city as organism
new visions for urban life

22nd **ISUF** International Conference | 22-26 september 2015 Rome Italy

edited by
Giuseppe Strappa
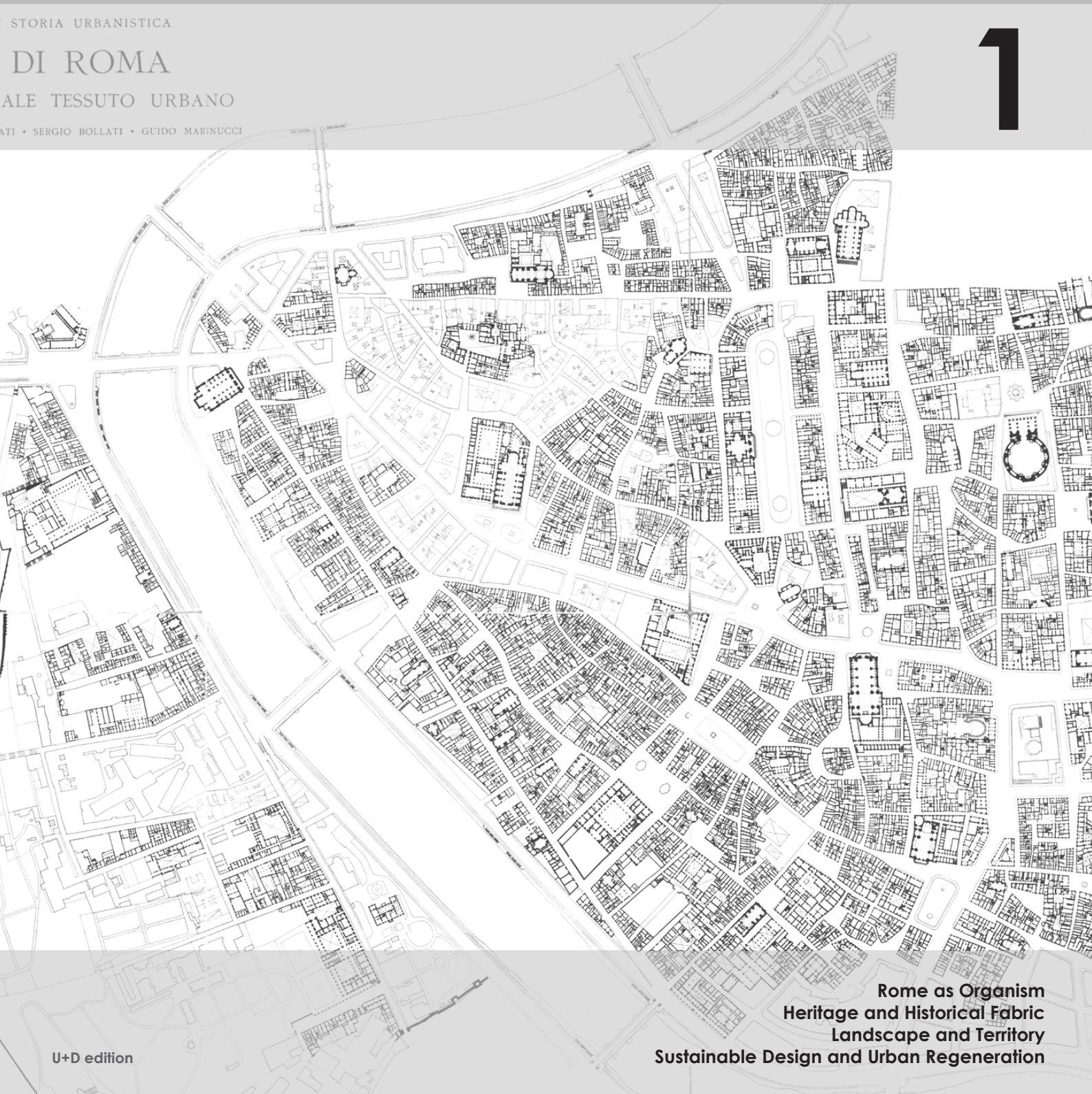Anna Rita Donatella Amato
Antonio Camporeale

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STORIA URBANISTICA

DI ROMA

ALE TESSUTO URBANO

ATI • SERGIO BOLLATI • GUIDO MARINUCCI

**Rome as Organism
Heritage and Historical Fabric
Landscape and Territory
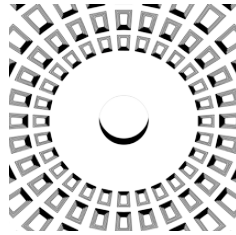Sustainable Design and Urban Regeneration**

U+D edition

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Contacts
email: roma2015@isufitaly.com

Organization

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Introduction
Giuseppe Strappa
 "Sapienza" University of Rome

Conference Chair

First of all let me say how happy and glad I am to host an Isuf Conference in Rome, in our Faculty of Architecture of "Sapienza" University.

Since our early Isuf meetings in the Nineties, I always thought that, sooner or later, we had to organize a conference in Rome on Urban Morphology.

We were a few people at that time but since then many years have passed and the number of Isuf members is much increased.

Even the fields of interest and scientific methods have proliferated and the meaning of the term "urban morphology" now applies to many schools of thought, sometimes quite dissimilar from those of the founders, but certainly useful to the progress of "discipline."

To our field of interest it was actually recognized the status of discipline, whose roots do not belong only to the schools of cultural geography and building typology, but also acknowledged the different influences of scholars of the city form such as Christofer Alexander, Colin Rowe, Kevin Lynch.

For our conference we had about 700 submissions by Urban Morphology scholars belonging to different schools from all over the world. It is noteworthy that most of submissions came from countries rapidly changing, a sign that Isuf has become an association of actual reference in studies on urban transformation.

Each Isuf Conference had its peculiar character linked to the specificities of the place that hosts it.

I think that an Isuf Conference in Rome has two special reasons.

The first is that Rome is a true text of Urban Morphology, not only for its monumental and archaeological part, but mainly for its urban fabric that have been transformed over centuries. This also explains the presence here of numerous colleagues interested to heritage and interventions inside the historical fabrics.

Not by chance, is involved in this conference Daniela Esposito, the Director of the School of Restoration in Rome, one of the most prestigious institutions in the field in Europe. Moreover, as Jeremy Whithand has written in the last edition of our Journal, the matter merit high priority on the Isuf agenda, as the contribution of UM studies in the various Heritage Organizations has been meager in recent years.

The second reason is that this school of Valle Giulia hosted the birth of one of the schools of thought on which (along with the conzenian one) was founded Isuf. A school with a long tradition, born in the '30s with scholars such as Giovannoni and Milani, and continued by Calandra, Muratori, Caniggia and many others. A tradition which we try to continue with an open mind and by experimenting in new ways.

A last point. In organizing the structure of this conference we faced the problem of collecting many different contributions within, as far as possible, homogeneous sessions. As for any conference proposing an "oriented" theme, we had to deal with the answers of ap-

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plicants and often with some very specific papers that it was not always possible to place in entirely consistent sessions. We preferred to anyway accept these contributions, giving up, in some cases, an ideal coherence of the sessions and preferring, instead, to include the most valuable materials proposed for the Urban Morphology disciplinary debate.

In opening this Conference I feel obliged to thank the Vicar Rector of Sapienza, Renato Masiani, The Dean of the Faculty Annamaria Giovenale, the Director of the Department of Architectural Design Piero Ostilio Rossi. All of them have strongly encouraged this project.

A special thanks is due to professors and students of our Draco PhD School.

They have actually coordinated, helped, and concretely supported the initiative.

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Plenary Session

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City as a process.
Rome urban form in transformation

Giuseppe Strappa

DiAP Department of Architecture and design, "Sapienza" University of Rome, 53 A, via Gramsci, 00197, Rome, Italy

Abstract

Rome is a vivid example of urban organism where each part is tied to another by a relationship of "necessity" and all contribute to the same end.

In its consolidated part, the city is the result of an organic process. Like any organism, to live, Rome needed continuous transformations in buildings and aggregates. These transformations are all different from each other and the resulting architectural multiplicity provides the beauty and the fascination of the urban form of Rome. The forming process, however, can be understood only if we can also comprehend their common characters.

The paper intends to propose a reading of Rome urban form, to the scale of the buildings and fabrics, based on the notion of "process" (Strappa, 2014). This term indicates the vital sequence that generates and transforms buildings and aggregates by marking, too, their inevitable decay and ruin.

A Reading of four phases of transformation process will be proposed: Consumption of the ancient substratum and formation of basic types; Formation of urban fabric; Merging the basic buildings to form new housing and palazzo specialized types, Restructuring urban frame to form a new organicity.

To these four phases, completing a whole cycle, follows the long phase of crisis, a process in itself (Muratori, 1966) that, since the mid-nineteenth century, comes down to our days.

