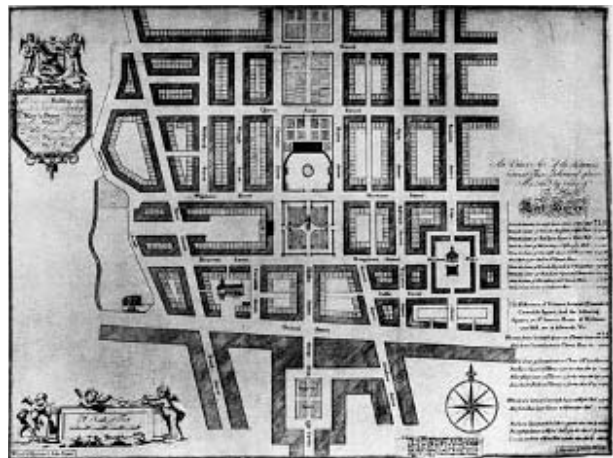


Figure 2.7. Plan of Lord Harley's estate. The illustrations in figures 2.5, 2.6 and 2.7 show the extent to which the large estates were planned. Rendered using a modern aesthetic, these would now be called 'master plans'. (Source: Chancellor, 1907)

The Bedford Estate created three closely planned estates: in the early seventeenth century, Covent Garden, described above; in the late eighteenth and early nineteenth centuries, Bloomsbury; and in the mid to late nineteenth century, Figs Mead. Covent Garden was designed as a whole, but in Bloomsbury and Figs Mead codes were used as part of a master-planning process that laid great emphasis on controlling all aspects of the development (Chancellor, 1907) (figures 2.5–2.7); no great surprise, perhaps, in view of the fact that these were in general speculative developments, involving large

numbers of people, all of whom expected to turn a profit, and all of whom therefore had a vested interest in minimizing uncertainty.

This inevitably led to conflicts, since the timescales of landowner and builder were so completely different. Whereas the builder would typically want to build the small, cheap houses that could quickly be sold for an immediate profit, the landowner, who would typically sell a ninety-nine year lease for the new property, would tend to prefer large, solidly-built dwellings that would still be capable of turning a profit ninety-nine years hence, since this was where (or when) their long-term profits lay (Olsen, 1982).

In practice, compromises on both sides had to be made. For example, in the case of Keppel Street, Bloomsbury, in a conflict between the landowner, the Duke of Bedford, and the builder, Thomas Lewis, it seems likely that Lewis was allowed to build smaller and poorer houses than the Duke of Bedford would have liked. The Keppel Street houses were eventually demolished by the Bedford Estate when their leases ended, and the cleared site was sold to the University of London in 1927 (*Ibid.*). Enforcing strict observance of leasehold conditions risked driving builders to bankruptcy, which benefited no one. This was particularly the case during the Napoleonic Wars, when the costs of building materials were high (*Ibid.*).

These developments did not happen in complete isolation. Besides the requirements of the landowner, developments by the large private estates had happened within the context of increasingly sophisticated building acts. The regulations brought in following the Great Fire continued to be developed further, both in terms of scope and geographical coverage. Thus the building acts of 1707 and 1709 affected the cities of both London and Westminster, they affected the appearance of terraced housing, and they were both concerned with fire. The Act of 1707 abolished the wooden eaves cornice, requiring the front wall to be taken up above the roof as a parapet, and the Act of 1709 required window frames to be recessed at least four inches (10 cm) from external wall face. Further Acts were passed during the eighteenth century on the construction of party walls and even to encourage the standardization of bricks.

In 1774 all previous legislation was consolidated in a new Act, which divided all buildings into various 'rates' according to size and type and established standards of construction for each rate. Each of the four rates was defined in terms of floor area and land value. The Act of 1774 was something of a milestone, drafted by Sir Robert Taylor and George Dance. The changes, though minor, were significant. For example, most of the wooden window frame had to be set within the brickwork of the reveals (the sides of the window aperture), so that only a thin strip of wood remained visible. This affected not just the resistance to fire of the buildings, but also the appearance, a fact not lost on Taylor and Dance, both of whom were accomplished artists, and both of whom understood that the changes they had set out in the Act would play themselves out in a way sympathetic to the neoclassical architectural aesthetic that prevailed at the time (Summerson, 1945).

Besides the existence of the master plan, and the building acts, there were other conditions imposed upon the builders who had been contracted to carry out the work. At Bedford Square, for example, a strict agreement set out the requirements for both materials and dimensions to be used in the first London square to be designed as a unified whole, although it was built by several different contractors (Olsen, 1982). Façades were to follow uniform design proposals that had already been drafted, for example, while pavements outside the houses were to be 9 ft 6 in (about 3 m) deep in the square itself, and 6 ft deep (a little less than 2 m) in the streets leading from the square. This is not unusual: as Olsen (1982) points out, building agreements tended generally to specify such things as building line, dimensions, materials, quality, as well as including covenants against nuisance and trade.

Coding for the Fashionably Healthy: A Summary

Planned schemes outside of the City, such as those of the Bedford Estate, were only possible because land development rights were concentrated in the hands of a few wealthy families, the Russells in the case of the Bedford Estate, and remained so through the generations. The Bedford Estate was able to commission builders to take much of the financial risk, and the use of pattern books and the demand for particular styles ensured the consistency in design that conferred a unity to the whole estate, even though it was designed and built by a variety of different builders.

The developers of the great London squares kept a close eye on the market, including the prevailing architectural trends and fashions. They had to, since although the squares themselves were basically supply-led, it was a supply-led process that assumed the existence of a latent demand. The prevailing fashions of the time were also reflected in designs that sought to be both up to date and relatively safe in terms of fire resistance: here the building acts played their part in dictating the types of material used and how they were used and, in combination with fashion, they had a significant influence on the appearance of buildings and streets. We see this particularly in the 1774 Act drafted by Sir Robert Taylor and George Dance and discussed above.

The prevailing aesthetic of the time was peculiar to England at a larger scale, too. English squares tended to differ from their continental counterparts in that they were not intended to be monumental constructs, but rather simply shared open areas that could be used by the local residents. Easily linked together to form a larger whole, as in Bloomsbury for example, they still avoid pretentiousness (Rasmussen, 1982). Even the house plans are similar from house to house: as anyone who has been in more than a few London houses from the eighteenth and nineteenth centuries will know, differences are often of scale, rather than form. Rasmussen (1982, p. 200) sees this as a cultural matter, the reserve of the urban form mirroring the reserve of the people behind it.

But even if the urban form of many of these estates is reserved, eschewing grand boulevards for leafy streets, the great estates of London such as Belgravia or Bloomsbury were planned from the outset, with both master plan and building type specified (Olsen, 1982). Olsen sketches the contrast with Paris, which initially grew with no plans at all. Instead, it is 'an unplanned jungle, hidden behind the elegant façades of Haussmann's boulevards' in the tradition of French landscape gardening: geometrical patterns cut through a dense substance, shrubbery in the case of gardening, buildings in the case of city planning. London's great estates, planned *ab initio*, were mostly private developments, often carried out speculatively, and over which the master planner could exercise a degree of control that was close to absolute (*Ibid.*).

Conclusions

Urban Codes and English Culture

The 'insistent verticality of the London house is idiomatic', thus wrote John Summerson, who added that it is an idiom that derives from two fairly basic economic considerations: the need to maximize the number of houses on a street, resulting in narrow, deep plots of land; and the fact that such a layout enables a more economic layout of drainage and sewers (Summerson, 1945, p. 51). To be sure, London's pre-industrial urban form is the consequence of a rich blend of complex interactions, but if we had to boil it down to its essence, we could reasonably point to three things: statutory instruments; individual agency as expressed through market forces; and architectural fashion (the increasing use of stucco in the late eighteenth century, for example). Only the last of these was not driven mostly by pragmatism, and all are closer to urban codes than master plans.

From Fitzwilliam's Assize in response to a tragic fire, the development of London has been guided above all not by notions of an ideal city, but by basic rules intended to ensure that the place would continue to function. Such an approach is entirely consistent with London's history, which, as Hebbert (1998) has pointed out, is 'more by fortune than by design'. Thus the first legislative planning instruments were simple regulations, designed to ensure a modicum of structural soundness and fire resistance. Subsequent plans for London were more ambitious and, it turns out, less practical than the earlier tools. From the various royal proclamations, starting with Queen Elizabeth's in 1580, that aimed unsuccessfully to limit building outside the City walls, to the grandiose and short-lived attempts by Charles II's surveyors, including Christopher Wren, Robert Hooke and John Evelyn, to plan the City anew after the Great Fire of 1666, pragmatism in the face of inertia has usually won through in the end; no surprise perhaps, in so market-driven a place as seventeenth-century London, and still the case three centuries later. For the streets and squares of the great estates were also driven

by private enterprise; but there being no ground plan to follow, master plans had to be drafted, the urban codes providing the framework by which the labours of the various contractors could be brought within the control of the landowner. Rasmussen (1982, p. 176) got it right when he observed that 'In England, there seems to be a general aversion against making any institution public which can by any means be run by a private enterprise'.

And underpinning *all* of this is a simple cultural foundation, also identified by Rasmussen in the first half of the twentieth century, and still true today. The English have, since the Middle Ages, preferred to live in one-family houses, and the response of both the authorities and the market has been to recognize this preference and to work with it. This approach is different from the continental one, which rests on mediating the growth of a city through an abstract idea of some kind of ideal urban form. The English approach simply 'legalizes what has already taken place' (*Ibid.*, p. 75). This, Rasmussen notes, reflects the differing legal systems of the two places, whereby continental law has been codified, whereas English law has been developed through precedent.

This is crucial, because the system of precedent is essentially a pragmatic one, based on what works. The post-fire codes for the City of London are a case in point, and Rasmussen highlights this in his discussion of whether or not the failure to implement Wren's plan for rebuilding the City of London after the Great Fire in 1666 was a good or a bad thing. He concludes that it was a good thing, largely because the approach eventually adopted worked *with* the grain of English culture rather than *against* it, as in practice Wren's plan would have done. And this is the clue to understanding how urban coding approaches can work in England in the twenty-first century.

Bringing It All Back Home

A clue then, but to a question with no easy answer. It seems clear enough that the British, or perhaps English preference for 'muddling through' when things gets difficult is an old habit. A kinder observation, already made by Hebbert (1998), might be that London's planning has its intellectual roots in pragmatism above all else; perhaps no great surprise in view of the fact that London was founded as a centre for those two institutions that are most necessarily pragmatic, commerce and the military.

The modern day planner or urban designer (or urbanist) finds him or herself caught between a rock and a hard place. On the one hand, a tendency to pragmatism may be looked upon as a generally positive attribute. On the other hand, such a tendency may also be distinctly short term in nature – closer to that of the eighteenth-century builder than the eighteenth-century estate landlord – and the conflicts that existed then between short-term and long-term profits have not been resolved in the intervening couple of centuries. The eighteenth- and nineteenth-century squares worked because

there was a market for this sort of urban environment. There is a real sense here that the development of the richer parts of London has been led by market forces, working in some cases in fairly close cooperation with Royal patronage. One could argue at a pinch that this is an early example of public-private partnership, but the reality is that these were property developers speculatively carving up the available space to develop as housing estates aimed squarely at the wealthier members of society.

There are of course huge differences between the eighteenth- and twenty-first-century contexts. The biggest with regard to planning are these: development rights are now nationalized; there is a town and country planning system that mediates between private and public interests; there is a system of building regulations to ensure minimum standards of construction in terms of both structural and environmental integrity; there are many more people with much greater mobility for whom to plan; environmental interests are now paramount; notions of a prevailing fashion that holds sway – on the authority of a pattern book for example – have given way to an approach that engages stakeholders and seeks a democratic consensus.

Urban codes, then, have come in a variety of forms and are nothing particularly new, even if the moniker is. Rather, they were called ordinances, or building acts, or royal proclamations, or assizes. But now that the planning and building regulations systems have between them mopped up much of what those ordinances and acts and proclamations were for, the *role* of the urban code has come to be defined more narrowly, even if its provenance is clear. If there is a master plan, or an existing ground plan as was the case in the City of London after the Great Fire, the urban code can provide a general framework within which the urban environment can be (re)constructed, while providing sufficient freedom and versatility for change over time. Indeed, this ancient definition retains its relevance: modern definitions of urban codes by both CABE (2003) and Carmona *et al.* (2006a) deviate little from this older order.

There are now many forces to be balanced in urban and regional planning, roughly summed up in the classic sustainability triumvirate of environment, society and economy. Urban coding can help in this invidious balancing act by simple virtue of the fact that it seeks to steer rather than prescribe the final outcome. In this respect, it owes more to Charles II's post-fire Acts than it does to the landowners of London's great estates. The post-fire Acts were general enough to survive the passage of time; the pattern books of the eighteenth and nineteenth centuries, though beautiful, might now be seen as overly prescriptive, even if the master plans of that time, rendered using modern graphical techniques, would not look out of place in the twenty-first century. And here perhaps is the lesson from London: it is the *combination* of plan and code that has proved so powerful in the past, providing a means of steering development towards a clear outcome while leaving room for those doing the work to proceed as they see fit; a pragmatic response to an awkward issue; a hopeless fudge come good.

Chapter Three

The Controlling Urban Code of Enlightenment Scotland

Charles McKean

Giancarlo di Carlo's suggestion that the morphology of a town, deriving from the rules that directed its evolution, reflects a city's specific culture, has been developed by Professor Daniele Pini to suggest that each town has a discernible genetic code. If properly understood, such a code would enhance understanding of the *genius loci* and be valuable in assessing the suitability of any proposed change.¹ This concept has great value for the analysis of urban history in Scotland, since it suggests not only that the historic, pre-modern towns had been built according to a genetic code, but that eighteenth-century urbanism could be examined against it to see the extent to which the latter was an *evolution* of that code or a *departure* from it.

This chapter has four objectives. First, it seeks to establish the pre-modern code of Scots burghs, and then to identify the new philosophies and concepts that persuaded Scots to adopt a radical new urban code during the later eighteenth century. It will examine both the principal features of this new code and the mechanisms by which it was enforced; and finally it will address the applicability of such an approach to the twenty-first century. The key issue is the extent to which the new code was merely an evolutionary response to the practical problems of expansion in people and trade, or whether it was the expression of something entirely different – namely the built embodiment of an *a priori* Enlightenment concept of a new civil society. Some 500 realized and unrealized new plantation towns or new suburbs were proposed throughout Scotland between 1750 and 1830 (Lockhart, 1974), and new means of enforcement were required to achieve consistency of execution.

Eighteenth-century people referred to all urban regularization as 'improvement', as though towns were undergoing a seamless evolution. This chapter questions whether

that was really so. To exchange a code originally devised for practical purposes for a code introduced for social or aesthetic purposes, implies a radical departure. Moreover, the means by which owners or councils compelled house proprietors, their architects and builders to produce such a stunning homogeneity (verging indeed upon the remorseless – ‘a cold eternity of lime and stone’ as Robert Mudie (1825, p. 152) put it) were entirely novel (see McKean, 2009). It has been suggested that this new urban code of Enlightenment Scotland was instigated by the Heriot’s Governors when laying their land for development as Edinburgh’s second New Town in the early nineteenth century (Rodger, 2001, pp. 60–61). This chapter suggests, however, that Heriot’s fearsomely didactic and authoritarian requirements were, instead, merely the most extreme expression of a code whose foundations can be found in Scottish Enlightenment philosophy, and whose manifestations had spread throughout Scotland by the latter decades of the eighteenth century. What was distinctive about the Heriot Governors’ version was merely the degree to which this code enforcement was taken.

Pre-Modern Scottish Urbanism

Scotland’s towns had evolved in an unusual manner, resembling towns neither in England nor in Europe. Its natural building material of stone and its pattern of land ownership together led to a predisposition to build stacked apartments upwards and densely in a manner unknown in England.² Scots towns also differed from European ones since they were not laid out with defence in mind. Instead of the European concentric form of encircling walls and myriad open spaces and market places, Scots burghs had a linear plan focused upon a single urban space which evolved to control the tempest by narrowing the entries to it (figure 3.1).³ A secondary service space for noisome activities lay towards the edge (see McKean, 1999, 2009).

Scots burghs laid out during the reign of David 1 in the twelfth century were parcelled out in standard units called *burgage* plots or rigs, dimensions varying slightly from town to town, but rigorous within each. From the beginning, the burgh demarcated between the public realm and private building lots; and the latter were sold (*feued*) to burgesses. The combination of the town plan, and the insistence on standard widths formed the basis of its distinctive genetic code (Guild, 2008). Civic intervention was initially restricted to the practical matters of sewage, sanitation, fire and building safety, and the built fabric was generally under the control of a burgess with the office of Dean of Guild, who had the power to vet construction and compel demolition as required. To begin with, buildings facing Edinburgh’s High Street could rise no higher than the twenty-foot fire ladder (a restriction soon abandoned). The 1621 fire regulations included a ban on the use of thatch, and a ban on timber projections encroaching on the streets followed in 1674 (Bell, 2008, p. 58). In these respects, the evolution of Scots towns was very little different from that in Europe

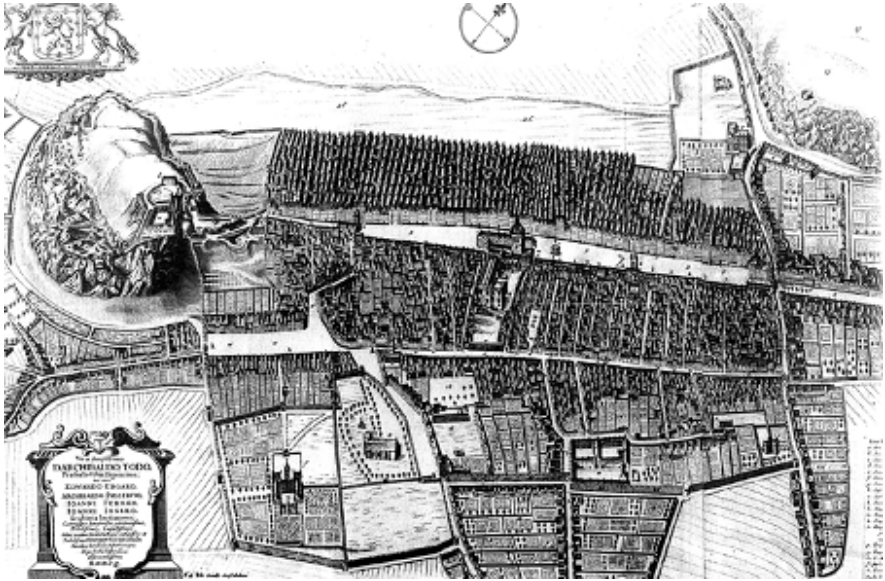


Figure 3.1. Old Town of Edinburgh in 1645, drawn by James Gordon of Rothiemay. (Source: Author's collection)

and remarkably similar to Lisbon (Barrios, 2008). Holland was stricter about height and sanitation, but slightly more lenient in the matter of thatch, acknowledging it was the most economic roofing material (Burke, 1956). Scotland's urban buildings being largely of stone, there was no need for the fire breaks between buildings customary in predominantly timber-built towns.

In time, the principal properties fronting Scottish market streets rebuilt their façades to face the street; and when they did so, their upper storeys were permitted to extend over the public pavement,⁴ initially in colourful timber galleries and superstructures supported on ground-level arcades formed from timber posts and beams. However, throughout Europe such timber projections became acknowledged as a fire hazard, so proprietors were encouraged to rebuild in stone, encouraged by being permitted to build out to the line to which their jetting timber upper storeys had encroached above the pavement. When Glasgow rebuilt its four principal streets after a major fire in 1652, the city council reviewed its code and insisted that the rebuilt façades had to be of ashlar stonework sitting upon ashlar arcades, leaving a standard eleven-foot wide pedestrian passage running behind them. None taller than four storeys (although their height could vary), they were built to the varying inherited plot widths. The resultant stone-arcaded apparent uniformity vastly impressed Daniel Defoe:

the finest built that I have ever seen in one city together. The houses are all of stone, and generally equal and uniform in height, as well as in front; the lower storey generally stands on vast square dorick columns, not round pillars, and arches beneath give passage into the shops...

tis the cleanest, and beautifullest and best built city in Britain, London excepted' (Defoe, 1725, pp. 215–217).

It was therefore in Glasgow that the 'genetic code' of pre-modern Scottish urbanism was at its most refined (figures 3.2 and 3.3).

Apartments were customarily reached by a common staircase that projected into the street to maximize the accommodation within (figure 3.4). Becoming anxious to

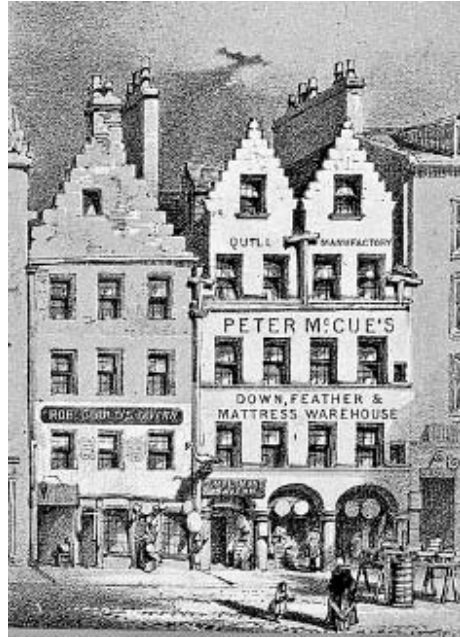


Figure 3.2. Seventeenth-century arcaded houses in Glasgow's High Street, drawn by William Simpson from *Views and Notices of Glasgow in the Olden Time*. (Source: Author's collection)



Figure 3.3. Glasgow's Trongate in 1798, from the *Picture of Glasgow*. Note the arcaded buildings on the left. (Source: Author's collection)

keep streets clear from danger and encumbrances,⁵ the civic authorities began to insist that such projecting stair towers should be moved to the rear of the building – indeed all stairs in Glasgow’s post-fire city centre rebuilding were placed at the rear. The rank of the occupiers of each floor differed markedly according to which storey they occupied:

the floor nearest heaven, called the garrets, has the greatest number of subdivisions; and here roost the families of the poor. As we descend, the inmates increase in wealth or rank; each family possessing an ‘outer door’ [i.e. to the stair]. (Ritchie, 1835, p. 153)

The apartments on the *piano nobile* or principal floor were occupied by the highest rank (Gilhooley, 1988), and the highest value properties were probably those facing the Market Cross.⁶ The very building form enforced social mixing by virtue of all ranks having to share the same stair. Thus the pre-modern Scots burgh comprised vertically proportioned stone apartment blocks of roughly standard dimensions sitting on standard plot widths. Controls were only applied for reasons of fire, safety, efficiency, and, increasingly, against the perpetual tendency of private houses to encroach upon the public domain.

Pressure for Change

In the mid eighteenth century, this inherited way of life came under pressure. The urban population expanded and growing trade required better carriageways, widened

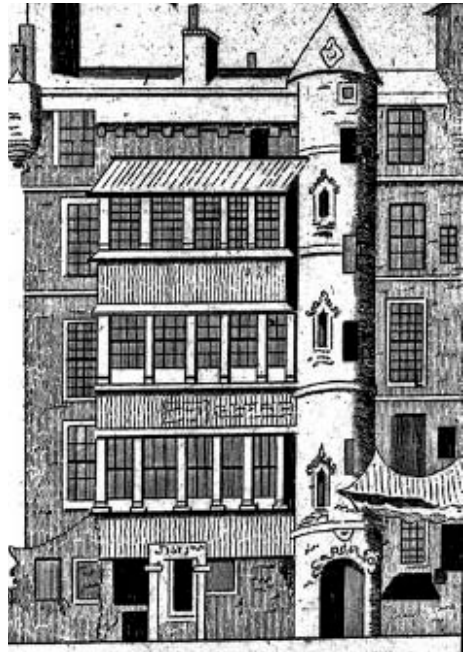


Figure 3.4. The ‘Black Turnpike’ in Edinburgh’s High Street – sixteenth-century European-style stacked apartments accessed by a common ‘vertical street’ projecting into the High Street pavement. (Source: Author’s collection)

streets and new bridges, and the removal of obstacles such as town gates, market crosses and encroaching buildings. New long-distance turnpike roads which were opened between and through towns could act as the catalyst for new suburbs – as they did in Aberdeen, Banff and Dundee. Properties that blocked their progress and entry to market places were purchased and demolished.⁷ Maybole burgh council even persuaded the Earl of Cassilis that the kitchen in the inner court of his ‘castle’ (his seventeenth-century town house) should be demolished to allow the turnpike road to enter the town’s market place.⁸ Changes like this, required for efficiency and trade, could probably be regarded as evolutionary. But the evolutionary way in which the inherited urban code would respond to a rising population would be either by increasing density, or by building similar blocks of apartments on vacant land; and it was becoming doubtful whether, given the chance in an era of polite behaviour and increasing ‘gentility’, people would continue to be satisfied with living in very tall buildings with all classes sharing a common stair (see Bell, 2008, chapter 11).

Now that towns were conceived as stages for polite interaction, a genteel town aspiring to *politesse* had to be decent. Paving and lighting programmes were accelerated and edict after edict was issued banning the *glaur* of blood, offal, mud, nightsoil and dung. Most burghs briskly relocated their shambles or slaughterhouses from the high street to the towns’ fringes. Buildings and porticos that prevented the regularization of the principal thoroughfares were demolished,⁹ as were stair towers projecting into the highway.¹⁰ As the Aberdeen Police Commissioners observed, ‘to let the streets remain in their former inconvenient and wretched state ... [would prove] ... a bar to every rational and judicious improvement’.¹¹

A genteel town was also expected to take all necessary action to ‘ornament’ itself, since a town’s ornamentation governed its esteem in the eyes of others. The concept of ornamentation was slippery, sometimes meaning only the regularization and smartening of a burgh’s principal spaces but the term was also used for civic aggrandisement. Pioneered by Dundee in 1735, several burghs undertook a programme of compulsorily purchasing ruinous houses facing the main streets and rebuilding them the better to edify the town.¹² The removal of timber galleries and frontages or of thatched roofs – allegedly ‘for preventing the hazard or damage by fire’¹³ but probably more because burgh councils were striving after a superior appearance¹⁴ – was considered ornamental. So ‘ornamental’ works could vary from removing an ugly shed,¹⁵ to making buildings ‘uniform’ and streets regular.¹⁶ Stone frontages and slate roofs became the minimum requisites – Dumfries, for example, requiring the construction of any new houses facing the High Street to be at least two storeys high, with roofs slated or tiled.¹⁷ Irvine followed suit in 1784 for the ‘ornamentation’ of the burgh.¹⁸ Ornamentation had become a catch-all concept difficult to oppose.

Improvement and ornamentation, however, were not going to be confined to mere efficiency; they soon embraced civic adornment through appropriately located and

suitably imposing civic buildings. The importance of appropriate public buildings to a burgh's self esteem was underscored by the welcome given to Dundee's Exchange Coffee House in 1828:

Beyond doubt, it will be a great ornament to the town, *deficient as it is in public buildings* [my italics]; and although it would be ridiculous to compare this erection ... with the splendid monuments of architecture in other places, yet its beauty, simplicity, and adaptation to the purposes intended, it is not surpassed by any building whatsoever.¹⁹

As most burghs were becoming impatient with the public buildings that they had inherited from the pre-modern period, they began to consider their churches, academies, schools, tolbooths, prisons and town houses as inadequate in size, in condition, and in civic dignity in this world of competitive civic construction. It is evident that the population increase caused a particular problem with schools, prisons and churches, whereas the replacement of town houses or tolbooths was usually justified on the poor condition of their fabric, or even on the aesthetic grounds that they were no longer sufficiently imposing. The anonymous author of *The History and Description of Inverness* (albeit late for this study) considered the 1708 Town House too plain: 'it possesses no other ornament than the arms of the town, and the Royal Arms'.²⁰

So, although decisions by eighteenth-century burgh councils remained fundamentally *ad hoc*, they had revealed, whenever the opportunity had arisen, a fondness for regularity and ornamentation that extended far beyond mere efficiency. Thus when they got the opportunity of laying out new streets, squares or suburbs, those same councils were tempted to exert much more control than had their predecessors. Furthermore, one can infer changing urban hierarchies as new streets or civic buildings were located away from the old centre. Following the construction of a new bridge in Ayr, the elite part of town shifted westwards, away from the High Street in the direction of the bridge. So when the council proposed to develop an 'elegant' square (Wellington Square), the preferred site was naturally in this new district, and the old town around the High Street began its inexorable decline.

Changing Social Patterns

The arrival of the new code was heralded in 1752, when proposals were published for the construction of an aristocratic suburb on farmland to the north of Edinburgh, and the construction of what became called the New Town followed an architectural competition in 1766. Thus began the construction of five phases of consistent neo-classical suburbs or new towns over the following seventy years, collectively comprising the most extensive example of coherent Georgian town planning. Generally thought to have been designed by James Craig, the plan was probably much earlier and may have been designed by the architects Robert or John Adam (see McKean, 2005). The

plan was to construct a suburb to house ‘people of rank and certain fortunate only’, who were to be attracted back from London by the greater sophistication of this ‘new town’. The phrase ‘houses after the English manner’ ‘inhabited’, as Robert Forsyth (1805–1808, Vol. 3, p. 191) put it, ‘by a single family from top to bottom’, had been used to describe new houses in Edinburgh’s existing Argyll Square and Brown Square; and it has been assumed that this was the preferred goal of eighteenth-century Scottish urban dwellers. The English observer Edward Topham (1776, p. 6), for example, characterized the greatest part of the New Town as being ‘built after the manner of the English, and the houses are what they call here ‘houses to themselves’. It has been assumed that there was a great pent-up demand to quit the apartments of the Old Town for these new fashionable houses. But Topham, like historians after him, was deceived.

The continuing popularity of the Old Town living long after the New Town was begun is indicated in James Boswell’s resentment that in 1777 his father sold the family apartment in Blair’s Land facing Parliament Close. He pledged himself to repurchase it when he could (Milne, 2001, p. 284). Substantial rebuilding continued within the Old Town of Edinburgh throughout the later eighteenth century, as the old fabric was modernized or rebuilt (Bell, 2008, chapters 13 and 16). Tenements were refaced in a spare and elegant classicism, sometimes capped with a pediment, and usually sitting on an arcaded ground floor in echo of the original arcades. Indeed, the architecture of South Bridge was strikingly similar to that of post-earthquake Lisbon (figure 3.5). Essentially, it was the Scottish-European pattern of apartment living updated. However, to see a coherent development of this type one had to travel to Glasgow.

The form of Glasgow’s first suburban expansion, west of its mediaeval High Street (now called the Merchant City), was also a modernized version of European urban living, namely apartments above arcaded commercial premises – real arcades rather than visual echoes of them as in Edinburgh (Cleland, 1856). This was the pattern of Robert and James Adam’s Stirling’s Square, their designs for Ingram Street, George Square, and also for Glassford Street, which was built as two floors of apartments

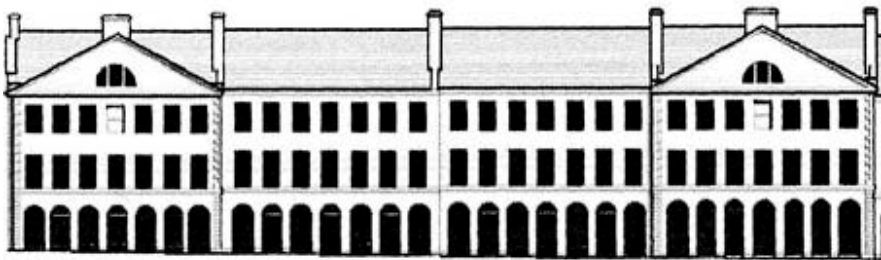


Figure 3.5. South Bridge – elevation as built by Robert Kay, showing late eighteenth-century apartments above arcaded commercial premises. (Source: Reproduced by courtesy of Simpson and Brown Architects)

above an arcaded commercial ground floor.²¹ A similar urban form appears in the first plans to modernize Aberdeen east of the Denburn Bridge (Brogden, 1986, p. 39). Although lower and much more regular than those in the old towns, these new blocks could still be interpreted as a revised version of the original code, entirely appropriate for a mixed-use city centre. Glasgow, however, applied it to its first suburb.

Curiously the architect James Craig, generally ascribed as author of the plan of Edinburgh's New Town, proposed a compromise between the old and new urban forms in his development of St. James Square at the east end of the New Town in 1773 – namely tall blocks of apartments enclosing a private square. Craig boasted of its fiscal advantages and of its greater proximity to Parliament House and the Exchange than most of the New Town. He emphasized how much his new square would be 'sheltered by the New Town from the westerly winds *which blow near half the year with the greatest Violence* [my italics] from that Quarter'.²² He did not exaggerate. As the Edinburgh historian Hugo Arnot observed in 1779, the New Town was 'in a special manner, exposed to very violent winds, which rage in Edinburgh with incredible fury' (Arnot, 1998 [1779], p. 185); and when Robert Southey visited in 1819, he observed sourly that in the New Town there was 'neither protection nor escape from the severe winds' (Southey, 1929). Given the success with which the old city had evolved to exclude the wind, the carelessness with which the New Town plan had disregarded climatic factors was further evidence of its rejection of the past rather than its evolution from it. However sheltered though St. James Square might have been, it had none of the proportional elegance of neo-classical squares. Rather, it more resembled a reworking of Milne's Court in the Lawnmarket of a century earlier. Glasgow's first suburb had been occupied by businessmen, those involved with the University, and lesser military folk;²³ but the growing social influence of England implied something different for Edinburgh.

A New Urbanism

In 1761, the painter Allan Ramsay sought to build on his land on Edinburgh's Castle Hill, and petitioned the Council for permission 'to build two houses *in the English fashion* [my italics] fit to accommodate two small families of distinction – a project of certain advantage to the city of Edinburgh'.²⁴ What were these supposed advantages to Edinburgh? Since taller denser tenements on the St. James Square model would have produced a great volume of occupation and tax, Ramsay was almost certainly suggesting that it was the type of house that would raise the tone of the capital.

However, simply building 'houses after the English manner' would not of itself produce the new urbanism for which Scotland was to become famous, as had become obvious from the abortive nature of Argyll Square and Brown Square constructed on the flat lands to the south. Neither was a complete square nor was it homogeneous

in scale or architecture. Even Edinburgh's first complete square, James Brown's enormous speculative George Square, begun in 1766 (see Tait and Gray, 1948), did not represent what Scotland was going to achieve later, lacking both the three-dimensional intellectual rigour of the first New Town and the architectural rigidities of the second. Relatively small terraced houses of approximately similar scale, with approximately similar details in very variegated stonework, were impressive solely for their orderliness. They were disproportionately small to act as an adequate enclosure for the garden which they enclosed.²⁵ Its lacklustre architecture and urbanism led Lord Cockburn, tellingly, to refer to it as 'the new part of the old town' (Cockburn, 1856, p. 27) (figure 3.6).

Figure 3.6. West side of George Square, Edinburgh, begun in 1766. Note the heterogeneous nature of the houses, altogether more relaxed in their scale and materials than subsequent developments in the New Town. (Source: Author's collection)



George Square resembled squares in London such as Berkeley, Hanover and Cavendish Squares, although the latter were much tighter – *more urban* – in proportion. Like them, it spoke of wealth and a separation from the common throng, and its residents, who included the Countess of Sutherland, Lord Melville ('the absolute dictator of Scotland' (*Ibid.*, p. 79)), ambassadors and eminent military gentlemen, were far from 'lacklustre' (Bell, 2008, p. 222)²⁶ (considerably more distinguished than the first occupiers of the Earl of Moray's fourth New Town sixty years later) (see Mitchell, 1998; McKean, 2005). Yet it was the last development to be satisfied with a mere rough homogeneity of buildings and scale instead of a formal design. When, almost half a century later, the Heriot Governors laid out the second New Town, they imposed a precise fifteen-clause specification governing all aspects of the buildings' appearance – scale, size, roof pitch, use, dimensions, and building materials. So it was between 1760 and 1800 that the code of Scotland's new urbanism evolved (Youngson, 1970, pp. 208–211).

A New Civil Society

For such stringent controls on ancient liberties to become acceptable, a substantial change was required to the Scottish mind set – and that was provided by the Enlightenment with its concept of a new civil society of useful people effectively led by the intelligentsia. Its rationale was encapsulated in the classic Enlightenment text – the *PROPOSALS For carrying on certain PUBLIC WORKS in EDINBURGH* published in 1752. Following a major tenement collapse in the High Street in 1751, a Committee, whose members were largely members of the Revolution Club, and whose perspective was entirely British, had been appointed to advise on various building projects required for the Old Town of Edinburgh and on ‘other useful works’ (McKean, 2005, p. 44). The document set out to justify three propositions: first, to build a Merchant’s Exchange upon ruins beside St Giles parish church; second, to build an extensive multi-functional administration building, including *the great charter room of the nation* in Parliament Square; and finally to extend the city boundary and open new streets north and south, canalizing the Nor’ Loch and laying it out with ‘walks and terrasses’ (*Ibid.*, p. 26). Of these, the enlargement of Edinburgh was ‘the most important article’ (*Ibid.*, p. 30). Exactly what type of expansion was implied by comparison: London was praised for ‘the neatness and accommodation of its private houses’ and the ‘beauty and conveniency of its numerous streets and open squares’ (*Ibid.*, p. 6), and the new towns of Berlin and Turin were admired for ‘their spacious streets and large buildings’ (*Ibid.*, p. 32). Edinburgh’s new suburb was to be ‘thinly inhabited and that too by strangers chiefly, and persons of considerable rank’; whereas men ‘of professions and business of every kind’ were expected to remain living in the city centre (*Ibid.*, pp. 31–32).

The proposals were justified on three grounds: efficiency, ornamentation of the city, and, above all, the capital’s inadequacy to represent the new Scotland: ‘the meanness of Edinburgh has been too long an obstruction to our improvement and a reproach to SCOTLAND’ (*Ibid.*, p. 24). The authors attacked ‘local prejudices ... inconsistent with polished manners and growing wealth’ (*Ibid.*, p. 8), particularly apartments whose height was ‘almost incredible’ (*Ibid.*, p. 7), in which – crucially – all classes had to use the same ‘upright street [i.e. staircase] constantly dark and dirty’ (*Ibid.*, p. 8).²⁷ Spacious streets and squares were the coming thing.

Fourteen years later, once a bridge to the north was under construction and powers to extend the city boundary imminent, the City Council issued advertisements inviting plans for laying out the fields ‘for the purpose of building houses’. They were ambiguous, in that it was unclear whether they meant ‘houses after the English manner’ or ‘houses’ as generally implied in Scotland – namely apartments. The implication is the former. Architects and others were invited to submit plans which marked ‘out streets of a proper breadth, and bye-lanes...’ (Mears and Russell, 1941, pp. 6–8). The Council was looking for ‘plans of regular streets and buildings’ that avoided ‘the inconveniences and

disadvantages which rise from carrying on buildings without regard to any order or regularity'. Order and regularity was to characterize the architectural expression of the Enlightenment.

However, a plan for the site already existed. Bishop Pococke had seen it when in Edinburgh in 1760. Perhaps the architects John and Robert Adam had prepared it when involved in the Committee drawing up the *Proposals* (John had even sketched a proposed North Bridge on their copy). This plan was for a suburb on the hill to the north laid out 'into three streets from east to west, and the houses to be only three storeys high, which will make it a most noble city' (Pococke, 1887, p. 306). It is therefore curious that the prize in the 1766 architectural competition was awarded to the 27 year old James Craig (not as young as previously thought and one of Edinburgh's establishment)²⁸ whose design sacrificed the necessary regularity for the symbolism of the British flag – the Union Jack – with a circus at its centre (figure 3.7).²⁹ His plan of sharply triangular building blocks, being both contrary to the competition brief and unbuildable, was taken away for amendment by John Adam and William Mylne.³⁰ The final agreed plan bore far less resemblance to Craig's 'Union Jack' design than to that described six years earlier by Pococke, with the addition of squares at each end.



Figure 3.7. James Craig's initial Union Jack plan. (Source: Reproduced by courtesy of the Trustees of the National Library of Scotland)

It has been fashionable to deride the plan of the first New Town, Youngson (1970, pp. 74–79) calling it mechanical – a poor affair that failed to include fashionable elements such as a circus, and Bell (2008, p. 227) referring to it as 'crude and unsophisticated'. Because these criticisms arose from considering the plan as a work of art, and comparing it to contemporary town planning elsewhere, they miss both the plan's significance, references and purpose. It is, first, a careful exercise in ancestral piety. It is also a recreation of the ancient world. Above all, it represented the physical expression of the Enlightenment's new civil society. Only ancestral piety can explain

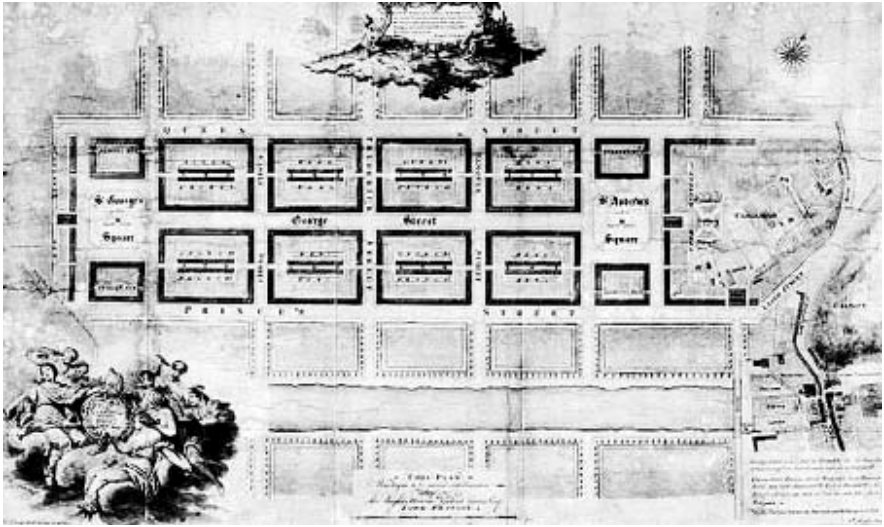


Figure 3.8. The final accepted plan for New Edinburgh, 1767, centred on a principal parade or *decumanus* in echo of a Roman fort. (Source: Author's collection)

the decision to hinge the suburb on a single large parade running along a ridge in echo of the High Street, with a width (about 30 metres) almost identical to it. The resemblance to a Roman fort (Rome being a strong influence on the lives of the Adam architects and their patron Sir John Clerk of Penicuik) best explains the plan's form – an isolated rectilinear plantation on a rural site, approachable only from its south-eastern extremity, focused upon a central urban street – virtually a *decumanus* (figure 3.8). The squares at either end represented the apex of the proposed social hierarchy. Squares were private spaces owned by the property owners surrounding them. This suburb had no public gathering point – no space to riot in. Thus Edinburgh's New Town plan turned its back on the European tradition of urban dwelling and public spaces, opting firmly for a London-inspired, and therefore 'British', concept.

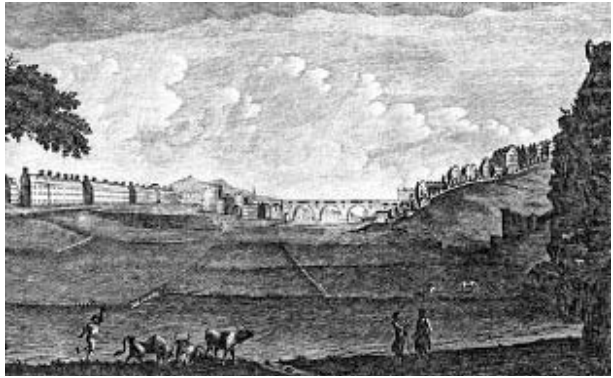
This plan went far beyond creating urban shapes. The key feature of Enlightenment thinking exemplified by this plan was what we now call social engineering: the controlled construction of a new civil society free from arbitrary rule; and the plan embodied a clear conception of how everybody useful in the new civil society might be arranged. First, streets were to be occupied by people of a similar rank, with separate streets for those of a different rank, and everybody had a pre-ordained place – ordered, categorized, classified and separated.³¹ Those who had shared the same staircase in the Old Town lived in separate streets in the new one: almost as though that staircase and its apartments had been laid flat upon the ground. Second, the arrangement of the blocks reflected the interdependent relationships between useful persons – the elite, the professionals, the service providers, suppliers and the servants each in their own

place. Third, the width, height and building materials of the streets were governed by rank; and their consistency of appearance suppressed the individuality of the occupiers. Fourth, the ‘equality’ praised in the *Proposals* implied the sublimation of the individual to the collective: all buildings in the same street were to be identical in scale and virtually in appearance – save where urban aesthetics required emphasis (such as pedimented centrepieces or corner pavilions).

Social segregation, of itself, was not novel. Dutch building codes, for example, had become quite prescriptive in the later sixteenth century, laying down plot sizes, height and, sometimes, building materials (Burke, 1956, p. 130). However, as their towns expanded, the type of control was extended to a form of zoning. Extensions to Leiden between 1610 and 1659 distinguished those streets or canal frontages reserved for the most prosperous merchants from those for workmen’s quarters, workshops and industrial housing. Streets built specifically for weavers in Amsterdam in 1671 consisted of narrow brick terraces facing streets 28 feet wide: in many ways not unlike the original houses in Rose Street (*Ibid.*, pp. 132–133, 138). Edinburgh, however, was different. No industry at all was to be permitted in the New Town and the concept of segregation was applied instead to social stratification. Moreover, whereas the new town plan had borrowed the concept of squares from England, since the Council had purchased the entire site, it could arrange them with much greater control – as the Cambridge professor, John Symonds, observed: ‘detached parts of London or other cities might possibly be put together to equal [the New Town], but such a contrived mass of excellent buildings I never beheld’ (Brown, 1997, p. 117). The New Town’s rigorously geometric grid achieved far greater axial splendour than ever contemplated in the casually connected squares of Mayfair. The final plan of the New Town showed pure overarching form within which considerable variety appeared to be possible, exemplifying the Enlightenment aesthetic ideal of Francis Hutcheson – namely diversity within unity (see Broadie, 2001, chapters 3 and 6).

Craig’s plan had not clarified exactly what type of building was proposed.³² From the very careful delineation of each garden, the implication is that the buildings were intended to be individual terraced houses in the English manner. Yet some of the properties were blocks of apartments from the beginning. When the mason Alexander Reid bought his first stance on Princes Street in 1781, he constructed a building which looked like a house from the front, but contained four spacious apartments;³³ and current research suggests that ‘family’ houses entire unto themselves were in the minority in the New Town (Bell, 2008, p. 237). To disguise that fact, apartments facing Edinburgh’s cross streets, such as Sir Walter Scott’s house at 39 Castle Street, were disguised to look like classical villas. Nonetheless, these new apartments differed from those of the old high streets, in that not only did they *look* like their adjacent classical neighbours (same height and materials), but they were occupied by persons *all of approximately the same rank* (figure 3.9).

Figure 3.9. The Old (right) and New (left) Towns of Edinburgh separated by the former Nor' Loch, drawn in 1776 by John Elphinstone. (Source: Author's collection)



The *Proposals* had been widely broadcast throughout the country – not only read out at the Convention of Royal Burghs, but at burgh council meetings with the highlights engrossed in the minutes.³⁴ However, excluding the ubiquitous rural weaving villages founded on comparable controlling grid-iron principles (Lockhart, 1974) (figure 3.10), there was little real emulation of Edinburgh until it was clear that the New Town was going to be a success – in other words, little before the mid 1790s. However, once Edinburgh's New Town had turned the corner it became customary, as can be gauged from entries to the *Old Statistical Account* in the 1790s, to evaluate the sophistication of a Scottish burgh according to the extent to which it had followed suit. A flurry of



Figure 3.10. Proposal to remove the ancient town of Fochabers, Moray, to a new site, further away from Gordon Castle, laid out on grid-iron Enlightenment principles. (Source: SCOTLANDSIMAGES.COM, Crown copyright 2009, the National Archives of Scotland, RHP2356)

plans of similarly segregated suburbs were prepared for, *inter alia*, Greenock, Paisley, Aberdeen, Glasgow, Banff, Ayr, Dumfries, Thurso, Stonehaven, Arbroath and Perth. The concept was three-dimensional since the width of streets was conceived in proportion to the scale of the houses facing them, their dimensions rising from 25 feet wide in the 1760s to a norm of 40 feet wide by 1820 – or 60 feet in the highest ranked locations. If the enclosing buildings were too tall, as in Dundee’s Castle Street, or too low as in Aberdeen’s Union Street, a street’s dignity could be compromised.

Nor were all parts of a ‘new town’ equally elite. A square, faced by the largest plots and subject to the most elaborate design requirements, indicated the apex of the proposal. In 1799, a new square was proposed for Ayr (later called Wellington Square) intended for ‘decent houses and offices for the accommodation of genteel families’ – *only*.³⁵ Moreover, proprietors of square properties had greater burdens than those of a property facing a street – as the problems encountered in completing Edinburgh’s Charlotte Square indicate. Begun in 1792, Charlotte Square stuttered to a virtual halt after the completion of its northern wing; and it remained quarter-built until the construction of the entire second New Town on the Heriot Estate downhill was completed (figure 3.11).³⁶ Success in the one against stalemated the other was caused by the lavish scale and the Robert Adam design discouraging purchasers. Sale conditions, for example, required façades of Redhall ashlar stonework, and adornment with ‘Sphinx, Bulls head, Swag husks and Ribbon knots’ (cited in Youngson, 1970, p. 201). Purchasers also had to contribute to maintaining the square itself. Charlotte Square was finally saved by the personal intervention of the Lord Provost, Sir John Marjoribanks of Lees, who bought virtually the entire south side in the 1820s.³⁷



Figure 3.11. North wing of Robert Adam’s Charlotte Square, 1792: nine terraced houses lining the north side disguised as a single palace-front design to which developers had to adhere. (Source: Author’s collection)

The Means of Enforcement

The principal issue was how to enforce this new code, and how much variety could be permitted before its unity was compromised. Edinburgh's Council expected that 'individual purchasers were bound to observe certain rules in their building, conducive to the general beauty and conformity' (Arnot, 1998, p. 183), and each purchaser was required to sign their agreement to Craig's plan. The plan, however, showed just the streets and pavements, the plots and their gardens – to which the Council added a maximum height. They must have assumed that this control of rank, scale and alignment only would provide sufficient uniformity. But the plan did not prevent the deviation from terraced houses to apartment blocks. Moreover, the Council itself led the way in more significant deviations. Even before construction began, it decided to permit the amalgamation of the three central stances in each block for the creation of larger buildings which could then be set back from the street line.³⁸ Further deviations from the plan included allowing the banker and principal investor in the New Town, Sir William Forbes of Pitsligo, to erect a house of only two storeys on Princes Street (Chambers, 1825, Vol. 1, p. 65), and, above all, the Council selling the axial site designated for the eastern church facing down George Street to Sir Laurence Dundas for his grandiose mansion.

The Council refused to control the details of façade design 'as people's taste of building is so different'.³⁹ The resulting mish-mash of façades – some harled rubble, some coursed rubble, some ashlar and some polished ashlar – compares strangely with Bristol's enforcing the façades of houses facing Queen's Square being of brick with stone dressings almost seventy years earlier. Even Craig himself proposed to break the regularity of George Street by proposing lower buildings, embellished by an octagonal bay projecting into the street, to flank his Physicians' Hall in George Street.⁴⁰ So the plan's power to govern both visual and functional deviation was increasingly revealed as ineffective, and the House of Lords determined in 1818 that Craig's plan could not, on its own, be used safely as a basis to determine what could or could not be built (Rodger, 2001, chapter 2 and personal communication). It was no surprise.

The 1818 decision merely codified a tendency to supplement the control exercised by the plan with conditions attached to the sale of properties that had been growing over the previous twenty years. It had been realized that the new urban code had to be reinforced – resulting in the mutually interdependent combination of the requirements of the plan together with the specific architectural and functional requirements imposed by the sale conditions. Thus, when Glasgow laid out a second new town focused on George Square, its houses had to conform not only to the dimensions and location specified by the plan, but to the appearance of three square storeys, built of ashlar work, and roofed in slate,⁴¹ with the prohibition of carrying out of any business or industry, as specified in the sale deed.⁴² When Dundee's Council opened a new street through its

Kirklands in 1793 to join together two new turnpike roads, the restrictions were only that each house had to be slated, face the new street (i.e. no gable to it), and consist of a ground storey and two storeys above, and laid out according to the plan.⁴³ Aberdeen's Bon Accord Square, built some decades later, required additionally that the houses be built of granite 'and dressed equal to ashlar work' (Macaulay, 2002, p. 419). Proprietors facing Tay Square at the bottom of Dundee's new street were required to sow seed and contribute one-seventh to the railings for the 'common benefit of all'. Not all did so. Since the railings were never erected, the square attracted rubbish; yet the Council enforced the sale conditions in 1806 only after being compelled by the angry occupant of lot seven with a lawsuit.⁴⁴ The failure to include a restriction of function in the sale conditions could be disastrous. The amenity of Tay Street was damaged by a foundry operating at the bottom of one of its gardens, and that of the adjacent Park Place ruined by the failure to prevent a sugar house opening at its head.

In 1785, accepting that its rules and regulations 'had, in some instances been disregarded and attempted to be evaded', Edinburgh's Council had tightened its aesthetic controls.⁴⁵ Each builder now had to submit a plan and elevation, with the implication that the submitted elevations would be subject to Council scrutiny (although it is not clear if any control was exercised). Building height was restricted to 48 feet – or three principal storeys – in the main streets, two storeys being adequate for the lesser and narrower Rose and Thistle Streets. Since gables to the street and dormer windows would interrupt the uniformity, they were prohibited. Yet as it slowly moved westward, Edinburgh's George Street was not a good advertisement for this tightened aesthetic. Neighbour vied with neighbour in janglingly decorative pilasters, quoins and cornices, and during the late 1780s, façades of individual houses became competitively elaborate. The homogeneity of this great urban parade was maintained only through the scale of the street itself, and the consistent use of large blocks of Craighleith stone (figure 3.12). Moreover, the plain blocks of George Street conceived in 1767 if not 1752 were much less architectonic than, for example, the emergence of 'palace-fronted' blocks with emphasis on a pedimented centre and end pavilions that had begun to appear in Glasgow's George Square. So it was probably in reaction to the relative design failure of George Street that Edinburgh's Council commissioned Robert Adam to design unified façades for Charlotte Square in 1792, and required purchasers of plots to conform to what proved to be such extravagant and unaffordable plans.

Aberdeen's Improvement Trustees were also caught between the necessity to achieve regularity and the desire to be permissive. They desired 'as much individuality as might suit the ideas of individual purchasers, and at the same time preserve uniformity and regularity in the street'. Housing blocks between the cross streets had to 'form one compartment and be of the same height of forewall, number of floors and pitch of roof' (*Ibid.*, p. 415), ensuring a remorseless regularity of scale in a street that extended for well nigh a mile in length. Controls in Ayr's Wellington Square went considerably

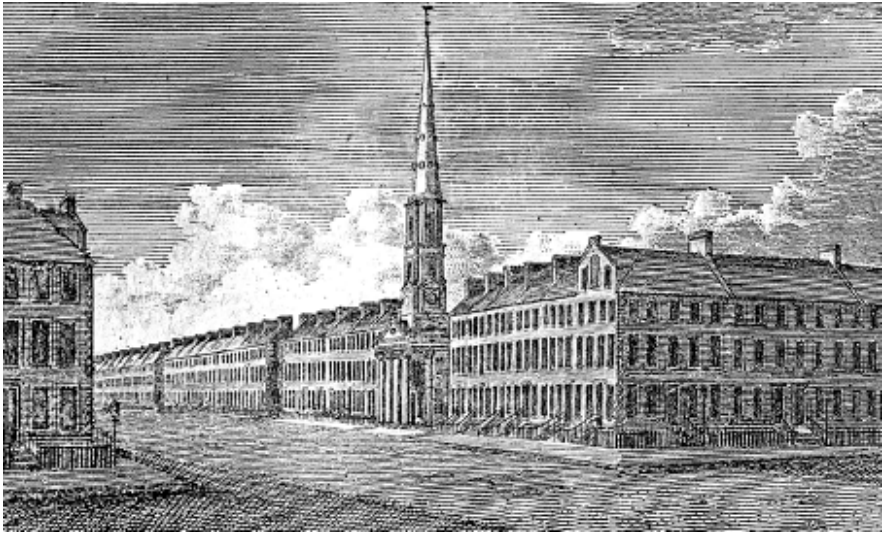


Figure 3.12. George Street, Edinburgh, looking west in 1806: a mixture of apartment buildings and terraced houses carefully disguised to resemble each other. (Source: Author's collection)

further, when the burgh council asked the architect J. Robertson to prepare suitable elevations in 1799. These were to govern the hierarchy, scale, height, materials and decoration of each house. Demonstrating that whereas the occupiers may all have been of a similar rank, there was still a hierarchy amongst them, houses in the pedimented centre were 41 feet wide, the pavilions at each end 37, and the ordinary houses between just 27.⁴⁶ In truth, very little deviation was permitted from the elevation. As was so common, imprecision about how to share the obligations of the square was revealed when the Council unexpectedly held the occupiers responsible for paying for the street and drain in front of their houses as well as the square at the centre.⁴⁷ Once complete, Wellington Square attracted the greatest concentration of the gentry of the burgh – as much as its two rivals Sandgate and Barns Street combined.⁴⁸ That was what such controls were intended to achieve.

The combination of ground plan, sale conditions, and a fixed aesthetic determined by architect's agreed elevation ensured consistency, but the method and degree of *enforcement* varied according to location. Some Councils were so relaxed that they appeared to be commissioning the so-important elevational drawings for rhetorical purposes only. Following the construction of a new bridge into the Cross, Kilmarnock Improvement Commissioners laid out a new street in 1802, instructing a design from Robert Johnstone – *as they had to*. Yet the sale conditions hardly required rigorous conformity to the design: 'Purchasers shall be at liberty to make the doors & windows what height they please, but not under six and a half feet in the ground and principal storey, and five and a half feet in the third storey, and that all of the said storeys shall

be uniform as to the windows, and either to build the fronts of hewen stone or Ruble (rubble) work as they think proper'.⁴⁹ So Kilmarnock was insisting on the control of scale only.

When laying out their prestigious Marshall Place facing the crucially important South Inch parkland in June 1802, Perth Council was much tougher – presumably because the genteel status of the burgh was considered crucial. Purchasers were bound 'to erect thereon buildings conform to the plan at least in the front and gables: the front to be of ashlar work and not to be more than two feet longer nor any shorter than the dimensions on the plans'. Elevations and sections were prepared by the Edinburgh architect Robert Reid. The inclusion of building sections implies that the Council intended to insist on conformity *within* the houses as well. In return, it agreed not to erect any buildings on the South Inch within 400 yards in front of these houses so that their prospect would remain unsullied.⁵⁰ In practice, however, the obligation was partially relaxed. Buildings were required '... of the dimension, and agreeable *at least in the outward fronts*, [my italics] roofs and gavils [gables] and in situation, to the plans of the front and elevation and ground plan and sections thereof ...'.⁵¹ So not only would the Council accept minor deviation in dimensions, it would ignore deviations within the house or to side or rear façades. This emphasis on 'outward front' both underlines the extent to which the code related more to visible expressions of rank than to practicality, and its rhetorical nature.

No such flexibility would be permitted, however, in the apotheosis of the new code in the second new town of Edinburgh. When the Heriot School Governors decided to lay out its much more extensive grounds downhill from Edinburgh's first New Town, it advertised an architectural competition for the layout and design in October 1800, specifying only 'streets and squares' (cited in Byrom, 1994, pp. 46–48). The architects Robert Reid and William Sibbald were asked to produce a design composed from selected entries, and their design showed as much homage to the first New Town uphill as the latter had done to the old one: the unusually wide central street of Great King Street, terminated with great spaces at each end – a circus at the west end, and what might be called a 'squarcus' [half square, half circus] at the east – flanked by streets of lesser rank, interspersed with lanes of service buildings (figure 3.13).

There the resemblance ended. Reid's perspective of Great King Street showed far greater three-dimensional architectonic control than had Craig's perspective of George Street (figure 3.14). Reid distinguished between a street as *route*, and a street as destination or *place*. *Streets as routes* were identified by the greater height of corner pavilions and the plain austere uniformity of the terraced houses between (lacking any centrepiece), whereas the *places* had a greater accent – such as a church or a pedimented centrepiece – on the dominant axis (see Reed, 1982, p. 132).

