A FINE GRAIN LAYOUT OF BLOCKS AND BUILDINGS

INTEGRATED GUIDELINES FOR SUSTAINABLE NEIGHBOURHOOD DESIGN

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INTRODUCTION

All cultures in and continents have used perimeter blocks for five thousand years. They are the most enduring form of urbanization. Their morphological variety is immense. They accommodate a high cultural diversity, from Imperial China to Medieval Japan, from the Roman Empire to the European city of the Industrial Revolution. They have created energy-efficient and climate responsive layouts in places as different as Helsinki, Tunis, or Singapore.

The foundational scale of the urban block is an especially difficult and crucial topic for architects and urban designers. It is positioned between the scales of urbanism and architecture. The focus of sustainable development is on perimeter blocks that establish a strong and coherent relationship with streets and the public realm. In traditional sustainable urbanism, the street form is defined by the built mass. The three major elements of an urban block are

- The street or square as the public sphere.
- The buildings themselves.
- The interior of the block – the private or communal courtyard space.

The inner spaces inside blocks are a determining element. Their nature gradually evolves from being intimate, introverted, and private (like in courtyard houses in Arabic medinas for example), to being more communal, in the case of a compound and its shared space. House courtyards are not necessarily fully enclosed. They can be opened at their angles and linked by galleries. An example is Chinese quadrangle houses that extend in an open mesh covering large blocks mixing different levels of family privacy and group integration.

Moreover, these perimeter blocks are divided into plots and can accommodate a variety of distinct housing types. These housing types can be as diverse as courtyard houses, row houses, compounds, and apartment buildings.

This chapter is divided into four guidance sections.

EXPOIT THE VERSATILITY OF URBAN BLOCKS
DESIGN PERIMETER BLOCKS
BLOCK LAYOUT AND DESIGN
DESIGN BUILDINGS WITH RHYTHM, COHERENCE, AND VARIETY

The chapter presents in detail four case studies.

EDINBURGH BLOCKS
AMSTERDAM BLOCKS
MANHATTAN BLOCKS
HAMMARBY SJÖSTAD BLOCKS

EXPLOIT THE VERSATILITY OF URBAN BLOCKS

An urban block is the smallest area surrounded by streets. It is the original cell of every urban design structure. It is a central element of planning and design. It defines the network of streets around its edges and the building plot arrangement in the middle. An urban block is a mainly built-up urban area defined on its borders by streets, whose components are street fronts. The sustainable urban block is a complex rather than a uniform element. Its character may vary a lot on each street front depending on the type of streets it faces upon. An ordinary urban block exhibits four street fronts, because it normally sits on four streets. Because streets generally possess different 'importance' (main, local, secondary...) depending on their centrality, the street fronts constituting an urban block reflect such diversity. This is due to the evolutionary character of the urban fabric: its formation is led by streets developing in time from the most to the less central, a process which is accompanied by the subdivision of adjacent land in plots and therefore the constructions of street fronts. Urban blocks are the result of this stepped process. They are formed by the completion of this cycle of formation when it reaches the point where four streets close up in a loop and their street fronts get consequently developed[1].

City blocks are built-up to varying degrees and thus establish the physical containers or 'street walls' of the public realm. They are the space for buildings within the street pattern. They may be subdivided into any number of smaller land lots usually in private ownership, though it may be other forms of tenure. The land lots determine the rhythm of the edifices at the block perimeter. They reflect the property ownership and the relations in the society that had adopted them.

Many pre-industrial city cores in Europe, Asia, and the Middle East tend to have irregularly shaped blocks, while cities based on grids have much more regular arrangements.

'The narrower the mesh of the block structure, the more transparent, porous and suspenseful the town is.[2]' In neighbourhoods that have developed over time, often founded hundreds or thousand years ago, the dimensions of the blocks were always proportionate to the size and height of the buildings.

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[1] Porta and Romice 2010.

[2] Krier 2006.

Irregular block patterns in Paris on 1 square mile. Source: Urban Morphology and Complex Systems Institute.

Regular block patterns in Philadelphia on 1 square mile. Source: Urban Morphology and Complex Systems Institute.

BLOCKS AND HOUSING TYPES

Perimeter blocks can accommodate a variety of distinct housing types. These housing types can be as diverse as courtyard houses, row houses, compounds, and apartment buildings.
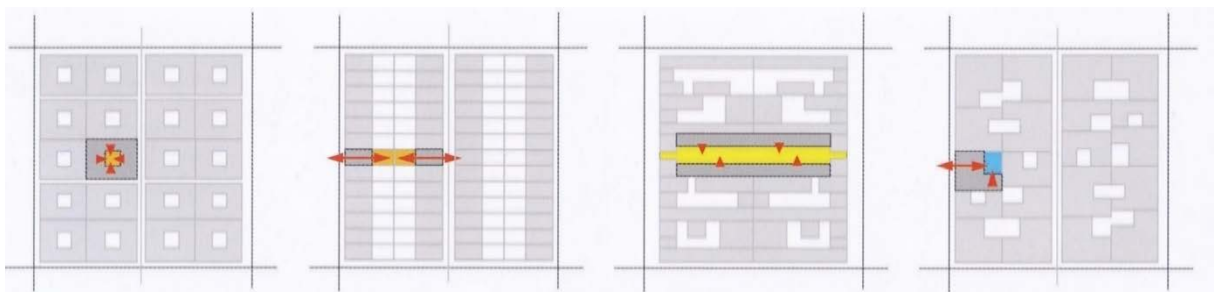
From left to right: courtyard houses, row houses, compounds, and apartment buildings. Source: Firley and Stahl 2009.

Casbah, Algiers, courtyard houses
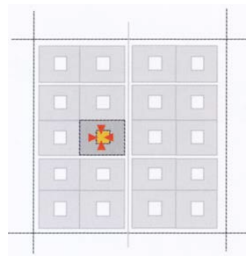
Casbah, Algiers. Drawing by Melissa Lyria Khali. École Spéciale d'Architecture, Paris.

The lack of an orthogonal grid and the organic or 'non-Cartesian' shape of the Arabic urban fabric often suggest a notion of irrationality in comparison with Western cities. In fact, the disparity between the two attitudes is due to an alternative development process. There is no top-down master plan to order a medina. The citywide urban rules seem to be limited to a wall as a spatial boundary and the connection of its gates with the mosque as the central element. The morphology is the result of a bottom-up process starting from the courtyard house type. This piecemeal block development is very flexible and can perfectly adapt to the geographical particularities of the site[3].

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[3] Firley and Stahl 2009.
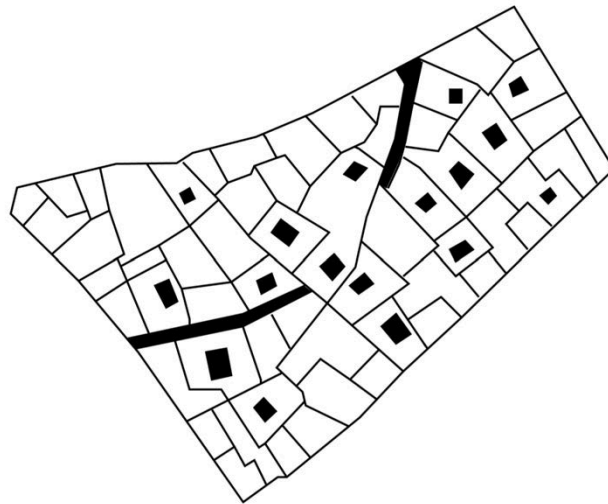
Casbah, Algiers. Drawings by Melissa Lyria Khali. École Spéciale d'Architecture, Paris. Left: Contrast between public and private. In black and white, the public space contiguous with streets, squares, large and small mosques and interior courtyards. The continuity and positivity of public space. In grey, the compact mass of private courtyard buildings. Right: A typical Arabic block.

The street pattern presents a three-tiered hierarchy with a high density of bifurcations offering the equivalent of 23.3 km of streets and 500 street intersections per square kilometre.

The typical Arabic block (top right) is characterized by scale symmetry, that is, the similarity of shapes by enlarging or reducing the plots. Thus, the variations interlock with each other and compose shapes. The courtyards punctuate the inside of the blocks. There are seventeen interior courtyards and two dead ends which form empty spaces. There are 17 courtyards for an area of 6960 m^2, corresponding to 24 courtyards per hectare. The block comprises 59 plots, corresponding to 85 plots per hectare. The size of a plot varies between 70m^2 and 100m^2.

Casbah, Algiers. Photos by Melissa Lyria Khali.

Pembridge Square, London, semi-detached and terraced houses[4]
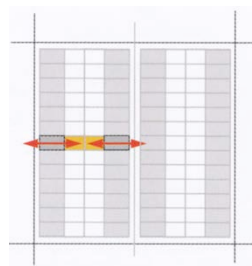
London's neighbourhoods are an archipelago of regularly designed places with a high level of order, detail coherence and delicacy, interspersed with spaces less perceptibly organized. These designed places are centred around parks or squares lined by brick row house (with brick either apparent or covered with white stucco). This archipelago organization is different from that of Paris (with its unified regularity making the

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[4] In architecture and city planning, a terrace or terraced house (UK) or townhouse (US) is a form of medium-density housing that originated in Europe in the 16th century, whereby a row of attached dwellings share side walls. They are also known in some areas as row houses or row homes.

whole 19th-century city a giant work of art). London's urbanism has its distinctive sense of order where row house and park form self-enclosed entities. As noted by Steen Eiler Rasmussen, 'the English square is very different from the grand continental square… The English square is a restricted whole as complete as the courtyard of a convent. (The Squares) form fine geometrical figures … they are regular and completely uniform … and a series of such squares may be linked together in any order.'[5] This variety in the neighbourhood organization differs fundamentally from the 'grand composition' of Paris which subordinates all its elements to the unitary city form. London form is plural and not unitary, ensuring both diversity and freedom, and coherence and unity.