The reading of the transformations will be made through examples. The aim is to provide a brief morphological guide to Roman buildings and fabric.

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Dialectic transformations

In order to mark the first Isuf conference held in Rome, I will propose a reading of the urban transformation of Rome, on a building scale, giving an idea of the roman fabric read as urban matter, substance in continuous transformation.

This phenomenon takes in Rome the character of a stratification, that is a composition of consecutive layers, where each new form assumes and interprets (in an original way) the previous one.

This secular condition has been considered over time by poets and artists, as the peculiar character of the roman urban form.

Henry James wrote, in 1873: *Then you see that the little stuccoed edifice is but a modern excrescence on the mighty cliff of a primitive construction, whose great squares of porous tufa, as they underlie each other, seem to resolve themselves back into the colossal cohesion of unhewn rock. There are prodigious strangenesses in the union of this airy and comparatively fresh-faced superstructure and these deep-plunging, hoary foundations; and few things in Rome are more entertaining to the eye than to measure the long plumb-line which drops from the inhabited windows of the palace, with their little over-peeping balconies, their muslin curtains and their bird-cages, down to the rugged constructional work of the Republic. In the …. Nothing in Rome helps your fancy to a more vigorous backward flight than to lounge on a sunny day over the railing which guards the great central researches. It "says" more things to you than you can repeat to see the past, the ancient world, as you stand there, bodily turned up with the spade and transformed from an immaterial, inaccessible fact of time into a matter of soils and surfaces* (James,1909).

These literary and picturesque interpretations, sometimes as amazing as those by Goethe and Stendhal, have however favored a double role of Roman heritage in modern architecture, both dangerous, in my opinion: an example for the nostalgic ad-mirers of the past; an indication retained unconstructive for modern architects looking for innovation.

It is known as le Corbusier warned that the lesson of Rome is only for the wise and dangerous for students. Perhaps few architects have, in fact, realized the modernity of the lesson of Rome: definitely Friedrich Schinkel and Louis Kahn, who have never imitated the architecture of ancient Rome, but understood in a innovative way its profound meaning of organism.

In my opinion the modern message of Rome is contained in the notion of "process" and in the connected one of "formativity", a neologism proposed by the philosopher Luigi Pareyson to indicate the development through which the architectural product (to paraphreise the author) is not the result of a sudden creation but is generated by a progression of formative moments (Pareyson, 1960).

Thus, I believe that in reading Rome's urban form we should replace the romantic and sometime overused term "ruin" by the rational, and for us much more inspiring, term

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Schematic overview of the transformations

	substrata / early base aggregate	base types	special types	fabric (aggregative rule)
1st PHASE . from XV to XI century . Reuse of ancient substrata in Late Antiquity and Early Middle Ages .	**Ancient substrata. Imperial structures: insulae**	Cryptae (ancient remains used as dwellings) - Tendium (wooden house) - Domus* terrinea (elementary single storey house) - Domus solarata (two-storey house, generally **Profferlo house**) - * The term "domus" is generically used, in late latin, to mean "house"	Castrum (fortified building aggregation) - Turris - Domus major (or Curtis). At the end of the cycle formation of Palatium (embryonic form of noble special house) * The term "castrum" is generically used, in late latin, to mean "castle".	Loss of ancient routes related to the aggregates. New routes linking fortified areas. No continuous paths inside the the "contrade". Loss of the notion of "fabric" . At the end of the cycle, spontaneous, **serial, episodic fabric.**
2nd PHASE. from XI to XV century. Differentiation between open artisanal and commercial areas and closed large aristocratic properties in Middle Ages. Formation of building aggregates .	**Serial, episodic aggregation**	Formation of the notion of building type. **Single-family row house** (atrium house, bottega house, merchant house with porch) .	Large mansions derived from disorganic building aggregations. Later, beginning of the formation of large specialized religious organisms. Formation of private special organisms. **"Palazzo/element"**	Formation of continuous routes linking different districts. Acquisition of the notion of "fabric" as social coexistence between buildings. **Serial, systematic fabric**
3rd PHASE. From XVI to XVII century. Recovery of ancient Roman roads in Renaissance. New planned axes linking urban nodes. Building merging.	**Serial, systematic aggregation**	Transformation of single family row units. Demolition or closure of the porches *. **Multifamily row house.** * Sixtus IV edict - 1480	Conscience of aesthetic synthesis at the building scale. Acquisition of the notion of rhythmic facade. Formation of the cardinal and religious companies palaces. Formation of the **"Palazzo/fabric"**	Formation of new urban specializations due to route nodalities and commercial fabric knotting. Aggregates of special buildings. **Organic occasional fabric.**
4th PHASE. from 1600 to mid 1800. Building and urban synthesis in Baroque and post-Baroque periods. Early modern urban updates	**Organic, occasional fabric**	Multi-family units critically designed with most apartments per floor . **In linea multifamily, multi-storey house .**	Formation of special organisms and their integration with the fabric. Later formation of large public buildings. **"Palazzo/urban organism"**	Critical conscience of the aesthetic synthesis at the urban scale. The building organisms integrated with fabric. **Fully organic fabric**
Crisi. Permanenze e Mutazioni	Aggregato organico obsoleto sul quale si interviene con pianificazioni rigide e astratte	Casa in linea imitativa della leggibilità del palazzo.	differenziazione funzionale. Nodi amministrativi.	Decadenza della qualità organica e dell'integrazione spaziale col tessuto.

Figure 1. Plan of the ancient area south of Piazza Navona by Guido Marinucci (in Muratori et al., 1963). The ancient urban structure can be read through routes orientated by the river, fabrics mostly formed by *insulae* and *horrea*, large special organisms as theatres, *portici, thermae* and the *odium*.
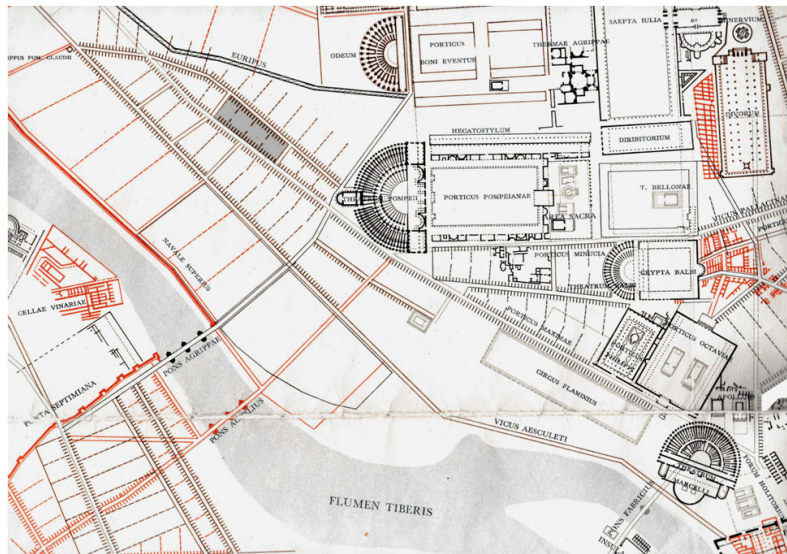
"substrata" indicating a not apparent, pre-existing matter that generates any following developments.

It should be noted, moreover, that in the scholastic philosophy of the Fourteenth century, when great urban changes were taking place in Rome, the word substrata indicates the substance itself, the true and stable reality "underlying" any single transformations.

A permanent process

These transformations could be summarized, simplifying a lot, in four phases:

Phase 1. From the fifth to the eleventh century
Starting from the sack of Rome by Visigoths, the organic unity of the Roman world collapses in Early Middle Ages. Not by chance for many historians the Middle Ages just begins in 410.

The huge imperial public structures (as theaters, amphitheatres, circuses, temples, etc.) are abandoned and fragmented. The city, scarcely inhabited, is transformed directly reusing their remains.

On a building scale arises a kind of house derived by semi-rural types (*profferlo* house with external stairs).

On a fabric scale, aggregations are elementary (serial and occasional), a result of spontaneous conscience. The parcels are indicated, in notarial deeds, in a vague way, without actual measure and only indication of the neighbors. The same latin words indicating building types, as *domus*, are used in a very contradictory meaning.

Phase 2. From the eleventh to the fifteenth century Middle Ages
The previous structures are now recomposed serial on a more systematic basis.

The large increase in population, mainly in the fourteenth century, corresponds to a phase of "building solidarity" expressed clearly by the *consciousness of the concept of fabric intended as aggregative law*.

 From the thirteenth century are in fact the *magistri stradarum* imposed building and street regulations.

At building scale the single-family row house is the bearing type. The multistorey house, the *domus solarata*, spreads.