The elevations, dated 1806, were accompanied by seventeen clauses of restrictions, which specified scale, appearance and materials in minute detail. Houses in the

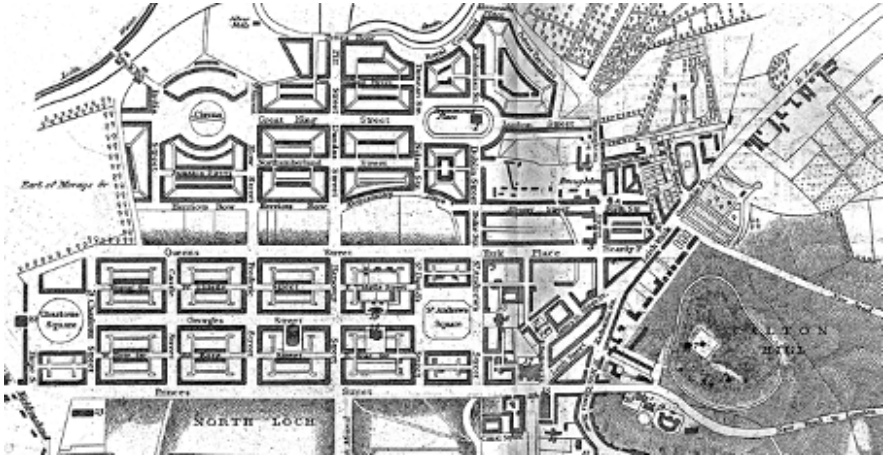


Figure 3.13. Plan of the First and Second New Towns from *A Graphic and Historical Description of the City of Edinburgh*, 1820 (J. and H.S. Storer). Drawn in 1818, it shows that nothing had yet begun on the third, fourth or fifth new towns. (Source: Author's collection)

secondary Heriot Row were to be 35 feet high (save the taller projecting pavilions at 51 feet), and compared to those of the principal street of Great King Street (46 feet) which were, in turn, almost one-third higher than the houses in the tertiary Northumberland Street. The buildings were to be constructed of 'broached ashlar, or rock work' in the basements or sunk storeys, the storeys above should be of polished, droved or broached ashlar, with blocking courses 15 inches high. Slates could not project more than 15 inches (cited in Youngson 1970, pp. 208–211), and dormer windows or mansard roofs were permitted only on the lesser streets. Control of such detail would have been impossible without both Reid's explanatory drawings and the sale conditions. The two types of information were interdependent, and represented the new code at its most authoritarian.

So the permissive controls of the first phases of the new code had ceded to a stricter regime, and even virtually imperceptible deviations were pounced upon. What



Figure 3.14. Robert Reid's perspective of Great King Street from Drummond Place, 1804. (Source: Reproduced by courtesy of RCAHMS, www.rcahms.gov.uk)

was now being sought was uniformity *tout court* – and nor was this just restricted to Edinburgh. Kilmarnock Improvement Commissioners took enforcement action against John Parker in 1813, whose simple desire for a projecting cornice (!) ‘would tend to hurt the uniformity of the houses in the Street’.⁵² He was not just forbidden but enforced against.

Conclusion

The mainspring of the new Scottish urbanism had been the need to find a way of adapting ancient burghs to the expanding population and increase in commerce. Looking back from 1830, Lord Cockburn observed:

The more immediate changes in Edinburgh proceeded chiefly from the growth in the city. The single circumstance of the increase of the population and its consequent overflowing from the old town to the new, implied a general alteration to our habits. It altered the style of living, obliterated local arrangements, and destroyed a thousand associations, which nothing but the still preserved names of houses and of places is left to recall. (Cockburn, 1856, p. 26)

Borrowing from many locations but unique in its execution, the new Scottish urbanism set out to reshape Scottish towns, and to house the new, useful, urban Scot in what Patrick Geddes saw as ‘a disastrous increase in the social separation of classes who had been in Old Edinburgh so peculiarly mingled’ (Geddes, 1919, p. 288). Signifiers of rank were embedded into the very fabric – the building materials and even the street widths – of the new suburbs, whose very design would signal quite clearly whether you would be welcome or not. By 1806, controls originally intended to subdue unreasonable individuality in favour of communalism had evolved into an aesthetic authoritarianism.

The urban environment created by the Enlightenment code was strikingly different from the inherited urban fabric. In 1774, Edward Topham observed of Edinburgh ‘in no town that I ever saw, can such a contrast be found betwixt the modern and ancient architecture’ (Topham, 1776, pp. 12–13). Seventy years later, Nathaniel Willis reached the identical conclusion:

A more striking contrast than exists between these two parts of the same city can hardly be imagined. On the one side, a succession of splendid squares, elegant granite houses, broad and well-paved streets, columns, statues and clean side-walks, thinly promenaded and by the well-dressed exclusively – a kind of wholly grand and half deserted city [he was visiting in September during the legal recess] which has been built too ambitiously for its population; – and on the other, an antique wilderness of streets and ‘wynds’ so narrow and lofty as to shut out much of the light of heaven; a thronging, busy and particularly dirty population... (Willis, 1844)

Those who bought into the new urban code could no longer perceive any value in

the old one. In his survey *Beauties of Scotland*, Robert Forsyth described the new civil architecture as ‘handsome’, ‘elegant’ and ‘regularly laid out’ (Forsyth, 1805–1808, Vol. III, pp. 87 and 41). He much preferred the houses of Glasgow’s second New Town around George Street and Square – ‘the finest of all the new streets’ – to the arcaded buildings of the adjacent High Street, which he now considered ‘rude’ (*Ibid.*, pp. 188–191). So the stunning uniformity of the new classical suburbs was achieved at the cost of Scots rejecting their historic urban culture, and this intellectual shift meant that fewer ancient town centres would survive in Scotland than in England. Yet the extreme authoritarianism represented by Great King Street could not last. The enforced homogeneity of streetscape and suppression of individuality would create its obverse, and crumble in the face of the ‘efflorescence of castellated gables’ and Scottish baronial ‘tenements and villas’ as Patrick Geddes (1919, p. 287) put it.

Lessons for the Twenty-First Century

So far as the coding debate is concerned, Scottish Enlightenment urbanism offers a few lessons. In *Cities in Evolution*, Patrick Geddes wrote (in the Outlook Tower in the heart of Old Edinburgh), ‘We must above all things seek to enter into the spirit of our city, its historic essence and continuous life’ (Geddes, 1915, p. xxiv). He was both appalled and full of admiration for Edinburgh’s New Towns. Far from getting into the spirit of Edinburgh’s or Scotland’s historic essence, they rejected it in its entirety; and he, in turn, rejected that approach.

What was admirable was that over eight decades, a continually evolving Georgian townscape was created, built according to local conditions but coherently scaled and consistent country-wide, which achieved a quality that has attracted world recognition. Edinburgh’s new towns are widely accepted as the world’s finest example of coherent eighteenth-century town planning. Their gracious urbanism was achieved by insisting that houses should be in proportion to the street width, and that these differed according to rank; and the plan also prevented any individual occupier from overwhelming any other. Local aesthetic conditions of sale governed consistency of materials and details, and maintained quality, all combining to create a new and distinctive urban identity. Any difference tended to reside in a town’s topography and variations in the local stone. Their streets all played a crucial social role in the urban theatre, and their gracious scale reflected more the Georgian notion of a ‘parade’ than our current perception of pavement. The urban ceiling was the sky, framed by the houses’ cornices. The generous public domain represented investment for the long term and the resulting three-dimensional sense of proportion and urban openness of these suburbs stands in striking contrast to all subsequent periods of urban development.

The social thinking underlying the first and second New Towns was more subtle than mere class segregation. They were less single-class developments than single-class

streets within mixed-class developments – for those who provided services to the elite lived adjacent to them. Although it was far more segregated than in the Old Town, there was probably more genuine social mixing, representing the interdependence of ranks, than can be found in many twenty-first-century housing developments which tend to ghettoize financially on a district basis.

The need to suppress individuality in accordance with Enlightenment philosophy and its belief in the control of an ordered society, goes directly against the trend emerging in the late nineteenth century – and really flourishing in the consumer boom of the 1930s – wherein every occupier wished his house to be distinctive from his neighbour's. Judging by the popularity of these Georgian houses today, it might not be impossible to persuade purchasers to buy into a comparably controlled regime, but the qualities of the houses themselves would have to balance any concerns about conformity. It cannot be taken for granted, as it was then.

The broad aspirations for these new suburbs began with the iconic plan: a plan that not only demonstrated the rectangularity and modernity of outlook, but also delineated the public domain within which individual house developers were expected to build. It was the landowner's plan that governed site, alignment and scale, and conveyed the generosity of its layout, the nobility of streets, width of the pavements, the gardens, and the majesty of urban parades. The plan expressed the expectation of conformity. To this plan, each builder/purchaser had to comply; and conformity by developers was often enforced by complaints of fellow builders on adjacent plots. Being found insufficient to achieve enough homogeneity at a time when the thirst for conformity was increasing, the plan became supplemented by sale restrictions communicated usually through or with architectural elevations. Whereas the plan governed scale and alignment, the elevation governed appearance, and the sale conditioned detail. Neither the sale conditions, nor the plan, nor the elevations could, of themselves, have achieved the result they did in isolation from each other.

Nonetheless, the plan controlled the context within which buildings were set, and gave them their urban status. Without it, the effectiveness of controls on the appearance and details of individual buildings would be greatly diminished. Ultimately, therefore, the crucial factor in Scotland's Enlightenment code was the plan.

Notes

1. Pini, D. (2008) *New Design in Heritage Settings*. Angus Miller Memorial Lecture, Edinburgh.
2. This is lucidly laid out in Rodger, 2001, chapter 3.
3. There were, for example, four entries into Dundee's Market Place, each called 'narrows'; Seagate narrows 6 feet wide, Nethergate 8 feet wide, Overgate and Murraygate 12 feet wide.
4. In Lisbon, they could extend to a third of the street width; in Edinburgh only 14 per cent.
5. Good examples of where the staircase has been relocated to the rear probably in the seventeenth century, are the Merchant's House, Sailor's Walk, Kirkcaldy, and Gardyne's Land, High Street, Dundee. The stair at Wigtown's Red Lion Inn (formerly a gentry town house) had been

- relocated to the rear and reached through a close.
6. For more information about tenements see Worsdall (1979) particularly chapters 1 and 2.
 7. TCM Ayr 5 June 1793; Montrose did similar in 1800, and Dundee's Nethergate was widened in 1810. When the turnpike road arrived in Tain in the 1790s, the access between the High Street and Tower Street was widened accordingly, thus destroying the enclosure of the market place. See Oram *et al.* (2009).
 8. TCM Maybole 1804.
 9. TCM Irvine 2 January 1763; RCM Ayr 21 August 1781.
 10. They were being demolished in Ayr as late as 1793, and in Inverness in the 1820s. TCM Ayr 24 January 1786.
 11. Aberdeen City Archives, *Account of Receipt on different Articles of Police*, 10 April 1797.
 12. Dundee City Archives, Guildry Sederunt 9 May 1735. I am grateful to Innes Duffus for this.
 13. *Municipal History of Dundee* (Dundee, 1878): Acts and Ordinances made by Provost and Magistrates 1762, p. 113 ff.
 14. TCM Dumfries 1752 and elsewhere.
 15. TCM Kilmarnock 1756.
 16. TCM Ayr 31 May 1775.
 17. TCM Dumfries – 1809.
 18. Irvine TCM 1784.
 19. *Dundee Directory 1828* (Dundee, 1829), p. v.
 20. *The History and Description of Inverness* (Inverness, 1847), p. 67. It was lucky to have lasted that long, and did not do so for very much longer.
 21. As had been required by the Council ordinance of 1652 and may not yet have been repealed.
 22. NAS RHP 101/1. Even though Register House was not begun until the following year, Craig reproduced Adam's facade on this plan.
 23. This can be inferred from Strang (1856).
 24. Petition to the Council 4.2.1761, cited in Armet (1959), p. 28.
 25. *Plan of the new buildings in Ross Park, by James Brown Archt., 1779* (in Tait and Gray, 1948, p. 16).
 26. A schedule of the occupants is given in *Book of the Old Edinburgh Club*, Vol. 26, 1948, pp. 33–132.
 27. They classified the turnpike stairs as 'constantly dark and dirty'.
 28. Craig's birth date is earlier than was believed, see Cruft (2002).
 29. Based upon the delineation of 'New Edinburgh' in John Laurie's map of EDINBURGH and places adjacent in 1766. This was first noted by Meade (1971, pp. 40–52). A more detailed analysis, which this chapter follows, is Harris (1992). See also Fraser (1995) and McKean (1995).
 30. See Fraser (1995). Lewis (2002) provides conclusive evidence that, whoever had the ideas, the rectified plan was produced by William Mylne.
 31. A similar concept of social segregation was manifest in Robert Adam's sketch plan for the rebuilding of Lisbon in 1757.
 32. Reprinted in *Book of the Old Edinburgh Club*, Vol. 23,
 33. Register of Sasines, Midlothian, PR247140, 17.5.71; PR 17177, 19.1.81.
 34. The town clerk described it as a 'long harangue'. Irvine TC Minutes 1752.
 35. Ayr TCM 9 January 1799.
 36. For the Second New Town, see Rodger, 2001, p. 62.
 37. Marjoribanks took nos 28–31 to begin with. Feuing of the central five houses had begun at the same time as Heriot Row, between 1803 and 1808; but William Sibbald took thirteen years to build on his, and no 28 was feued unsuccessfully to a builder, then to a writing master/builder, and was not built for a further six years. Nos 29–31, abortively feued to Thomas Russell, builder, in 1803, were feued again ten years later to another builder Peter Lorimer, who finally built them for Marjoribanks in 1817 – one for himself, one for his mother, and the last presumably as a speculation.
 38. Town Council Minutes, 29 July 1767, cited in Reed (1982).
 39. Act of Town Council of Edinburgh, 24 February 1768.
 40. Shown in the David Allan portrait of him. See Brown and Lewis (1995). I disagree with their interpretation that these were likely to be tenements. They were too low. The buildings that

eventually flanked the Assembly Rooms also had pavilion roofs distinctly out of place in a terrace.

41. Even the feuing conditions for Dundee's Tay Street in 1793 had these stipulations.
42. *Copy Restrictions as to buildings in the New town of Glasgow* held in Aberdeen, New Street Trustees NSET/4/12. Undated, but c. 1780s. Prohibited activities (which Dundee forgot to include) were tanning of leather, making of candle soap or glues, preparing vitriol, erecting glueworks, distilleries, sugar houses, foundries, smelting houses of brass, lead or other metals, or forges etc.
43. SRO, RHP 1147. Not only was that the case along Perth Road and down into Roseangle, but virtually all of Neave's largely abortive feuing plans between 1816 and 1829 were for estates of detached houses – save an isolated crescent of houses two of which yet survive at the toll on Perth Road, probably following an idea by W. Burn.
44. DCA, TCM, 6 January 1806.
45. *Rules with Regard to the Feuing out of Ground of the Extended Royalty of the City of Edinburgh* 29.6.1785 – in Aberdeen City Archives, New Street Trustees Working Papers NSET/4/12.
46. NAS RHP 2555.
47. Ayr TCM 25.2.18. They settled at contributing half the cost. Also Ayr Archives C0S 3/7/10.
48. Pigot's *Directory of Scotland, 1825–6*. the only other occupiers were four Writers and a Lady's Academy.
49. Kilmarnock Improvement Commissioners, *Minutes*, 4.11.1803, 9.12.1803.
50. PKAC : The Committee anent Feus at South Inch 10.6.1802.
51. PKAC Feu to former Provost David Ramsay of 4th Lot B 59/8/54 30.4.1804 Rouped 25.6.1802.
52. Kilmarnock Improvement *Minutes* 13.10.1813.

Acknowledgements

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Chapter Four

The Ideal and the Real: Urban Codes in the Spanish- American Lettered City

Jean-François Lejeune

To found a city. I found a city, he founds a city – it was a verb that could be conjugated.

Alejo Carpentier, 1953 (author's translation)

As John Charles Chasteen (1996, p. vii) wrote in his introduction to the translation of Angel Rama's *La ciudad letrada* (The Lettered City) 'writing, urbanism, and the state have had a special relationship in Latin America'.¹ From the early years of the discovery and the founding of the outposts of what would become the first world global empire, the Spanish conquerors established a network of cities and towns carefully planned according to royal instructions, where institutional and legal powers were administered through a cadre of elite men called *letrados*. Rama's *The Lettered City* provides an overview of the power of written discourse in the historical formation of Latin American societies, and highlights the central role of cities in deploying and reproducing that power. It is the urban nexus of lettered culture and state power that the Uruguayan scholar named 'the lettered city'. Rama viewed the city both as a rational order of signs representative of Renaissance progress and as the site where the Old World is transformed – according to detailed written instructions – in the New. The Renaissance idea of the city as the embodiment of social and political order 'corresponded to a moment in the development of Western civilization as a whole, but only the lands of the new continent afforded a propitious place for the dream of "The Ordered City" to become a reality'.² The cities of Latin America became 'the first

material realization of that dream, giving them a central role in the advent of world capitalism' (Rama, 1996, p. 2):

There, native urbanistic values were blindly erased by the Iberian conquerors to create a supposedly 'blank slate', though the outright denial of impressive indigenous cultures would not, of course, prevent them from surviving quietly to infiltrate the conquering culture later... Having cleared the ground, the city builders erected an edifice that, even when imagined as a mere transposition of European antecedents, in fact represented the urban dream of a new age. (*Ibid.*)

Modernity is destructive and cruel. It implies a globalization process whose innate propensity and ultimate goal is to destroy an existing order and replace it with a new one (Lejeune, 2005; see also Dussel, 1995 and Subirats, 1994). In *The Invention of the Americas*, Edward Dussel has placed the birth of modernity in the Valladolid dispute (1550) between Ginés de Sepúlveda and Bartolomé de Las Casas, regarding the 'other' – in this case the Indian. Summarizing Sepúlveda's argument he wrote, 'the violence inflicted on the Other is said to serve the emancipation, utility and well-being of the barbarian who is civilized ... it absolves the modern subject of any guilt for the victimizing act'. 'The suffering of the conquered and colonized people appears as a necessary sacrifice and the inevitable price of modernization'; he continues, 'this logic has been applied from the conquest of America until the Gulf War...' (Dussel, 1995, p. 64).³

Within the Renaissance context of the early sixteenth century, urban modernity meant not only to erase material evidence of unknown cultures and pagan religions and idols, but also to leave 'behind the distribution of space and the way of life characteristic of the medieval Iberian cities – "organic", rather than "ordered" – where they had been born and raised' (Rama, 1996, p. 1). Accordingly, the conquest of the New World was the first phase of a European-induced process of globalization in America: the orderly checkerboard plan of foundation – with its memory of Roman settlement forms in Iberia and its abstraction of a cross – symbolized the rational organization of the territory combined with forced evangelization. Paradoxically, it is both the encounter and concomitant destruction of the local order that speeded up the process of improvement and 'the search for a prototype responsive to the functions and requirements of a bureaucratic urban form: the concentration of power' (Gasparini, 1991, p. 16; see also Lejeune, 2005, note 6). The central plaza, even more than the gridiron, was the efficient result of the political, religious, social and bureaucratic needs and structures of the colonizing powers and their colonized populations (figure 4.1). In his book *La Plaza Mayor*, the Chilean sociologist Miguel Rojas Mix describes how, lost in the confusion of the German medieval streets of Cologne where he went into exile in 1973, he understood what was the essential condition of being an 'American' in space:

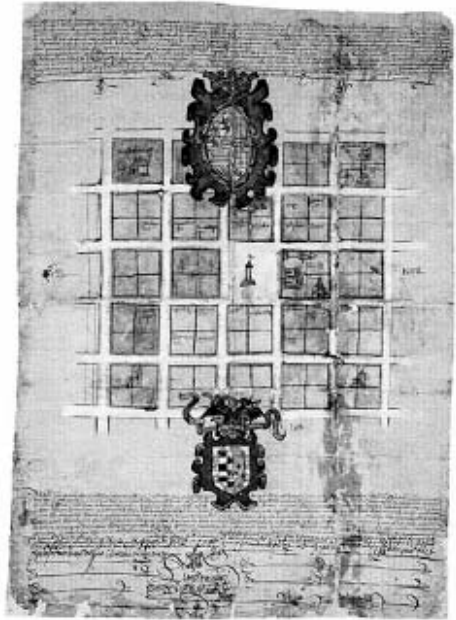


Figure 4.1. Foundation plan of San Juan de la Frontera (now in Argentina) 1562. The plan represents a perfect example of the *cuadrícula* (grid made up of square blocks with central plaza). (Source: © Ministerio de Culture, Spain, Archivo General de Indias, Sevilla, AGI, M. y P., Buenos Aires, 9)

The topography [of Cologne] had nothing to do with the ‘mental topography’ that I generally attributed to an urban layout. When dropped in one of ‘my’ cities, and in whatever street, I knew with certainty that I would cross parallel streets to the right and to the left, that, behind or ahead of me, all of them were perpendicular and that, right in the centre, I would find the Plaza de Armas flanked by the cathedral. Here, the fact that I was an American revealed itself in clearly urbanistic terms. (Rojas Mix , 1978, pp. 9–10)

The first section of this chapter explores the origins and technical nature of the written instructions that gave rise to hundreds of gridded cities and *plazas mayores* on the American continent. The sequence of ordinances enacted by the Spanish court from 1513 and culminating in the Laws of the Indies of 1573, along with the individual acts of city foundation that accompanied them, forms a body of early planning literature that illustrates the role and the rule of the written text in the process of Latin American urbanization. Why, how and by whom was the checkerboard and the central square established as the fundamental pattern of Latin American urbanization? Given the absence of primary explicative source materials, historians have long been forced to make assumptions and elaborate theories that often contradict one another. The most recent and balanced scholarship suggests that the conceptual framework of the Latin American city reflects a synthesis of four main influences: the new foundations in Spain during the medieval Reconquista; the theories of the Renaissance and the Ideal City; the expression of a rational will of Roman-imperial inspiration; and, finally, the encounter with the pre-Columbian cities and civilizations.

The second section analyzes the specific urban outcomes of the coding legislation, particularly as it relates to the consolidation of a model prescribed by law but which, in many cases, took two centuries and more to acquire a definitive urban form. Whereas many planning historians have adopted a short-term view of the planning process, thus putting in doubt the importance of the legislation, this section will, to the contrary, stress how the Laws of the Indies reflected the overall planning consensus and constituted a fundamental ferment of urban stability.⁴ As Woodrow Borah wrote:

When the consensus relative to the tracing of new streets and groupings of public buildings in the ideal city was adopted in Europe, it immediately became part of the cultural heritage ... but not of the popular tradition... In Spanish America the consensus about the correct way of designing cities quickly became part of the popular habits and was utilized in all territories under a central supervision or even in its absence. As in all other activities that belong to the folkloric tradition, this organization (ordering) has remained in use until now, even in cases where the application of another type of planning would prove to be more convenient. (Borah, 1973, pp. 74–75)

The third section highlights the case of two cities where new codes were introduced and strongly impacted urban form. In Havana, the *Ordenanzas de Construcción* promulgated from 1861 were a unique body of regulations that shaped the urban and suburban expansions of the city by defining the profile of urban spaces: arcades, street widths and building heights were regulated, taking their inspiration from neo-classical examples and establishing a hierarchy of streets for and within the new neighbourhoods. The chapter then discusses the case of Buenos Aires, a classic example of a regular large-size grid that expanded limitlessly and without hierarchy to the dismay of visitors like Werner Hegemann and Le Corbusier, both of whom admired its building types but criticized the absence of overall planning. In the Argentinean capital – as in most metropolitan centres of South America including Rio de Janeiro, Recife and São Paulo – the modernist-inspired building codes established around 1945 destroyed the continuity of the horizontal fabric and replaced it with an explosion of mid-rise and high-rise structures, whose code-induced chaos has become the visual trademark of the contemporary Latin American city. Using Brasilia as a last case study, the conclusion sets up the bicephalous reality of urban Latin America: Lúcio Costa's *Plan piloto* as the last 'lettered' foundation versus the ever-increasing un-coded 'informal cities' that surround the planned and coded centre.

The Square as Origin and the Culture of Perspective

On 5 August 1502, Nicolás de Ovando laid out the first European city of the New World, Santo Domingo. Far from reflecting the 'harshness of a first try', the foundational plan displayed, in spite of the distortions imposed by the geography, the invariants of all future Spanish American planning: firstly, the *plaza mayor* generating

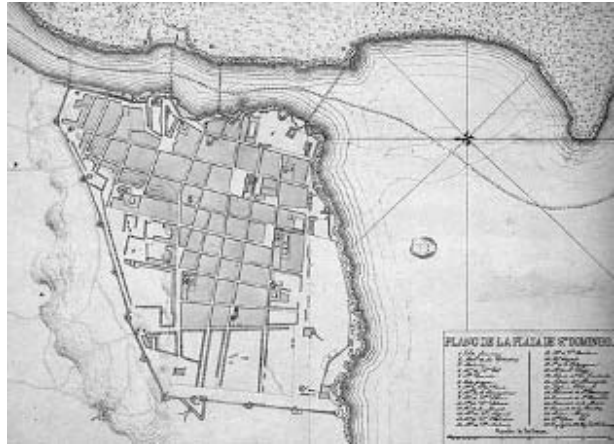


Figure 4.2. Plan of Santo Domingo, eighteenth century. (Source: © Ministerio de Culture, Spain, Archivo General Militar, Madrid, No. 5.730/E-1-30)

the network of streets – in this case, a block left empty and partially occupied by the cathedral placed parallel to the square; and secondly, the checkerboard pattern, here irregular and distorted, made up of well-ventilated streets opening up long perspectives toward the sea and the river (figure 4. 2) (Stanislawsky, 1947, p. 95).⁵ The modernity of this original pattern – apparently unconnected to any specific written document – was repeated a couple of years later on the island of Cuba. The seven cities created by Diego Vélazquez – Baracoa, Bayamo, Trinidad, Sancti Spiritus, Havana, Puerto Principe and Santiago – displayed the same irregular grid of straight streets generated from a small plaza in two quasi-perpendicular directions.

Since an early historian like Daniel Stanislawsky (*Ibid.*, p. 94) erroneously asserted that ‘the idea that it was possible to found a city according to a plan laid-out in advance was unknown to the Spanish’, decades of research have shown that from the twelfth to the late fifteenth century during the Reconquista, medieval Spain had seen the foundation of dozens of new cities which displayed patterns of Roman order radically breaking with the Muslim organic tradition.⁶ The new towns were laid out as an irregular chessboard and had a central square at the intersection of the axes. Among them were Petra on the island of Majorca (c.1300), Puerto Real (1488) and Santa Fe de Granada (1491), founded during the siege of the Andalusian city and experienced by various future stakeholders of the Conquest. One of those was Ovando, founder of Santo Domingo. In spite of their prevailing medieval character, the conceptual image of those towns was undoubtedly a source of inspiration for the first American foundation.

However, it was not the plan that most impressed the first visitors to Santo Domingo but the Renaissance ‘modernity’ of its streets. On his arrival in 1519, walking along the Calle de las Damas, the first street of the New World, the humanist bishop Alessandro Geraldini wrote: ‘the streets are so straight and so broad that they leave behind even the



Figure 4.3. View of the first street of Santo Domingo, Calle de las Damas, c. 2000. (Photo: Jean-François Lejeune)

streets of Florence' (figure 4.3).⁷ In the absence of genuine Renaissance streets in Spain at that time, Oviedo y Valdés underlined this view by contrasting the clarity of Santo Domingo's plan with the Arab-based urban 'disorder' of medieval Barcelona:

The town is much better laid out than Barcelona, because the streets are more even and much wider, and without comparison much more straight; because, as it was founded in our times ... it was traced with rule and compass, and all the streets of one dimension, facts that demonstrate its superiority in respect to all the other populated places that I have visited.⁸

It is this 'idea of a town' and the omnipresent 'perspective as symbolic form' which places Hispano-American cities, from Santo Domingo onwards, at the centre of Renaissance modernity. As Leonardo Benevolo (1978, p. 430) has put it:

It would be a mistake to consider the American experiments as marginal episodes in the history of architecture; they were not only quantitatively the most remarkable schemes realized in the sixteenth century, but were also in some ways the most significant, because their characters depended more upon the cultural concepts developed at this time, and less upon the resistance put up by the environment.⁹

The Instructions of Population of 1513 marked the second and definitely 'lettered' phase of colonization. Enacted in Valladolid to the benefit of Pedrarias Davila, who would lay out the first city of Panama the following year, they lay down the foundations of the populating doctrine:

Having ascertained all things that are necessary for the settling of the site, and having selected the site most appropriate and well provided with all the things that are necessary for the settlers, the lots shall be distributed to build the houses; and they shall be allotted according to the quality of the settlers; and in orderly fashion, so that, once constructed, the town will look well-ordered as regards the space reserved for the central plaza, the location of the church, and the order of the streets; because the new towns or settlements that are ordered at their inception will remain ordered with little effort and cost, while the others will never be ordered.¹⁰

The same instructions were reissued in 1521 to Francisco de Garay for the population of the Amichel province in Mexico and to Hernán Cortés in June 1523. Charles V would confirm and reinforce them three years later.¹¹ Common to all, the repetition of the very word ‘order’ clearly reflected the will of the Spanish government to proceed on a coordinated and bureaucratic development during the continental phase of the conquest. From then on, the Ordinances for Population – of 1526, 1543, and the Laws of the Indies of 1573 – were to rule the official act of foundation: the imposition of the Christian faith in a pagan world and the designation of the city as a perfectly sacred and geometrical space, whose spiritual and symbolic centre was the *plaza mayor*.

The surveyor or *alarife* who eventually established the practice of urban design in the American territory was Alonso García Bravo, perhaps the greatest planner of the continental colonization. First, he laid out Panama la Vieja (1519) on the basis of the 1513 regulations. The same year, he accompanied Hernán Cortés, who ordered him to draw up the plan of Vera Cruz: the result was an almost regular grid, whose small dimensions related it to the Caribbean foundations. Bravo took part in the conquest of Tenochtitlán and in 1521 he went on to establish the plan of Mexico City on the ruins of the Aztec capital (Toussaint, 1956). The quantum leap that the design of Mexico City represented at the time has no rational explanation and cannot be determined solely by the instructions about order already mentioned. What is certain is that the discovery of the city and its very large and orderly spaces must have coincided with and reinforced the desire for the new order dear to the Renaissance. Cortés’s second letter of 1524 to Charles V included the first Western-style ‘representation’ of Tenochtitlán – a view that went around the globe and whose monumental and geometrical character, never seen before, may have influenced, as Erwin Palm (1951) has argued, the mature Renaissance vision of the ideal city, and particularly Albrecht Dürer’s.¹² The urban diagram of Tenochtitlán appearing in Cortés’s letter is clearly visible in the reconstruction plan that Alfonso García Bravo laid out: the two main axes intersecting in the centre and continuing across the surrounding lagoon; the orientation of the checkerboard and the elongated rectangular form of the blocks; the immense space occupied by the Spanish plaza that coincided with the Aztec market on the edge of the ceremonial centre; and even, on the outer edge of the lake, the market square of Tlatelolco.¹³



Figure 4.4. Aerial view of the city of Puebla, Mexico, c. 1970. (Source: Gasparini, 1992)

Can we affirm then that the discovery of Tenochtitlán and other Pre-Columbian cities created the Hispano-American city in its classical form? Yes in regard to the perfection of the grid, which will prevail in all future foundations; not completely in the sense that the rectangular blocks of Mexico City, Puebla and Cholula, of Aztec origin, will not reappear outside of Central America (figure 4.4). In fact, it is in Oaxaca and Santiago de los Caballeros de Guatemala – two foundations of 1527 – that Bravo invented the *cuadrícula*: their perfect gridiron plan marked the last turning point in the definition of urban form in America and the creation of the exclusively Hispano-American model of urban grid made of large square blocks centred on a square plaza. In his autograph manuscript *Primer nueva crónica y buen gobierno* (c. 1613), the scholar of Inca nobility descent Felipe Guaman Poma de Ayala gave a remarkable account and panorama of Peruvian and Latin American urbanization: forty hand-drawn perspectives identified forty cities with their central plazas amidst a grandiose and fertile landscape.¹⁴

From the founding of Quito (1532) and Lima (1533) on the same model, the perfect checkerboard spread everywhere. Hispano-American urban planning had entered a new phase: the encounter between the spatial conception of the European Renaissance and the open and geometric pre-Columbian space definitely buried all traces of medieval urbanism on the South American continent. Among all the checkerboard plans created in history (Greece, Rome, Eastern Europe, Inca Empire), the Latin American ones have the largest urban blocks: their unique dimensions must have responded, consciously or not, to the theoretical concept of cities without walls, to the immensity of the territory, and to the discovery of the Aztec and cosmic Inca vision of space. They were the horizontal and modern answer to the ‘natural and built mountains’ of pre-Columbian cities (Scully, 1991, pp. 6–7).

The Laws of the Indies and the Process of Urban Consolidation

Enacted and signed in 1573 by Philip II, the ‘Ordinances for the Discovery, the new Population, and the Pacification of the Indies’ constitute one of the most remarkable documents of ‘modern’ urbanism, a Hispanic utopia of the ‘ideal City’: to create a city perfect in its form and in its physical and symbolic order. As Rama (1996, p. 28) wrote:

Only the *letrados* could envision an urban ideal before its realization as a city of stone and mortar, and then maintain that ideal after the construction of the city, preserving their idealized vision in a constant struggle with the material modifications introduced by the daily life of the city’s ordinary inhabitants.

Out of one hundred and forty-eight ordinances, the fifty-two articles that specifically refer to the urbanization process – site selection, layout, plan, square, location of the main buildings – confirmed what had become common practice in the Indies: the open checkerboard plan generated from the *plaza mayor* as the political and social centre (figure 4.5). As established by law, those principles met the three criteria

Figure 4.5. Diagrams of the Laws of the Indies. (Source: Terán, 1989)

The following quotes are from Gasparini *et al.*, 1991.

Top of left column: The main plaza is to be the starting point for the town; if the town is situated on the sea coast, it should be placed at the landing place of the port, but inland it should be at the centre of the town.

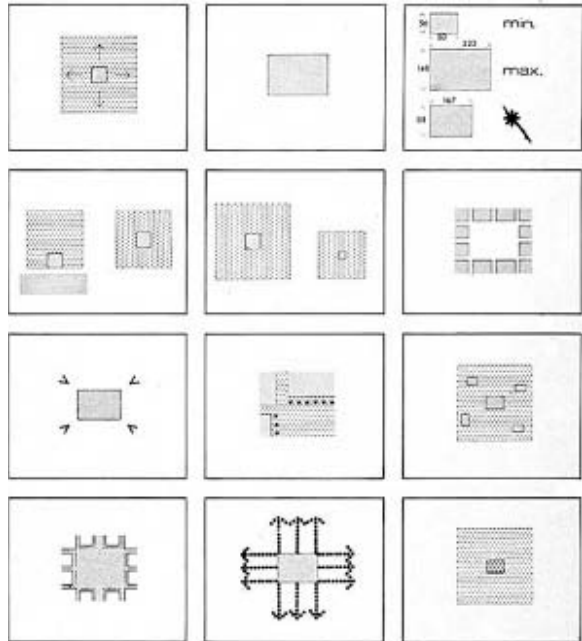
Top of middle column: The plaza should be rectangular, in which case it should have at least one and a half its width for length inasmuch as this shape is best for fiestas. The size of the plaza shall be proportioned to the number of inhabitants...

Top of right column: The square shall be not less than two hundred feet wide and three hundred feet long, nor larger than eight hundred feet long and five hundred and thirty feet wide in average. From the plaza shall begin four principal streets, one shall be from the middle of each side, and two streets from each corner of the plaza...

Bottom of left column: The four corners of the plaza shall face the four principal winds, because in this manner, the streets running from the plaza will not be exposed to the four principal winds, which would cause much inconvenience. Around the plaza as well as along the four principal streets which begin there, there shall be portals, for these are of considerable convenience to the merchants who generally gather there.

Bottom of middle column: The eight streets running from the plaza at the four corners shall open on the plaza without encountering these porticoes, which shall be kept back in order that there may be sidewalks even with the streets and plaza. The streets shall run from the main plaza in such manner that even if the town increases considerably in size, it shall not result in some inconvenience that will make ugly what needed to be rebuilt, or endanger its defence or comfort.

Bottom of right column: Here and there in the town, smaller plazas of good proportion shall be laid out, where the temples associated with the principal church, the parish churches, and the monasteries can be built, in such manner that everything may be distributed in a good proportion for the instruction of religion.



which, according to Pierre Lavedan (1941, p. 34), synthesize the urban principles of the Renaissance: firstly, the organic connection between all parts of the city and the subordination to a clearly established centre; secondly, the monumental perspective; and, thirdly, the 'programme'.¹⁵ Moreover, this ideal city as *urbs* was also conceived as *civitas*.¹⁶ To that effect, the other ordinances deal with Indians' rights, protection from slavery, education, punishment and conversion to Catholicism. In theory at least, the times of 'cruel' discovery and colonization were over and a new humanistic phase of administration and population was to follow.¹⁷

The architectonic precision and the direct quotations from Vitruvius and Alberti often suggested that, behind the hand of the King, the personality of a major architect could be discerned (see Crouch *et al.*, 1982). No direct material evidence exists, but Catherine Wilkinson-Zerner has argued that Juan de Herrera, architect of the palace-convent of the Escorial (whose geometrical order and representative abstraction may have influenced the spirit of the Laws) was the co-author of the urbanistic aspects of the Laws. Another influence on the Laws, although difficult to fully evaluate, was Franciscan Francesc Eiximenis's treatise *Lo Crestià* (The Christian, 1384–1385), in which the Catalan monk proposed a theoretical model of the city, based upon a regular grid pattern with a spacious central plaza of square dimensions and additional symmetrically laid out smaller squares.¹⁸

The Ordinance 110, the first to address the physical space of the city, reaffirmed the orderly structure of the city by incorporating the preceding instructions of 1521 and 1543 relative to the grid and the central square:

On arriving at the place where the new settlement is to be founded – which according to our will and disposition shall be one that is vacant and that can be occupied without doing harm to the Indians and natives or with their free consent – a plan for the site is to be made, dividing it into squares, streets, and building lots, using cord and ruler, beginning with the main square from which streets are to run to the gates and principal roads and leaving sufficient open space so that even if the town grows, it can always spread in the same manner.¹⁹

Although walls and fortifications protected many port cities around the Caribbean (Havana, Cartagena) and along the Pacific Coast (Callao), the reference to the defence system in the Laws was minimal. On the contrary, the ordinance hinted at the possibility of a continuous expansion, which contrasted with the fixed and military image of the Renaissance cities and treatises. None of the cities built away from the coasts were protected by walls: even Buenos Aires, which was protected by a fortress on the Río de la Plata, grew without walls. This concept of potentially 'open city' led Sigfried Giedion (1941) to write that the Hispano-American city constituted 'the real invention of the modern city'.

The following ordinance 112 confirmed the fact that the square was seen as the

main monument of the city but now added a direct reference to the ideal proportions of a square according to Vitruvius:

The main plaza is to be the starting point for the town; if the town is situated on the seacoast, it should be placed at the landing place of the port, but inland it should be at the centre of the town. The plaza should be rectangular, and have at least one and a half its width for length inasmuch as this shape is best for fiestas in which horses are used and for any other fiestas that should be held. (Lejeune, 2005, p. 21)

Another requirement that referred directly to the Renaissance vision of the new square as a reinterpreted and reinvented forum on the basis of Vitruvius's description was to line the sides of the plaza mayor with arcades or *portales* as the ordinance 115 made clear: '*Around the plaza as well as along the four principal streets which begin there, there shall be portals, for these are of considerable convenience to the merchants who generally gather there*' (*Ibid.*).²⁰

The first Renaissance arcades in Latin America appeared from the 1530s along two sides of the huge central square of Mexico City that Bravo established at the location and with the exact size of the Aztec market (figure 4.6). However, most cities were too poor and lacked density to support the expense of constructing the arcades. As a result, most *portales* appeared during the seventeenth and eighteenth centuries when cities grew bigger and their main squares were remodelled and rebuilt, a period which saw more extensive dissemination of the Laws through the *Recopilación* of 1680. Overall, only a handful of cities displayed arcades on the three or four sides (Guadalajara, Cuzco, Nueva Guatemala, Nueva Panamá or Portobelo). However, almost all cities had at least one arcaded side; likewise the city hall or *cabildo* often incorporated porticoes, which provided commercial premises on the ground floor while administrative offices occupied those above (Mexico, Antigua Guatemala, Salta, Buenos Aires, Cartagena,

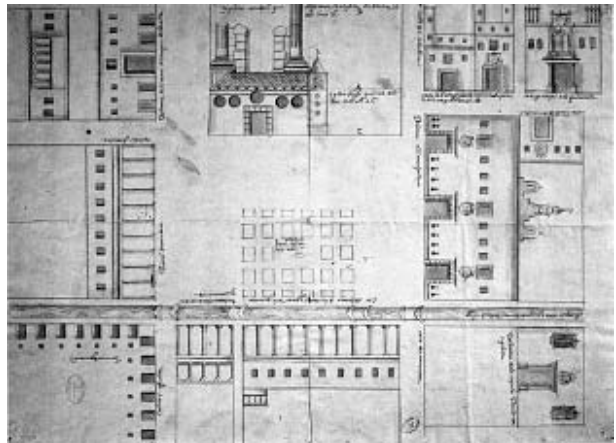


Figure 4.6. Plan of the *plaza mayor* of Mexico City, 1596. Notice the arcades and the small general plan of the city inscribed within the plaza. (Source: © Ministerio de Culture, Spain, Archivo General de Indias, Sevilla, AGI, M. y P. Mexico, 47)

Mérida, etc) (see Salcedo Salcedo, 1996, pp. 198–201). Havana’s squares are a case in point: the Plaza Vieja was arcaded along its entire perimeter at the end of the seventeenth and the beginning of the eighteenth century; the arcaded palaces on Plaza de la Catedral were completed around 1777 and those on three sides of the Plaza de Armas about fifteen years later (figure 4.7) (see Rodríguez and Zequeira, 1993).

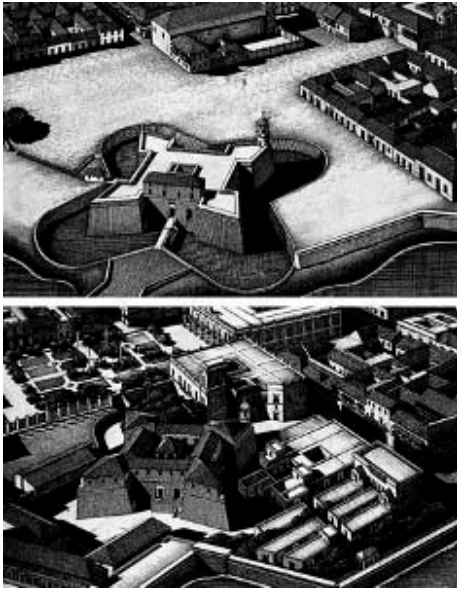


Figure 4.7. Evolution of the Plaza de Armas, La Habana (top: late sixteenth century; bottom: eighteenth century). (Source: Drawings by Eduardo Luis Rodríguez in Rodríguez, 1998)

Other critical ordinances were related to the width of the streets (116: *‘In cold places, the streets shall be wide and in hot places narrow; but for purposes of defence in areas where there are horses, it would be better if they were wide’*); to the good design of streets in preparation of growth, extending the concept of ordinance 110 (117: *‘The streets shall run from the main plaza in such manner that even if the town increases considerably in size, it shall not result in some inconvenience that will make ugly what needed to be rebuilt, or endanger its defence or comfort’*); the reservation of space for *‘smaller plazas of good proportion ... where the temples associated with principal church, the parish churches, and the monasteries can be built’*); on the position of the main church (120 and 124) to be placed *‘at a distance and be separated from any other nearby building, or from adjoining buildings, and ought to be seen from all sides so that it can be decorated better, thus acquiring more authority; efforts should be made that it be somewhat raised from ground level in order that it be approached by steps, and near it, next to the main plaza, the royal council, the city hall and customs houses shall be built’*; or on the uses allowed around the main squares, mostly non-residential (126).

Looked at comprehensively, and even though no city was planned that responded to all of them (one of the closest is the new foundation of Panama in 1673, figure

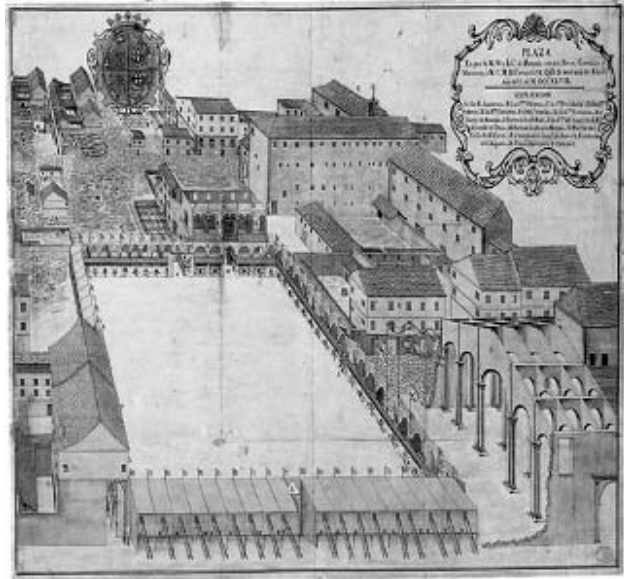


Figure 4.8. Panama, Plaza Mayor during a celebration, February 1748. Notice the plaza under construction and the temporary arcades around its edges. (Source: © Ministerio de Culture, Spain, Archivo General de Indias, Sevilla, AGI, M. y P. Panama, 144)

4.8), most of these ordinances were selectively but actively enforced. As a whole, they contributed largely to establishing the specific image of the consolidated Latin American city by the first quarter of the eighteenth century. Two ordinances that addressed a succinct vision of typology were particularly successful. The first (133: ‘*each house in particular shall be so built that they may keep therein their horses and work animals and shall have yards and corrals as large as possible for health and cleanliness*’) helps explain the very large size of the lots in a first phase of settlement and, over time, the development of the courtyard house type that has become synonymous with Latin American colonial towns and cities. The second one reinforced the visual and typological cohesion of the urban environment envisioned by the King and his architect:

134: *They shall try as far as possible to have the buildings all of one type for the sake of the beauty of the town.* (Lejeune, 2005, pp. 21–23)

Despite this evidence, planning and urban historians have often minimized – and continue to do so – the importance of the Laws, arguing that more than two hundred cities, including the future capitals, were founded prior to 1573 (see, for example, Lemoine, 2003). They certainly have a point, but it minimizes the fact that, first of all, the Laws extended the scope of the previous instructions; moreover, those critics rarely take into account the fact that, in the 1570s, the original urban cores, with some exceptions like Mexico City, were still sparsely inhabited and built. The process of urban development was overall very slow in Latin America as can be seen in the plans of Havana (1691), Santiago de Cuba (1729), Caracas, etc. For decades, a limited

number of small buildings, often placed at street corners, complemented by walls or equivalent fences, established streets and public spaces. As Salcedo Salcedo (1996, p. 49) wrote, 'contrary or different to the European cities which grew and transformed themselves with architectural projects, American cities were first of all *idea of city* that with time, and sometimes with much time, ended up being architecture'. Like the first city of Santo Domingo, every single foundation existed from the very first day, even if its built fabric was limited or remained limited for decades or more.²¹

Until the mid-1700s, Central and Southern America remained unequally settled and not very populated (Rojas, 1994, pp. 262ff, using de Solano, 1987). Most of the population growth gravitated around Mexico, Puebla, Lima, Bogotá and Havana, whereas 'a monotonous existence, more rural than urban, marked the physiognomy of most of the rest of urban Latin America' (*Ibid.*). During the reign of King Carlos III of Spain, major cities went through an increased process of modernization involving recreation and embellishment, infrastructure development, and overall densification. It is during this period that, as we have seen in the case of the arcades and *portales*, the Laws of the Indies became particularly influential. At the same time, Spain launched an intense policy of new foundations along the borders (with Brazil and the United States, for instance) and of interior colonization in Guatemala, Cuba, Río de la Plata, and Chile. By sheer size this new wave of urban development could be compared with the first phase of the sixteenth century; most urban centres followed the spirit of the Laws of the Indies, even though the square plaza (and not the rectangular one as prescribed in ordinance 112) became the norm and the regulating pattern of the grid. The size of the blocks usually decreased and the number of original parcels went from four (sixteenth century) to eight or sixteen. Santa Fé (New Mexico, 1610), Nueva Guatemala (1777), or Matanzas (Cuba, 1764), are examples of the latest application of the Laws of the Indies (*Ibid.*).

To summarize, the great merit of the Ordinances of 1573 is that they stabilized an urban form still in its infancy and clarified the conditions allowing its consolidation. These texts gathered both concepts and experiments that, turned into laws and put into practice, allowed the development of both architectonic unity and urban density, two major attributes of Latin American urbanity. Of course, the Laws were respected in spirit and not always in the exact words. Critics of the Laws have systematically highlighted the contradictions between the Laws and the reality in order to undermine their value: one of the most often repeated criticisms is that, contrary to the ordinance 112 which prescribed the plaza mayor as a rectangle of Vitruvian proportions (two to three), most of the built plazas were square in shape. Interestingly, those same critics rarely cited ordinance 113 which linked the size of the square to the assumed future growth of the city (a remarkable and modern idea that proved to be quite well intuited) and requested the very large dimensions that have indeed distinguished most Latin American plazas from their European counterparts:

The size of the plaza shall be proportioned to the number of inhabitants ... thus the plaza should be decided upon taking into consideration the growth the town may experience. The square shall be not less than two hundred feet wide and three hundred feet long, nor larger than eight hundred feet long and five hundred and thirty feet wide in average. A good proportion is six hundred feet long and four hundred wide. (Lejeune, 2005, p. 21)

Furthermore, the difference between the work built and the work on paper was in fact not unusual in Renaissance time: as in Andrea Palladio's *Four Books of Architecture* (1570), the Laws of the Indies combined the ideal with the real, the immaterial perfection of the Neo-Platonic vision of the world with the real construction of the city. Palladio's idealization of his work was necessary to diffuse successfully his ideas about type and city. However, unlike the authors of the Laws of 1573, modern historians never criticized him for those infractions between text and reality (see Salcedo Salcedo, 1996, p. 37, note 21). Surprisingly, what has been historically accepted in one culture is being denounced in the other. The explanation might be that the 'artistic' and 'individualistic' ideas of the Renaissance as expressed in Italy have obscured other forms – perhaps more bureaucratic – of implementation. What has been praised and attributed to one particular man as artist and architect such as Rossetti in Ferrara has been systematically refused to the group of Latin American founders and surveyors. In the individualistic interpretation of the Renaissance, only the man – the artist – and not the Law can be given full artistic authority and credit. To some extent, the interpretation of Spanish-American cities has suffered from an ideological interpretation that intends to deny the traits of modernity to a society that did not theorize it intellectually but embraced it politically and bureaucratically with supreme efficiency.²² This is where one has to be reminded of the flexibility of the Laws. They functioned as a set of instructions, as a general urban code of sorts, whose application in relation to collective memory, pre-existing traces, topography and geography generated a quasi-infinite amount of variations around a theme. The grid characterizes the Latin American city, but there are no two grids, and thus no two central squares, alike.

The Case of Havana and Buenos Aires: Codes and Growth

During the late eighteenth and early nineteenth century, a boom in plantation production spurred a dramatic increase in Cuba's population and the consolidation of the Creole aristocracy in Havana. The city fabric got denser and the first linear suburbs appeared outside of the walls along the roads, known as *calzadas* (avenues), connecting to the *ingenios* of the countryside. The most important ones were the Calzada del Monte continued by the Calzada del Cerro, a 3 km suburban road; and the Calzada de la Reina, prolonged during Miguel Tacón's governorship (1834–1838), with the neoclassical and boulevard-like Paseo de Tacón. Regulated not without problems and abusive speculation by engineer Mariano Carrillo de Albornoz's *Plano*

de Ensanche (1849–1850), the Cuban capital city grew with such inevitability that the walls were destroyed in 1863 and a ‘ring’ on the model of Vienna was built. Prestigious places of business, theatres, cafés and Spanish clubs would establish themselves along its edges and squares in the following decades.²³ Two years earlier, the municipality had adopted the *Ordenanzas de Construcción para la ciudad de La Habana y barrios de su término municipal*. This set of ordinances, revised several times and still in use during the twentieth century, was the planning tool that shaped the new, more metropolitan, image of Havana.²⁴

The 476 ordinances covered the range of issues of a rapidly modernizing city, with a strong emphasis on urban morphology and typology. In accordance with Albornoz’s plan, the article 15 defined four categories of streets (first order, 25 m; second order, 14 m; third order, 9–14 m; fourth order, 6–9 m) with which were associated widths of sidewalks (from 2.5 m to 1 m), and the heights of edifices and individual floors (from a total height of 15.54 m in the first order of streets to 9.45 m in the fourth order). Other ordinances required street trees on squares and along streets of the first and second order (article 40). Moreover, in the tradition of the Laws of the Indies, the articles 36 and 37 mandated the construction of *portales* (arcades) along the streets of first and second order as well as around squares:

In front of the houses facing a square and streets of the first and second order within the new districts, portals will be established on land inside the individual lots; yet, the portals will remain open to public passage... The width of the portals will be 3.5 m on lots facing the square and streets of the first order; of 3 m along streets of the second order.²⁵

The impact of these ordinances in defining the specific character of the new ring and the extra-muros neighbourhoods of Havana was very significant. Among Caribbean and Latin American cities, Havana was one of the very few where urban codes allowed a smooth and coordinated transition, without an excessive break in scale or mass, between the one- and two-storey colonial building types and the more modern requirements of a developing bourgeois capital on the European model (up to three and four storeys). Arcades along colonial streets being redeveloped (Paseo del Prado), along the new streets of the Ring traced over the destroyed fortifications, and along the new avenues structuring the extra-muros neighbourhoods (such as Galiano, Belascoín, Calzada de la Reina, Paseo de Tacón, etc.) allowed for narrow street widths, provided protection against sun and tropical rains, while permitting a significant increase in traffic capacity. Emerging wealthy sections of the city were equally impacted with the ordinance: in the Cerro district, a continuous colonnade was built along the entire length of the Calzada, in front of and linking the porches of the existing *casa quintas* or country estates. Presenting ‘the passerby with a dramatic rhythm of light and shade,’ the arcades transformed the suburban character of the area into an exceptional neo-classical urban landscape (figure 4.9) (Coyula and Rigol, 2004). Overall, those



Figure 4.9. Calzada del Cerro, La Habana, between 1900 and 1910. (Source: © Cuban Heritage Collection, University of Miami Libraries, Manuel R. Bustamante Collection)

arcades, extending over a couple of miles, brought a unique character to Havana’s late-nineteenth- and twentieth-century neighbourhoods and streets, making the Cuban capital the Latin American equivalent of famous arcaded cities like Bologna or Turin in Italy – novelist Alejo Carpentier called Havana, *La Ciudad de las Columnas* (The City of Columns) (Carpentier, 1970).²⁶

In another subchapter dealing with *nuevas poblaciones* [new districts], article 31 required that, if at all possible, ‘*in order for all buildings to benefit from the prevailing winds and be protected from the sun as much as possible, the streets be traced straight between parallel lines oriented NE/SW and NW/SE*’. Moreover, article 32 defined the hierarchy of the grids by requesting: ‘*In the new districts, a calzada of the first order will be established every five blocks; for all the other streets, one will adopt in general the model of the second order*’. Influenced by the plans of Ildefonso Cerdà’s *Ensanche* of Barcelona and Carlo María Castro’s *Ensanche* for Madrid these specific articles of the 1861 ordinances were used to establish the hierarchy of streets within the new district of El Vedado, a large ‘city within the city’ traced from 1860 on a large and rigorous grid facing the Caribbean Sea, a couple of miles away from the most distant blocks of the colonial city. Of particular interest is the precise orientation of the grid along the NE/SW and NW/SE as required by article 31.

At the time that landscape architect and urbanist Jean-Claude Nicoles Forestier was redesigning the image and public spaces of Havana, two other great figures of modern urbanism visited Buenos Aires: the German Werner Hegemann in 1931 and the Swiss architect Le Corbusier in 1929. Both agreed that the city was a troubled environment. Le Corbusier criticized the infinite numbers and expansion of the *rue-corridor* and wrote in *Précisions*, ‘Buenos Aires is one of the most inhumane cities I have known; really one’s heart is martyred. For weeks I have walked its streets “without hope” like a madman...’ (Le Corbusier, 1991, p. 200). Hegemann on the other hand defended the original structure of the city: ‘as far as I know the capital cities of five continents,

there exists nowhere a greater wilderness of buildings with such a minuscule quantity of green oases as in the capital of Argentina' (Collins, 1995). Interestingly, both men praised the urban quality and way of life of the *casa chorizo*, the half courtyard house that had become the most important type for urban development from the late nineteenth century, and that Jorge Luis Borges extolled in his writings ('The patio is the incline by which the sky spills into the house' (Borges, 1996)) (see de Gregorio, 2006). Whereas Le Corbusier's plans imagined a radical and destructive restructuring of the metropolis, Hegemann focused on the need for adequate urban regulations and attacked the code of 1930, responsible according to him for creating chaos and jeopardizing the lower-scale structure of the city.

Until the 1910–1920s Latin American cities could be described in general terms as 'horizontal cities'. Buenos Aires was a paradigmatic example. Given its large dimensions (about 120 m by 120 m), its basic urban block or *manzana* had developed and densified over time as a solid block to be occupied by low-rise patio houses extending to the very interior of the block. This was the logical solution to avoid inefficient and excessively large spaces at the centre of the blocks (see Diez, 1996, pp. 105ff). The challenge of the late nineteenth century and early twentieth century was to develop new types of buildings that would be denser and allow extensive use of the ground while providing enough air and light at the interior of the block. In Buenos Aires, architects were the leaders of typological innovation as building codes, until 1945, controlled the building



Figure 4.10. Walter Moll, Building Safico on Avenida Corrientes, Buenos Aires, 1932. (Source: Postcard collection Jean-François Lejeune)

heights in relation to the width of the streets and did not interfere with the manner that open space was organized within the blocks themselves – the code of 1930 was somewhat analogous to the New York City 1916 Zoning Resolution that mandated that high-rise buildings use a ‘setback’ section to reduce bulk and increase light and air (figure 4.10). Codes only determined the amount of space to be left unbuilt and the general regulations for the dimensions of patios. Those regulations were ‘restrictive’ in character and application, as they tended to control parameters related to public and private space without interfering directly within the typological realm. Faced with these difficult conditions architects generally displayed an incredible amount of invention in the development of modern building types that maintained the cohesion of both blocks and streets.

As Hegemann noticed, the code of 1930 increased permitted heights dramatically but problems could have been corrected. Things changed for the worse in 1944 with the introduction of a new set of codes that Fernando Diéz (1996, pp. 113ff) has described as *regulaciones postulativas*, or prescriptive codes (see Collins, 1995). Influenced by the modernist utopia of the 1920s of a *ville radiuse* made up of ‘object buildings’ floating on undifferentiated and totally public open green space, these codes aspired to a new vision of orderly space defined here in a fixed form, subject to a unitarian design and replacing the idea of the city by the idea of the city as a building. For the first time, the code intended to generate a particular form considered by planners to be the ideal building for the future city. Practically, the method was to impose the creation of a large open space at the centre of the block, thus limiting drastically all typological solutions that made use of the centre to create private spaces and patios on individual parcels. Diéz (1996, p. 125) has commented on the ideological construct of the codes which refer unambiguously to the concept of ‘ideal cities’, not only ‘because it is based upon a form which is not perfectible but to the contrary considered as complete in itself’, but also ‘because it embodies a optimistic but quite ingenuous misunderstanding about the radical possibilities of change that urban design can have on socio-economic conditions’. Applied to the real urban conditions, such a vision and code reflected ‘a transparent objective of what the future city should be, but did not specifically elaborate on the realistic ways to achieve it and particularly on the transition process that would allow the contemporary real city to transform into the ideal city of the future through a quasi infinite series of urban substitutions that the changes implied’ (*Ibid.*).

