THE NEIGHBOURHOOD STRUCTURE AND IMAGE

INTEGRATED GUIDELINES FOR SUSTAINABLE NEIGHBOURHOOD DESIGN

United Nations Environment Programme

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CREDITS AND ACKNOWLEDGEMENT

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INTRODUCTION

As stated by Kevin Lynch\(^1\), we need an urban environment that is ‘not simply well organized, but poetic and symbolic as well’\(^2\). Legibility means the ease with which the city parts can be recognized and organized into a coherent pattern. When understanding the city structure, city dwellers can order a substantial quantity of facts about the nature of the world they live in. Like any good framework, such a structure gives the individual a possibility of choice and a starting point for the acquisition of further information. A clear image of the surroundings is thus a useful basis for individual growth. A vivid and integrated physical setting, capable of producing a sharp image, plays a social role as well. It can furnish the raw material for the symbols and collective memories of group communication\(^3\). The neighbourhood visual theme should talk about individuals and their complex society, their aspirations and historical traditions, and their natural environment. The clarity of the neighbourhood structure and the vivacity of its identity are the first steps in the development of strong symbols for the community. By appearing as a remarkable and united place, the neighbourhood could provide a fertile ground for regrouping and organizing community meanings. Such a sense of belonging improves all human activities and encourages inclusiveness.

Sustainable neighbourhoods are bound in area and structured around a centre defined by limits. Each community mixes housing, offices, retailers, leisure activities, civic centres, schools, medical care centres, and parks. Key design principles are

- The neighbourhood has a centre and an edge.
- The optimal size is 400 m from the centre to the boundaries.
- The neighbourhood offers a mix of housing, shops, offices, schools, places of worship, and leisure activities.
- The neighbourhood arranges buildings and circulation along a fine-grained, interconnected network of streets.
- The neighbourhood gives priority to public spaces and to the appropriate placement of institutional structures.

This chapter comprises five guidance sections.

THE NEIGHBOURHOOD STRUCTURE
THE NEIGHBOURHOOD IMAGE
GROUP FORM
THE NEIGHBOURHOOD LINKAGES
THE ART OF COMPLEX COMPOSITION

They are illustrated by three case studies.

LINKAGES AND GROUP FORM IN 17TH CENTURY DUTCH CITIES
SHAPING THE NEIGHBOURHOOD IMAGE IN BO01, MALMÖ, SWEDEN
ECO-NEIGHBOURHOOD BASED ON A TRADITIONAL WATER TOWN, SHANGHAI AREA

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1 Kevin Lynch was an American urban planner and author. He is known for his work on the perceptual form of urban environments and was an early proponent of mental mapping. His most influential books include *The Image of the City* (1960), a seminal work on the perceptual form of urban environments, and *What Time is This Place?* (1972), which theorizes how the physical environment captures and refiges temporal processes.
2 Lynch 1960.
3 Lynch 1960.
THE NEIGHBOURHOOD STRUCTURE

Neighbourhoods with a visible structure and image are essential to give their inhabitants a sense of belonging to a community. Such neighbourhoods are urban areas in which people enter ‘inside’. They are noticeable as having an identity. Always recognizable from the inside, they are also an external reference if they are discernible from the outside.

Left: Sprawl patterns with segregated zoning of functions, disconnected car-oriented road networks, and buildings either too big or too small should be avoided. Right: A sustainable neighbourhood has a fine grid of connected streets, defining small blocks, with civic and commercial activities clustered in the centre, close to transit stations. Source: The Government of Scotland 2010.

A compact walkable neighbourhood is usually enclosed within a 400 to 800 m radius. It is centred around a core with shops, restaurants, public buildings, health, cultural and educational facilities, and transit stops (bus, urban rail). This way of structuring communities provides easy access to work (either walking or by public transportation) and shopping. Each neighbourhood has a variety of housing types (apartments, town homes, single-family homes). Houses are built on smaller lots and are close to the street. Street design accommodates cars, pedestrians and bicyclists. Residential streets are narrow, slow and quiet with sidewalks, trees and on-street parking. Commercial streets provide wide and comfortable sidewalks. The neighbourhood includes a network of parks and trails for walking and biking. It also has a defined boundary.

Senlis historical core within a 300 m radius circle. Drawing by Ulysse Bérard. École Spéciale d’Architecture, Paris.

Left: Map of Senlis (3rd century AD). Founded in Antiquity, the town of Senlis retains an exceptional heritage from its long history. It all began in the second century AD when the Romans decided to create a new town north of Lutetia (Paris), along the Via Agrippa linking Lugdunum (Lyon) to Bononia (Boulogne-sur-Mer). Their attention turned to this small promontory overlooking the Valois plain, surrounded by forest and framed by two rivers: the Aunette and the Nonette. The Romans settled there and traced the Cardo (in green) and Decumanus (in blue) of the new city which they named Augustomagus Silvanecte, ‘Augustus’s market of the Sylvanects’. In the 3rd century, the city surrounded itself with ramparts (in red) to protect itself from the attacks of the Germanic hordes. Significant remains of it remain today.

Right: Map of Senlis (1772) after the plan of Desmaretz.

CENTRE AND BOUNDARY

Stockholm Gamla Stan. A 4.62 km² district with a density of 13,885 people/km² and with a well-defined edge and centre. Photo: Arild Vågen.
Left: The palace and the city. In the 11th century a jetty was built in the waters known as Strömmen. It became necessary to guard the passage between the Baltic and Lake Mälaren. In the 13th century a tower and a castle were built on one of the islands. A city – Stockholm – was born. The central island was first known as Stadsholmen, and more recently as Gamla Stan, the ‘Old Town’. The map shows the castle and the shoreline in the 14th century, the 17th century and the present day.

Right: Stockholm, a city shaped by water and topography. Photo: © Françoise Labbé.

Centre

As Raymond Unwin observes: ‘even in districts, suburbs, parishes, and wards, it is desirable that there should be some centre. There should be some place where the minor public buildings of the district may be grouped and where a definite central effect on a minor scale may be produced. The importance of the central point can hardly be exaggerated. It will be wise, therefore, at a very early stage in our planning to select suitable sites for the main and subsidiary centres, and as these are to serve, not only as sites for the public buildings, but also to focus the common life of the community, both these points of view must influence our selection. to secure that they shall be genuine centres, where people will be likely to congregate, they must either be themselves the focal points of the main traffic lines, or must lie very near to these points, the latter in many ways being preferable.’

The principle is absolutely general: ‘the idea of the centre should not be confined even to centres of districts, parishes, or wards. each area should have its special central feature or point of interest round which its plan should be grouped and up to which it should lead. At the point where several roads converge, there should always be something of an open space arranged, to give freedom for circulation of traffic, and architectural effect to the various road junctions.’

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4 Unwin 1909. 5 Unwin 1909.
Senlis historical core within a 300 m radius circle. Drawing by Ulysse Bérard. École Spéciale d’Architecture, Paris. All the lines converge towards the focal point. At the confluence of many streets, the cathedral square attracts pedestrian flows. In the curved mesh of medieval streets, everyone can see the cathedral spire.

**Boundary**

The association between a focal point and a limit contributes to the social identity of the community. The centre is always a public space, eventually a square, a green space, or an important junction. The centre is the place for public buildings, be they civil or religious. It offers a strong concentration of shops and offices. The edge can be a natural area, like a forest, a lake, the sea, or an artificial infrastructure. In contemporary metropolitan areas, the edges can be large green space or zones dedicated to urban farming. To create a natural ecosystem on a large scale and preserve the biodiversity threatened by urban sprawl, the green areas along the edges have to be continuous, connected to one another, and to the surrounding rural space.

In the delineation of a neighbourhood, the presence of a boundary is of decisive importance. A neighbourhood is determined either by conspicuous edges or, at least, by a change of urban texture which implies a limit. 'The distinctive quality of any man-made place is enclosure, and its character and spatial properties are determined by how it is enclosed. Enclosure, thus, may be more or less complete, openings and implied directions may be present, and the capacity of the place varies accordingly. Enclosure primarily means a distinct area which is separated from the surroundings by means of a built boundary. It may also be manifest in less strict form as a dense cluster of elements, where a continuous boundary is implied rather than positively present.'