Figure 2-3. Housing block in via del Pellegrino (the area is indicated in grey in the map in fig. 1). The free central area is filled with profferlo houses, perimeter is formed by row and in linea houses.
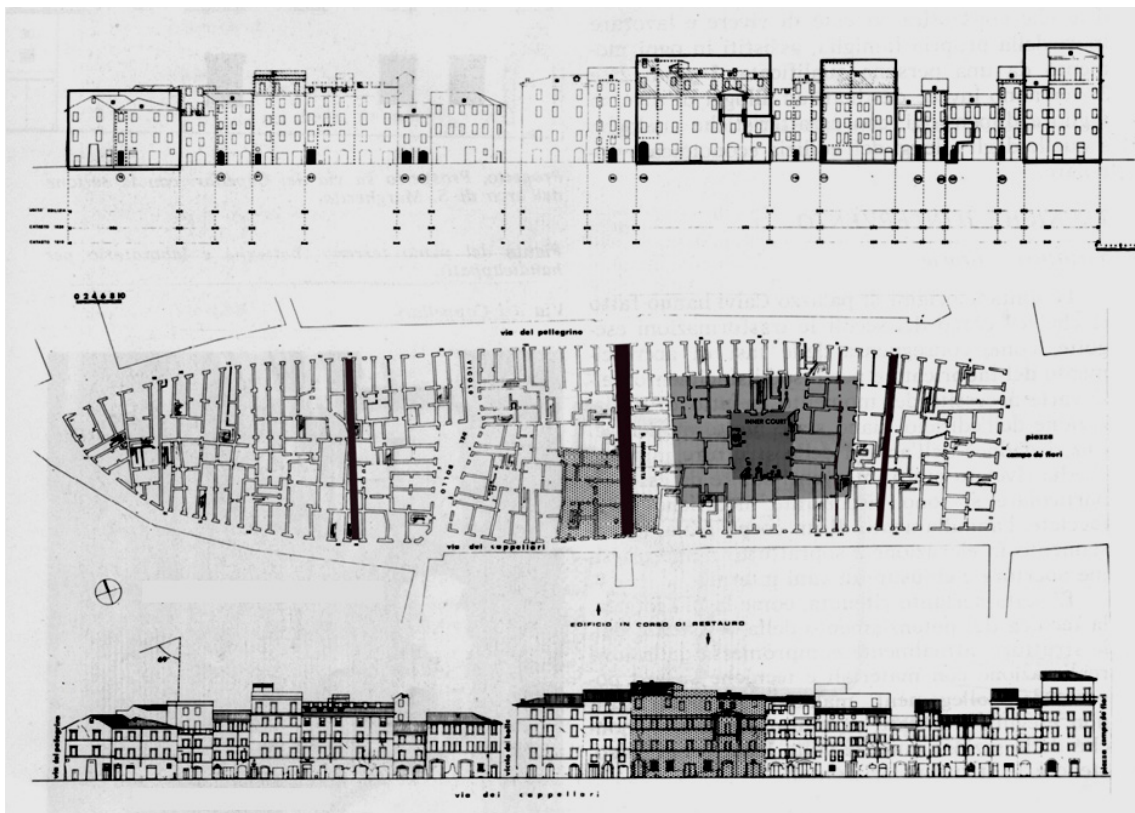
At fabric scale the previous serial aggregations are recomposed on a more systematic basis. From the fourteenth century the porch houses, today almost completely disappeared, became numerous. The presence of the porch is always reported in deeds, as it testifies the quality level of the construction. The porch played a role as a link between public and private space; in which commercial activities and transactions are carried out.

Phase 3. From the fifteenth to the seventeenth century
Organic, closed units are obtained within the serial fabric recasting base building.
Special building are critically designed (project); the continuous façade-wall arises in the base building and the rhythmic wall in the special one.
On a building scale new diachronic variants of row units are formed as the multifamily row house.
On a fabric scale new large organic units (most palazzos) are obtained within the serial fabric by recasting base building.
Extensive demolition are operated to make room for public spaces.
In the new Renaissance statutes aesthetic principles are introduced. They prescribe to build to decorum *civitatis et eorum commoditatem*, first the beauty of the city, then the private interest.
Although very expensive, even expropriations by private citizens are permitted as long as they will build new palaces.
The porches are largely demolished or walled following an edict of Pope Sixtus IV in 1480 (perhaps, according to S. Infessura, on advice of the king of Naples, Ferdinando d'Aragona).

Phase 4. From the seventeenth to the nineteenth century
We can consider this period as a conclusion of the cycle. Extensive, organic recastings in the urban fabric takes place during Baroque and post-baroque periods.
An organic relationship between architecture and urban spaces is established.
Architectural facades involve now urban tissue and represent the urban space.
On a building scale the *in linea* multifamily house is increasingly recognized as the bearing type.
On a fabric scale, especially in the Seventeenth century, the relationship between urban space, base building and special building are being consolidated.
It should be noted how, in the development of these phases, the relationship between type and fabric, is of a dialectic type.
The new building arises from the transformation of the previous fabric, where each fabric is modified by the building transformation "preparing" (we could say) for the transformation of the next phase.
Each of the different steps is a period of crisis, but the end of the cycle is the most critical one. In nineteenth century extensive demolition of tissues are made (*sventramenti*) to build new, large routes.
The architect intervenes in the base building (what ever happened before) using the tools at its disposal, imitating the special building (Caniggia, 1989).

Substrata and built landscape

The ancient urban structure can be clearly read, (see fig. 1) through three fundamental components:
- routes, orientated by the river: matirix route (parallel to the river) and building routes (orthogonal) for access to bridges and riverside;
- fabrics mostly formed by *insulae* of multifamily housing or *horrea* of specialized buildings;
- large special organisms that form urban nodes, as theaters, *portici, thermae* and the *odeum*.
The current existing fabric has its typical morphology which can be read through "substrata types".
Substrata type may be defined, I propose, as a building type that has lost its function,

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Figure 4-5. Profferlo houses in Arco degli Acetari (courtyard of the via del Pellegrino block).

its symbolic role, while retaining some property boundaries and some common constructive and geometric characters transmitted to future buildings. The usual distinction between basic and special building is not helpful, in our case, but rather between perimetral courtyard types (both *insulae* and *horrea*) and monumental structure types.

We can take as an example the transformation of the block between via del Pellegrino e via dei Cappellari (fig. 2,3). Actually there are no excavation reports, of course, but we can consult some sporadic surveys of the Archeological Heritage Superintendence confirming that the area had a perimeter of square cells dated to the first century After Christ.

The building types show quite clearly the transformation process.

At first, the free central area, in the Middle Ages, was filled with houses of a very simple, semirural types (the *profferlo* house, from latin *pro-fero*, bringing in the front), with external staircases, aggregated on a serial, occasional basis.
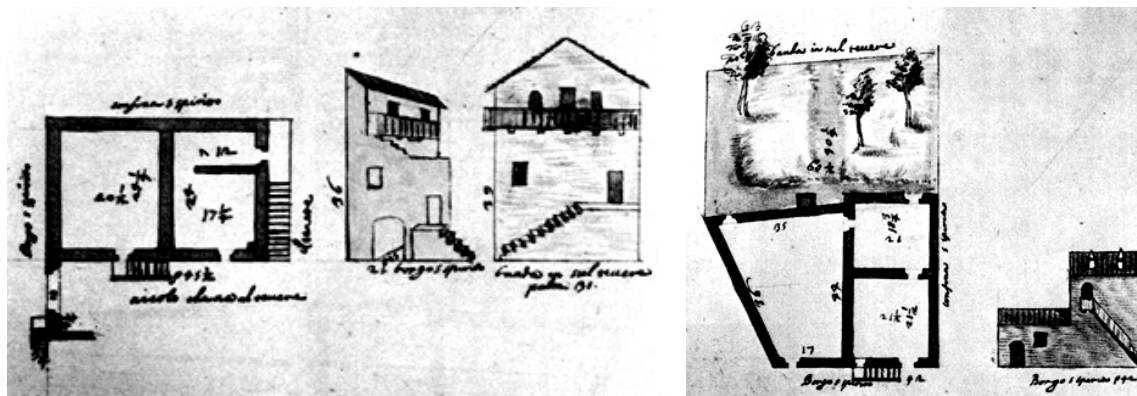
Figure 6-7. Types of roman profferlo houses.

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Figure 8-9-10. Row houses in via dei Cappellari. Row houses in via del Pellegrino extensively transformed in the Nineteenth century. It is still possible to recognize the original type with double window and double doors.

On the outer "husk" of the block, a geometric regularity is maintained by the old substrata. Here the transformation process is much longer and deeper, forming row houses transformed over time into multi-family row houses and then recast into *in linea* houses.

This part of the city is very dense and it is surprising, entering the courtyard, to find a kind of almost countryside houses, confirming the diacronicity of the process (see fig. 4,5).