As seen in the diagrams, the models proposed by the code were purely speculative and did not correspond to any specific block in the ‘real city’ (figure 4.11). Applied to the traditional and built structure, its effects on the city were traumatic and destructive, not only on the neighbouring lots and buildings, but on the urban structure itself, destroying its conceptual cohesiveness (block, street, neighbourhood, private/public) and jeopardizing the overall understanding and use of public spaces. The ideological tenet of re-socializing private space in the form of interior public gardens may have

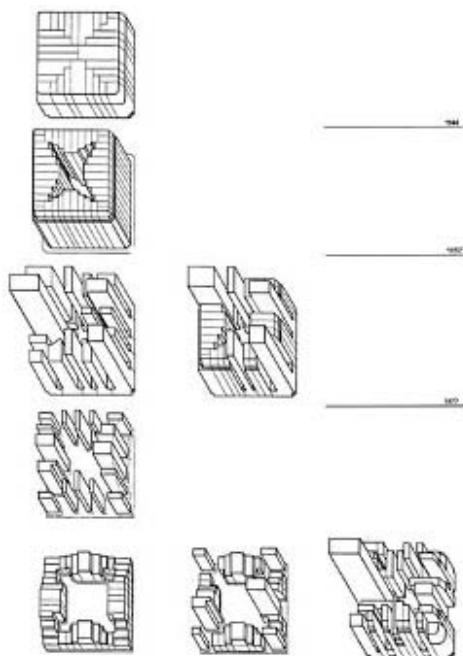


Figure 4.11. Study of the transformation of a typical Buenos Aires block (*manzana*) as a result of the changes in occupation and density permitted by the successive urban codes. Left column: the building types implicitly defined by each code; centre column: random superposition of building types; right column: superposition of the various building types produced by successive codes within the same urban block. (Source: Drawings by Fernando E. Diez in Diez, 1996)

been laudable in some prewar experiments that maintained a clear distinction between outer and inner space (like the Harlem River in New York) (see Sonne, 2008), but rigidly applied as a vernacularized version of the *cité radieuse*, it failed across the whole of Latin America: from Buenos Aires to Rosario, from Rio de Janeiro to Recife and Porto Alegre, from Caracas to Baranquilla. The uniform and horizontal fabric that characterized the profile of the Latin American city, often in contraposition to the out of the ordinary landscape, was irremediably broken and transformed into a form of uncontrolled but in fact strictly coded ‘eruption’ of small towers, blank walls, and open ventilation wells. As Carlos Eduardo Comas wrote:

Codes and regulations did not particularly concern the pioneers and all those who ideated the ‘City Functional’, intent as they were to conceive the project of the modern city as a large unitary project of construction to be built all at once in the large Beaux-Arts manner. It was their epigones – and particularly those in the third world – who perfected the utilization of the codes to the bitter end in order to create caricatures of the utopia. (Comas, 1996, p. 11)

Conclusion

As I have tried to show here, the impact of postwar modern codes in Buenos Aires and many other Latin American cities – inspired by the utopian ideal of the tower within a publicly undifferentiated space and lot – has been devastating for the traditional

fabric.²⁷ Yet, those neighbourhoods continue to contain much of the traditional public life and spaces. To protect what is left, new codes and practices – including historic preservation, which has come late to Latin America and is not yet common practice as in Europe – are needed. Architect Carlos Comas’s argument is that the problems identified by the modernist movement in the construction of streets, blocks and neighbourhoods did not justify the condemnation of the types, but more logically should have entailed their correction – a position close to Hegemann’s in the 1930s. He has coined another concept, the Figurative City, as a possible alternative to both Traditional City and Functional City. The Figurative City would be characterized by the study and introduction of specific variations to the traditional types and possibly by the aggregation of old and new types – an approach that bears some similarities to the New Urbanism in the United States but is more willing to research and develop compromises between the traditional and modern types. This strategy has been discreetly discussed in Havana during the last decade in a collaboration between Cuban planners and New Urbanism mastermind, Andrés Duany. Urban codes in Havana, contrary to Buenos Aires and many other Hispano-American cities, were not radically changed after 1959: the early-twentieth-century codes were adapted to contemporary conditions without provoking radical breaks in the urban fabric. Duany and his partners in Cuba have worked on further re-actualizing these codes (many of which derived from the 1861 ordinances) in the hope that they will accompany the unavoidable political and socio-economic changes to come.²⁸ Sustaining this game plan is the belief that the urban priority of post-Communist Havana will not be to design grand plans but rather to devise urban codes intent on protecting the existing districts of Havana by encouraging historic preservation of the city’s physical and social fabric, and controlling their unavoidable redevelopment under a capitalist system.

At the same time, another chapter would be necessary to deal with the complex situation of the contemporary Latin American City, where extreme forms of urbanization have been developing alongside the ‘traditional’ city built and rebuilt from colonial types to the 1970s. At one extreme are the ‘gated neighbourhoods’ – whether urban or suburban – which have been appearing from São Paulo to Rio de Janeiro, Buenos Aires and Mexico City. The gated neighbourhood is, in a way, the apotheosis and the ultimate deviation of the ‘lettered city’: everything in it is coded, not specifically to propose an urban form, but rather to exclude those people and functions that do not belong. At the other extreme, every *ranchito* or in its better-known Brazilian name, *favela*, is a popular affirmation against the codes and the ‘lettered city’ tradition of Latin America: informality versus formality, vernacular practices versus established types, absence of codes versus increasing regulations not only on urbanism but on social behaviour. As nobody is officially the owner of his or her lot, no cadastre exists, and until the advent of Google Earth no cartography was even possible given the issue of personal safety for outsiders wishing to enter those neighbourhoods. Beyond the

ugliness and violence, the *favelas* and other ‘informal’ settlements are veritable ‘cities within the city,’ which are in a process of constant flux; they are not fixed as traditional cities, planned or not.

No city reveals more clearly than Brasilia the contemporary conflict between formality and informality. At its heart is the foundational *Plan piloto*, the iconic master plan in the form of a cross designed by Lúcio Costa, about which Eduardo Subirats (2005, p. 86) has written:

On its organization and performance, Brasilia is the reflection of the secularized ideas of colonial mercantilism and salvationism transferred first to the modern, secular and positivist discourse of ‘order and progress’ and, secondly, reformatted under the stylistic concepts of the international functionalism of the post-war decades. It is an ideal space, an abstract and complex design – an archetype of the ‘lettered city’.

Costa also wrote the urban code for the *superquadra* (superblock), the basic neighbourhood unit that makes up the two ‘wings’ along the circulation axis. He defined the basic building type (the block on pilotis), its height, width and number of units within each superblock, leaving to every architect the freedom to interpret the code spatially and urbanistically (El-Dahdah, 2005). However, the *Plan piloto* now houses only 10 per cent of the population. At the other end of the spectrum are the *favelas*, which shelter close to a quarter of the 2.7 million city residents, and where codes and planning regulations are unknown. From Brasilia to Rio de Janeiro, São Paulo, Caracas, Mexico City to Mumbai and Johannesburg, this increasing polarization is jeopardizing the future of the global metropolises of the former ‘third world’. How to better integrate these ‘informal’ settlements within the overall metropolitan structures will be the socio-political challenge and urbanistic predicament of the twenty-first century, one for which a new generation of urban codes and implementation methods will have to be invented.²⁹ As the social and physical complexity of the Latin American metropolis grows, urban codes are likely to be more and more difficult to formulate. Up until the nineteenth century, the colonial grids, with their plazas and courtyard houses, were almost always the product of the ‘written’ code (the Laws of the Indies) rather than a ‘blueprint’ plan. In Latin America, the European-inspired master plans of the late nineteenth and first half of the twentieth century intent on ‘modernizing’ the expanding grids were, in spite of their intrinsic quasi-utopian qualities, usually ineffective (see Lejeune, 2005 and Almandoz, 2010). More than likely, it is in the interstices of the metropolises that very different plans will have to be designed: plans that will not focus on controlling the urban fabric itself, but rather make use of the landscape and geography to create the vital and sustainable infrastructures of the future.³⁰

Notes

1. Angel Rama (1926–1983) was a Uruguayan writer, academic and literary critic. His main work *La Ciudad Letrada* [The Lettered City] was published posthumously in 1984.
2. ‘The Ordered City’ is the title of the first chapter of Rama’s *La Ciudad Letrada*.
3. In contrast Dussel (1995, p. 72) writes that ‘Bartolomé de Las Casas demolishes the nucleus of modernity’s myth and places the blame where it belongs, on those pretending to be innocent: the civilizing European heroes, especially their leaders’.
4. The first and second sections of this chapter are adapted from my introductory chapter ‘Dreams of Order: Utopia, Cruelty, and Modernity’, in Lejeune, 2005, pp. 31–49.
5. On the first foundation of Santo Domingo, see Palm (1955).
6. Kagan (2000) discusses the permanence of the Roman heritage in medieval Spain. In particular, during his long reign (1252–1284), Alfonso X the Wise consolidated the antique heritage by establishing the *Siete Partidas* as the main code of the Spanish law. This pioneering text resembled an encyclopedia while reflecting the three cultures present at the court – Catholic, Jewish and Arab. It established the Roman law as the legal basis of the Iberian monarchy and was to exert an enormous influence on the medieval foundations in Spain and the administrative habits of the New World.
7. Quoted in Palm (1955, p. 61), from Alexander Geraldinus, *Itinerarium ad Regiones sub Aequinoctiali*, Roma, 1631.
8. Quoted in Palm (1955, p. 61), from Gonzalo Fernández de Oviedo y Valdés, *Sumario de la natural historia de las Indias* [1515–1527] (Madrid: Editorial Summa, 1942).
9. See also Panofsky (1991) and Rykwert (1988). The debate between historians who stress the importance of the Renaissance versus those who deny it in favour of medieval connections has been going on for decades and would take too long to analyze. As an historian and urbanist, the author strongly believes in the importance of the Renaissance thesis, particularly in regard to the radical shift that occurred after the foundation of Mexico.
10. Quoted in Palm (1951) and Martínez (1967, pp. 172–173), author’s translation.
11. For detailed analysis of the ordinances, see Salcedo (1996); also see Rojas (1994).
12. Hernán Cortés, *Praeclara Ferdinandi Cortési de Nova maris Oceani Hispania Narratio* (La claire relation de Hernán Cortés à propos de la Nouvelle Espagne de l’Océan Atlantique), 1524. On the relation between the drawing of 1524 and Albrecht Dürer, see Panofsky (1943). For more on Precolombian influences on the plan of Mexico City, see Gasparini (1992, pp. 38ff).
13. On the Renaissance influences on the plan and the first decades of development of Mexico City, see Tovar de Teresa (1992) on the urban projects of the Viceroy Mendoza after his arrival in 1532. A copy of Alberti’s *De Re Aedificatoria*, annotated by Mendoza’s hand (1539) corroborates how much the Renaissance culture had penetrated the heart of Latin America. The recent catalogue, by Pohl and Lyons (2010), is a rebuff to all the historians who in the last decades have attempted to deny the value of Renaissance thinking in the early urban development of Hispano–American cities.
14. Poma’s manuscript, in the Royal Library of Denmark, was not published until 1936 in Paris. The best facsimile version can be found at <http://www.kb.dk/permalink/2006/poma/info/es/frontpage.htm>. Also see Kagan (2000, pp. 125ff).
15. On the Laws, see Crouch *et al.* (1982); also see Salcedo Salcedo (1996); Rojas (1994); and de Terán (1989).
16. On that distinction, see Kagan (2000, pp. 1–18).
17. See Hanke (1974) and Dussel (1995). The debates about the validity of the conquest and the rights and identity of the Indians (the dispute of Sepúlveda versus Las Casas) had calmed down, and, in this perspective, the Laws of 1573 clearly reflected the moderating influence of Bartolomé de las Casas.
18. Eiximenis (1384–1385). Also see Eaton (2002). Interestingly, in the reconstruction realized by the architect García Fernández, the unusual size of the blocks (about 71.7 m square) almost matched the scale of the Mexican foundations to come (sides of 100 m).
19. ‘Transcription of the Ordinances for the Discovery, the Population and the Pacification of the Indies, enacted by King Philip II, the 13th of July 1573, in the Forest of Segovia, according to the

- original manuscript conserved in the Archivo General de Indias in Sevilla', in Lejeune (2005, p. 21). See the Spanish facsimile edition, *El Orden que se ha de Thener en Descubrir y Poblar, Transcripción de las Ordenanzas de descubrimiento, nueva población y pacificación de las Indias, dedas por Felipe II, el 13 de Julio en el Bosque de Segovia, según el original que se conserva en el Archivo General de Indias de Sevilla* (Madrid: Ministerio de la Vivienda, 1973).
20. It is interesting to mention that the *portales* were also present in the ideal city of Eiximenis who proposed them around the Plaza de los Mercadores [Merchants' Square] for obvious commercial use.
 21. I agree with Salcedo Salcedo's (1996, p. 23) comment that Chueca Goitia cannot be right about the fact that cities were created irregular and then regularized later on: this goes against all known laws of property 'dando la orden en el comienzo sin ningún trabajo ni costa quedan ordenados, y los otros jamás se ordenan' (Pedrarías Davila, 1513, see note 10 above).
 22. Mario Sartor (1992/1993, p. 23), in an article in the Italian magazine *Zodiaco* 8, goes out of his way to try to diminish the Renaissance's influence on Spanish American planning while simultaneously stressing the 'medieval' culture of Spain. Sartor even makes intellectually dishonest statements such as 'It seems most unlikely, then, that Vitruvius' text had any direct influence on urban development in Spanish America. To believe so would be tantamount to saying that the discovery of America had been both forecasted and expected, and that, as a result, avant-garde urban planning deriving from Renaissance theorizing which Alberti had, of course, initiated and late fifteenth century Italian culture had embraced, had developed in a Spain where Alberti was still unknown'. See also note 13.
 23. See Segre (2010); also see Venegas Fornias (1990). In 1860, there were 122,000 residents outside of the walls against 46,000 intra-muros.
 24. See Maria V. Zardoya, 'Las Calzadas, arterias vitales', at http://www.lajiribilla.cubaweb.cu/2002/n47_marzo/1217_47.html. Accessed 28 May 2010; Segre (2010); Grupo para el desarrollo integral de la Capital, Taller sobre las regulaciones urbanísticas de El Vedado, 20–27 May 2003.
 25. Ordenanzas de construcción para la ciudad de La Habana y pueblos de su término municipal. Habana Impr. del Gobierno y Capitanía General por S.M., 1866 [1861].
 26. Carpentier's book is beautifully illustrated with black and white images of the 'columns' of the city.
 27. In Europe, the modern city and its types have indeed tended to be inserted within the traditional city in the form of urban renewal involving from one block to an entire neighbourhood, and this often as a result of wartime destruction. Examples abound in Europe, London, Berlin, and more generally in the new postwar peripheries of French, Spanish and Italian cities where the model of development followed the canons of the Functional City. In Latin American capitals – and here I will be using the example of Buenos Aires as a paradigm of a phenomenon that equally impacted Chile, Mexico and particularly Brazil – the situation has been significantly different.
 28. See Grupo para el desarrollo integral de la Capital, Taller sobre las regulaciones urbanísticas de El Vedado, 20–27 May, 2003. One issue in the re-actualization is, for instance, the likely impact of increased car ownership and parking needs within the future regulations. It should be mentioned that Andrés Duany together with Cuban citizens developed a charter for 'The Rights to the City of the Socialist Citizen' (2003). See <http://www.intbau.org/newsarchive2003.htm>. Accessed 27 July 2010.
 29. About the experience of re-integration of some *favelas* in Brazil, see Machado (2003).
 30. For an overview of those strategies, see Mostafavi and Doherty (2010).

Chapter Five

Paradigms for Design: the Vastu Vidya Codes of India

Vibhuti Sachdev

Many societies in the world show a coexistence of traditional and modern cultures, as old techniques and methods have been revived or updated to stand alongside newer systems. For example, thatching is a building technique that goes back centuries and is still in use in modern Europe. The continued use of such techniques, however, is not an indication of continuance of the culture or lifestyle of the past, for they sit on the modern palette alongside other techniques as one of many. Herein lies a difference in the coexistence of tradition and modernity between Europe and, say, India. Aspects of traditional lifestyles are still followed by the most modern and 'hi-tech' communities in India, not in a bid for revival, but as part of a world-view or belief system. For example, a calendar that gives both solar and lunar dates, which lists auspicious and inauspicious days, and which marks all the festivals and reminds us of their associated rituals, is the most popular format that is sold every year. These calendars also carry information about government holidays and recipes for microwave cooking. The two sets of information are recognizably traditional and modern but sit alongside each other without conflict, and are read not as alternatives but as aspects of one whole. Textiles, dress, food, music, and dance are all strands of Indian culture where this kind of coexistence flourishes. The story of architecture, however, is different. How, and why, will be explored below.

This chapter examines the relationship between traditional and modern building paradigms in India. On the basis of the complexity of Indian society, it argues for an expanded role for the currently marginalized traditional knowledge system, known as Vastu Vidya. Little understood by contemporary practitioners, the historical Vastu

Vidya system is an example of ‘urban coding’ as defined elsewhere in this volume: ‘the generic specification of allowable and necessary components and relationships ... extending from urban scale locational regulations to prescription of building design details’ (see chapter 1). In its written forms (to be examined in more detail below) Vastu Vidya differs from other instruments such as master planning in that it employs generic principles rather than drawings.

Aspects of Vastu Vidya

Vastu Vidya is a generic term that describes a body of knowledge on architecture and related topics, which informs all traditional building design in India, including urban design. ‘Vastu’ means ‘consecrated space’ and ‘Vidya’ is ‘knowledge’ or ‘science’. The discipline of Vastu Vidya comprises three terms which have a dynamic and ever-developing relation with each other. The first is Vastu Shastra or literary texts on architecture that dwell on topics such as urban design, building typology, materials, measurement systems, orientation and building components. By and large, these texts are similar in style and composition, and are written mostly in verse form in Sanskrit, and sometimes also in regional languages. These texts are found all over India, and incorporate the cultural, regional and geographical contexts of their locations. So, for example, a text from the hot and arid region of Rajasthan discusses aspects of construction in stone, while one from wet and humid Kerala will pay more attention to construction in timber. The content of the texts intersects with allied disciplines such as astrology, *ayurveda* (medicine), and numerology, which are integral to the Indic world-view. The texts are written by, and for, a variety of professionals (priests, architects, masons, patrons and connoisseurs) and the specialism of the author or the audience is also reflected in their content. So too is the historical, political and social context in which they were written. A text that was a royal commission, set in a fifteenth-century court and written by the court-architect will differ in its content from one published by a small-scale builder of houses set in a professional context of clients and practitioners.¹

The second term of this discipline is the body of practitioners of Vastu Vidya. Although the original guild system that most of the texts refer to is now extinct, the knowledge survives in the hands of some craftsmen and priests who today find employment in conservation projects, the construction of temples, and in conducting ceremonial rituals related to buildings. As in the past, such specialists need not be writers – or even readers – of the texts, but people who have assimilated their content and develop it through practice. The third term is Vastu Kala, or built architecture: the body of surviving traditional buildings, which manifest the knowledge in tangible forms.

As these definitions imply, the three terms are interactive rather than parts of a

hierarchy. Their interaction could best be described as triangular, rather than linear. Just as a new category of design described in theoretical terms in a text might facilitate a design innovation, so conversely a new building innovation might find its way into a text, and even expand the archetypal category to which it belongs. Practitioners are influenced by previous buildings as much as they are by texts. In addition, advances in technology and changing patterns of patronage have also expanded the fields of all the three terms.

Vastu Shastra (textual) codes set design parameters using descriptive and prescriptive regulations – a sort of a theoretical three-dimensional web of guidelines in which the design unfolds, to become an interpretation appropriate for the context. The variety in traditional design found in the secular, royal and religious structures that abound in India bears testimony to the flexibility of these codes, while the stylistic coherence of particular types or regions indicates the rigour with which the codes were applied.

The word ‘traditional’ is here being used to indicate products of pre-modern architectural practice, as distinct from the new institutionalized and homogenized practice that was introduced in the early to mid-twentieth century. Within this brief time spell – which saw the mushrooming of new architecture schools, newly trained architects returning from study abroad, and the building of the iconic modernist city of Chandigarh amid strong political support – the process of marginalizing Vastu Vidya was complete. The generation of Indian architects who followed Le Corbusier gained no knowledge of traditional principles.²

The traditional builder and the ‘city’ architect grew further away from each other in terms of both training and practice. Vastu Vidya was never incorporated into the curriculum of architecture schools, and the situation today remains unchanged. The entire infrastructure – the planning authorities, design and building processes, and the provision of materials – caters to an industry that is entirely different and separate from traditional practice. If there was ever a modernist dream to wipe the slate clean of all traces of tradition, it was nowhere more vigorously attempted than in India. Traditional building typologies and methods were drowned under the euphoric wave of new building styles and technologies that swept the country in the mid-twentieth century. As a result the remnants of traditional knowledge and practice stand fragmented and marginalized, and are largely ignored by the formalized profession.

There are fundamental differences between the design methods of traditional and modern practices. These differences lie in every aspect of spatial conception and organization – the way space is measured and contained – and in the way materials are handled and used. The differences extend to how space is represented in drawings (and therefore understood), and the role such representation plays in the execution of design. The traditional process establishes a building strategy by using a combination of codified terms and diagrams, rather than the accurate scaled-drawings of modern practice. For example, in the traditional scenario, a verbal description of a desired

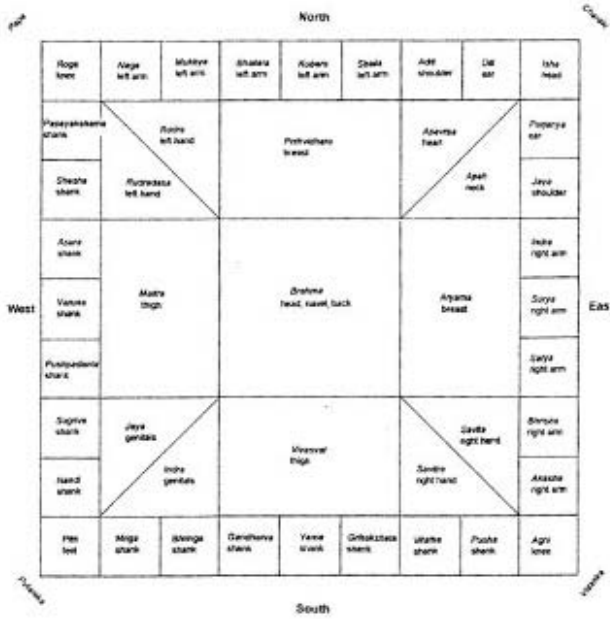


Figure 5.1. *Vastu Purusha Mandala*, a conceptual grid for design. (Source: Author after Manasara)

courtyard house, provided it uses the appropriate terminology, would be sufficient to draw out all the necessary building details, from the macro scale (such as the size of the rooms) to the micro scale (the dimensions of the columns).

One of the primary tools for conceptualizing design and setting the rhythm of proportionate measurement of the building parts is the *Vastu Purusha Mandala* (figure 5.1). This mandala is a design aid that works like an elastic geometric grid. It is a mental map and *not* a drawn diagram or a ground plan. It can be used to design a small item like a door knob, or the two-dimensional space of a painting or a cloth, or the large spaces of a building or a city. It adopts the shape, size, and features of the site and maps onto the site the many layers of meaning that each of its squares holds. The network of lines of the mandala guides the relative position and size of building parts, in a manner that ensures a proportional equation between all the macro and micro features of the building. For example, from the horizontal division of the site are derived the width, height and location of the doors, columns and walls, thereby transferring the horizontal attributes of the site onto the vertical face of the building. All the stylistic and decorative features are decided using codified terms.

In modern practice by contrast, working with scaled-drawings is a completely different proposition. Drawings no doubt serve as a useful contractual interface between the client, the builder and the designer, but they are nevertheless inflexible to change. The design is frozen on paper in all its detail, and the field of design creativity rests entirely in the hands of the architect. A mason or a plasterer is not in charge of any creative input. In fact the efficacy of drawings rests on ensuring that the design is not

'meddled with' by any of the hundreds of workers who see it through its construction stage. Also, the design does not have to conform to *any* given system of proportions. It does not have to relate its micro spaces to its macro ones dimensionally.

Another important difference between the two practices is that the currently applicable planning regulations support the modern and not the traditional practice. For example, if one were to design a house on a standard rectangular plot within a modern city development, one would have to set it back from the road and from the sides in adherence to the planning laws. Consequently, if one wished to incorporate a traditional central courtyard, there would be insufficient space left for the building. The urban planning regulations are not laid down with traditional design typologies in mind. The regulations favour the 'bungalow' type of house that has become the model for the residential plotted development in urban India and is (in terms of building mass) the inverse of the traditional courtyard house or *haveli*. In the bungalow type, most of the open space is allocated around the covered area and the building sits in the middle. Traditionally, the courtyard house extends to the perimeter of the rectangular site, with open courtyards nestling within the surrounding built ranges. Here the traditional 'code' is effectively outlawed by modern instruments of planning.

Apart from typological differences, there are also other more complex dissimilarities between the two systems. These are to do with zoning and use of spaces. Traditionally, built and open spaces are designed for multiple mixed uses, and not restricted to a singular purpose. The separation of the commercial, institutional, religious and residential spaces in urban design and planning, regarding any mixing of the functions as 'untidy', is a recent way of thinking. There are several buildings in Jaipur, for example, which serve as both temple and college. Besides providing for all the functions of these two institutions, they also provide a congregational space during festivals, have shops that sell items relating to religious and ceremonial activities, and have residential quarters for people associated with the temple. Jaipur contains no modern example of an institution with such a mix of functions in a single building.

The roadside paving, which is meant for pedestrians to walk on in an old city like Jaipur, is also a space for the sale of perishable items like fruit, vegetables, snacks and refreshments. The modern pavement is designed solely for pedestrian circulation, and any other use would be regarded as undesirable and can be punishable. Recently, the Municipal Corporation of Delhi announced a ban on the cooking and sale of freshly prepared snacks on the roadside pavement. It remains to be seen whether this ban proves to be enforceable. Single-activity spaces are preferred by modernists due to their uncluttered and predictable nature. Multivalent spaces and mixed land use look random and chaotic. More importantly, the effects of a multivalent space cannot be accurately forecast and frozen at the design stage.

To permit a layered use of space, a design system that is more complex and sophisticated than the modern one is required – a system that makes design a fluid

and ongoing process, with more than one individual architect in charge of aesthetic and functional decisions. It requires a design system that places more constraints on the designer to make the solution an exercise in striking a balance between his or her personal preferences and the various demands of context and use. Such a system would use a multidisciplinary approach to design a community rather than just the material enclosures for living. Some efforts in the direction of community participation are evident in the work of the late Laurie Baker in Kerala, and Charles Correa's plans for Belapur.³

Elsewhere, some recent American and British approaches are exploring the introduction of Urban Codes to make new design processes more relevant and contextually sustainable. But this is being achieved, by and large, without the added complexity of the need to address a living building tradition. In the Indian context, any such experiment of upgrading the system of urban design cannot be successful without taking into account those traditions, often dismissed as archaic, that have managed to survive the onslaught of modernism. They have done so without institutional and political support, and it is time to upgrade the indigenous systems to meet the modern challenges, so that an alternative building system can be put to work.

Urban Codes in Texts

The 'codes' of Vastu Vidya are expressed in built form and in written texts known as Vastu Shastras. Amongst other subjects, these texts lay out fundamental principles of classification for towns and cities. What follows is a brief overview of the content of some of them.

Manasara, a medieval text on architecture (dated around the tenth century AD), is perhaps the most voluminous one so far discovered. It was originally written in Sanskrit, first came to light for the English-speaking audience in 1834, and was fully translated into English by P.K. Acharya in 1934 from a collection of various fragments and copies. Despite these efforts, the text remains better known amongst Indologists and linguists, who use it for academic purposes, than amongst architects and designers, for whom it was originally composed. The text is divided into seventy chapters on standard topics including: units of measurement; the selection of sites; the examination of soil; the laying out of villages, towns and forts; the elevations of one-storeyed to twelve-storeyed buildings; and the measurement system for carving idols.

A similar but slimmer text called *Mayamata* is dated later than *Manasara*. Also a well-known text originally in Sanskrit, it was first translated into English in the 1980s (figure 5.2). The division of its content is generic, and its thirty-six chapters cover topics that are similar to those of *Manasara*. Both texts are contextually located in southern India, and in their tenth chapters⁴ describe seven types of towns:

अथ दशमोऽध्यायः

[नगरविधानम्]

नगरादीनां मानं विन्यासं च क्रमादहं वक्ष्ये ।

[नगरमानम्]

आद्यं धनुषां त्रिशतं तस्माच्छतदण्डवर्धनादुपरि ॥ १ ॥
 साष्टकसप्ततिभेदाश्चाष्टसहस्रान्तकं यावत् ।
 नगराणां विपुलं हि प्रोक्तं पूर्वोक्तमानेन ॥ २ ॥
 शतदण्डादिदशार्द्धां त्रिःसप्तत्रिशतदण्डान्तम् ।
 क्षुद्राणामिदमुदितं नगराणामेव सर्वेषाम् ॥ ३ ॥
 उत्कृष्टपुरपरिधिर्नृपतेर्यष्टद्विरष्टसाहस्रैः ।
 चातुःसहस्रकान्तं पञ्चशतोनादि पञ्चपञ्चधा मानम् ॥ ४ ॥
 त्रिशतादिचतुःशतकं यावद् वृद्ध्या तु विंशतिभिः ।
 षड्विधमुक्तं खेटं श्रेष्ठे मध्ये परे विपुलम् ॥ ५ ॥
 तस्मात् त्रिरष्टवृद्ध्या द्रोणमुखे पञ्चधा मानम् ।
 षण्णवतिचतुःशतकं यावत् तावत्तु विस्तारम् ॥ ६ ॥
 द्विशतादि चतुःशतकं यावत् पञ्चाशदभिवृद्ध्या ।
 पञ्चप्रमाणमेवं खर्वटविस्तार उद्दिष्टः ॥ ७ ॥
 द्विशतादिपङ्क्तिवृद्ध्या चत्वारिंशत्त्रिशतदण्डं स्यात् ।
 यावन्निगमे विपुलाः प्रोक्तास्त्रिःपञ्चभेदाश्च ॥ ८ ॥

Figure 5.2. A page from Mayamata defining types of towns. (Source: Bruno Dagens)

1. *Kevala Nagar*: literally meaning 'ordinary town', this has four gates, with one at each cardinal point; it is heavily populated, being full of merchants and markets, dwellings for all classes and temples for all Gods.
2. *Rajadhaniya Nagar* or a royal capital: this is a city with the royal palace in the centre and is inhabited by numerous wealthy people. It is in the centre of the kingdom and is preferably located on the banks of a river; it has lofty gateways, temples, gardens, and contains people of all classes.
3. *Pura* is a town frequented by buyers and sellers, abuzz with trading activity. It is like a capital city (above) but is located in forested country. It has temples of seven gods and is inhabited by people of all classes.
4. *Kheta*, literally meaning 'field' is an agricultural town situated next to a river or in the vicinity of a mountain, with dwellings of the lowest class.
5. *Kharvata* is a town surrounded by mountains and pastures and inhabited by people of all classes.

6. *Kubjaka* is a town situated between a *kheta* and a *kharvata* (as described above). It has a large and mixed population without a surrounding rampart.

7. *Pattana* is a coastal trading town. It stretches along the coast and is protected by a rampart. It has dwellings of various castes with a strong mercantile community conducting import and export of goods such as jewels, silk cloth, camphor, and precious stones. Products of other countries are found here.

Samarangana Sutradhara, an eleventh-century text from the northern plains, defines the relative sizes of settlements. This gives us an insight into the organization of the population. A *rajdhani* is where a king lives, around which are *shakha nagar* or satellite towns. A *karvat* is a sub-type of a *shakha nagar*, and a 'lesser' *karvat* is a *nigam*. A *nigam* is made up of *griha* or houses.⁵ *Rajavallabha*, a fifteenth-century text from western India, lists the settlements in terms of their relative sizes: $\frac{1}{2}$ *nagara* (town) = a *grama* (village), $\frac{1}{2}$ *grama* = a *kheta* (as above); $\frac{1}{2}$ *kheta* = a *kuta* (similar to a *kubjaka*, as above); $\frac{1}{2}$ *kuta* = a *kharvata*.⁶ A large nation (*rashtra* or state) has 9,090 or 9,064 *grama* or villages, a medium sized nation has 5,384 and a small nation has 1,548 villages. All nations must contain the seven types of cities.⁷

These textual definitions are neither exclusively prescriptive (saying how things ought to be) nor simply descriptive (saying how they are). As suggested above, the relationship between theory and practice is more interactive than either term would imply, as they are both expressions – respectively written and built – of the same body of knowledge, or 'codes'.

This brief outline of the classification of towns suggests the importance of their location and setting. *Shukraniti* (a sixteenth-century text on polity) says,

a ruler should build his capital in a place that abounds in various trees, plants and shrubs; is rich in cattle, birds and other animals; is endowed with good sources of water and supplies of grain; is happily provided with resources in grasses and woods; is bestirred by the movements of boats up to the seas; is not very far from the hills; is even-grounded and on a beautiful plain.⁸

The landscape around the settlement defines the nature of the city. A settlement in a forest will differ from one located on a coast or one that is surrounded by mountains. The predominant function of a town is also an important feature. The economic and commercial settlement has a different quality from an administrative capital. Most towns have a mix of castes and classes.

Although they vary in terms of size and activity, the seven types are also inter-related: even the *grama* (literally meaning village) is listed as a type of town in the texts, which do not make the modern distinction between urban and rural. Contemporary urban development plans do not address the problems of villages because rural issues

are regarded as being distinct. The traditional texts, by contrast, treat all human settlements as parts of a cohesive system, and give each type equal attention.

The texts also describe a more detailed aspect of coding, namely the layout options for various towns and cities.⁹ The recommended plans are all regular grids and differ from each other principally in their degree of complexity.¹⁰ *Mayamata*, for example, names fifteen types of road layout, starting with *dandaka*, which is a town with one principal straight road through it, and ending with *sarvatobhadra*, which is a town with eleven *rajvithis* or main roads on the east-west axis and eleven on the north-south axis.¹¹ *Samarangana Sutradhara* describes a road layout where three roads running north to south, and three running east to west, divide the site of the town into sixteen plots.¹² The central line is *raj marg* or a royal highway, which for a large town (*jayeshtha pura*) is 24 *hasta* (432 feet) wide; for a middling town (*madhyama pura*) it is 20 *hasta* (360 feet) wide; and for a small town (*adham pura*) it is 16 *hasta* (288 feet) wide. The *raj marg* is for the use of kings, subjects and the army, and should be strong and lined with services for travellers. On either side of the *raj marg* are *maharathya* or principal carriageways, which measure 12, 10 and 8 *hasta* for large, average and small towns respectively. In the centre of the sixteen plots, four *yaan marg* or vehicular roads measuring 4 *hasta* for a large town are recommended. On either sides of the *yaan marg*, a large town should have footpaths that are 3 feet wide. In total there are seventeen types of wide and narrow roads in a town.

The sixteenth-century *Shukraniti* describes *raj marg* as a feature of all towns and villages, connecting the palace or the centre with all the directions, and used to transport marketable commodities. Other roads in the town are *padya* or footpaths, *beethi* or alleys and *marg* or streets. The roads are built like the back of a tortoise (high in the middle) with drains on both sides. The houses are arranged facing the *raj marg* with *beethis* at the back, in double rows. Roads should be repaired every year with gravel by prisoners.¹³ On the topic of public amenities, *Shukraniti* appeals to 'wise men' to give away land for temples, parks and public grounds. Any obstruction of tanks, wells, parks, boundaries, temples or roads is punishable by law.¹⁴

Planning an urban settlement entails not only laying out houses and roads, but also a longer term commitment towards their maintenance and upkeep. Ensuring that the city's growth is healthy requires administrative measures that keep decay and abuse at bay. *Arthashastra*, an ancient (third century BC) text on economics and statecraft, gives a detailed account of the factors that need to be considered in the organization and the administration of a town. For example, one well should be provided for every ten families.¹⁵ Regular inspections of the sources of water-supply and water courses, roads and pavements, ramparts, parapets and other fortifications should be carried out by the city superintendent. He should also impound stray cattle and lost property. A fine of one *pana* is imposed for defecating in a holy place, in a place for water, in a temple, or in a royal property; and half a *pana* for passing urine in the same places; but the fine is

waived if the cause of the offence is sickness or fear. The fine for throwing dirt on a road is one-eighth of a *pana*, and a quarter *pana* for blocking it with muddy water. All fines are doubled on the royal highway.¹⁶

According to all of the architectural texts, the zoning of activities in urban settlements followed the concept of mixed land use. This phrase is much used today, and it is important to ask what the nature of a mixed land use setup really was, as described by the texts. It was not an arbitrary blend of activities poured over the land to achieve an interesting purée of functions. Traditionally, there were regulations dictating what went where and in what proportion. For example, the orientation of activities, or their relative positioning in space, was governed by the associational values of the various directions, or points of the compass. The south-east is associated with fire, and here were placed those who are *agnijivi* (who work with fire) like the jewellers and the blacksmiths. The south-west is associated with ancestors and was considered an appropriate place for storage of the assets of the town, including arms and produce. The north-west is associated with wind and movement, and so was considered the ideal location for making or storing carriages, and for those whose work involves mobility, such as policemen and shepherds. The north-east is associated (amongst other things) with water, and the direction was thought ideal for dyers and washermen. The objective of bunching certain functions and professions together was to allow the sharing of infrastructure facilities such as kilns and tanneries, and thereby to promote in the community a sense of shared responsibility. There are other advantages like sharing customers and raw materials, generating a healthy, constructive competition (rather than a combative one), and creating a team spirit amongst the producers of goods.¹⁷

The Example of Jaipur

To move from the texts to examples of practice, the walled city of Jaipur (founded in 1727 AD) remains a living testimony to the application of the pre-modern system of urban design. Set on a flat site that gently slopes towards the north, with hills to its north-west and east, and a trading highway to its south, Jaipur was conceived by Maharaja Sawai Jai Singh II (r. 1699–1743) to perform the dual functions of a royal capital and a commercial centre (figures 5.3 and 5.4). As per the norm, the temple of the royal household and the palace are placed in the centre of the nine-square mandala, with the city all around it.¹⁸ The principal streets run east–west and north–south; they are lined with shops and intersect at crossroads where the main open markets are located. The quarters of the city are further divided by lanes and alleys. Each quarter is dedicated to the production and sale of specific crafts, and the principal lane of each quarter serves as its bazaar outlet (figure 5.5).

The process of habitation of the city was conducted in a controlled and coordinated

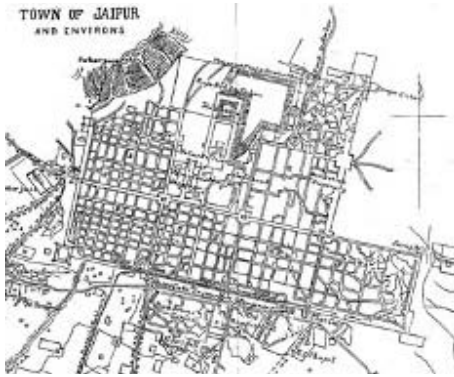


Figure 5.3. Plan of the city of Jaipur. (Source: A local guidebook, c. 1900)



Figure 5.4. Aerial view of the city of Jaipur. (Source: Author)



Figure 5.5. A street of Jaipur. (Photo: Author)

fashion, and in accordance with the coding norms of Vastu Vidya. First the principal roads and quarters were demarcated, using the concept of the mandala, and the plots and shops were laid out within it. Leading merchants and craftsmen from the region and beyond were invited to settle in the city to produce and to market their goods. Initially the traders sold high-value commodities from a variety of sources; but as the goods produced in Jaipur itself became known for their excellent craftsmanship, the authorities required the traders to concentrate on these local manufactures. This meant that customers came to Jaipur to buy the well-known ‘made in Jaipur’ objects, thereby raising the city’s profile from being one among many trading towns to being the best place to shop. So, who was going to live in Jaipur, what they were going to do for a living, where they were going to sell their produce, and what they were to sell, were all matters that were carefully addressed and planned for. The result was a vibrant mix with an astounding number of craft skills (most of which are still practised today).

Apart from a strong commercial identity, Jaipur has a distinct visual identity. The city was built at a time when the hold of the Mughal empire which had been the largest power base in India for the preceding two hundred years was on the decline. The

Mughals built their forts and palaces in red sandstone and marble (the more expensive marble being reserved for royal use). The visual identity of the stronghold of power was of impenetrable fort walls of red sandstone, with Delhi and Agra forts being the key examples. Jaipur is built from a material that looks like red sandstone, but is in fact much cheaper plastered rubble, coloured terracotta. The southern side of Jaipur – the longest side of the city’s site – abuts a major Mughal highway, a road that connects Delhi with the important Mughal pilgrimage site at Ajmer, and which was used for trade and transport between the two Mughal centres. The façade lining the highway presented a formidable frontage, expressive of the prestige of a royal walled city. The palace in the centre of the city uses lime stucco plaster that is reminiscent of marble.

Apart from the terracotta colour-wash, the city’s principal streets have a uniformity of scale and design that creates a visual coherence that lends Jaipur its unique identity. The key factor that was instrumental in making all this happen and in maintaining the city’s reputation was its capable administration, by ministers appointed by the court.¹⁹ Such ministers drew on the expertise contained in traditional coding. The minister involved in the layout of the city, Vidyadhar, though identified in the modern popular imagination as an ‘architect’ was in fact simply applying the coding principles of *Vastu Vidya*.²⁰

The Example of Vidyadhar Nagar

Jaipur is of course only one of a number of examples of living cities that successfully embody *Vastu Vidya* ideals (other notable examples include Madurai and Srirangam, both in the south of India). One reason for selecting Jaipur as an example here is the attention paid to it by a post-Independence generation of architects who have studied historic towns and settlements in search of ideas to contextualize, or provide local flavour to, their own designs. Prominent in this generation is the distinguished architect B.V. Doshi, a one-time associate of Le Corbusier, whose practice based in Ahmedabad includes a department devoted to the study of traditional architectural principles.²¹

In the mid-1980s, a brand new town began its life on the outskirts of Jaipur. Conceived as a satellite town, Vidyadhar Nagar was designed by Doshi (figures 5.6 and 5.7). The design of the town was said by the architect to embody the ‘essence’ of both traditional urban design and modern building principles – a sort of a happy blend of the complexity of mixed land use planning and the modernist starkness of a ‘Le Corbusier style’. The main premise of this effort to bring together the best of traditional and modern design, however, was aesthetic. *Vastu Vidya* was invoked in the pictorial ‘concept sheet’ that was used to present the architect’s ideas to the civic authorities (and to the readers of architectural journals where it was published). But it has ceased to be coding: isolated elements are included in a post-modern thematic



Figure 5.6. The model of Vidyadhar Nagar. (Source: B.V. Doshi, by courtesy of the Vastu Shilpa Foundation)



Figure 5.7. Vidyadhar Nagar under construction. (Photo: Author)

manner, and jostle for space with other themes such as modernism and ecology. The claim that the planning principles embodied in the historic town of Jaipur served as a primary influence for Vidyadhar Nagar is not borne out by its final design, where the Le Corbusian legacy predominates. Indeed, a comparison between Vidyadhar Nagar and Jaipur clearly illustrates the distinction between urban planning – that depends on a design conceived by an individual architect – and the application of traditional urban codes.

It is true that, as in the old city, there is generous accommodation for commercial activity along with the residential, but not such as to make shopping there a unique or desirable experience. Who are the sellers? Where are the goods produced, and how

are they procured? How are the things being bought and sold here any different from those in other modern cities? These are some of the questions which were of primary concern in the planning of Jaipur, but which are not addressed here at all.²²

One might argue that Vidyadhar Nagar, unlike Jaipur, was not intended as a commercial city, and so its success does not depend on the quality of the shopping experience. Nevertheless, addressing the questions of the economy and sustainability of a city is now more important than ever. To make cities energy efficient, questions of what people do for a living, and what services are provided for them will have to be a part of the planning agenda – just as they were once part of the coding that shaped Jaipur. Reviving such codes achieves a beneficial mix of professions and trade that would enhance community living. Also, ensuring that a city has a distinctive edge – whether in industry or through its institutions of education or entertainment, for example – provides scope for exchange with other cities of the region.

The Example of Gurgaon

A study of the even more recent city of Gurgaon is useful to show what happens in the absence of traditional coding, or even of much modern city planning beyond the demands of the market. Gurgaon's evolution and problems point to some of the issues that were historically addressed and solved by coding.

Situated to the west of Delhi, Gurgaon is one of a number of new satellite cities that wrap a belt around the capital to cover its expanding girth. Together with Faridabad, Noida and Ghaziabad (to the south and east), Gurgaon is an important part of this collective known as the National Capital Region. These new cities share common developmental aspects, not as a result of considered design or forward planning but because each reflects the short-term needs-based management of the building industry.

Gurgaon originally had large tracts of agricultural land. In the 1980s this gradually provided space for some of the industrial growth of Delhi. With the expansion of the road network a decade later, Gurgaon was ready to receive the residential spill-over from Delhi. Throughout the 1990s, agricultural land was rapidly bought at attractive rates from farmers and converted to housing estates with a mix of plotted developments, low-rise independent flats, and some high-rise centrally air-conditioned housing towers.

The dream was of a clean and hassle-free living environment. The developers' publicity photographs showed apartments that look like five-star hotels, with happy couples drinking champagne in their jacuzzi, or swimming in the pool on the roof of their tower block, cooking a meal together, or entertaining in interiors designed by 'foreign' architects using exclusively imported materials. The city has numerous shopping malls (with many more under construction); these are enclosed, air-



Figure 5.8. One of the office towers in Gurgaon. (Photo: Author)

conditioned steel and glass containers of designer goods, providing leisure and entertainment. In terms of work, Gurgaon has emerged as a key centre for business processing offices, and takes pride in calling itself an IT city (figure 5.8). So the image is of a life divided between ultra-modern office, shopping mall and apartment block.

What this picture edits out is the mechanics of daily existence. The city already suffers from long power cuts and water shortages, and from the poor maintenance of roads. These services are inadequate to sustain the projected lifestyle.

The picture also overlooks some key workers. Daily essentials such as newspapers, milk and vegetables are delivered by people on scooters or carts (they are also available in the mall supermarkets, but buying them from these requires driving). The household rubbish is collected every day by people with carts, who sift through it manually to recycle the contents. Each household employs either a full-time maid who cleans, cooks and washes, or a part-time cleaner and a cook who provide their services for a few hours every day. Many households also get their laundry ironed by workers who collect clothes every morning and deliver them in the evening. Other casual workers wash cars, tend private gardens, and sweep the common areas of residential enclaves. Thus each household is visited daily by at least three or four and perhaps as many as ten people providing domestic services.

Yet there is no proper allocation of housing for these workers. They live in the region's residual villages that have yet to be taken over by the developers. Others live in unauthorized slums adjacent to the developed colonies where they work. Here they have no electricity or water supplies except what they are able to siphon from their more affluent neighbours. Despite being a source of labour, the slums are therefore regarded as a threat, but no effort is made to provide alternatives. Making houses for the economically weaker section (EWS) of society is not a profitable business, with low

budgets and small profits. The effective lack of a government master plan (as the NCR plan for 2000 was published only in 2007) and poor forward planning has meant that any land allocated for EWS housing has been used for more profitable purposes. The lack of public transport adds a further problem for the sustainability of these services. The advertised image of Gurgaon is of a classless society offering luxury to all.²³ In reality the luxury depends on the presence and work of a large underclass, for whom little or no provision is made. Plainly this is not sustainable in the long term, and planners will have to address the deficiency.

In doing so, there is much to be learned from historic coding traditions. An instructive comparison might be made with the definitions of various kinds of city listed in the *Vastu Shastras* (as described above), which stress the provision of ‘dwellings for all classes’; or with a functioning historical example like Jaipur, where labour and the civic economy were planned at the same time as the city’s physical fabric. The key shortcomings of Gurgaon – the lack of forethought and planning with regard to social and economic aspects – are matters that were of primary concern in traditional coding, as is shown here by the comments on textual definitions of towns and on the economy of Jaipur. The absence of aesthetic coherence in Gurgaon’s architectural design – another feature which many people object to – is also something that traditional codes addressed directly, as many historic towns like Jaipur demonstrate.

All this is not to suggest that new cities like Gurgaon should be made to fit definitions or ‘codes’ from ancient texts, or made to imitate particular historical examples, out of some nostalgic impulse. It is to suggest that modern urban planning is not always an improvement on the past, and that India’s traditional urban coding (expressed in both theory and practice) contains much that is relevant to the problems of today.

Challenges for the Future

Although disenchantment with modernism is very widespread, regional responses by very definition are place-specific. The Indian context is vastly different from that of the UK and the USA, and so any set of new urban codes developed in these cultures and from their traditions would be unlikely to produce the desired result in India. Here, the traditional building systems are part of a living heritage, albeit gasping under the weighty presence of modern architectural practices.

In the contemporary context, there has yet to be an earnest attempt at developing an urban planning system based on the principles of *Vastu Vidya*. The application of the past to present design so far has been limited to the post-modern technique of abstracting and reinventing spatial and decorative motifs from traditional buildings. This technique is hardly an application of the process of traditional design (as is sometimes falsely claimed). A successful updating of traditional principles for

contemporary use can be achieved only by focusing on the *method* of design. An application of the design *process* (rather than of built motifs) would generate an architecture that is not self-consciously atavistic and dated, but at ease with modern requirements and technology. This process would have to involve a multi-disciplinary approach to community design, taking indigenous models as the starting point. Unlike the modern system, where the individual architect uses architectural drawings to create static forms, the emphasis would be more on the design codes of Vastu Vidya, which establish guidelines for collaborative work, leading to dynamic forms.

Some of the specific tools of Vastu Vidya, and notably the *Vastu Purusha Mandala*, are readily applicable to contemporary design because of their inherent flexibility. To date, the mandala has been invoked (like other aspects of Indian coding) only in a post-modern way, whereas its original use and greater potential is as a generative instrument, as described above. Other aspects of coding may require some updating in the light of recent technological advancement. For example, the discussions in texts about the properties of materials need to be expanded to include new materials such as concrete, glass and steel. This updating can be done in the spirit of the original discussions, with their focus on quality control, energy consumption and economics. Thus even on matters that they do not directly cover, there is much to be learnt from the methods of coding traditions.

An important aspect of the process of applying Vastu Vidya codes is to re-establish an appropriate definition of mixed land use. Traditionally, this entailed addressing issues such as: the mixture of functions; the provision of services for the entire population; achieving a desired demographic profile for the city with regard to a range of occupations (not just incomes); defining the nature of the commercial activity of the city; maintaining the cultural context of the place and its people, by identifying social and religious ceremonies and providing facilities for them (places of worship, and spaces for festivals, weddings and recreation). These aspects of urban planning are as important as the architecture that forms the skeleton of the urban environment. Master planning, as practised in India in recent times, has failed to address them, but solutions are readily available in the texts and historic cities like Jaipur that embody India's traditional urban codes.

Notes

1. For a detailed and comparative analysis of a broad range of texts from different periods and regions of India, see Chakrabarti, 1998.
2. For an early critique of Chandigarh, which likens it to colonial practice, see Nilsson, 1973. In the 1980s there was an effort to rehabilitate Le Corbusier's work in India by arguing that it responds sensitively to regional tradition; see, for example, Curtis, 1987. Most critics have found such arguments unconvincing; see Prasad, 1987. Even if it is accepted that Le Corbusier responded to selected Indian motifs, he did not employ Indian design codes.
3. In other projects Correa's approach to tradition is typically post-modern, and does not engage with design 'codes'. For Baker, see Bhatia, 2003.

4. *Manasara* X.39–87; *Mayamata* X.5–36.
5. *Sanarangana Sutradhara* 22.2–7.
6. *Rajavallabha* IV.9.
7. *Samarangana Sutradhara* 23.83–87.
8. *Shukraniti* I.425.
9. *Mayamata* X.16–17; *Manasara* X.110–114; *Samarangana Sutradhara* 23.2–4; *Rajavallabha* II.4.
10. The texts describe conceptual plans, whose realization need not involve geometrical regularity.
11. *Mayamata* X.54–76.
12. *Samarangana Sutradhara* 23.4–15.
13. *Shukraniti* I.519–536.
14. *Ibid.* I.423–424; 601–602.
15. *Arthashastra* 2.4.26.
16. *Ibid.* 2.36.26–43.
17. *Samarangana Sutradhara* 23.88–103; *Arthashastra* 2.4.8–15; *Rajavallabha* IV.18–20.
18. For a full account of the planning of Jaipur, see Sachdev and Tillotson (2002). Taking Jaipur as a test case, this work explores changes in Indian planning and urban design between the eighteenth and twentieth centuries; i.e. from pre-colonial to post-modern.
19. The role of the Jaipur court in the commercial life of the city is further explored in Sachdev and Tillotson, 2008.
20. On the modern misunderstanding about Vidyadhar, see Sachdev and Tillotson, 2002, pp. 46–47.
21. For more on Doshi, see especially Curtis, 1988.
22. For further discussions of the relationship between Vidyadhar Nagar and traditional principles, see Chakrabarti, 1998, pp. 91–92; Sachdev and Tillotson, 2002, pp. 134–138.
23. The advertising of Gurgaon is discussed by Christiane Brosius, 2007.

Translations and Published Editions of Texts mentioned in the Notes

- Architecture of Manasara*, Manasara series, vol. IV. (English translation: Acharya, P.K.), 1934, reprint Delhi, 1980.
- Mayamata: An Indian Treatise on Housing, Architecture and Iconography* (English translation: Dagens, Bruno), Delhi, 1985.
- Mayamatam: Treatise of Housing, Architecture and Iconography*, 2 vols. (English translation: Dagens, Bruno), New Delhi, 1994.
- The Kautilya Arthashastra*, part 2 (English translation: Kangle, R.P.), reprint Delhi 1972.
- The Shukraniti* (English translation: Sarkar, B.K.), 1st ed., 1914, reprint New Delhi, 1975. *Samarangana Sutradhara* (Hindi translation: Shukla, D.N.), Delhi, 1994.
- Vasturajavallabha* [or *Rajavallabha*] of *Mandana Sutradhara*, 2nd ed. (Hindi translation: Ojha, Ramyatna), Benares, 1934.

Chapter Six

Prescribing the Ideal City: Building Codes and Planning Principles in Beijing

Qinghua Guo

In dynastic China, governments developed distinctive building codes and planning principles; consequently the relationship between building and planning was quite strong. The body of traditional Chinese codes was large, and has yet to be fully researched: a systematic study of the building codes has not been attempted, and the coding history has yet to be written. This chapter interprets the Chinese building codes in the context of design, with a focus on the relationships between architecture and planning within Beijing's history. Various studies on Beijing have been published during the past twenty years across a range of disciplines, including architectural and urban history, town planning and urban geography (Whitehand and Gu, 2006). The city has been viewed as a monument, form, space and place. However, what has not been well understood is its planning practice from the perspective of codes. Perhaps even less known is the interactive relationship between coding and planning.

This chapter is divided into three sections. The first analyses codes and coding traditions, particularly the building codes of the Qing dynasty (1644–1911 CE). The second discusses planning and planning traditions, primarily through an ancient case: the Zhou dynasty plan outlined in 1100–771 BCE, which influenced planning principles and urban patterns for ideal cities until the end of dynastic China, a period of some three thousand years. And the third section points out the link between architecture and planning, specifically through courtyard houses and *hutong* laneways in Beijing. The aim is to explain how 'ideal' design codes were related to 'ideal' city planning. The central concern of this study is how the building codes confirmed or

supported the planning of the city. In this context we shall see how urban planning and building codes shaped and transformed the physical form of Beijing.

Codes and Coding Traditions

Traditional Chinese building codes have survived in the form of building manuals. They were collected and edited by the central government and stored in imperial archives. Several terms were used in the documents to designate regulations and standardizations, and did not refer to buildings alone. These included *fashi* and *zhidu* used in the Song dynasty (960–1279 CE), *zhengshi* in the Ming dynasty (1368–1644 CE) and *zuofa* and *zeli* in the Qing dynasty (Wang, 1963).

The building codes were made for administration, and were enforced together with construction laws (Johnson, 1979, 1997). *Yingshan ling* (literally ‘Decree of Construction’) became part of the Tang law in the Tang dynasty (618–907 CE), making this the first known appearance of Chinese building construction law. Though no longer extant, it is mentioned in textual sources.

The oldest existing building manual in China is the *Yingzao Fashi* (State Building Standards) published by the Song government in 1103 CE. The book deals with modular systems, design standards with architectural and structural patterns indicated in drawings, construction principles and labour estimations. It specifies thirteen types of construction work: city wall and moat, stonework, structural carpentry, non-structural carpentry and joinery, wood carving, turning and drilling, sawing, bamboo-work, tiling, wall building, painting and decoration, brickwork and glazed tile making.

The last design specifications of imperial China were entitled *Gongcheng Zuofa* (Imperial Specifications for State Buildings) compiled by the Qing government and enforced across the country in 1734. The Song manual and the Qing manual were closely related. However, because Beijing was the capital of the Yuan, Ming and Qing dynasties, rather than a Song city, this chapter will look at the *Gongcheng Zuofa*, with a focus on content and function. I have discussed the *Yingzao Fashi* elsewhere (Guo, 1998).

The meaning of the title *Gongcheng Zuofa* is, literally, ‘construction methods’. The book comprises a set of specifications and regulations for building design with twenty-seven illustrated examples. Qing building codes were subdivided into two categories: *neigong* (imperial work) and *waigong* (public work). The former referred to palace projects carried out under the supervision of the Imperial Household Department (*neiwu fu*), and the latter referred to state or public projects under the supervision of the Ministry of Works (*gong bu*). Typical projects for which codes were written were: palace buildings, altars and shrines; royal nobles’ mansions; granaries and storehouses; canals, bridges and city walls; government offices and temples (Wang, 1995).

The *Gongcheng Zuofa* contains seventy-four chapters: chapters 1–27 deal with

structural design; chapters 28–40 with timber structural components; chapters 41–47 with earthwork, stonework, arch-work, tiling and joinery; chapters 48–60 with material quotas; and chapters 61–74 with work norms. The code offers models or examples in the style of ‘architectural data’ and includes structural patterns, roof types, building sizes, modular systems, decorative motifs, colours and materials, unit/weight guidelines and the price of building materials, and labour or work norms.

The buildings, predominantly wooden column-and-beam systems, were specified according to structural typology. Architectural design was controlled by regulations, including building size, roof type, decoration and material. The codes were applied to a range of scales, from dimensions of structural members to ways of assembling frames. The book contains twenty-seven examples with illustrations, including twenty-three ‘major types’ (*dashi*) and four ‘minor types’ (*xiaoshi*), ranging from the smallest, five-purlin single-storey structures, to the biggest, multi-storey, hip roofed nine-purlin structures with block-bracket sets (figure 6.1).

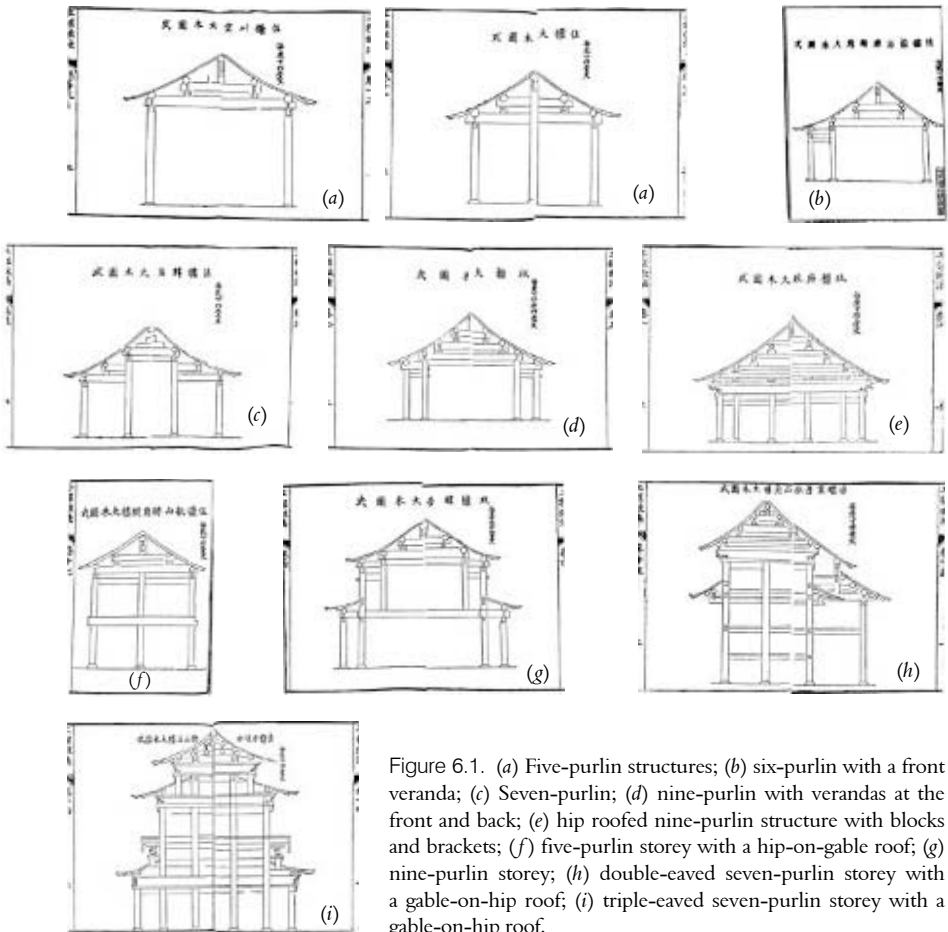


Figure 6.1. (a) Five-purlin structures; (b) six-purlin with a front veranda; (c) Seven-purlin; (d) nine-purlin with verandas at the front and back; (e) hip roofed nine-purlin structure with blocks and brackets; (f) five-purlin storey with a hip-on-gable roof; (g) nine-purlin storey with a gable-on-hip roof; (h) double-eaved seven-purlin storey with a gable-on-hip roof; (i) triple-eaved seven-purlin storey with a gable-on-hip roof.