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6 Norberg-Schulz 1980.
The fact that the neighbourhood is the fundamental compositional unit of the global urban structure does not mean that it is possible to make a sustainable city simply by juxtaposing communities. Neighbourhoods need to be integrated in the metropolis, through a series of coherent scales ordered by limits, nodes, and long-range connections. Although having a clear internal structure, a boundary and a distinct image, neighbourhoods are not isolated entities. The neighbourhood scale is embedded in a sequence of nested scales. The shift from the local scale to the metropolitan scale should result from inclusion into larger and larger ordered structures. In well-structured cities, neighbourhoods are part of larger urban ensembles (macro-districts) and are composed by

*AN ASCENDING SERIES OF SCALES*

Stockholm boundary facing the sea. Photo: © Françoise Labbé.

smaller entities (micro-districts). As urban design increases in scale, numerous small ensembles make up bigger sets that are in turn part of even larger ensembles.

In Barcelona, for example, the Mercat (market) de Santa Caterina is also part of a larger urban design ensemble comprising the market square and an adjacent larger plaza to the west, fronted by the city’s medieval Cathedral.

This urban design ensemble of Mercat, plaza, and cathedral, is diverse in age, program and architectural composition but it creates a related, coherent, linked, and complex, ensemble of spatial elements. The Mercat de Santa Caterina seamlessly merges into a larger space at the intersection of via Laietana and the cathedral plaza. The plaza is itself composed of several smaller spaces, including the Placita de la Seu directly in front of the cathedral, and the adjacent Plaça Nova. This plaza sequence is just one episode among many. They link Barcelona’s old city to the harbour front and to the Ensanche grid to the north. Adding to this complexity is layering due to the many periods of construction coexisting in the plaza sequence. Time and evolution engender layers of space. They are an element of pluralism in urban design.

The west side of Paris, for example, is one such macro-district, in which micro-districts such as the Place de l’Étoile, surrounding the Arc de Triomphe, are connected to other squares by boulevards, within a consistent city fabric of seven-story buildings. Another macro-district is Barcelona Eixample designed by Ildefons Cerdà in 1859, with consistent structure, aesthetic intention, and clarity.

Ryan 2017.
NATURAL AND BUILT FORM

A neighbourhood unique identity and image stem from the relationship between its natural and built form, the configuration of buildings and neighbourhood structure, the composition of historic buildings and the contrast between planned and organic, enclosure and openness. The variety of viewing points and formal juxtaposition results in a townscape of great interest yet considerable visual unity.

LANDSCAPE, MOVEMENT FRAMEWORK AND BLOCK TYPOLOGY

The landscape, the movement framework, and the block typology are the three main design elements of neighbourhood projects. Urban designers should define and knit together the landscape, the lines of movement, the development blocks, the streets, the buildings, and the open spaces. It is the dynamic interrelationship between all these elements, rather than their characteristics, that bond together to make a vibrant and unique place. This design process should apply everywhere: to the city centre and to the transformation of the suburbs, and to everything in between. It should be implemented through many scales: from the city and its neighbourhoods to mixed-use green urban blocks. The latter should be conceived with a micro-urbanism approach. This structure provides the foundations for further detailed design of the constituent elements. It forms the basis for designing individual developments—possibly by different actors to enrich diversity and complexity.
Edinburgh map, 1575. This early map of Edinburgh was drawn during the sixteenth century. It shows Edinburgh shortly after the reign of Mary, Queen of Scots. The castle and city walls are clearly visible, along with the distinctive crown of St Giles Cathedral. The map highlights the role of edge, centre, landscape, streets, and block patterns in defining the urban structure.

Edinburgh map 1610. A city structure shaped by the topography.
Edinburgh map 1647.

Edinburgh today. Photo: © Françoise Labbé.

Edinburgh. Photo: © Françoise Labbé.
A well-structured neighbourhood is as articulated as a good building. Urban design shares components with architectural design while reframing and enlarging their use and signification.

- **Rooms** in urban design are not limited to rooms within buildings but include courtyards in urban blocks and large squares. These are the primary spaces where people socialize. These ‘urban rooms’ support community life from the most public to the most intimate.
• **Walls** in urban design separate and modulate space vertically. Walls are places where outward and inward forces interface, and this interaction defines the form and function of the wall. The sequential, rhythmic, vertical facades of buildings are walls defining the streets’ and squares’ edges. They should be designed as interior walls of the public realm: it constitutes a ‘room’ when it is designed with a sufficient sense of enclosure.

• **Floor or roofs** in urban design are elements that separate and modulate the space horizontally. These elements include water surfaces and the sky, which, when framed by building cornices or seen from a well-enclosed patio, appears like a roof. When the public realm is designed as a room, the square pavement patterns become those of a floor.
Thresholds in urban design are transitional elements that mediate from one space to the other and where functions often overlap.
**Links** in urban design connect elements together and create a whole.


**THE NEIGHBOURHOOD IMAGE**

Genius loci (spirit of place) is the quality of a place that makes it unique and recognizable, a place one remembers. Image plays to the innate human ability to see and remember patterns. Separate elements form a memorable place when they are easily identifiable and grouped into a pattern.  

*Edge and landmark in Brussels. Photo: Jean-Pol Grandmont.*

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The city image is structured with nodes, defined by edges, traversed by paths and sprinkled with landmarks\(^\text{10}\). None of these elements exists isolated. They overlap, contributing to the creation of a complex whole and distinctive image. A sequence of nodes, landmarks and vistas provides rhythm and orientation. Creating an easy-to-read neighbourhood is crucial as inhabitants have to navigate within a place and between different locations. People find it easier to orientate themselves and recognize where they are when a project safeguards important views between areas or designs new ones, while respecting or adding new local landmarks. To maintain or enhance the legibility, designers should evaluate the relationship between the elements and determine how the proposals contribute to developing a series of linked public spaces and landmarks. Paving, planting, orientation, light and shadow, shelter, signage, street furniture require special attention.

Nodes, edges, paths and landmarks define the image of Bruges.

The shapes, colours, or arrangements facilitate ‘the making of vividly identified, powerfully structured, highly useful mental images of the environment’\(^\text{12}\). An example is a rectangular garden enclosed continuously on four sides with Italian-style house facades in London such as Pembridge Square.

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\(^\text{10}\) Lynch 1960.
\(^\text{11}\) Cullen 1961.

\(^\text{12}\) Lynch 1960.
A highly imageable neighbourhood invites the eye and the ear to attention and greater participation. Image expands and deepens the understanding of a legible urban setting. It can be apprehended over time as a pattern of high continuity with many interconnected distinctive parts. Good city form is not a final but an open-ended order, capable of uninterrupted further development. The image of the city ‘should preferably be open-ended, adaptable to change, allowing the individual to continue to investigate and organize reality: there should be blank spaces where he can extend the drawing for himself’\textsuperscript{13}.

\textit{El Greco, View and Plan of Toledo. 1608. Museum of El Greco, Toledo.}

\textit{Toledo. Photo: © Françoise Labbé.}

\textsuperscript{13} Lynch 1960
Nodes are the strategic points of a neighbourhood in which a city dweller can enter and which constitute the intense focal points to, and from, he is travelling. They may be squares, primary street intersections with a crossing or convergence of paths, public transport interchanges, moments of passage from one structure to another.

Or the nodes can be simply concentrations: they gain importance by gathering certain uses or physical characters within a well-defined geometry.

Some of these nodes are the focus and quintessence of a neighbourhood on which their influence radiates and of which they are the symbol. Nodes are associated to paths, because junctions are generally the convergence...
of paths, and events of the urban dweller journey. It is possible to arrange a series of nodes to form an interrelated structure.

The image of Florence, for instance, is that of the monumental path of the Medici, linking the nodes of princely power and of ecclesiastical power. The cupola dominates the view but the whole of the princely route has been traced in our memory. From top to bottom: Santissima Annunziata, Via dei Servi, Dome, Via Calzaioli, Signoria square and palace, Uffizi, Vasari Corridor, Ponte Vecchio, Palazzo Pitti, Boboli gardens. Nodes can be linked together by a close juxtaposition or by allowing them to interact. They can be placed in a common connection with a path or edge, joined by a

14 Source: Fanelli and Trivisonno 1983.
linking element, or related by an echo of some characteristic from one to the other.

Such linkages between nodes can organize a neighbourhood.

**EDGES**

**Edges are linear elements that act as boundaries, breaks in continuity: shorelines, railway cuts, edges of development, walls.**

They may be barriers, more or less penetrable, which close one area off from another; or they may be seams, lines along which two regions are tied and connected.

The gates to the city used to be, with its walls, its most monumental sign, defining at once boundary, threshold and access. When the gateway has been preserved, as in Prague, it can continue even without the walls to play a structuring role in the city.