In fact they remained single family, *profferlo* type houses (fig. 6,7).

In the perimeter of the block, instead, we find more recent, urban row houses.

In the semi-abandoned via dei Cappellari, the houses remained quite close to the original row house form (see fig. 8). In the busy via del Pellegrino, a road much more commercial and used by pilgrims going to the Vatican, houses extensively transformed in the Nineteenth century are encountered. Even in the transformations, it is still possible to clearly recognize the original type with double window and double doors (fig. 9,10).

Those types of row house are individuated in two synchronic variants widespread in Rome, casa con *bottega* (or house with shop) and *atrium* house (fig. 11). Even we find examples of the early type of the new multifamily *in linea* house, obtained by fusing together two or more row units, with a staircase in common inserted in the pertinent area and new horizontal distribution (fig.12). The *in linea* apartment house will be employed, in many updated variants, in all modern expansions of Nineteenth-century Rome and is still in use in our days.

The substrata of the great monumental types has given rise to a completely different process, both basic and specialized building types.

The ground floor map shows the transformation of theatres and circuses and how the Medieval and Renaissance fabric overlapped the ancient structures (fig. 13).

The Theater built by Balbus in 19 BC is a glorious example of this process.

The transformation is quite complex. The substrata is formed by two parts: the *crypta*, a serial structure around a large open space which has resulted in basic buildings, extensively recast, and religious complexes: the *cavea* (the steps) and the *scena* (the stage) which has resulted mostly in palazzos.

The *crypta*. The existing fabric confirms the substrata of the porch.

The exedra was transformed in a lime kiln, where lime was obtained by the calcination of ancient remains. In the Twelfth century porched merchant houses are built (often in the unusual three doors variant), for fabric traders in Via delle Botteghe Oscure and in Via dei Delfini, recasting over time (see fig.15).

The coloring in yellow in the map displayed indicates clearly a transformation process in which row houses are merging into one single property building. The access to differ-

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Figure 11-12. Row houses in the Campo Marzio area: three storey casa con bottega; two storey atrium type. Early form of *in linea* multifamily house obtained by melting two row houses and introducing a common staircase in the pertinent area.
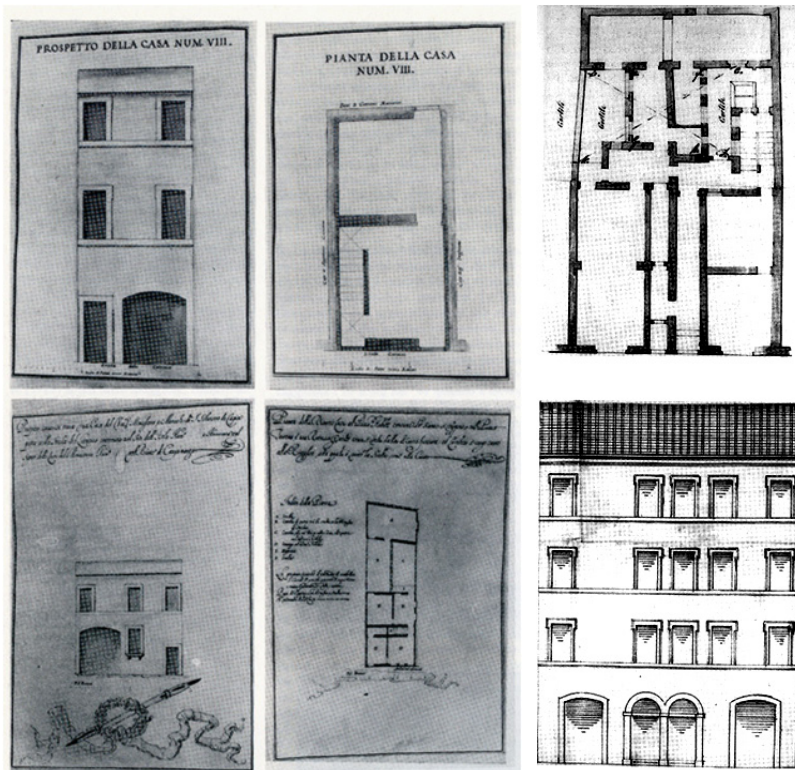
ent rooms can no longer be from the outside and a new path for distributing the different spaces is formed. The facade is made regular. The embryo of a palazzo is formed.

On the west side a special building arises by reversing the structure of a serial fabric (I will explain later). It is the Conservatory of Santa Caterina, built in the sixteenth century by Sant'Ignazio di Loyola to host and assist the daughters of prostitutes: the Collegio delle Vergini Miserabili Pericolanti (Miserable Virgin at risk) and the church of S. Caterina dei Funari.

The *cavea* (Insula Mattei). The transformations in the second area, that of the *cavea*, were quite different.

The area, iside the Jewish Ghetto, was at first filled by a fragmented settlement of some noble families, fortified houses lying on the ancient steps spaces (*Castellum Aureum*).

Then most of the area was acquired by the Mattei family, between 1540 and 1580, who organized it with a unitary, introverted structure (Insuala Mattei, see fig. 19). The process follows the typical transformations of real estate properties of many Roman families, such as Massimo and Altieri, and gives rise to major palaces, founded as true "small city", overturning the structure of an urban fabric.

The example of Palazzo Caetani a Botteghe Oscure well illustrates the origin of the palazzo type as a fusion of basic building.

Considering its formative process in its logical and architectural aspects, it is possible to recognize four main phases.

1. acquisition and unification of row house units;
2. overturning external route inside the property;
3. formation (by analogy with the terms employed in the urban routes) of "building route" and "connection route" like in a fabric.
4. Final transformation of the original base fabric into a single specialized building like small towns, to use an expression of Leon Battisti Alberti, through the development and expression of a unitary architecture.

Figure 13. Ground floor map of the Rome historical center (from Muratori et al., 1963). In grey the area of the Balbus theatre (19 BC).

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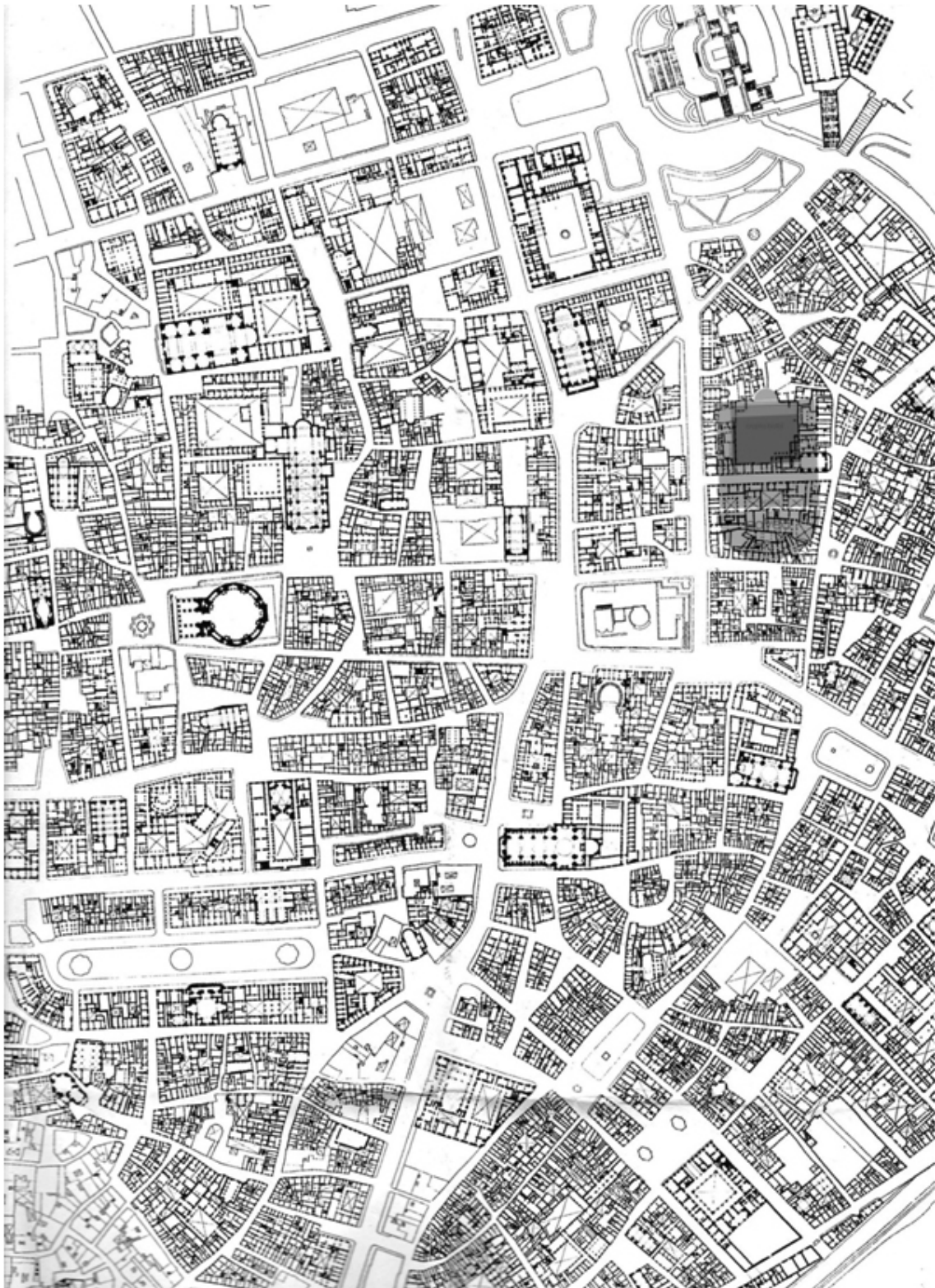
Figure 14-15. Plan of the Balbus theater area superimposed over the actual fabric in the area between Via delle Botteghe Oscure and Via dei Funari. Plan of the Balbus crypta indicating the exedra transformed in a lime kiln, the merchant row houses along Via delle Botteghe Oscure and Via dei Delfini, the forming of an early type of palazzo (in yellow) as melting of row unities.