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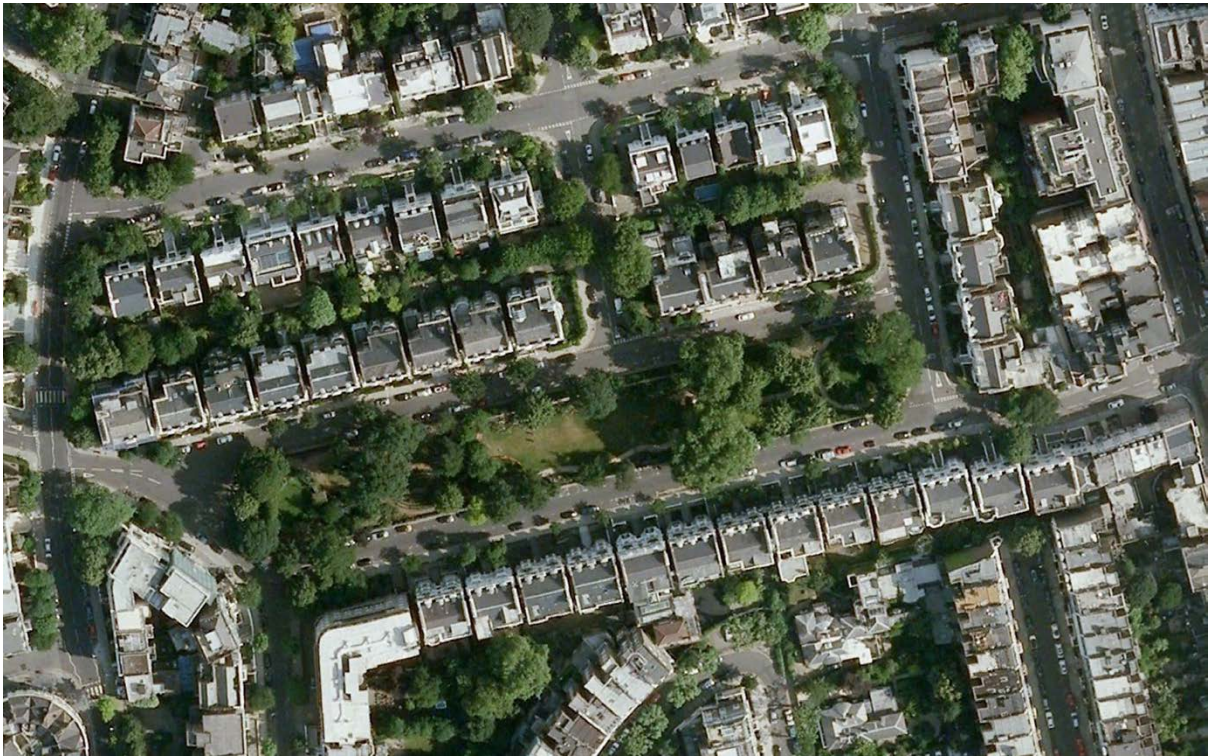
[5] Rasmussen 1988.
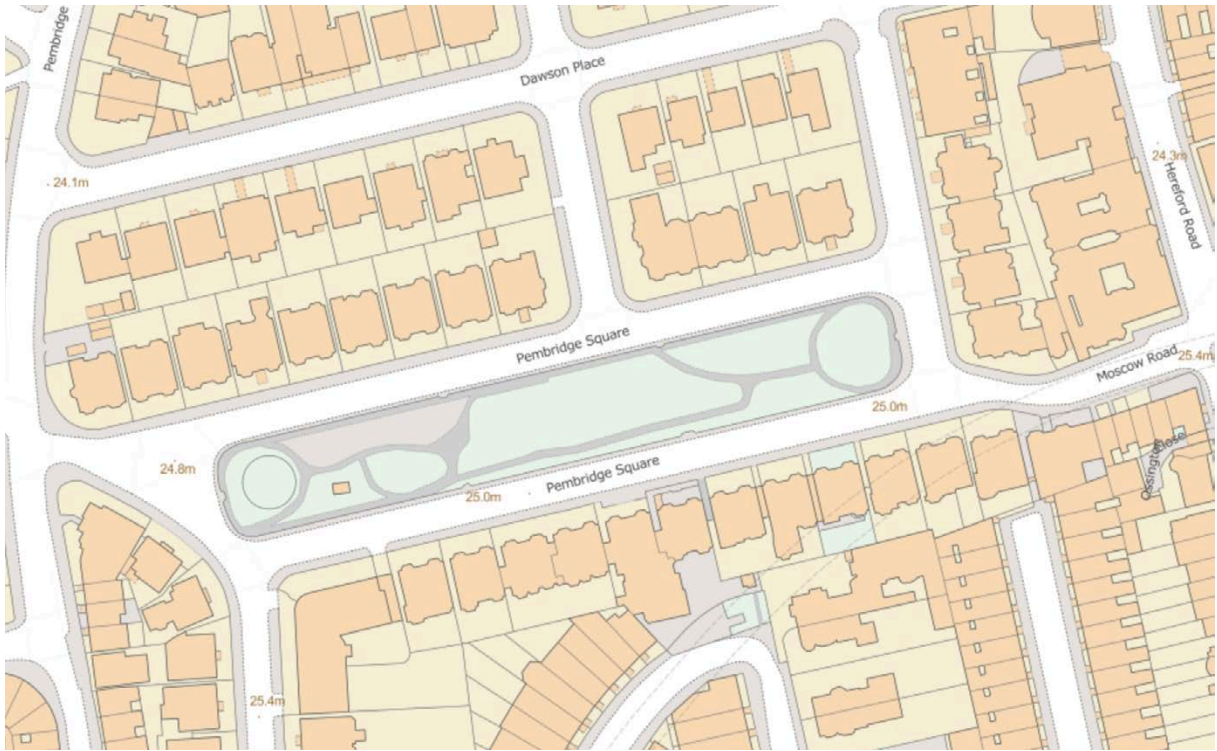
Top: Progression from the house front entrance to its back. Photos: © Françoise Labbé.
Bottom: Back of houses in Pembridge Square. Photos: © Françoise Labbé.
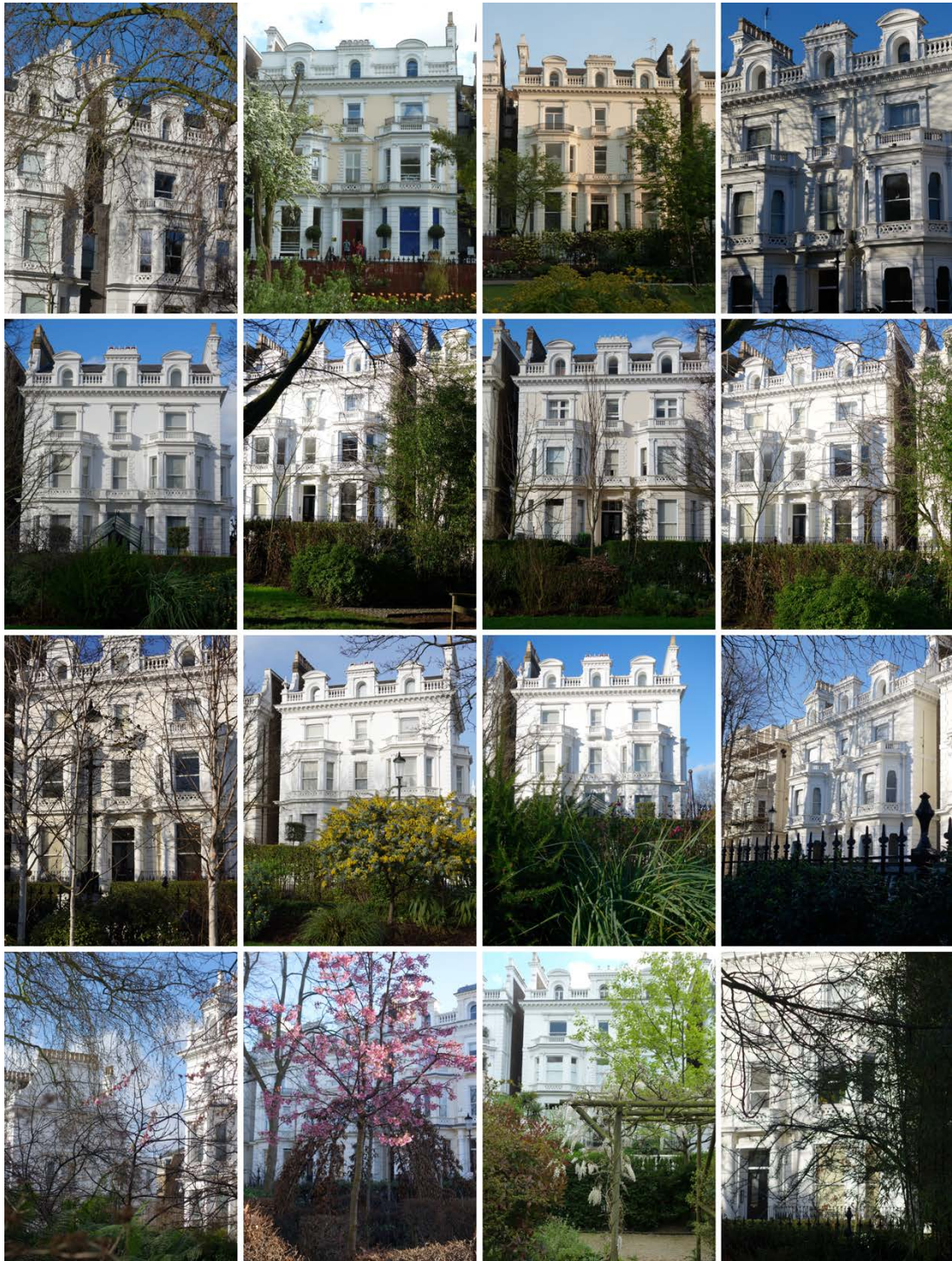
Pembridge Square, London.

In Pembridge Square, the repetition of identical white facades, constructed of stock brick, and covered with stucco, rusticated to imitate stonework, and completed with complex mouldings, window frames, friezes and cornices, defines a homogeneous yet diverse and complex urban wall. It encloses Pembridge garden like a jewel in a box. The repetition of the facade elements through many scales creates coherence. Backs offer a more relaxed and intimate atmosphere.

