
Urban identity and historical density

Making the city through the historical density

EURAU'12

ABSTRACT. This paper considers Urban morphology as a form of heritage to preserve and to consider as a possible model for the developing of the contemporary city. Analyzing the formal relationships between the existing buildings, between the buildings and the public realm and between the different "open" spaces existing in the historical cities, we can identify spatial models to preserve. Those spatial models are very often strictly related to the way of life, to the aesthetical values and to the identity of the inhabitants of the city. That's why morphology and local identity seem to be strictly related: preserving urban shape means to strengthen community's sense of identity. The paper will try to define new definition of the concept, which mainly characterizes the traditional urban tissues of the compact cities, trying to define more precisely the concept of density and its formal and social effects. Depending on the meaning of Density that we are considering (population density, residential density, floor area ratio, gross density, net density...) the fallout on urban design can be very different.

KEYWORDS. Density, Urban Morphology, Urban Fabric, Urban Spaces, Identity

Barosio Michela *

** Interuniversity Department of Urban and Regional Studies and Planning,
Politecnico di Torino and Università di Torino
Viale Mattioli 39, 10125 Torino (Italy)
michela.barosio@polito.it
+39.340.4989328*

1. The urban density as a value to preserve: historical overview

During the 18th and 19th century, when the culture of the architectural preservation was born, only religious and political architectural objects were considered as heritage to preserve. In the following century, through the Restoration Charts and the action World Heritage Centre of UNESCO, the concept of preservation has been extended to many others objects as civil buildings, industrial architectures, natural landscapes and historical cities or their monumental districts. Through the studies of Viollet-le-Duc and Camillo Sitte in the second half of the XIX century, European culture started to understand the importance of the preservation of some historical urban complexes or monumental districts. But only after the second world war, that seriously damaged the European cities, architects and planners stroke up a debate about the need of restoring and preserving historical city centres¹. The urban shape began to be perceived as an heritage to preserve and the debate focused on the acknowledgement of the significant characteristics of the traditional urban tissue. The urban studies in Italy developed the typo - morphological analysis of the city whose works investigate the formal constants in urban morphology, in order to construct, or re-construct, the city on its archetypal figures and features¹.

At a world level we must wait the Charter of Krakow (2000) for the principles for the conservation and restoration of built heritage starting to include the preservation of urban tissues instead of single monuments, and the World Heritage Convention of l'UNESCO² in the 2005 to connect urban fabric and city's identity.

This paper considers Urban morphology as a form of heritage to preserve and to consider as a possible model for the developing of the contemporary city. Analyzing the formal relationships between the existing buildings, between the buildings and the public realm and between the different "open" spaces existing in the historical cities, we can identify spatial models to preserve. Those spatial models are very often strictly related to the way of life, to the aesthetical values and to the identity of the inhabitants of the city. That's why morphology and local identity seem to be strictly related: preserving urban shape means to strengthen community's sense of identity.

If the city has always been perceived as more dense than "the rest", dense of commercial traffics, dense of population, dense of buildings, dense of culture and so on, from the late XIX century these "density" become a negative value. In that period the role of urban planners has been initially held by the sanitary engineers who considered the city has a sick body whose worst disease was the building and population density that forbade healthy life conditions³. The goal for the urban planners became to rarefy the city to provide air and light to heal the old city. Haussman in Paris, Ceppi in Turin, later on Piacentini in Rome simply tried to design a healthy and modern city. Following those ideals the Modern Movement born fighting against city density and for a completely new and healthy city. On these ideas Le Corbusier built his proposal for the modern city starting with the nearly complete demolition of the historical urban tissues that were, in his mind, to dense and compromised to be healed. Looking at his sketch comparing the historical tissues of Paris, New York and Buenos Aires with Le Corbusier's proposal for the Ville Radieuse his goal is clear: less density. But analysing carefully the drawing and the written theory, the goal becomes slightly different: Le Corbusier preaches for less built space at ground level (as less as possible) but for a densification of population distributed on very high buildings. For modern architects the city has to

be crowded, but urban spaces should be free, open to air and light and characterized by nature with trees and lawn. In this vision of the city, life and car traffic should be isolated and separated, the street becomes only a leisure place: no commerce, no traffic, no business.