The ritual relation between the design and its materialization

Saverio Muratori is fully aware of the fact that, being intrinsically "de-centered" with respect to nature, men always have to transform the nature, to adapt it to their necessity. If the body is originally instrumental to human orientation through the natural "opacity", rationality becomes the technique through which men can literary superimpose their own domain, acquired through nature experience, to the nature itself. Since the type represents the domain men have to project onto the nature to transform it and since that project always preserves the traces of the previous experience of the nature, its application onto the nature transforms the nature into a "working ritual" of its original experience to be repeated. The territory becomes therefore a literal and metaphorical reflection of phenomena on themselves; of human beings on themselves; of practices on themselves. This self-reflection is, according to Saverio Muratori, strategic to explain the built reality. Through self-reflection, in fact, the human beings reach that level of self-consciousness which distinguishes themselves from any other form of living organism, which are missing this possibility. Muratori derives this philosophical background from Hegel's Idealism. Hegel is the first who clearly identifies human rationality with the capacity to literary translate and re-address the natural laws, the greek *physis*, which is intrinsically aimless and indifferent to human needs, as Spinoza whose already stating, to his specific purposes and intentions, without changing them. This self-reflective capacity, which nonetheless requires sacrifice, time and many attempts to be obtained, is therefore the highest technique ever reached, and is carried on by the type definition itself. The type is not solely a cultural project. Through its embodiment within the territory, at all scales and grades, by the means of the human work, the type acts as a *principium individuationis* and transforms itself into a "working history". Showing an impressive analogical relation to the type definition, also the body acts according to a twofold perspective. At a phenomenological level, it supports and sustains the never-ending experience of the Nature, defining its specific space and time. At a rational level, it carries on and promote a cultural project

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Figure 16-17. Row houses and in linea houses in Via dei Delfini.

performing it in coherence with an already established structural framework. This also explain why Saverio Muratori, paraphrasing Hegel, believes that "what is rational is real and what is real is rational" (Hegel, 1987).

A modern heritage

This theorical interpretation of the process explains how new special buildings arise in Rome as a fabric unified by internal routes (fig. 20), explains a process common also to nearly all Roman palazzos, from which, in my opinion, we can acquire a noteworthy consideration for the contemporary design (Strappa, 2014).

The palazzo is not just an invention of the architect, nor is it formed as an evolution of a building type, but is the critical result of a dialectic process between fabric and building.

Another example in Insula Mattei is Palazzo Mattei di Giove, begun by Carlo Maderno in the late sixteenth century. The palace, although fully designed, bases its structure on the logic of overturning external routes inside. The staircase can be interpreted as vertical continuation of the main internal route. Note that the façades of the courtyards are considered more architecturally remarkable than external ones, proving that this phenomenon is conscious and gives rise to an aesthetic synthesis.

As the Balbus one, all the other ancient theaters have formed the substrata of new buildings through several stages of transformation. Just to give an idea, in Palazzo Savelli, built by Baldassare Peruzzi on the remains of the Marcellus Theatre, the courtyard palazzo type is critically applied, although difficult to adapt to the existing structures; in Palazzo Massimo alle Colonne, also designed by Peruzzi (just before 1536), the facade follows the shapes of the Domitian Odeon, as all buildings that have been formed in this area. The Theatre of Pompeus, instead, generated mostly basic building, with some specialization in knots such as Palazzo Pio.

Piazza Navona, built on the Stadium of Domitianus, is the best known example of the transformation of an ancient substrata.

Figure 18. Reconstructive model on Via dei Delfini with the Church of S. Caterina dei Funari.

Figure 19. Forming of palazzos inside Insula Mattei as as melting of basic building around the open courtyard. On the left the formative process of Palazzo Caetani through unification of row houses units and forming of new hierarchized internal "routes").

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Figure 20. Schematic interpretation of the special building forming process as a urban fabric unified by common internal routes (from Strappa , 2014).
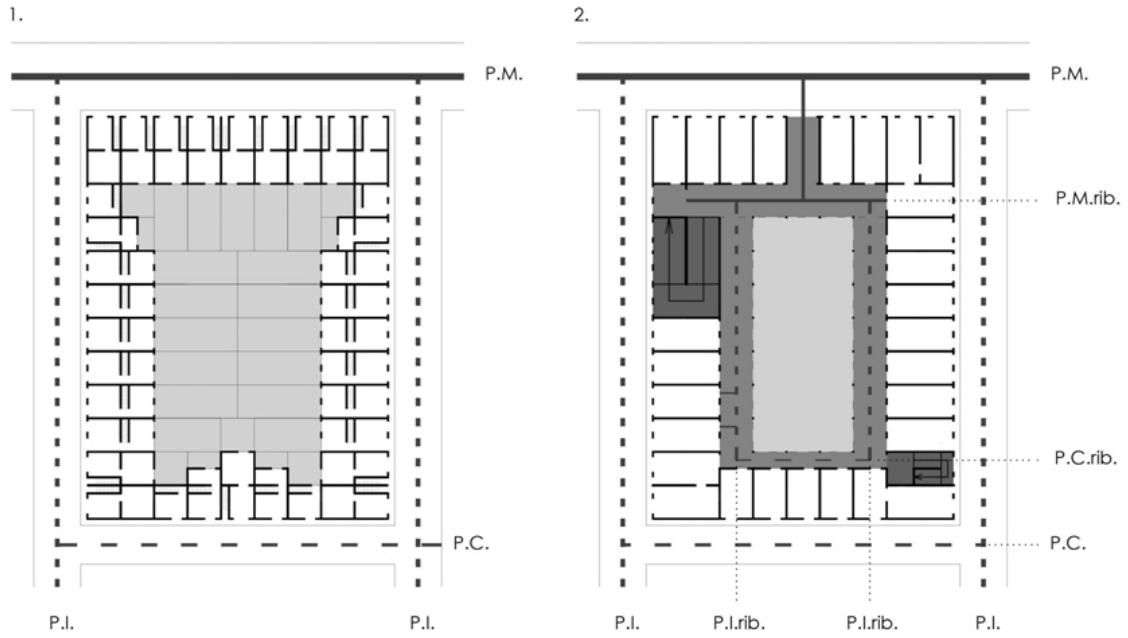
Figure 21-22. Internal façades in the courtyard of Palazzo Mattei di Giove.

Figure 23. Plan of the Pompeus theatre excavations superimposed on the cadastral map (beginning of Nineteen Century).