**Walls and gates in Toledo**

*Toledo. Photos: © Françoise Labbé.*
Edges define and hold together urban areas, such as in the outline of a place by water. They are better when they act as links, creating transitions from one neighbourhood to the other. They also require continuity and articulation of form throughout their length. Examples are walls of medieval cities punctuated by gates.

**Edges, nodes and links in Prague**

*Prague. The traditional route of the coronation processions which started from the old powder magazine of the city, the Powder Tower which served as the gateway to the Old Town, to Malá Strana Castle.*

*Towers, gates and bridges act as boundaries but also as thresholds and crossings in a sequential vision of the city. When the gates have been kept, as here in Prague, they continue, even without the wall, to play a pivotal role in the urban structure. Raymond Unwin proposed to extend the idea of the city gate to bridges. The Charles Bridge in Prague between the Old Town and Malá Strana, acts as a connection between two city parts. It is an access from one to the other. In laying out the Charles Bridge and its approaches, the crossing of a threshold is highly expressed with a well-characterized form reminiscent of a city gate. Photos: ©Françoise Labbé.*

**Edges in Tallinn**


The turrets and bastions can define the visual identity of the city, as they do in Tallinn. Walls of the medieval city act as an edge in Tallinn. Photos: ©Françoise Labbé.

The formally designed waterfront promenade in Hammarby Sjöstad is such an edge that gives a strong visual impression. An edge is enhanced by increasing its accessibility or use, as when opening a waterfront to recreation. The waterfront in Hammarby Sjöstad is not simply an obstacle where the neighbourhood meets the sea: visual and motion penetration in the neighbourhood is allowed through it; it is structured with depth and is a seam rather than a barrier, a line of exchange between the water and the neighbourhood along which they are sewn together. The waterfront promenade is a feature to which the neighbourhood inside is easily connected.

Edges and links in Hammarby Sjöstad

Hammarby Sjöstad waterfront is both an edge and a link. Left: photo by Holger Ellgaard. Right: photo by Jopparn.

PATHS

Paths are the channels along which people move. These may include streets, bridges, public transport lines, canals, railways. For many inhabitants, these are the predominant elements of their city image. Paths with clear and well-known origins and destinations tie the city together. Where major paths lack identity, or are easily confused one for the other, the entire neighbourhood perception is in difficulty.

Sequences along movement lines constitute the most powerful means by which the form and image can be ordered. The key lines of motion must have a singular quality that distinguishes them from the surrounding ones: a concentration of use or activity along their edges, a distinctive spatial quality, a special density. These characters ensure the continuity of and rhythm of progression along the movement line. If one or more of these qualities are used consistently, the line can be conceptualized as a continuous, unified element. It can be a tree plantation on a boulevard, a colour, a unique texture of pavement, the rhythmic vertical lines of the facades, windows and shutters.
The rhythm of windows in Haarlem, Netherlands. Photos; © Françoise Labbé.
The regularity can be rhythmic, a repetition of blocks and space openings\(^{15}\). This leads to a visual hierarchy of streets and ways: the identification of the main lines and their unification as continuous perceptual elements. These are the skeleton of the neighbourhood image. Lines of motion should have clarity of orientation. This can be supported by strong *termini*, and by a directional gradient or differentiation, to give the line a sense of progression where the opposite directions are unlike. A gradual thickening of signs, stores or people may mark the approach of a shopping node. There may be a gradient of colour, texture, or of the plantation; a shortening of the block length; a space funnelling may signal the proximity of the city centre.

**LANDMARKS**

**Landmarks are a crucial component of place spirit.** Their singularity and location in relationship to the context are essential. They act as visual termination goals, orientation points, and contrasts in the urban setting. They structure the urban space around them. ‘A landmark lifts a considerable area around itself out of anonymity, giving it identity and visual structure’\(^{16}\).

Landmarks should have a clear form in contrast with their background. The setting in which an element stands out need not be limited to immediate surroundings. Some landmarks, such as the Torso Tower designed by Santiago Calatrava in Malmö, are faraway points, usually seen at many angles and distances, above smaller structures, and used as radial references.

Asymmetries can be used, such as having a park on one side.

If the positions along the movement can be measurably differentiated, then the line is not only oriented, but scaled. A change in shape or quality such as the funnels punctuating Strøget in Copenhagen or via del Corso in Roma grant a recognizable form to distinct events along the journey. When the trip contains such a series of peculiar incidents, reaching and passing one sub-objective after another, the journey itself becomes meaningful and evolves into an experience in its right. The dynamic carving of the movement line gives it its identity and produces a continuous experience over time.

They can be in the neighbourhood or far. For all practical purposes, they symbolize a constant direction. Such are the isolated towers, the golden domes, the great hills. The Duomo of Florence is a prime example of a landmark: ‘visible from near and far, by day or night; unmistakable; dominant by size and contour; closely related to the city’s traditions; coincident with the religious and movement centre; paired with its campanile in such a way that the direction of view can be gauged from a distance. It is difficult to conceive of the city without having this great edifice come to mind.’\(^{17}\)

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\(^{15}\) Lynch 1960.

\(^{16}\) Tunnard and Pushkarev 1963.

\(^{17}\) Lynch 1960.
Other landmarks are mostly local because they are only visible in restricted areas and from some approaches. They are frequently used as clues to neighbourhood identity and structure. A sequential series of landmarks, in which each calls the anticipation of the next, so that they trigger movements of the city dweller, seem to be a standard way for many people to travel around cities.
GROUP FORM

The traditional city shows us an irregular, complex network of streets and squares. It combines in a subtle dosage connectivity and complexity, a high quality of very different buildings and a unity of materials for walls, openings, and roofs. Traditional cities show us ‘families’ of forms for openings, doors, windows, the pitch of roofs, the position of dormers, etc. As Pierre Riboulet writes: ‘We can recognize successive construction periods by different signs and this construction evolves little over the centuries and only by gradual transitions that do not disrupt the unity of the whole. The evolution takes place without abrupt breaks.’\textsuperscript{18} This city is at once one and diverse. It displays no literal repetition of forms and no uniform series. No element ever exactly resembles another. ‘Every composition is original: doors are of varying heights, lintels are more or less elaborate, windows come in different sizes. In one place, a projecting balcony creates an event; in another, a corbel encroaches on the street; elsewhere, the ground goes down several steps. Nothing is regular. On the contrary, everything appears random and fortuitous.’\textsuperscript{19}

This urban space is a complex human experience. It emerges from the interaction of the observer with different visual, tactile, acoustic and thermal information fields. If these fields are coherent, well defined, continuous, and structured through scales, they generate urban spaces with which people can connect\textsuperscript{20}.

\textsuperscript{18} Riboulet 1998.
\textsuperscript{19} Riboulet 1998.

\textsuperscript{20} Salat et al. 2011.
The composition of the historical city at different scales was structured by a syntax. The same principles were applied to the scale of the apartment, the architectural complex and the city as a whole. The relationships between urban squares and buildings were identical to those of the forecourts and the courtyards of buildings, the vestibules and the galleries, and they were the same as those linking the rooms of the buildings. The historical city brought together elements to form a unity instead of breaking them down in a scattering of disjointed buildings. The continuity and unity of public space is inseparable from composition. In insisting on the fusion of parts in a continuous whole to form urban squares, Camillo Sitte was one of the last representatives of a fundamentally urban aesthetics in which buildings only have relative autonomy and only on condition that they contribute to the global effect. This conception of the composed whole is true as much for the city as for architecture, with an additional difficulty for the city: that of unifying disparate elements that have sedimented over the long term. It is testimony to the genius of the architects of Venice, Florence, and Siena that they succeeded.

**GROUP FORM**

‘Group form’ goes beyond simple aggregations of unrelated buildings, to find a spatial language creating meaningful urban environments. Fumihiko Maki describes group form as ‘a system of generative

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21 Salat et al. 2011.
22 There is a need to distinguish ‘form’ from ‘design’. ‘Form implies what a building – whether it be a church, school, or house – would like to be, whereas the design is the circumstantial act evolving from this basic form, depending on site conditions, budget limitation or client’s idea, etc.’ (Kahn 1960) This understanding of urban form describes a form that acts as a catalyst,
elements in space’. Consistent use of basic material unfolds at human scale with sequential development. Group form is flexible—and able to embed the transformative flow of time. It is both evolving and holistic, with open spaces, nature, housing, and topography merging together in a unified whole, like in Italian townscape. Group form characterizes the organic growth of most European cities. Italian hill towns or Greek Islands cities are among paramount examples. Factors which determine the spatial organization of these towns are

- Consistent use of basic materials and construction methods and spontaneous but minor variations in physical expression.
- Wise and often dramatic use of geography and topography.
- Human scale preserved throughout the town.
- Sequential development of basic elements such as dwellings, open spaces between houses, and the repetitive use of visual elements such as walls, gates, towers, open water, and so forth.