In this sense we have to distinguish among different meanings of the term density. As we will see on the next paragraph, density can refer to total building area or just to the area occupied on a specific plot or to population present on the plot or even to the functions present on the area. Two areas can have the same population density, but different building density or different concentration on ground level which means completely different urban shapes. Besides, density doesn't refer only to quantity, but it can also describe quality when she expresses functional mix for an example.

In the period of post-world war II, in Europe, the massive reconstruction of the seriously damaged cities became a priority with two main goals: building many houses as far as possible, and reconstructing the identity of the nations. To reinforce national identity planners and architects started to rebuild the historical cities centres looking at their original shape, at their urban tradition. Sometimes those "new" buildings have been built "*à l'identique*" exactly how they were before the war, as in many German cities like Frankfurt, to highlight the link with the tradition of the nations, other times new buildings were built with more contemporary architectural language to remark a distance towards the war and the national values that had led to it. In both cases the reconstruction is the opportunity to increase the density in historical cities keeping the urban characteristic as compact fronts, rhythm and proportions of the façades and of the streets, public spaces at a human scale and, last but not least, the mix of functions. At the same time, the development of the new suburbs didn't follow the same criteria. The new neighbourhoods were designed looking at the garden city's model, with a low density, a lot of green areas, private and public, and over dimensioned public spaces. Hosting a very poor range of functions and nearly no commercial or leisure activities because of their low density, those districts became very often only dormitories. Speaking about low density of those new suburbs is not always correct in the sense that some of them were designed exactly on the garden city models, especially in the Anglo-Saxon area, others, especially in Mediterranean context, were conceived to be high density blocks lost in the middle of nowhere without connections with the traditional city (we can think about the very famous example of Corviale near Rome or the ZEN in Palermo). This second case is characterized by an important density on the single plot, but by a very low density considering the entire area surrounding. The reconstruction of European cities ended with the petrol crisis together with the end of population exodus from the countryside towards the metropolis. Since then metropolitan areas had to face a new phenomenon: the urban sprawl. The progressive gentrification of the city's centres and the popular myth of the detached house as a personal paradise draw many people to move from the centre towards the suburban areas. Besides, many European countries present a much stronger regulation of the building activity in the city centre and a very softer regulation (or no regulation at all) for the new buildings in the suburban areas. This imbalance led to sprawled settlements not urban neither rural, simply unshaped, with no identity and, of course, with very low density.

In the 1980, la *Strada Nuovissima* fitted out at the *Biennale di Venezia* edited by Paolo Portoghesi, celebrated the importance of the historical concept of Street as urban fundamental element. Nearly sixty years before Le Corbusier exposed his theory of the *Rue Corridor* against historical streets – that in his mind hide sky and light –, arguing for their vanishing and preaching for new urban spaces, opens spaces without continuous façade, where sun and nature could come in, la "*Strada*" was back. But then Urban Design was missing urban shape of the traditional city and starting to understand that historical urban typologies can't aside from density.

Moreover, the ecological movement has made the world aware of the waste of land that urban sprawling has engendered. That's why in the two last decades the urban debate is come back to the concept of density trying to define it more precisely and to conceive new urban and architectural typologies able to combine high density settlements and life quality, especially referring to residential typologies and public spaces.

2. Urban density: old concept, new challenge

Urban morphology expresses both qualitative and quantitative values. Urban density is a very large concept that has many different definitions and meanings. In the field of town planning it's used both to describe the city and to regulate its transformation, in this second case it's also called index.

Traditionally used to describe the physical proximity level between architectural objects or persons, nowadays digital networks allow us to consider urban density not only as a physical matter, but also as a more immaterial parameter that shows the consistence of relationships and flows between the inhabitants (or it will be better to say "users") of a specific geographical area. That's why urban density can be considered as a combination of several specific densities (Malavolta 2007).