Catasto Attuale
Catasto Gregoriano (1836)
Resti Archeologici (allo stato attuale)

Piazza Madama
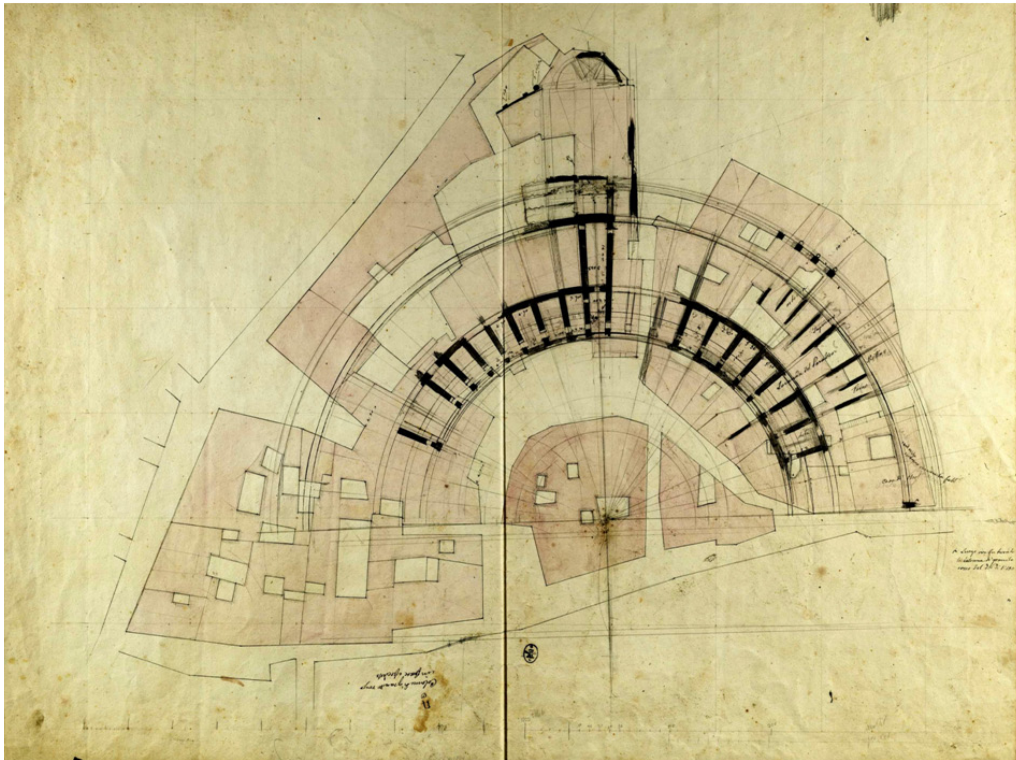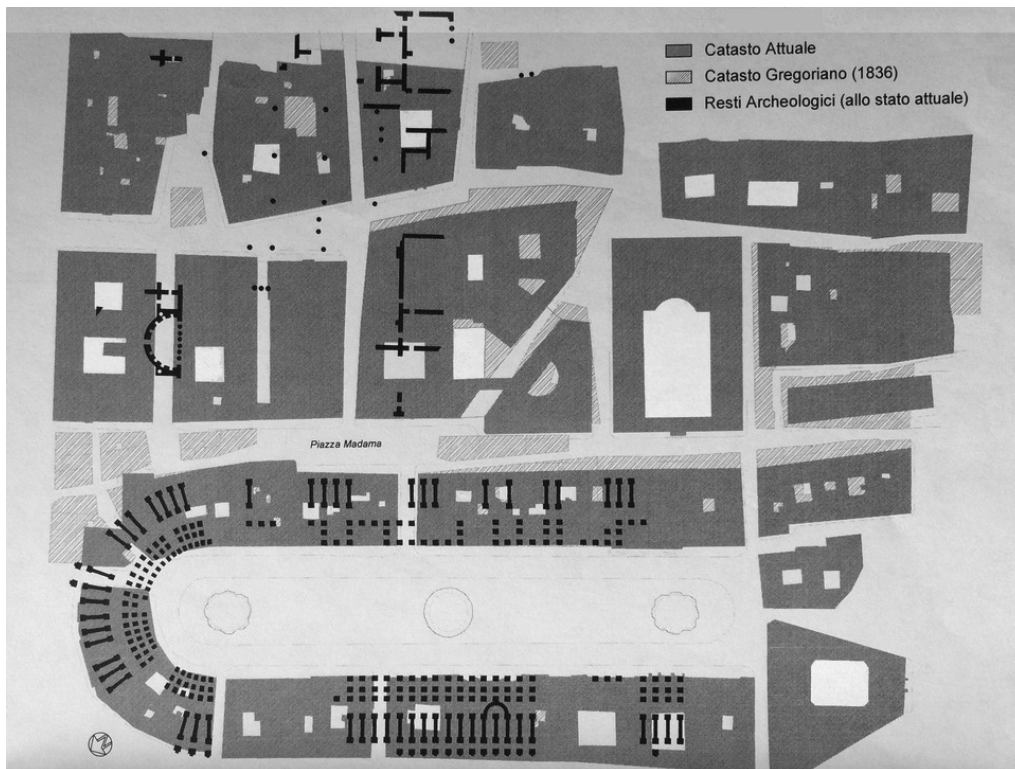
Figure 24. Comparison between the situation of the urban fabric in 2012 and the Gregorian Cadastre (1836).

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Figure 25-28. Arnaldo Foschini, reconstruction of Corso Rinascimento (1936-40).

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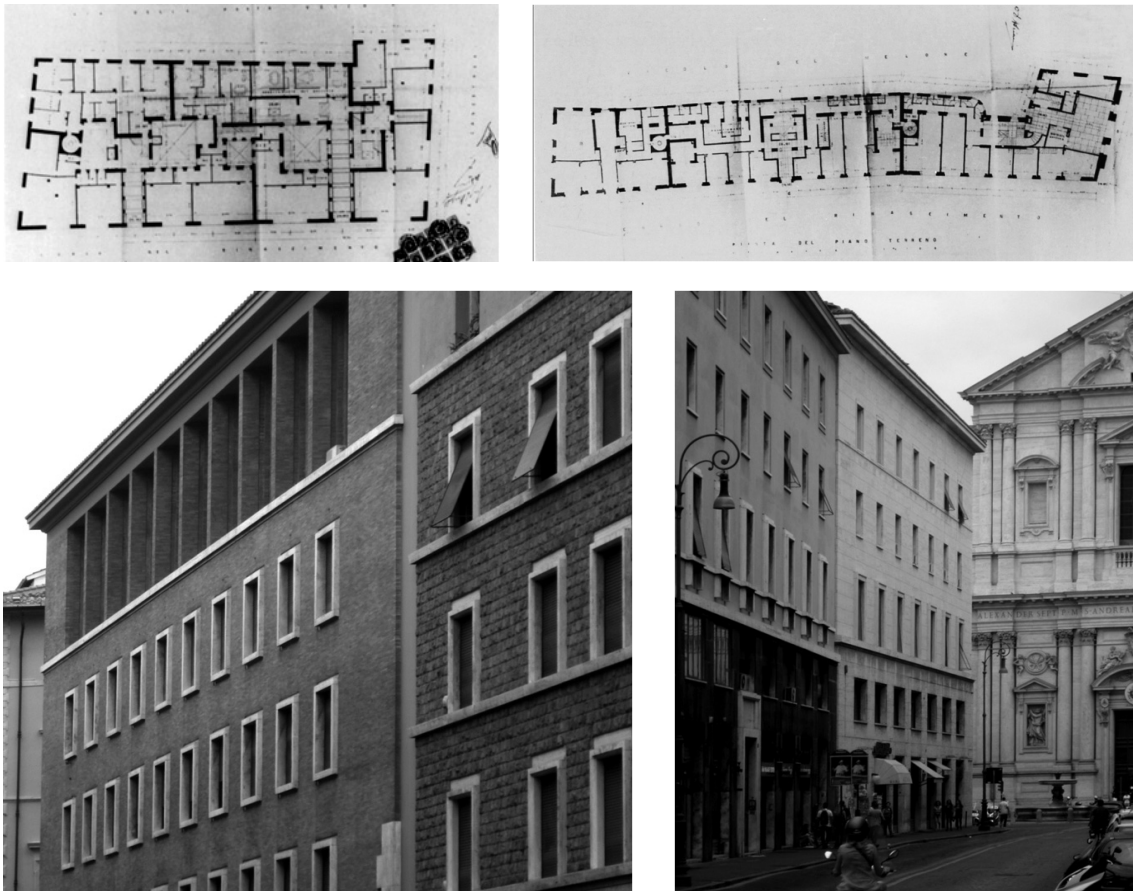
The plan of the modern transformation in the Thirties testifies to the crisis of the organic process. A crisis which takes place in Rome in the mid-nineteenth century, when, at urban scale, we have conspicuous demolition (like everywhere in Europe) with some great restructuring route that destroys the character of the existing urban fabric.

This approach continues with fascism, a period of disastrous interventions in the historic centre. It must be said, however, that in Rome also a culture of attention to historical fabrics was developed.

The studies of Gustavo Giovannoni contributed also to this interest (Giovannoni,1931, 1946; Strappa, 2003). He proposed a new way of intervening in the historical fabrics, avoiding the rigid geometric grid in use in international architecture, by proposing a realistic attitude towards the "minor" architectural heritage.

The plan of Corso Rinascimento by Arnaldo Foschini, although destructive, proposes a logical continuity in the reconstruction. It is a realistic kind of "redesign" of the old fabric (Strappa and Mercurio, 1996).

The Foschini's rebuilding design (fig. 25,26) is, in some way, an interpretation of an urban process. A process from which also arises, in my opinion, some of the specific character of much Roman modernity, as in Libera, De Renzi, Capponi and others.