THE TRADITIONAL ‘IDEAL TYPE’

Yet this diversity seems to be informed by types that are never manifest but always subjacent. What is the source of this unity? Culture and more precisely a culture that has its source in an approach to work that does not separate knowledge from expertise, maintaining, actualizing and constantly enriching both. This culture is nothing other than an accumulation of intellectual work. Traditionally ‘unseparated intellectual and manual training made it possible to imagine the work to be done in advance and fostered the ability to intellectually resolve the questions it raised. It also led to a knowledge of models, which are the sum of previous responses to the same problem.’

The ideal model does not exist anywhere. It shows through in every realization, each time interpreted and reinterpreted by the artisan(s) who used it mentally. This is an example of max Weber’s ideal type, which is an intellectual construct meant to measure significant individual relationships by their singularity. ‘These ideal types work here, consciously or unconsciously, as collective cultural references and a common language for all those who participate in the creation of a work, with each one using the part that concerns him/her. We could even say that the existence of this collective model is the absolute condition of the collective creation of the traditional city.’

‘Each part is different. It is characterized by an ascending relationship to the ‘model’. The movement of this reference is what enables each part to be so similar to its neighbours and, consequently, to maintain a lateral relationship with them. This capacity of each part comes from the fact that it is the seat of an original creation. You can’t give what you don’t have.’

In the traditional mode of composition, those in charge of the project produce an original work every time. ‘The formal model here is mental and does not define everything. Actually, everything remains to be invented and accomplished when people get down to work.’

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24 This section draws on Salat et al. 2011.
26 Riboulet 1998.
ALTERNANCE OF GROUP FORM AND COMPOSITIONAL FORM

Formal composition and group form alternated in European cities creating a layered urban structure

When considering a long-time span, most European city forms are the product of two thousand years evolution layering different phases

- Initial compositional form: The Roman Empire grid of 70-meter side square blocks oriented according to cardinal directions. The two main axes are the *cardo* and *decumanus*.

- Group form: transformations during the Medieval period with the reorganization of the grid into more curvilinear patterns converging toward competing spatial and social attractors – the church, the market, the City Hall or feudal lord palace.

  - Compositional form again with the Renaissance Popes grand schemes in Roma or the Kings of Savoy Baroque axial compositions in Torino.

The European city is in a constant flux between compositional and group form. Straight streets in Roma, Paris, or London have been created in periods of compositional form while the intricacies of curved streets in these three cities and many more in Europe come from group form.

THE NEIGHBOURHOOD LINKAGES

Links at various scales are what holds the totality of the neighbourhood together. Linkages refer to physical and visual connections – from building to the street, building to building, space to space or one side of the street to the other – that tend to unify separate and disparate elements. Linkages can be expressed in a physical fact (as a street or a bridge between two buildings) or by implication (as in the composition of buildings and spaces). A striking example of linkage by implication is the visual integration of Gran Madre church to the expansive regular arcades of via Po as a seemingly close strong termination point. In reality the church is far away on the other side of a bridge over the Po River. More generally, the technique of "borrowed scenery" in Chinese or Japanese gardens is a form of linkage by implication.

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29 Compositional form does not evolve sequentially through time like group form but establishes by design functional, visual, spatial and symbolic connections between urban elements in two or three dimensions. Although it has led to magnificent realizations such as Michelangelo Capitol Hill Square in Roma, it is mostly a static approach because the act of making a composition itself tends to complete a formal statement. Contemporary compositional forms include the Rockefeller Centre in New York, Chandigarh Government Centre, and Brasilia.

30 Borrowed scenery (Japanese: shakkei; Chinese: jiējǐng) is the principle of "incorporating background landscape into the composition of a garden" found in traditional East Asian garden design. The term borrowing of scenery ("shakkei") is Chinese in origin, and appears in the 17th century garden treatise *Yuanye*. 
A curved path punctuated by medieval tower gates and the crossing of the Moldau by the Charles Bridge links the Market Square in the old town to the main square in Malá Strana. The scansion of the urban space by gates continues down to the smaller scales of the urban fabric. Source: Urban Morphology and Complex Systems Institute based on Google images.

Plan of Prague within baroque fortifications, copper engraving, 1650.

Source: Markéta Lazarová, Jiří Lukas, Prague, Picture of the town, in the 16th and 17th centuries, List of views on graphic art pieces.
Linkage is what allows making connections between discrete urban elements. It makes the complex whole of the neighbourhood understandable by articulating its parts. 'Linkage is simply the glue of the city. It is the act by which we unite all the layers of activity and resulting physical form in the city. Insofar as linkage is successful, the city is a recognizable and humanly comprehensible entity.'

Linkages allow us to understand and navigate in cities as patterns of events. 'Like a piece of architecture, the city is a construction in space, but one of vast scale, a thing perceived only in the course of long spans of time, interrupted, abandoned, cut across. It is seen in all lights and all weathers.' Linkages allow us to know and enjoy urban experience through its physical, temporal, and social dimensions.

City design is therefore a temporal art, but it can rarely use the controlled and limited sequences of other temporal arts like music. On different occasions and for different people, the sequences are reversed, 'Ultimately, linking is assembling patterns of experience in cities.'

Linkage can occur longitudinally along a street or laterally across a street and through the adjacent blocks. When streets are lined with well scaled, street-oriented edifices, a primary design objective is met: a reciprocal relationship between the private space of block interior and the street public space. When this relationship is strong, the interactions, both physical and visual, between the public and private spheres are smooth and relatively unimpeded.

The possibility for seeing other people and courses of events is limited to a distance between 20 and 100 metres, depending on what is to be seen. This places great demands on the degree of linkage. Maintenance of sight lines and sidewalk connections are obvious ways to provide linkage. It can also be created in more subtle ways. Trees can contribute to linkage: continuous tree rows can psychologically connect places at either end, and tree patterns that reflect or amplify building geometry can psychologically link buildings to the street.

Five Basic Linking Operations: to mediate, to define, to repeat, to make a sequential path, and to select

- To mediate is to connect with intermediate elements. Once established, mediation suggests a multitude of other transitions. The arcades of Italian cities, for example, unify the

33 Lynch 1960.
34 Maki 2008.
35 Maki 2008.
street and provide shelter from the sun and rain. The Dutch stoep or the traditional Japanese house engawa (the veranda edge between the interior living spaces and the outdoor garden) blur the threshold between public and private, being half house, half outside.

- **To define** is to enclose a site by a wall (in the extended urban sense of the term) and thus identify it as a separate place.

- **To repeat** is to link by introducing one or more common elements in an urban situation. Besides the repetition of facade elements, Pembridge Square is linked by the repetition of what Kevin Lynch has called the ‘grain’ of the urban fabric, that is the clustering of buildings which have spaces between them of a common size and shape\(^37\). The cluster becomes an identifiable group because it has a peculiar grain or pattern.

- **To create a sequential path** is to arrange buildings or elements of the public realm in a sequence. Designing or reinforcing a path in the natural landscape will catalyse and give direction to a new development.

- **To select** is to establish unity by the choice of the site. The designer may choose a piece of land prominent enough to be a unifying visual force. Obvious examples exist in towns like Miletus and Priene in Turkey.

### THE ART OF COMPLEX COMPOSITION\(^38\)

The ultimate aim of any composition is to achieve unity. It joins parts that have their characteristics and functions in a site displaying a natural or artificial organization with historical depth. The site’s history needs to be preserved but also complemented in a way that contributes to revealing it. The composition creates unity from multiple relationships and correspondences between parts. It generates complexity.

### COMPOSING FORMS FROM THE SMALLER SCALES

The sense of connection to the environment begins with the smallest scales. Their composition determines the impact of the whole. Surface details constitute the first information perceived. Through them we connect to the urban world in a series of successive amplifications. Consequently, no detail or a break in scale progression undo our relationship to the world and create alienation and hostile urban environments.