The codes specified structural members in order to achieve the desired architectural form and scale. The repeated application of prefabricated components resulted in a modular system in Chinese timber architecture which came with the positioning of columns or beams and governed individual parts of buildings. Standard components could create more or less identical buildings, but also could be assembled in various combinations. In this way, the structural members of the modular system created variety with harmony. The intention was that the design solutions be prototypical rather than strictly tailored to site constraints and as a result be applicable to a number of similar locations. The twenty-seven examples illustrated in the code do not represent particular buildings to be built in particular locations; they could be applied to any number of designs in any number of locations within the purview of the code. The architectural drawings were abstract, and relational patterns of dispositions and configurations served primarily as illustrated accompaniments to the technical text. Furthermore, they constituted only a small portion of the *Gongcheng Zuofa*.

The code had two functions. First, it was used by the administration to estimate building materials and the work required for each project. The *Gongcheng Zuofa* was aimed at providing sumptuary regulations for engineering agencies of the central government to budget for specialist work areas, to monitor the expenditure of various state projects, and to examine the quality of the work. Only by standardizing the design and construction of state buildings could budgets be met. Secondly, the code recommended advanced standard practices. The building regulations were part of top-down control, whereas architectural knowledge was bottom-up, collected from the profession and beyond cost considerations.

The code was a legal text; it was not a law. The construction law of the Qing dynasty was called '*fangwu yingjian guize*'¹: it specified what was permitted in both architecture and planning and had jurisdiction status.² The codes need to be studied in the context of the Qing legal system and administration, rather than have modern conceptions of urban coding imposed on them.

The unit of Chinese architecture was a group of buildings, often an enclosed complex of houses and courtyards. The way to regulate courtyard houses was to regulate the main hall, namely the type and size of the front hall, and the number of principal buildings, as well as their materials and decorations (Wang, 1970, 1609, vol. 4) (table 6.1).

For a small courtyard house, the main or front hall was three bays in size, and the span of the central bay measured about 3.3 m. The main hall of a large courtyard house was five bays in size and the span of the central bay was 3.9 m–4.2 m. There was proportionality between courtyards and buildings: a small courtyard measured about 7 m by 7 m and a big one 13 m by 13 m. Buildings were standardized according to the social status of their inhabitants. For example, the use of *dougong* (block-bracket sets) in residential courtyard houses did not apply to people of non-royal blood. In

Table 6.1. Ming regulation of courtyard housing (*sancai tuihui, Gongshi*).

	<i>Gatehouse</i>	<i>Front hall</i>	<i>Central hall</i>	<i>Rear hall</i>	<i>Family shrine</i>	<i>Storehouse/ kitchen</i>
1	3 bays × 5 purlins; lacquered door with tin door-knocker	5–7 bays × 9 purlins, gable roof	7 bays × 9 purlins	7 bays × 7 purlins	3 bays × 5 purlins, roofed with black flat tiles, ornamental ridge; block-bracket, coloured painting, lacquered or black-oiled columns purlins	≤ 5 bays × 7 purlins
2	3 bays × 5 purlins, green door with tin door-knocker	5 bays × 9 purlins, ornamental tiles, block-bracket, blue-green painting				
3	3 bays × 3 purlins, black door with tin door-knocker	5 bays × 7 purlins, ornamental tiles, blue-green painting				
4	1 bay × 3 purlins, black door with iron door-knocker	3 bays × 7 purlins, brownish yellow painting				
5		3 bays × 5 purlins, no colour painting				

general, houses of the elite were larger and more elegant and durable than those of the common people, but it is evident that the basic principles were the same typologically and structurally, which proclaimed an essential unity. As discussed above, Chinese timber architecture is marked by the modularization of structural carpentry and the prefabrication and assembling of building components *in situ*.

The main hall of the Imperial Court in the Forbidden City illustrates the interrelationship of the modules, proportions and codes. The main hall (*Taihedian*, ‘Hall of Supreme Harmony’) was first built in 1420 under Emperor Yongle (reigned 1403–1424). It was situated on a huge stone platform of three tiers, and was 9 × 5 bays (30 × 15 *zhang* or 95 m × 47 m) in plan. Rebuilt three times in the Ming dynasty after fires, the present building was entirely rebuilt in 1689, but its size was reduced by one third (11 × 5 bays: 60.08 m × 33.33 m). The platform is clearly original and excessively large in proportion to the present hall.

Of the buildings constructed in Yongle’s reign, of the same standard as the original main hall, at least two survive in Beijing: the main hall of the imperial ancestral temple

(*Taimiao*, 60.92 m × 28.83 m) and the main hall (*Ling'endian*, 66.56 m × 29.12 m) of the *Changling*, the tomb of Emperor Yongle. The main difference is that the Taihedian and its platform are out of proportion. For a picture of what the original imperial court looked like, evidence is available within the Forbidden City: the palace (*qin*) behind the court (*chao*) on the axis. The *qin* and the *chao* share similarities in planning: each encloses three great halls, but the ratios of buildings and platforms do not coincide. The three rear great halls occupy the platform completely and are well positioned; this is one of the most original and important features of the design (figure 6.2).

The present Taihedian is much smaller than the original one; difficulty in obtaining

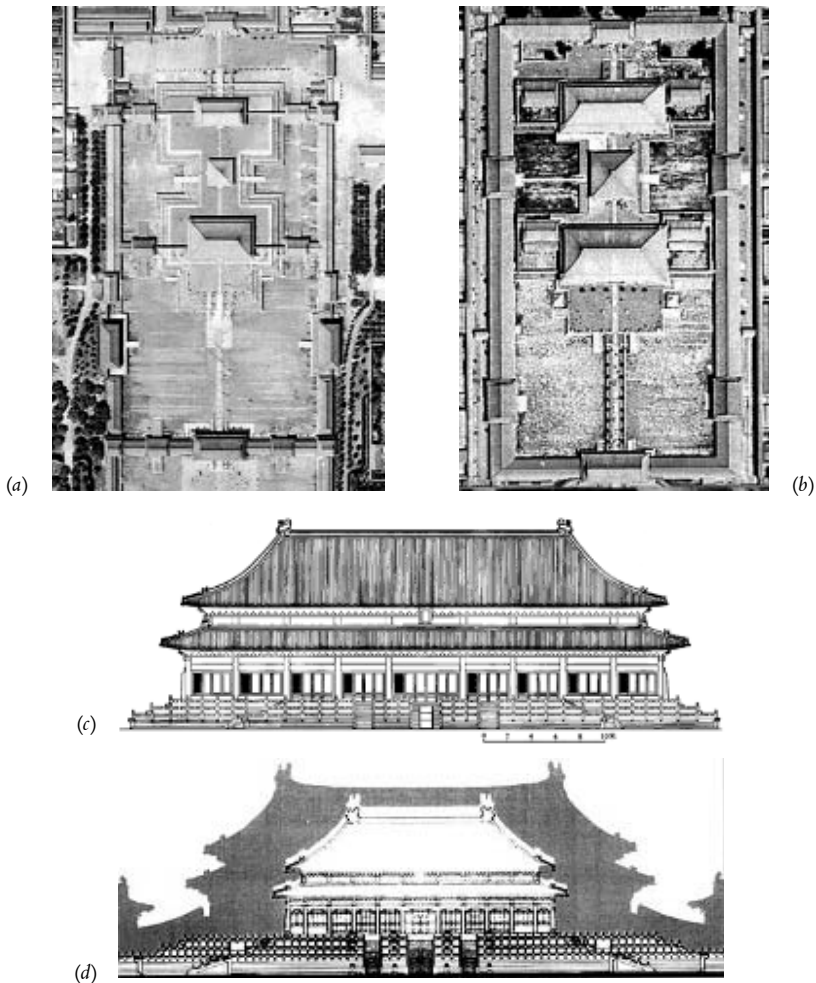


Figure 6.2. (a) Imperial Court consists of three halls placed on the geometric axis of the Forbidden City; the first one is Taihedian; (b) Imperial palace, each of the three main halls takes up almost the entire platform; (c) Ling'en dian of Changling (Yongle's tomb); (d) the present main hall and the original one (in shade).

large timbers was the cause of the change. The size of the bays was reduced, but the number of bays in the building was increased to eleven, the maximum number for imperial main halls. The modules (*doukuo*) used in Qing carpentry were smaller than those used in the Ming and earlier periods. The system of building modules coexisted with the principles of architectural proportion, controlled by codes. The codes did not refer to materials or structures only, but ruled the relationships among all the aspects of design and planning.

Planning and Planning Tradition

Throughout its history Beijing was envisioned as an ideal city, characterized by its concentric plan and symbolic-ideological representation. As the capital of China, Beijing was designed according to traditional principles during the Mongol reign of Kublai Khan in the Yuan dynasty (1271–1368), rebuilt and enlarged by the Han Chinese in the Ming dynasty, maintained by the Manchurians in the Qing dynasty and renewed by the Chinese government after 1949. Town planning in Beijing will be discussed here in the historical setting, with a focus on principles and patterns, in order to examine the changes and the reasons behind them. Beijing was the result of the application of master planning and building codes. The master planning and the building codes were conceptually linked in a design continuum.

The master planning was rooted in ancient Chinese practices of land distribution, traditionally named *jingtian zhi* (literally ‘grid-field system’) in the Zhou dynasty (eleventh century–771 BCE). The *jingtian* served as the basis for the allotment of agricultural fields. Geometrically, it was a nine-squared plot, with eight of the squares each owned by a family. The eight families formed a neighbourhood and shared a revenue land, the ninth square, in the middle, with roads between the plots (figure 6.3). The practice of the equal distribution of plots of land generated an urban pattern. The first known city planning of the Zhou was derived from this basic model – a nine-squared grid, where each square was 100 *mu* in area. From this the Zhou established the fundamental rules of constructing cities, which were recorded later in the book *Zhou Li*, written in the fifth century BCE (figure 6.4) (Anon, 1922). Although it is clear from textual sources that urban planning had been developed before the Zhou period, the *jingtian* grid from the Zhou period developed into the classical layout of the ideal cities (He, 1985).

Chinese cities were walled. City size was regulated by the number of city gates and the height of the city walls. The city gates led to the main roads through the city, thus determining urban order and creating a geometric configuration. Urban fabric and order, and functional zones were determined by master planning. Urban pattern and form were intertwined.

Ancient maps have survived that demonstrate the master planning of the time.



Figure 6.3. Diagram of the *jingtian* system: nine plots each 100 *mu* in area for eight families with a 'public land' in the centre, showing ideal land configuration. This diagram appeared in 1607 encyclopaedia. (Source: Wang, 1970 (1609))

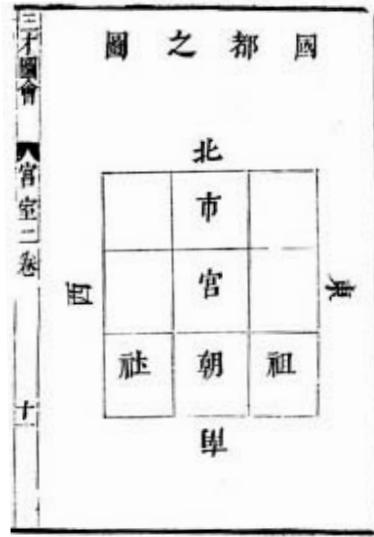


Figure 6.4. Diagram of a national capital, modelled on the grid plan with the imperial palace in the centre. There exist correspondences or correlations between building and planning. (Source: Wang, 1970 (1609), *gongshi* [Architecture], 2.11a)

Examples include a number of wall paintings and stone engravings of the Han dynasty (206 BCE–220 CE). Chinese maps merit close attention, particularly as buildings are illustrated as urban components. The maps reflect architectural and planning considerations: buildings are shown in elevation (figure 6.5). The locations and sizes of state buildings and markets were decided by the master plan, and private dwellings were infill, built according to traditional practice and enforced regulations. The building designs were integrated with the urban design by the building codes which generated a coherent urban form.

There was a preconceived overall plan from the beginning for Beijing (called Dadu in the Yuan dynasty), which outlined urban patterns, order and relationships. The master planning during the Yuan dynasty was supported by the building code, which was in turn supported by the modular system. Modular design features in both Chinese architecture and planning. The palace city was the most important element in Dadu and was the base module of planning: the Dadu plan was a multiplication of the module. Denoting the width and depth of the palace city as A and B respectively, Dadu's width is 9A and its depth is 5B. Also, the depth of Dadu is four times the depth of the imperial city (C), so 5B is equal to 4C (figure 6.6) (Fu, 2001). All these relationships are geometrical as well as architectural. The modularity was associated with both design and planning: planning and coding were interlocked as a coherent

Figure 6.5. This map of Shenyang dates from the seventeenth century. Streets are drawn in plan while buildings are depicted in elevation. State buildings are depicted and labelled. North is at the top. The map indicates the intention to convey information of both planning and building, and spatial relation between them. In view of this, architecture was considered as part of planning. (Source: Redrawn by author)

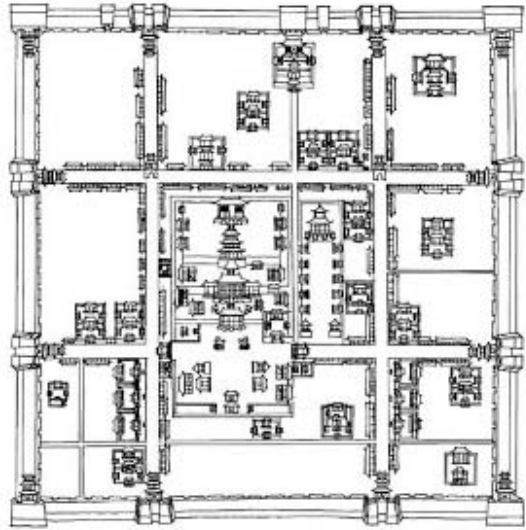
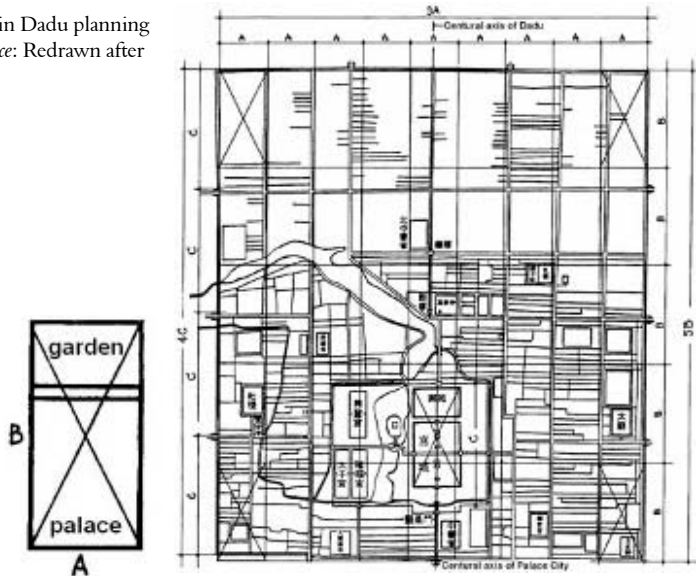


Figure 6.6. Module in Dadu planning (Yuan dynasty). (Source: Redrawn after Fu, 2001)



whole. Chinese planning and design were architectural, municipal and ideal, with all three aspects being remarkably uniform and well integrated.

Dadu: Great Capital of the Yuan

Beijing (Dadu) is situated on a plain (north of the Great China plain) screened on the north, north-east and north-west by large and continuous mountain ranges which are part of the Taihang Mountain chain. It was an important strategic site of special

advantage for military defence, with the Great Wall along the mountains separating it from the Mongolian steppes to the north and the Manchurian plain to the north-east. Its history as a capital city in the frontier region can be traced back to the Warring States period (403–221 BCE). In the Han dynasty, Beijing was a provincial town. From the tenth century onwards, it was held by various nomadic peoples including the Liao (from 938), and became the capital (called Zhongdu) of the Jin (from 1153). The actual location and size of the city varied in each period. The foundation of the present Beijing was laid in 1267 by Kublai Khan. Following the tradition of his adopted land, Kublai proclaimed himself founder of a Chinese dynasty, which he named Da Yuan – ‘the Great Origin’; he chose the name from the Book of Changes (*Yi Jing*, late Shang to early Zhou) (Wilhelm, 1967). The Yuan dynasty later selected this military and commercial site to build Dadu (meaning the Great Capital) according to Chinese planning principles.

The fundamental principles (or conceptual ideas) for constructing a capital city were established by the Zhou and followed throughout Chinese history. Now, as ever, any description of the Chinese capital’s planning and its planning history has to begin with the *Rites of Zhou* (Zhou Li). The book dates from the fifth century BCE. As a form of history, the text has served for centuries as a dominant power to form people’s beliefs and influence their habits.

In the chapter ‘Artificer’s Records’, the Zhou Li states:

The city is laid out as a square, surrounded by city walls; each side extends nine li and contains three gates. Within the city there are nine longitudinal and latitudinal avenues, each consisting of three chariot lanes. In the city centre is the imperial palace. On the left (east) side of the palace is the Ancestral Temple; on the right side is the Altar of the Land and Grains. The front part of the palace is the emperor’s administrative court, and to the rear (north) of the palace is the capital’s market place and commercial centre. The planning area is one *fu* (or 100 *mu*) for the palace and market each.³

Dadu was a new city built on flat and open land where these principles were applicable, and most of the principles were closely adhered to. Although it was common practice in Chinese planning history that a new city be built on the old by renewal and redevelopment, Dadu was an exception, albeit not the only one. Chang’an (in present Xi’an), the capital of the Sui and Tang periods (589–905 CE), clearly inherited the planning model, and reflected a renewal of the classical tradition from remote antiquity.

Central to capital selection was finding a suitable location for the palace. The site selected for the Yuan palace in Dadu was on the east bank of a lake (the present Beihai Park) to the north-east of the Jin capital Zhongdu (figure 6.7). There were at least two reasons for this decision. First, an imperial retreat (called Daninggong Palace) of the Jin already stood there, so it was possible to create a great city that combined grandeur with

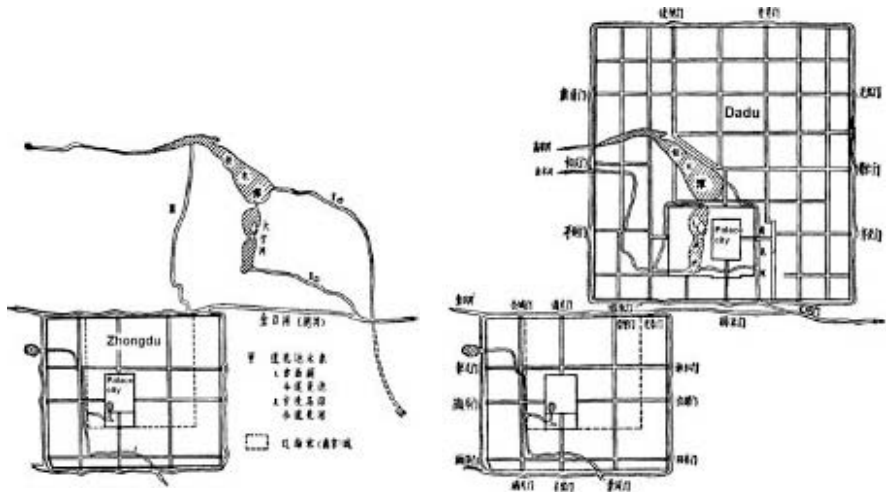


Figure 6.7. *Left*: Zhongdu (1153–1214), ‘The Central Capital’ of the Jin. It was gradually abandoned after the completion of Dadu. The route between the two nearest city gates became a diagonal street and remained as an important commercial street in Ming–Qing Beijing. *Right*: Dadu (1271–1368): the palace in front and the market behind. The renovated Great Canal from the east up to the north terminated at the market. (Source: After Hou, 1979)

beautiful scenery. Second, the palace of Zhongdu had been overrun by the Mongolian army, and its water supply from a small lake (now called Lotus Pond) was depleted. In 1266 Kublai Khan commissioned Liu Bingzhong (1216–1274), one of the dynasty’s highest scholar-officials, to draw up plans for a new capital and Guo Shoujing (1231–1316) to manage the construction of the city and its canal system (Song, 1965).

As in all ancient Chinese capitals, the boundary of Dadu was defined by walls and moats. The city was regular, geometric and almost a complete square, distinguished by a ‘chessboard’ plan due to its cardinal-orientated road network and central axis. There was a natural logic between chessboard pattern and city size. As mentioned above, the road system was determined by and linked directly to the city gates, and the number of city gates was governed by city size. Dadu was built on a grandiose scale, 50.9 km² (7,600 m north–south, 6,700 m east–west), with eleven gates – three on each side except the north. The palace was not exactly at the city centre in terms of the north–south axis. The geographic centre of the great capital plan was physically marked by a stone engraved with ‘*zhongxin zhi tai*’ (central podium), at about the position of the present Drum Tower (Xiong, 1983), from which the city extended 3.8 km to the north and south, 3.5 km to the west, and 3.2 km to the east.

To the north and west of Dadu, several rivers flowed down from the mountains. They were fundamentally important for water supply and transportation and were managed as state projects. The water supply project included tapping the springs of the mountains into two water courses in the central part of the city: one course extended

to the lake behind the palace and the other to the lake within the palace. The former was further channelled south-eastwards outside the east wall of the palace, where it met the latter, then ran eastward to join the Great Canal. The Great Canal had been built earlier, 605–610 CE, in the Sui dynasty, and was one of China's great feats of engineering; it was re-opened in 1293 to facilitate transportation from the lower reaches of the Yangzi River to Dadu.

Beijing: the Forbidden City in the Ming

Ming Beijing has seen many changes. Yet it is a good example of how architecture and planning are interrelated and how planning accommodates and facilitates architecture.

In 1368 the Ming forces captured Dadu. General Xu Da abandoned the northern portion of the city, which had been burnt down by the Mongols before they fled via the north-east gate, and built a new wall about 3 kilometres south of the old wall, leaving the north-western-most part of the north water course outside the city (figure 6.8a). The Ming had already set up their capital in Nanjing ('Southern Capital') following their defeat of the Mongols. In 1403, the Ming emperor Yongle established Beijing as the 'Northern Capital'.

Beijing consisted of four enclosures: the Palace City (known as the Forbidden City, 760 m × 960 m), the Imperial City (c. 7 km² and including the Palace City), the Capital (known as the Inner City, about 35 km² and including the Imperial City) and the Outer City (about 24 km²). Beijing was designed for the emperor to perform his role as 'the Son of Heaven'. His imperial place at the centre of Beijing symbolized

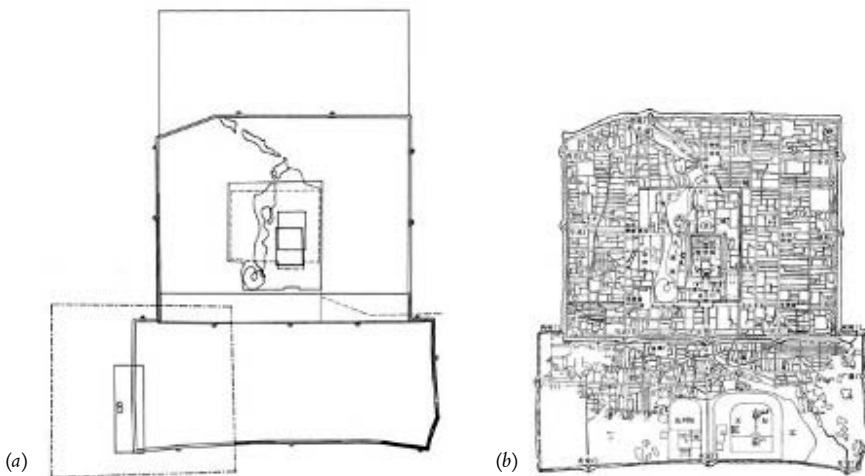


Figure 6.8. (a): The relation of the successive capitals of the Jin, Yuan and Ming-Qing on the site of Beijing. Locations of Yuan Palace and Ming Palace. Transformation of water system from Dadu to Beijing. (Source: Redrawn after Editorial Committee of Beijing History Books, 1985). (b): detailed Ming-Qing Beijing plan (1420–1911). (Source: Liu, 1980)

his centrality: he was the centre of the cosmos. The palace was a city within cities. Each domain was enclosed by massive walls. The outer city wall was originally planned to encircle all sides of the capital city, and the old northern wall of Dadu was to be restored. The construction was not completed, however; only a section of the wall was built in 1553 encircling the southern outskirts of Beijing, which had by then developed into a densely populated area with streets full of busy commercial life (figure 6.8*b*).

In the Chinese built environment from ancient times, city walls were geo-architectural components primarily for civil administration, public security and military defence. Beijing was fortified by walls and surrounded by moats. Technically, these were mutually dependent: digging the moat created the wall. The moats were an integral part of the composite water system: one of their functions was to drain storm water.

The Forbidden City was a palace complex built in 1406–1420 on the site of the Yuan palace but further south (Hou, 1988). To understand how and why its location was decided, it is necessary to compare Beijing with Dadu. The new palace city was larger and more symmetrical. Also, a hill in the centre along the axis is a characteristic feature of Beijing. Archaeological excavations carried out in the late 1960s revealed that the hill was built on the site of the Yuan palace's Yanchunge Hall, the Yuan emperors' retiring chamber (Yuan Dadu Archaeological Team *et al.*, 1972). Moreover, the axis of the Forbidden City appeared to be off-centre from the Yuan imperial city. Thus, the axis of the Forbidden City and that of Beijing became one. The new hill and the new axis were not accidental, which suggests a different urban design rationale from that of Dadu. This is the subject of the discussion below.

The imperial city of the Ming was bigger than that of the Yuan and extended in all directions, particularly south. It was planned to extend the south city wall out about a kilometre in order to contain the Ancestral Temple and the Altar of the Land and Grains within the imperial city wall. In Dadu these imperial buildings were outside the imperial city. In Beijing, immediately outside the south gate of the imperial city, were government offices, including the ministries, major boards and bureaux; these were aligned on each side of the axial way, known as the 'Thousand Step Walkway', which led to the Forbidden City. In terms of architectural arrangement, Beijing achieved a higher aesthetic level than did Dadu, and the Forbidden City was the greatest achievement of all.

The hill behind the Forbidden City is about 70 metres high (present-day Jingshan). The hill was constructed using the earth excavated from the new moat of the Forbidden City and from a new lake (present-day Nanhai, 'South Sea') at the southern end of the existing lake. The resulting lake became known as the 'Three Seas': the South Sea, the Middle Sea and the North Sea. It is clear that the new hill and lake and the new palace axis introduced into the planning and design were logical decisions for the sake of construction. However, the more we learn about Beijing, the more evident

it is that they represent a theoretical discourse. The hill, then called *Zhenshan* ('hill of suppression'), on the site of the Yuan imperial hall symbolized that the new dynasty had overpowered the former rulers. The sequential connection between this period and the previous dynasty was symbolically cut by shifting the axis of the Forbidden City away from that of the conquered. The Jingshan hill functioned in multiple ways as construction, skyline and *fengshui*. Thus it could be concluded that city planning, architectural design and building construction were integrated and functioned well as a whole, and also had symbolic and cosmological meaning. The change from Dadu to Beijing was a product of the tension between reconstruction and reinterpretation.

Compared with Dadu, where the market place was in the north behind the palace, the market in Beijing was shifted to outside the inner city's south gate. This move resulted from a change of watercourse; the canal connecting Beijing and the south of China had been neglected during the late Yuan and the early Ming (Hou *et al.*, 1986). Furthermore, when the eastern portion of the new imperial city walls was extended further east, the canal (Tonghui River), once used for transportation, was now enclosed in the palace rampart. Water had a great influence in Beijing planning. The planning, imposed from above, consolidated imperial interests.

In addition to markets, Beijing had a number of other public places such as temples, which were the major sites of religious, cultural and commercial life. Chinese popular religion was an eclectic and heterogeneous body of doctrines. The temples were open to all for teaching, provided a variety of rituals and ceremonies, and attracted social and commercial gatherings. Temple markets, fairs and festivals were organized regularly at these locations on monthly and annual bases.

After the Ming, Beijing remained the capital of the Qing (1644–1911) which had originated in Manchuria. The Qing dynasty made no revisions to the layout of the Forbidden City, but they did repair and rebuild buildings.

Courtyard Housing and *Hutong*

Courtyard housing and *hutong* (laneway) serves as a case to see how the building codes were implemented and to understand the relationship between architectural, design and urban planning.

In Beijing, small laneways between the main traffic thoroughfares in residential areas are called *hutong*, the name coming from the Mongolian *huto* (or *huddug*), meaning 'water well' (Zhang, 1997, p. 172). An example is Mao'er hutong where there was a well to supply fresh water. A courtyard house from Mao'er hutong will be examined. A well is called a *jing* in Chinese, and many *hutong* were named after *jing*, such as Wangfu-jing, a shopping street to the east of the Forbidden City. The names are an urban-cultural phenomenon, reflecting the transformation of Beijing through history.

The ‘urban planning ordinance’ issued in 1285 and recorded in the *Yuan Shi* (History of the Yuan Dynasty) stated that a standard block size was 80 *mu*; each block included a 6 *bu* (c. 9 m) wide laneway, and was divided into ten equal sections. As a result, one block contained ten house lots. An ordinary street was 12 *bu* (c. 18 m) wide and a main street was 24 *bu* (c. 36 m) wide, bordered by ditches along which trees were planted. These figures were standard units in Dadu. The *hutong* marked off residential blocks, each 50 *bu* (c. 77 m) deep.⁴ The standard house lot was 8 *mu* (about 0.5 hectare) in size, certainly for the governing elite. The standard layout consisted of a series of one to five courtyards, with three being the norm. Yuan Dadu was notably less dense than Ming and Qing Beijing. It was a common practice in ancient Chinese cities to leave tracts of land for gardens and for future expansion.

A district known as Nan Louguxiang and lying to the north-east of the Forbidden City maintains the characteristics not only of Ming–Qing Beijing but also of Yuan Dadu; it is now protected as a heritage site. It provides typical evidence of the allotment system of residential planning. The district is 1,060 m (east–west) by 820 m (north–south). Urban blocks are marked by *pailou*, well-crafted free-standing gates, that do not constitute a boundary but serve as identifying devices to individual parts of the city. The *pailou* are the historical remains of the walled ward system of the Tang dynasty. The block is also the basic unit of social organization. In the example, the plot depth is 78 m on average, the *hutong* width is 5–7 m, and the widths of the house lots vary from 16 to 26 m. A standard courtyard complex covered an area of about 1,500 m². Two or three lots would be occupied as one property by people of higher class, and one lot would be shared by two families of lower status. A plot along a main road was over 100 m in depth for state buildings, mansions of government officials or shops (figure 6.9).

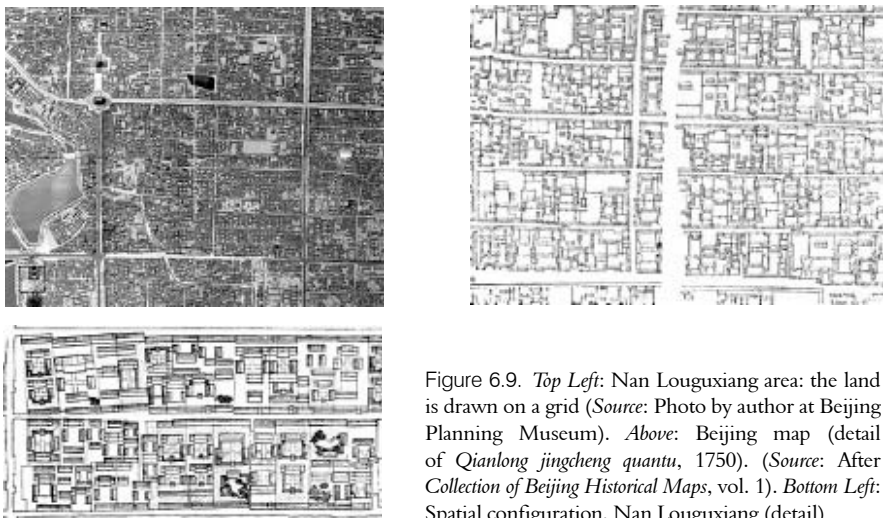


Figure 6.9. *Top Left*: Nan Louguxiang area: the land is drawn on a grid (Source: Photo by author at Beijing Planning Museum). *Above*: Beijing map (detail of *Qianlong jingcheng quantu*, 1750). (Source: After *Collection of Beijing Historical Maps*, vol. 1). *Bottom Left*: Spatial configuration, Nan Louguxiang (detail)

Courtyard houses were not necessarily built right up to the lane. Some stood back a few metres, creating 'urban pockets'. Outside the front entrance, screen walls were often employed to form a 'recess space' or zone between courtyard house and *hutong*.

Features of the courtyard house included, first of all, buildings around the perimeter of the site; this creates a courtyard (or courtyards) of maximum size within the homestead. The courtyard was the centre of the house, an open living space often paved with bricks and dotted with trees to form an enclosed garden. Secondly, courtyard houses featured timber structures with exterior walls functioning as curtain walls to enclose the building. The exterior walls were of masonry, enclosing and massive, whereas the interior was framed, open and soft. The exterior presented solid brick walls without openings, whereas windows faced inwards and overlooked the courtyard. Extensive masonry walls were built to contain fire, and organized fire fighting was a prime undertaking. Fire was an ever-present danger that could easily destroy not only a courtyard house but a whole area. The connection between the walled courtyard houses and the timber constructed buildings was palpable. Further features were, thirdly, roofed walks linking individual buildings to offer protection from sun, rain and snow. Also, to link outdoors and indoors, the building façade on the courtyard side was fitted with removable windows and doors for light and ventilation. Fourthly, buildings were arranged symmetrically, the main hall being the key to the composition; and fifthly, courtyard houses were introverted spatially. As the complex was cut off from the outside and the inner space secluded, the courtyard house was not only a type of architecture, but also a way of life.

In the Nan Louguxiang heritage area, the courtyard house in Mao'er hutong illustrates how the house functioned (figure 6.10). In this plan, the typical usage is as follows: the first courtyard is a service space with a kitchen and a privy in a corner; the second and third courtyards are formal spaces, the buildings on the north–south axis being the main reception/living rooms where memorial tablets of the ancestors would be housed, and the flanking buildings are for guests; the fourth and fifth courtyards are family spaces, the main building being for parents, with bedrooms on the sides, flanking buildings for married sons and their families, and the innermost building for children or young girls. An interior garden lies to the east, appearing to have been divided into two parts by a main hall for family leisure and social life, respectively. The courtyard architecture was designed in accordance with the relationships between men and women, senior and junior, family members and guests, ancestors and present occupants. It was an ordered social environment, and Confucianism was the underlying philosophy.⁵ These courtyard houses, in which architectural order and spatial sequence were articulated, were a materialization of kinship systems, gender relationships and correlative cosmology.

There is an ideal or standard layout: a north–south orientation with the main hall facing south on the axis.⁶ This echoes the orientation of the ancient ideal plan. The

Figure 6.10. Between two *hutong*, a five-courtyard house with a garden. 9–11 Maoer hutong. (Source: After Cheng, *nd*, vol. 2, p. 82)

basic concept of the courtyard house was simple: a model or prototype could be repeated and adapted to the site. In unfavourable situations, a key to design was access to the courtyard house according to the site condition (figure 6.11). The standard layout persisted nevertheless, and embodied a degree of perfection in its initial concept and an internal logic between architecture and planning. This design conferred a great uniformity; once a form was found and had justified its existence, it became a primary type.

Architecture operated within a socio-economic context. In accordance with the rules, houses were made that reflected the owners' status economically, socially and aesthetically. The design rules were rooted in the administrative system, and its purpose was to allow a large number of people to live together in civilized harmony – the ideal society was realized through an idealized architectural mode.

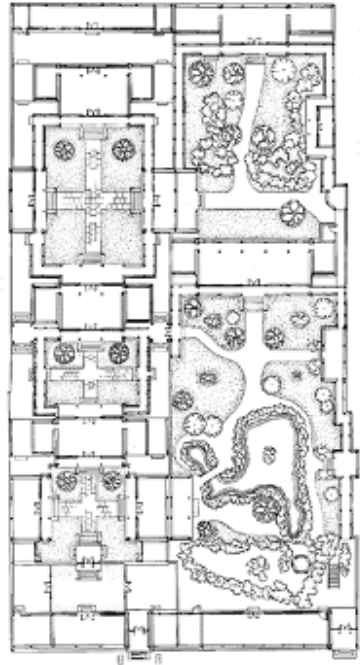


Figure 6.11. Orientation of courtyard houses in four different sites: a principle is that main buildings are orientated to the south, and the access is designed accordingly. (Source: *Left* after Ma, 1999, p. 12)

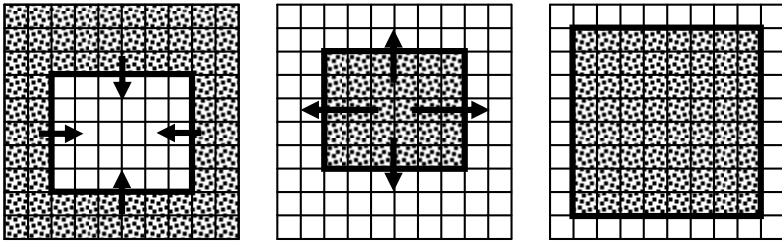


Figure 6.12. *Left*: Building coverage of courtyard house: ground floor area is 70 per cent of site area; outdoor space 30 per cent. *Middle*: House in a courtyard: building 30 per cent; outdoor space 70 per cent. *Right*: Building 64 per cent; outdoor space 36 per cent. (Source: After Shang and Yang, 1982, p. 56)

One more feature, or consequence, of courtyard architecture needs to be pointed out: back to back blank walls of adjoining properties, which allowed a relatively high building density. A comparison of the building coverage of Beijing courtyard houses with that of detached single-family houses reveals that ground floor area of the former occupied 70 per cent and the courtyard 30 per cent of the site, whereas the opposite was the case for the latter. Increasing it to 70 per cent would mean there would be no usable outdoor space (figure 6.12) (Shang and Yang, 1982).

Conclusion

The Beijing region has been continuously occupied and re-mapped since ancient times. Central to this study is how the 'ideal' became real, and how the abstract pattern was applied and/or modified in terms of architecture and planning to meet practical requirements, and how the interactive relationship between urban pattern and building typology was played out.

Beijing has been subjected to multiple layers of urban design. The city was designed to produce meaning, in which political ideology and historio-cultural legacy, coding and planning, engineering and technology were engaged with one another. The imperial palace was physically, visually and symbolically linked to a series of state buildings. Courtyard housing was less differentiated and less identifiable, and became essentially a context and a mass background to the palace.

The courtyard housing of imperial Beijing realized Chinese architecture and planning. A key to its design was typology and modularity. It was architecturally a single object, but it was repeatable in construction, adaptable to site and flexible in use. The imperial palace dominated the city in scale and position, but architecturally it was part of the same ideology; state buildings shared similar architectural features with courtyard houses. The variety of the buildings was bounded by a structural typology, rather than by usage or style. Practicality and economics were essential. The elements of design were modularity and typology in terms of architecture, and the grid and the

axis in terms of planning. The results achieved a desired integration, symmetry and balance.

Chinese building codes and planning express the continuity and the interdependence of architecture and planning, and an inner formal structure. Beijing was built upon old capitals and has now been transformed into a modern city. To revive the old capital in any proposed urban renewal, further studies are required. These should, first of all, reconstruct the purpose, function and context of traditional Chinese coding practice; and secondly, address the lack of research on *neigong*; most *neigong* codes lie in archives, unpublished. To date there has been no research on urban design aspects of the ancient building codes. Moreover, Chinese building codes are largely unknown to non-Chinese scholars. Abundant opportunities for further research lie in the collections of documentary material that need to be examined for evidence of codes used by the Ming and the Qing administrations.

Notes

1. *Qing Huidian* [Collected statutes and precedents of the Qing dynasty]. Chapter Gongbumen [Ministry of Works section], Taipei, 1968 (reprint).
2. 'Jurisdiction status' means that it is a rule made by the government and used to order the way of the whole system.
3. The ideal layout of a royal capital was recorded in *Kaogongji* (*The Book of Artificers*), compilers unknown. It is believed that the book was an official document of the Qi State, completed around 470 BCE. The *Kaogongji* was included as a part of the *Zhou Li* in the Western Han.
4. *Yuan shi* [History of Yuan Dynasty] compiled under imperial decree by Song Lian. The record was made on 22 February of Emperor Shizu's reign. *Bu* is a traditional unit used to measure land, two steps is a *bu*. The *bu* varied from dynasty to dynasty: $1 bu = 5 chi$, $1 chi = 0.308 m$, thus $1 bu = 0.308 m \times 5 = 1.54 m$ according to Zhang, 1986, p. 440.
5. For Confucianism, see Yao, 2000 and Creel, 1960.
6. Note that the alignment of the Beijing plan is not true north–south, but is slightly inclined towards the west, which indicates that north was probably determined by the observation of the North Star. This method is described in the *Yingzao Fashi*.

Chapter Seven

***Machizukuri* and Urban Codes in Historical and Contemporary Kyoto**

Yoshihiko Baba

Planning is often interpreted as a top-down activity. Viewed as part of the planning system, codes could be seen as an element of this top-down system of control. On the other hand, coding could also be considered as part of a bottom-up approach to decision-making. Yet the bottom-up nature of codes has not been much of a topic for discussion in the past, particularly from a community perspective.

The plan of Kyoto, following the model of the ancient Chinese capital of Chang'an (present-day Xi'an), is well known. The current gridiron street patterns may reflect the original urban form of the city in which the street network was laid out in rectangular grid fashion and the Imperial Palace was located in the north of the centre. However, in this chapter, we are not concerned with the city as a representation of Japanese or Asian planned cities. Instead, we will study the history of *machizukuri* and urban codes in Kyoto as a unique case of community-based cities. In fact, the city has grown up with a strong sense of its communities (called *chō*), which developed urban codes (known as *chō shikimoku*) to reform the original city layout. Such urban codes were made, to some extent, under the influence of the contemporary political leaders, but more significantly, by groups of local landowners, and thus until the Second World War reflected the needs of local people after which the centralized planning system took over the urban codes.

The archive of urban codes in Kyoto was published a little over ten years ago (KCMHEC, 1999). Some of the early findings from researchers have implied that reading these codes will reveal the path dependency of institutions, townscapes, and

other community activities. Indeed, Bellah *et al.* (1991, p. 303) state ‘... intensive study of an institution may begin with formal codes but requires one to immerse oneself in how an institution works’. In addition, some local communities have re-evaluated their urban codes and developed modern versions of them in accordance with the current planning system.

In the first section of this chapter, we will study the history of urban codes in Kyoto between the fifteenth and mid twentieth centuries. A particular focus will be on the relationship between urban codes and neighbourhood communities referred to as *chō*. In the second section, we will study the recent attempts of communities to re-evaluate the potential of urban codes. Two case studies will be reviewed in the following section. Both case studies explicitly mention that the idea of urban codes was adopted, and a modern version was drafted in accordance with the current planning system. In the last section, we will discuss the relation between codes and community. Note that the two Japanese words, *chō* and *machi*, are interchangeable words for town, burg, villa or neighbourhood. Both may represent a community area with an administrative boundary or local organizations such as neighbourhood associations (*chōnaikai*). The recent practices of *machizukuri*, literally ‘town-making’ or ‘neighbourhood-building’, can be seen as the Japanese version of New Urbanism. In the *machizukuri* of Kyoto, these small community units have played a significant role in making and enforcing urban codes.

***Machizukuri* and Urban Codes in History**

Kyoto was planned and constructed as Japan’s capital city in 794 CE. The city is well known for its symmetrical gridiron plan of more than 20 square kilometres. Until the Civil War in the fifteenth century, the population of the city steadily increased to as many as 100,000. The city entered the Warring State (*Sengoku*) period in the sixteenth century, and was significantly reformed in both physical and social structure. Urban codes developed in Japan in this period.

The Birth of Urban Codes

The earliest urban codes were born during the Warring State period and dealt with property purchase. The Warring State period of Japan is the name given to the period from the Civil War (*Ōnin no Ran*, 1467–1477) until the beginning of the Edo period (1603), during which time people in the neighbourhood supported each other for protection. During the Civil War, when the city was the main battlefield, these communities built gates across the street. The neighbourhood associations were tax-exempted and permitted to administer their neighbourhoods. They also maintained many traditions, such as the Gion Festival, one of the nation’s three notable festivals,

and the statue of Jizo (Ksitigarbha Bodhisattva), a guardian deity of children for the neighbourhood, originally from India.

The population of Kyoto decreased from 100,000 to 20,000 after the Civil War. However, the last few years of the Warring State period saw a significant reform in the economy, technology, culture, and city form. The first samurai who tried to unify Japan was Oda Nobunaga. After Oda was killed in the Honnō temple, Toyotomi was the samurai who unified Japan and ended the Sengoku period. He is not only known for unifying the nation, but also as a planner: he supervised the redevelopment of Kyoto's street networks, the construction of the Jurakudai castle and the city walls.

The codes of the neighbourhood association were developed first in the countryside and later in the cities. In the fifteenth century, a twenty-article code of Imabori village, located approximately 50 km east of Kyoto, defined agreements on communal resources and the buying and selling of properties (Tonomura, 1992). Some of the earliest urban codes of Kyoto are from the late sixteenth century. *Reisen-cho*, one of the earliest codes, defined the procedure of buying and selling properties within the *chō* boundary in 1585 (three articles) and 1588 (four additional articles) (Kamata, 2000). The code states that 10 per cent of the sale price shall be given to the neighbourhood, which was a common code in Kyoto throughout the Edo period.

At this time, several neighbourhoods (*chō*) formed two larger communities: district (*chō-gumi*) and ward (*so-cho*); but they did not make codes. This implies the importance of the neighbourhood as an administrative institution for community management, rather than a larger district or ward. The codes were largely confined to property purchase and matters which might directly affect the safety of the residents. The townscape of Kyoto still consisted of a mix of poorly built single-storey houses and wealthy three-storey houses with clay roofs. The building lines were also irregular and the overall townscape was messy.

The Development of Urban Codes

In Pax Tokugawa (1603–1868), the political centre was shifted from Kyoto to Edo by the Tokugawa shogunate. This gave a relatively weak, but still important, right of autonomy to the local communities in Kyoto. The districts and wards had become even less important during this period. Each *chō* served as an enforcement organization for the Tokugawa government (Takahashi and Nakagawa, 2003). The neighbourhoods chose the officers within the neighbourhood to act as public servants. Jansen (2000, p. 125) describes, 'for townsmen, inhabitants of the *chō*, qualification brought responsibilities in the form of specialized labour in their craft and unspecialized labour in the form of public labour; for some, administrative burdens as elder of the *chō* had the same connotation'. Jansen also states, '... these responsibilities began as privately held feudal governance ... they became public as well as private, bureaucratic as well

as feudal'. As a result, the neighbourhoods served as the bottom of the shogunate governance hierarchy and received tax exemptions and self-governance.

The shogunate often ordered its own building codes, and such orders were passed through the centrally controlled Kyoto Town Magistrate Office (*machi bugyōsho*) to each neighbourhood. The governmental codes varied and sometimes were very strict. One of the most important governmental codes, in terms of building, was that buildings with more than two storeys were prohibited. However, most of the governmental codes were written in an ambiguous manner and left the opportunity for each neighbourhood to determine the details. A 1686 circular states, 'the houses shall be consistently designed at each neighbourhood'. In addition, the size of lattice windows (*kōshi*) and pitched roofs and eaves (*hisashi*) was specified in 1697. These regulations are integrated into neighbourhood codes (figure 7.1).



Figure 7.1. Cho Shikimoku of Shimohonnojimae-cho: a neighbourhood code of Shimohonnojimae, Shimogyo, Kyoto, 1594.

Codes for Neighbourhood Management. It is common in any organization that the rules for managing that organization are set out explicitly. Throughout Edo and Meiji periods, there was a clear distinction between landowners and renters. Landowners discussed any neighbourhood matters and made decisions. Renters were given tasks, but not involved in the decision-making process. The most important part of the codes of neighbourhoods is, therefore, property purchase and letting. Most, if not all, neighbourhoods defined this. In one of the earliest codes of Reisen-cho in 1585, it was stated that any person who wished to buy a house in the neighbourhood would be granted permission by the association in return for an admission fee to the association. Similar agreements were found in many urban codes throughout the city. In the later codes, voting rights were defined as given to landowners and homeowners.

Homeowners paid tax to the neighbourhood based on the size of the house. Sometimes, the subdivision and unification of plots were prohibited in the codes. It is

not clear if this was intended, but it resulted in bringing equal rights to neighbourhood members. Therefore, unlike in rural areas, neighbourhoods seem to have been managed, not by a single strong family, but by consensus of the members. As a result, neighbourhood associations were managed in a relatively democratic style in that period. There was little in the way of strong leadership lasting over generations.

The ownership of land matters. Shane (2005, p. 25) states:

To own land in the city – an inherently limited resource – is one way to control and profit from the city’s processes and flows. In the European tradition, the great landowners of the city, together with the collective interests of small landowners, have powerfully influenced the city’s form. This is why the legal codes governing and recording landownership are one of the earliest and most constant of written urban memory structures.

This was also the case in Kyoto. The criteria for the right to purchase land, such as profession and class, varied. In some neighbourhoods only one man of a certain profession could buy a property, while in others more than two members of a profession were permitted to do so. Renting was also carefully determined, for example being limited to the employees of the businesses within the neighbourhood boundary.

Codes for Building Standards. There are several research studies into how the urban codes regulated building design (e.g. Maruyama 2007). However, we can clearly identify unwritten rules from the existing buildings. One of the effects of urban codes developed during the Edo period is the standardization of townhouses. These had common features such as wooden lattice ‘insect cage’ windows and dark ceramic tiled roofs. People in Kyoto developed the *de facto* standards of affordable houses, which are now known for their modularization (Hyuga, 1998).

The building style of the *machiya* townhouse is a masterpiece of the townsmen of Kyoto of this period. The lattice window is the art and wisdom of such craft, and is designed to exclude prying eyes from outside without shutting out light and soft breezes. The size of the lattice depends on the business of the townhouse. For example, the textile merchants required lighter and thus wider breadth; the rice and flour merchants had a thinner breadth.

The townhouses were mostly two storeys, but the upper floor was so low that people could not stand. Although it was the rule at that time that townsmen were prohibited to look down at samurai, no particular code was written that directed building that way. The upper floor was, in most cases, used as storage. In a larger house, the first floor in the back was sometimes used as rooms and had normal height for living. The clay-coated window was used for the upper level. On the ground floor, the surface of the building was mostly wooden. In contrast, the surface of the first floor of townhouses was coated with clay for fire prevention.

Codes of Conduct. Much has been written about codes of conduct. For example, throughout the city, the streets in front of the property were to be cleaned every morning. Festivals and other events for the neighbourhoods were also written of as they are important for the community, and are sometimes a strong motivation to sustain the community. The physical and financial support at weddings and funerals was also defined.

The most important codes related to safety: fire prevention, fire fighting, and crime prevention. Fire proofing was one of the most important issues, as is often the case in medieval cities with wooden buildings. In Kyoto, there were the three great fires of 1708, 1788, and 1864, which burnt more than 10,000 houses. There were also relatively smaller fires that burnt tens or hundreds of houses once every ten years. To some extent, the buildings were encouraged to use fireproof materials. However, in Japan, the building codes never went as far as replacing the wooden structure with a fireproof structure. In the urban codes, the residents were encouraged to prevent fire, and once it occurred, were forced to be involved in extinguishing the fire. At the time there was no public fire service, so when a building started burning, the neighbourhood residents were responsible for putting out the fire. Possibly many people ran away in such cases and, therefore, many urban codes defined the penalty for not fighting a fire. In most of the cases, this was a fine, but in stricter urban codes, a person would be barred from the neighbourhood.

Crime prevention was also an issue. During the periods of Warring States and Pax Tokugawa, it was ordered that every neighbourhood build a gate and close it at night. This lasted until the early Meiji period when the new government allowed the removal of the gates. This does not necessarily mean that the city had been in an unsafe state, especially in the late Edo period, as crossing the gates in the night was a common practice. It is assumed that the existence of the gates and these activities strengthened the neighbourhood sense of security.

Other regulations include the customs, such as annual festivals and special events. Gion Matsuri, now one of Japan's three major festivals, is a festival of townsmen in the inner city of Kyoto, and held each July. The customs and conventions for special events, such as births, house rebuilding, weddings and funerals, were also defined in the urban codes.

***Machizukuri* and Urban Codes in Contemporary Kyoto**

The buildings in Kyoto gradually developed during the Edo period. Although Western style brick and stone buildings were introduced in the late nineteenth century, the majority of the buildings were still built in the traditional style. It was after the end of World War II that Japan's planning system, and also the building style, drastically changed. The new Building Standard Act (1950) was enacted to set the minimum

requirements for building standards. When the City Planning Act (1968) introduced a zoning system in which a neighbourhood was to be designated for just one class of land use, for many people in Kyoto their workplace was also their home, and different types of trades coexisted, including traditional industries like pottery and textile manufacturing. Therefore, the city authority had no choice but to designate most of the city as either industrial or commercial to preserve the existing businesses. The national and local economy needed massive redevelopment throughout the country. In Kyoto, this resulted in a series of anti-development movements and landscape disputes.

With the new 1968 planning regulations, there have been several large-scale developments in the centre as well as in the suburbs of the city. A significant change in the City Planning Act from height control to floor-to-area ratio (FAR) allowed higher buildings to be built. Under the FAR control, developers are allowed to plan a building of any height, and in practice, they tend to plan a tall structure to maximize floor space. Fostered by the bubble economy, the beautiful townscape composed of traditional low-rise wooden houses was rapidly replaced with modern, yet thin and plain, concrete buildings (Fujitsuka, 2005). These developments generated a significant number of local disputes, which led the city to make several ordinances.

Some local neighbourhoods took action against such development. One approach is to draw up an urban code. However, under the current architectural and planning regulations, having a code is not sufficient to control development. The neighbourhoods then adopted planning tools such as Building Agreements and District Plans to make their code effective. In some cases, city ordinances were promulgated. Before we move to case studies, the tools adopted will be explained.

The Neighbourhood and Building Agreements

The Building Agreement (*kenchiku kyōtei*) system allows landowners (and renters) to enter into an agreement on the design issues identified in the Building Standard Act, such as subdivision, building line, structure, use, form, design, and relevant facilities. The inclusion of the Building Agreement in the law was insisted upon by Goro Ito, the Director of Housing in the Ministry of Construction, after the success of the garden cities of Denenchofu and Tokiwadai and his own experiences in the 1920s. The draft bill of the Building Agreement system proposed in 1947 was expected to serve as a basis of local codes, but was contested on two points. First, the draft required only two-thirds of landowners to set the code for the area. The criticism brought up was that the system would violate individual rights defined in the constitution. Second, it would give a stronger administrative role to citizens than to central and local governments. The idea that more powers be given to citizens was not acceptable to policy-makers and thus the Act was not passed as proposed. Considering these issues, the system was

changed to require the local authority to set ordinances for the Building Agreement and the agreement of all the landowners and other stakeholders. Although the Building Agreement system was introduced in the Building Standard Act of 1950, it was in 1972 that the city of Kyoto adopted the system. The philosophy of Building Agreement is to give rights to landowners to set out building controls. But in fact, it has been used mostly by developers to maximize the profit from development.

As of November 2007, there are Building Agreements in more than 60 regions in central Kyoto, mostly in the suburbs but also including nine in the city centre (table 7.1). The area of a Building Agreement is usually the size of one or several neighbourhoods and is much smaller than a district. In some cases, the neighbourhood association and the determining organization for Building Agreement are one and the same.

Table 7.1. Building Agreements in central Kyoto.

<i>Ward</i>	<i>District</i>	<i>Area Name</i>	<i>Households</i>	<i>Area</i>	<i>Year</i>
Nakagyo	Fuyuu	Fuyacho-dori Sasaya-cho	23	0.31 ha	1990–
Nakagyo	Chikkan	Tenshu-cho	21	0.27 ha	1991–2001
Nakagyo	Joson	Kamanza-cho	18	0.28 ha	1991–
Nakagyo	Chikkan	Matsunaga-cho	20	0.57 ha	1996–2006
Nakagyo	Chikkan	Ebisu-cho and Matsuya-cho	34	0.53 ha	1997–
Nakagyo	Meirin	Shinmachi-dori Mukadeya-cho	36	0.54 ha	2001–
Nakagyo	Chikkan	Aneyakouji Street	83	1.40 ha	2001–
Kamigyo	Kyogoku	Tsuruyama Park	24	0.40 ha	2004–
Kamigyo	Muromoachi	Ichimatsu-cho	41	0.37 ha	2007–

Shinmachi-dori Sasaya-cho was the first neighbourhood to enter into a Building Agreement in central Kyoto. During the bubble economy period of the 1980s, a property developer purchased two plots within the boundary of the neighbourhood association. This sort of purchase by the developers was, at that time, quite common throughout Japan. The local landowners entered into a Building Agreement so that high-rise apartment houses could not be built in the neighbourhood. Most Building Agreements are made within as small an area as one or two neighbourhoods. The only exception is Aneyakouji Street Building Agreement District which consists of thirteen neighbourhoods. Kamanza-cho entered into a building agreement with two other neighbourhoods because of the development of a large apartment building occupying land in the three neighbourhoods.

Sasaya-cho's experiences seem successful. Kamanza-cho and several other neighbourhoods also entered into Building Agreements. However, many more

neighbourhoods also took similar steps to Sasaya-cho, but did not reach a statutory agreement. In some neighbourhoods, people declared that they would create a better environment, but failed to enter into any statutory agreements. Another issue is the sustainability of the Building Agreement system. The number of households involved in the agreements of Sasaya-cho and Kamanza-cho decreased when the agreement was revised.

The District and District Plans

The District Plan (*chiku keikaku*) system was introduced in 1980 as an amendment to the City Planning Act. A district plan consists of general policies (*hōshin*) and a more detailed district development plan (*chiku seibi keikaku*). The Building Agreement and the district development plan of District Plan systems are similar in function. One of the main differences is, while Building Agreements require all the participants to approve, District Plans only require approval from a majority of landowners. Another important difference is that the Building Agreement requires a local organization to determine building plans, but in the District Plan system, the organizations dealing with enforcement verify whether the building application complies with all the building standards.

By August 2006, the city of Kyoto had adopted forty-four District Plans. For the first twenty years since the 1981 Amendment to the City Planning Act, the district plans have been used for relatively large-scale development and redevelopment, such as universities, temples, hospitals, and governmental buildings, and most of them were developed in suburban areas. In the centre of the city, the neighbourhood of Sasaya-cho made its District Plan in 1992 to prevent the building of high-rise apartments. Since the case of Sasaya-cho, the District Plan system has been considered an effective tool for communities to use to prevent future developments. District Plans target larger areas than Building Agreements at least in Kyoto, because District Plans do not require the agreement of all the landowners, nor the committee, for the area to evaluate each development application (table 7.2).

The planning sections of the city authority, with limited planning powers, have taken action to persuade local communities to make District Plans. In the historic centre of the city, these are the communities of school districts, comprising twenty-five to thirty neighbourhood associations. Three districts, Shutoku, Honnoh, and Meirin, located in the centre of Kyoto, entered into a type of District Plan called 'Local Cooperation Model'. The Shutoku residents and the City Council met and discussed this over the course of a year. At the conclusion, the City Planning and Zoning Commission approved a 'Local Cooperation-Model' district plan (policy statement) in 2001 for Shutoku district. The Honnoh and Meirin districts took longer to enter into the district plan.