Place des Vosges, Paris, terraced houses
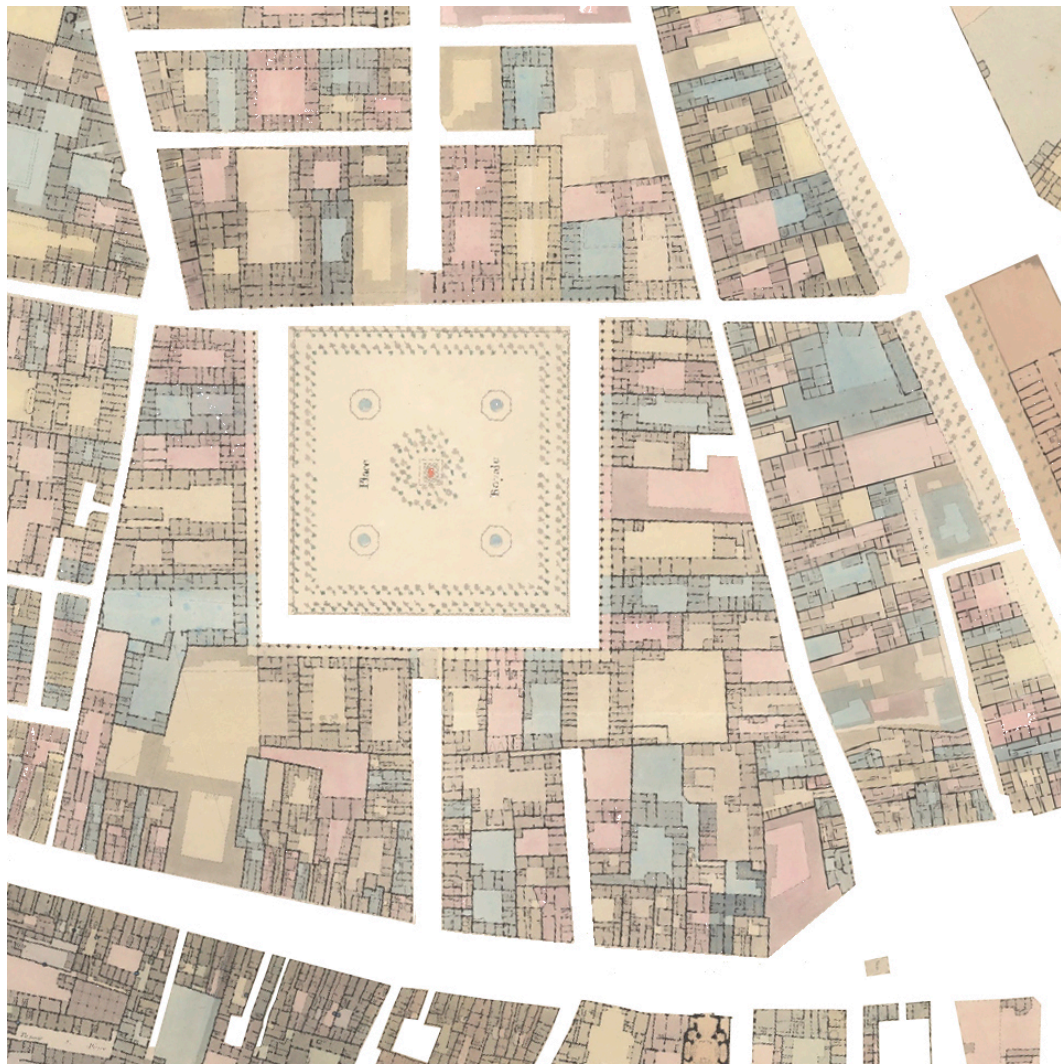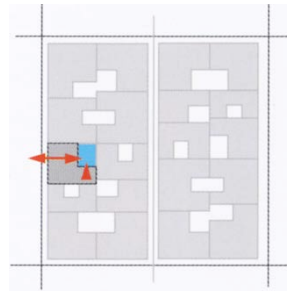
Place des Vosges, Paris. Atlas Vasserot (1810-1836).

The creation of the royal square is organized by Henri IV. In August 1603, Henri IV announced that he wanted to establish a factory for silk, gold and silver fabrics. Taking up an urban project that did not take place initiated by Charles IX, the king offers six associates a trapezoidal land bounded to the west by the streets of L'Égout, the Minimes in the North, the Tournelles in the east and by rue d'Anjou to the south (now rue des Francs Bourgeois). Henri IV announced by

the royal edict of July 1605, his desire to create a place in front of the workshops. The square meets three objectives: to continue the activity of the manufacture by providing housing for artisans, providing a place to rest and walk for Parisians, and to be able to use a place to organize court celebrations. The facades of the pavilions meet the expectations of the King who wishes to assert the commercial character of the constructions which began in 1605. The King's Pavilion is the first to

be built. It differs from the other facades by its height, its composition (fluted Doric pilasters at the level of the base, highlighting the central arch) and by the absence of shops on the ground floor. It is designed as an entrance pavilion, it is organized along the axis of the rue Royale (now rue de Birague) starting from rue Saint-Antoine. The other pavilions were built from 1605 to 1609 on land donated to relatives of the king. Wishing to harmonize the facades of the pavilions with the manufacture, Henri IV had a gallery built in front of the silk workshops. The construction of the fourth side closes the square by building two pavilions at the northeast and northwest angles. It was in 1610 that the square construction was achieved. Thirty-four pavilions were built on the same model apart from the pavilion of the king and queen which are higher. So that's 36 pavilions in total.
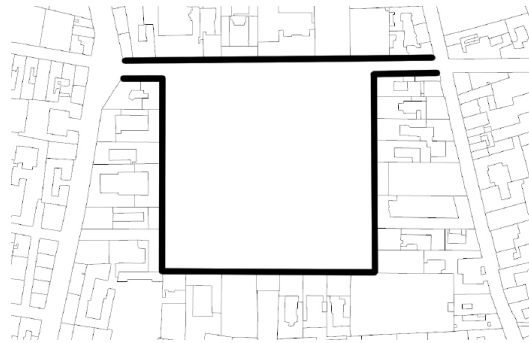
Place des Vosges - the North and South facades. In the centre of the south facade is the King's Pavilion, higher than the others. And in the centre of the north facade is the Queen's Pavilion.
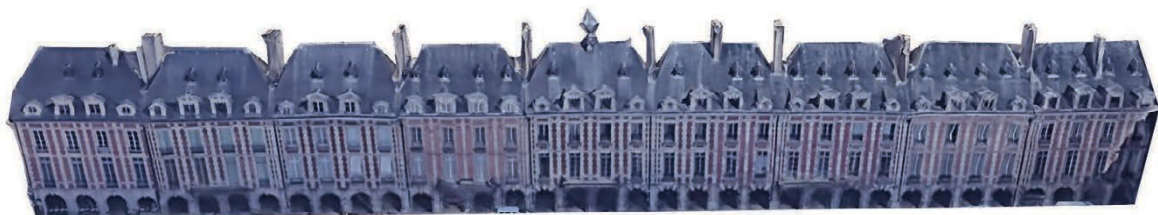
Place des Vosges - the east and west facades are symmetrical and similar to the other two facades with the exception of the pavilions of the king and the queen. They consist of a ground floor with arcades, two square floors and two attic floors.
Drawing by Charline Roizon-Monserrat. École Spéciale d'Architecture, Paris.
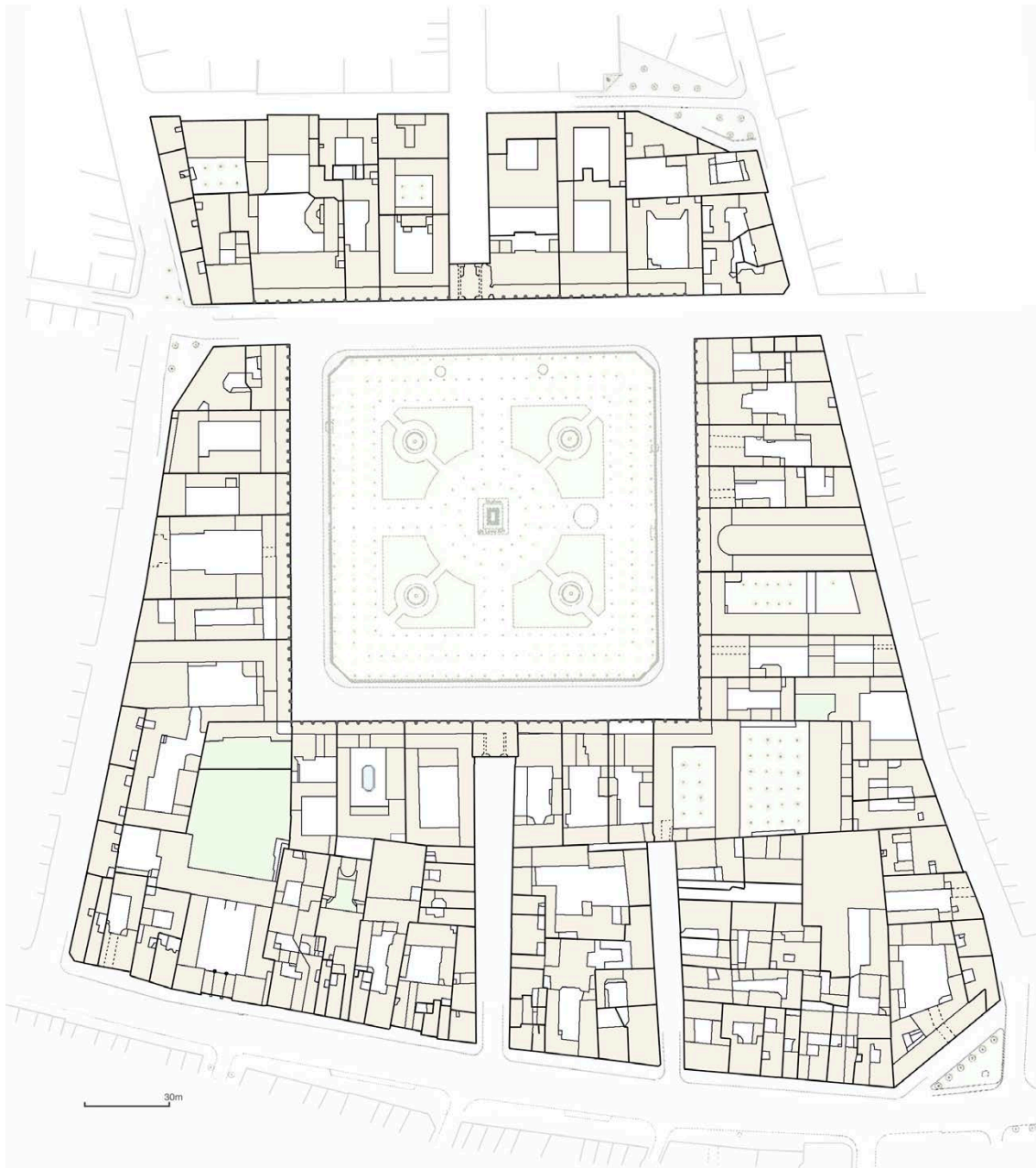
Place des Vosges. Cadastral map.
The northern block gives access to Place des Vosges. It comprises 26 plots, equivalent to a density of 21.6 plots per hectare. The total number of courtyards in this block is fourteen, for a total area of 1.2 ha, which would give 11.6 courtyards per hectare.

RESILIENCE AND EVOLUTION OF URBAN BLOCKS

In ancient Italian towns, where the Roman structure is still identifiable, the adaptability and resilience of such a layout appear astounding. The network of streets and blocks has functioned well over 2000 years, despite the changes of civilizations, societies and technologies.