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\(^{37}\) Lynch 1954.  
\(^{38}\) This section draws on Salat et al. 2011.
Urban space is structured by its boundaries. Turin’s colonnades, Bologna’s arcades, the rows of houses in Dutch towns with their narrow alleys leading to courtyards deep in the core of the blocks, are all human interfaces. Such permeable interfaces facilitate as much the movement of pedestrians as the movement of the eye while preserving interiority. Perforations in the urban fabric are useful when they are linked to the human scale (between a few centimetres and four to five metres). By the complex rhythm of its facades and its decomposition into smaller components, the traditional street was connected to human beings and connected them to the urban world.

**CONNECTING PEOPLE TO A DIVERSIFIED INFORMATION FIELD**

Buildings, walls, arcades and the pavement define and reinforce the continuous field of information that constitutes urban space. Within such an information field, greater intensities stand out and invite pedestrians to stop. These are edges, places of transition or of intersection. Historic urban spaces optimize the visual, thermal, acoustic and tactile information received by a pedestrian. To a slow pace of pedestrian motion corresponds much information, hierarchized on multiple scales, to ensure a continuous, diversified flow perceived according to distinct temporalities and tempos.

**Scales of perception in Toledo**

A city is a continuous flow of information. The narrow streets of historic cities as Toledo or Siena were rich in detail perceived at close range. They offered a very dense information field that was both coherent and diversified and that unfolded gradually at a walking pace. Brice Gruet describes the information field created by the details of Roman streets: ‘We could speak about the roughness of these facades, their peculiarities, from the ground to the roof [...]. then there are the details of the windows, their shape, size, cornices, mouldings, and texture, the details of the entry gates or doors, the shops ... a wealth of information usually reaches us in the street [...]. All this information generates the atmosphere of a street by the impressions to which it gives rise and we are all the more under its spell when the streets are narrow, because the proximity between us and the buildings is that much greater.’

**Scales of perception in Delft**

The information field emitted by the surrounding surfaces constitutes the urban space as a totality that is coherent and protective. Paths, nodes of activity and urban spaces should be mutually reinforcing. Public space is a three-dimensional volume that encloses and guides the movements and interactions of people. In a complementary manner, paths and nodes of activity need to be protected and surrounded by an urban space. The role of urban space as a connector is the key to its success. The segments of the urban fabric that are used, are those where the geometry and the information field foster interaction between the urban space and inhabitants.
Look at any picture of urban Venetian streets, St Mark’s Square, the inside of the basilica, or even the most modest campo, and you cannot help but observe the saturation of visual information, the rich continuous fabric of perceptions that permeates consciousness. Urban space is a moving fabric of shifting relationships, further complicated by the presence of other observers, stationary or moving.

Public space in cities is shared by many viewers. Architectural structures have to provide visual information for multiple points of view and not for a single observer. The multifocal Baroque space in this regard is an improvement over the monofocal Renaissance space. However, maximizing information can lead to perceptual saturation, which is why the whole has to be harmonized through symmetries and connections. This is the role played by the classical language of architecture. It develops symmetries of dilatation, translation and rotation to link in a harmonious nearly musical manner the information flow emitted by the structures bounding urban space as the viewer moves through space.
PRINCIPLES OF COMPLEX COMPOSITION

Contrast

Urban elements can establish connections only if they present contrasts. ‘The elements of a composition [...] cannot be of equal importance. The importance of contrast, which comes from a fear of equality, is manifested in virtually everything and everywhere in architecture: in solid masses, in their importance and their shape, in heights, in the solids and voids of walls. Contrast assists in the subordination of the parts to the whole that ultimately ensures unity.’\(^{40}\) The law of contrast is universal. ‘A reciprocal enhancement is involved in the handling of opposing materials, with the light of the one bringing out the darkness of the other, and the vibration in one place finding fuller expression because of the calmness that reigns in another. It is a law of sense perception that something can be appreciated better when juxtaposed with its opposite, or at least with something different, that brings out its character.’\(^{41}\) The urban compositions that move us are those that offer contrasts of all kinds. This is the case when ‘coming upon the piazza del Campo in Siena from the narrow streets or upon the Palais Royal gardens in Paris from Rue Richelieu. It is the case of a quiet courtyard to the bustle of the city. It is also a solid mass within a wide-open space, like the buildings along Quai Voltaire and the Seine, the buildings along rue de Rivoli and the Tuileries.’\(^{42}\)

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\(^{40}\) Gromort 1946.

\(^{41}\) Riboulet 1998.

\(^{42}\) Riboulet 1998.
Symmetry

Vitruvius thought of symmetry as bringing together all the qualities of the composition, and thus responding to the ideas of measure, harmony, proportion, and the proper relationship between the parts and the whole. In the city as in nature, symmetry introduces perceptible regularities that present a reassuring character. “We have a need to see symmetry. It’s like a lifeline. Confronting the informal is beyond our strength. Everything in life seems confusing and incomplete and suddenly the symmetry of a palace and of any beautiful architectural piece makes us feel that nature has a purpose: to become visible and intelligible. It’s like a gift.”

Balance

“A balanced composition is one where all the solid masses answer one another and balance each other as if, despite the different shapes and materials, they had the same “weight” in space. The sense of a balanced composition involves a subjective component, since the weight of the parts can only be assessed mentally.” A case of a balanced composition without symmetry is the Piazza della Signoria in Florence and how the work of Arnolfo di Cambio came to be introduced in a continuous process. “The buildings, sculptures, galleries, fountain, even the ground of the square respond and correspond to each other, resonating as in musical harmony. And they do so without the slightest axis or formally apparent “organization”.”

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43 Vitruvius, De Architectura.
45 Riboulet 1998.
46 Riboulet 1998.
Proportion

Proportion is manifested by the permanence of a relationship between dimensions. Painters and architects have always known its importance. Proportion is ‘the convenience and relationship of the parts of a whole, in comparison with one another and with the whole’.\textsuperscript{47} ‘It is always the same relationship between the part and the whole that proportion must regulate in the most harmonious way possible. Otherwise put, the unity of a work can be ensured not by repetitions of the same dimensions but by the presence everywhere within the work of the same relations between the dimensions.’\textsuperscript{48}

\textsuperscript{47} Cited in Riboulet 1998.

\textsuperscript{48} Riboulet 1998.
Scale

It is crucial for people to relate to the city through a cascade of successive scales starting from details on the human scale. 'This means, very simply, that all built elements that can be apprehended with the hand and with the body must be calculated according to human dimensions. The height of a ceiling, the support of a window, the measure of the steps, the width of a corridor or sidewalk must be sized in such a way that by the use which is made of them, we immediately feel a correlation between these spaces and our bodies.'

'The importance of these dimensions is such that, inscribed and solidified in space, they will appear as the common reference for ordinary buildings throughout the city.' Finding the proper scale is always a necessary part of the work of composition. It has to be established for the fragment that is being composed and this scale must, moreover, be in harmony with the environment. Success in this area is a fundamental condition for formal coherence and harmony of urban complexes. The cities that appear to be highly coherent display very extensive unity of scale.

The Material

'There is an aspect of truth to the material that the work of composition must express as often as possible by showing the correlation between the material and the form. This is another way to achieve unity.'

The Character

Urban composition, through its categories of contrast, balance, and scale, through its forms and materials, and plays of shadow and light must express the destination, the social and symbolic use of urban space. It must show what Vitruvius called convenience. It is through character that urban forms become both identifiable and susceptible to appropriation and multiple uses.

INTENSIFYING INTERACTIONS BETWEEN PEOPLE AND THE CITY

Different techniques can intensify the interaction between people and the city. Such interaction depends on the information contained in the forms, surface textures, patterns, colours and details. The idea of mutual coherence or harmonization describes the effects of mutual reinforcement. Coherence ultimately depends on judgments made by the human brain. The old humanist approach to urban design sought harmony between components. It is this complex harmony that the urban composition on all scales should allow us to recover.

Ornament

Adolf Loos called ornament ‘a crime’. Yet ornament has been a constant feature in human history. Traces of it have been found dating to the second millennium BCE, in Scotland, where stones are decorated with spirals. Diversity and complexity are part of both nature and our minds. Built on the rejection of human scales, modernist cities provoke a sense of alienation. In rejecting the ornament, they removed the basis of all human-scaled structures: the structure at a human scale (from 1 cm to 2 m). Without this essential foundation, the poverty of organization spreads to the rest of the urban ‘structure’.

Texture

The qualities the surface and the texture of architectural elements create an information field that varies with the scale of observation. This was the role of bossage in the Florentine Renaissance palaces. Textural effects don’t only belong to the material. The repetition of a colonnade, with its hatching of light, creates a larger urban texture that amplifies the flutes of a single column by repeating the pattern on a bigger scale.