Table 7.2. District Plans made by local communities in the central area of Kyoto (non-local plans, such as redevelopment of prefecture council building, are excluded).

<i>Ward</i>	<i>District Name</i>	<i>Scale</i>	<i>Area</i>	<i>Year</i>
Nakagyo	Sasaya-cho	neighbourhood	0.8 ha	1992–
Shimogyo	Shutoku	district	15.9 ha	2001–
Nakagyo	Honnoh	district	19.7 ha	2002–
Higashiyama	Gionmachi Minamigawa	neighbourhood	6.1 ha	2002–
Nakagyo	Shijo Dori	street	12.7 ha	2003–
Higashiyama	Shinmonzen Nishino-cho	neighbourhood	1.2 ha	March 2004
Nakagyo	Meirin	district	22.2 ha	2006–

The City and City Ordinances

Although city ordinances are not considered urban codes, in the case of Kyoto, many ordinances have had an important relationship with urban codes since the 1960s. Some of those ordinances can be seen as ‘urban codes written by planners’, to prevent future development disputes. At the earliest stages of Japan’s city planning system, before Building Agreement and District Plan systems were introduced, ‘development by/or with local community’ was only supported by local municipal by-laws.

In the city of Kyoto, height control has been an issue since the national laws shifted from a height control system to floor to area ratio (FAR) control in 1970. In 1972, the city passed the ‘Kyoto City Urban Area Landscape Ordinances’ to retain height control, and defined several ‘Aesthetic Districts’ and ‘Special Preservation and Landscaping Districts’. However, compared to existing buildings, most areas were given a relatively high maximum FAR. It allowed buildings of six storeys or more in an area dominated by two-storey townhouses.

Consequently, gentrification started in the 1980s in Kyoto. The 1994 amendment to the Building Standard Act removed the floor area of shared spaces (such as corridor and community rooms) and the basement from the definition of total floor area. Almost ten years after the gentrification started, the city promulgated the ‘ordinances concerning formation and maintenance of living environment pertaining to architecture of medium and tall buildings in Kyoto City’ in 1999. The city also designated ‘Business-Residential Special Use Districts’ in the central and gentrified areas and applied new building rules such as designating Height Control Districts and Aesthetic Districts.

In 2004, a plan for apartment buildings gave rise to another dispute. The plan was for an eight-storey block of flats with two floors considered as basement, to be built on a hill called Funaokayama. In 2005, the city promulgated the ordinances to control the height of buildings on hills in Kyoto City.

Case Studies

In the previous section, we introduced the planning tools of Building Agreements, District Plans, and city ordinances, which make urban codes effective. Here, two case studies are selected to investigate how these tools are used with urban codes.

Aneyakouji

Aneyakouji is a street in the historic centre of Kyoto. In Kyoto, the boundary of a neighbourhood is defined by the streets: for east–west streets, an area between two north–south streets is a neighbourhood. A neighbourhood is much smaller in the centre than in other parts of the city and many developments were larger than a single neighbourhood boundary. When this east–west street centre was threatened by gentrification, therefore, some of the neighbourhood associations along the street under pressure took it as a common issue and, after discussions, entered into a Building Agreement as well as a *Machizukuri* Agreement. This was supported by the city council.

In 1995, Osaka Gas announced a plan for an eleven-storey apartment house on Aneyakouji Street. The committee of Aneyakouji, which consisted of several neighbourhood associations and 160 households, became involved. The committee had formed the same year as a dispute organization in response to a proposed high-rise apartment plan. In 1998, local residents, Osaka Gas, and the Kyoto Center for Community Collaboration started to discuss alternative plans. The plan was then completely rewritten to meet the local needs. Not only that, approximately half the members felt the need to write down their experiences and entered into an urban code (see Box 7.1) in 2000 and the Building Agreement in 2001. Later, in 2004, a design code was set as the Cityscape Environment Improvement Project (*machinami kankyō*

Box 7.1. Aneyakouji Cho Shikimoku (the Urban Code of Aneyakouji).

1. Aneyakouji street has maintained the balance of ‘residential quality’, ‘business’ and ‘cultural assets’. We shall cooperate to develop our neighbourhood, while considering the maintenance of this balance.
2. Aneyakouji consists of neighbourhoods that express living and working, in which ‘people’ and ‘work’ to maintain the community shall be accepted and supported.
3. Aneyakouji is a neighbourhood with a sense of community made of lively business and quiet residency. We shall keep the environment and atmosphere.
4. We shall maintain our low- to mid-rise townscape that is suitable for the scale of our living and business.
5. We shall consider the surrounding neighbourhoods and develop our own unique characteristics.
6. Aneyakouji has been known as the place of expressing hospitality. We shall inherit the fame and continue to develop a more enjoyable and beautiful street.

seibi jigyō). A notification stating the new urban codes was placed on public display. The new urban code is a set of general objectives for the street, with more detailed Building Agreements and design code.

Soon after these Building Agreements, in 1999, the city promulgated the ‘Ordinances concerning formation and maintenance of living environment pertaining to architecture of medium and tall buildings in Kyoto’ and established the ‘committee for town planning maintenance and reinvigoration of central Kyoto’ in 2001 that revised the regulations of the city centre including Aneyakouji. As a result, the city made changes and created a set of ‘New Building Rules’ in 2003 and ‘New Landscape Policies’ in 2007, both of which set lower height control among other rules.

At Aneyakouji, with financial support from the central government, eight townhouses have been renovated according to the design code (figure 7.2). The code is concerned with Kyoto’s traditional townhouses, which are characterized by pitched roofs and eaves, wooden lattices and such-like.

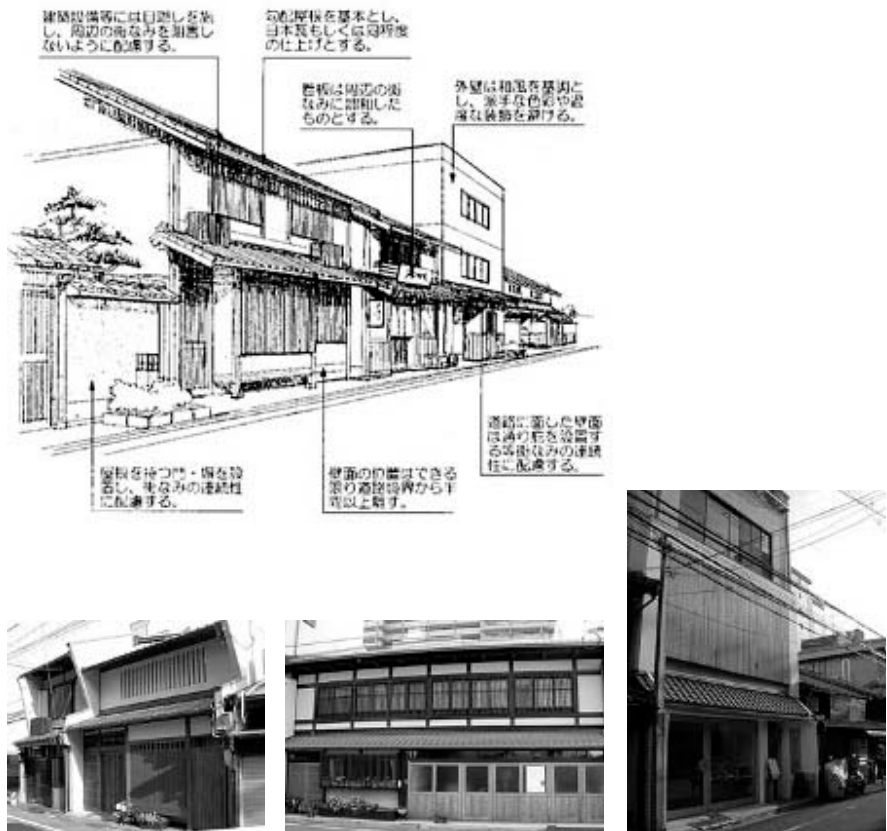


Figure 7.2. (above) An image of townhouse renovation based on the Design Code of Aneyakouji; (below) new buildings and renovations based on the Design Code. (Source: © 2009 Yoshihiko Baba)

Gionmachi Minamigawa

Gionmachi Minamigawa is situated between the central area and Yasaka shrine, and is one of the seven Flower Towns of Kyoto; special districts known for their traditional teahouses and geisha. The area has conserved the typical image of Kyoto's townscape. Gionmachi Minamigawa was originally part of Keninji temple. The land was given to the shogunate government in 1867, the last year of the Edo period, and a job training institution for women was set up there in 1872.

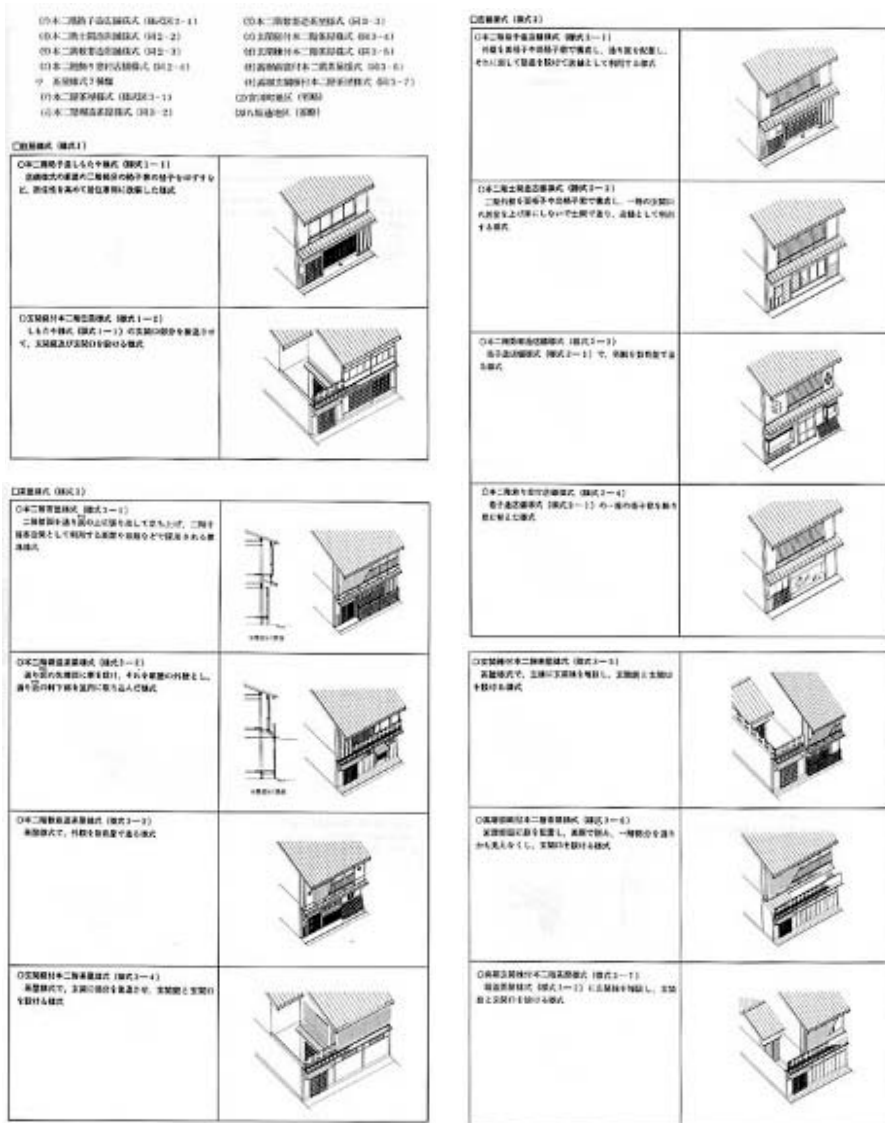


Figure 7.3. (above) Building types in The Code to Conserve and Develop Historic Landscape; (opposite) New buildings and renovations based on the Design Code. (Source: © 2009 Yoshihiko Baba)

Gionmachi Minamigawa has been designated as an Aesthetic District (*bikan chiku*) since 1972. However, many of the traditional buildings were replaced in the 1980s and 1990s. In 1996, the local residents set up an organization called Gionmachi Minamigawa Neighbourhood Council with 320 households to conserve their environment. Since then, they have set a series of official and unofficial codes with the municipal government. The municipal government designated the area as a Historical Landscape Preservation and Adjustment District (*rekishiteki keikan hozen shō kei chiku*) in 1999 (Hiratake, 2002). In that same year, the local residents entered into a Landscape Agreement. In addition to this, fire restrictions were lifted in the area so that traditional wooden houses could be built. Instead of a fire zone, the district is covered under the Ordinances related to the Fire Prevention of Conservation of Traditional Landscape in Kyoto. The Fire Prevention Zone system does not allow the traditional and characteristic wooden style of construction.

Why were such actions needed? The area is characterized by traditional ‘teahouses’, in which a person is served by geisha. The architectural style of teahouses, due to their low fire and seismic resistance, needs to be replaced with stronger structures. Under the current Building Standards Act, this means that, when a house is being rebuilt, it is built as a modern structure. For the people living and running businesses in the traditional style in approximately 200 houses, shops, and restaurants, the central regulation presented a great threat to their living environment. In 2006, the district wrote a *chō shikimoku* that consists of six chapters and twenty-four articles.

The Building Agreement is direct and detailed, and it is in some ways similar in function to those in the Edo period. The first chapter states the general purpose of the regulation, followed by the duties of the residents. Fire and crime prevention is mentioned. The renters are allowed to refurbish their houses, but must sign an agreement with the organization to conserve the townscape atmosphere. Most of the code is to encourage or discourage certain behaviour to preserve the atmosphere of the district. The building codes shown in figure 7.3 define two standard house types and seven teahouse types.



Planning and Coding in the Modern Context

The two case study areas and other areas have different characteristics. The city plan, however, only distinguishes the areas by use, height, and fire zone. This is because the current planning system of Japan does not consider the historic and social aspects of the space. The urban codes, on the other hand, may add the unique characteristics to the areas (figure 7.4, table 7.3).

Table 7.3. Plans and codes.

		<i>Aneyakouji</i>	<i>Gionmachi Minamigawa</i>
City Plan		Commercial zone Height control district (45 m, 31 m) Sub fire zone Aesthetic district	Commercial zone Height control district (20 m) Aesthetic district
Urban Code	Neighbourhood	Cho Shikimoku Building Agreement	Cho Shikimoku Landscape Agreement
	District	District Plan	
	City		Historical landscape preservation district. Ordinances related to fire prevention and conservation of traditional landscape in Kyoto

The urban codes of both case study areas are essential to conserve the historic identities. In Aneyakouji, after regulatory negotiation of development, the local people entered into the local code and Building Agreement. The process of negotiation is shared with the city officials, and this led to new building rules (2003) and landscape regulations (2007) in the city centre. Gionmachi Minamigawa is a special case. Historic sites and buildings have wooden structures which are easily burned down or destroyed by natural disasters. In Japan, many of the historic buildings are expected to be lost by earthquake and fire. This community-based approach will therefore be beneficial for many historic sites and buildings.

The urban codes were made at three levels: neighbourhood, district, and city. The neighbourhood and district codes are integrated in the Building Agreement and District Plan systems. The city ordinances can also be considered as urban codes in both case studies. In Kyoto, as the case studies show, the residents have carefully studied the planning system to make the most for their own communities.

Conclusion

Since the fifteenth century, neighbourhoods have been the important community unit in Kyoto. They formed a community association to protect themselves in the Warring

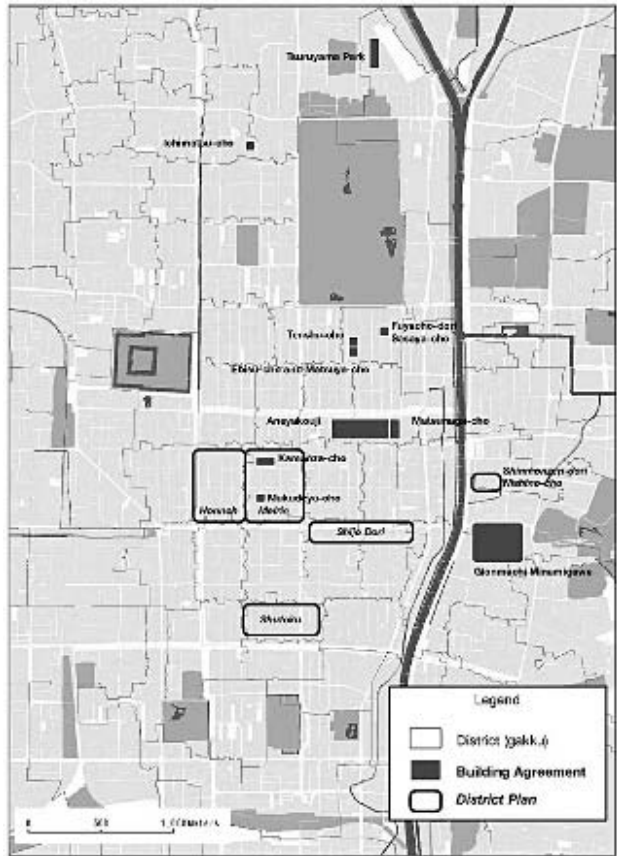


Figure 7.4. Map of Building Agreements and District Plans, Kyoto.

State period. They were given privileges to manage their neighbourhoods by the rulers, and it continued through the peaceful Edo period. These neighbourhoods still remain and form the basis of local communities. Although most of the privileges were removed in this modern period, even today community matters, from street cleanup to festival management or objections to building plans, are usually dealt with by this relatively small community.

In the urban codes of neighbourhoods in Kyoto, the contents varied from neighbourhood concerns to city and national concerns. Neighbourhood concerns most likely needed the agreement of the landowners, but city and national concerns required the confirmation of edicts made by the city magistrate. The codes and the process of making codes have contributed to building and conserving the beautiful townscape and rich culture of the city. They cover not only the design of buildings, but also many aspects of urban culture, from everyday life to festivals.

The contexts of the sixteenth century and today are different, and the nature of codes has changed over this time. In particular, whereas the neighbourhoods in history were given certain control, today's urban planning is centralized throughout the nation, and

the neighbourhood associations have very limited control over their neighbourhoods. Although limited compared to previous periods, some neighbourhoods have started to find ways to make urban codes under the current legal framework. The legal framework of urban coding is supplied by Building Agreements and District Plans. If these are not sufficient, the city may promulgate ordinances.

Also, as the buildings become larger from wooden houses of two-storeys to concrete buildings of six-storeys or higher, they sometimes stretch over neighbourhood boundaries, and thus several neighbourhoods, or a district, collaborate together to make a new code. The recent re-evaluation of urban codes has been used to settle the dispute regarding high-rise and modern apartment building construction. For neighbourhoods, in the case of Kyoto, the Building Agreement is used as a legal basis of the building code. For the same purpose, District Plans are used by districts. However, both can define only certain aspects of buildings, such as uses, height, and floorspace. The control of overall design needs further political decisions.

The effects and issues of urban coding have been identified in the case studies. The neighbourhoods have started to restore the traditional townscape. In Kyoto, as well as other cities in Japan, the conservation of urban landscape has been difficult due to the nation-wide policy towards development. In the central area of the city, dominated by two-storey wooden buildings, the landowners wish their land values to be competitive while maintaining the milieu of their neighbourhoods. To do this, a set of urban codes defined by the local landowners and residents is more efficient than the city plans made by planners who are relatively less familiar with the area.

However, the current procedure for creating an urban code is too complicated. To protect the existing townscape, under the current planning system, a neighbourhood should enter into a Building Agreement, propose a District Plan, and ask the municipal authority to set up an ordinance. This requires great effort from the landowners. This is particularly so in Kyoto, as these planning tools require agreement among the landowners but the number of landowners is relatively large. In fact, similar movements are seen in other neighbourhoods and districts, but the progress is slow.

Chapter Eight

Adelaide's Urban Design: Pendular Swings in Concepts and Codes

Barrie Shelton

Urban codes are used to effect urban form towards desired cultural ends. They may take the form of regulations, guidelines, or prescriptive frameworks, which can be expressed in words, tables, diagrams, plans, 3D or even animated images. Codes embody design intent to give shape and form to the layout, buildings, spaces, and sometimes to physical details (materials, building components, signs, pavement dining, etc.), and are directed towards the achievement of particular cultural conditions. The relationship between built form and these broader conditions may be explicit or not: whichever, there will always be underpinning ideas about the kind of physical city that is sought – that is, about the morphological outcome and its component building and spatial typologies, physical appearance, etc, and associated lifestyles and culture. The focus of this chapter is city form and the design theory and the coding documents that shape it.

Ideas and ideals about form change with each new wave of design theory, the latter being tied to wider cultural change that includes emerging scientific and philosophical ideas, social values and the emergence of new technologies. Accordingly, there can be substantial swings in the nature of codes from one era to the next – in intent, content and mode of expression. Over the last 125 years, design views of the city have changed; for example, it has been seen as an (aesthetic) work of art (Sitte, 1889), a (functional) machine (Le Corbusier, 1924), and a (legible) text (Lynch, 1960). For Jacobs (1961) it was 'organized complexity', and for Alexander (1966), a 'semi-lattice' and certainly 'not

a tree'. More recently, terms used to describe the city and urbanism have multiplied to include the 'generic city' (Koolhaas, 1995), 'quantum city' (Arida, 2002), 'vertical city' (Yeang, 2002) and 'landscape urbanism' (Waldheim, 2006), among others; and the dimensions explored to underpin our understanding of the city have expanded considerably, for example, memory (Hayden, 1995), and morphology and movement (Hillier, 1996). In Australia, such changes in thinking are apparent in the urban codes adopted by most cities, although some cities suggest themselves more than others for the spotlight: Adelaide, the state capital of South Australia, is one such city with a very special planning history that makes it an excellent case study.

The City of Adelaide was founded with idealism and an unusual model plan – one that Ebenezer Howard considered to be sufficiently distinctive to feature in his *Garden Cities of Tomorrow* (Howard, 1902)¹:

- ◆ The plan has a strong 'enlightenment' form with clear boundaries and hierarchical order, being surrounded by parklands and incorporating nested 'quarters'. Indeed, it may be argued that the plan is more of a heritage item than any individual buildings; it has therefore been a point of reference for most major design interventions.
- ◆ In more recent times, it has been considered on several occasions as a place of progressive planning action and a model for other parts of Australia. This may reflect a broader context in which the city has been recognized as a strong centre of culture, and dubbed the 'Edinburgh of the South'.
- ◆ Though little more than 170 years old, and still young as cities go, Adelaide has experienced steady growth as a state capital to become the metropolitan home to 1 million people.
- ◆ Lastly, although at the centre of an extensive metropolis, the City is a distinct district with a higher proportion of metropolitan shopping, offices, jobs and university students than equivalent Australian centres. Thus the metropolis exerts proportionately more pressure upon the centre.

It has therefore experienced the typical pressures of a sizeable Western city centre (for tall buildings, for freeways, etc), been more conscious of changing design philosophies (the cultural dimension), and developed within the framework of a plan that is distinctive in its internal form and as an object in the landscape. These factors combine to expose more clearly the particular nature of design interventions. They also make many of the changes in design philosophy and urban coding that have occurred across urban Australia more visible than in other places. In a very real sense, Adelaide caricatures change in urban design and coding.

Foundation Plan 1836

The original City of Adelaide Plan was designed in two parts as North and South Adelaide within a figure-of-eight parkland. Today the city's extensive suburbs lie beyond the Park Lands, which still encircle these northern and southern components. South Adelaide has often been referred to as 'the Square Mile' (reflecting its approximate area), and is the main metropolitan centre. Here we will concentrate on this component, which is endowed with a rectilinear plan (see figure 8.1). There is a square at the centre and terraces about the edges, which look out across the surrounding Park Lands. Within this pattern, are four nesting 'quarters', each with its own central square and similar pattern of streets. The one departure from absolute symmetry is in the east, where there is a slightly extended stepped edge that is contour-related.

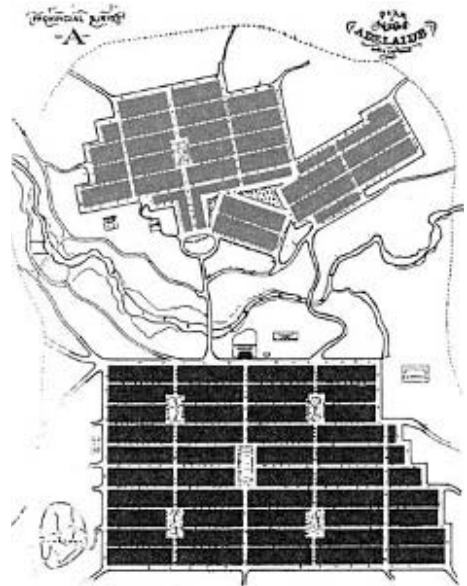


Figure 8.1. City of Adelaide Plan 1837, highlighting South Adelaide. (Source: Adapted from *Provincial Survey A* of 1837, held by the National Gallery of South Australia)

'Street' was the nomenclature given to the main grid streets. Where the carriageway of a 'street' continued across a Terrace and through the parklands, there was a name-change to that of 'road': thus Wakefield Street in the city becomes Wakefield Road in the Park Lands, reflecting the common English situation where 'streets' were of the town and 'roads' of the country and connecting the towns. It was a clear statement of urban intent with Adelaide termed 'City' from the outset.

This background as a founded colonial city with a distinctive plan and implied form is important for understanding subsequent attempts to shape Adelaide's built form, for the initial plan has been repeatedly a point of reference through subsequent planning eras, though in widely different ways. It is this that makes it of special interest.

Thus Adelaide's urban design-cum-coding 'story' has already begun with the description of the original plan. It will now trace the main phases of development and change, and the associated design thinking in each. It will show how building habitually followed a consistent set of urban design principles for well over a century, and then focus on how 'coding' (albeit by other names) propelled the Square Mile through several identifiable design eras, each coloured by different design theories, to shape the city into the often contrary and conflicting variety of forms that leave their mark on the city.

Streets, Squares and Terraced Edges, 1836–1950

From Foundation in 1836 until World War I development took place according to a consistent set of principles within the original plan, to result in a city of one-, two- and three-storey buildings that were street-aligned and street-orientated – i.e. with street doors, windows and mostly frontal decoration. If a building was set back, a fence (or plinth-and-fence) would mark the street edge (see the top image of figure 8.2 which shows part of the Square Mile in 1887). The Square Mile was a 'compact' low-rise, walking city; for most people, to enter and exit, there was the tram, train or bus. This was the typical cultural model of the early decades of the twentieth century.

Another element of the city's form is the labyrinth of narrow streets and alleys that has intensified circulation in the Square Mile. In addition to the original 1, 1.5 and 2 chain (c. 20 m, 30 m and 40 m) streets, are numerous narrow streets and lanes only a few metres wide (mostly 10 m or less). The street blocks were big – over 500 m long and 130 m wide: thus, given what we know now about morphology and movement from a range of authors over the last half century, including Jane Jacobs (1961) and Bill Hillier (1996), it was inevitable that such large blocks would become riddled with more convenient routes, especially from north to south. In fact, the street pattern became two-tier: the planned and regular, spacious and visually dominant original grid plus an unplanned and relatively inconspicuous labyrinth of lanes within the blocks. This describes South Adelaide at the turn of the twentieth century.

It took about 70 years from Foundation for buildings to start to rise above the 'established' nineteenth-century one- to three-storey skyline (spires and chimneys excepted), and a good deal longer before building height was controlled in building codes. Tall buildings entered onto the Australian urban agenda in 1888 with the construction of a ten-storey building in Melbourne: the Australian Property Investment Building. In its wake, debate about height peaked some two decades later, after which Sydney and Melbourne adopted 150 ft (46 m) and 132 ft (40 m) height limits in 1912 and 1916 respectively, following the application of similar codes in several US cities (Collins *et al.*, 2006, p. 25).

Early Coding

In Adelaide, there was a first wave of higher buildings (eight of five to seven storeys) completed between 1907 and 1912, including a hotel, department stores, an apartment block, offices and a government education building. Most of these were more massive as well as higher than previous buildings (see the middle image of figure 8.2, which shows two such buildings). Following World War I, another six-storey office rose (1922), at which time a debate about tall buildings was framed as 'Paris' versus 'NY': in the argument, the parklands were even cited as a constraining collar equivalent to the water around Manhattan, and therefore had the same need to grow tall on the 'island' of South Adelaide (*Ibid.*, pp. 27–28). In other words, reference was by way of overseas precedents: essentially European versus US models. In 1923, a State Building Act allowed for a taller skyline with building heights of 75 ft to 110 ft (23–36 m) and 110 to 132 ft (34–40 m) for streets of less and more than 30 ft (9 m) width; the lower and upper figure in each category differentiated between buildings with load-bearing walls and steel frames. Church spires and similar decorative elements were exempt (*Ibid.*, p. 28).

Eleven seven- to ten-storey buildings followed before World War II, including four of ten storeys. While the first rose as early as 1926 (the T & G Insurance Building), most of these fledgling 'skyscrapers' came after the Great Depression, rising on the Town Acres on or close to the north end of King William Street – the most conspicuous, central and accessible part of town (the bottom image in figure 8.2 shows the first building to reach ten storeys). These conformed to the established pattern of street-aligned buildings. In addition, they occupied the length of their frontages, and were generally executed in the classic idiom of base, middle and top, a few Gothic ribs excepted. But even the slender buildings were not 'towers' in the sense of being designed to stand alone: they were composed to stand shoulder-to-shoulder and contribute to a strong street edge; and the resulting form may be read as either a compressed NY or an extruded Paris! The biggest changes brought about at street level by the new building typologies were fewer doorways and verandas along and over the pavement. Verandas and balconies rose through three storeys on many Adelaide hotels.

If building height was linked to images of commercially successful American cities (and new structural and service technologies), another image of the time was that of the English garden city, which was viewed as an antidote to urban squalor. This generated another regulation: a minimum lot size of 3,960 ft² (368 m²). In fact, 60 per cent of the Square Mile's lots were smaller than this, and the regulation a recipe for stagnation (no change on existing lots) or amalgamation. Thus South Adelaide became an expression of ideals derived from English ideology, Parisian aesthetics and American pragmatism – of which the first became the most destructive. These two elements of coding (height

and spacious lots) reflect a concept of the specialized high-rise commercial centre surrounded by more spacious houses.



Figure 8.2. Adelaide's built and spatial form: *top*: the 'Square Mile' in 1887: formed streets, one- to three-storey buildings, plus spires and chimneys; *centre*: the first wave of tall buildings: five-storey examples dating from around 1910; *bottom*: the start of the second wave of tall buildings: this ten-storey building was completed in 1926. (Source: South Australian Archives)

However, while the handful of taller buildings started to transform parts of the Square Mile at higher levels, the minimum lot size had a fossilizing effect over much of the lowest (ground) level. It encouraged the continued occupation of increasingly dilapidated small houses on less-than-regulation sized lots, especially along small streets within the original street blocks. In effect, 'improvement' through new development could only occur on amalgamated lots! Consequently, South Adelaide's population remained remarkably stable – it changed little over the 70 years from 1880 to 1950 – and the highly ordered nesting grids and central squares, big streets and little lanes, and street-orientated street-aligned buildings remained remarkably intact over the period. But post-war economic recovery and the arrival of Modernist design ideology brought abrupt change.

Modernist Space and Outmoded Streets, 1950–1972

In 1949, a remarkable little book appeared on the Adelaide scene with the rather innocuous title of *Replanning Our Towns and Countryside*. The authors were Andrew Benko and T. Rex Lloyd who gave a public lecture series to the Workers Education Association on the same topic. As vehement advocates of

the 'horizontal garden' and 'vertical garden' cities, their message was radical: Howard offered a 'beautifully conceived plan' and Le Corbusier presented 'brilliant ideas', both of which were 'beginning to find expression amongst town planners all over the world' (Benko and Lloyd, 1949, p. 6).

The book came complete with a model plan for the Square Mile. They advocated a building height of ten to twenty storeys with buildings 'completely surrounded by parks': no longer would the residents of the Square Mile view 'walls of adjacent homes, fences and untidy yards' (*Ibid.*, p. 21). For the two authors, the strength of the Light plan was not its street pattern but the 'generous and progressive (provision) of parklands', which were now to invade and conquer the city as the setting for: high-rise slab blocks and low-rise cul-de-sac garden homes; a commercial area of free-standing buildings; isolated industrial buildings within reorganized super-blocks; and a cultural centre that retained a few existing historic structures as isolated monuments. The plan also proposed a re-orientation of the main axis from north-south to east-west, recognizing Grote-Wakefield Street as the axis that led all the way to the metropolis's most important piece of Modern infrastructure, Adelaide Airport (see figure 8.3, right).

In this context, Ebenezer Howard's earlier-mentioned depiction of Adelaide as a garden city is telling. He abstracted the city plan to show no streets yet name individually every piece of parkland and square (see figure 8.3, left). Thus parks are valued at the expense of streets and a true indication of the Modernist values embraced by Benko and Lloyd.

While their plan carried no official status, it foreshadowed the mind-set that would try to shape the Square Mile for the next two decades. In fact, the concept of separately

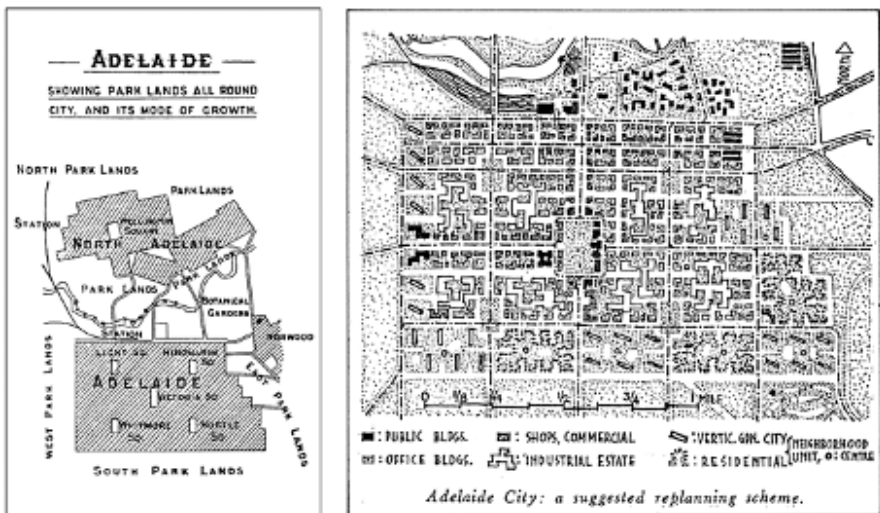


Figure 8.3. *Left*: Howard's 1902 depiction of the Adelaide plan – showing parklands and squares but no streets; *right*: Benko and Lloyd's 1947 Modernist (functionalist) plan: a mix of Le Corbusier's 'vertical garden' and Howard's 'horizontal garden' cities.

zoned functions struck hard through the 1940s, 1950s and 1960s. Housing was virtually eliminated from the Square Mile through bye-law zoning in favour of retail, commercial, civic and industrial activities. Only meagre ribbons of residential zoning remained along South Terrace and around the two southern squares – far less than even Benko and Lloyd had contemplated. As a consequence, in the decade from 1957 to 1967, the Square Mile lost around 175 houses and 900 people each year (Horner 1978, pp. 50–51). The 1962 metropolitan plan inferred a target residential population of zero: the area was shown as the metropolis' densest in 1958 but devoid of residents in 1991 (Town Planning Committee, 1962).

In the late 1960s, there was a partial reprieve when surveys showed that new commercial development could not possibly fill the areas zoned to take it. It was realized that a huge increase in vacant land was inevitable without expanding the area available for residences (City Engineer and Surveyor's Department, 1968). At the same time, the City was designating several Action Areas, which showed clearly the kind of urban forms that were intended to take Adelaide into the final quarter of the twentieth century – demonstration by example. Some such areas were residential, some commercial, and some open space.

One Action area covered 86 acres (35 ha) of the city's east end where densities were to rise to up to 150 persons per acre with free-standing residential buildings and parking stations, extensive greenery, traffic-pedestrian separated circulation, and so on. The intent was 'an environment associated with the adjacent Park Lands, which would virtually make a garden environment through the whole residential area' (City Engineer and Planner's Department, 1969a, p. 32). Another was aimed at a commercial equivalent in the city's core: for Stock Exchange Plaza, two town acres (0.8 ha) of the original subdivision were designated for demolition and redevelopment as an open plaza with two identical and perfectly square freestanding towers (City Engineer and Planner's Department, 1969b). Just as Corbusian typologies were favoured for housing, a Miesian model was favoured for a commercial showpiece (see figure 8.4). At 300 ft (91 m) this was intended to break the city's height limit and require special legislation. It was a matter of great pride that these would occupy only one-quarter of the site while doubling the plot ratio from 2.5 to 5; further, the height 'would provide a focal point at this inner block location' (*Ibid.*, p. 11)

These approaches were fuelled also by the University of Adelaide's School of Architecture, under the leadership of Professor Rolf Jensen, author of *High Density Living*, who 'tried to get the government to bulldoze old neighbourhoods and build big heaps of flats (i.e. towers and slab blocks) in their place' (Stretton, 1985, p. 5).

Some Action Plans were partly realized; some morphed with time into other forms; most (perhaps fortunately) remained as proposals. Housing plans were largely unrealized. The plaza plan emerged with one instead of two towers, to stand conspicuously as the dark glazed Grenfell Centre, known colloquially as 'the Black

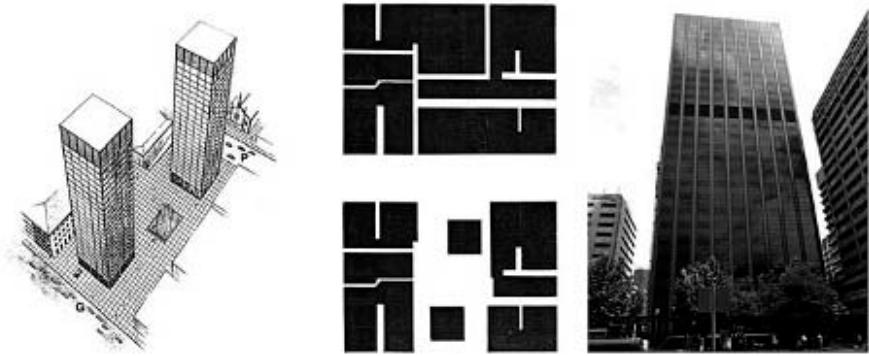


Figure 8.4. The Grenfell Centre, Grenfell Street (1974): *left*: the original ‘Miesian’ concept with twin towers in a plaza (from the City of Adelaide *Planning Report*, No. 10, 1969); *centre*: the street block figure-ground as existing at the time of the proposal (above) and as it would have been following development of the full scheme (below); *right*: the modified result, a single tower known locally as ‘the black stump’ – as it appeared in 1985.

Stump’. The name, ‘Centre’, was significant in that the tower and plaza took its name from the adjacent street: it was indicative of an intent to transform the spatial structure from a network of streets to a collection of more conspicuous ‘centres’. The City’s direction at the time is reflected well in the words of the engineer-planning consultant, P.G. Pak-Poy. In a paper entitled ‘The Challenge of Redevelopment in Adelaide’, he warned against ‘the possible mistake of simple replacement of the old with a new version of the same thing’, and praised cities that had ‘broken the shackles of outmoded street systems’; further, he pointed to London’s Roehampton Estate, Paris’s La Défense and Chicago’s underground shopping streets as models for a future Adelaide (Pak-Poy, 1968, pp. 14–16).

Modified Modernism: Human Scale and Greenery, 1972–1986

These schemes brought a vociferous reaction, especially following proposals of similar spirit for the more salubrious North Adelaide: this was home to ‘some of the State’s most prestigious, wealthy and educated citizens’ who lobbied the South Australia government. Change followed with new councillors and reform (Sandercock, 1975, p. 140). As a consequence, the City of Adelaide Development Committee (CADC) was formed consisting of three councillors and three State government representatives: Also, the Sydney-based architecture and planning firm, Urban Systems Corporation (USC)² was appointed as consultants. The Committee was to remain in control until the USC had completed its plan – after which the City of Adelaide was to resume duties. The CADC and USC worked quickly to complete their reports – an incredible one week for the CADC’s interim policy and 18 months for the USC’s comprehensive investigation. Informed by the critiques of Jacobs (1961), Cullen (1961), Lynch (1960)

and Alexander (1966), they produced landmark work to make the years from 1972 to 1974 a turning point.

No longer were policies based on essentially negative attitudes towards the old city: fear of vacant space, alarm at the possibility of lost revenue from rates, dislike of old buildings, and a suspicion of city (as opposed to suburban) living. The CADC stressed a more 'urbane' city centre, and set about reversing the decline of residences by abolishing the large minimum lot size, replacing mono-functional zoning with living and working, and shifting emphasis from the destruction of established qualities to their retention; though in retrospect it would seem that they were often more certain of what they did not want than what they did. For instance, 'scale would not be breached by scattered towers'. Further, statements on built form were usually vague: high buildings would be allowed only in the established core of high buildings; otherwise building and landscape forms were to be of 'a horizontal closely built character (that paid) careful attention to the scale of the street (and) immediately adjacent properties' (CADC, 1972, pp. 5–9).

A key figure on the CADC was Hugh Stretton – historian turned urbanist and author of *Ideas for Australian Cities* (1970). He viewed *Death and Life of Great American Cities* as 'the most readable of all statements of the case against the bulldozer' (that is, against the demolition of old neighbourhoods). He was, in many ways, Adelaide's Jane Jacobs, even though he had reservations about her work, viewing it as of 'no help (for) the planning of low density suburbs', for which he was an apologist and advocate (Stretton, 1970, p. 217). His sensibilities showed through in that the 'horizontal forms should be well-covered with trees and vines – as uniquely Adelaidean as possible' (CADC, 1972, p. 5). While towers in greenery were unacceptable, greenery-shrouded low buildings served by traffic-pedestrian segregated circulation were encouraged. Such sentiments guided development until the adoption of the USC's 1974 report in the form of the *City of Adelaide Plan 1976–81*. It was the City's first official plan since Foundation, and was made possible by the City of Adelaide Development Control Act 1976, State legislation that separated Adelaide's planning from that of the rest of South Australia.

The 1974 and 1976 documents (known locally as the 'Red Book' and 'Blue Book' respectively) continued the directions of the CADC work: the Red Book was both a comprehensive investigation and plan covering activity, movement and environment, the latter embracing land/street-scape, built form and heritage, and environment. The documents' broad design concept for the Square Mile was of a 'pyramid' with its high point in the central commercial area (towards the north end of King William Street) descending through a mixed use 'Frame' area, to a more 'Residential' periphery in the east, south and west. The centre would have a height limit of 42 m and a plot ratio (floor to site area ratio) of 6 to 10, and these would fall to the edges where the height limits were 6 m to 9 m, plot ratio 0.5 to 1, and there was a 'usable open space

requirement' of 30 per cent of the site area. But it was also to be a fragmented pyramid in that the aim was to bring 'the feeling and texture of the Parklands into the city', with the city 'woven into the Parklands'. There was emphasis on residential, heritage buildings and 'fit' in terms of adjacent scale: but there was little value placed on the physical form of the Light Plan, including street form. The Light Plan continued to be valued most for the green landscape of the Parklands.

Apart from area-related regulations such as those indicated above, key elements of the planning framework were the Statements of Desired Future Character (SDFC), which at the time were innovative³ word-based shapers of character and form. The Square Mile was divided into many precincts, and an SDFC presented for each as the major guide for development.

In reality, the SDFCs were vague, and had a tendency to do little more than extend the better existing characteristics to neighbouring properties, while stressing the importance of open space, landscaping and 'high quality design'. A typical SDFC is that for the Wakefield Precinct District in the Frame⁴ area:

The existing blighted environment should be transformed by major residential and educational development initiatives on under-utilized land. The Precinct should be characterized by buildings of high quality set into generous planting and landscaping. Street planting should be on a grand scale, complemented by well designed street furniture and discreet signage.

The intensity and height of buildings should taper away from the Core District. Development adjacent to the Core should reflect the design standards therein, while elsewhere in the Precinct buildings should have a more intimate scale and character. (USC, 1974, p. 139)

Most SDFCs were supplemented with pictures, usually photographs showing existing characteristics considered as desirable.

Hence, a combination of quantitative regulations and SDFCs was organized to generate a pattern of building that decreased in building height and intensity out from the city core. These were also accompanied by a series of well-illustrated Action Plans for specific sites, mainly concerned with landscaping for selected streets, pedestrianization, pocket parks, historic public buildings and community facilities. Though not termed guidelines, they nevertheless served as examples of desired design approaches and urban character. Thus these several word plus picture components came together to offer an embryonic form of illustrated urban coding.

This framework continued to guide development through to the 1981 review and resultant *City of Adelaide Plan 1981–86* (or 'Green Book'), which brought little change in approach or format. In fact, the review resulted in SDFCs that were more descriptive and bland. There were more historic photographs in place of contemporary ones; and altogether fewer drawings. Illustrations were generally more decorative than informative, weakening the design content. In retrospect, it is not difficult to conclude

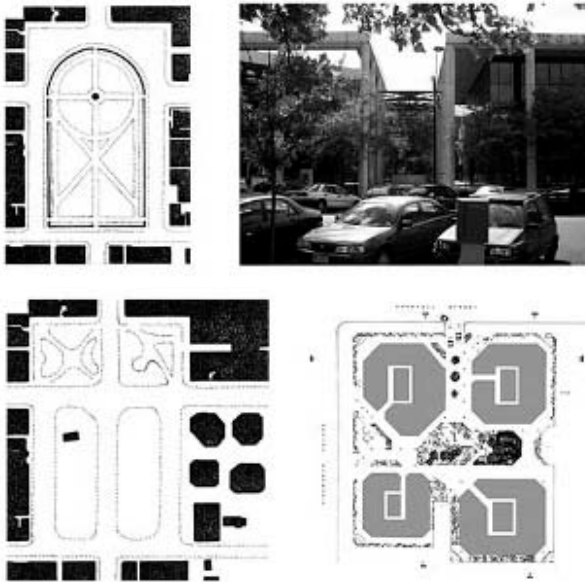


Figure 8.5. The Citcom Centre, Hindmarsh Square, dates from the early 1980s and is a good example of the ‘modified Modernism’ phase of guidance: it follows from the 1976 City of Adelaide Plan. The development’s pavilion forms transformed the interface between the site and the square. *Top left*: shows the building footprints and edges to the square as before development (c.1980), and the layout of the square as it was in the early decades of the twentieth century. *Bottom left*: shows the footprints and edge to the square after development, and the layout of the square at that time. *Bottom right*: shows a more detailed plan of the proposal, and *top right*: is the building as seen today. The design strategy was to allow the square’s greenery to ‘overflow’ into the development with both on-site planting and a building exterior that reflects the greenery of the park.

that the review brought a bureaucratic dilution of the pioneering 1974–1976 work, with increases in allowable densities, more discretion and greater ambiguity. Nevertheless, the Urban Systems-generated Plan and the subsequent review continued the Stretton-influenced philosophy. It had introduced SDFCs, increased design content, demonstrated social concerns (mixed low-rise housing, commerce and community facilities), valued the Light Plan (albeit for its parklands), continued to erode street form, and encouraged extensive informal planting.

Light Revisited, Figure-Ground and Formed Spaces, 1986 – Continuing

The critique of Modernist forms continued in the next phase of change with similar concerns about isolated high-rise forms. However, thinking went considerably further with a fundamental reappraisal of spatial form and building typology. In 1986, exactly

150 years after Foundation, the City of Adelaide produced a wide-ranging review and one of the most ambitious explanations of urban design intentions (in both illustrated document and exhibition formats) that Australian planning had witnessed.⁵ At the same time, it was a sponsor for a major urban design competition: the Royal Australian Institute of Architects' *Adelaide 2000 Ideas Competition*.

Reflecting on the fall of CIAM (Congrès Internationale d'Architecture Moderne) and the important contributions to urban design that followed, Andrés Duany (2006) notes that Colin Rowe had 'rediscovered spatial definition', Team 10 'reconstituted the street network', Aldo Rossi restored 'respectability to typology', and Leon Krier 'transcended the pervasive hesitation (to propose) the traditional city'. These ideas permeated the next period of Adelaide's urban design. In this phase, forms associated with the 'traditional' city assumed greater importance with a deeper appreciation of the Light Plan⁶ as a city structure – that is, of *both* parklands *and* the particular pattern of linear streets formed by more or less continuous building and fence lines. In the wake of authors such as Duany, Anderson, Gehl, Alexander and others (Rowe and Koetter, 1978; Smithson, 1968; Rossi, 1966; Krier *et al.*, 1978, Anderson, 1978; Gehl, 2008; Alexander *et al.*, 1977) city buildings and spaces were now seen as having some equality in their figure-ground relationship. The Adelaide review paralleled the later stages of work in Britain and the United States by Ian Bentley *et al.* (*Responsive Environments*, 1985) and Roger Trancik (*Finding Lost Space*, 1986), having commenced well before the release of these 'design primers'.

The fundamental change in spatial thinking that occurred with this review is reflected in the changed positions of the Square Mile's planning precinct boundaries – that is, within coding's spatial framework. Whereas previous plans had frequently used long lengths of street to separate one precinct from the next, most boundaries of the new plan ran through the middle of street blocks, putting the focus of the plan on streets, terraces and squares as the primary spatial elements. Although along part of North Terrace, this characteristic was reversed (and consistent): here, the Terrace became the boundary between the space of the Parklands and those buildings marking the edge of the Square Mile and its street blocks – whereas previously in this area, the precinct had crossed the line of the Terrace to include areas of city and parkland. In other words, the change reflected the Terrace's formal role as a city edge and boundary between contrasting spatial components.

Although the Statement of Desired Future Character was dropped as a term, its spirit continued in precinct information given to cover desirable patterns of *Use*, *Built Form* and *Movement*. However, whereas Use and Movement had previously occupied most space (USC, 1974; City Planner's Department, 1981), Built Form was now given the most extensive coverage (City of Adelaide, 1986), to include quantitative parameters and qualitative guidance on *Density*, *Height*, *Scale and Siting*, *Townscape Context* and *Heritage*. Further, there was more direction given on aspects of form under

the heading of *Environment* where landscaping, signage and shelter were all included as main items. These multiple changes reflect a continuing shift from a preoccupation with *functionalist* towards *formal* and *cultural* concerns that had commenced in an embryonic manner in the 1972 and 1974 works of the CADC and USC.

At the heart of the new approach was a new respect for the integrity of the Light Plan – of the particular pattern of the city plan as a rectilinear network of streets and squares and its contrasting placement in the landscape of the Parklands – and for the spatial form of the squares, terraces and streets in that wider context. For the first time there were both maximum and minimum heights for street-edge components of buildings, and setbacks for upper building levels to achieve a measure of consistency in the ‘address’ and enclosure of streets and squares.

There were more precincts that were street-centred and contained more detailed guidance. For instance, the new Wakefield Street West precinct covered only part of the (previously cited) Wakefield Precinct District with intentions that are more clearly stated:

The height, scale and massing of buildings should contribute to the strong definition of Wakefield Street as a major thoroughfare.

Buildings should attain a high degree of site coverage and have minimal setbacks from front and side boundaries.

Buildings fronting Gawler Place and other minor streets should follow the existing pattern of setbacks.

A high level of pedestrian amenity should be established primarily by large growing street trees appropriate to the width of streets. Shelter may also be provided by verandahs and balconies, or canopies over footpaths where street trees permit. (City of Adelaide, 1986, p. 106)

It also included maximum and minimum building heights of seven and two storeys, and much more.

Most important, in a separate but complementary document, there were *Urban Design Guidelines* (Corporation of the City of Adelaide, 1988) in largely graphic form (see figure 8.6). These demonstrated, with case studies, a large range of design information, guidance and advice from an explanation of the underpinning design philosophy (e.g. the Light grid and its implied spatial structure as the interpretive starting point), through principles of building-space relationships (e.g. ratios of building height to street width) to more detailed aspects of design (e.g. fenestration patterns and the design of street-level grills).

Recent Times: Similar but Different

The last 15 years have again seen significant change in Adelaide’s planning. This has however been more related to the context within which planning has taken place than

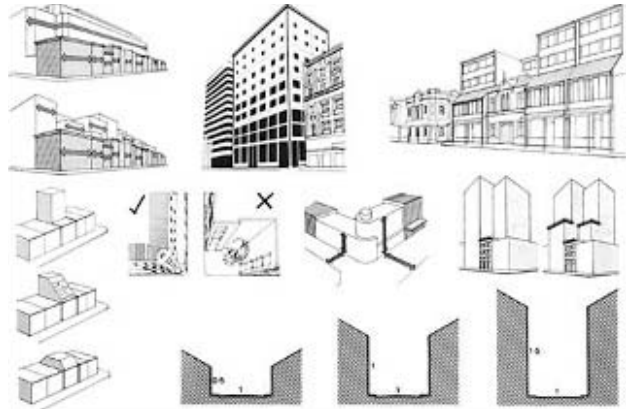


Figure 8.6. Drawings of design principles extracted from the City of Adelaide *Urban Design Guidelines*, 1988.



Figure 8.7. These buildings in Grenfell Street followed from the 1988 *Urban Design Guidelines* (see figure 8.6). Early responses were often crude, with high rear components overpowering low front ones, the latter having insufficient mass to form a strong street volume.

in any fundamental change of design direction – although the context appears to have influenced design control and guidance in the way it has been conceived, prepared and delivered.

The basic nomenclature of the City's plan has changed from the *City of Adelaide Plan* to *Adelaide (City) Development Plan*. This reflects an end to the City's independence from the State planning system and a nomenclature that fits a standard State format. Further, the recent plans look and feel very different from the schemes discussed earlier and referred to colloquially by the colours of their covers – it is reasonable to say that the new plan is more formidable in sheer volume and tedious in presentation. In addition, while some design-related documents have appeared during this latest period, their content has been broader and less focused, and increasingly their role in the scheme of things (especially their relationship to the plan) has been less clear. This section will discuss briefly this latest phase.

Review of the guidelines came in the early 1990s with a final version of the new document released in 1995, following a 1991 review of the Plan. However, the new

guidelines differed from those of 1988 in title, scope, content and image. Whereas the old title was simply *Urban Design Guidelines*, the new one was *Planning and Design Guidelines* inferring both wider and more technical guidance.

The 1988 version had dealt directly with matters of form and townscape – focusing specifically on design context (the Light Plan as a valued point of departure), and *design principles* (such as scale, alignment, orientation and heritage character). These were followed by *case studies*, which demonstrated application of the principles to particular sites. In fact, there was one page explaining straightforwardly the relationship of the Guidelines to the Plan, 44 pages of mostly large-format pictorial urban design guidelines, and 25 pages covering example applications in some fifteen case studies (three sites each for the Core, Frame, Residential and two Parkland areas).

However, in 1995, the first 10 pages were essentially a summary of the planning scheme. Though brief, the document then turns to ‘land use’ (2 pages). There are: 4 pages on urban structure (less visual than before); 18 on building design and townscape (more finicky and more concerned with detail); 8 pages on how to calculate aspects of the planning scheme; a huge 30 pages on heritage matters; 8 pages on urban detail for the public environment, including public art and shop fronts; 12 on social aspects (e.g. security, disabled access, privacy); 10 on environmental aspects (e.g. energy, micro-climate, noise); 7 on ‘movement’ dealing mostly with the parking of cars and bicycles (parking is hardly ‘movement’); and 1 page on the Parklands. Case studies were dropped although individual principles were often illustrated with a basic example. The number of pages had almost doubled over the 1986 document (up from 70 to 130), but it was also far denser in content with many more words – vastly more relative to images. In the process, the previous clear distinct but complementary relationship between plan and design guidelines had been muddied, though the guidelines were not a statutory document.

The greatly enlarged sections on heritage and environment in the new document reflected the long-standing strength of the City’s heritage lobby and the rising tide of ecological concerns. Heritage had risen as an issue in the wake of Modernist schemes of the 1960s and 1970s. At first, concern was mostly with individual historic items but this widened to view heritage items as important components of townscape, as part of a broader appreciation of place (memory), and (politically) as the most tangible weapon of resistance against the advance of unwanted change.

Since the release of *Planning and Design Guidelines*, there have been several documents that have bordered on guideline territory, and these will be referred to later. However before doing so, we shall turn to the latest plans that have emerged during the ‘recent’ planning phase.

The 2006 *Adelaide (City) Development Plan* is some 506 pages long (including 80 pages of area-defining maps) and at least 400,000 words. (This compares with 299 pages, including 85 graphically superior maps in 1986 – and a mere 20 pages, including

one map, in the landmark City of Adelaide Interim Development Control document of 1972.) There are twenty-two 'zones' of which four have six, ten, eleven and twelve 'policy areas'; within each zone or area, there are statements of 'Desired Character' (the phrase is resurrected) followed by 'Objectives' and Principles'. For the Square Mile and its immediately adjacent Parklands (i.e. excluding North Adelaide and the remaining Parklands), there are 172 objectives and no fewer than 1,169 principles. 'Principles' range from the strictly quantitative (e.g. plot ratio) to the general qualitative ('maintenance of biodiversity in the local environment'). And, in an attempt to be comprehensive at every point, similar points are repeated for many places: how many times must it be said that architecture and urban design should be of a high quality, innovative, contemporary, sympathetic to nearby heritage places, and so on, and that 'Development should strengthen, achieve and be consistent with the desired future character' of the area (a tautology that is repeated for every area)?

While a model of systematic documentation, it is clear that this was more the focus of the effort than the ideas it attempts to articulate, the latter having been mostly inherited from the earlier period. This emphasis on systematic presentation is no doubt why the current plan received a national Planning Institute of Australia Award for Planning Excellence in 2006 for the profession is preoccupied with management systems and processes.

In the new State planning system, a clear relationship is required between a plan and the broader policies of both the City and the State. Thus the City prepares and updates regularly its Strategic Management Plan, of which the city plan and any guidelines must be supportive. For South Adelaide, a goal is to raise the density, and to make it an environment that is more of a mix of living, working, learning and entertainment – with more people, more square metres of living space per person, and inevitably more cars, which means more and denser building. For instance, in 2004 the Council stated that it intended to increase considerably people in the city by the year 2010: to attract 150,000 visitors daily (up from 103,500 in 2003), have a city workforce of 110,000 (93,000 in 2002), 66,000 students (52,000 in 2003) and 34,000 residents (21,000 in 2003) (Adelaide City Council, 2004).

As a consequence, some of the more important studies of recent years have been to explore the capacity of the City's existing plan: in other words, could the targets be reasonably accommodated within the potential building mass allowed under the prevailing plan? Recommendations emerged to increase the potential volume (through changes in building heights, plot ratios, etc) within the transitional Frame and selected Residential districts of South Adelaide (Bechervaise and Associates, 2002; Connor Holmes Consulting, 2003). Significantly, this has occurred without changes to the coding principles that give basic shape to the city, only to the quantitative controls.

While plans were being updated, other documents emerged that ventured partly into 'design guidelines' – in addition to the earlier-mentioned and slightly confused

Planning and Design Guidelines (City of Adelaide, 1995), *Streets, Squares and Park Lands: Adelaide's Public Realm* (City of Adelaide, 1997) offers a clear summary of the City's structure, followed by principles to guide many dimensions of public realm design (e.g. lighting, street furniture, trees). In other words its primary focus is on urban details that complement both plan and urban design guidelines. As much as anything, it is a guide to the Council's own public works. In 2005, an *Urban Design Strategy* was also produced, but its role is less clear. It reads more as a discursive 'state of the city' report synthesizing various urban design objectives to lead to a rather broad spread of, often tentative ('will investigate the potential to establish...'), recommended actions; it has remained as a 'preliminary draft for internal consultation'.

Conclusion

Although the context within which planning has occurred has changed in the recent phase, and although the nature of the documentation has likewise changed (arguably for the worse), the basic design parameters and guidelines that were applied to the shaping of South Adelaide in 1986 have substantially endured. While more dimensions of control or guidance dealing with heritage, ecology, security and other things have been introduced, the underlying formal concepts giving basic shape to the Square Mile have proved remarkably robust. In other words, these 'basic dimensions' prevail despite their rationale being less apparent.

It is difficult to judge how much the changes have been a consequence of internal workings of the City of Adelaide or of the City's inclusion in the State Planning system under the South Australian Development Act of 1993 – probably both. The new system demands standard approaches and formats that can apply as much to open paddocks of outback local authorities as they do to the metropolitan centre with its functional primacy and distinctive form – a product of the 'one system fits all' syndrome. In the period since 1993, the Plan has become more voluminous, more descriptive and repetitive, with associated design guidelines increasingly marginalized. It is ironic that the State system may have thwarted a design emphasis in the very place that needs it most – that small intensely built-up square mile that is effectively its centre.