The city of Timgad was founded as a military colony against the Berbers by Emperor Trajan around the year 100. The original square shape of the city was divided into small insulae of approximately 70 by 70 Roman feet (21 by 21 m), mainly residential and commercial.
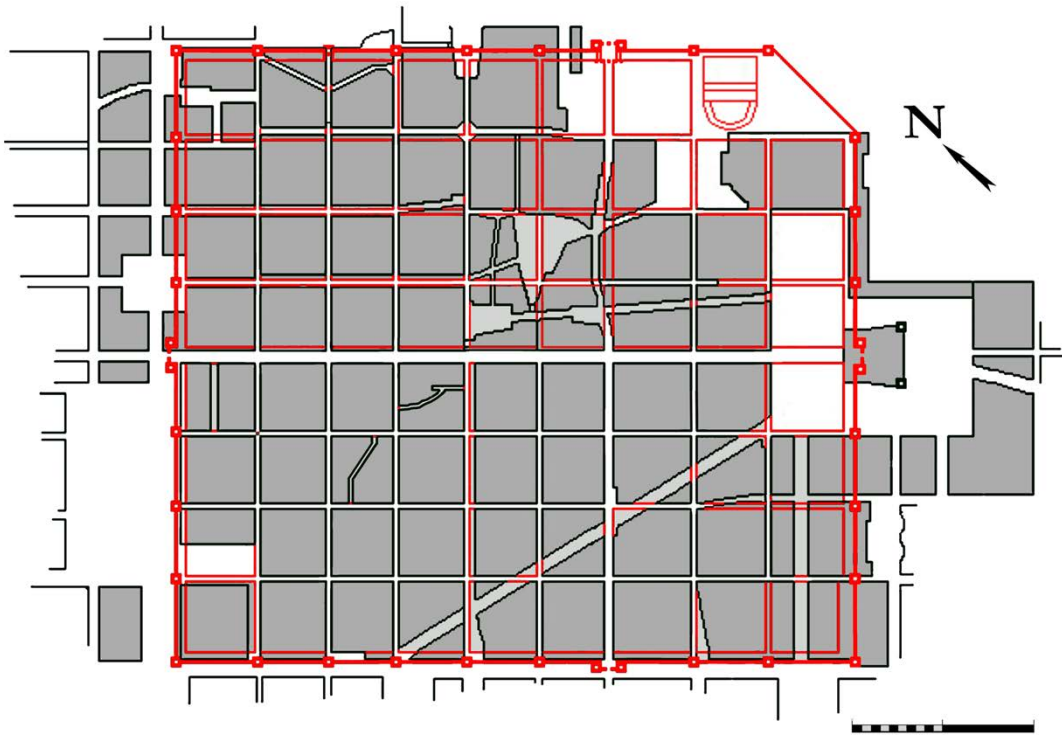
In red: Turin Roman plan based on 70 m side square blocks like most Roman cities around the Mediterranean and across Europe. In grey: Turin today.
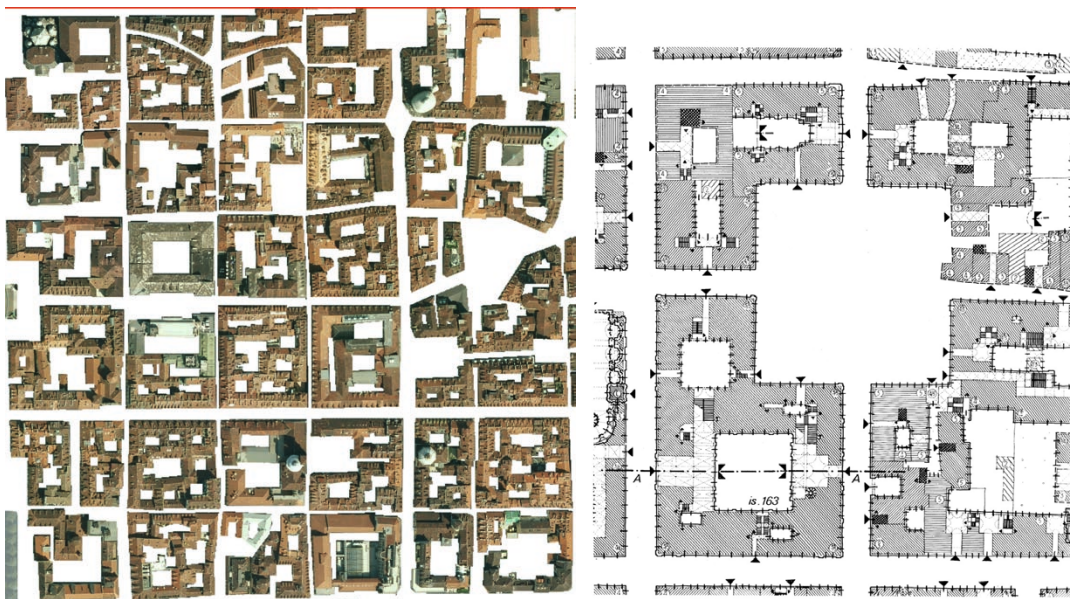
Left: Turin quadrilatero romano today in a 400 m side square urban fabric selection. Source: Urban Morphology and Complex Systems Institute. Right: A complex courtyard block in Turin. Source: Cavallari Murat 1968.
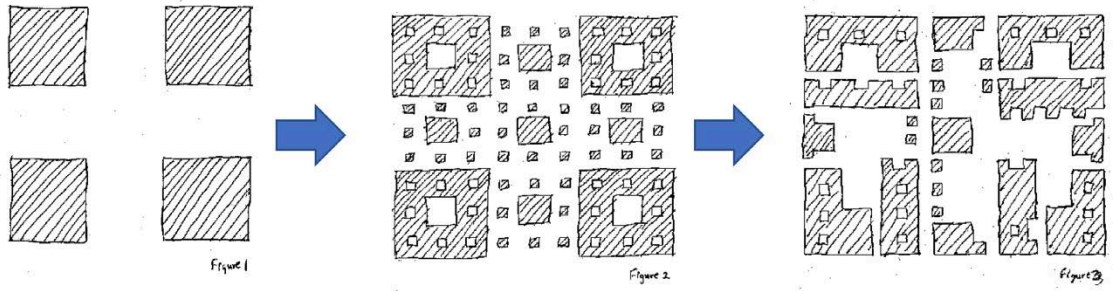
Courtyard forms have a high potential of complexification.

Turin Urban blocks in Via Garibaldi
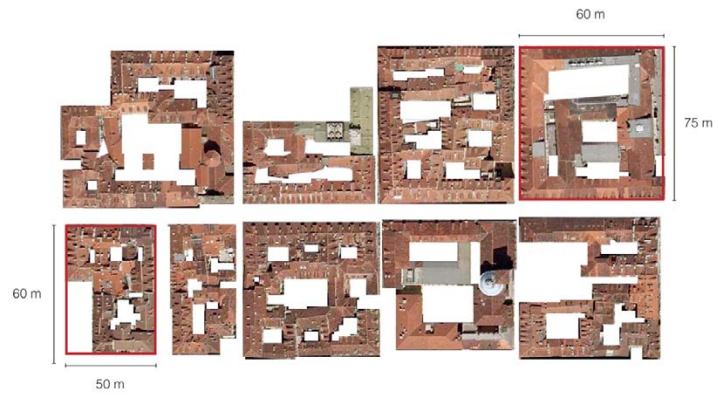
Analytic drawings: Melody Grolla, Paris Special School of Architecture.

Turin Urban blocks in Via Po
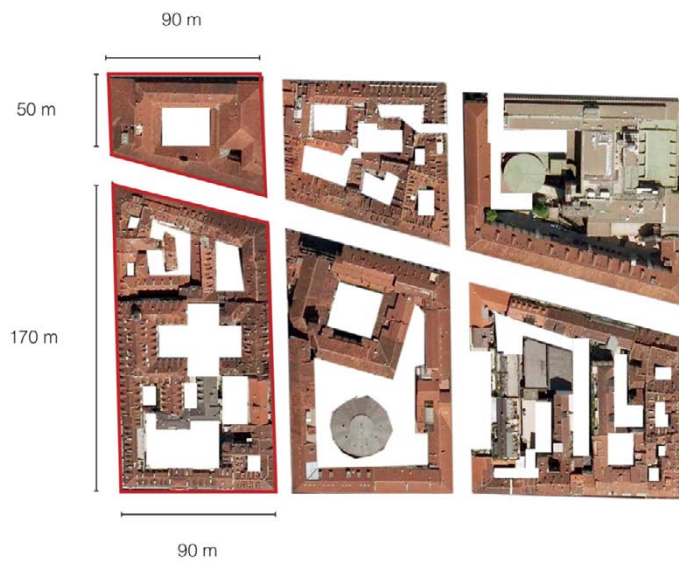
Analytic drawings: Melody Grolla, Paris Special School of Architecture.

DESIGN PERIMETER BLOCKS

A perimeter block comprises buildings on all sides surrounding a central space that is semi-private. It fulfils the most fundamental requirement in structuring urban form: the relationship and articulation between the private and public realms. Perimeter blocks aligned along streets establish a clear distinction between public fronts and private backs. The buildings that line the streets, squares and parks present their public face to the outside world and bring it to life. The inner block comprises a series of courtyards and is less formal and more flexible in its forms and uses. Aligning buildings along the block perimeter is the best way to design a variety of building types and uses, from medium to high density, with quiet and green inner block space. Perimeter blocks are a key component of many cities and are an urban form that allows high urban density to be achieved without high-rise buildings.

Perimeter blocks enhance the street character. They ensure that buildings have a positive relationship with the public realm. Developments at the street boundary provide the street with definition and enclosure.
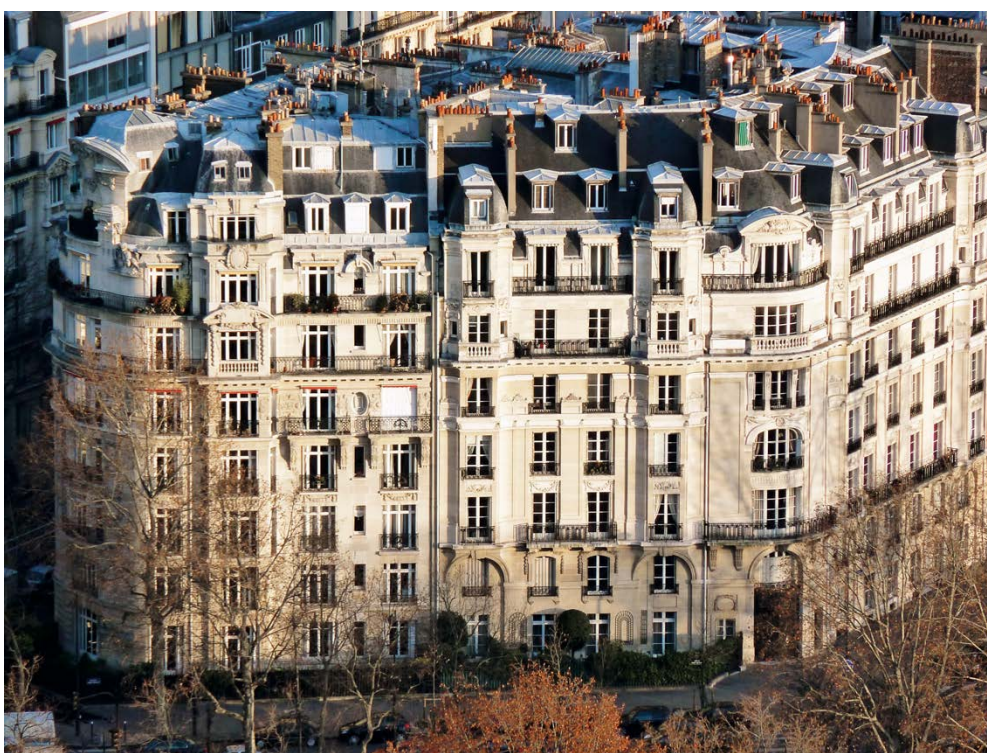
Perimeter block in Paris. Photo: © Françoise Labbé.