Colours, materials and textures in Toledo

49 Riboulet 1998.
50 Riboulet 1998.
51 Riboulet 1998.
52 Riboulet 1998.
Photos: © Françoise Labbé.

Photos: © Françoise Labbé.

Photos: © Françoise Labbé.
Colour

Modernists decried the use of colour as much as ornaments. The neoclassical taste for white, inspired by Greek and Roman antiquities, forgets that these buildings and columns were originally colourful. Colour carries meaning. Witness the Forbidden City yellow roofs emerging from the flat grey sea of Chinese courtyard houses or the radiant blue roof of the temple of Heaven. The vertical progression of colour connects Heaven and Earth in many religions. The Dome of the Rock in Jerusalem, for instance, has a relatively dark base, reminiscent of the earth; its middle part is light blue, blending with the sky; the sparkling gold dome symbolizes the mystical sky and holy light.

Left: Beijing Forbidden City. Right: Dome of the Rock in Jerusalem.

Basilica San Marco, Venice, Porta di Sant’Alipio, with flanking columns (twelfth to early thirteenth centuries). Photo: © Françoise Lobbé.

The Ground Treatment

From the Roman world mosaics to those of Saint Mark’s Basilica in Venice, connecting pedestrians to the pavement by a textured surface and paving patterns enriches the urban information field.

CASE STUDY: LINKAGES AND GROUP FORM IN 17TH CENTURY DUTCH CITIES

In contrast to modernist urbanism or the industrial production of repetitive buildings, the traditional ‘ideal type’ supports an unending series of variations on a single theme. Once a coherent and flexible formal and spatial pattern established, it can support endless local variations. No building in Amsterdam is strictly identical to another one and all Delft houses are different between themselves and all are distinct from Amsterdam houses while ensuring consistency within diversity.

In Amsterdam or Delft, houses are aligned on each side of stonewalled canals and separated from the canal by cobbled roadways. The gabled houses create a continuous canal frontage and behind them are less formally organized gardens. Just outside the houses is a special area called the ‘stoep’, which is partly a pavement and partly a threshold to the house. The stoep is actually a component of the house, and owners maintain it with pride. It is a social place where neighbours meet and children play. It gives privacy to the house even with the large glass panes in front. The stoep does not separate between housing and public space. It creates a formal and visual unity between canals and trees, paved roadways, large glass windows and rear gardens. This set of relationships has emerged from Dutch distinctive mix of individualism and community. It constitutes the Dutch spatial and formal pattern. In Dutch cities, urban forms have their unique built-up links: the longitudinal progression of continuous houses along canals and the transversal visual and formal sequence leading from the canal to the stoep and to rear gardens. These links, whether expressed or latent, hold the structure together.

Houses along the old Delft Canal. Photo: Serge Salat.

53 Types are the opposite of standards; they foster variety while standards constrain forms into repetition. The industrial modernist doctrine of city production is standardized and presents itself as a-temporal and universal. The buzzwords of the modern movement are a litany of abstractions and reductions: ‘maschinenstil,’ ‘machine for living,’ ‘standard unit,’ ‘existenzminimum,’ ‘standard,’ ‘control’. Modernism denies culture, difference, time, and place, supplanting them with a myth of universal needs that gives rise to a universal standard. ‘The physical type (the human body) is standard and varies between sufficiently generalized limits that it is possible to establish standard tools that are perfectly suited to it (car, bed, chair, glass, bottle, etc.); and following the same sufficiently general rules, a standard housing tool can be established for this physical type,’ writes Le Corbusier in 1924 in Urbanism. The home and the city are turned into an industrial product like any another, independent of cultures and geography.
Group form emerges from these overlapping linkages. As highlighted by Fumihiko Maki\textsuperscript{54}: ‘Group form and its space are indeed prototype elements, and they are prototypes because of the implied system and linkage. The elements and growth patterns are reciprocal – both in design and in operation. The elements suggest a manner of growth, and that in turn demands further development of the elements in a kind of feedback process.’ Group form is the essence of the community; it is a unifying force that translates into urban space fundamental linkages within the society. Urban form is a community manifested in physical space. Group form evolves from society not from power.

The dwelling group in Delft is group form, not the Stadthuis (the City Hall), which is compositional in character. Among Delft coherent typology of canals and houses, exceptional buildings stand out and punctuate the urban landscape such as the Oude Kerk (Old Church), the Neuwe Kerk (New Church) and the Stadthuis (Delft City Hall). With the wealth of colourful detailing and formal contrast these large-scale elements act as landmarks, physically and visually linked together, creating a macroscale in the urban texture. Compositional form adds thus a higher scale structure and order in urban form. In Delft, the Neuwe Kerk and the Stadhuis face each other, each occupying the narrow side of the elongated Markt Square, lined on its two long sides with sequential lines of houses. The juxtaposition of the two scales and the two orders, the long horizontal line of houses and the emerging vertical monuments, is striking.

\textsuperscript{54} Maki 1964 and 2008.
The traditional mode of composition is continuous, split on all scales, and constantly varied. It’s a complex mode that seamlessly manages to integrate periods and styles. It creates a very intense, varied field of information with changes in tonality and rhythm. Details of the Renaissance-style Delft City Hall. An intensified rhythm and saturation of details polarizes the Markt square like a magnet with the Nieuwe Kerk (the New Church) facing it on the other side. Photos: ©Françoise Labbé.

CASE STUDY: SHAPING THE NEIGHBOURHOOD IMAGE IN Bo01, MALMÖ, SWEDEN

Bo01, Malmö, Sweden. The neighbourhood is defined by water and green edges.

According to Klas Tham, who crafted the urban design of Bo01:
The plan has also been shaped by our ambitions: to offer an urban structure that is sufficiently robust, to meet the demands of an uncertain future (the network structure of block city and clear borders between the public and private spaces), to provide the conditions for the essence of the city, the meeting between different people and cultures, to come about gradually (the small-scale property division of the plan, its range of different residential environments), to let cars get through, but on the terms of the pedestrians, to provide the conditions of a city environment which, over and above empathy and comprehensibility, also offer a wealth of information, mystery, surprises, and many unique and promising urban spaces; a dramatic tension between the grand and the intimate, to offer a wealth of all forms of vegetation, from the individual garden, to the sheltered, thickly wooded public canal park through the interior of the area. That is how the plan took shape. The grid has been distorted by the wind, among other things, like a fishnet hung out to dry. And, as a result, it has actually become more rational, more valuable to build, live and stroll around in.\textsuperscript{55}

The urban form and image of Bo01 in Malmö are shaped by the contrast between two distinct scales:

- The large maritime scale of the magnificent site. The sea, the great sky, the horizon, the sunset, incorporate the dramatic Öresund bridge, the longest combined road and rail bridge in Europe from 2000 to 2019, linking Denmark and Sweden.

- The intimate scale established by diverse small plots of different sizes. Placed at shifted angles to one another, they create a maze and a path full of surprises and discoveries for the inhabitants.

Clearly defined urban edges and a landmark, the Turning Torso tower, in white colour, link the neighbourhood to the wide maritime landscape. Quite the opposite, a rich palette of material and colour, and green and water spaces at all scales, determine the inner blocks experience. Water is included in park axes and as stylized streams of storm water in squares, piazzas, streets, and lanes. It establishes natural boundaries and structures people’s movement. Bridges, canals, and courtyards organize journeys with views of water.

The neighbourhood has a definite limit, with the sea forming a natural border. The plan is organized around a traditional pattern of streets and promenades defining large, semi-public blocks. ‘The pattern provides a clear and legible framework, yet each element has been transformed in both bold and subtle ways, creating a richer order of surprise, unique urban rooms, and dramatic contrasts between the magnificent and the intimate’.\textsuperscript{56} The design intensifies purposely the counterpoint between the outside and inside. A wide public promenade, the Sundspromenaden, runs along the entire west edge of the site, commanding panoramic views of the sea. A berm of stone boulders forms a rugged buffer separating the promenade from the water’s edge. A wooden boardwalk runs along the top of the boulders for the entire length, backed by continuous stepped seating facing in both directions. The area has become a favourite destination for the people of Malmö, re-establishing the city’s link to the sea. This linear promenade creates a strong contrast with the intimate and maze-like design of the inner blocks.

\textsuperscript{55} McCollum n.d.
\textsuperscript{56} Fraker 2013.
Linear promenades facing the open sea landscape or parks create a well-defined edge. Photos: © Françoise Labbé.