It would be interesting to know how many of the reflections of the Thirties were transmitted to the Roman typological school. Here we have no time to deal with the topic but maybe we will have the opportunity to discuss the matter in some of the sessions.

In conclusion, I believe that Rome communicates to architects, geographers, planners, an idea of urban form eternal but, paradoxally, unstable.

This idea is absolutely modern and fertile for contemporary architecture. It allows us to consider the past not only as evidence, history as a dusty museum, but the living matter

of modern life.

It also gives a different meaning to the terms "creation" and "invention": the contemporary design as the last phase (innovative and provisional) of an ongoing process.

Rome is, in this sense, even today, an extraordinary lesson.

References

James, H. (1909), *Italian hours* (Riverside Press, Cambridge, Mass.).

Giovannoni, G. (1931), *Vecchie città ed edilizia nuova* (Utet, Torino).

Giovannoni, G. (1946), *Il quartiere romano del Rinascimento* (La Bussola, Roma)

Pareyson, L. (1960), *Estetica. Teoria della formatività* (Sansoni, Bologna).

Muratori, S., Bollati, R., Bollati, S., Marinucci, G. (1963), *Studi per un operante storia urbana di Roma* (Consiglio Nazionale delle Ricerche, Roma).

Caniggia, G. (1989), 'Permanenze e mutazioni nel tipo edilizio e nei tessuti di Roma (1880-1930)', in Strappa, G. (ed.), *Tradizione e innovazione nell'architettura di Roma Capitale. 1870-1930* (Kappa, Rome).

Strappa, G. and Mercurio, G. (1996) *Atlante dell'architettura moderna a Roma e nel Lazio* (Edilstampa, Roma).

Strappa, G. (1998), 'Caratteri specifici dell'architettura romana tra le due guerre', in Benzi,F.,Mercurio,G., Prisco, L. (eds.) *Roma 1918-1943* (Viviani, Roma).

Strappa, G. (2003), 'La nozione caniggiana di organismo e l'eredità della scuola di architettura di Roma', in Maffei, G.L. (ed.) *Gianfranco Caniggia architetto* (A Linea, Firenze).

Strappa, G., Ieva, M., Di Matteo, M.A., (2003), *La città come organismo. Lettura di Trani alle diverse scale* (Adda, Bari).

Strappa, G. (2014), *L'architettura come processo. Il mondo plastico murario in divenire* (Franco Angeli, Milano)

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A double urban life cycle: the case of Rome

Giancarlo Cataldi
DIDA, Dipartimento di Architettura, Università di Firenze
Keywords: Rome, urban structures, city planning, historical transformation

Abstract

Rome is distinguished from the large majority of other cities by the double life cycle of its long history. In this paper attention is focused on the permanent substratum structures that ensured 'continuity in change' during this city's transition from Antiquity to the Middle Ages: for the Muratorian school this is the basic principle of 'cyclic law', that regulates the life and history of the city. In Rome this phenomenon of rebirth is particularly clear: the basic buildings of the medieval city, attracted by the new religious centre of the Vatican, were located spontaneously in the planned fabric of the imperial special buildings in Campo Marzio. On an urban scale, this implemented the 'medievalization process' theorized by Gianfranco Caniggia, following Saverio Muratori's studies of Rome's urban history.

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The focus of attention in this paper is the 'substratum permanent structures' that influenced the transformation of Rome. Owing to its dual life cycle and unusual complexity, Rome is an exceptional city. *The New Rome Topography* by Nolli (1748) (Figure 1) is the first measured urban map of the modern era. It documents the form of Rome in the middle of the eighteenth century when, after a period of building stagnation, the city entered a new phase of growth. The areas built within the Aurelian walls (which were still intact 1500 years after their construction) are located mainly in the area formed by the meander of the River Tiber facing the Vatican citadel. The remaining area within the ancient city walls in the eighteenth century was mostly pasture, having been employed for centuries as a source of building materials. Painters, academics and architects, have left countless testimonies to this landscape, especially in figurative form.

Urban development and territory

The Ager Romanus (Figure 2), the rural area surrounding Rome, was traversed by the meanders of the River Tiber and consisted of an alluvial plain between the Tyrrhenian coast and the pre-Apennine ridge. In its last stretch the flow of the river was, and still is, influenced by the presence of three orographic systems: the Monti Volsini and the Alban Hills, of volcanic origin, and between them the north-eastern system of the Monti Sabini.

Rome is a prime example for those who believe that the origins of cities are closely linked to the characteristics of their territory. The union of three peoples, destined to come together in the future urban setting seems to originate from the convergence in Rome of three ridge paths, Latin, Sabin and Etruscan (Caniggia and Maffei, 1979, pp. 206-10; Cataldi, 1970, pp. 3-29; Cataldi, 2004, pp. 80-1; Muratori, 1967, pp. 499-506) (Figure 2). One can postulate that lines of communication were to be lastingly connected at fords located where it was easier to cross the river. Only the south-eastern ridge reaches directly the area of the Forum, consistent with the pre-eminence of the Latin component. Such a notion gains credibility from the myths of Aeneas, and Romulus and Remus concerning the foundation of Rome, the literary sources for which, though having long been deemed fantasy, have been validated by numerous archaeological and topographical findings (Carandini, 2006; Carandini and Cappelli, 2000).

The overview of the city's territory is completed by the Via Salaria (Figure 2), an old caravan route employed for the salt trade, which from the saltworks of Ostia runs along the valley floor, passing through the Roman Forum, which became the most important market area of central Italy.

After crossing the Tiber at the Tiber Island, the Via Salaria followed the Campidoglio ridge, bypassing the river meanders to reach the promontory of Antenne, before descending to the Salario bridge, where it continued its path on the valley floor. The territory in which the city developed, is an area surrounded by rivers, the Tiber, the Aniene and their two tributaries, the Almone and the Caffarella. The springs of the last two in particular are very close and form a square enclave, accessible through the ridge by the narrowing of the 'Roma Vecchia'. The strategic importance of this territory, working as an exchange area, may well have led the Sabins to cross the Aniene to reach and occupy the Campidoglio promontory via the Nomentana ridge. Such a transverse path may have marked the border between the 'lower' area of the Sabin pagi collini and the 'higher' area of the Latin pagi montani. The naming of the railway station as 'Termini' is probably recogntion of the intersection of the two ridges.

The formation of settlements on ridges is thus the central feature of the proto-urban phase of Rome (Figure 3), notably on the two opposing ridges of the Quirinale-Campidoglio and the Oppio-Palatino. Each of these comprised a number of villages of huts on the main rises (*septem pagi*), and linked by paths converging towards the valley of the Forum like beads in a necklace (Cataldi, 2006, pp. 118-9).

In the vicinity of Romulus's Roma quadrata (Cataldi, 2006, pp. 118-9) (Figure 4), important archaeological evidence has been found in the last few years. This reinforced the

view that the term quadrato (square) should be taken literally, as a first manifestation of a planning strategy that in time has become recognized as the most important, substantial and lasting structural characteristic of the whole Roman civilization (Carandini, 2000, pp. 95-150; Carandini and Cappelli, 2000).

The great Rome of the Tarquini

The first proper city was the 'great Rome of the Tarquini' (Cristofani, 1900) (Figure 4). The last dynasty of Etruscan kings in the course of the sixth century BC promoted the re-claiming of the valley floor between Campidoglio and Palatino, compacting the ground and providing the basis for the Forum and the construction of the first public buildings. The three hills of Campidoglio, Quirinale and Viminale and the four mountains of Palatino, Cispio, Oppio and Celio (Figure 3) were all encircled by the Servian Walls in a unification project that gave physical form to the proto-urban synoecism (Cataldi, 2006, pp. 118-21).

The first project of Etruscan Rome appears to be the expansion of the *Roma quadrata* to the higher Termini ridge. The two orthogonal axes, which are the basis of the system, are the extension, from the intersection in the Forum, of two secondary valley floor paths of the Palatino, the *vicus Tuscus* and the *Sacra Via*. The origin of the geographical co-ordinate system is presumably the Arx, on the north-eastern rise of the Campidoglio, with the *auguraculum* being where the church of Santa Maria in Aracoeli now stands. The modular grid of the co-ordinates remains the same, since the new *umbilicus* lies on the same meridian, one *centuria* away from the *Ara Maxima*. The dominant position of the Campidoglio seems to justify such a shift: the *Arx* had in fact to appear as the ending *caput* of a fortified line, which followed halfway up the *Alta Semita*, the important ridge path of Via del Quirinale. The walls towards the ridge turn at a right angle to become parallel with the Termini ridge and rejoin at the previous augural center of the *Ara Maxima*. The Aventino – the mythical 'antagonist' hill – was included only later within the walls in order to protect the valley floor of the Via Appia (Cataldi, 2006, p. 120).