mixed use
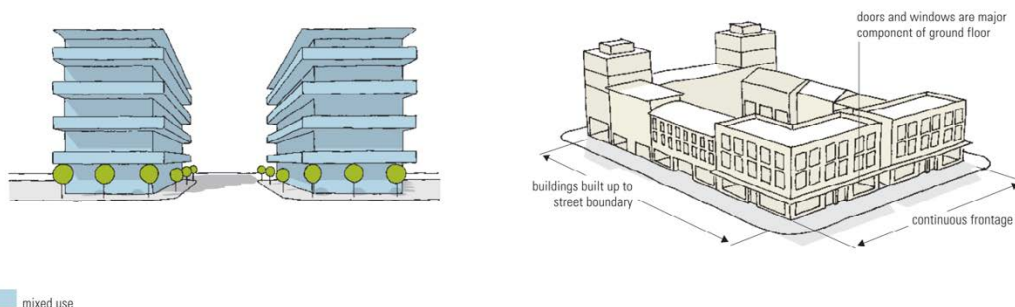
Left: Building to the street boundary creates a sense of enclosure that helps define the public realm.
Right: A building establishes a strong relationship with the street when it has a continuous frontage and when windows/doors are a major element of the ground floor.
Source: North Shore City 2005.
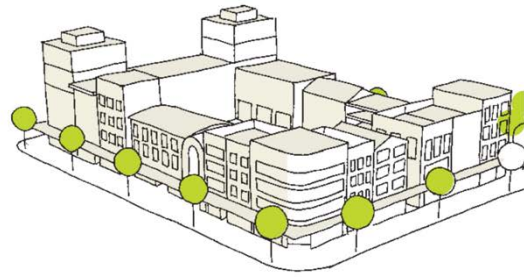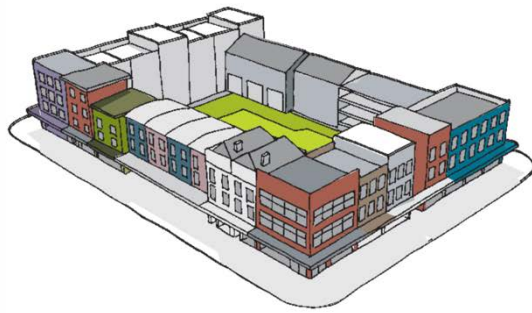
Left: Perimeter development strongly defines the street edge. Verticality, rhythm and colour enliven streets in which the perimeter has been defined by stages of building.
Right: A single perimeter development need not be monolithic, but may include variety among many forms.
Source: North Shore City 2005.

COURTYARD FORMS

By aligning all sides of blocks along streets, a semi-private courtyard form develops within the blocks with privacy and a distinct identity. A courtyard development is usually arranged along the front, side, and sometimes the rear boundaries of a site, while maintaining an open area in the centre. Factors to consider for the central courtyard design include its size, the privacy it offers, its security, and its landscaping. These urban fabrics can accommodate diverse activities yet still deliver good living conditions because of the courtyard arrangement.

Courtyard perimeter block in Paris. Photo: © Françoise Labbé.

A fabric of courtyards can accommodate intense activity along public streets while providing relaxed semi-private living space within. Courtyards also moderate the microclimate in summer and winter. They have low energy consumption patterns[6]. Their mixed-use development arrangement offers residents easy access to employment opportunities, shopping, neighbourhood services, schools, and recreational offerings, thus reducing travel.
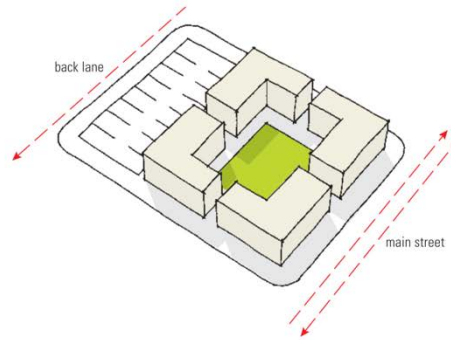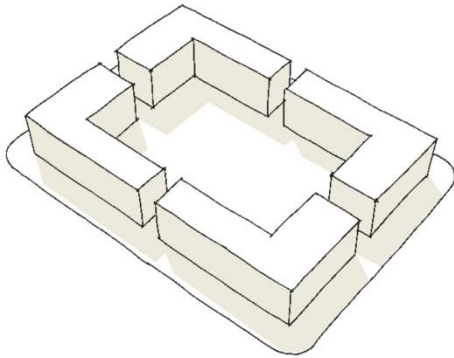
Left: Basic courtyard development with access limited to pedestrians.
Right: Smaller courtyard development with parking at rear.
Source: North Shore City 2005.
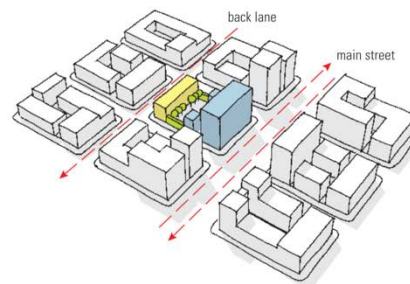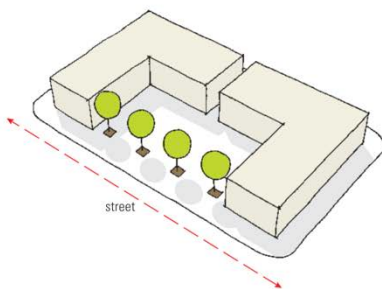
Left: Maintain street frontage with screening elements. Central courtyard layouts are preferable to 'U'-shaped developments as they provide an edge to the street and a protected area at the rear. However, if a 'U'-shaped courtyard design must be used, screening elements such as trees, benches, or screens can help maintain the street frontage.
Right: Residential areas should be placed to the rear of courtyard development.
Source: North Shore City 2005.

BENEFITS OF PERIMETER BLOCKS WITH COURYARDS

- More intensive form of development
- Continuous street frontage
- Private, open space for occupants

- Spaces along the street suitable for commercial tenants seeking a high profile and hoping to attract foot traffic

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[6] Salat 2009 ; Salat et al. 2011.

- Spaces further back on the site suitable for businesses and workplaces that don't require a street frontage
- Quiet areas at the rear highly suitable to residential uses
- Safe environments. Where residential uses are above ground floor commercial uses, the movement of customers during the day contributes to street activity and creates passive surveillance of residential units. The coming and going of the inhabitants in the morning and evening creates surveillance for the businesses. Ensuring that the development has a strong relationship with the street contributes to safety by providing entrances visible to passers-by. Large windows on the ground floor also allow people inside commercial spaces to see what is happening on the street.

Narrow streets and ample inner green blocks in Venice. Photos: © Françoise Labbé.

BLOCK LAYOUT AND DESIGN

Key points for designing with perimeter blocks

- **Plan small perimeter blocks with high street intersection density and narrow streets.** Well-connected street patterns should have at least 100 street intersections per square kilometre. Blocks of approximately 1ha to 1.2 ha create a vibrant and varied streetscape. A mesh of 1 ha blocks provides a structuring device practical in planning and can be further refined to reflect more precisely the site context and the preferred types of constructions. Buildings 10–12 m deep for mixed use or fine grain housing allow cross ventilation and natural lighting.

- **Adapt the perimeter block typology to different combinations of mixed uses**

- **Chose a block type fitting the community culture and aspirations**

- **Adapt blocks to local climatic conditions.** Enhance natural ventilation and breezes to cool the urban fabric, solar gains in cold climates, natural lighting and shading. Design interior green spaces, both for natural cooling and social interaction.

- **Divide blocks into smaller development plots.** Each should be attributed to a different team of architects and developers. They should work according to a form-based code. This gives rise to a diverse and controlled expression of architectural ideas, with minimal and subtle differences, like how historical cities superimpose distinct morphologies over time.

Bo01 Malmö.

CAPTURE THE QUALITIES OF EACH SITE

For instance, Bo01, in Malmö, uses a larger block type. It establishes a strong contrast between inside and outside – between quiet, intimate areas and public spaces with expansive water views. Hammarby Sjöstad, in Stockholm, opens one side of the block for views to the lake. Kronsberg, in Hannover, establishes a progression of block types from closed to open, from a one-sided commercial frontage to a more open landscape edge. Vauban, in Freiburg, employs open 'finger' blocks with commercial ends defining an intermittent commercial street. Moreover, the block types are further divided into smaller plots, each assigned to a different architect-developer team. The result is a diversity of contemporary architectural ideas. However, the coherence is like historical urban fabrics that have slowly evolved through time[7].

ADAPT BLOCK SIZE AND SHAPE TO THE CONTEXT AND THE COMMUNITY

Perimeter blocks have no once and for all optimum size and shape. Designers must find a trade-off between

- Ease of access
- The ability to sustain a variety of building types and uses adapted to local cultures
- The ability to change and adapt over time
- Greening and bioclimatic considerations
- Biodiversity considerations

A reliable rule of thumb is that a block width of 80–90 m enables this trade-off to be achieved in a variety of urban locations and circumstances, reducing to 60–80 m in town/city centres. A mixed-use neighbourhood should contain a range of block sizes and shapes to promote variety and adaptation to uses while fitting in a coherent pattern of streets. Block size can affect biodiversity. Too small blocks can limit the continuous green space available to support wildlife. Blocks of about 90m x 90m can include private or communal gardens. They offer a good compromise between biodiversity, uses variety and movement ease[8].

Adaptation to use, and to cultural, economic, and climatic context is paramount for creating appropriate block shapes. Blocks do not need to be square like Roman Empire blocks (70 m side) or Barcelona *Eixample* (Extension) blocks (113 m side) planned by Cerda. They can be elongated like in New York, or irregular (like in Haussmann Paris with the dominance of triangles). Square blocks are extremely resilient and have withstood the test of time. Roman Empire blocks still constitute today the layout of most European cities' cores after two thousand years of evolution. Kyoto square blocks have been reconfigured during the medieval Japan transformation from an imperial city into a city of merchants[9]. For contemporary projects square blocks offer a very flexible basis for a range of commercial and residential buildings and internal layout options[10]. Irregular blocks can be shaped to meet the topography and the creation of focal points such as greens or squares with non-parallel construction facades.

ESTABLISH A CONTINUOUS STREET FRONTAGE[11]

- Locate mixed use development at the street edge to give the street definition and enclosure

- Design ground floor spaces or rooms to address the street and to accommodate 'active' (non-residential) uses

[7] Fraker 2013.
[8] Llevelyn Davies 2000.
[9] Salat et al. 2011.
[10] Rectangular blocks with depths of about 110 m are more comfortable to accommodate larger buildings, such as factories and warehouses, without exposing the back/side walls. These may therefore be more appropriate in certain circumstances, such as the periphery (or 'transition zones') of city centres.
[11] These recommendations draw on North Shore City 2005.