2.1. Building density

This indicator shows the quantity of square metres or cube meters built on a specific area or district. If the referring area includes streets and public spaces it's called gross density, otherwise if it's calculated only on the building area of the plot it's a net density. In both cases this parameter highlights the relation between solid spaces and open spaces but it doesn't reflect how much there is life in the area, how many people inhabit it.

It's also interesting to note how the unit of measurement affects the meaning of the building density. Considering the building density in square meters of floor means not to take in account the height of the single storey, so that urban settlements with the same storey area, but with very different total heights, and obviously different urban shapes, will be represented with the same building density. On the other side, to express building density in cube meters implies that having higher floors will increase the density value even if the number of inhabitants doesn't grow.

Some additional indicators can be used in order to describe in a more refined way urban shape and, particularly, the organization of space and mass in the city.

The Ground Space Index (GSI) indicates the relationship between the footprint of the building and the available site area. It doesn't take in account the total amount of floor surface but how much the available area is occupied by buildings and how much non-built space is available.

The Profile Density (PD) is the quotient of the surface area developed per horizontal metre of the cross section. It helps to understand how buildings are "deep".

The Façade Index (FI) stands for the ratio of the surface area to the gross floor area. It describes how buildings are compact or more articulated and, therefore, open toward the public space.

The Angle of Obstruction (AO) is determined by the pattern of built/unbuilt space as well as the profile of the ceiling height and the stacking factor. It shows the relationship interior/exterior.

2.2. Residential density

This parameter expresses how many people live in a specific area, it is expressed in people/sqm or in number of dwelling/sqm and it is obtained by multiplying the number of housing units in the area by the number of people who can inhabit in them. When referring strictly to the plot this is a net residential density. When referring to a district or a more large area, including streets and all sort of public space it's called population density and it's a gross density. Considering only people living in the area, this parameter doesn't take in account workers or general users of the area. Those people generate flows as traffic, noise, life that all together contribute to generate a sense of density in the context. Those people populate some city areas only in specific time slots. We can think about business districts, which are very dense during the day but almost deserted in the evening or about residential suburban areas nearly empty during the day that start living in the late afternoon. To measure this phenomenon we need another parameter.

2.3. Use density

If the quantity of people living in a specific area still significant to describe it, many studies (Martinotti, 1993) demonstrate how the real amount of people in an area is often very different from the quantity of resident people. Many "temporary users" get advantage of services and spaces from areas where they are not "residential". Those city users can be divided on to four different categories: permanent, occasional, quick and touristic. The permanent city users are those who are present in a specific area (different from their residential area) regularly, almost at the same time as workers for an example. Occasional city users are attracted from a specific occasion, a special event as a sport meeting, an art exhibition. Quick city users are people who go to a place for a short time but with a certain regularity as people who move to commercial district but also to facilities as an airport or a maritime port. Touristic city users concentrate their presence in specific year's period. Obviously those four categories, that influence in different way the urban life, often mix.

It's also important to point out that historical European cities are strongly connoted by a mix of uses that guarantee life and urban quality nearly all day long. Those *mixité* has been lost as the zoning law has regulated most of the city's areas.

2.4. Flow density

Also the quantity and the typology of regular movement of people and goods can be considered as a factor of density. For instance we can observe as the sprawled city is characterized by long distance a high speed flows, whereas compact city is characterized by a lot of different short and almost lower flows. We can observe a strong interdependency between the speed, the frequency of the flows and the morphology of the public space. Related to the flows which cross the urban territory, the typology of the mobility infrastructures (roads, paths, railways, bridges, parking, and so on) engender different kind of perception of the space and consequently, a different feeling of density. Sometimes the mobility infrastructures can help reconnecting the urban tissue, and therefore contribute to improve urban density, other times infrastructures create a split inside the city that engenders discontinuity which can be considered as the opposite of the density.