On the east-side, larger blocks front a linear green space with a saltwater canal running the entire length. The canal is a stormwater retention basin before the surplus water returns to the sea. Like the west-side promenade the constructions on the east-side form a hard edge facing the park. As remarked by Harrison Fraker57: ‘While the park and the continuous-edge buildings define the east side of a large block, the park itself can be understood as the interior space of an even larger block framed by a series of existing and new buildings. This double reading – what is outside for one part of the plan is inside for another – adds to the complexity of the urban experience. As an urban strategy, it creates multiple and distinct orientation demands for each individual development site, encouraging diversity in architectural styles chosen in response. This urban form is a progression from a space within a space, similar in concept to the nesting of Russian dolls. Each transition offers contrast, difference and surprise. Under such circumstances, the treatment of the ground, the urban floor, and the proper treatment of stormwater, both an environmental issue and a design feature, play an important role in tracing the multiple transitions from inside to outside, from private to public.’

Further shaping the neighbourhood image, a landmark, the Turning Torso, a predominantly residential tower with 55 floors, designed by Santiago Calatrava, stands in sharp contrast with the low-rise, high-density small blocks of the plan. Being the tallest residential building in Sweden, it introduces a hyper-contrast in height and density (a factor of ten measured on the blocks) with its surroundings. It serves as a landmark for the wider landscape of the Öresund Strait, perceptible from Denmark. It is visible from the maze of small blocks, framed always differently through slits between

57 Fraker 2013.
buildings. This creates never-ending surprise and discovery like the towers of San Gimignano in Tuscany. Seen from the intimacy of the blocks, the tower provides the inhabitants with contrast, sense of scale, and linkage with the wider landscape.

**CASE STUDY: ECO-NEIGHBOURHOOD BASED ON A TRADITIONAL WATER TOWN IN THE SHANGHAI AREA**

Françoise Labbé, Architect

**Designing from context**

Each culture has a connection to space that translates its social and familial organization, its history and its link to nature. The relationship of people to space has to be preserved through the slow, progressive transformation of urban forms. The project respects the site cultural memory and its topography. It incorporates ancient elements into future plans. Integrating natural and ancient characteristics in new developments is a key strategy for building viable, liveable communities that continue the heritage of the city.

*Left: On this feng shui drawing for Zhifeng village, Jiangxi province, each of the mountains, water bodies, graves, and important structures are named as components of an auspicious orchestration. The positioning of houses, their relationship to the landscape and to their neighbours, were all prescribed by the rigorous yet fluid demands of feng shui. This topographic configuration for the city as a whole and for all its parts, orders space. Right: Eco-neighbourhood based on an ancient urban texture in the Shanghai area, Françoise Labbé architect.*

The project aim is to design on a traditional fabric pattern a prototype for a Chinese eco-neighbourhood of 800 m × 800 m for 16,000 inhabitants. The site selected comprises a dense network of branching canals. The scheme draws its inspiration from the vernacular fabric of the small water towns around Shanghai.

The spatial system was established from an analysis of ancient water town plans. This organization can be perceived at different scales. First, the fabric is generated by an irregular grid following the topography and hydrography. Second, houses, arranged around a quadrangle, compose an open network of courtyards. The structure must be sufficiently rich and flexible while being legible. Ancient water town streetscapes comprise dead ends, projections, and narrowing. The sequence of courts establishes a deep hierarchy. Layers of interiority include small gardens and nature at all scales between white walls. The scheme adapts these features.

Left: Suzhou. Urban scale: city walls, web of main streets, axiality and hierarchy. Right. City edge: gates, enclosure and thresholds.\textsuperscript{58}

\textsuperscript{58} Source: Salat et al. 2011.
Three urban fabric typologies

Eco-neighbourhood in the Shanghai region, Françoise Labbé architect. Each square: 250 metres side.

2. Northern and eastern Districts.

The eco-neighbourhood fabric is complex with a composition varied and fine-grained on all scales. It comprises three main typologies. The first, in the centre (corresponding to the 800 × 800 m square in the plan), extrapolates on the traditional vernacular. It proposes numerous enclosed courtyards and a pattern of narrow and curved streets with connections that allow for many choices. The centre comprises smaller passages and more residential buildings. Wider streets along the canals around this first space are lined with local retail. The second typology to the north and east draws inspiration from lilong housing. This housing form comprises a network of narrow streets and alleys. The housing units have two courtyards: one for pleasure, preferably to the south, and a service courtyard to the north. Since the units run from one side to the other and have entrances on the south and north, every alley becomes a space for pleasure or a service area. The spatial gradient between public and private enriches interpersonal relations, and improves the comfort of residents by offering them spaces that can be appropriated for different practices. Lastly, more activities and offices are on the south-west of the neighbourhood. The typology there comprises taller buildings. They are integrated into the fabric to avoid big empty spaces on the ground that would break the continuity.

The complexity is thus created by a progressive gradient of functions and forms. The neighbourhood edge is made up of vertical elements. The centre is more horizontal and residential. The neighbourhood’s enhanced legibility allows inhabitants to appropriate their place. This legibility is accentuated by the aesthetic, proportions, and materials used for distinct buildings.

The plot subdivision is a fundamental design step. A fine-grained division is the key to architectural diversity and generates complexity on a small scale. Keeping the plots small and having different sizes and shapes create rhythm and variety. Plans and surveys of ancient neighbourhoods have inspired the size and shape of each plot. The urban designer decided how to organize the diverse possible plot relations (dense, compact, contiguous, aligned, skewed, etc.) and attributed a surface area and a geometry to each plot. The design respected the traditional Chinese subdivision structure (L and U-shaped lots, narrow plots running perpendicular to the street, square with courts).

The general orientation of buildings optimizes access to sun and enhances wind breezes. Several types vary with plot location. The aim was to avoid a monotonous repetition and to be able to differentiate the constructions on the main streets while visually marking the intersections.
Eco-neighbourhood based on a traditional urban texture in the Shanghai area, Françoise Labbé architect. The plan of the eco-district combines the geometric and the irregular. Dynamic forces generate its forms. It grows organically like a leaf.

Common aesthetic principles are applied to all blocks. They are related to local architectural characteristics: colours, materials, entrances, openings, or significant architectural elements.

Transitional spaces mediate between outside and inside: private exteriors, semi-public courtyards, setbacks, shelters. The scheme follows the sequences of traditional Chinese architectural composition. Psychologically and visually, a minor difference in level, a slight offset or narrowing, a separation wall, or an archway suffice to give an identity to a space.
Designing the neighbourhood as a green landscape

The green network is structured in a gradient of private, semi-private, and public gardens. It respects the traditional way of nature integration in Chinese cities. Sprinkled at fine scales throughout the urban fabric, nature has beneficial bioclimatic effects. Rural areas can be progressively urbanized while preserving their productive character. City farming used to exist and can be revived to complement the city’s other sources of food supply in a less polluting way because less transport is needed. It can enhance resilience and provide educational spaces.
The green spaces of the eco-neighbourhood the Shanghai region, Françoise Labbé, architect. As in the tradition of the Chinese garden, green spaces are diverse and internalized. Public gardens and willow trees along the canals complement the multitude of indoor gardens in residential blocks.

1. Interpenetrations of built volumes and green spaces. 2. Composition of built volumes. 3. Gardens, a network of green spaces at all scales.

In the traditional garden villas of Suzhou, which are one of the inspirations for this eco-neighbourhood, the human scale is manifested in the interpenetration of interior and exterior, of buildings and nature. All empty spaces are integrated into the composition.
Suzhou Garden. Photo: Serge Salat.

Framing in a Suzhou garden. Photo: Serge Salat.
The Garden of the Nets Master in Suzhou. The garden is centred around a pond surrounded by a covered passageway. The plan of buildings and gardens in this small space is so subtle that it gives the impression of great dimensions and diversity. Photo: Serge Salat.

Gardening is an ancestral Chinese art that needs to be preserved. It will facilitate the neighbourhood appropriation by its inhabitants. Spaces are set aside in the urban fabric for Chinese gardens, so that these traditions can live on, without being turned into museum artefacts.

The street and canal layered pattern

Detail of Pingjiangtu. The vernacular morphologies of the lower Yangtze combine the ordered urban layout reflecting Chinese social hierarchy and the fluid character imposed by the topography, with its many waterways. The street grid is deformed to follow the network of waterways with a street-canal duality. In Suzhou, as in Amsterdam or Venice, the dual system of transport by streets and canals, overlays two patterns and creates complex intersections, continuities, and irregularities. Source: Heng Chye Kiang 1999.
Eco-neighbourhood in the Shanghai region, Françoise Labbé architect.