- Orient the backs of new buildings towards the backs of existing constructions
- Locate primary entrances along the main street elevation and design windows to look directly onto the street to improve the

pedestrian realm. Glazing should comprise most of the ground floor facade to ensure transparency and vibrancy of the street perceived at eye level

ENHANCE STREETSCAPES[12]

The extent to which a mixed-use development is physically and aesthetically integrated into its context will determine public attitude towards the project. The new structures should relate to the streetscape and enhance it. Besides, mixed-use developments should work with nearby buildings to create a coherent but varied character. In existing communities, designers should take inspiration from neighbouring old constructions and reinterpret them in a contemporary way.

- Build to boundary lines to maintain the street facade
- Ensure that the scale, height and massing of a new development does not overpower that of nearby existing buildings
- Make certain that a new development's facade responds to the proportions and solid-void relationships of neighbouring buildings
- Ensure that the materials employed in a new development are responsive to those used on neighbouring buildings

DESIGN FRONTS AND BACKS, OUTSIDE AND INSIDE DIFFERENTLY

Designers should employ different treatments in the design of the fronts and backs. The principle is 'public fronts and private backs.'

The perimeter block structure enables a variety of inner treatments, including

- car parks or service yards
- private/communal gardens with children's play space

- houses, offices, workshops or life-work units, a park or civic square to occupy part/whole of the block

The range of inner uses can change over time. The interval between the backs of the properties should consider privacy. This influences land use and therefore density. A privacy distance of 20 metres (i.e. rear gardens or back yards of 10 metres back-to-back) is an approximate rule, but should not be applied too strictly.

DESIGN BUILDINGS WITH RHYTHM, COHERENCE, AND VARIETY

CREATE THE CHARACTER OF STREETS AND SQUARE

A city for walkers and cyclists needs visual diversity and 'accidentals' (in the musical sense) in its street patterns and its edifices, because the pace is slower and the human mind desires variety. The building components that contribute to character feature elevations, corner treatments, roof lines, doors and windows, materials, colour and texture. The public realm elements concern the street, the pavement and the square and include

planting, street furniture, lighting and public art. The interfaces are the steps, the fences, front gardens, hedges, walls, windows and doors – the hinge between the horizontal and vertical planes .

In ancient cities, collisions of scales and of past and present create extraordinary views, which combine dramatic changes of scale and buildings from different

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[12] These recommendations draw on North Shore City 2005.

centuries. These 'accidents' belong to our historical cities patterns . 'Accidents' are part of cities' history, of their memory and their poetry. They tell us that nothing was designed instantly, that cities are stratification of time and memories, and that their forms have come to us deformed through time, like our remembrances.

Some contemporary projects are successful in creating delightful irregularities, such as the funnel-shaped streets of Malmö's new Western Harbour. Its principal architect, Klas Tham, has described its street pattern as 'distorted by the wind like a fishnet hung out to dry'.

RESPECT AND ENRICH THE CONTEXT

Good edifices visually enrich the surrounding fabric, while exceptional ones add the magic of counterpoint and innovation. The main concern is how a building 'fits' into the urban landscape, sometimes by blending, occasionally by contrast.

Respect for the context requires adherence to

- the continuity of building line.
- the vertical and horizontal rhythms of a street (the width of buildings, the proportion and scale of windows and doors).
- the local morphology (the patterns of streets, blocks and types of buildings).
- adjacent construction heights, roof and cornice lines.
- local materials.

Good buildings enhance the local identity. Distinctive places have their character and atmosphere. Remarkable edifices establish a unique sense of cultural and community identity. The variety of architectural expression will create interest and pluralism if it follows a coherent pattern. Designers can strengthen identity by

- a diversity produced by many designers. This principle should guide the approach to land parcels and plot subdivision.
- drawing inspiration from local traditions of built forms and crafts such as masonry, ironwork or stained glass.
- developing a material strategy that responds to the place.

DESIGN MEDIUM SCALE BUILDINGS

The shape of mid-rise 4 to 7-floor buildings is optimal. They can accommodate a variety of uses (decreasing over four floors). They offer medium- to high-density. They lower energy demand and construction costs[13]. In

suburban areas where two or three floors are the norm, it is advisable to place higher buildings in key locations such as corners, main streets, end of vistas or around parks.

SOLVE SCALE JUXTAPOSITIONS

Mixed-use schemes may assume different scales, arrangements and forms. Mixed-use buildings, particularly those next to commercial centres, may be taller or have greater site coverage than existing nearby constructions. The perceived scale of the new buildings should relate to those of adjacent developments. Where a new edifice is larger than its neighbours,

facade design should secure compatibility with existing facades. Large areas of blank wall should be minimum, especially in pedestrian zones. The design can divide the façade in sequences to reduce perceived size and bulk. Employing diverse materials can provide interest and articulation. Techniques for ensuring compatibility include continuing existing window lines through to the

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[13] Tall buildings may have a role to play as landmarks. They highlight locations of civic, commercial or visual importance, or focal points in urban activity such as city

centres or transport hubs. However, this has to be weighed against possible negative impacts on the microclimate (such as wind funnels or too much shade.

new building, consistency with rhythms and facade complexity of previous buildings (window spacing, structural modules, etc.), and using vertical massing like that of present buildings.

Scale juxtapositions can be solved in the following ways

- 'Wrapping' large spaces with small buildings.
- 'Stepping' a mass down to its neighbours.
- Ensuring that the ground level most relevant to pedestrian experience is as active and interesting as possible.
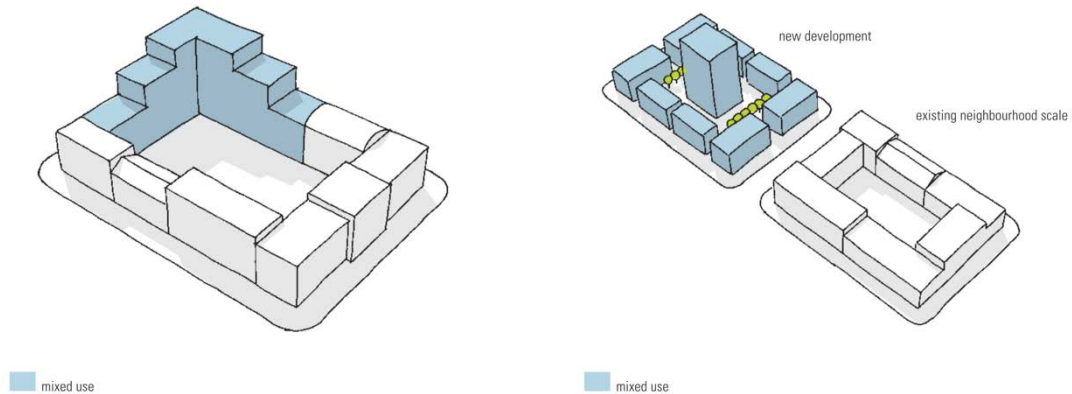
Left. Stepping down large-scale buildings to meet their neighbours preserves the present street scale.
Right. Wrapping a larger building with smaller ones may help maintain the existing street scale.
Source: North Shore City 2005.

GET THE RYTHM RIGHT

Making facades 'active' adds interest, life and vitality to the public domain. It means:

- frequent doors and windows, with few blank walls

- narrow buildings' facades giving a vertical rhythm to the streetscape
- articulation of facades, with projections such as bays and porches, providing a feeling of welcome
- lively internal uses visible from the outside.

INCREASE TRANSPARANCY AND CAPTURE STREET SPACE

Transparency refers to the degree people can see or perceive what lies beyond the edge of a street or other public space. Physical elements that influence it include windows, doors, fences, landscaping, and openings into midblock spaces. Whether the space invites or repels people depend on transparency. Flexible boundaries and transitional zones can function as connecting links making it easier, both physically and psychologically, for activities to move back and forth between in and out. Experiencing simultaneously what is happening in the public environment and what is taking place in the adjacent residences, shops, offices and communal edifices, extends and enrich possibilities. Facade design can make a building reach out to the street. This means:

- Adding windows and doors facing the public domain
- Using clear glass for windows
- Animating edges with balconies, bays, porches, colonnades or other projections providing a more comfortable threshold in bad weather
- Extending activities and allowing uses to overlap on the street
- Considering changes in level between the building ground level and the street, with steps to access the doors of houses or raised terraces

'Capturing' street space can create opportunities for activities to add vitality to a place. Allowing restaurants, cafes and pubs can attractively colonize the streets. Urban design does not stop at the front door. Lively and more public indoor functions can animate outdoor spaces, improve appearance and perspectives, and often enhance the profile of commercial operations. This requires orientating towards outside the most active uses (for example, a staff canteen, a theatre box office or an office reception area) rather than hiding them inside the building.

PLAN SHALLOW

Building depth has a critical impact on the need for artificial lighting and ventilation. It also affects the variety of possible uses. Regardless of use, a building depth of 10–14-metre is optimal for many reasons.

- A building with a shallow plan (less than 10 m wide) is often too narrow for introducing vertical or horizontal circulations. This limits options for room layout and distribution space.

- A building deeper than 14 metres cannot be naturally ventilated. Natural ventilation is environmentally preferable and economically advantageous because the cost of air conditioning can be high over the long run.
- A building deeper than 14 metres will require artificial lighting in its centre.
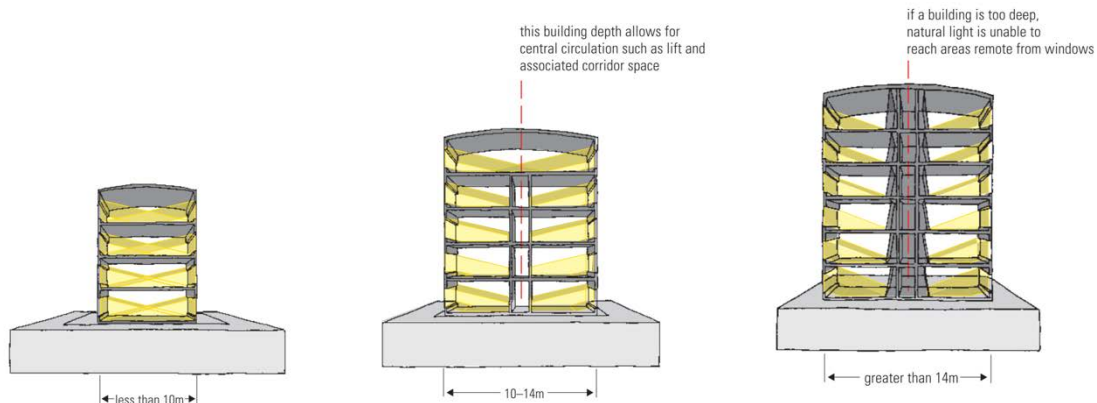
Left: Excellent natural lighting, possible difficulty with circulation
Middle: Good natural light, optimal circulation
Right: Requires artificial light and ventilation
Source: Source: North Shore City 2005.