Also, the teams preparing more recent plans are less design-experienced than earlier ones, and this again may be symptomatic of the system in that the new framework may be less attractive as a working context to 'designers' (who understand form), as opposed to 'managers' (who are more at home with processes). In Adelaide, the design contribution to the planning process has been increasingly reliant on advice from consultants and design panels,⁷ rather than being designer-led. In fact, this whole process of change is indicative of the nature of planning itself – more management, more words, fewer meaningful illustrations, and less design content.

Nevertheless, built evidence of the 20 years, 1986–2006, shows a relatively

consistent 'shaping' of the Square Mile, that is readily apparent to any resident or return visitor. The pattern of the Light grid is stronger. The edges between 'city' and 'parkland' are mostly sharper. Street form is more consistent with built edges more continuous. While too many new buildings may have suffered from a 'heavy' design hand (an Adelaide architectural condition), they have generally shaped the city into a more cohesive form. Where development has occurred about the squares, these are generally better defined (see figure 8.8). The place is more pleasantly permeable through improved small streets and alleys. Higher buildings rise behind street-addressing frontages to give both some measure of enclosure and good natural light to the spaces between. There is more shade to be gained from trees, verandas and canopies. Car parks (and there are oodles of them) are usually glimpsed above street edge activity or down lanes on sites that occupy internal positions on the street blocks (rather than experienced along grid-streets at street-level) (see figure 8.9). The place is both denser and more vibrant (the two are not to be confused).

Figure 8.8. A recent building that gives a sharp edge to Hindmarsh Square. Compare this edge with that of the Citicom building on the opposite side (see figure 8.5).



Figure 8.9. A common sight in South Adelaide: at the end of this 'small street' vista is a building in which the upper levels and roof are for cars.



These are no small achievements and must be attributed to the clarity with which certain form-shaping concepts were articulated and illustrated over 20 years ago, and have been carried out consistently through to the present. They also point to the importance of a design-sensibility at the centre of urban design policy-making and code-preparation, and to clarity in the relationship between policy, plan and guidelines. Without these (both of which have weakened), the question must be asked: can Adelaide ride the next wave of change in design values, which is almost certainly just around the corner,⁸ without such design-leadership and clarity of design position and documentation? This question is especially important in a place that is a conspicuous cultural showpiece, is a comprehensible district of a design scale, and has such a rich planning history.

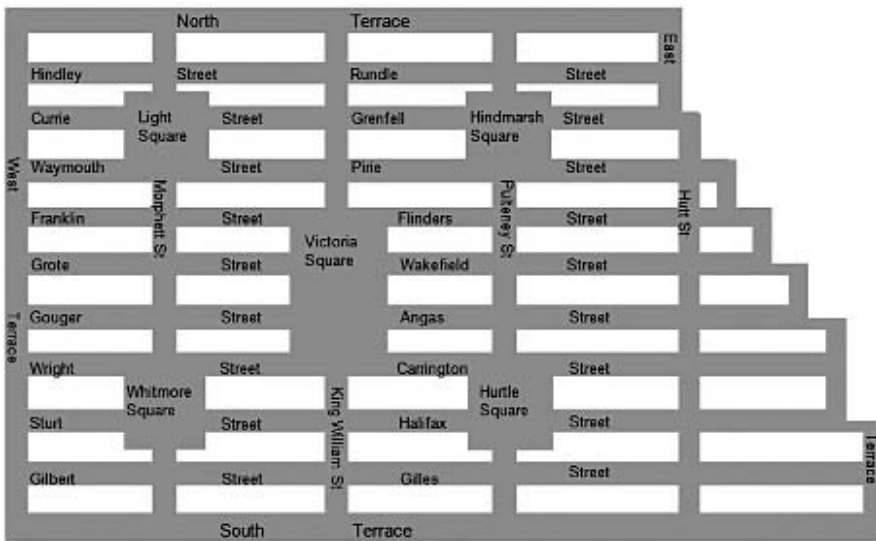


Figure 8.10. South Adelaide: street names.

Notes

1. Howard included a plan of the City of Adelaide highlighting its parklands, which he saw as a prototypical 'garden city'.
2. USC was a large and progressive architecture and physical planning (in effect, 'urban design') practice. It was Sydney-based but with offices in several Australian states. The Adelaide work was under the direction of principal, George Clarke, perhaps Australia's most prominent figure in planning at the time.
3. I believe SDFCs made their Australian, and perhaps international, debut in Adelaide at this time, and were taken up by several other Australian cities in subsequent years.
4. The Frame area was conceived as a transitional area of intermediate and descending height between high (central) 'Core' and low (edge) 'Residential' zones.
5. The work was directed by Harry Bechervaise, City Architect and Planner, under a Town Clerk, Michael Llewellyn-Smith, who was also an architect and had worked for Urban Systems Corporation at the time of their pioneering Adelaide work in the early 1970s.

6. The original Adelaide Plan has been commonly referred to over many decades as the 'Light Plan' – after Colonel William Light whose signature (as Surveyor General) appears on the plan. The new attention given to the Foundation plan in 1980s planning prompted historians, Donald Langmead and Leslie Johnson, into further research. They claim that Light's assistant, George Kingston, had the major role in the design of Adelaide, suggesting that continued reference to the Plan as Light's is misleading. However, our interest is not in who devised it but in its actual form, and we shall continue to refer to the 'Light Plan', according to the Plan's signatory.
7. Since 1993, the City of Adelaide has had an expert Urban Design Advisory Panel that has provided wide-ranging advice on policies, programmes, master planning, guidelines and competition projects: it does not however participate in development approvals.
8. Emerging design ideas for cities involve multiple ground structures, and buildings and infrastructure as landscape (Ruby, 2006): such ideas will require careful consideration in a city composed of a rectilinear and hierarchical plan that contrasts with its parkland surrounds.

Chapter Nine

Coding in the French Planning System: From Building Line to Morphological Zoning

Karl Kropf

Coding is integral to the French planning system. The core elements are a zoning plan, a set of regulations, and a mechanism for administering building permits in accordance with the plan and regulations. All three elements have roots in historical practice in France and have been elaborated over four hundred years as the whole French planning system emerged and developed. The first part of this chapter gives a brief sketch of the historical development of the French planning system and explores the place of coding within it. The second part goes on to examine more recent developments of the system that incorporate typomorphological analysis to make the coding more responsive to local and regional character. The piece concludes by suggesting that in addition to its function as a means of control, coding within the French system can be seen as a repository of learning which can be enhanced by a fusion with the typomorphological approach.

Coding as an Integral Part of the French Planning System

Planning and development control in France operate within the framework of the French legal system and take certain characteristics from it. As is commonly pointed out, there is a broad distinction between European or 'Continental' legal systems (Romano-Germanic) and Anglo-Saxon systems. In principle, Romano-Germanic

systems are based on a set of written civil laws or ‘codes’ (the Napoleonic Code, for example) while Anglo-Saxon systems are based on ‘Common Law’ or Case Law.

This distinction follows through into the planning systems in the differences between the code-based continental systems and the discretionary UK system. In the former the codes broadly anticipate general types of development and proposals are deemed acceptable in detail if they comply with the specifics of the codes. In the UK system, any proposal is considered on its merits against a range of material considerations. To hazard a caricature, the French system provides more certainty but might be considered too rigid, while the UK system is more flexible but might be considered too arbitrary.

This brief characterization illustrates the extent to which the idea of ‘coding’ is fundamental to the whole of French planning and essentially runs through the entire system. Strictly, the French do not use ‘Design Codes’ in the sense of a specific, distinct tool to deal with a limited range of issues as might be said of design codes in the UK context. What might be recognizable as design codes in the UK are embedded within the French system and need to be picked out of it in order to understand how they might be evaluated and applied in other situations.

Historical Development of Planning Controls in France

Beginnings

The germ of the French planning system can be found at the beginning of the seventeenth century in the initiatives of King Henry IV of France to improve the physical fabric of Paris and control the process of development. His aim was ‘to establish his ascendancy over the whole kingdom, in part through a programme of public works and, in particular, in the embellishment of Paris’ (Booth, 1996, p. 41). ‘The crown had a double goal: to clear away the ruins of the siege of 1589–1594 and to bring a measure of order to the city, where the texture of urban life permitted it, by giving squares and promenades a monumental character while restoring equilibrium to the distribution of functions and population’ (Chartier, 1994, p. 137).

The initiatives took the form of both legal edicts and three main building projects: the Place Royale (1605–1612, now Place des Vosges), Place Dauphine, and Place de France (never completed). The explicit ideas of order informing the projects were the principles of Classical architecture revived and elaborated over the course of the Renaissance. These principles (regular, clear, open, rectilinear, axial, geometric) contrasted with and were seen as an antidote to the irregular and congested character of medieval Paris with its narrow, winding alleys and lanes and buildings projecting out over the street.

Core Elements of Control

The key tools used in the projects were the *building line*, *height limits* and a set of architectural principles, along with an administrative body and process for approving plans and issuing building permits. A further significant degree of control was exercised by the king through the subdivision of the land establishing the layout of the public space and surrounding private parcels. In the case of Place Royale and Place Dauphine, the regulations were attached as a condition on the sale of the individual parcels.

Regulations for the Place Royale included a height limit of 8 *toises* (about 16 metres), requirements for an arcaded ground floor with four arches on each parcel, four windows on each floor above, vertically aligned, and the specification of stone for the ground floor arcade and brick for the walls (Chartier, 1994, p. 138).

The building line and height limits had been used since the Middle Ages in relation to the street, in the effort to prevent appropriation of public highway and so maintain accessibility (the dimensions were a 7 metre street width and 12 metre height). These regulations were enforced by the post of *voyer*, responsible for maintaining the streets and keeping them passable. Henry IV consolidated these elements in the edict of 1607 and created the post of *Grand Voyer* to administer a system of *permis de construire* (building permits) for all rebuilding projects as well as new buildings (Booth, 1996, p. 42).

With this move, the elements of the planning system were in place, at least in rudimentary form: an area of control (at this stage limited to Paris, inside the walls), a set of regulations and an administrative system of building permits.

Extension and Development

Over the following two hundred years, the core package of controls was extended beyond Paris to the rest of the country with the role of *Grand Voyer* taken up by the *intendants* created by Louis XIV as representatives of the Crown in the provinces (Booth, 1996, p. 44).

With the Revolution there was a significant degree of continuity in terms of the content and operational effect of control, despite the considerable change in the overall constitutional framework. The principles of an area of control, regulations on building line and building height and a system of building permits were retained essentially untouched. The role of the monarch was replaced by the Emperor and National Assembly, the *intendant* was replaced by the equivalent *préfet* (prefect) and the provinces were replaced by the reconfigured and renamed *départements*. The parish was also replaced with the *commune* as the basic unit of democratic government.

The foundations of further change were laid down with the codification of law in the *Code Civil* and the creation of the technical field services, staffed mainly by

engineers from the *École Nationale des Ponts et Chaussées*, 'designed to create a comprehensive network of technical experts in each of the *départements*' (Booth, 1996, p. 54).

Moving into the nineteenth century, further changes were mainly of extent and degree, setting aside the issues of expropriation and finance that were of such importance to the transformation of Paris under Haussmann. A decree of 1852 focusing on public health established a more rigorous regime for building permits, adding, in particular, control of levels, requiring applicants to submit dimensioned plans and sections and allowing the imposition of conditions in the interests of health and safety (Booth, 1996, p. 47). Initially this applied only to Paris but with the laws of 1884 and 1902 all communes were required to produce a plan of building lines and levels and to operate a system of building permits.

A further impetus for the extension of planning controls was the essentially uncontrolled subdivision and development of land (*lotissements*) mainly on the periphery of major urban areas. Progressively larger areas were being subdivided over the nineteenth century and in the worst cases, the *lotissements* had no modern utility services and very poorly constructed public highways.

Comprehensive Planning Legislation

The twentieth century brought the concept of *urbanisme* and steps towards more comprehensive planning legislation in response to continued urban growth and intensification. The *Loi Cornudet* of 1919, reinforced by the *Loi du 19 Juillet* of 1924, added the requirement for all communes of more than 10,000 people to produce a *plan d'aménagement, d'embellissement et d'extension* (development, improvement and extension plan), which was to identify key public buildings, open spaces, a future street network and zones for residential and industrial development. There was a further requirement for more extensive building regulations (Booth, 1996, p. 51). A significant development of the plan was the move from an emphasis on the street to the use of zones, influenced by German and US practice at the time. The need to identify zones with different regulations for each zone put in place the elements of the planning system that are still recognizable today.

Technical and Financial Resources

While the acts of 1919 and 1924 placed the responsibility for producing plans and controlling development with the commune, it was deemed necessary by 1943 for the state to provide technical and financial assistance. This assistance was set in place by the *Loi d'Urbanisme du 15 Juin*, which created the Services d'Etat de l'Urbanisme (later to be renamed the Direction Départementale de l'Équipement or DDE) based at the level

of the *région* and *département* and paid for by the state. Despite the help provided by the *Services*, many communes did not have a plan, and many of those that did had plans that did not go much further than the building lines and levels of the previous century. In response, the *Décret 25 Août* of 1955 created the *Règlement National d'Urbanisme* (RNU, national planning regulations) which acted as the default regulations in cases where no plan had been produced by the commune.

Moves Towards the Current System

A number of changes in the organization, scope, detail (and name) of the *plan d'aménagement* were made in subsequent years (notably 1958, 1967 and 2000), but the three core elements of the system remained the same: a zoning plan at the level of the commune, regulations applying to each zone; a mechanism for assessing proposals against the regulations and issuing building permits. More recent legislation in 2005, taking effect in October 2007, has sought to simplify the system of permits but has left the principal elements of control in place (on past legislation see Centre de Documentation de l'Urbanisme, 2008).

The Place of Codes within the French Planning System

The Legal Framework

To begin to describe in more detail the elements within the French system which can be described as 'design codes', it is worth setting out the basic framework in which they sit (France, perpetual 1).

There are three main branches of law within France: (i) Private law; (ii) Public law.

Private Law essentially deals with matters between individuals. Penal or criminal law, while it deals with matters between the individual and the state is strictly included within Private Law, which therefore encompasses: Civil Law – the Napoleonic Code – family, property, contracts; Criminal Law; Social Law – work, social security; *Le Droit des Affaires* – commercial, consumer, intellectual property.

Public Law deals with the actions and powers of public bodies and includes: Constitutional Law; Administrative Law; Public finances; International public law.

Planning within the French Legal System

Planning falls within the sub-branch of Administrative Law. This area of law deals with the structure of public administration and the general balance between public and private interests.

Planning Law or *le Droit de l'Urbanisme* is concerned with managing and controlling space for the public benefit and has connections with the areas of housing, public health, environment and public finances. The range of laws, regulations and institutions making up *le Droit de l'Urbanisme* is set out in the *Code de l'Urbanisme*, which includes the *Règlement National d'Urbanisme*, a set of general rules applying across the country (France, perpetual 2).

Regional and Local Planning

While the *Code de l'Urbanisme* and *Règlement National d'Urbanisme* provides the overall framework and some 'default' detailed regulations, the application of planning at the level of the region, department and commune is carried out through locally produced spatial plans. In accordance with the *Loi Solidarité et Renouvellement Urbains* (SRU) of 13 December 2000, these include:

- ♦ *Schéma de Cohérence Territoriale* (SCOT);
- ♦ *Plan Local d'Urbanisme* (PLU); and
- ♦ *Carte Communale*.

The SCOT (which replaced the *Schéma Directeur d'Aménagement Urbain*) is intended to co-ordinate spatial planning between communes as agreed by those individual communes. The grouping is elective, as opposed to one imposed by administrative boundaries. The agreed group or *la communauté* is officially recognized as an *Établissement Public de Coopération Intercommunale* (EPCI) and is the administrative body empowered to prepare the SCOT.

Plan Local d'Urbanisme

Each municipal council, or intercommunal group, is obliged to prepare a *Plan Local d'Urbanisme* (which replaced the *Plan d'Occupation des Sols*). Smaller single communes may elect to prepare the less elaborate *Carte Communale*.

The key components of the PLU include:

- ♦ Analysis and rationale;
- ♦ Planning and sustainable development objectives;
- ♦ Specific planning aims;
- ♦ Graphic documents;
- ♦ The *règlement*;
- ♦ Annexes (utility easements, noise exclusion zones, etc.)

Design Control, Development Control and Land-Use Zoning

The PLU is the principal tool for development control within the French planning system and it is at the level of the PLU that there can be said to be ‘design codes’ operating within the French system.

In this respect ‘coding’ is not a bolt-on to the development control system to deal with ‘design’ issues which, seen in this way, might be assumed to be optional or superficial in relation to ‘real’ planning issues. On the contrary, in the French as well as American and German systems, coding is itself the main tool for development control and so the principal means of dealing with ‘real’ planning issues. Design control is explicitly integrated into development control.

The underlying principle of these systems is essentially the structural mechanism of *zoning* which is, in essence, applying a set of regulations to a defined area. As set out in the first section, however, the principal basis for defining the area has changed over time. The French system of development control began by dealing with building lines and building heights, irrespective of use. It was only at the beginning of the twentieth century that the principle of ‘land-use zoning’ was introduced with the primary aim of separating uses. It is important, therefore, to distinguish between land-use zoning, on the one hand, and coding or ‘form-based zoning’ on the other. In land-use zoning, the primary aspect or attribute that defines the zone is the land-use such as residential, commercial or industrial. The codes that apply to the area regulate aspects of both the activities and the form of the buildings that might occupy the land. In coding, the areas are defined primarily by the physical form of the building with the regulations specifying aspects of form and, in some cases, also aspects of use.

The Regulatory Plan or Plan de Zonage

The French system remains a land-use zoning system and the PLU is fundamentally a zoning plan (as was the case with the earlier POS). As becomes clear below, however, the way the uses are defined does not put the emphasis on *separation* of uses and allows for significant flexibility with respect to use.

Thus, in contrast to some American versions of land-use plans, the French system mandates the use of only a few very broadly defined zones:

- ◆ Urban areas (zones ‘U’);
- ◆ Future urban areas (zones ‘AU’);
- ◆ Agricultural areas (zones ‘A’);
- ◆ Natural and woodland areas (zones ‘N’).

These designations define the broad use of land with the aim of retaining the distinction between settlements, arable land, and forest or natural areas. The zoning

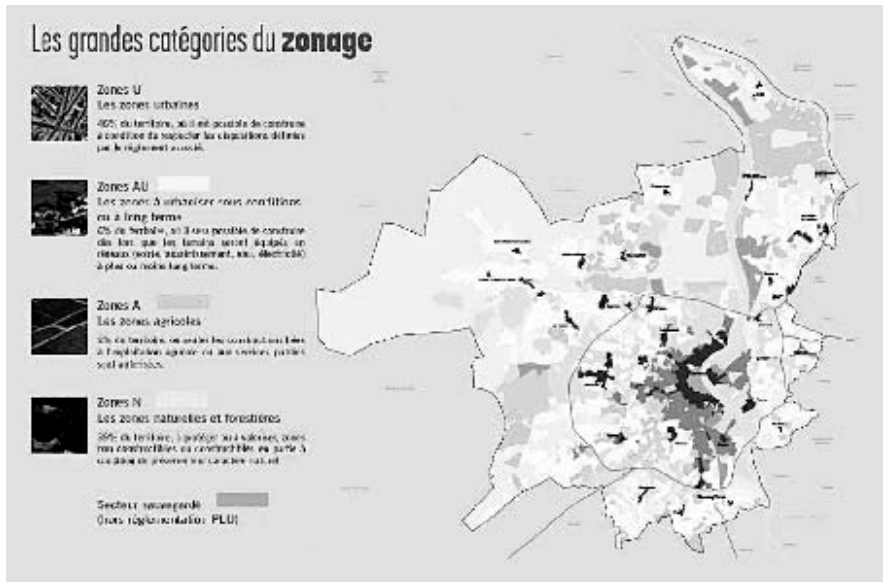


Figure 9.1. General Zoning plan for la Communauté Urbaine de Bordeaux showing the main, broadly defined zones U (urban), AU (future urban), A (agricultural) and N (natural). (Source: http://www.bordeaux-metropole.com/projets/02_plu_aaz_contenu.asp)

plan can also identify other specific areas such as protected woodland and reserved sites for public buildings.

All PLUs must have a *plan de zonage* (see figure 9.1) using these designations as appropriate. It is possible to identify more detailed sub-areas within the main zones to achieve more specific and detailed control of development.

The function of the *plan de zonage* is to delimit the spatial extent to which different, specific regulations, proposals and policies apply. The written regulations are included in a separate section of the PLU know as the *règlement*. It is by means of the zoning plan and attendant regulations that the PLU can set out more detailed controls beyond those included in the *Code de l'Urbanisme*, tuned to the specific circumstances and characteristics of a particular commune. Reduced to its essence, the fundamental parts of the 'code' embedded within the PLU are the zoning plan and the *règlement*.

The Règlement

There is a mandatory structure for the *règlement* with three main sections including a total of fourteen articles.

- ♦ *Nature of the occupation and use of land*
 1. Proscribed types of occupation or use
 2. Types of occupation or use subject to specific conditions

- ◆ *Conditions on the occupation of land*
 3. Access and public highways
 4. Services
 5. Ground conditions
 6. Position of buildings relative to public highways
 7. Position of buildings relative to side boundaries
 8. Position of buildings relative to each other within a plot
 9. Building coverage
 10. Maximum height of buildings
 11. External appearance
 12. Parking
 13. Open space and planting
- ◆ *Maximum occupation of land*
 14. Maximum occupation of the land by buildings

Nature of the Occupation and Use of Land

The main zones (U, UA, A and N) prescribe use but only in very broad terms. The principle applying within the main zones is negatively permissive. That is, the regulations (*les règles*) proscribe or exclude uses rather than prescribe them and put restrictions on particular uses. What is not proscribed or restricted is allowed.

The proscriptive approach allows for a kind of prescription by exclusion while still allowing for flexibility. As an example, in Le Havre, the central urban area excludes only caravans and other temporary shelters, quarries and ‘batteries’ of garages while the dock area excludes these as well as residential, office, retail and sports/recreation grounds.

Conditions on the Occupation of Land

Control of the physical form and characteristics of development as well as some of its performance standards is exercised through articles 3 to 13 of the *règlement*. The regulations are mandatory requirements regarding a range of specific issues or aspects of development some of which are treated in more detail below. These articles are the core of what might be considered ‘design codes’ in the UK.

The combination of articles 6, 7, 8, 9 and 10 (position of buildings relative to public highways; position of buildings relative to side boundaries; position of buildings relative to each other within a plot; building coverage; maximum height of buildings) are essentially equivalent to ‘urban design codes’ as used in the UK. They fix the position of buildings relative to the street and each other as well as the height.

Articles 7 and 8 together determine ‘building types’ as usually distinguished in

the UK as detached, semi-detached or terraced. Articles 6, 9 and 10 together with the zoning plan, which fixes the width of streets, effectively fix the street section.

Article 11 covers the external appearance of buildings and typically includes a range of features often dealt with in design guides in the UK: Basements; Façades; Gable ends; Cornices; Roofs; Antennas; Materials and colours; Projections; Electricity boxes; Front boundary features.

Maximum Occupation of Land

Density is dealt with in terms of floor area as opposed to dwelling units. It is controlled through regulations in article 14, expressed principally as the *coefficient d'occupation du sol (COS)*, which is equivalent to plot ratio or floor area ratio (total gross internal floor area over total site area).

Structure and Flexibility

Strictly, the binding part of the *règlement* is the written text. It is therefore necessary that specific regulations are expressed verbally. As realized in particular cases, a range of graphic devices is used in addition to the text to express and explain the regulations as clearly and succinctly as possible.

While the structure of the *règlement* is mandatory in terms of the general subject matter of the articles, the specific nature of the contents is not prescribed. All *règlements* must set out each article but it is possible to have the equivalent of an 'empty set', with the contents of the article being 'no particular provision is imposed'. The degree of control can therefore be varied depending on the aims of the PLU while still maintaining a fixed and familiar structure. One benefit of the 'empty' article is that it is clear that there is no specific control exercised. In this respect the articles also serve as a kind of checklist for consideration.

Returning briefly to the zoning plan, it is possible to identify sub-zones within the four broad zones of U, AU, A and N. In Bordeaux, for example (figure 9.2), there are eight sub-zones within the U zone: central urban (UC), urban tissue of moderate continuity (UM), varied urban tissue (UD), detached housing (UP) and hamlets (UH), employment (UE), industrial (UI) and public facilities and institutions (UGES). Within the UC zone there are six further secondary sub-zones. Typically, the sub-zones and secondary sub-zones are defined in terms of morphological characteristics. The specific characteristics defining the zones are then embodied in the regulations of the *règlement*.

The fixed structure does present limitations. Some desirable objectives such as active frontages do not easily fit into any of the existing categories, even if it might be possible in principle to include them. Similarly, compositional issues relating to

establishes the overall structure and the more detailed regulations are tied into either one area or the other (public highway or private property) or the boundary between the two.

The Frontage Line

The frontage or *limite* between the public highway and private property is used as a key reference point in setting out the *règles* regarding such aspects as access and services, the position of the building relative to the public highway, building coverage, height and open space (see figures 9.3, 9.4).

Figure 9.3. The Paris PLU makes use of the frontage line (thin solid line) as a key reference for identifying *bandes* (shaded areas) which are in turn used to control various aspects of development. Bande E is used to control the position of the building within the plot and building heights. Bande Z is used to control the relative amounts of building and open space within the plot. (Source: Paris, 2008b)

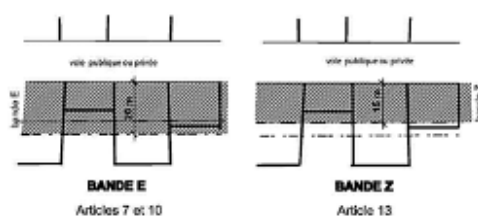


Figure 9.4. The actual frontage line as represented on plans at a scale of 1:2000 is used on the detailed plans of the Paris PLU to prescribe heights and roof treatments. Colours represent different heights and the dash represents different roof types. The detailed plan also identifies areas and specific elements such as individual buildings that are subject to particular codes in the règlement or policies in the PLU. The range of policies and controls includes provision of social housing, reserve sites for public facilities, areas for environmental enhancement, protection of historic buildings and urban form, protection of open space and planting. (Source: Plan http://www.v2asp.paris.fr/fr/Urbanisme/PLU/Atlas_PLU/H_08.pdf; and Legend <http://www.paris.fr/portail/viewmultimediacdocument?multimediacdocument-id=21739>)

Buildable Area

A further concept used is the 'buildable area' or *bande/zone constructible*, which is generally identified as the area defined by the frontage line and a fixed dimension back from the frontage into the plot (see figure 9.3). The position of a building is thus tied fundamentally to its position relative to the frontage.

Relative Position and the Definition of Types of Form

With respect to the physical form of buildings, another key principle in the *règlement* is the focus on the relative position of buildings with respect to the frontage, side plot boundaries and one building to another. The result of combining relative positions with the idea of a buildable area is essentially an outer boundary within which buildings can be located with a clearly defined orientation to the street and adjacent buildings.

A further result of focusing on relative position is that a number of principles of good urban design, such as continuous building lines, well defined street sections and perimeter blocks, can be prescribed with a relatively small number of simple rules. A perimeter block, for example, can be generated by a simple code at the level of the plot: the building should sit at the front of the plot with the front façade on the frontage line and the building extending along the frontage with each side wall of the building forming a party wall on the boundary of adjacent plots.

The more generic, structural approach to defining built form through key relationships allows for significant flexibility and is essentially agnostic in terms of style. The structure of the system neither enforces nor excludes any particular building type or style. It is the specific *content* of the regulations rather than their structure that determines the physical result.

Going Beyond the Structure of the System: The Question of Content

In the early 1990s the issue of the specific forms prescribed by the *règlement* in terms of style or tradition became a source of conflict. The nature of the conflict is encapsulated in the case of Asnières-sur-Oise, a small village about 45 km north of Paris. The mayor of the commune, Paul Lassus, had been elected in large part for his promise to protect the village from being homogenized by new suburban development. At the heart of the issue was the POS and its standardized *règlement*. In Asnières, as in most communes, a POS had been prepared by the Direction Départementale de l'Équipement. As noted above, the DDE is the technical field service of the government, formally part of the old Ministry of Works (l'Équipement), now the Ministère de l'Écologie, de l'Énergie, du Développement Durable et de l'Aménagement du Territoire (Ministry of Ecology,

Energy, Sustainable Planning and Development). Operating at the departmental level (roughly equivalent to the county), the DDE is responsible for regional planning and urbanism, housing, transport and roads.

The Functionalist Bias

Outside of the historic cores of some of the larger towns, the *règlement* as prepared by the DDE tended to limit development to a small range of typically suburban forms. From an historical perspective, the source of this bias can be found in the origins of the planning system and the field service itself. Their initial purpose and preoccupations were to deal with issues of public health and safety. The ideas they applied to solve those issues had been generated in the late nineteenth and early twentieth century, most notably the Modernist precepts of functionalist zoning, set out in the Charter of Athens (written in 1933 and published in 1943), a manifesto of urbanism produced by the Congrès Internationaux d'Architecture Moderne (CIAM). A particular *bête noire* of CIAM was the 'corridor street', associated with the crowding and poor hygiene of the nineteenth century. As a result, the codes incorporated into most *règlements* in France were abstract, universalist rules stipulating minimum distances between dwellings that indirectly promoted the detached villa type or '*pavillon*' housing, which were, collectively, equivalent to contemporary suburbs in the UK or US.

Concern for the Local

Despite criticism of the results of Modernist planning, beginning as early as the 1950s and 1960s (see Ellin (1996) for a comprehensive review), many of the concepts such as minimum distances between dwellings were propagated unquestioned through the planning system in the form of standardized *règlements* used by the DDE. This was reinforced by the ambitions of people living in flats and terraced houses to move out of these 'historic' housing types, which were stigmatized by an association with poverty. At the same time, within academia at least, there was an emerging social critique of life in the suburbs (see Raymond *et al.*, 1966).

By the late 1980s, however, the continued and growing sense of discontent at the local level with the homogenization of settlements by the generic, suburban *pavillon* type of new development, particularly in smaller villages and towns, broke through to the level of the POS and its *règlements*. The concern was driven by a desire to retain the positive, historical character and locally distinctive features of existing settlements. In order to make the POS more sensitive to local character, some communes took up the option of using consultants rather than the DDE to prepare or revise the POS based on a more detailed appraisal of the settlement.

The case of Asnières-sur-Oise is an early example of such an alternative approach

to the revision of the POS based on an extensive typomorphological analysis of the settlement to get a clearer and more articulate description of its structure and character. Completed between 1991 and 1993, the revised POS for Asnières was one of the first to carry through a typomorphological analysis into the *règlement* in a comprehensive way (for accounts of the project and further examples see Rey, 1993; Samuels, 1993; Kropf, 1996, 1997).

The Typomorphological Approach to the POS and PLU

The study of urban morphology and building typology has a long history in France (see Darin, 1998 for a summary) and is perhaps most cogently set out in the classic works *Formes urbaines: de l'îlot à la barre* (Castex *et al.*, 1977) and *Lecture d'une ville: Versailles* (Castex *et al.*, 1980). These in turn have their roots in the work of the Italian Saverio Muratori (1959). As Darin (1998 pp. 70–71) notes however, while there is a general acceptance and use of the ideas of morphology and typology within France, they have not been used on a consistent basis, particularly at an operational level. The general acceptance of the ideas, however, combined with a motivation to take a new approach to the POS presented a significant potential for bringing the two together.

An alternative description or label for the typomorphological approach to urban coding is form-based or morphological zoning (Kropf, 1996, 1997). As a distinct method it can be seen as a pragmatic fusion of two ready-made systems: the zoning system of planning and development control on the one hand and typomorphological analysis and composition on the other.

The Règlement and Levels of Scale

The overall structure of the French planning system, based on areas or zones with distinct characteristics as defined in the *règlement*, and the emphasis in the *règlement*

Table 9.1. Comparison of morphological elements or levels of scale and attributes included in the *règlement*.

<i>Morphological element</i>	<i>Coding attribute</i>
Complex/polycentric settlements	Main zones: U, AU, A, N
Simple settlements	
Streets/tissues	Sub-zones/ <i>voirie</i>
Plot series – routes/public highway	Frontage line/position of buildings relative to public highway
Plot	Position of buildings relative to side boundaries and to each other within a plot, buildable area
Buildings	Building type, coverage and height
Rooms	
Structures	Appearance
Materials	

on the relative position of elements makes the system particularly amenable to a typomorphological approach. Both systems define generic types of form in terms of the relative position of elements and the relation of part-to-whole, which generates a hierarchy of levels of scale. The structure of the *règlement* maps well to the morphological hierarchy of elements.

The correspondence between the two lies in the generic structure of the systems rather than the specific content of the codes. The strength of both is the capacity to describe or prescribe a wide range of forms with a consistent degree of detail regardless of the specific forms.

The POS for Asnières-sur-Oise

Looking in more detail at the application of typomorphological thinking in the French planning system, it is worth noting that France does not have a planning profession as it is known in the UK or USA. There are courses in urbanism at universities and individuals who complete such courses are known as urbanists but there is no French equivalent to the RTPI and no equivalent 'registered' status. Urbanism *per se*, and in particular the preparation of a POS/PLU, is carried out by a range of professions including civil engineers, urbanists, architects, landscape architects, geographers, economists and historians. These are the professions employed by the in-house departments of urbanism and the DDE.

As noted previously there is an established body of research and practice in the subjects of building typology and urban morphology which is commonly taught in the education of architects, urbanists and geographers. A 'typo-morpho' analysis is a typical constituent of most appraisals leading to the preparation of a POS/PLU. What sets the POS for Asnières-sur-Oise apart is the detail of the analysis and explicitly taking the analysis through into the definition of zones and the content of the *règlement*.

The basic process was to undertake a morphological analysis of the settlement and define the sub-zones for the POS on the basis of their detailed morphological characteristics (see figure 9.5). Those characteristics were then used as the basis for the codes for each sub-zone. The typomorphological descriptions were fairly easily translated into the prescriptions of the codes with the aim of maintaining the character of the area (see figure 9.6). In an effort to make the character of the areas and the codes as clear and accessible as possible, the codes were set out in terms of ranges of allowable types at different levels of scale starting with those relating to the street and moving down through plots, buildings and details and materials.

The more innovative step was to use some of the characteristics of existing areas as the basis for the codes for new areas, either within the existing built-up area (resulting in the transformation of existing forms) or for the extension of the urban area. New development could be built according to the positive and relevant characteristics of

settlement as an object lesson. On the other hand, gaining perspective on the recent past makes it possible to see the suburban forms imposed by previous codes as the product of an ideology rooted in particular historical moment.

The Rennes PLU

Over the past ten to fifteen years, the typomorphological approach to zoning and regulations in PLUs has become more finely tuned and applied to much larger towns. A good example of a recent morphological PLU is that undertaken for the town of Rennes. This example is of particular interest because it illustrates very clearly and explicitly the typomorphological approach as applied to a larger town. An evident advantage of the approach is that it provides the commune and its officers in the department of urbanism with a clear logic for their zoning plan. Rather than being an abstract set of rules, there is a connection between the codes and distinct differences on the ground. This is well illustrated by the material presented by Rennes to explain the zoning plan (see figures 9.7, 9.8 and 9.9).

What is particularly clear from the figures is that the zones correspond to morphologically distinct parts of the town. Figure 9.7 illustrates the difference between the pre- and post-morphological zones. The pre-morphological zones are larger and cross over areas that have distinct physical differences. The morphological zones are more finely tuned and it is also notable that they tend to outline streets (the public highway and the plots either side). This is particularly evident in figures 9.8 and 9.9 in the case of the radial avenues and concentric boulevards around the historic core, Zone UB, shown in detail in figure 9.9. The focus on streets as a unit of coding, rather than a more arbitrary zone, follows on from the general tendency for streets to be the unit of development in the process of growth and transformation.

Figure 9.7. Page from the Rennes PLU showing zoning plans before and after taking a morphological approach. The zones on the later, morphological version (to the right) are more clearly articulated to correspond to the detailed characteristics on the ground, in particular the street (public highway and the plots either side) (Source: <http://www.rennes.fr/plu/>)

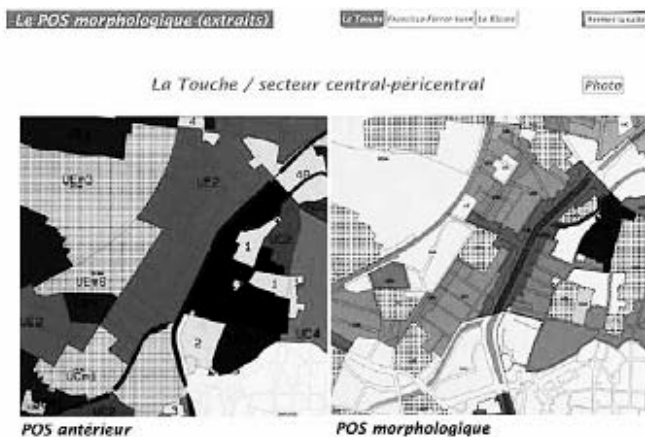




Figure 9.8. The zoning plan for the Rennes PLU based on a morphological analysis of the settlement. The result makes evident the process of development of the town and the changes in physical characteristics of successive phases of growth, from the central historic core to smaller, early extensions, intermediate extensions, radial avenues and concentric boulevards and larger, more recent extensions on the current fringe. (Source: <http://www.rennes.fr/plu/>)



Figure 9.9. Detailed illustration of Zone UB, grand avenues and boulevards, a typomorphological zone from the Rennes PLU. The illustration shows the location of the type within the settlement and its characteristic features of distinct street type, plot shape and size, building positions and building type. These distinct characteristics are then the basis of the specific codes for the zone. (Source: <http://www.rennes.fr/plu/>)

Learning from the Typological Process

Indeed, the typomorphological approach is rooted in an understanding of the process of development and transformation of urban areas over time (see Castex *et al.*, 1977, 1980; Caniggia and Maffei, 2001). Awareness of the *process* of development as an underlying logic to the form and character of urban areas points in two directions with respect to coding. On the one hand, the built environment can be seen as an extensive pool of past experimental results and the refinement of practical solutions over an extended period of time. Morphological analysis as a basis for coding reveals the existing settlement as a significant design resource that offers solutions with a proven performance which make a positive contribution to the character of an area.

On the other hand, acknowledging that the process continues to operate means that ongoing changes and modifications made by individuals to adjust to current circumstances could be picked up within a code by monitoring changes and revising

codes once there is agreement that a change is sufficiently beneficial. This is essentially to incorporate, systematically, bottom-up innovation into the planning system. While not currently an explicit aim within planning policy, making it so would be to view the built environment as a pool of innovations not just reflecting the current preoccupations of professional planners but the concerns and daily lives of the wider population and professionals outside the institutions of planning.

The Type and Levels of Scale

The typomorphological approach makes explicit use of the *type* as a basis for codes at the various levels of scale. As elaborated by Caniggia (2001) and Castex *et al.* (1977, 1980), the *type* is in essence a repeated arrangement of common elements with socio-cultural roots. Within the context of the PLU and its *règlement*, the *type*, as a coherent generating idea, has the benefit of presenting accessible and easily illustrated packages of characteristics or codes that avoid the tendency towards the specialist abstraction evident in some French codes. The *type* presents a recognizable entity and separating the *types* by levels of scale helps to keep the codes for each relatively simple and generalized while still allowing for comprehensive coverage. The most effective and frequently used generic *types* are the street (a public highway with plot series either side), the plot and the building.

While using *types* is beneficial in terms of accessibility, at the same time, a degree of abstraction is a positive defence against the *types* becoming too rigidly codified so as to inhibit innovation. To that end, the emphasis on the *relationship between elements* in the definition of *types* allows for a high degree of specificity in setting out codes while still allowing for variation. The relationship, for example, of a building to the frontage line in a plot *type* can be specified to a high degree of precision but the nature of the frontage line and the building can be left open for a wide range of possible *types*. This allows for the prescription of key urban design objectives without specifying (if considered inappropriate) building forms.

Conclusion: The Generation and Control of Urban Form

Integration with the Plan Making Process

When compared with the discretionary, policy-based planning system in the UK, the French system offers a greater degree of control and certainty over the physical form of development because ‘form-based coding’ is included as an integral component of the system rather than as an additional layer of considerations. A better term might be ‘development coding’ as opposed to ‘design coding’ to avoid accusations that it is superficial and extraneous to real planning issues.

Top-Down and Bottom-Up

Looking at the French approach to coding in light of both New Urbanist codes and the codes produced within the UK suggests that there is significant benefit in having a well articulated and illustrated master plan as a starting point for a code that applies to new development. The French approach as applied to existing areas is very robust and at the same time sensitive to subtle details. The strength and subtlety of the approach has substantial potential for use in areas of new development, though that potential does not seem to have been fully realized within France. The potential could be unlocked by bringing together a morphological analysis of existing areas, a strong master plan or design framework for an area drawing on existing characteristics, and applying the coding methods and some of the specific codes as used in existing areas.

While a master plan-based code operates in an essentially top-down fashion, typomorphological analysis can be used as a bridge to a bottom-up process by extending the analysis to recent modifications and emerging types. The master plan can incorporate type solutions which are being generated in response to current issues and situations.

The Generation and Control of Urban Form

In considering the question of top-down and bottom-up approaches, it is critically important to distinguish between the *control* of form, on the one hand, and the *generation* of form, on the other. The insights provided by typomorphology show that control has a fundamentally limiting or selective function and generation has a multiplying or combinatorial function (Kropf, 2001). The two are not mutually exclusive, rather they are necessary and complementary parts of the same process. However fertile the generating process is within the mental design space, a particular design must be selected and worked out in detail if it is to be built in a particular physical space. However elaborate and comprehensive a design code, it must still be 'run' with a specific intention by a particular person or set of people putting together the parts.

What is more, it is not particularly helpful to view the process hypothetically outside of actual practice, unsituated in time and place. The history of the French planning system illustrates that the generating function is native to the population (and likely all populations). Given free rein, the population will generate a wide range of forms of their own accord, to suit the particular needs of individuals at a particular time. The control function in its external, institutional form arises when it is necessary to balance the needs of the group against those of the individual. Within pre- and post-revolutionary France, the control has been exercised by the political and progressively more professional elite. Starting with the building line and building heights, the early controls allowed a maximum freedom for generating form. With time the controls have

become more extensive and complex in response to concerns, first for public health then for an image of the just society, and extending more recently to environmental, social and economic sustainability.

Can the resulting code be used both to control *and* generate form? In seeking to answer such a question, it is worth emphasizing that a generative process is by definition divergent and unpredictable. If it seeks to produce particular forms, it functions as a limiter or selector. In this respect, is a 'generative code' a paradox or a contradiction in terms? Even within the realms of biological evolution, which provides the source material for evolutionary metaphors, the genetic material or 'code' of an organism is not strictly generative but *replicative*. New – that is to say, different – forms are generated by the combination of *variation and selection*. True variation is not a product of the code but is a function of *chance* and occurs in spite of, and at a higher level than, specific instructions. It is notoriously difficult, for example, actively to code for the variety we see in existing environments in a convincing way. Deliberately creating variety requires exercising more control to specify and enforce acceptable forms of variation. This necessarily adds to the length and complexity of the code and as a consequence detracts from its usability. There is also the danger that the variations appear artificial or arbitrary or too self-consciously composed. The variations are by definition prefigured and so cannot generate new forms.

The alternative is to exercise less control, keeping the codes more abstract and simple to allow the variety to arise as it comes. The results are necessarily less predictable and may or may not be new. From a positive perspective, a code with a control function can be seen as an explicit, social repository of learning, where methods of control, beneficial specific types and, ideally, the results of chance variations can be recorded for future use. By the same token, a typomorphological approach can help to increase the capacity for learning by actively using the implicit repository of the built environment itself as a design resource and translating it into the explicit, written code.

The trick is to strike a balance between control and variation so that embodied knowledge is retained and new ideas can emerge. Such a code could be generative in the broader sense of 'replicative', producing forms with a family resemblance as well as a range of individual expression. The result would be both dependable and adaptive.

Acknowledgement

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Chapter Ten

Coding as ‘Bottom-Up’ Planning: Developing a New African Urbanism

Gerald Steyn

This chapter investigates the nature and potential of African urbanism south of the Sahara, focusing on how the existence, needs, skills and perceptions of the urban poor are shaping the built environment in contemporary southern Africa. In this chapter we will learn about African urbanism, but (as with other chapters) we will also learn what this study of African urbanism tells us more generally about ‘urban coding and planning’. A brief historical overview precedes a description and analysis of the case study, an illegal informal settlement, also called a shantytown, or a squatter camp, created exclusively by its inhabitants, situated in Mamelodi, a township east of Pretoria, South Africa. It will explore the notion that the shantytown represents the evolution of a long-established coding tradition that is rooted in the rural village and recently transferred to the urban environment. This is followed by a speculative discussion of how that embedded coding could be integrated with contemporary planning dogma to create more appropriate African cities.

For two million years only the hunter-gatherers occupied eastern and southern Africa. These Pygmies and Khoisan were Stone Age hunters and food gatherers. Then – in a movement that started from their cradle land in West Africa – came Bantu-speakers with their knowledge of agriculture and iron-smelting, bringing their corn and cattle and iron weapons. They reached the northern shore of Lake Victoria by about 500 BC, the Indian Ocean by 200 AD and moved down the Zaire and through East Africa, reaching the northern parts of southern Africa by 300 AD. The

San retreated before this advance. McEvedy (1995, pp. 32–34) boldly states that this movement was *'the most important happening in African history'*.

Willcox (1988, p. 95) reminds us that this southward movement by the Bantu-speakers was not a nomadic migration but rather a gradual movement by small groups, or clans, over fairly small distances. They established villages and built more permanent huts, compared with those of nomadic people. The result is that the predominant indigenous pre-colonial settlement landscape of sub-Saharan Africa is that of dispersed rural villages – a homogeneous pattern of homesteads consisting of mud and thatched huts around outdoor living spaces. This was how the people lived for millennia. Basil Davidson (1967, p. 169) explains succinctly that their guardian institutions were so successful that the two outstanding and admirable achievements of African village society were that social harmony prevailed without centralized authority and – that everyone had a house. Both social behaviour and the making of shelter were subject to strict rules – codes for surviving under precarious conditions. The most significant characteristic of a rural village is, however, not physical but the way space is organized and used. For example, the location of livestock pens for surveillance, and a privacy gradient from public space for community interaction, to semi-private for the use of an extended household, to totally private for the exclusive use of the family. This codified manipulation of space to create appropriate places, rather than the focus on buildings as such, is unquestionably a lesson from which contemporary practice can benefit.

Today, most African cities south of the Sahara face daunting problems, including explosive growth, sprawl, overcrowding, and lack of basic shelter, infrastructure and public amenities. In South Africa, the presumed economic power-house of the continent, nearly a fifth of the population live in shacks, officially called informal dwellings, a type the government pledged to eradicate by building vast low-density dormitory suburbs at the fringes of cities.



Figure 10.1. Veranda houses in the Marico Valley near Pretoria, as depicted by Campbell, 1812–1813. (Source: Willcox, 1988, p. 101)

This perpetuates a trend established in the 1950s when the South African government started to build segregated model townships with standardized, freestanding ‘matchbox’ houses, recently augmented by social housing schemes consisting of medium-rise apartment buildings for rent. The greatest weakness of current township planning is that it fails to recognize economic realities: that a significant proportion of the people have to rely on a neighbourhood-based informal economy for survival (rather than on government or big business) and for providing jobs. It also does not reflect the cultural dynamics of extended families or of wards for people of kinship or other shared values. These socio-economic phenomena clearly demand a highly responsive environment – the homestead must adapt to changing household demands, and the neighbourhood must adapt to changing community demands.

Judging from the continuing mushrooming of squatter camps, there is absolutely no evidence that the backlog is being reduced at all. From the fact that the majority of the ‘ultra-poor’ (57 per cent) live in formal dwellings (Brown and Fölscher, 2004, pp. 76–80), mostly for free, it has to be deduced that shack-dwellers are possibly better off financially! Contrary to popular perception, many people choose to live in shanty towns. Students and many permanently employed people live in squatter settlements because they enjoy township life and because shacks are affordable. The only people who have very limited choice are those that migrate from rural to urban poverty.

Considering the scale and exponential growth of informal settlements, it is extremely doubtful if government could ever fully solve the problem by conventional means, and the need for a new paradigm is now obviously critical. All evidence points to a self-help strategy. John Turner’s (1976) views were considered radical when he suggested that informal settlements complement a nation’s housing stock. Today those views are widely accepted. Geoffrey Broadbent (1990, p. 349) suggests that informal settlements often ‘have far greater vitality than anything that has been formally planned’. Matthews



Figure 10.2. A portion of Mamelodi East. (Source: Author)



Figure 10.3. A neat and well-maintained shack and garden. (*Source:* Author)

and Kazimee (1994, p. 133) remind readers that squatter settlements are major factors in the formation and growth of Third World cities, and point out that ‘this type of settlement is perhaps the only affordable method to provide shelter for the urban poor and will continue to be the way that the majority of urban dwellers in third-world cities use to solve their quest for shelter’. A Rousseauian complacency would, however, be inappropriate; not all offer pleasant, supportive environments – many are unhealthy, polluting and crime-ridden – but while some residents openly consider them transit camps, they are permanent homes for others.

The paradox is that South Africans of all races are very much part of the global community as far as culture (meaning lifestyle), electronic communications and consumer tastes are concerned. In that regard squatters are no different from flat dwellers. Although low-income communities certainly deserve the same quality environment as affluent people, and although safety, security, a healthy environment and access to amenities and employment are universal requirements, there are at least three reasons why a new African urbanism should be different. The first is simply that problems are more severe and the resources less (CIB, 2002, p. 21). The second is that Western-type cities are inappropriate settings for the informal economic and cultural activities that are characteristic of most African communities (Burton, 2002, p. 25). The third is that, since most successful ideologies approximating sustainable urban forms are based on ecology, regionalism and history, it follows that appropriate African urban solutions should be informed by context and African urban precedent.

What is an appropriate precedent considering the lack of pre-colonial cities in the region? This study will argue that the informal settlement is essentially a re-interpretation of the rural village, and therefore a manifestation of contemporary African urbanism. Although developments such as gated and golf estates are also contributing to sprawl and will have to be reconsidered in the near future, the affluent

can for now compensate for a 'bad' city by paying for transport and commuting to work. This study, however, recognizes that the urban poor are struggling for survival, and urgently need an environment that would improve their quality of life.

The Informal Settlement in Its Historical Context

The term 'urbanism', as used in this chapter, means any place where people live permanently in reasonable numbers and at reasonable densities. The difference between villages, towns and cities depends on the degree of diversity of specialization and of cultures, but it is so controversial that it is largely rhetorical. Pre-colonial southern Africa had great urban centres (Great Zimbabwe for example), but no cities like those of West and East Africa (such as Timbuktu, Zaria, Kumasi and Lamu). Belonging to a community, and living by the philosophy of *ubuntu* (a person is a person because of others), is probably *the* strongest concept in vernacular African settlement. Its material manifestation had been the village – the fundamental unit of the region's urbanism.

Village forms might generally seem 'haphazard', but this informality is structured, ecologically responsive and according to strict farming rules and cultural beliefs in rural areas, and according to the needs of commerce and customs in urban settings. As Paul Oliver (1987, p. 131) observes, '... the compound system of individual units dispersed within a defined open space is extremely flexible'. Particularly enduring seem spatial patterns; not only the hierarchy of spaces from public to semi-public to private and the paths between them, but also the relative locality of elements, whether it is an entrance gateway, a cattle kraal, the chief's hut, the men's meeting place, the women's cooking areas or a sacred site. What all villages have in common is that residents can walk to any point within the village. Communities are made up of families, usually extended, with three or four generations per compound. Families can be matriarchic or patriarchal, monogamous or polygamous. Also, nearly without exception, we find that courtyards, the open living spaces, are truly the centres of household activities: food preparation, washing, crafts, private socializing, children playing, and so on. Another significant feature of indigenous settlement is smallness – there is a sense of intimacy and human scale, even in densely populated conditions. Village-based customs, spatial configurations and materiality developed over hundreds of years and are characterized by continuity: African societies have always been very reluctant to abandon patterns that work, because that might threaten survival.

Since information from literature is often unreliable, the underlying dynamics of traditional African settlements remain largely unexplored. Researching this theme without fieldwork is simply not credible. Even so, we discovered that field surveys and observation of traditional villages – valuable as they undeniably are – could take a long time before any significant patterns are recognized, if at all. In addition, interviews

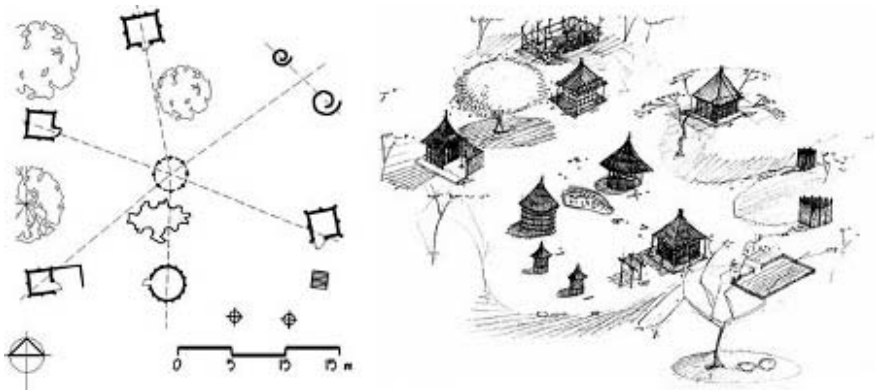


Figure 10.4. A Tonga homestead in Zambia. (Source: Survey and perspective view by André Roodt for the author)

seldom reveal these patterns, basically because inhabitants cannot conceive that their customs might be of interest to outsiders! Somebody remarked, 'They live the pattern'. The pattern, we learned, is embedded in the belief system as a set of unwritten – and often unspoken – codes.

In the nineteenth century the continuity and equilibrium ensured by this codified village system was shattered in southern Africa by Zulu, British and Boer expansionism. Since European occupation, black workers were lured to places of employment like farms and mines and, of course, to the new cities. Most major contemporary African cities consist of business districts (often complete with modern skyscrapers), sometimes bordered by older areas with apartment blocks, and adjacent zones with 'pods' of gated communities and patches of low-density suburbs for middle- and high-income households, industrial precincts and sometimes university or institutional campuses, and always, as Ernest Harsch (2002, p. 30) observes, 'far into the distance spread Africa's real urban conglomerations: unplanned, chaotic settlements built of wood, corrugated metal sheeting, mud bricks and whatever other materials may be at hand'. The point is that the morphology of the central business district of Nairobi, Kenya, is not really different from that of Austin, Texas. The villas of the wealthy outside Dar es Salaam, Tanzania, are not different from those outside Tel Aviv, Israel. What is different is, first the way hawkers occupy territory wherever people congregate, often in front of big, formal shops, and second the way informal settlements are shaped and inhabited.

To the uninitiated all informal settlements look similar – most calling to mind a denser form of rural settlement, but constructed with materials salvaged from urban society. Closer scrutiny, however, shows considerable responsiveness to place and time, confirming that those settlements are ingenious and enduring examples of what innovative and determined people can do for themselves. Figure 10.5 shows how the

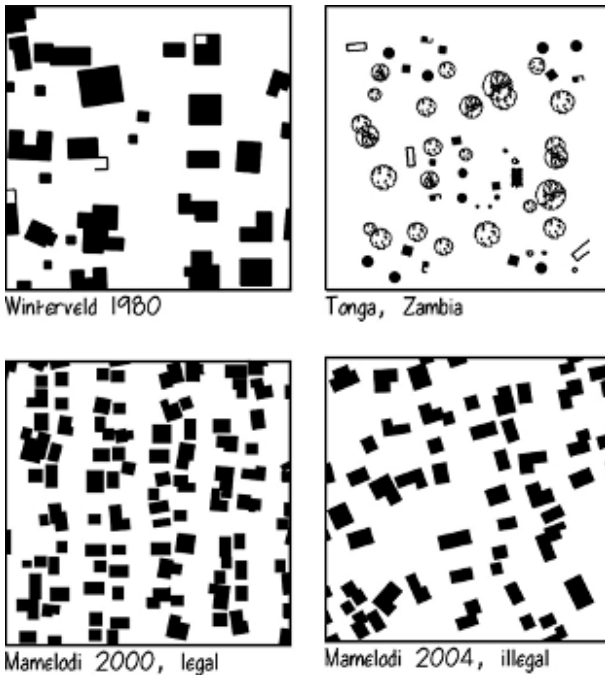


Figure 10.5. Comparing three informal settlements and a rural village. (Source: Author's drawing)

organic layout of a rural village is emulated in an illegal squatter situation, but becomes more geometrical on site-and-service stands. The spatial organization of the illegal squatter camp cannot, however, be considered a direct replica of rural forms; rather, with its rectangular shape houses, its fairly straight alleys and lanes, its configuration is midway between rural and urban spatial forms. It is in reality a new and innovative form of spatial organization, structurally aspiring to an urban form, while receiving inspiration from and retaining elements of rural forms.



Figure 10.6. Social space in the squatter camp. (Source: Author)

There are sufficient precedents to illustrate this potential for urban transformation. These include the urbanization and densification of rural sites, and the making of informal settlements, which Alan Lipman (2003, p. 156) recommends as viable urban models, commenting on the hierarchy of paths and narrow streets, the wide range of amenities (*spaza* shops (makeshift kiosks), communal water outlets, open spaces, taxi ranks, political party offices, etc.) and the intensity of social engagement: 'There is, in other words, space for many of the congenial attributes of urban, as against suburban life'.

The Case Study

History and Locality

Our case study was selected because – as an illegal settlement – it offered an opportunity to study how such a shanty town was collectively and uniformly created by its inhabitants under the most tenuous conditions of eviction possible. It also allowed us to observe how the inherently low-rise, suburban shanty town accommodates urban lifestyles. Mamelodi (meaning the place of music) is one of Pretoria's oldest residential areas. Mamelodi West, established in the early 1950s, is a typical model township and an example of formal housing. Although also shaped by Apartheid-era spatial planning doctrine, that area is now structurally a part of Pretoria, rather than simply a satellite city. The informal site under study is adjacent to that and to the east, making it more marginal and peripheral (figure 10.7). The settlement sprang up after the 1994 elections and is still growing rapidly.

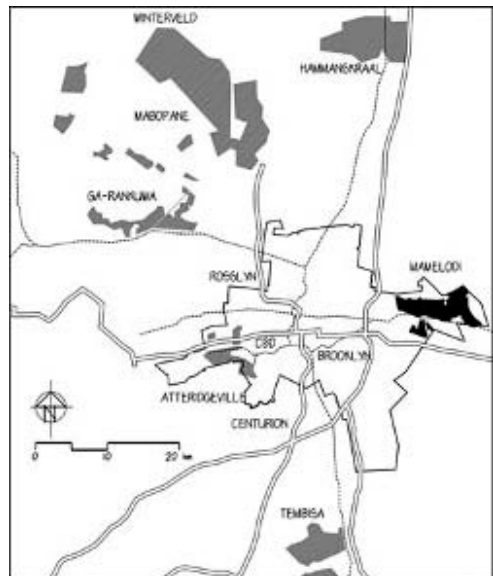


Figure 10.7. Map of Tshwane metropolitan region, showing distribution of historic townships relative to the Central Business District of Pretoria (CBD). (Source: Author's drawing)

It is a vibrant, sprawling city. Mamelodi as a whole has a footprint of 32 square kilometres and a population estimated at approximately 600,000 inhabitants. Public amenities for shopping, health, education, entertainment and policing in Mamelodi West, often referred to as Old Mamelodi, could be described as reasonable, but the same amenities are mostly absent in Mamelodi East. Similarly, although both areas are well serviced by public transport, particularly minibus-taxis, Old Mamelodi is situated directly adjacent to two major industrial districts, while Mamelodi East is more remote. The authorities are desperately trying to relocate the squatters, who invaded land destined for a turnpike, to formal housing schemes. The area also features subsidized formal houses and site-and-services programmes intended to accommodate the continuous influx of immigrants. Mamelodi as a whole contains only low-rise and freestanding housing types. By way of comparison, if Mamelodi were structured like the older parts of European cities such as London or Edinburgh, it would have consisted of between twenty-seven and thirty urban villages and would have occupied no more than 9.5 square kilometres – only about a third its present size.