The curvilinear street pattern is integrated with the topography and canals. It creates complex and diverse pedestrian routes. Left: square 800 metres side. Right: square 200 metres side.

The pattern of streets in the eco-neighbourhoods draws on projections observed on different scales in the vernacular morphologies. The projection is widely used, be it to treat entryways to houses or squares or for the design of streets. Their façades are often non-aligned, due to slight projections. Left: Plan of Xu village entrance in She District. Right: Sequential vision along a canal in Zhouzhuang. The rows of stores open onto the street and the canals, while residential complexes are developed in depth with small courtyards offering privacy. The urban layout is oriented toward the street and the canals. They form the main space of circulation and retail. Source: Urban China 2007.
Marking the ‘entrances’ to the neighbourhood is the first step in establishing a sequential path. Distinction is made between what is accessible to pedestrians (passages under archways, footpaths), to bicycles (reserved lanes) and to cars. The streets have various widths. Movement lines develop in sequences by playing on differences in levels (access slopes), by recesses or narrowing, by using strong points (visual perspectives on a noteworthy element) or creating a centre that is easy to find. The street pattern relies on a precise stratification of passageways and bridges in Chinese canal cities. Every street type is dimensioned according to its use and its place in the pattern. Some streets will accommodate cars or trams, while the smaller streets are only accessible to pedestrians and bicyclists, thereby preserving the peacefulness and intimacy within the block cores. A scaling street network down to the tiniest scales creates a distribution of speeds so that cars can travel faster on main roads and slower on small streets shared with walkers and bicycles. The eco-neighbourhood network has a high connectivity, with 383 intersections per km² and 252 blocks per km².

Canals establish an additional network which overlays with the street grid. They are also linkages for transports and walks. Their role changes with their size. They may constitute a greenway with trees. They are reserves of biodiversity, accommodate bicycle lanes, and are places for strolls and recreation. Their first function is water circulation. They must be kept in good condition and water must flow efficiently. With a connected system of waterways, water in the subsidiary canals can flow naturally. Water quality has to be preserved. Grey water is treated in a series of wetlands before pouring into other canals. The second function of canals is cultural. Waterways embellish the neighbourhood and create a calm, peaceful setting for residents. The proximity of water is an important social element and access to canals has to be preserved and reassessed so that new practices can take place there.

**Modular courtyard forms**

In China, for thousands of years, walls were an essential aspect of the urban and architectural tradition. They protect the private character and life of the family. They enclose an internal world. They comprise a reduced, symbolic model of nature in the form of a garden or courtyard. Designing sustainable communities in China involves renewing this spatial form.

Vernacular cities in Southern China are structured by three levels of hierarchical depth. The main streets establish the first level with their alignment of houses and shops along canals. The second level is constituted by alleys penetrating the blocks, sometimes through an entry gate. Although they are public spaces, walking along them is like being in the private sphere of the community daily life. The homes open onto the alleys. The inner courtyards form the third level of interiority, reserved in the past to the extended family, and today to a restricted group of neighbours. This three-tiered hierarchical order of spaces establishes a pedestrian realm on a human scale, where it is easy to understand where one is. The nested organization creates an intelligible and reassuring urban texture.

Only a portion of the unbuilt spaces is accessible to all inhabitants (planted avenues, streets, squares). The hearts of the block, the courtyards, dead ends, alleys, and service roads are private. Visually, it is important to design these spaces as places of life for the people that reside there. Inhabitants living on the ground floor may have small private gardens, while those on the upper floors can have loggias or patios.
Chinese house modularity. Diagrams of Chinese house modular composition. Top: Northern China. Bottom: Southern China. Over a period of time as a family’s circumstances improve, dwellings tend to develop from a three-bay rectangle shown here on the left, to more complex shapes. The top drawing shows the common pattern in Northern China where, first, an L-shape emerges, then an inverted U-shape, before full enclosure of a courtyard within a rectangle. In Southern China, as the bottom drawing reveals, additions are sometimes made to the front or back with small ‘sky wells’ situated within the growing mass. Source: Knapp 2005.

In traditional homes in Suzhou, the axiality and the configuration centred around the courtyard initiate a gradient of intimacy. The spatial sequence toward the interior corresponds to an increase in the degree of privacy. This is essential to creating meaning and intelligibility for residents and for the organization of their daily life. This sequence coincides with the circulation path alternating courtyards and buildings in a pattern as rich and multiconnected as a leaf. The quadrangle is the core of the traditional Chinese home. It provides the coordination needed for the synthesis of the buildings and social activities. The dense network of interior courtyards reinforces the neighbourhood’s urban structure, endowing it with a continuous spatial and social order across a series of successive scales. The common spaces are integrated into the configuration. The spatial order of the neighbourhood develops out of their intimate, familiar composition. The community structured in this way on three levels of hierarchical depth provides a reassuring, intelligible local harmony inserted into the more extensive space of the city.

Right: plan view of Yueguan courtyard, near West Lake (Xi Hu) in Hangzhou.
Left: plan view of Shilin in courtyard in the Lingering Garden (Liu Yuan) in Suzhou.

The Chinese classic architectural layouts comprise one or more groups of separate constructions centred around the empty space of courtyards or gardens. Each courtyard with its buildings constitutes a module. Interfaces connect them.
These transitional elements are often columned galleries in Northern China and white lattice walls in Southern China. By their centrality, the courtyards are the basic unit of composition.

Left: Eco-neighbourhood in the Shanghai area, Françoise Labbé architect. Size of the detail: 200 metres. The composition of blocks around courtyards.

Right: The quality of the block cores is key in creating a sustainable urban fabric, as shown by the example of Bo01 in Malmö, Sweden.

1. Articulation of inner space and gardens, opening to nature from within the most interior spaces.
2, 3, 4. The interpenetration of pavilions and gardens. Areas of circulation belong to recreated nature and to the pavilion of contemplation. Perspective views in the Liu yuan garden in Suzhou:
   2. Perspective of the Shilin courtyard (view to the east of Jingzhongguan).
   3. Cross-section of the rear courtyard, Wufengxianguan.
In traditional Chinese layouts, the garden is delimited, and framed in sequences in a dynamic movement punctuated by static, pictorial poses. The treatment of the membranes and the angles simultaneously ensure variety and the greatest possible area of contact with the garden, at once physically and visually. The four principles of Chinese composition are bilateral symmetry, axiality, hierarchy, and enclosure. This defined structure is then traversed by a changing flow of spaces. The principles do not produce rigidity but rather extremely adaptable, free configurations.
Private garden in Suzhou. The creation of a classic Tang garden by the artist Ye Fang soberly turns a small space into a vast landscape of mountains and water.
Transitional spaces mediate between outside and inside: private exteriors, semi-public courtyards, setbacks, shelters. Psychologically and visually, a minor difference in level, a slight offset or narrowing, a separation wall, or an archway suffice to give an identity to a space.

**Diversity of forms and uses**

Traditionally, the retail areas in Chinese water towns are at the junction of canals on the ground floor of residential buildings. The central space of the eco-neighbourhood is mainly residential. The retail spaces will be grouped in several identifiable small squares near the canals. For greater flexibility, the ground floor of some buildings will have direct street-level entrances and could be converted by simple substitution.
Mixed use in the eco-district in the Shanghai region, Françoise Labbé architect.

**One of the major goals is to offer a variety of functions. The project comprises housing, employment, local shops and amenities. Constructive typology is modulated according to this pluralism, with a gradient of heights near transit stops.**

**Housing supply is diverse, with options for all income groups.**

The development of a community has to renew with the creation of meaning to allow a real appropriation of the space by its inhabitants. The eco-neighbourhood sets aside places that carry meaning, organized in a scaling manner. Meaning is embedded in all the components. It is in the street sequences, the perspectives, the orientation of buildings. It is in the relationship between the public fronts and the private backs of houses, in the pattern of streets and the alignment of façades, in the entrances. Meaning creates emotion in architecture and urban design. It evokes feelings and ideas. It establishes a unity in the human mind by visual, auditory and tactile feelings. All the perspectives, all the movements contribute to the formation of perceptions and sensations. Bringing legibility and image to the space, the project goes beyond the quantitative targets of the programme to establish a living experience for human beings.
REFERENCES