TRIM AND SLIM

Building width has an impact on use versatility and on customizing spaces. It influences the vertical rhythms and the active facade seen in elevation. Buildings with 'cells' or 'modules' 5 to 7-m wide provide an extremely flexible form. Each cell can be combined at will to become a small shop or a terraced house. Below about 5.5 m, it is more difficult to add rear extensions without blocking light and ventilation.

TURN THE CORNER
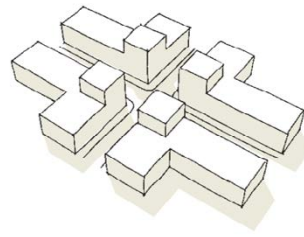
Corner sites have greater street frontages and offer a unique opportunity for marking the corner and outlining public space. Source: North Shore City 2005.

Corner sites are visually prominent, have two facades and can potentially offer more entrances to different parts of the building. They therefore present special possibilities of mixing uses.

- Corner developments provide an opportunity to define the street corner and reinforce the adjacent public space/street. For instance, designing the corner with more vertical accentuation allows the building to 'mark' the street intersection. Windows forward at the top express height and highlight corners. Additionally, a corner building's articulation or facade treatment may express its unique position on the street. Building elements that emphasize the corner include

  o use a corner building's form and facade articulation to announce its unique position on the street.
  o feature elements including corner pediments, parapets, and awnings or verandas that wrap the corner.

- Corner developments allow for the clear separation of entryways to different uses. An entrance to ground floor commercial/retail space can be situated in the most prominent position at the corner, while an entrance to upper residential spaces can be placed along the facade on either street.

Block corner design in Paris. Photo: © Françoise Labbé.

Edinburgh. Photo: © Françoise Labbé.
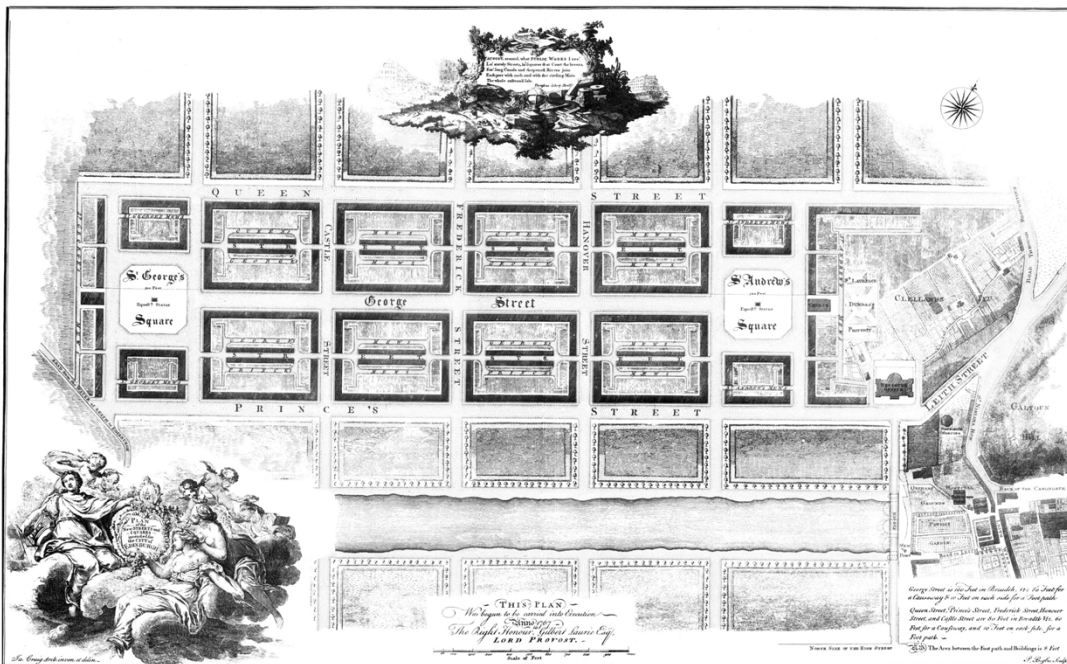
Edinburgh perimeter block composition. James Craig's original plan of Edinburgh's New Town, 1767.

Edinburgh's Town Council, in the mid-1700s, demonstrated a grand, civic example of historical plot-based development. In acquiring land to the north of the existing town core, a substantially scaled expansion was initiated with the separating valley (contained the Nor Loch) drained and bridged, a process that took over a decade. A competition was set in 1766 to produce a plan for the laying out of this prestigious new development. It was subsequently won by the 21-year-old James Craig. He created a classically inspired plan through a combination of grand streets, mews lanes and axial linking of squares, churches and views. The rectangular, gridiron plan centred on George Street, which ran along the

topographical ridge, with the two main squares (and associated civic building plots) at either end. It was bound by Queen Street to the north and Princes Street to the south[14].

Edinburgh. Photo: © Françoise Labbé.

The plan divided the eight 'perimeter and mews' blocks into plots with dimensions reflecting their position in the street hierarchy – the building footprints and private gardens were clearly detailed. The development of the plots themselves (over a period of forty years from 1767) was undertaken by a range of builders and wealthy individuals. They utilized their architects to meet the standards and design required of the plan – a plan which was amended over time to allow for a wider range of plots. Over time, the plots accommodated a greater extent of commercial uses. The inbuilt adaptability of the New Town design and its ability to sustain change has been demonstrated by its two-hundred-year successful transition from an upper-class residential suburb to mixed-use civic core[15].
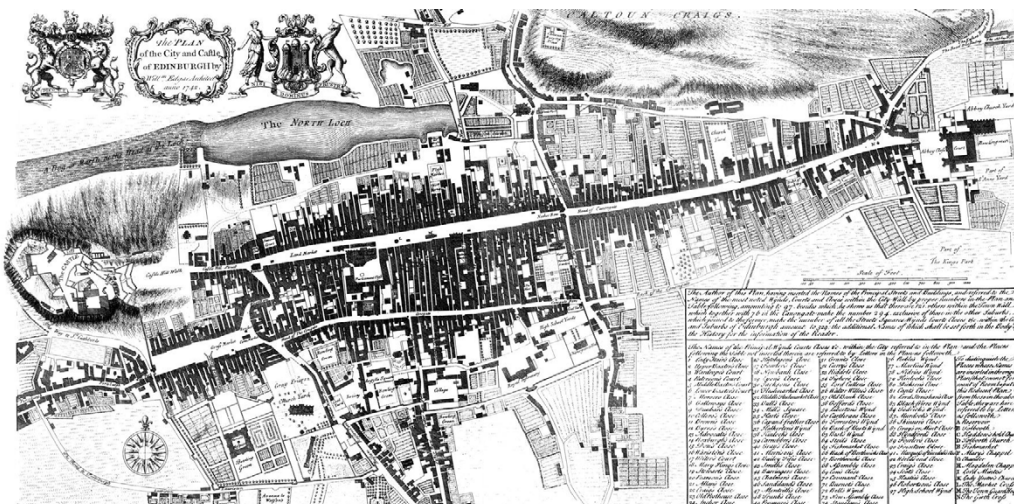
This map drawn by architect William Edgar in 1742, shows Edinburgh as it was at the time of the Jacobite risings led by Bonnie Prince Charlie. It clearly shows the distinctive pattern of closes and wynds, creating what is often described as a herring bone shape. Some key city landmarks are shown which no longer exist, such as the Luckenbooth shops next to St. Giles' Cathedral, and the Netherbow Gate which marked the entrance to the city.

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[14] Adapted from David Howell, Gillian Black in Porta and Romice 2010.
[15] Adapted from David Howell, Gillian Black in Porta and Romice 2010.

Edinburgh. Photo: © Françoise Labbé.
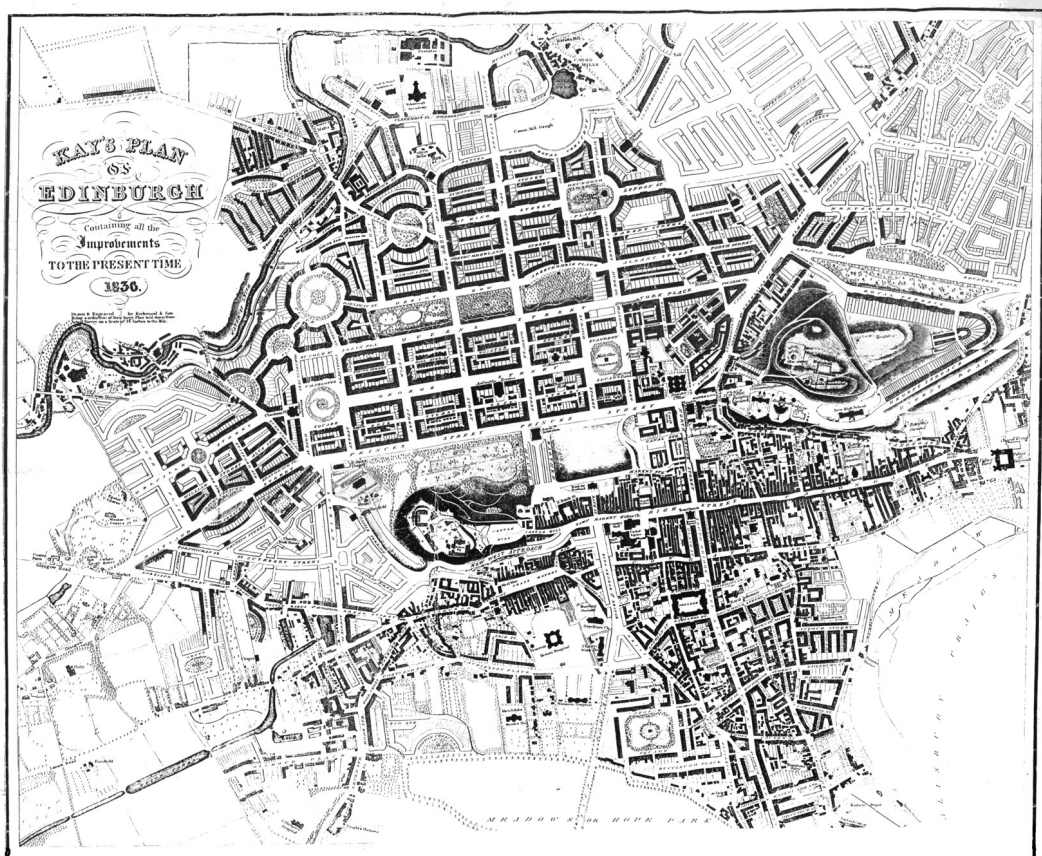
Edinburgh in 1836. This map clearly shows the contrasting street plans of the Old and New Towns. By 1836 the New Town was almost complete, and the difference with the Old Town was clear. The medieval pattern of narrow closes and wynds on the Old Town contrasts with the broad, elegant squares and circuses of the classically inspired New Town. The Nor' Loch is now drained and, in its place, there is now Princes Street Gardens, and the Mound formed from the earth removed during the building of the New Town. Just a few years later this area changed again, with the building of the railway and Waverley Station.