Demographics

Since very little in-depth research has been done on the needs and demographic profiles of shack dwellers, information derived from observations and surveys in the study area seems particularly relevant. Teams from the Tshwane University of Technology (TUT) and the Hogeschool Utrecht (HU) have been surveying Mamelodi since 2003, relying on extensive fieldwork and close relationships with stakeholders and the inhabitants for collecting data. A list of likes and dislikes (table 10.1) reveals that the form of housing does not elicit much response. In fact, most inhabitants are proud of their homes and yards are kept clean, in spite of the absence of municipal waste removal. People complain about unemployment and long walking distances. It is significant that the squatters appreciate the social quality.

The informal settlement is mostly inhabited by nuclear families of four persons on average, and a large and growing population of single mothers with one or two children. HIV/AIDS is already impacting substantially on demographics, with an

Table 10.1. Squatter camp 'likes and dislikes' (author's data).

<i>Likes</i>	<i>Dislikes</i>
<ul style="list-style-type: none"> ● Good public transport ● Safe streets ● Crime under control ● Pleasant neighbourhood ● Cheap shelter ● Convivial atmosphere 	<ul style="list-style-type: none"> ● Lack of services ● Unemployment ● Lack of public amenities ● Too few trees ● Lack of government control ● Long walking distances

alarming increase in the number of AIDS orphans and households headed by children. Due to the large number of rural migrants, unemployment is estimated at 60–70 per cent and child benefit grants are a major source of income for single mothers. One effect of these high levels of poverty on the built environment is the inadequate quality of the building work undertaken by residents. It must be noted, though, that a number of residents became wealthy and replaced their shacks with villas in nearby areas where security of tenure was achieved.

About 4 per cent of the residents own cars. Most residents rely on walking (35 per cent) and the ubiquitous minibus-taxis (27 per cent). Other modes are trains (14 per cent), and public buses (13 per cent). The poverty level is so high that many young people simply do not have the money to go anywhere to search for employment ... or even recreation. The elderly and the young are also trapped in the settlement. We could not determine the number of people involved with informal economic activities, but the large number of *spaza* shops, *shebeens* (unlicensed drinking places) and urban agriculture, clearly point to efforts to achieve higher levels of self-sufficiency.

Urban Structure

The alleys are linked by a fine-grained mesh of footpaths in a distorted grid that defines blocks rarely larger than 50 x 25 metres, a truly walkable environment (figure 10.8). Today it is recognized that 'successful street level urban environments are permeable to pedestrians, that is, they permit or encourage pedestrians to move about in a variety of directions' (Tibbalds, 1992, p. 50). This is particularly important in an African urban environment where the vast majority of the people are pedestrians.



Figure 10.8. Site plan of the informal settlement under study. (Source: Author's drawing)

Land Use Intensity

The site still has a very low coverage at 16 per cent, but a reasonable dwelling density at about 50 units per hectare and at least 170 people per hectare. The situation is, however, unstable – space is available for more building and as the settlement matures, households could gradually become extended and the area overcrowded, approximating the 740 people per hectare that has been described as ‘a common Third World density’ (Kathpalia, 2003). Figure 10.9 shows the area under study to the right of the playing field. Whereas traditional dwellings are known for their distinct front yards (semi-private open space) and rear yards (private open space), the private open space in front of the shacks is limited to some screened courtyards and patios defined by L-shaped houses (figure 10.10). This is probably due to the small size of the plots.



Figure 10.9. Perspective view of a portion of Mamelodi East showing both informal and formal structures. (Source: Drawing by Kobus Pretorius for the author)



Figure 10.10. An L-shape shack with shaded stoep. (Source: Author)

Spatial Experience

The narrow lanes allow access for the occasional car in a single-lane configuration reminiscent of tropical holiday resorts. It has a network of footpaths, creating a fine grain that favours pedestrians, resulting in an intimate and friendly streetscape (figure 10.11). In spite of poverty, the trees have not been stripped for firewood and the area is relatively verdant. Since the area is so flat and without any higher buildings and landmarks, orientation is initially difficult. It is easy to imagine how pleasant the place would be with paved alleys and some improvements to houses and fences.



Figure 10.11. A quiet alley.
(Source: Author)

Housing Units

Most shacks are constructed by the inhabitants themselves, using mostly salvaged metal sheeting over a frame consisting of recycled wood. This seems to be a technology preferred even by those with secure tenure. A number of 'shack factories' build wall and roof panels with both used and new corrugated and flat metal sheeting over a frame assembled from wooden sections discarded by the nearby Ford Motor Company plant. These are sold in kit form as one or two-room shacks (each room 4.0 x 2.0 m) for R950 and R1,500, respectively (about US\$120 and US\$180 in July 2009). Such shacks are easily demountable – a prudent precaution when tenure is not secure. To enclose the same floor area with formal construction consisting of concrete tiles over clay brick walls plastered internally would cost in the region of R34,000 (about US\$4,250)!

The standardized houses of Old Mamelodi, the so-called 'matchbox' houses, were built by big contractors with close connections to the previous government. With a total area of 53 square metres, offering four rooms and a bathroom, they are 'better' houses than the current two-roomed 30 square metre subsidized units. The position

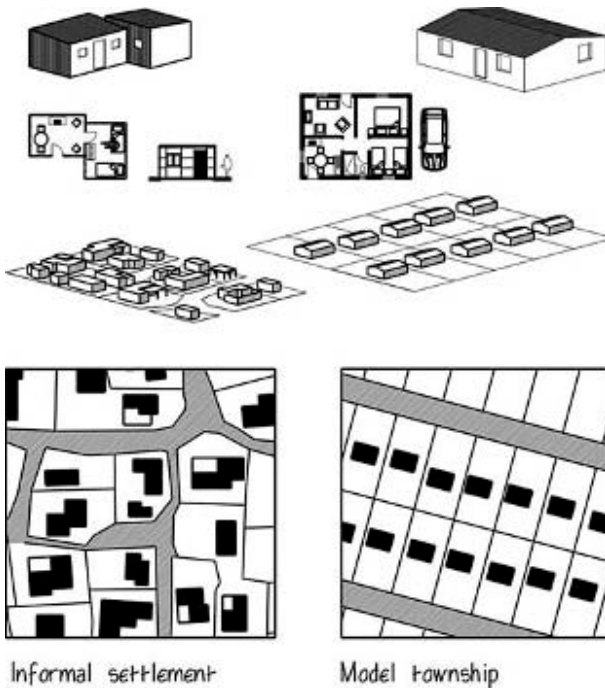


Figure 10.12. Shacks compared with 1950s formal housing. (Source: Author's drawing)

of the detached formal housing units right in the centre of their plots wastes outdoor living space and makes additions awkward. Even the shacks often offer more positive, consolidated outdoor space.

Towards a Concept of African Urbanism

Accepting the potential of informal settlement as a reference for the development of a new African Urban paradigm, how can it be integrated into the contemporary African city? The answer lies undoubtedly in the root concept of 'village': Sékéné Mody Cissoko (1986, p. 2) writes that many African peoples do not have words to distinguish a city from a village. Based on observations in Mamelodi, it is clear that empowering a community to apply its embedded coding capacity to shape its environment upwards, rather than from official perceptions downwards, could dramatically improve the quality of life for the urban poor, as well as their self-reliance. In fact, here we do not find the culture of entitlement that is so rampant where housing is free.

In much of Europe and the United States, the rich and poor, and people from diverse cultural and ethnic backgrounds share the same housing types; only the locality, size and standard of finishes tend to reveal the socio-economic status of inhabitants. Not so in Africa. The future South African city will inevitably have to evolve from its inherited resource base – its existing Western-Modernist fabric – but it will be

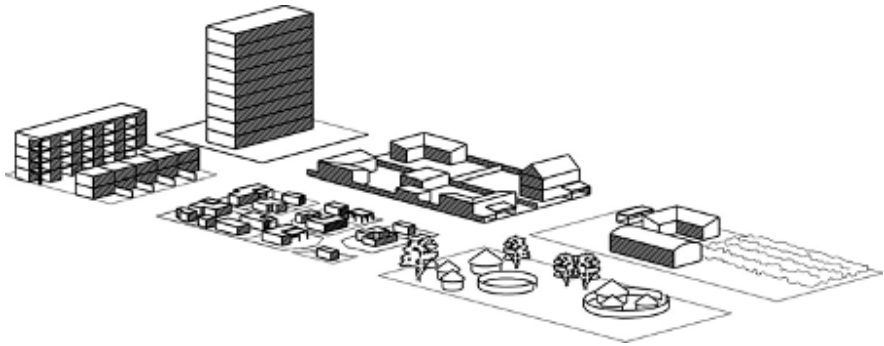


Figure 10.13. The complexity of African urban morphologies. (Source: Author's drawing)

heterogeneous and complex, with different urban morphologies co-existing: a vision combining morphological diversity with social harmony (figure 10.13). So, to speak of a new African Urbanism is probably misleading, since many parts of the city will not feel like Africa at all. African Urbanism is patently not merely '[a focus] on the adornment of public urban spaces and linkages in the textures, colours and materials that speak of Africa', as a well-intentioned journal described an otherwise good scheme. It is especially in the informal settlements that the African orientation, or 'Africaness' – the social fabric and traditions – is made manifest. The challenge is to identify the prevailing codes that contribute to social, economic, political and environmental sustainability, as well as those that do not.

The key to this vision of co-existence is unquestionably the superblock; not to promote tribalism but to accommodate different types of communities and architectural models. This concept is aligned with the Alexandrine patterns of identifiable neighbourhoods and a mosaic of sub-cultures (Alexander *et al.*, 1977, pp. 42, 80). In fact, Geoffrey Broadbent (1990, pp. 349–350) recommends such a mix of morphologies. He writes that a city with Rossi-like monuments surrounded by a general urban texture consisting of a mix of formal and self-build suburbs, 'seems likely to offer the widest possible range of urban choices, to more people, than many of our current cities do'.

Since a good community consists of a range of household types, from students, single parents and young couples to extended families, and from permanently employed people to those active in the informal economy, it is essential that the urban codes should allow inhabitants to construct a range of building types in due course. Superblocks would allow communities to grow democratically and organically within this predefined space. They also allow rural immigrants to retain the informality of the rural and squatter village and to shape the environment to accommodate and protect diverse cultures. Three main principles have been defined that could enable bottom-up coding to shape a community within such a superblock (figure 10.14):

1. Streets must be suited to minibus-taxi routes with narrower widths for reduced car ownership. Some must be configured as boulevards and trading streets that should also form some of the neighbourhood edges.
2. Buildings should be mixed-use and clustered in open compounds suited to incremental expansion around paths and a hierarchy of courtyards.
3. Vernacular and innovative technologies, utilizing local and readily available materials and suited to self-help and semi-skilled labour, must be developed to encourage the construction of functionally adaptable and climatically responsive buildings.

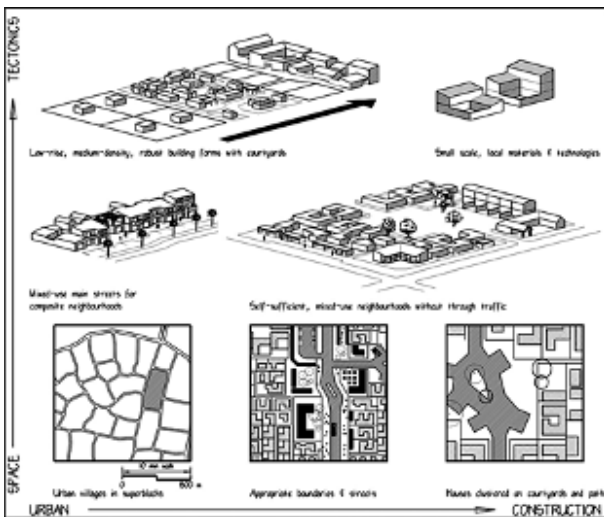


Figure 10.14. Matrix illustrating some of the proposed principles. (Source: Author’s drawing)

Appropriate Streets and Services

Traffic engineering still dominates urban planning and an unrealistic proportion of land is allocated to roads and parking, even in low-income areas where less than 10 per cent of the households own cars and rely on walking, bicycling and minibus-taxis. The New Urbanism movement provides the necessary principles for narrower streets, pedestrian and bicycle-friendly environments and provision of public transit (Southworth and Ben-Joseph, 2003).

The formal economy here is, like everywhere in sub-Saharan Africa, unable to cope with the alarming rate of urbanization, and the livelihood of many people depends on an informal economy – hawkers and small traders in small sidewalk shops, and artisans and technicians in home industries (Burton, 2002, p. 25). Apparently about

one-quarter of South Africa's economically active population relies on the informal economy, a proportion likely to increase in the future (Brown and Fölscher, 2004, p. 60). Mixed-use neighbourhoods and self-sufficiency are prerequisites to accommodate this scenario, necessitating that restrictive zoning legislation be urgently reviewed. Like the Arab *souq*, the African market street is a significant typology and organizer of urban space. It is a distinct code with buildings facing a 'communication route' to benefit from passing trade. In the Ashanti villages of Ghana, these streets are often 30 metres or wider (Oliver, 1987, p. 46). It seems meaningful to use traders' streets as some of the superblock boundaries in association with public transport and other nodes.

Building Clusters

Almost 15 per cent of African households still live in traditional dwellings (Brown and Fölscher, 2004, p. 80), which have, since antiquity, consisted of the clustering of compounds around communal open space and of a number of huts around a central courtyard, the *lapa*. Although this iconic image of the 'African village' is firmly embedded in the perception of the urban population, regardless of colour, it is not the construction but the hierarchy of spaces and the clustering of units that are replicated in informal settlements, a pattern largely ignored by planners.

The traditional village and the layout of informal settlement – both the result of bottom-up coding – could be directly interpreted as open compounds, clustered around, and defining, paths and a hierarchy of spaces, from public social space to private courtyards. Streets, alleys, *spaza* shops and *shebeens* are the true social spaces in shanty towns and continuity can be achieved by restructuring the settlement, but respecting nodes, paths and occupied territory. Although community architecture is propagated, professionals should provide assistance.

Rather than providing housing, government should facilitate site-and-service schemes with basic, achievable engineering services, but also with comprehensive community facilities, including facilities for education and training, health care, trading and recreation, and of course – public space. Social space can also be created by making local vehicular traffic subservient to pedestrian activities, such as in the Dutch *woonerf* layout.

Appropriate Technologies

While current formal low-cost designs reflect a central European bungalow paradigm, shacks tend to provide private outdoor living space, lettable rooms and home industries that are easily achieved with thin houses, only one room deep. Buildings often consist of separate structures connected with canopies or pergolas. Such small-scale structures are responsive and ideally suited to incremental additions. But authorities justifiably

view these with suspicion; lack of cross-ventilation, climatic comfort, thermal and sound insulation, and risk of fire, flood and building collapse often make living in a shack a hazardous experience. The problem, however, is not the metal-clad timber frame construction, which is also found in many parts of Australia and the United States, but the lack of potable water, sanitation, insulation and clean energy, and these, rather than formal houses, are what government should provide. As with site planning, there should be professionals on hand to advise on orientation, spatial organization, fastening techniques, floor and foundation systems, the placing of openings in walls to allow cross-ventilation, and the shading of exposed walls.

Although traditional mud, pole and thatch houses were described as ‘the ultimate in green architecture’ (Du Plessis, 2001), and although rammed earth, mud-bricks and compressed earth-bricks are highly appropriate sustainable technologies that are compatible with indigenous knowledge systems, they are not popular in informal settlements, even in semi-rural ones where the resources are available. To stimulate the growth of a local building industry, and to allow greater participation by communities, the technologies of both informal construction and traditional masonry wall construction should be optimized. The solution undoubtedly lies in a fusion of informal vernacular, conventional and innovative technologies.

Translating Embedded Codes into Empowering Codes

The purpose and representational format of urban design coding, the process of regulating the built environment, were greatly enhanced when Duany and Plater-Zyberk released the urban codes for the new town of Seaside, on the Florida Panhandle, in the early 1980s (see chapters 1 and 11). Those documents provided quantitative and normative standards for streets, squares, buildings, and the spaces between them – in fact for the whole morphology – in a crisp, annotated, diagrammatic format, intended to be intelligible to a wide spectrum of people.

This system was readily adopted by schools of thought such as the New Urbanism in the United States and the Urban Village Movement in the United Kingdom. It is certainly not a coincidence that the illustrated format of urban coding is now being widely used; whereas functional planning has essentially been driven by centralized control, whether government or big developers, New Urbanist-type projects rely heavily on community buy-in, thus the legibility and user-friendly formatting of codes.

In Europe and the United States codes are often presented as a matched set of documents – Regulating Plan, Urban Standards, Thoroughfare Standards, Architectural Standards, and Landscape Standards (Duany, 2003, p. 96). In the South African context, it is necessary to prepare coding documentation specifically for the relevant agents involved at the different scales.

Urban and Neighbourhood Scale

Rather than building millions of little subsidized houses in remote areas, government should acknowledge and accommodate the innate coding traditions entrenched in indigenous knowledge systems and the ability of its poorer citizens to build their own homes and achieve self-reliance. It should focus on the provision of accessible spatial frameworks and affordable, serviced sites to allow diverse communities to establish and maintain habitats that would support their socio-economic needs and expectations.

A number of South Africa's foremost architects and planners are collaborating with communities on projects that reflect these coding traditions rather than Western perceptions of what a neighbourhood should look like. But there is a need to convince councillors, representing political constituencies, to support such 'new' neighbourhood models. Officials are mostly educated and often well-travelled and informed people, and their resistance to change is puzzling. Influencing them will certainly demand that codes are embedded in informative models, maps and strategies (figure 10.15). Built-environment professionals should develop the skills to support this process.



Figure 10.15. A site model of a proposed upgrading scheme. (Source: Deckler and Ritch, 2004)

Groups of Buildings and the Spaces between Them

The most significant aspect of the African urbanism proposed is the village orientation and the revival of the multiple-family 'ward' as a socio-economic entity. The greatest advantages of such cooperative housing is that: first, it provides an identifiable spatial unit to belong to; second, it offers a setting for community support in matters such

as surveillance and caring for children, the sick and the elderly; and third, it creates political pressure for municipal and other services. Again the superblock would be the ideal configuration to demarcate the territory occupied by such a ward.

In informal settlements, proper site planning to achieve the correct orientation of buildings and an appropriate spacing between them – another form of passive solar technology – is crucial. Shacks are sometimes randomly positioned, often crowded too closely together and always haphazardly oriented. Energy-efficient site planning could be easily achieved with on-site support and advice. Advisors must be sensitized to the status of the ward committees in their communities. In shantytowns wards are controlled by elected committees. They have no technical training, but are highly politicized with a mandate to protect the interests of the community and, therefore, wield considerable power. A paternalistic attitude would not only be counter productive, it would be morally unacceptable in a region where people have managed to house themselves adequately for millennia! Although committee members are usually literate, coding should be explained through simple, attractive drawings, rather than text (figure 10.16). At this scale coding should address elements associated with a neighbourhood; its gateways, streets and lanes, its centre and the distribution of amenities, including educational, recreational, healthcare and governance, with a special emphasis on the public realm.

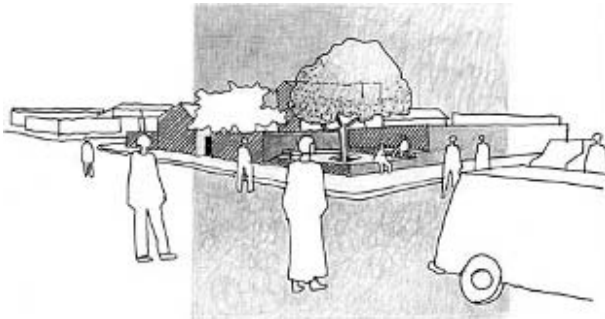


Figure 10.16. A sketch showing part of a proposed upgrading scheme. (Source: Deckler and Ritch, 2004)

Individual Buildings and their Construction

A significant South African contribution to the discourse on the vernacular is the traditional rural architecture of its black people in which 15 per cent of its population still live – low-energy thatch, wood and mud architecture that responds to the local customs, climate and conditions of the place, and which the villagers build from materials found in the immediate vicinity. But their builders are usually quite unfamiliar with the industrial products commonly used for constructing shacks and there is a need to advise them on how to build a basic shack.

Although the climate is temperate, shacks can be very uncomfortable in extreme summer and winter situations. Previous research indicated that the provision of cellulose fibre (recycled paper) wall and roof insulation and plasterboard roof and wall panelling could achieve relatively comfortable conditions. Other passive measures, such as cross ventilation and the shading of walls, as well as proper substructures, connections and fastening techniques, would vastly improve comfort, health and safety levels. This is an active field of research in South Africa and a substantial body of knowledge is available.

To allow greater participation by households and individuals, the indigenous knowledge of both informal and traditional construction should be reconsidered. Both technologies are inherently sustainable, since they rely on recycling and renewable resources. A very specific graphic style has developed in South Africa over the years for use in instruction manuals aimed at semi-literate and even illiterate people (figure 10.17). Using simple language and explanatory three-dimensional schematics, there is no doubt that coding for individual buildings and their construction will have to be presented in an illustrated story-book format.

Conclusions

This chapter has hopefully served four purposes: first, to contribute to the debate on African urbanism; second, to reaffirm the value and current relevance of indigenous

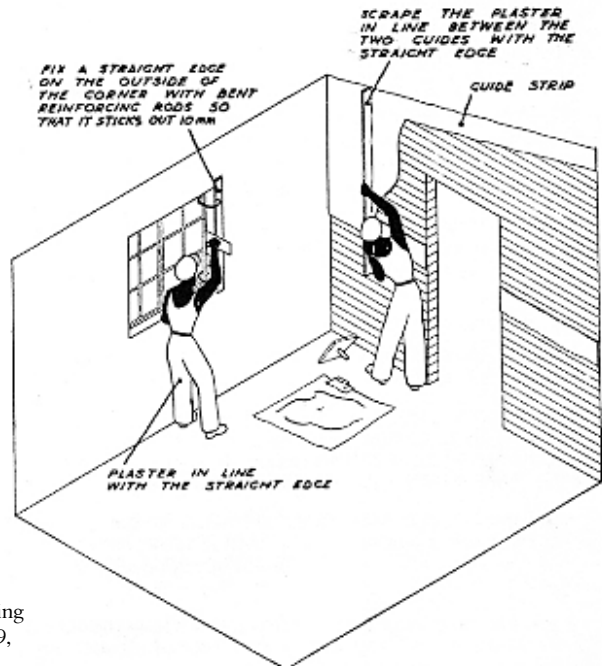


Figure 10.17. Explaining building techniques. (Source: Spence, 1979, p. 35)

coding traditions; third, to illustrate how those codes could be reinterpreted, packaged and applied to achieve identifiable, compact, mixed-use neighbourhoods; and fourth, an issue of general relevance – that it is feasible to translate lessons from coding traditions into frameworks for urban coding and planning to achieve the continuity and predictability so many people, vulnerable or not, find so desirable and comforting.

And rather than continuously debating the issue, South African planners, policy-makers and developers should, like the Dutch since the early twentieth century, have the courage to experiment with alternative urban models. Based on experiences with small-scale pilot projects, local as well as in Asia and South America, it is also obvious that the top-down centralized approach must be abandoned. Community participation, and the implementation of a coding system that has ensured the survival of many communities, are inherent elements in African settlement-building, and that must again become intrinsic to the process.

South Africa has appropriate land-use and development policies, but an alarming fact is that peripheral development is bound to continue simply because such land is cheaper and more readily available than land closer to economic opportunities – unless government embraces a new African Urban paradigm, implying a drastic rethink of lot sizes, housing standards, road and transport patterns and the way services are provided, but also, and especially, of town-planning control regulations, such as those for building and land use, coverage, floor-space ratios and setbacks.

Literature on housing seems to emphasize problem setting. It is hoped that this study demonstrates that appropriate solutions are achievable, possibly even at a lower cost to government, but that they would, as most stakeholders in fact agree, have to be community-based, supported and facilitated by committed architects, engineers, planners, economists and other professionals. The fundamental solution is the superblock and acceptance of an autonomous, self-help building tradition, rather than a suburban street grid regulated by Western-based town-planning controls. This approach would establish indigenous African coding traditions as a framework for fusing vernacular and First World urban, architectural and technological solutions – with the ultimate aim to empower communities to make truly African places.

Chapter Eleven

How Codes Shaped Development in the United States, and Why They Should Be Changed

Jonathan Barnett

In the United States almost all development takes place in accordance with codes which are usually described as zoning codes, but go far beyond establishing land-use zones to determine how much can be built, where it can be built, and what form development may take – including building height, placement, and total floor area. In the majority of jurisdictions these codes are the most effective planning instruments; frequently they are the only planning instruments. Planning textbooks say that codes are a means of implementing comprehensive plans, but most such plans today set forth goals, objectives, and policies without much in the way of specific physical references. As a practical matter, the zoning code is a comprehensive plan and defines permissible future development for most US communities.

These codes date back to early twentieth century governmental reform, which equated discretionary governmental decisions with corruption – and not without reason. As a result, discretionary governmental decisions about development today usually take the form of an amendment to a code, or an exception to a code. Recently, criticism of urban sprawl and isolated ‘cookie-cutter’ buildings has led to the realization that the codes regulating development in the United States need major changes, issues which will be discussed in detail in this chapter.¹ Current codes no longer represent shared social objectives, they are almost blind to environmental issues, and they are

out of step with the way that the real-estate market works today. New codes, such as Traditional Neighborhood Development (TND) and the Smart Code² being proposed by proponents of the New Urbanism, should be seen in the context of a more general movement to amend US codes so that they promote today's development goals. It has proved relatively easy to change the codes for undeveloped land, but changing codes in already developed, or partially developed, areas is immensely difficult, because property values reflect existing regulations.

Reforming codes which are as comprehensive and prescriptive as development codes in the United States requires confronting basic issues of urban design and planning, such as: How much is too much? What is the public interest in building form? What should be the character of the community? Code reform also raises basic issues of code writing such as determining the range of discretionary review, delineating the objective principles that might underlie subjective decisions about architectural style, and relating desirable building forms to real-estate marketability. These are the issues behind current discussions³ of the relative merits of performance-based codes, form-based codes, transit-oriented codes, environmental codes, pattern books as supplements to planned unit development, historic districts, specific plans, smart growth, growth limits, and so on. However, to make informed judgments about these issues as they apply in the United States requires traversing a thicket of seemingly impenetrable technicalities.

First of all, to understand development codes in the United States, one needs to remember that United States is not just a name; it is a description of a governmental system. The 'police power' to preserve public health, safety, and general welfare was left to the individual states by the federal constitution, subject to protections for life, liberty and property included in the Constitution's Fifth Amendment. The key provision of the Fifth Amendment related to property regulation is known as the Takings Clause, which provides 'nor shall private property be taken for public use, without just compensation'.⁴

Thus, while the power to regulate land use and development remains with the states, it is subject to review by the Federal courts because Fifth Amendment protections for individuals were expressly applied to the states by the Fourteenth Amendment:

... No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws...⁵

Because the federal courts can review cases where state laws may conflict with federal constitutional provisions, the limits of state power can be defined and redefined by court decisions, and ultimately by determinations of the United States Supreme Court. The Takings Clause limits not only compulsory purchase ('eminent domain' in

the United States), but also land-use regulation under certain circumstances.⁶ A state's courts also have the power to find that a law regulating land use and development enacted by the state, or a local government within the state, violates the provisions of a state constitution or a controlling state law.

Land-use and development issues are traditionally local issues not state-wide issues. While the states have the power to decide them, they long ago devolved most of the exercise of this power to the counties or cities and towns within the state. Governors and state legislatures did not wish to be involved in local land-use disputes, and local governments strongly wished to decide such issues themselves. Today, as urbanization has become more regional, larger planning and development issues can be left unaddressed by local jurisdictions. Similarly, leaving the regulation of development to the states has made it difficult to engage in national planning, except at a very general level, usually achieved by the federal government's ability to pay for public projects. There is a national park system, and the federal government's jurisdiction over navigation has meant many public works, such as harbours and flood walls, are built by the US Army Corps of Engineers. Most of the funds for the Interstate Highway System are from a gasoline tax collected by the federal government. States have an incentive to apply for these funds and follow whatever standards come with them. However, most of the planning for the Interstate routes has been left to the individual state highway departments. Recently the federal government has also exercised some back-handed national planning functions through environmental regulation and through the recognition of historic districts that carry with them some federal tax incentives.

However, planning in the United States is mostly left to local governments, and the chief means by which planning takes place is through local codes.

Local Codes

Land use and development are regulated by a portfolio of local codes, the most important being the Building Code, the Zoning Code and the Subdivision Code.

Building codes are concerned with the safety and habitability of individual structures. Requiring walls to withstand fire for no less than a specific time is an example of a building code provision, as is a requirement that every room has an exterior window. Building codes are local, but the building industry has become national and now international, leading to the need for local codes to recognize a set of national standards so that the same building products can be used everywhere. Minimum sizes and specifications for such elements as electrical wiring and plumbing are now likely to be much the same in every jurisdiction, but uniformity is not automatic. The biggest issues with building codes are recognizing new materials while maintaining safety standards and achieving uniformity among jurisdictions.⁷ Building codes can overlap with zoning codes in such areas as light and air requirements and

minimum room sizes, but most of the issues that relate to urban design and planning are determined by zoning and subdivision codes.

Zoning codes, as the name suggests, map separate districts where different land uses, or mixes of land uses, are permitted. But zoning codes in the United States establish far more than zones. They also regulate intensity of development, such as how tall a building can be, how much of the property it can occupy, and how the building placement relates to neighbouring properties. These two kinds of provisions have separate histories, coming together under the name of zoning in the early twentieth century.

Subdivision codes regulate how a property is subdivided into streets and lots that meet the requirements of zoning. The subdivision code sets standards for street widths and gradients, provisions for sidewalks, and for landscaping within street rights of way. Subdivision also sets grading requirements for the whole property, can require storm-water retention, and sometimes mandates public open-space set-asides.

Zoning is the most central of these three sets of codes, determining what, how much and where development can take place, but the importance of the subdivision code is often overlooked in writing about planning. Subdivision is especially important when farm or forest areas are urbanized for the first time.⁸

The building code is usually administered by a local building department which monitors the safety of buildings and their conformity to code. The zoning and subdivision codes are usually administered by a planning department, with amendments to the code considered by a Planning Commission, or a Planning and Zoning Commission, and then, if approved, also approved by the local legislature, such as a city or county council. There is also almost always a quasi-judicial board of appeal that can make exceptions to all three codes.

Evolution of Zoning Codes in the United States

Segregating activities which are bad neighbours goes back at least to medieval cities where slaughterhouses were relegated to land outside the walls. Protecting property owners against nuisances has a long tradition in the English legal system, which followed colonists to what became the United States. In this tradition, the right to own property includes the right to enjoy its benefits. If a neighbour's activities interfere with a property owner's ability to use the property, for example by creating noxious fumes or deafening noises, the courts can tell the originator of the nuisance to stop, even though the creation of the nuisance also takes place on private property. Legislation can take common nuisance situations and deal with them wholesale. In the US, cities passed ordinances that limited one or more land uses. St. Louis restricted the location of livery stables near schools or residences. Los Angeles enacted a city-wide code in 1908 which divided the city into heavy industrial, light industrial and residential areas.⁹

Such laws were intended to prevent property owners from creating nuisances for other property owners.

Meanwhile, a separate trend was taking place towards limiting the size of buildings. Paris has had building height limits related to the width of streets since the eighteenth century, but the issue gains increasing importance when the steel frame and the elevator permitted ordinary buildings to attain unprecedented size and height. In 1899 the United States Congress enacted a height limit for Washington, DC, based on the height of the Capitol Dome, later modified in 1910 by a more restrictive limit: the distance across a street from building face to building face, plus 20 feet (about 6 metres). (Washington, the District of Columbia, is Federal territory. Congress reduced its role in local affairs when it granted self-rule to the District in 1973.)¹⁰ Baltimore enacted a height limit of 175 feet (53 m) in 1904, as part of a general code overhaul after a major fire.¹¹

The first US code to put together land-use and building form requirements for an entire city was the New York City Building Zone Resolution of 1916. It was a response to both land-use factors, such as the potential encroachment of garment industry workshops onto fashionable Fifth Avenue, and the height of elevator buildings, notably the Equitable Life Assurance Building at 120 Broadway in lower Manhattan. The Equitable building was under design and construction while studies for the zoning law were going forward. At thirty-six storeys and 1.2 million square feet (111,600 m²), it was the largest and tallest building in the world when it was completed in 1915. By provoking concern that it and future similar buildings would block light and air from neighbouring properties, the Equitable tower helped create a political constituency in favour of restricting the bulk of buildings.

New York City's 1916 Building Zone Resolution created four land-use categories: residential, retail, business, and unrestricted. It created five progressively more restrictive area zones that specified the amount of space required for yards and courts on each property and the percentage of the property the building was permitted to cover. It enacted five height restriction zones that were, like those in Paris, based on multiples of the width of the street, going from one to two and a half.

The height restrictions are the best known aspects of New York's 1916 Zoning Code and are seen in retrospect as early examples of what is now called Form Based Coding. Like the earlier codes in Paris, an imaginary plane was drawn from the centre of the street, the angle of the plane determined by the street width. When the front wall of the building intersects the imaginary plane, it must set back to stay under the plane (see figure 11.1). To prevent all buildings from turning into pyramids, the setback requirement ends when the area of the tower has been reduced to 25 per cent of the site.

The strong shaping effect that zoning turned out to have on the form of the city was probably not anticipated by the framers of the 1916 zoning, concerned as they were with protecting properties from adverse neighbours. Designing under this code

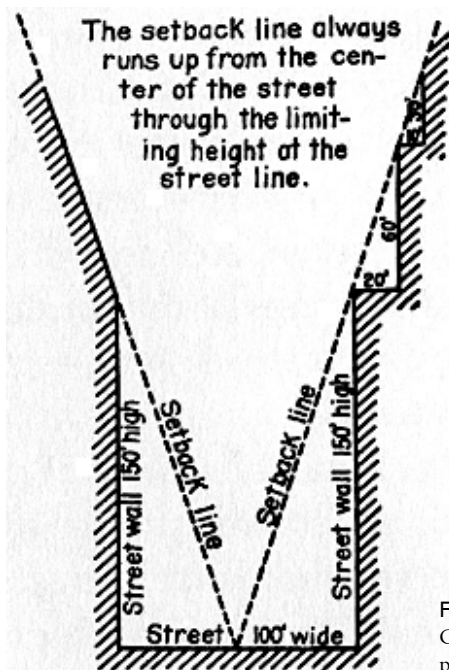


Figure 11.1. Diagram from the 1916 New York City Code showing how an imaginary line, the sky exposure plane, relates building height to street width.

was somewhat like sculpting buildings from a solid form that rose straight up from the street but then turned into a pyramidal mass. Architect and illustrator Hugh Ferriss made a well-known series of drawings showing the evolution of a building from the zoning requirements in his 1929 book, *The Metropolis of Tomorrow*.¹² Ferriss's Metropolis showed clusters of tall buildings occurring at intervals among more mundane development laid out in blocks like the street layout prescribed in New York City's Commissioner's Plan of 1811 (see figure 11.2).¹³

Daniel Burnham's 1909 Plan for Chicago¹⁴ was completed just before discussions began on creating a zoning code for New York City. The Chicago plan calls for avenues lined with buildings that maintain a uniform height that is related to the street, clearly modelled on precedents from Paris (see figure 11.3). The legal opinion in Burnham's plan, written by Walter Fisher,¹⁵ a leader of political reform in Chicago, stated that the only way to achieve this design result would be to follow the same practice that Baron Haussmann had used in rebuilding much of Paris, buying land for the new streets with a wider fringe suitable for development on both sides of the right of way. Then, following Haussmann's example, the extra land could be sold to developers with deed restrictions regulating the height and bulk of the future buildings. Fisher was sceptical about the likelihood of the Illinois State Legislature funding such an enterprise, and of course he was correct. No such initiative took place. However, the Chicago Plan might well have been implemented through zoning, if anyone had made the connection, as the New York code included building height limits related to the width of streets.

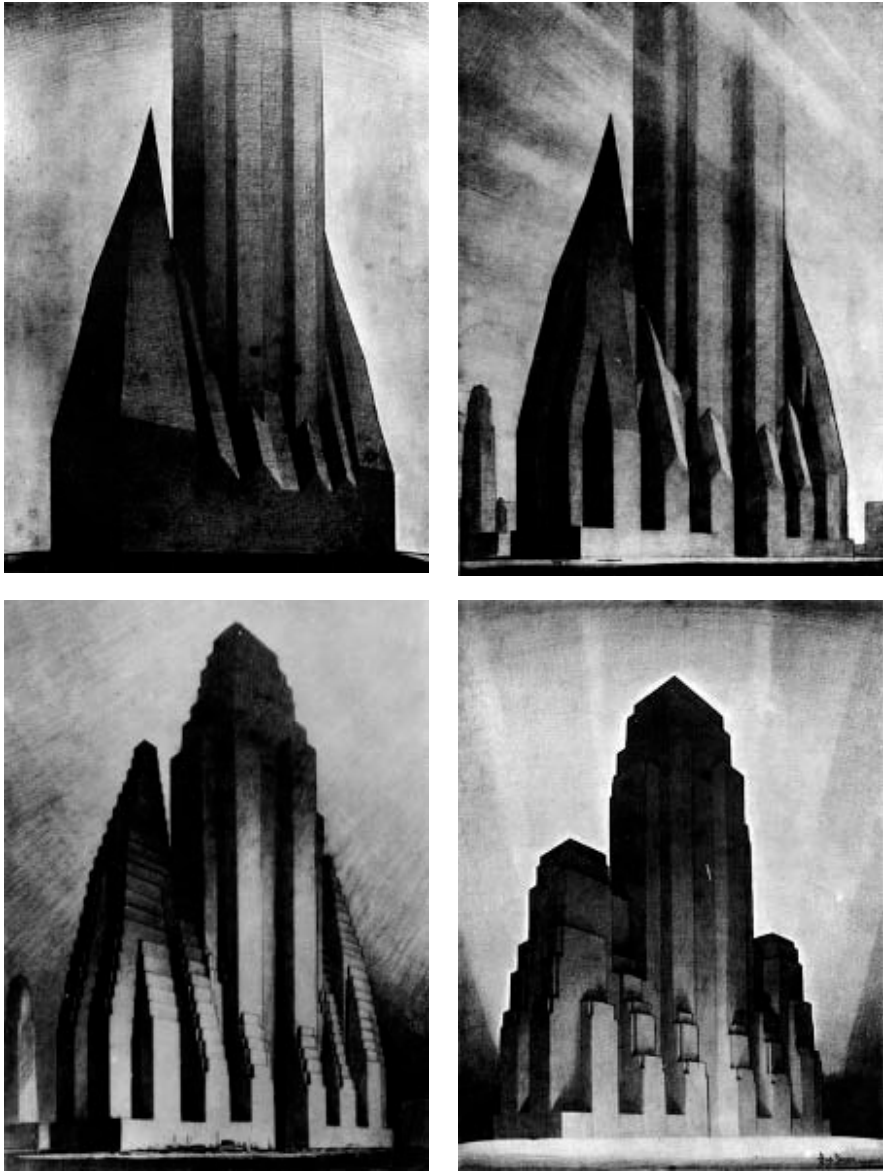


Figure 11.12. A famous sequence of drawings by Hugh Ferriss published in his book, *The Metropolis of Tomorrow*, in which the setbacks required by the sky-exposure plane in the code form a mass from which a building then appears to be sculpted.

The 1920s were a formative period for zoning and subdivision in the United States. The Village of Euclid, Ohio, a suburb of Cleveland, enacted a zoning code in 1922 which limited height, use and area. Ambler Realty, which owned 68 acres (27.5 ha) of land in the village, brought a law suit saying that the ordinance violated the protections of the US Constitution by depriving the property owners of their rights without



Figure 11.3. A rendering of buildings along the Chicago River delineating the uniform Parisian skyline of Daniel Burnham and Edward Bennett's 1909 *Plan of Chicago*.

compensation and without due process, as required by the Fourteenth Amendment. The case eventually reached the US Supreme Court in 1926, and the court found that zoning was a rational use of the village's police powers. This precedent still stands. The court is thought to have accepted arguments made by Alfred Bettman in an *amicus curiae* brief (a brief submitted by someone who is not a party to the actual dispute). Bettman, a Cincinnati lawyer, obtained a re-hearing after the case had already been argued. It seems likely that, without Bettman's intervention, the decision could have gone the other way. Bettman at this time was also advising a committee established by US Commerce Secretary Herbert Hoover, who was to become the US President in 1928. This committee was writing standard enabling legislation for zoning, city planning, and later for subdivision. The enabling legislation could be adopted by state legislatures, which in turn would then permit local governments within each state to create their own zoning codes, city planning departments, and subdivision ordinances. The standard zoning enabling legislation first published in 1924 was eventually adopted by all the states, and the equivalent for subdivision, published in 1928, had a comparable influence. By preparing standard enabling legislation, Hoover made it easier for the states to promote zoning, planning, and subdivision codes, and also, by providing expert legal assistance, helped the state codes stay within what was considered a permissible use of state powers, without violating the US Constitution.¹⁶

While 'Euclidean' zoning, established by the Supreme Court decision about the town of Euclid, Ohio, is still the normative pattern in the US, a major innovation took place in the late 1950s and 1960s when floor area ratios were added to zoning codes, to replace or augment form-based provisions such as setbacks, height limits and other requirements which dealt with the building envelope or mass (figure 11.4). Floor area ratio, or FAR, is really a multiplier not a ratio. If your property is 10,000 square feet, and the FAR is 10, then you are permitted 10 times 10,000 square feet, or 100,000 square feet of floor area. However not all of a building's floor area is considered floor

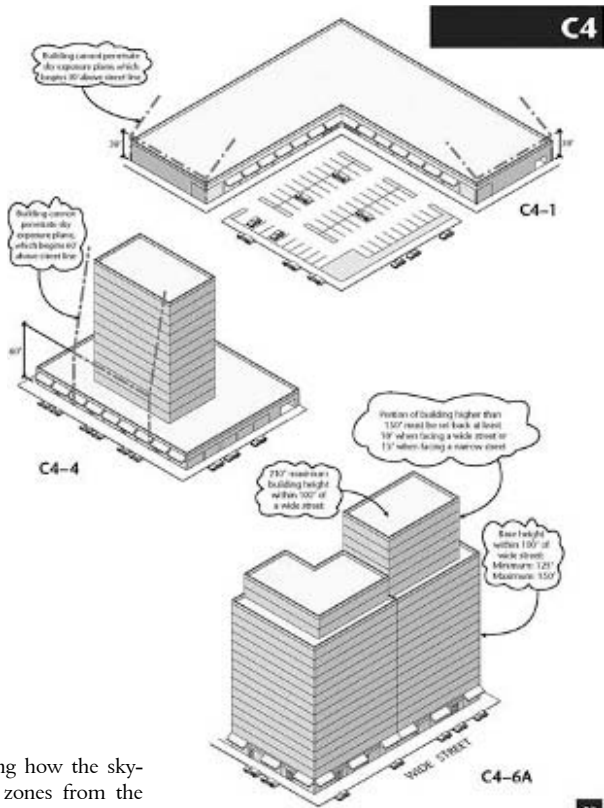


Figure 11.4. Diagrams showing how the sky-exposure plane works in C-4 zones from the current New York City Zoning Handbook.

area for zoning purposes. Above-ground parking may well not be counted; elevator shafts and stairwells are usually exempt, as are mechanical rooms. FAR is intended as an occupancy control not a way to shape the building. It was recommended by planners as a more objective way of regulating intensity of development than the controls tied to building forms that FAR was to supersede. Limits to floor area appeared to be easier to justify as an exercise of the 'police powers', because the number of occupants in a building could be related to transit access and street capacity. What was not sufficiently appreciated was that traditional form-based requirements, like heights related to street widths, promoted uniform cornice lines and buildings that aligned with the front property line, and were a major unifying force in the design of cities (figure 11.5).

At the same time that FAR came into use, many codes adopted provisions that promoted on-site open space and towers instead of buildings built to the property line. As a consequence, cities started seeing unexpected results when buildings that met the FAR in the zoning were constructed to take advantage of tower provisions. Free-standing towers seemed to their proponents to be the essence of the modern city, but they have always been unpopular in residential neighbourhoods and many planners



Figure 11.5. Photo of Central Park frontage in New York City in the 1960s.

and designers now see them as disruptive to the continuity of street frontages needed by urban retail. However, towers limited by FAR rather than form-based controls are the standard outcomes from the high-density district regulations of most current zoning codes.

Zoning and Other Codes in the United States Today

Every zoning ordinance contains two parts: the *text*, which defines each zone, and the *map*, which shows where each zone is located. The text also contains what are called ‘bulk provisions’ for each zone. These directly shape buildings by setting limits to the amount of floor area, the height, and such placement issues as setbacks, both vertical and in plan.

Most zoning codes contain three basic land-use categories: residential, commercial and industrial – sometimes called manufacturing. They are generally considered a hierarchy, with residential being the most protected. Uses can go down the hierarchy one layer, but generally not up. For example, sometimes residences are permitted in a commercial zone and offices in an industrial zone.

Zoning codes arrange each of the three uses in a gradient, as from light to heavy or small to large. Residential zones are usually written as a continuum based on density – that is number of families per lot, lot size, and building type. At one end of the spectrum are single-family houses on large lots, and, at the other end, tall apartment houses.

Commercial zones are written as a continuum based on density, but also on the degree to which the uses generate traffic and have other impacts on neighbouring properties. An art gallery, a neighbourhood store, and a night club, each with similar amounts of floor space, could occupy different places along the commercial zoning continuum. A medical office building, which generates a great deal of traffic, might not

be permitted in the same zone as other kinds of small office buildings; and a big office tower might be considered a more ‘desirable’ use on the continuum than a regional entertainment complex.

Industrial uses are organized primarily by the degree to which the uses could have adverse impacts on surrounding properties or districts, ranging from so-called ‘light’ industry, which has few external effects, to big manufacturing installations like a steel mill, a refinery, or a paper mill, which emit noise and odours.

Zoning districts, because they let some property owners do things not permitted to other owners, have to be mapped in such a way that the maps are demonstrably objective, to meet equal protection and due process expectations, as well as being based on principles that safeguard the overall welfare of the community. As noted earlier, while zoning codes are supposed to be the instruments for implementing comprehensive plans, often such plans are written in such general terms that the code itself is the effective plan. This circumstance has led to a presumption in favour of large districts that extend over areas of similar development, and against a mosaic of small districts that include only one or a few property owners (such districts are often called ‘spot’ zoning) unless there are clear defining or pre-existing circumstances that justify the smaller zones.

The Problems with Typical US Zoning Codes

While zoning provisions are continually amended in attempts to bring them up to date, the original concepts were formulated in the period just after World War I, and they no longer correspond to current ideas about a desirable society,¹⁷ to current development patterns, or to the way that the modern real-estate industry operates. They also treat land as a commodity to be divided among different ‘land uses’ without acknowledging that land is also an ecological system that needs to be protected and enhanced. In the same way, historic buildings have no value in traditional zoning, which often creates land prices that make the existing plot more attractive as a site for new development and make preserving the existing structure more difficult. An additional set of problems was created after World War II when more modern, ‘scientific’ provisions were added to earlier zoning codes, promoting towers and ground-level open space, and substituting floor area ratios for height limits and setbacks. The result was that the physical form of the building was no longer as predictable and was likely to break with established patterns without creating a new one.

Problems with FAR Zoning

Almost as soon as zoning codes based on FAR began to take effect in the 1960s, some municipalities started to amend these codes in response to the sudden appearance of

tall towers. San Francisco enacted a height limit after a much more restrictive six-storey limit, a citizen-sponsored ballot initiative, almost won in a local election.¹⁸ In New York City, special zoning districts were created to preserve the existing development patterns: a special theatre district, a Fifth Avenue district to preserve retail continuity, and height limits based on prevailing building elevations in residential neighbourhoods. Other cities accepted the new paradigm of towers restricted only by floor area limits, and the towers were often made taller by provisions that encouraged lower site coverage and gave incentives for providing ground level open space. Older post-card photos of a US city would show a street lined with buildings. The new iconic photo became the distant view of the city skyline, with towers of different shapes vying for supremacy. While attractive from a distance, the new downtowns were often far less pleasant up close, with isolated towers sitting amidst parking lots, lined by the sidewalls of buildings that were meant to be seen only from the street.

Problems with Suburban Commercial Zoning

When zoning codes were originally drafted, most commercial development was expected to take place in big-city downtowns, on neighbourhood commercial streets, or in small-scale downtowns in residential suburbs. The codes did not anticipate modern patterns of distributed commercial development: the suburban office park, the regional shopping mall, or the suburban commercial corridor or strip. These new development types have been distorted by the pre-existing zoning codes, or zoning precedents.

Suburban office headquarters or office parks often began in estate areas that had been opened up to such development by new highways. These exclusive residential districts could be remapped to a commercial zone, but they did not have the road infrastructure necessary to support offices, and access has had to be improvised through road widenings at the expense of much community conflict. Nor did the new office parks have the support of other commercial districts that could supply food, hotels and other services for office workers and business visitors.

The regional shopping mall has been built near highway interchanges, which provide a comparable level of access to a traditional downtown. But these malls are isolated from other commercial uses, such as hotels or office buildings, or the high-density residential zones that support shopping in traditional downtowns.

The zoning districts that accommodated the linear main street in a small town or suburb, or the commercial corridor along a streetcar route in an urban neighbourhood, have been extended and mapped for miles along arterial streets in cities and suburbs. This commercial strip zoning does not work at such a large scale. It is dysfunctional for traffic movement, as shoppers making turns conflict with drivers headed for more distant destinations. A narrow band of land is mapped as a commercial zone on both

sides of an arterial street for many miles, too much land to be used efficiently, and the band is uniformly narrow so that too little commercial land is available at the most desirable locations along the corridor.

Problems with Residential Zoning

The assumption that residential zones should be considered in a continuum from the most protected, single-family houses on large lots in country-club or estate areas to high-density apartment buildings in city centres reflects development patterns and concepts of social hierarchy that existed in the 1920s when zoning codes were first enacted. During the 1920s, social leaders in big cities could be found living in town houses or luxury apartment buildings in a few elite downtown neighbourhoods; but, in general, people who lived in apartments, duplexes, triplexes, or row houses were considered to be of lower social standing than people who lived in single-family detached houses. Families that lived in small houses on small lots, in turn, were thought to be of lower social standing than people who lived in bigger houses on bigger lots. This hierarchy corresponded to the organization of cities in the 1920s, where a core of downtown commercial uses and exclusive downtown neighbourhoods was surrounded by a ring of manufacturing and 'slum' housing. The next ring out from the downtown core was the location for the streetcar suburbs of apartments, attached houses, and smaller single-family residences. The residential suburbs for larger houses were reached by train or automobile and occupied the ring farthest out. These suburbs generally were zoned to exclude industry, and apartments were confined to a small central commercial district. Beyond this outer ring was a rural area of farms and country estates, often the summer homes of people who lived in town houses or apartments in the elite downtown residential districts, or, beginning around World War I, in country-club suburban neighbourhoods.

This 1920s hierarchical city still exists as an underlying element in today's far more complicated development pattern and much more open society, where the size of a house or lot is as likely to be a lifestyle decision as a social indicator. The development industry today operates at a scale unimaginable in the 1920s, while modern highways and car ownership have permitted the extension of cities and suburbs far beyond their dimensions more than eighty years ago. The bias in zoning administration towards mapping large, single-zone districts, combined with residential zoning's original exclusionary character, has created the modern housing tracts of same-sized houses on same-sized lots, built by corporate development organizations at a scale not anticipated when zoning codes were originally drafted. These kinds of housing developments are often called *subdivisions*, referring to the fact that the subdivision of the land into lots that meet the zoning code is the main formative influence. It is a major problem that residential zoning typically creates new subdivisions consisting only of one type of

house rather than neighbourhoods with diverse housing types or communities with a mix of uses or activities. Some recent suburban subdivisions may consist of townhouses or garden apartments, but the problem is the same: large tracts of single-size residential units. The problem can be overcome to some extent with special measures like planned unit development amendments to the code, or traditional neighbourhood development codes – discussed later in this chapter – but the underlying hierarchical bias of residential zoning still needs to be addressed.

Problems with Industrial Zoning

Problems with industrial zoning concern the map and not the text. There continues to be a consensus that most industrial uses should be separated from commercial and residential development. The problem is that industrial districts in the central areas of older cities are no longer suitable for most modern industrial users, while they may well be suitable for adaptive uses as residences, offices, or both. Meanwhile, it is difficult to locate new industrial zones because of the absence of effective regional planning. The biggest zoning text problem is managing the transition away from industrial uses in older areas, without forcing out jobs that are still badly needed in these communities.

A Basic Problem with All Zoning Codes, Made Worse by Subdivision Codes

When zoning codes were first written, the interactions between the built and natural environments were not as well understood as they are today. Almost all zoning codes treat land as a commodity that should be allocated among various uses, and not a living ecosystem that needs to be preserved as well as developed. The increasing prevalence of flooding in developed areas is just one indication of why zoning codes need to be amended to protect natural areas that should not be disturbed if the regional ecological balance is to be maintained.

The blindness to the ecological character of land to be found in the zoning code is made worse by well-intentioned provisions found in most subdivision ordinances. Steep streets can be dangerous, so subdivision codes restrict the gradient of streets, often to 5 per cent. The difficulty is that to keep the regraded streets connected to their adjacent lots, the lots have to be regraded as well. The result is that the entire property has to be regraded and all trees and vegetation end up being bulldozed in the process.

Historic Buildings and Districts, Another Code Problem

Zoning and subdivision codes do not recognize historic buildings. When new codes have been written to encourage the preservation of historic buildings and historic

districts they often operate in opposition to the larger new development that would be permitted by the zoning code. New York City's zoning code permitted a much larger building on the site of Grand Central Station, which had been designated a historic landmark. A developer purchased the zoning 'air rights' over the building and proposed a tower that was opposed by the New York City Landmarks Commission as an inappropriate addition. The US Supreme Court, in *Penn Central Transportation Co. v. New York City*, has held that designating the Grand Central Terminal as a historic landmark meets constitutional tests for due process and uniform administration because designation is part of a comprehensive approach to an entire city, and because the owner had the option of transferring development rights permitted under the zoning code to adjacent properties.¹⁹

Planned Unit Development

The adverse interactions between zoning and subdivision in new residential development led to Planned Unit Development provisions, sometimes called Cluster Zoning, being added to most zoning codes. These rules permit what amounts to a custom zoning and subdivision ordinance for an individual property. Streets and buildings can be designed together, and buildings can be clustered in parts of the site that are most suitable for development, leaving the rest of the land in its natural state. The approval process involves substantial discretion and generally requires review and approval of the plans by both the planning commission and the local legislature – hence the description as a custom code. Planned Unit Development only applies to properties in one ownership, which means that, however appropriate the design and planning choices may be for an individual property, the overall result in a community is likely to be fragmentation and disconnection.

Specific Plans

In California, state enabling legislation permits local governments to enact Specific Plan legislation.²⁰ Specific Plans are comparable to Planned Unit Developments in that they are zoning and street plans which are tailored to an individual situation. However, they can apply to properties with diverse owners if the properties are within the plan boundaries. This is a tremendous improvement over conventional zoning because it permits planning at a scale larger than an individual property. Unfortunately, most US states do not have enabling legislation that permits local governments to enact Specific Plans. It is possible to achieve somewhat similar results with special zoning districts, which can be enacted in some form in every state. Either way, it is possible to rethink outmoded zoning concepts within the confines of the specific district. There is more flexibility in creating the district than there is with Planned Unit Development, but

there are still major political difficulties in enacting zoning that applies to multiple properties, unless the majority of the owners have already come to an agreement.

Historic district legislation can create a unified plan and design for a group of properties controlled by different owners, because such codes permit a more discretionary approval process than zoning or subdivision. Development can be reviewed against a defined and consistent standard: is the proposed building in keeping with the established character of the historic district? Creating a comparable procedure to enforce consistent design in newly created special design districts requires specific standards, rather than the more intuitive judgments about consistency which are possible when administering a historic district.

Why Not Throw Out Existing Codes and Start Over?

The Smart Code is a cleverly named model ordinance, developed originally in the offices of architects Andres Duany and Elizabeth Plater-Zyberk.²¹ Its proponents say that it ought to replace conventional zoning and subdivision. The Smart Code is built on the experience of Duany and Plater-Zyberk with Traditional Neighborhood Development.

Traditional Neighborhood Development

Duany/Plater-Zyberk were the planners for Seaside, a resort community on Florida's Gulf Coast. Building at Seaside began in the 1980s; and the little town, only 80 acres (32 ha), has become a model for returning to the kinds of traditional neighbourhoods that were built routinely before World War II.

Seaside is a Planned Unit Development built under the ordinances of Walton County. The developer, Robert Davis, sold the small lots on deliberately narrow streets that emulate the best pre-World War II suburban planning. House lots came with deed restrictions related to a code written by Duany/Plater-Zyberk. The code required specific roof pitches, acceptable materials, and suggested proportions. Front porches and picturesque towers were encouraged. The street plan and the code were accepted as development plans by the county and thus were a permitted exception, as a Planned Unit Development, to the normal county zoning and subdivision requirements.²² However the way the code operated within Seaside was not like zoning or subdivision in a town or city. As part of the deed of sale, there was agreement by the buyer to abide by the code as a condition of acquiring the property. It was enforced by a 'town architect' employed by the developer who reviewed proposed house designs for compliance with the code. This was a discretionary process that involved matters of taste and architectural expression, similar to a historic district, but considered beyond the constitutional limits of a governmental code. However, as Seaside was private

property, the restrictions there were simply part of a transaction between the seller and the buyer. If the buyer did not like the restrictions, there was no obligation to buy.

Seaside showed developers that there was an unmet market for new developments that looked like towns and not subdivisions. It has led to hundreds of suburban communities²³ with relatively small lots and narrow streets, front porches, alley access for garages, and – in the best examples – a commercial centre within walking distance. Seaside was also taken up by the Walt Disney Company and became one of the models for Celebration, a Disney development near Orlando, Florida, of which only a small portion is a walkable community around a neighbourhood centre. At Celebration the discretionary design code administered by a town architect was augmented by ‘pattern books’ of acceptable designs, prepared by UDA Architects, which showed builders how to approximate the 1920s architectural styles that were found in the most fashionable pre-World War II suburbs. The Celebration pattern books have also been influential, so that the traditional suburban planning of Seaside has been joined with attempts to emulate the architectural dress code of the country-club suburb in many new developments.

At first, these communities were built under Planned Unit Development provisions because they were subdivisions of a single property belonging to one owner. But many of the zoning and subdivision requirements that underlie Planned Unit Development in local zoning codes mandate lot sizes and street dimensions that were incompatible with developments that emulated Seaside. So Andres Duany and Elizabeth Plater-Zyberk prepared a new model code, the Traditional Neighborhood Development, or TND, that could be added to zoning ordinances as an alternative to Planned Unit Development. The TND text, like Planned Unit Development, is a custom code that is administered as an alternative, when the entire property under development has only one owner. It became the preferred way of implementing these new traditional neighbourhoods, as everything needed for approval was contained in one package, as long as the developer’s architects and planners followed the Seaside model.

TND provisions are now widely accepted as an alternative method of Planned Unit Development, and some states, notably Wisconsin, have added TND provisions to their enabling legislation.