Beside, we have to consider not only material flows and infrastructures, but also immaterial infrastructures such as digital networks. Digital flows contribute to make a city denser, denser of data, of information, of social connections, in a world more participated. In fact participation to city life and to city governance could be considered strictly related to the concept of urban density, a sort of metaphorical density. Nevertheless it's important to but their immaterial character can lead to new urban morphologies: dense of networks but rare of physical meeting places.

3. Making the contemporary city

Various combinations between those relative densities lead to different urban densities helpful in analyzing contemporary cities but also to plan their transformations and to manage their moving status.

Building density and residential density refer to very physical data. In this sense, interesting Dutch studies (Uytenhaak 2008) have try to define "The laws of density" in order to develop intelligent urban tissues in which density and primary spatial quality can be optimized. Those laws investigate the relationships between building density and different urban pattern (characterized by different higher, depth, or mutual disposition).

User density and flow density refer to more immaterial or non-physical dimensions but their influence on the urban morphology is not less important. First of all because they have a great impact in human perception of urban space and in second hand because power, as the fact of taking decision than can orient and transform city and landscape, and people concentration are traditionally considered as two strictly related phenomenon. A city which is user and flow dense is a city where is possible to reach a high quality of life.

Two fundamental fallout of the parameter of urban density have been highlighted in this paper: the leading part of the density in defining urban morphology and it's role in making cities alive. In this sense if importance of density indexes in the control of the urban morphology is clear, the role of the different kind of density has to be tested more precisely not only to better analyse existing urban operation, but also to made up more efficient planning indexes.

The use of Density not as an analysing tool but as a planning tool is very clear in the so called "critic reconstruction", a wide operation of urban regeneration with the aim of preserving and renewing the still existing typical European urban fabric that the city of Berlin started in the Ninety's he. This meant to improve and develop the infrastructure of squares, boulevards and blocks with internal courtyard that characterized the traditional city. To preserve the city's morphology the maximum height has been limited to twenty-one metres. The plan of "critic reconstruction" avoided functional zoning and improved public transportation instead of private traffic. All this measure lead to a tradition urban shape designed trough contemporary architectural language. The regeneration of PariserPlatz and Luisenstadt has been the first step of a general plan for the city that recognized the importance of the different kind of densities at the scale of the entire city.

4. Notes

¹ Ernesto Nathan Rogers, *Continuità o crisi*, in «Casabella», n. 215, aprile-maggio 1957, p.3.

² « *L'inscription des centres historiques et des quartiers anciens est recommandée chaque fois que la densité et la qualité monumentales sont directement révélatrices des caractéristiques d'une ville d'intérêt exceptionnel. Il est déconseillé de faire des*

propositions ponctuelles portant sur plusieurs monuments isolés mais nullement complémentaires, censés évoquer à eux seuls une ville dont le tissu urbain a perdu toute cohérence. »

Orientations devant guider la mise en oeuvre de la Convention du patrimoine mondial, Centre du Patrimoine mondial de l'UNESCO, 2005

³ Guido Zucconi, *La città contesa. Dagli ingegneri sanitari agli urbanisti (1885-1942)*, Jaca Book 1988.

5. Bibliography

Uytenhaak, Rudy. *Cities full of space. Qualities of density*. Rotterdam, 010 publisher, 2008.

Barosio, Michela. *L'impronta industriale. Analisi della forma urbana e progetto di trasformazione delle aree produttive dismesse*. Torino, Celid, 2008.

Malavolta, Anna Rita. *Il tema della densità nella città contemporanea*, PhD thesis (Tutor M. Talia), Università di Camerino, 2007.

Michela Barosio is an architect, graduated in the Faculty of Architecture of the politecnico di Torino. She has a PhD in Architectural and Building Design (Politecnico di Torino) and at present she held Architectural Design courses at the same University. She is Research Fellow at Interuniversity Department of Urban and Regional Studies and Planning. As a researcher she works on the following topics: cultural landscapes, urban morphology, urban renewal.