Streetscape and civic space created by perimeter blocks. Photo: © Françoise Labbé.

Streetscape and passage within blocks. Photos: © Françoise Labbé.

Inside Edinburgh blocks. Photos: © Françoise Labbé.

CASE STUDY: AMSTERDAM BLOCKS

Amsterdam blocks and the plot patterns are twofold. On the one hand, organic and, on the other hand, more planned and organized. The parcel fabric has always been oriented with the canals, with a logical succession of canals and blocks. This has never changed for the surrounding neighbourhood in Dam Square. The streets obeyed a circular plan around the port, following the canals. The fields were gradually transformed into built-up areas.

Amsterdam in 1500.

Amsterdam block types, 1876.

Amsterdam. The architectural work along the streets, especially those facing the canals, is complemented by the treatment of the corner and the closures that block the perspectives. Photo: © Françoise Labbé

Amsterdam. The spaciousness and shape of the gardens inside the blocks provide residents with an interior space they can readily appropriate – in this case, to create an intimate, sociable setting in a French-style garden, bounded by plantings on a human scale. Photo: © Françoise Labbé.

CASE STUDY: MANHATTAN BLOCKS

The Taylor Map. Detail, Battery Park–Trinity Church/Wall Street. The first true attempt at a perspective map of New York city was by Will Taylor in 1879.
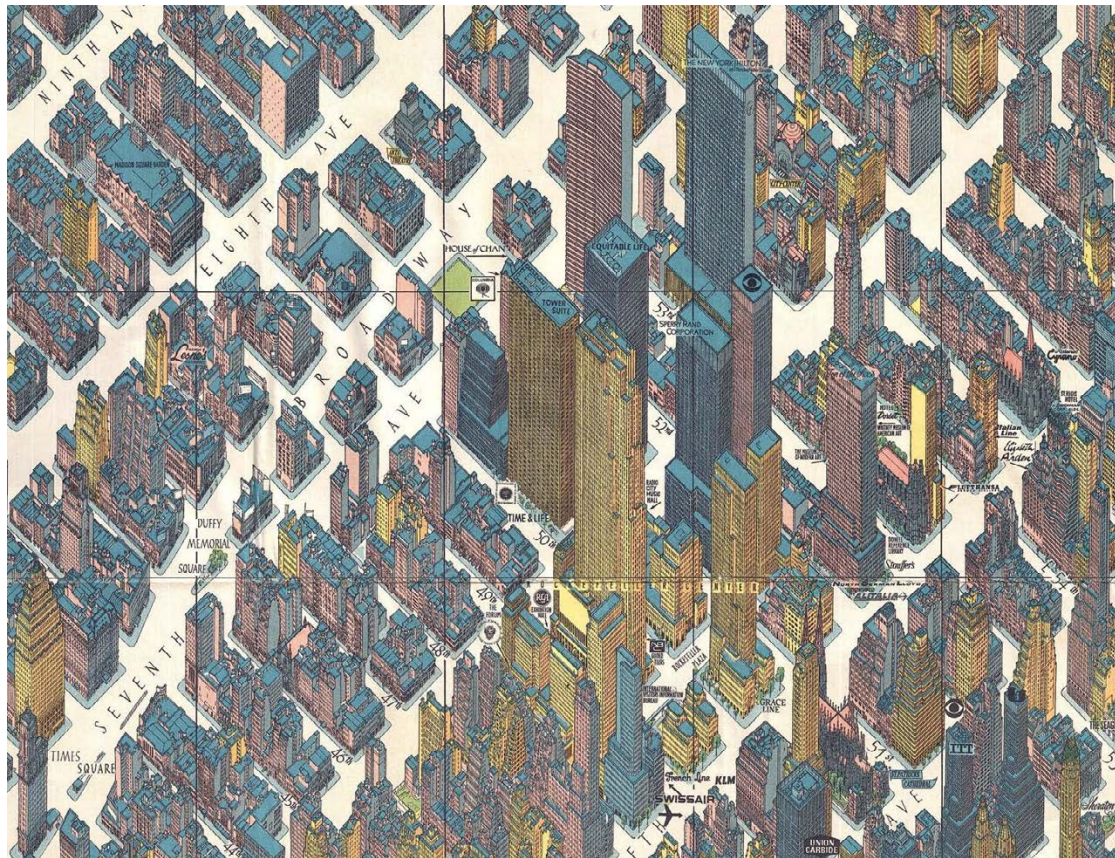
Detail, Rockefeller Center, Herman Bollman, 1962.

Rectangular blocks of 60 m by about 200 m oriented with their small side on the avenues increase connectivity and rhythm. They provide more crossings and create vibrant commercial avenues. Residential buildings can then line up along the streets and the quieter long sides of the blocks.

Block width: 60m
Block lenght: 280m, 244m, 189m,125m,198m

Built up/public space:
- ■ Built up area
- ▨ Public space - Streets

Uses:
- ■ Residential, single family
- ■ Residential, multi-family
- ■ Services
- ■ Industry
- --- GF commercial

Business block

FAR: 10m²/m²
Land coverage: 40%
Average plot size: 7500m²

125m
60m

Mixed residential block

FAR: 7m²/m²
Land coverage: 90%
Average plot sizes: 150-600m²

30m 5-6m 125m
60m

Residential block

FAR: 3.25m²/m²
Land coverage: 80%
Average plot size: 150m²

30m 5-6m 125m
60m

Industrial and residential block

FAR: 3m²/m²
Land coverage: 90%
Average plot sizes: 150-1500m²

30m 5-6m 125m
60m

Source: UN-Habitat 2015.

Detail, the Anderson map, 1985.

CASE STUDY: HAMMARBY SJÖSTAD BLOCKS

An Innovative Green And Open Inner-City Block Typology In Hammarby Sjöstad, Sweden

Stockholm typology of blocks and landscapes. 'Stockholm has four types of landscape and five types of public waterfront, as well as twelve different types of urban tissue and as many street profiles. Each of these types of tissue follows the earth's folds. The result is a city in which the fire brigade and the "tree line" (the height of the trees, 20 to 25 metres) fix the building height and only churches, public buildings and tower blocks are exceptions to this rule. The applications of these built system hierarchies to the existing landscape conditions create the variations in the city.'[16]Source: Assche and Meeus 2000.

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[16] Assche and Meeus 2000.

Hammarby Sjöstad relation with Stockholm inner city in the background. Photo: © Françoise Labbé.

The subtle implementation of Stockholm urban morphology, sizing, and scaling establishes a unique place in Hammarby Sjöstad. The dense settlement structure comprises four- to five-story constructions around spacious green courtyards. The design follows Stockholm's centre city morphology in terms of street width (18 metres), block size (70 × 100 metres), density, and land use. This human scaled urban fabric is integrated with openness, waterfront views, parks, and sunlight. The design allows for both wind-shielded and sunny inner quadrangles, with ample possibilities to develop inviting entrance and common courtyard greens and facilitate small-scale cultivation in micro-garden plots and greenhouses. The traditional Stockholm city fabric is transposed with a green architectural style. It responds to Hammarby Sjöstad's waterside context. It follows bioclimatic principles and maximizes light and views of the water and green spaces.

Hammarby Sjöstad inner green blocks. Photos: © Françoise Labbé.

Compared with the closed blocks of the historic centre, the Hammarby types are open and discontinuous. This design allows more natural light to reach the courtyard-oriented parts of apartment buildings and optimizes real estate values by maximizing the number of lake views. The blocks are often U-shaped, with one or two smaller and lower detached buildings loosely delimiting the open edge. In the Sickla Kaj subdistrict, the back buildings are taller and the lateral

buildings feature convexities to increase lake views. The end outcome is an innovative urban green block between the traditional block model and a uniquely local and new type that offers larger floor plates and more exterior spaces.

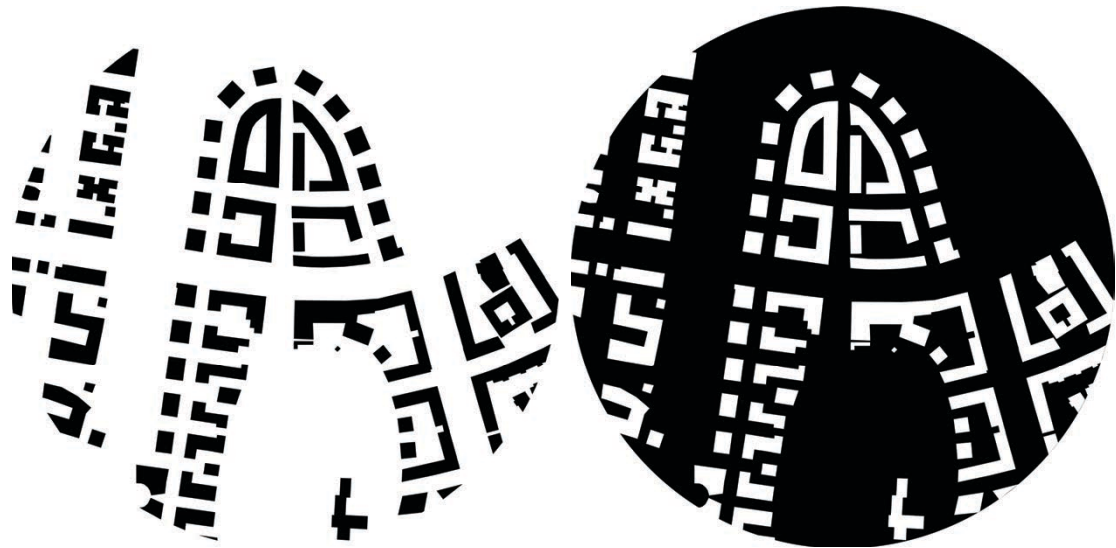*Hammarby Sjöstad green blocks. Photos: © Françoise Labbé.*
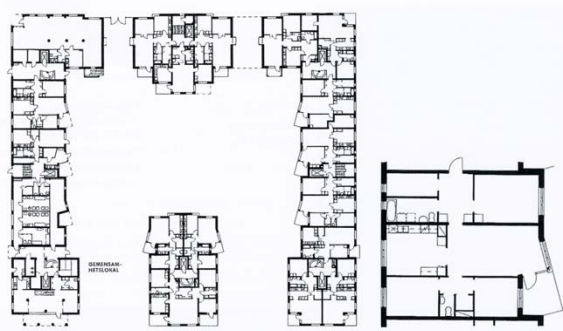

Hammarby blocks. Source Firley and Grön 2013.

Hammarby Sjöstad green blocks. Photos: © Françoise Labbé.

Hammarby Sjöstad inner green blocks. Photos: © Françoise Labbé.

Analytical drawings of Hammarby blocks by Ching Peng, École Spéciale d'Architecture, Paris.

Left: Ground floor plan of a U-shaped residential block in Mjärden on the north-western border of Hammarby. Middle: Detail of a three-bedroom apartment in the same building. Right: view of the Mjärden subdistrict. Source Firley and Grön 2013.

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