The Transect

The success of the TND gave Andres Duany the confidence to tackle the much broader range of issues contained in zoning and subdivision codes. He bases his call for reform on something he calls The Transect (see figure 11.6). There is an ecological succession that can be followed from the edge of the sea across the beach to the dunes and beyond to uplands and forest. In his explanations of the Transect, Duany claims to discern a comparable gradient from central city through urban neighbourhoods to

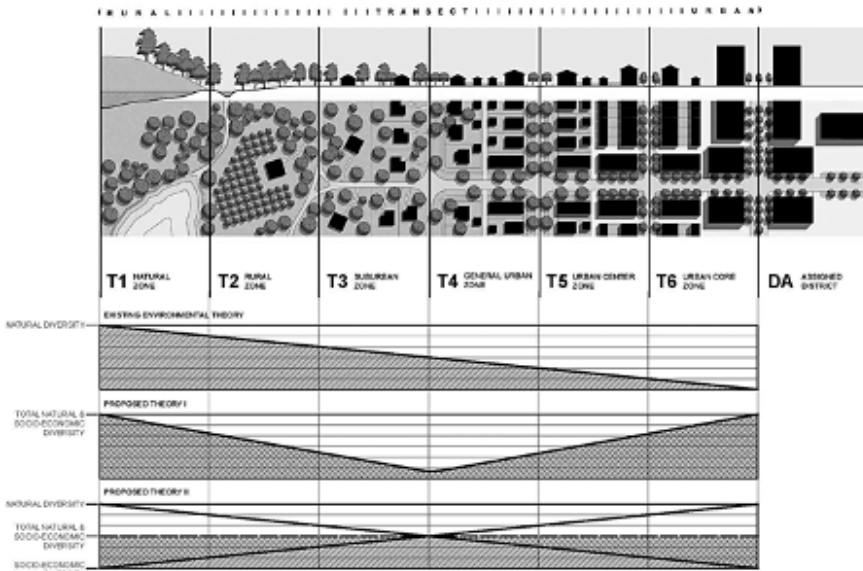


Figure 11.6. An illustration of the Transect drawn by the office of Duany/Plater-Zyberk.

suburbs and farmland. Back in the days of Herbert Hoover's Commerce Department Committee, this observation about urban geography was considered correct, although even then geographers and planners were observing that these settled patterns were changing. What Duany calls a Transect was pretty much the economic and social hierarchy that upper-middle-class experts enshrined in zoning and subdivision during the 1920s.

Duany's Transect no longer represents today's urban geography and real-estate market; cities are now regional and multi-centric; garden apartments and office parks are being built in former rural villages. Duany would like to go back to the development patterns of eighty or a hundred years ago, and he wants these social and economic changes mandated by codes.

Presentations of the Transect often go well in public meetings. Duany, when he is presenting it, has been known to describe the Transect as a 'natural law', which is a disingenuous description for such a radical social proposal. However, the Transect has a comforting logic about it, especially appealing to members of the audience who are old enough to remember when cities and suburbs were still somewhat closer to the Transect model. It is also a good way to explain to the public the importance of context in making urban design and planning proposals.

Using the Transect as the basis for zoning and subdivision, as Duany is proposing, is questionable. A place for everything, and everything in its place, is an aristocratic principle that is not clearly related to the common-law history behind zoning as a way to reduce and eliminate nuisances, or with the police powers of states to protect and

promote the public welfare. But the Transect is forthrightly proclaimed as the basis for a new kind of zoning and subdivision, the Smart Code.

The Smart Code

The Smart Code proposes six zones, ranging from Transect – 1, the Rural Reserve, to Transect – 6, a dense, mixed-use downtown. These zones differ from conventional zoning in that they are based more on intensity of development than use. In principle, a mix of different activities is permitted in all zones, although the lower density zones are more residential and the higher density zones are the ones more appropriate for business. The code uses individual residential lots as a modular basis for building types for all purposes, a hangover from the mechanism of the Traditional Neighborhood Development zone. In the early nineteenth century, the house lot might still have been the basic building module in cities, although even then factories were breaking this pattern. Today, office buildings, hospitals, shopping centres, schools and other basic building types are no longer designed so that they fit into a street and block pattern created for individual house lots. Because the Smart Code assumes such a pattern, it requires major changes in the practices of the development and building industries, and it is not clear that these changes are either possible or desirable. Industrial uses bigger than a back-yard repair shop are not part of the Transect. An automobile assembly plant or an electronics factory, and especially a paper mill or an oil refinery, are treated as requiring separate special districts. Any activity requiring its own campus, such as a research hospital or a college, also needs to be treated as a special district in the Smart Code.

Andres Duany has made the code available to any user at no cost, which means that localities are free to use all or part of the code. Nashville, Tennessee has adopted a new code that is based on the Smart Code, but has found it necessary to multiply the number of districts in each of the six categories, so that the Transect has ended up being more of an inspiration than a guiding principle.

Other communities have come close to adopting a version of the Smart Code, and then stepped back as they recognized that the biggest problem with its adoption is that it does not correspond to the organization of conventional zoning and subdivision. Once the law is changed, development is severely restricted for any property that does not conform to the new regulations. In zoning, previously lawful development that is now non-conforming is a situation to be avoided, as each instance becomes a special case, and any new construction has to go to a Board of Appeal for approval.

Some proponents of the Smart Code urge its adoption as a parallel code,²⁴ giving investors and developers a choice of which set of regulations they wish to follow. The obvious problem with this approach is that new development can take place according to one of two systems which are by definition incompatible. As the aim of each system

is to create compatible development, the policy of providing a choice defeats the aims of both.

Because Duany has made his code shareware, it may well evolve into a system of codes, perfected by many hands, which will manage the transition from conventional zoning to this new system and will make development more contextual and more desirable. In the process, the Transect as a central article of belief is likely to be more of an impediment than a help, because it does not correspond to today's economic and social reality and is a simplistic description of a desirable city. Mixed density may well be as important to urban vitality as mixed use.

How Conventional Zoning and Subdivision Codes Ought to Change

In their recently-completed *Growing Smart Legislative Guidebook*, the American Planning Association offers an alternative to the model enabling legislation written under the auspices of the US Department of Commerce back in the 1920s. The Legislative Guidebook is a consensus document, compiled through a sometimes agonizing seven-year process. It concentrates on smoothing out the most obviously outdated provisions, with little attention to innovations like Specific Plans and Environmental Zoning. It has brought model enabling legislation up to the best current code practices, but it does not address the basic structural problems of current codes that are outlined above. Enabling legislation also cannot address the technical issues of revising the codes themselves, which remain the main problem.

It is possible to imagine changing zoning and subdivision significantly, while still leaving existing property values in place and not promoting a return to a more hierarchical society. It is clear that some of the original distinctions among zones are no longer appropriate. There need to be more mixes of both uses and densities. It is also clear that FAR-based codes do not pay enough attention to the resulting building form. Looking back at neighbourhoods built before the prevalence of zoning codes, there are desirable characteristics that no longer meet today's zoning requirements. These older urban and suburban neighbourhoods offered a variety of house types and sizes, often on the same street, apartment buildings and houses co-existed, and there were neighbourhood schools and shops. Downtowns have also suffered from single-use zoning, undermining the synergy to be found among different activities in traditional cities, and preventing desirable walk-to-work residential development. The blindness of zoning and subdivision, and also the Smart Code, to the actual ecological character of the land being developed is another serious problem.

The following are some suggestions about ways that these problems can be addressed.

Changes Needed for Residential Zoning and Subdivision Codes

Zoning that recognizes a neighbourhood as a basic planning unit would be a way to replace large, single-lot size, single-family zones, with districts that permit a mix of different sized single-family houses, both attached and detached, and apartments which are in scale with the rest of the neighbourhood. These zones could be used to preserve existing neighbourhoods where there is already a mix of house sizes and building types and create new neighbourhoods in developing areas. The Traditional Neighborhood Development zones originally drafted by Duany/Plater-Zyberk and already adopted in some places can serve this purpose, but they only apply to new development on single pieces of property.

The most important characteristic of the TND, after its mix of housing types, is its walkability, derived from provisions that require connecting streets instead of dead-ends and smaller minimum street widths than those normally found in the subdivision code. A more direct way of realizing the same objectives is to put the narrower street dimensions, requirements for an interconnecting grid of streets, and requirements for sidewalks and tree planting into the subdivision code, rather than trying to realize them through zoning. Restricting the width of driveways and the promotion of alleys – or lanes, the more genteel term – can also be accomplished through amendments to the subdivision code. As subdivision generally applies only to new development, there is little risk of these changes destabilizing existing areas.

Walkability is also important for transit oriented development. Most of the United States does not have a local transit system used by a significant fraction of the population. In places which do have a working transit system, the areas around transit stops can and do accommodate a significant increase in density and the number of automobile trips per person is measurably fewer. An effective local transit system can support both walkable residential neighbourhoods and compact mixed-use centres (see figure 11.7). Transit-oriented development, TOD, has its advocates, but they have not been as effective as the proponents of TND in promoting their agenda. What both concepts have in common is a preferred neighbourhood size about half a mile across, or about 160 acres (65 ha).

Walkable Residential Neighborhood zones of about 160 acres could be a way to replace some residential zones in developing suburban areas. These zones would permit the mix of residential building types and lot sizes found in a TND while still limiting density. Such zones, they could be called WRN Zones, for Walkable Residential Neighborhood, should include design controls and guidelines that can keep the variety of housing sizes and types in scale with each other (see figure 11.8).²⁵ These WRN zones can also be used to regulate both ‘tear-downs’ and infill development in older districts that are attracting new investment. Together with changes to the subdivision

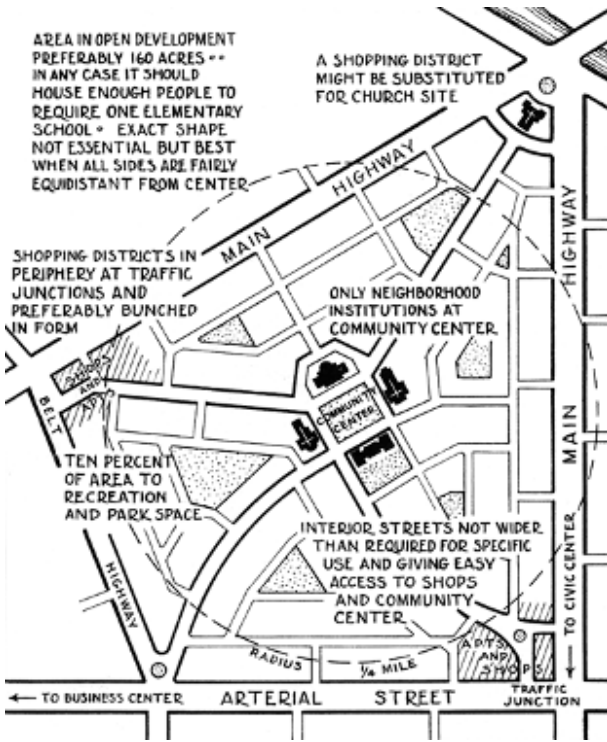


Figure 11.7. Clarence Perry's Diagram of a Neighborhood Unit, from the *Regional Plan for New York and New Jersey* of 1929.

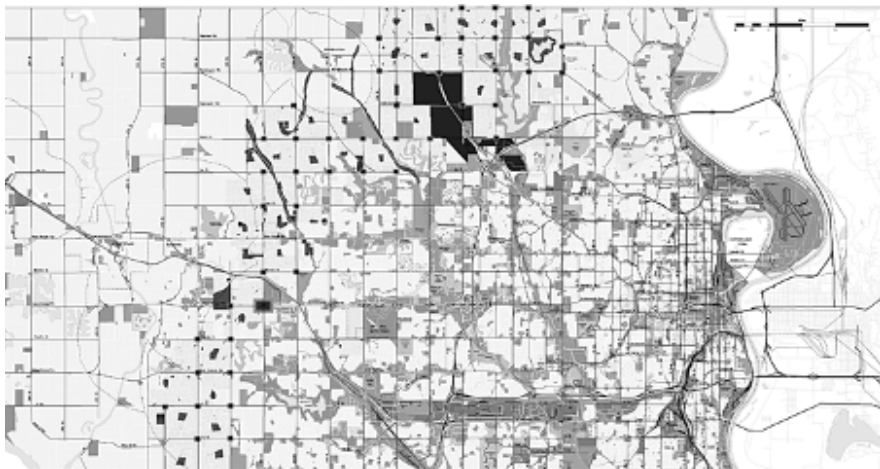


Figure 11.8. Diagram showing how an equivalent of Perry's neighbourhoods could be built in areas that will be annexed to the City of Omaha, Nebraska.

code outlined above, it would be possible to achieve the benefits of TND ordinances as standard practice, rather than as a special exception, with no need to go to an entirely new type of code.

Changes Needed in Commercial Zoning Codes

The principle behind all the changes needed in commercial zoning would be to move commercial development back in the direction of creating town and city centres, and away from single-use commercial zones. The result would eventually create a multi-centred urban region with enough intensity of development at each centre that they could be connected by transit systems as well as by streets and highways. Such a change is favoured by both planners and the real-estate industry, which is moving strongly in the direction of town-centre retailing with streets and mixed uses and away from isolated shopping malls and strip centres.

Commercial strip zoning along arterial streets needs to be remapped into a series of compact, walkable, park-once commercial districts at major cross streets, with lower density commercial or residential development in the intervening areas. It will take a generation or more for the current dysfunctional pattern to be replaced, but the effort will be repaid with higher commercial land values and much improved traffic patterns.

As super-regional shopping malls are constructed in each market, smaller, more ordinary malls lose their ability to compete. These malls were built on highly accessible sites, and are in good locations to be remapped as mixed-use urban centres, with offices and residential permitted as well as retail (see figure 11.9).

Some suburban office parks will remain as they are, but many of them are in locations where they could become the nucleus of a more balanced commercial district with shops and associated higher-density residential development.

Again, these new mixed-use districts need to be part of codes that include design controls to regulate the position and relationship of uses, and ensure good scale relationships.

Figure 11.9. Aerial view of Mizner Park in Boca Raton, Florida, where a failed shopping mall has been replaced with a walkable mixed-use district with retail, offices, and apartments, supported by parking garages.



Changes Needed in Industrial Zoning Codes

Existing industrial districts that are going through a transition to other uses need to be amended to mixed-use zones that permit some industry to remain, if it can operate safely in proximity to other uses, and otherwise promote a compatible mix of commercial and residential development. Making land available for industry and warehouses in developing areas shows the need for more effective regional planning, as this is a problem that cannot be solved effectively by individual localities acting on their own.

Changes Needed for All Zoning and Subdivision Codes

Most zoning codes base permissible development on land area, and for calculation purposes it is usually assumed that the land area is flat and uniform, like a billiard table. The late Ian McHarg perfected a relatively simple method of relating land area to its ecological carrying capacity as a way of making sure that land was not developed to the point where development began to destabilize the local ecological system. McHarg set forth these ideas in his famous book *Design with Nature*,²⁶ first published in 1969. His method was translated into zoning in the early 1980s by prototype ordinances in Bucks County, Pennsylvania and Lake County, Illinois. Ordinances on this principle discount the land area for zoning calculation purposes based on its sensitivity to development. Land under water, wetlands, steep slopes, and areas of unstable sub-soils are discounted, whereas stable, relatively flat upland areas are not. Many communities have recognized these issues in some way through zoning, but to be effective such zoning needs to be adopted by all communities in a region, as the ecosystem is not confined by jurisdictional boundaries.

Some time ago, I wrote a book entitled *Urban Design as Public Policy*.²⁷ One of the main points I made in that book was that development regulations, such as zoning codes and subdivision ordinances, usually determine what developers can build. Often the developer would prefer a different result and the public does not like what is being built either, but whatever achieves the maximum permissible development under the law is usually what is built. That leads us to the question: *If we get what we ask for, why can't we get what we want?*

Today it is understood that codes are a powerful influence on the built environment and that many development trends which are going wrong could be made to go better if the codes were improved. Chicago has just gone through a comprehensive revision of its codes, starting with adopting new text and then progressing to the maps. Denver, Portland, and other major US cities are in the process of revising their codes as well. The central question about codes in the United States today is whether zoning and subdivision codes can be made into more positive development controls, while

keeping protections of existing property values and remaining within established legal and constitutional requirements.

Notes

1. I have also written about the disillusionment with conventional zoning in my introduction to *Coding New Urbanism* (Congress for New Urbanism, 2004, pp. 1–7) and in ‘Regional Design: Local Codes as Cause and Cure of Sprawl’ (Barnett, 2001).
2. The Smart Code is a comprehensive rethinking of zoning based on intensity of development rather than land use. Its originator and major proponent has been Andres Duany. The latest text of The Smart Code can be read at www.smartcodecentral.com. Accessed 5 June 2009.
3. See, for example, Parolek *et al.*, 2008.
4. US Constitution, Fifth Amendment.
5. US Constitution, Fourteenth Amendment. The United States Supreme Court determined that the Takings Clause applies to state and local government decisions under the Fourteenth Amendment in, for example, *Chicago, Burlington & Quincy RR Co. v. Chicago*, 166 US 226 (1897).
6. See, for example, *Penn Central Transportation Co. v. New York City*, 438 US 104 (1978). The line between permissible and impermissible regulation remains complex and difficult to determine at the margins, in advance of final adjudication. See also note 19.
7. A comprehensive source on building codes is the website of the International Code Council: iccsafe.org.
8. A good basic text on zoning and subdivision is Salsich and Trynicchi, 2003.
9. See Weiss, 1997.
10. See Lewis, 1994; p. F03.
11. See Fogelson, 2003, p. 168.
12. Originally published in 1929 by Ives Washburn; reprinted in 1986 by Princeton Architectural Press; a Dover Books on Architecture reprint is also available published in 2005.
13. The Commissioners Plan adopted by the New York State Legislature in 1811 set forth the familiar pattern of rectangular blocks and numbered streets and avenues north of the lower Manhattan street plan which had already developed. Broadway, following the route of the highway that connected the original Manhattan settlement to Albany, is a famous exception to the grid plan for much of its distance within Manhattan.
14. *Plan of Chicago* by Daniel H. Burnham and Edward H. Bennett, edited by Charles Moore, originally published by the Commercial Club of Chicago, 1909. A Da Capo Press reprint was published in 1970.
15. Fisher (1970 [1909]).
16. For a more complete account, see Knack, *et al.*, 1996.
17. For example, segregating houses by the size of the lot, which is a way of segregating by cost, separating apartments from houses, separating residential and commercial uses which depend on each other for viability.
18. A good account of this dispute can be found in Jacob, 1971.
19. Architectural critic Paul Goldberger commented on the significance of this case after the retirement of the author of the majority opinion, Justice William J. Brennan, Jr. Goldberger’s article originally appeared in the *New York Times*, 16 September 1990, and was reprinted in *The Journal of Supreme Court History*, 1991. Law in the United States continues to change as a result of successive court decisions, so this one case, although significant, does not necessarily define how a court would decide this issue today.
20. See Governor’s Office of Planning and Research (1998).
21. See note 2 above.
22. Under Planned Unit Development, which the Walton County code includes, specific plans can be approved for a development that is within a property under single ownership.
23. The newsletter *New Urban News* keeps a tally which is currently well over 400.
24. For example, *Smart Code Charrette Client Manual*, Hurley-Franks, 2007. See www.smartcodecomplete.com/.../SmartCodeCustomization_070819.pdf, accessed 11 July 2010.

25. An optional WRN Zone has recently been added to the zoning code of Omaha, Nebraska. It has particular applicability as new areas are annexed to the City.
26. *Design with Nature* by Ian McHarg, Museum of Natural History, 1969. A paperback edition, reduced in size, was published by Doubleday in 1970. An edition was published by Wiley in 1995 to celebrate the 25th anniversary of the book's first publication.
27. See Barnett, 1974.

Chapter Twelve

Conclusions

Stephen Marshall

In the preceding chapters we have seen a diversity of traditions of urban coding and planning that have helped to create the ziggurat-like skyscrapers of New York, recreate traditional-style Kyoto teahouses, or crystallize Edinburgh's 'cold eternity of lime and stone' (see chapters 11, 7 and 3, respectively). Yet, despite the diversity of contexts and outcomes, there are some common themes, that are worthy of further examination and reflection. This concluding chapter aims to bring together a selection of these themes and suggest possibilities for future coding and planning.

Each of the preceding chapters already tells its own story in terms of its place and time, and each already has its own conclusions appropriate to its particular context. The intention here, therefore, is not to attempt a comprehensive synopsis of messages from the preceding chapters, but to provide a selective synthesis of some emerging themes and lessons concerning urban coding and planning in general.

The chapter is arranged in two principal parts. In the first part, we round up findings from preceding chapters relating to codes' purposes, content, format; the relationship between coding and planning; traditionalism versus modernism; and social perspectives. This should help to answer the questions set out in the introduction to this book. In the second part, we extend discussion to the possible future development of coding and planning, on five fronts: inter-professional roles; the nature of 'interlocking urbanism'; the potential for 'street-based urbanism'; neighbourhood blocks; and the possibilities for 'generative urbanism'. This is followed by some concluding reflections on the nature and potential of urban coding.

Lessons from Coding and Planning Traditions

In this book we have seen a variety of codes from different parts of the world, including

building codes, design codes, development codes, subdivision codes and zoning codes. These include codes that may be rather abstract, akin to planning regulations or civil laws; on the other hand, they include the very definitely physical cases of form-based coding, specifying details of materials and configurations of building components. Codes may also be associated with ordinances, building acts, royal proclamations, assizes, modules and mandalas, urban design guidelines and Statements of Desired Future Character.

From study of the preceding chapters, it appears that there is no single definition of coding, but rather a variety of concepts and definitions that coexist and overlap. It seems unnecessary here to try to force coding into one particular category or single definition, given we would not insist on the same for, say, planning or urban design. Yet some exploration of the purpose, nature and scope of codes is useful, in the light of the cases explored in preceding chapters.

Purposes

The purposes of codes, as seen in this book, may be assembled into three very broad categories. First, there are codes with utilitarian purposes, concerning issues to do with 'health and safety' (especially, fire prevention), and protection from nuisance. These are closely associated with the utilitarian purposes of town planning. A second broad range of purposes is to do with the nature of the urban fabric, concerning the creation or preservation of areas of particular character; or the promotion of architectural appearance, with physical 'variety with harmony'. These purposes are closely associated with what we would now call urban design, although they too have traditionally been part and parcel of the town planning agenda. A third kind of purpose is to do with social ends: the promotion of a spatial structure commensurate with a particular kind of social order; or the promotion of neighbourhood sense of identity and social solidarity. These could be identified with the 'utopian' tradition in town planning. Taken together, this range of purposes suggests that coding is not just about aesthetics or micro-management of site use; all the above purposes could be said to be consistent with the general prerogative of planning.¹

Content of Codes

We have seen a wide range of urban components that are associated with coding of one sort or another. A range of examples is shown in table 12.1. These focus on regulation of physical components, rather than use. Yet the list encompasses a breadth of architecture, urban design and planning related topics. In other words, rather than simply being a narrow, specialist component of planning, codes could in principle account for a large proportion of what is controlled by professionals in the built environment.

Format

Like other planning instruments, codes may be expressed in written or graphic form. Unlike building plans or urban master plans, however, the generic nature of codes means that components illustrated – such as doorway details or building types – do not represent any particular designed item to be built in a particular location, but may apply to any number of designs in any location within the purview of the code. For example,

Table 12.1. Framework for coded elements, with examples of coding in the book.

<i>Scope</i>	<i>Types of Elements</i>	<i>Relations between Elements</i>	<i>Qualitative Specifications (materials, etc.)</i>	<i>Quantitative Specifications (dimensions, etc.)</i>
Settlement	Classification of towns and cities (5)	Location: relation to natural features (mountains, plains, rivers, coasts, etc.) (4, 5)	Townscape (7, 8)	Relative size of settlements (5)
Quarters, plots and land subdivision	Types of land (9) Subdivision into quarters of different types (5) Ward or superblock as unit (10) Plot type (9)	Relation of parts to centre of city (4) Subdivision of land (4, 9, 11) Subdivision of plots (7) Unification of plots (7)	Landscaping (11) Use of block interior (4)	Lot size (4, 8, 11) Plot width (3, 8) Maximum site cover (8) Minimum green space (8) Plot ratio (8,9) Buildable area (9) Percentage coverage (11)
Streets and public spaces	Street layout type (4, 5) Street type (2, 4, 9) Footpaths (2, 5, 11)	Relation of public highway and private property (9) Relation of stairs, stair towers, to street (3)	Pedestrian amenity (8) Street furniture (8) Trees, planting (4, 8)	Road or street width (2, 3, 4, 5, 11), in relation to building height (3) Plaza dimensions (4) Width of footway or pedestrian passage (arcade) (3, 4)
Buildings	Building type (4, 9, 11) House type (2, 10)	Building lines (2, 7, 9) Building placement relative to road, street or square (4, 9) Building placement (on plot) (4, 9, 11) Separation of buildings (4) Setbacks (3, 8, 11)	Appearance of buildings (3, 4, 9) Scale, quality, character (8) Architectural principles (9) Standards for light and air (11)	Building size (3, 6) Floor to size ratio; floor area ratio (7, 8, 9, 11) Total floor area (6) Building height limit or number of storeys (3, 4, 7, 9, 11) Building or storey height relative to street type or width (3, 4)
Building components (use, placement, prescription or proscription)	Standard bricks (2) Structural components (3) Elevations, façades (5, 9) Roof type (6, 9) Arcades, jetties, porches, verandas, balconies and canopies (2, 3, 4, 8, 11) Gables, cornices (3, 9) Wall and roof panels (10)	Structural configurations (6) Placement of doors (3) Placement of windows (3, 9) Rooms to have windows (11) Roofs to have gutters (2) Front wall to form parapet (2)	Materials (2, 3, 5, 6, 7, 9, 10, 11) Ornament or decoration (3, 4, 6) Thatch to be whitewashed (2)	Room size (11) Thickness of walls (2, 11) Roof pitches (3, 11) Size of windows, roofs and eaves (7) Specifications relating to jetties (2, 3) Window frame recesses (2)

Note: This table is not intended to be an exhaustive synopsis of all codes and regulations in this book, but is intended to illustrate the range of types of things coded for. The content of the table is selective, focusing on physical components, rather than regulation of land use or other activities. Numbers relate to chapters: (2) London; (3) Scotland; (4) Latin America; (5) India; (6) China; (7) Kyoto; (8) Adelaide; (9) France; (10) South Africa; (11) USA.

the *Vastu Vidya* uses codified terms and diagrams, not scale drawings, the mandala being a mental map rather than a ground plan. There is an emphasis on the expression of relationships between elements; or the use of models or prototypes, adapted to site (see chapters 5, 6 and 8).

The use of graphical devices – providing ‘imageability’ and ‘legibility’ – can assist the comprehension of what is allowed or required to be built, which can help engage with members of the public who might otherwise be put off by the small print and professional jargon of other kinds of planning instrument. That said, coding does not necessarily involve graphic expression, and as Vibhuti Sachdev notes in chapter 5, may even imply ‘generic principles rather than drawings’. A code could be in the form of written instructions, and even a grid layout can be specified by a written text rather than a blueprint, as in the Laws of the Indies (see chapter 4).

At heart, the issue at stake – coding versus planning – is not so much whether the format is written or illustrated, but the nature of what a code or plan is and does. What is at stake is whether a given instrument is referring to a finite product at a specific location (whether described in text or drawn on plan) or whether it is a generic type of urban component, rule or standard (whether expressed textually or depicted graphically). In other words, it is the nature of a plan to refer to a specific location (and perhaps target date), while it is the nature of a code to be a generic type of rule or standard, applicable over time and space more generally.

The Relationship between Coding and Planning

Whatever the definition of coding, it is clear that coding is distinct from planning in its specific sense of ‘ground planning’, yet at the same time part of the wider package of planning, that includes not only ground planning and coding, but zoning, development control, location policy and so on (chapter 1). And so, while in principle coding is separable from planning, the two in practice tend to go together, hand in glove.

As we have seen, Seaside’s ground plan is conceptually separable from its code, but in practice, the two work together, to create the new settlement (figures 1.2 and 1.3). London’s 1667 code, although an alternative to an idealized master plan, was in the end associated with an actual ground plan – with the existing pattern of streets acting as a template (chapter 2). Both Nick Green and Charles McKean conclude that it is the combination of code and plan that has proved powerful (chapters 2 and 3). In chapter 9, Karl Kropf suggests that coding is ‘integral to planning’, while Yoshihiko Baba (chapter 7) notes in the case of Kyoto that the code can augment the plan, elaborating special details. Qinghua Guo in chapter 6 interprets Beijing as an integrated case of master planning plus use of building codes, where the overall framework and state buildings’ locations are decided by master plan; while the ‘infill’ of private dwellings is borne of a combination of traditional practice and regulation.

Coding, in a sense, provides a framework within which individual designers can work. Although it is sometimes associated with prescription and constraint, it is in a sense no more constraining than, say, a ground plan specifying streets whose location, width and plot-bounding similarly act as constraint to development. Coding for building lines and spacing between buildings simply extends the control of the layout plan within the private plots; meanwhile, a height limit is, in effect, just another bounding 'grid line', albeit in the third dimension.

Tradition and Modernity

Codes are sometimes associated with traditional style urban design, both because of their contribution to historic urbanism and their revival in the neo-traditional context of New Urbanism. However, as noted in the Introduction, codes have also been used in the modern era, whether in the specification of modern building standards or modern road layout conventions. Therefore, there is not an intrinsic tendency or bias towards the traditional. Coding can be either traditionalist or modernist – just as one could say of architecture or planning.

Codes in fact lend themselves to a combination of tradition and innovation. On the one hand, codes can be said to promote continuity with existing types and norms, they may also be regarded as 'urban memory-structures' or 'repositories of learning' (Shane, 2005, cited in chapter 7; see also chapter 9). We have seen that codes may be identified with historic traditions such as *Vāstu Vidya* in India, or associated with traditional community practices such as *machizukuri* in Japan. On the other hand, codes can be seen as prospective, proactive devices, often used to usher in new standards and formats. The post-fire building codes in London were, after all, aiming to break with an all too combustible past. In prescribing new building formats and banning romantic old straggling façades and overhanging structures, these codes were the functionalist, modernist tools of their day (as noted in Carmona *et al.*, 2006b, p. 214). Similarly, Charles McKean refers to a 'new urbanism' in Enlightenment Scotland, ushering in a new built order, associated with a new society; again, a break with the past.

This tradition of breaking with the past continues, of course. Twentieth-century Modernism tended to promote open-plan layouts with 'pavilion' type (stand-alone) buildings, in use-segregated land parcels or zones, separated by roads. In many countries, new developments have been created using modern codes imported from elsewhere. Conversely, old codes have been supplanted, suppressed or abandoned. As Vibhuti Sachdev has pointed out, modern codes prohibit or hinder building traditional courtyard housing; while *Vāstu Vidya* is not taught in architecture schools (see chapter 5).

But the pendulum swings back again, as Barrie Shelton has noted of Adelaide (chapter 8). Old Modernism gives way to something new once more. Once more, codes can be used to promote and preserve more traditional formats, as we have seen

in the case of Kyoto, where codes specifically promote traditional types and materials, in the form of the traditional wooden townhouses and ‘teahouses’.

Social Perspectives

In the Introduction, some critiques were aired, with respect to social agendas being served (or not served) by coding, within the context of contemporary New Urbanism in the United States. Here, we can reflect on the different angles of social agendas addressed by the codes in this book.

While codes may give power to those who create or control them, it seems that codes are not intrinsically any more power-concentrating or controlling than any other kind of planning or public policy instrument. Nor are codes intrinsically socially conservative or progressive. Care is needed when interpreting from historic cases, but at the very least a variety of different tendencies is detectable. In some cases, historic traditions were geared to accommodating all members of society, whereas in modern cities we find segregation or exclusion (e.g. Gurgaon, see chapter 5). Of course, having a place for all members of society does not necessarily mean an equal society. We have seen that some historic codes assumed or actively promoted a stratification of social classes, as in Kyoto and Edinburgh. But, while some historic codes are associated with what would now be considered undesirable social segregation, this is not to say that we cannot benefit from the spatial and physical order those codes provided – for example, Edinburgh’s legacy of dense but leafy Georgian urbanism, with human-scale spaces, that can be appreciated by all. In other words, we can still learn from historic codes as a means of creating desirable physical fabrics, even if we no longer identify with their original social purposes.

We have seen some interesting cases in which codes are related to particular kinds of social unit or social organization. As Qinghau Guo points out in chapter 6, in Beijing, historically, the courtyard block was seen as the basic unit of social organization – not just a building type but a way of life. In the case of contemporary Kyoto, codes are associated with democratic community governance (see chapter 7). In chapter 10 Gerald Steyn advances the case for the superblock as a future unit of social organization in informal settlements in South Africa.

Coding is not just about the built product, but the process, and here too we can see engagement with the social perspective. The process of coding can be configured to allow a participative element. In chapter 7, in the case of Kyoto, we have seen the participative element in the form of community involvement, associated with local politics and decision-making. Gerald Steyn demonstrates two ways in which coding can potentially help empower marginalized members of society: first, through the potential shift in division of labour from professional architect to self-builder, enabled by codes and incremental design processes; and secondly, through the graphic style of

presentation of codes which can assist greater participation by those with lower levels of literacy.

It seems that there is no reason why codes cannot be as democratic, inclusive or socially progressive as any other kind of planning instrument. And, just as Jill Grant (2006, pp. 220, 221) suggests that planning should be about promoting 'collaborative methods to transform existing power dynamics and empower local people', Matthew Carmona (2009, p. 2664) proposes that codes can be tools for 'consensus-building within a zone of productive negotiation'. In other words, coding can be part of the solution to the problem of planning.

Future Coding and Planning

In this book, the authors have noted possible ways forward for coding and planning appropriate for the contexts of their particular chapters. Here, we pick up on some selected elements and elaborate on these in terms of possible future applications. They are mainly concerned with issues following from the intrinsic nature of codes (to do with generic specifications), rather than content relating to specific properties or purposes (such as density or ecology or aesthetics) which could be desirable in variable degrees and achieved by a variety of means. The suggestions here are necessarily general, as they are drawn from themes and messages extracted from their historical and geographical contexts, but they could be applicable to a variety of circumstances. Some of the suggestions are speculative and, although they build from the work of the authors of preceding chapters, they do not necessarily represent the opinions of those authors. Five suggestions are made here: (i) inter-professional roles; (ii) 'interlocking urbanism'; (iii) 'street-based urbanism'; (iv) neighbourhood blocks; and (v) 'generative urbanism'.

Inter-Professional Roles

As noted in the Introduction, codes tend to engage a range of 'urban design professions' – architects, planners, engineers, environmental designers, and so on. Additionally, within the book, we have seen a variety of other actors involved in writing or applying urban codes, including landowners and priests, builders and masons, community associations and self-builders (see, for example, chapters 2 and 5). Despite this diversity, there is a basic mechanism in play: codes are in principle written by one party, with designs carried out to specification by another party or parties. In other words, there is a split between the roles of 'code-writer' and 'designer', where the designer could be an urban designer, building designer, road designer, and so on.

Conventionally, professional roles are readily identified with the production of particular elements in the built environment: a town planner plans towns; an architect designs buildings; a road engineer designs roads.² But because codes can cut across

different scales and between different types of element (for example, the rows in table 12.1) they have the potential to shake up this established order and the assumptions about which profession designs what. In other words, the involvement of coding could give more options for different kinds of actor in the design process (figure 12.1).³

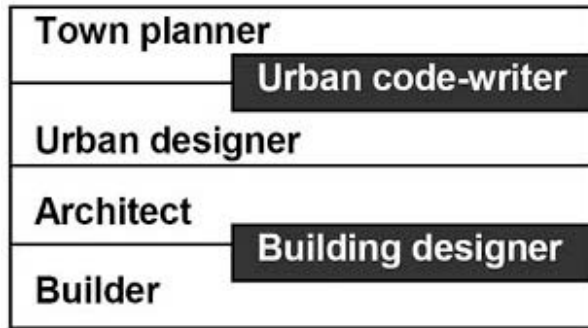


Figure 12.1. Inter-professional roles. An interpretation of the spectrum of built environment professionals.

The emergence of a newly distinct professional role of urban code-writer or ‘urban coder’ (separate from architect, planner or urban designer) could embody a shift in division of creative labour. This might involve the code-writer taking on roles traditionally practised by architects and town planners, and perhaps the combination of urban code-writers and building designers ‘squeezing’ the territory conventionally occupied by architects. Arguably, the greater the architectural specification that goes into the coding itself, the greater the potential that non-architects – including self-builders – could contribute to the design of buildings, by following the code.

This situation reflects some kinds of tradition, where the builder or mason had more creative control, relative to the architect, as noted by Vibhuti Sachdev (chapter 5). Conversely, professionals (whether architects or planners) could perform an advisory role, to assist local people build their own dwellings, as suggested by Gerald Steyn (chapter 10). This situation could reflect historic vernacular practices of building following coding traditions. But, rather than a case of ‘architecture without architects’ (Rudofsky, 1965), we could have a collaboration between building designers and code-writers, either or both of whom might be trained as architects.

As long as codes are interpreted as being the instruments of planners, the advance of coding could be seen as curbing the influence of architects. But if codes are created by architects, they could be regarded as extending the influence of architects into the wider urban fabric and layout – areas conventionally dealt with by planners. So, codes are not intrinsically pro-architect or pro-planner, but could be seen as aids to better integration, whatever the original training of the code-writer.

Overall, the different professions (shown in figure 12.1) could employ codes to help integration between levels (as in table 12.1), and so create an intense interplay of

roles and relationships within the design of the built environment. As such, the design and relation of buildings to each other and to public spaces could become almost as integrated a process as the design of rooms and corridors in a building.

Interlocking Urbanism

We have already seen that the scope of codes relates to elements at a range of levels or scales. We can also see that coding refers to relationships between elements, as seen in table 12.1. In effect, the configuration of elements at one scale contributes to the design of integrated components at the next scale up. For example, the combination of buildings and public space creates a certain street type; or the combination of walls, doors and windows creates a façade.

However, in the classic modernist model of open-plan layouts with stand-alone buildings and frontage-free roads, elements have often been designed in isolation from each other. That is, one could get by with planners laying out the land subdivisions, road engineers designing the roads, and architects designing the buildings. For example, figure 12.2 *left* shows a uniform grid of roads and plots, within which each building might be individually designed by a different architect. Such an arrangement does not necessarily require urban designers or street designers *per se*.

In contrast, in traditional (and neo-traditional) street-based urban fabrics, there is an interlocking relationship between ensembles of buildings, streets and public spaces (figure 12.2 *middle*). Coding has an affinity with this kind of interlocking urbanism, which we have seen, for example, in the case of streets and porticos and arcades in London (chapter 2) and Latin America (chapter 4). Figure 12.2 *right* demonstrates the specification of elements (front porches and placement of a line of trees) that could create a unified street design. It is simultaneously an architectural and urban specification.

Figure 12.2 represents the sense of interlocking components found in Christopher Alexander and colleagues' *Pattern Language* (Alexander *et al.*, 1977). That is to say,

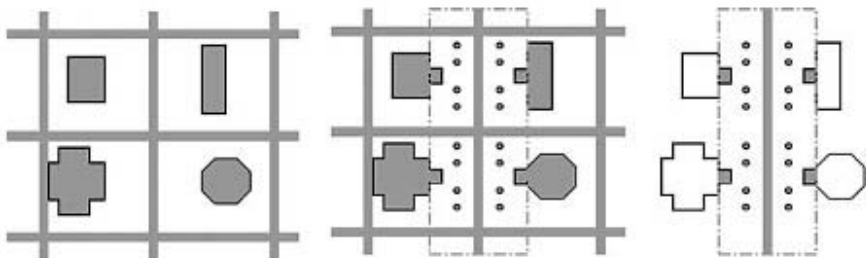


Figure 12.2. Interlocking urbanism. (*left*) Not interlocking: buildings designed independently of each other; (*middle*) Interlocking: the street type (boulevard with porches) is a combination of road, plot and building design; (*right*) The elements constituting the street type, suitable for specification in a code.

elements tend to be composed of smaller subsidiary elements, and in turn contribute to larger elements, or larger wholes. In figure 12.2 *right* the design of the buildings (the porches upfront) interlocks with the design of the 'boulevard'. The boulevard here is a 'larger whole' supported by the design of the buildings. Interestingly, the code specification relates to components – front porches, in this case – that are parts of buildings and in this sense sub-building scale. But their intended effect is towards the larger whole that is the boulevard.

This interplay across scales could help solve a problem highlighted by Christopher Alexander in his classic essay, *A City is Not a Tree*. This is the problem of an oversimplistic hierarchical organization of the urban environment, which does not allow for a rich complexity of overlapping elements; and the apparent difficulty of urban planners and designers in being able to conceive and deliver such complex overlapping arrangements on the ground (Alexander, 1966). While one solution would be to have a single 'street designer' tasked with creating the overlapping whole that is the street, a street could alternatively be created by a street 'code-writer'. Looking at figure 12.2 again, we could say the street is created by the combination of a 'street code-writer' and the designers of the individual buildings and roads and other public areas. The street emerges as an element, the product of several hands. To reverse an analogy suggested in the Introduction, the street code-writer is like an editor of a book or journal, and the building and road designers correspond to the individual authors. The point here is that we can obtain a street (book) without necessarily having a single street designer (book-author), but a combination of code-writer (editor) and individual contributing building designers (chapter authors). There is no overall street-designer (book-author), but the overall product is still an integrated street (book). The task of the code-writer becomes one of setting out formally and explicitly the design elements and relationships that individual designers would use intuitively in an equivalent all-of-a-piece design.

Street-Based Urbanism

A street is an integrated whole comprising a road, associated public space and adjoining buildings. The street in turn can be seen as a composite unit, or building-block for larger scale urbanism. Clearly, in a physical sense, streets multiplied up create urban fabric. But the street need not be only a physical building-block; it could also serve as a unit of land-use planning, rather than the conventional zone. Here, the street type may be represented as a cross-sectional unit or cell (figure 12.3 *top*) that generates a kind of linear, micro-scale zone (figure 12.3 *left*). The street and its associated plots and buildings become a two-dimensional unit that, multiplied up, fills out the whole ground plan (figure 12.3 *right*).

There are various ways that the 'street as linear zone' could be realized. In chapter 9 we saw some examples of how this has actually been done in practice, in France. For

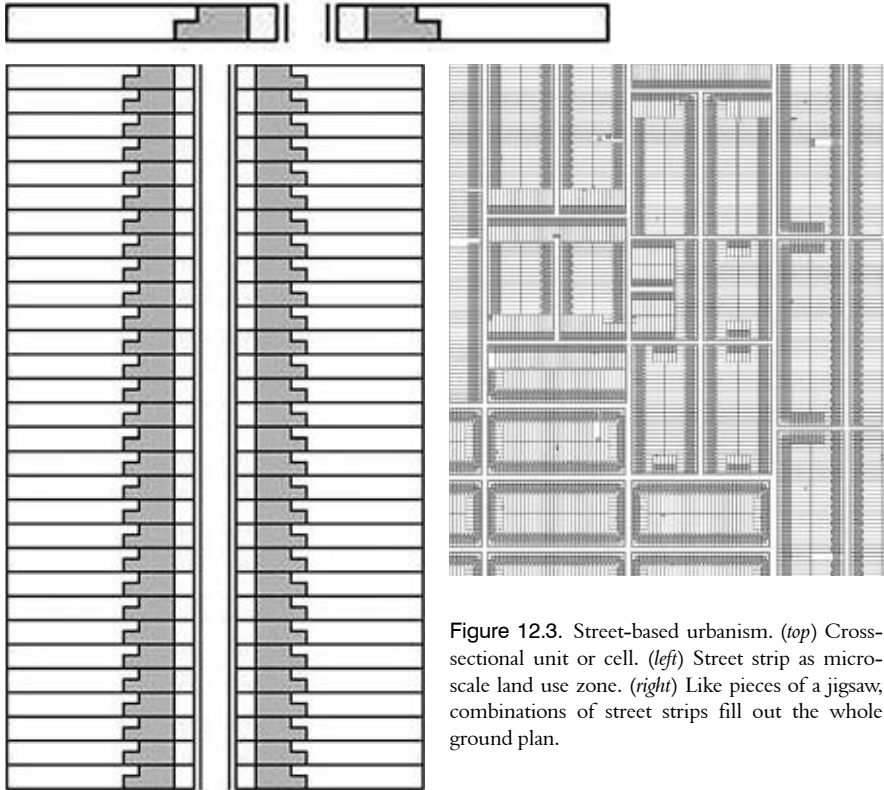


Figure 12.3. Street-based urbanism. (top) Cross-sectional unit or cell. (left) Street strip as micro-scale land use zone. (right) Like pieces of a jigsaw, combinations of street strips fill out the whole ground plan.

example, in the case of the Paris map (figure 9.4), we have consistent street frontages plus mixed-use blocks. Another form of linear zoning is seen in the case of the United States (chapter 11). This invites us to be cautious when applying the idea, since this ‘commercial strip zoning’ is seen in that context as part of the problem, due to being auto-oriented. While Jonathan Barnett criticizes the particular form and working of these in the US context, the problem lies in the content (which tends to produce car-dominated, pedestrian-unfriendly environments) rather than the format itself. Instead, it should be possible to have linear street-based ‘zoning’ that is pedestrian-oriented or transit-oriented rather than car-oriented linear zones. This would be compatible with Barnett’s suggestions for transit-oriented, pedestrian-friendly street grids, and also with the idea of a ‘transit-oriented street hierarchy’.⁴

Moreover, different street types could be connected together in a variety of ways to create particular kinds of urban structure. This could take advantage of the typical relationships between morphological arrangements of buildings and plots and streets of different types – a kind of ‘street syntax’ – but codified in terms of the allowable and necessary connections between street type and building type.⁵

So a new generation of codes for street type could be created, which could combine

the idea of street as physical format, street as land-use zone, and street as component of wider urban structure. In terms of physical form, this would address building line treatment and other items under 'relations between buildings' as well as 'streets and public space' (table 12.1). In terms of land use, street types associated with particular uses (shopping street, residential street) would connect together naturally to create mixed-use blocks. Overall, the street code would serve to mediate between the interests of the private stakeholders (e.g. individual building owners) and the wider public interest (including through passage along the street) (Marshall, 2005a, pp. 239–242).

Neighbourhood Blocks

Various contributors in this book have pointed to the courtyard house or block as a unit for social organization. In the case of Beijing (chapter 6), we have seen the block comprising a series of private dwellings, around a communal space or courtyard. In the case of South Africa (chapter 10), the focus was on the superblock as a potential unit, modelled on social units grouped roughly along lines of small communities, perhaps extended families.⁶

Traditional courtyard housing and communal blocks may seem somewhat removed from contexts where modern suburban development is typified by low-density, stand-alone, single-family dwellings. Yet, there are potential connections. For a start, co-housing, a modern concept involving shared use of communal facilities, has been applied in the United States as well as Europe (see, for example, ScottHanson and ScottHanson, 2005; Williams, 2005a, 2005b). Gated communities can also involve elements of communal living, facilities, and micro-level governance of one sort or another.⁷

In any of these contexts – traditional or modern – codes could help to create (or recreate) urbanism based on communal blocks. Block codes would regulate elements pertaining to 'quarters, plots and land subdivision' and relations between buildings and building components, especially with regard to the block interior (table 12.1).

Rather than having a single architect designing the whole block, or individual architects independently designing each building, a 'block architect' (or more strictly 'block code-writer') would co-ordinate the design on behalf of the block dwellers communally. This could involve a small community organization as seen in the case of Kyoto – of the order of twenty to forty households – that would be a communal decision-making entity on whose behalf the block architect (or code-writer) would act. The code could be agreed through a block community association, and indeed could involve participatory design mediation, perhaps using internet communication technologies. The point at stake here is the ability of codes to mediate between individual interests towards a communal goal, where the scale of the block is large

enough to require some sort of formal co-ordination, but small enough that there is a concrete common interest and an immediate prospect of participation of all concerned. This points to the capacity of the urban block to act as a *social* as well as physical building-block of urbanism.⁸

Planning theory has periodically attempted to use the concept of the neighbourhood as a basic unit of socio-spatial organization, intermediate between the individual house(hold) and a whole settlement or society. However, in the contemporary context in which individuals' social networks tend to be less tied to specific self-contained spatial locations, the conventional (district-scale) neighbourhood seems problematic, both in theory and practice.⁹ But perhaps the urban block could be the new, micro-scale 'neighbourhood cell'.

An urban block allows a combination of public, private and communal space – the last of these being space common only to those occupying the block itself (figure 12.4 *left*). This format echoes the broad logic of Clarence Perry's original neighbourhood unit (retail and principal circulation on the outside, civic on the inside) but on a smaller scale. Rather than a conventional district-sized neighbourhood based on the catchment areas of local schools, shops and district-wide social organizations, it is suggested that the block could provide a better prospect for a 'community of neighbours' where social interaction would take place in the use of shared facilities such as laundry, gym or shared workspace or childcare.¹⁰

Despite the quotidian simplicity of the rectangular block or enclosed courtyard, there are several alternative permutations to choose from (figure 12.4 *right*), and when alternatives are considered fully in three dimensions, a fantastic range of types and

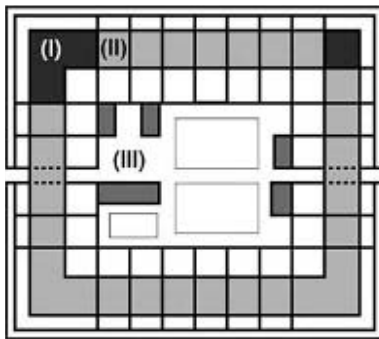
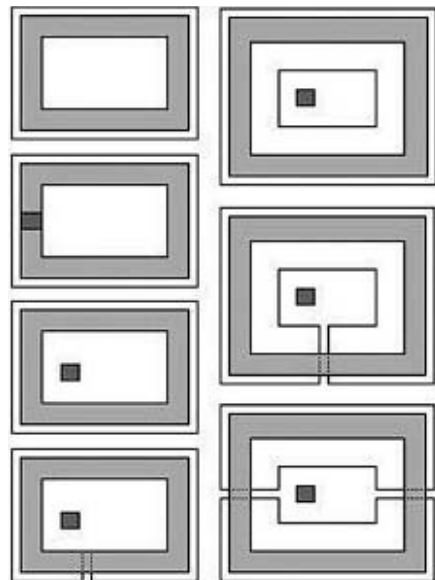


Figure 12.4. Neighbourhood blocks, controlled by communal codes. (*left*) Urban block as neighbourhood cell: (I) Retail and other uses requiring public access; (II) private residences with front and back gardens; (III) Communal uses (laundry, gym, shared work or childcare space, shed for maintenance and gardening equipment, sport court, allotments, etc.); (*right*) Alternative block topologies.



morphologies is possible (see, for example, Petruccioli, 2006). These can fit a diversity of types of social and functional organization, each adaptable in detail to a variety of contexts, whether extended families in traditional courtyards or modern co-housing communities.

Generative Urbanism

Codes could be used in a generative fashion, to specify generic urban elements and relationships, such as building type, how buildings relate to different kinds of street, and so on, but without an overall plan (master plan or ground plan).¹¹ A generative code could involve any or all of the elements in table 12.1 (below the first row, settlement scale). A generative code would be able to create, to use Jean-François Lejeune's phrase, 'a quasi-infinite amount of variations around a theme' (see chapter 4). In this case, the coded elements and relationships would be controlled, but the overall form would be *emergent*.¹² An emergent form or structure is one possessing constituent features or overall qualities that are not explicitly specified in (nor necessarily anticipated from) their mode of creation (e.g. rules of construction or location). An example of an emergent urban structure could be a spontaneously occurring concentric settlement pattern which might appear to possess order in retrospect but which was not specified as such in advance. This is in contrast to a conventional urban design or planned settlement in which there is a one-to-one relationship between blueprint and final product. Generative urbanism and emergent urbanism could be seen as two sides of the same coin, where the programme or process is generative, and the pattern or product is emergent.¹³

Ideas for both 'generative urbanism' and 'emergent urbanism' have been around for some time (not necessarily under those labels); the challenge is to convert these abstract ideas to specific design processes or planning instruments for general application. Work in this area is taking place on various fronts, including the development of generative codes by Christopher Alexander, Michael Mehaffy and others, where the codes are used (or could be used) in lieu of master plans, where the overall form unfolds from internal rules, and where neighbourhoods (if any) are emergent (Alexander *et al.*, 2008; Mehaffy, 2008; Mehaffy *et al.*, 2010). Elsewhere, the possibility of generating urban layout structure using street-based coding rules is being explored. To help combat the uncertainties of operating without fixed master plans, simulations can be used to test what the outcomes might be, to help anticipate in advance the possible emergent effects of different codes (figure 12.5).¹⁴

The prospect of generative codes leading to emergent urban order points to the potential for coding to stand alone, without the need for its higher profile sibling, planning, and hence provide an alternative to conventional planning. Alternatively, generative codes could be used in conjunction with a degree of planning in the form of

development control, but still with no premeditated master plan. Either way, the code would be the primary generator of urban form, and this kind of generative urbanism could help realize the prospect of a ‘new kind of city-making’ (Plater-Zyberk, 2008).

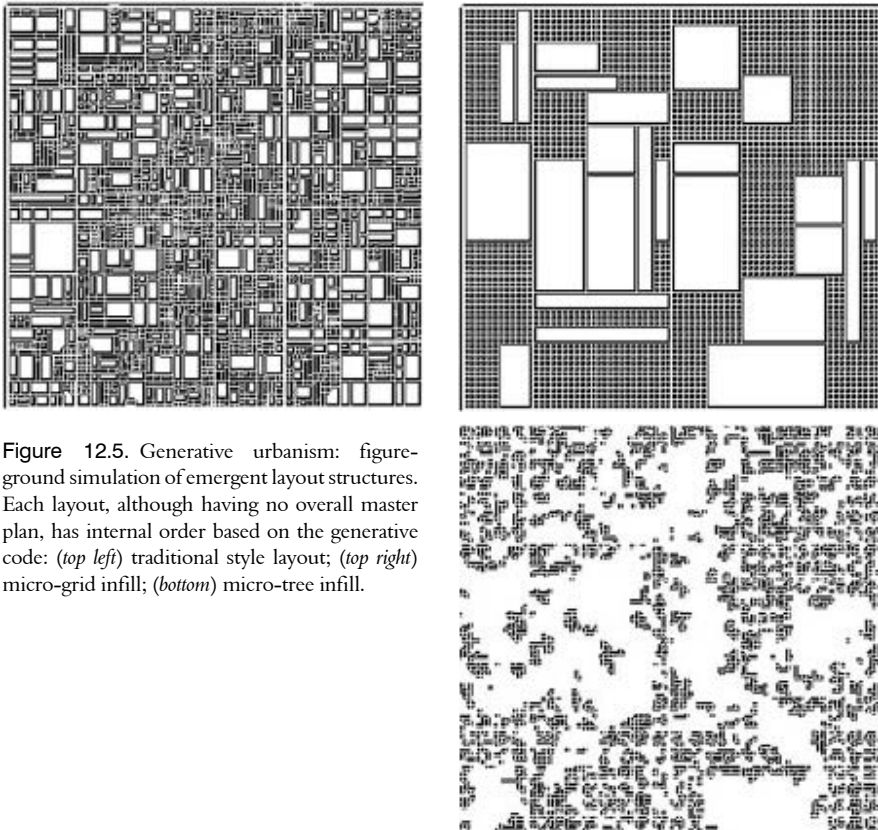


Figure 12.5. Generative urbanism: figure-ground simulation of emergent layout structures. Each layout, although having no overall master plan, has internal order based on the generative code: (top left) traditional style layout; (top right) micro-grid infill; (bottom) micro-tree infill.

Concluding Remarks

Urban codes have helped to create a diversity of successful urban places around the world: whether the ‘organic’ historic townscape of Siena, the more modern cityscape of Manhattan, the compact, mixed-use urbanism of Bloomsbury, or the architectural order and idiosyncrasy of Seaside. There is no single formula for success. Codes by themselves are not the only way forward, but can be an active ingredient in the solution.

Urban codes do not just deal with physical form, they can also regulate land use and other issues associated with ‘planning’. They can help create the ‘uniformity amidst variety’ associated with both aesthetic ideals and the mediation between individual and collective interests. Codes are not just about traditional urban fabrics but – like

architecture and planning – can be applied in modern formats too. Codes are not necessarily conservative of established social and political order, but can contribute to promoting progressive agendas for social equity and empowerment. Codes can operate in conjunction with conventional town planning and architecture, and also have the potential to offer alternatives to the conventional division of labour between the built environment professions, with different combinations of urban code-writers and building designers. Ultimately, we have seen the prospect of generative urbanism, where codes at the level of streets and blocks could be the primary proactive influence on urban form, even in the absence of overall master planning.

The essential aspect of codes as generic specifications naturally tends to promote a combination of flexibility and continuity over time, and coherence across scales and between multiple actors. Above all, it seems that codes are able to contribute to the creation of overlapping, interlocking urbanism associated with traditional, street-based urban fabrics: that is, where the designs of buildings and streets and blocks are interwoven with each other. Here, the street functions as an urban place and linear land-use zone, and the block can act as a unit of social organization, multiplied up to create a mixed-use urban structure. This is in contrast to the conventional modernist model of mono-use zones and district-size neighbourhood units separated by frontage-free distributor roads, assembled in a master plan. Code-based urbanism does not preclude modernity in architecture or anything else. But it has an interlocking complexity to it, operating across scales of design in three dimensions, that was absent from the theory and practice of the modernist zonal planning that has shaped so many of our towns and cities since the middle of the twentieth century. Codes can help redress this absence. A new generation of codes, informed from a diversity of traditions, can help create better urbanism in planning contexts around the world.

Notes

1. For the first group of purposes, see for example chapters 7, 2, and 11; for the second group, see chapters 7, 9, 6 and 3; for the third group, see particularly chapters 3 and 7.
2. Actually, we could state this the other way round, and say that the things we tend to regard as being definite identifiable components of the built environment are those things that are *designed*, as such. There is a definite relationship, therefore, between the designer, the design and the designed. See also Habraken (1998, pp. 3, 24) on the hierarchical organization of the physical form and associated professional division of labour.
3. Figure 12.1 is deliberately impressionistic, to convey simply the idea of additional roles inserted in between conventional ones that may be used in addition to or instead of conventional roles. Other more detailed structures are possible: see, for example, Carmona (2009, pp. 2657, 2660–2661; 2010).
4. For ‘transit-oriented hierarchy’, see Marshall (2005a, pp. 204–208; 2005b).
5. A ‘constitutional code’ is suggested in *Streets and Patterns* (Marshall, 2005a, pp. 228, 242); ‘street syntax’ is explored in *Cities, Design and Evolution* (Marshall, 2009a, p. 73–79, 291).
6. For example, courtyard houses in India and China (chapters 5 and 6); wards in Kyoto (chapter 7); superblocks in South Africa (chapter 10); building complexes used to house extended families in

various parts of the world (see for example, Bianca, 2000, p. 75). See also Edwards *et al.* (2006) on courtyard housing, focused especially in Arab countries, but within this Edwards (2006) relates this to the European perimeter block. See also Mehaffy *et al.* (2010) for a description of 'home blocks' in Tel Aviv.

7. Gated communities are associated with certain negative stereotypes, such as social exclusion. But cases should be judged on their merits: after all, it is normal for private buildings to have lockable doors that exclude the general public. What is of concern is the kind and scale of community enclosed. A variety of gated formats is possible. We may be reminded of the historic gated wards of Kyoto, associated with high-density, traditional urbanism. Meanwhile, new formats of CICs (common interest communities) and CIDs (common interest developments) and use of 'CC&R' (covenants and restrictions) are evolving, that have been applied in both affluent and less affluent countries round the world (Ben-Joseph, 2005, pp.133 *et seq.*; 2009, pp. 2694–2696). See Roitman (2010) for a recent review of gated communities.
8. Talen (2009, p.157) has highlighted the importance of community participation to the proponents of contemporary form-based coding (Parolek *et al.*, 2008). See Saad-Sulonen and Horelli (2009) for an example of a small-scale urban design project for an urban yard mediated using electronic communication technologies.
9. For recent discussion, see Mehaffy *et al.* (2010), who incidentally note that the scale of the neighbourhood unit is 'smaller than usually assumed' (p. 44).
10. This builds on an idea earlier suggested in Marshall, 2009a.
11. Talen (2009, pp.147, 152–153) discusses the relationship between generative and form-based coding. With the interpretation of this book, in which the defining feature of codes is that they are generic specifications (rather than designs), generative and form-based aspects are not mutually exclusive; although in principle one could have form-based codes that were not used generatively, or generative codes that were not form-based. Dittmar has suggested that systems of coding could replace land use planning (2005, cited in Carmona, 2009, p. 2663).
12. The idea of emergence relates to deeper theoretical issues in the scientific context, such as where various kinds of order found in nature – from beehive comb patterns to flocking birds – may be seen to arise through bottom-up processes via self-organization (see for example, Camazine *et al.*, 2001). For urban interpretations of emergence, see for example Johnson (2001); Batty (2005); Marshall (2009a); Simmons (2010).
13. The label 'generative urbanism' is preferred here, rather than 'emergent urbanism' to emphasize the proactive nature of the codes, and since there are many interpretations of emergent urbanism that do not involve codes (for example, the distribution of settlements, or concentric rings, or patterns of ghettoization; Marshall, 2009a).
14. See Marshall (2009b) for simulations of urban layout structuring by street-based rules.

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