It is not clear how the Republican city was divided into four regions. The original cores of the Latins and the Sabins were located in the regions of Palatina and Collina, and Esquilino and Suburra can be identified through the etymology of their names: the first means an 'external' area (the *esquilini* inhabitants of the outskirts compared to the *inquilini* of the centre), and the second (*sub-urbia*) means the 'low city' on the valley floor (Cataldi, 2006, p. 120).

The planned expansion of Campo Marzio

After the Punic Wars a vast programme of territorial planning was started in the provinces of the Empire. This included a development plan for the capital that would make it outshine every other city in the world. The north-western plain between the hills and the river was the only area large enough to contain a plan for the city that reflected its hegemonic role. A previous plan can be considered its technical derivative, but the new plan had a more rigorous design (Figure 5).

The new axis of expansion was Via Flaminia. In the other direction, *via Recta* ('straight road') is aligned on an east-west axis until it reaches the second Tridente of Sant'Angelo bridge, connecting it with Campo Vaticano across the river. From here the middle axis of the Tridente (via dei Banchi Vecchi) flanked the drainage canal of the *Euripus*, aligned south-east towards Tiber Island, and rejoining Via Appia. This canal linked the two meanders of the river, cutting diagonally the square plan of four *centuriae*. However, for this plan to be completed would have required a corresponding plan the other side of the Tiber. The problem of achieving this might have prompted Caesar's idea of creating a 'bypass' canal from Milvio bridge to the foot of the Janiculum, thereby forming a spatial *continuum* from the Vatican to Trastevere. Such a project was not completed owing to inherent technical difficulties. It would have changed the shape and history of Rome, including resolving the problem of the Vatican's relative separateness.

The building activity in Campo Marzio went on for many centuries, from the end of

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Figure 1. Nolli G. (1748) New Rome Topography (after Aronson, 1984).

the Punic Wars to the first barbarian threats at the borders of the Empire. These threats led to the building of a second and last wall, 650 years after the construction of the Servian Wall. The vast area between the Forum and the Tridente of Sant'Angelo bridge was progressively occupied by a number of large monumental complexes with special purposes. Following the example of Caesar, the first to start the building of his own colonnaded square, each emperor, beginning with Augustus, contributed to the growth of the monumental heritage of Rome. Finally, Trajan, in order to have his Forum built, ordered the hill between Campidoglio and Quirinale to be levelled, completing the process of uniting Campo Marzio with the Republican city.

The fourteen administrative regions of Augustus and the marble map of the *Forma Urbis*

Two other noteworthy occurrences that predate the construction of the Aurelian Walls need to be considered: the administrative regions in which Augustus organized the city and the marble *Forma Urbis Romae* of Septimius Severus (Figure 6)

The names and approximate borders of the fourteen regions are unknown (Cataldi, 2006, p. 122). Aventino and Trastevere have always been considered as to some extent 'external' to the city: Aventino being the 'antagonist' location of the auspices of Remus, and the quintessential plebeian hill, and Trastevere being the urban area bordering the Etruscan world, which was never completely assimilated. Of the twelve remaining regions, six were within the Servian Wall and six outside. The city had reached a population of 800 000 by the time of the census of Augustus. The old Servian Wall still worked as an administrative border, as did the paths along the valley floors.

The marble map of the *Forma Urbis*, part of which is missing, dates back to the Severan period, and is testimony not only to the development of the city at the beginning of

Figure 2. Ager romanus with convergence in Rome of three ridge paths, Latin, Sabin and Etruscan and of Via Salaria, old valley floor caravan route employed for the salt trade (after Cataldi, 2004, p. 80).
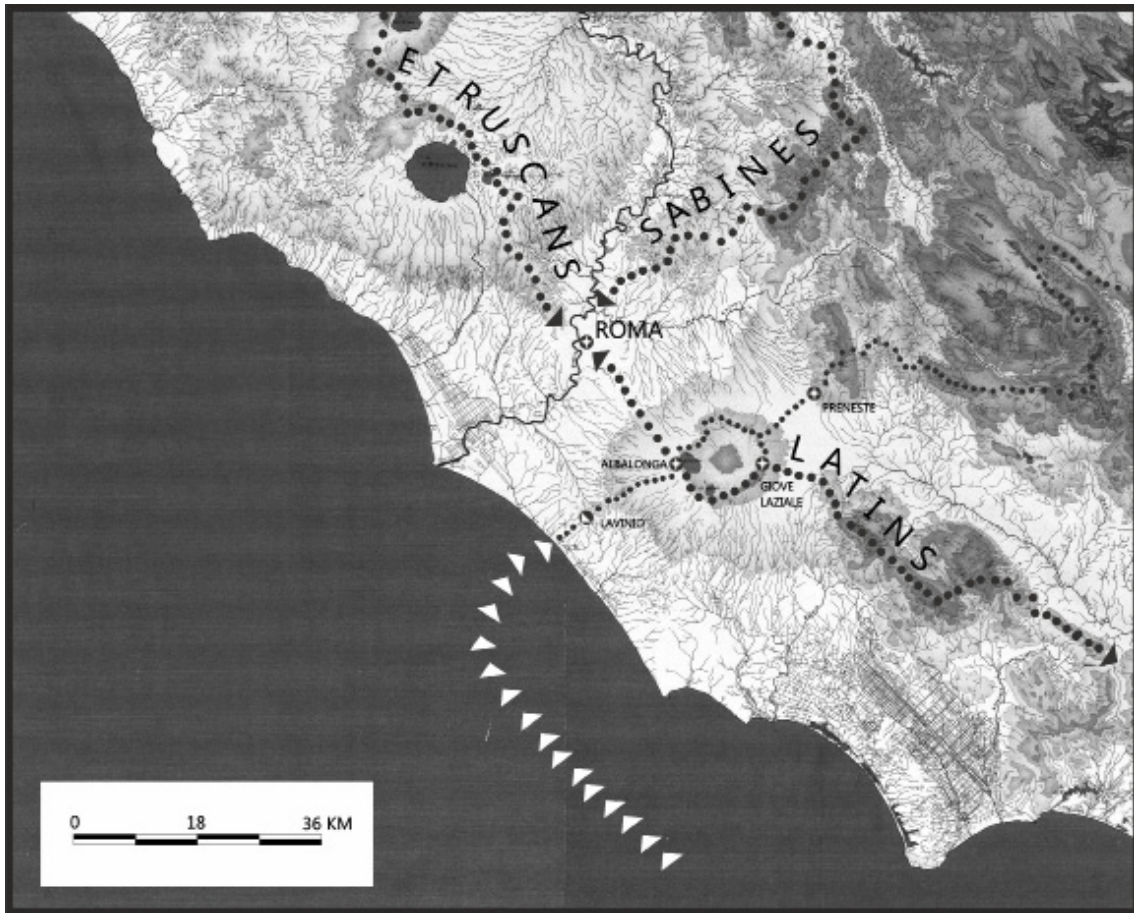
the third century AD, but also to the ability of Roman architects to trace precise 'aerial' representations (*icnographiae*) of very large, complex urban and territorial areas 'measured' directly on the ground. Its study has allowed precise relationships to modern maps to be ascertained. It has been possible to establish that its medial point corresponds to the centre of the co-ordinates of the Roman Arx, which lends credibility to the *Forma quadrata* theory (Cataldi, 2006, p. 123).

The Aurelian city

The design of the Aurelian Walls (270-275 AD) (Figure 7) followed the same system of co-ordinates (Cataldi, 2006, p. 125-7).   Their geometrical layout can be reconstructed without much difficulty (Cataldi, 2006, p. 126) (Figure 8). The total area, calculated in *centuriae*, was a little smaller than that of the *Forma Urbis* (25 *centuriae* compared with 27), a fact that might suggest a pause in urban growth. The orientation also changed. The number of gates was increased from twelve (in the Servian Walls) to sixteen, three of which were in the external bulwark on the Appia. The name *porta Metronia*, perhaps indicates the function of the gate as apex of the geodetic grid.

The geometry and shape of the Aurelian Walls influenced, and still does influence, the life of the city (Cataldi, 2006, p. 126). The geometry underpinning the alignments of the walls (Figure 8) and hence the shape of the city is consistent with a drawing from the early 1960s by Muratori (Figure 9) (Bollati, 1984, p. 55).

Figure 3. Proto-urban phase with two opposing ridges of the Quirinale-Campidoglio and the Oppio-Palatino. Sabin villages: Campidoglio (1) Quirinale (3) Viminale (4); Latin villages: Palatino (2) Cispio (5) Oppio (6) Celio (7) (after Cataldi, 2006, p. 118).
Figure 4. The 'great Rome of the Tarquini' as expansion of the Roma quadrata to the higher Termini ridge. The Servian Walls encircle the city, divided into four regions (Palatina, Collina, Esquilino and Suburra) with the addition of Aventino (after Cataldi, 2006, p. 118).
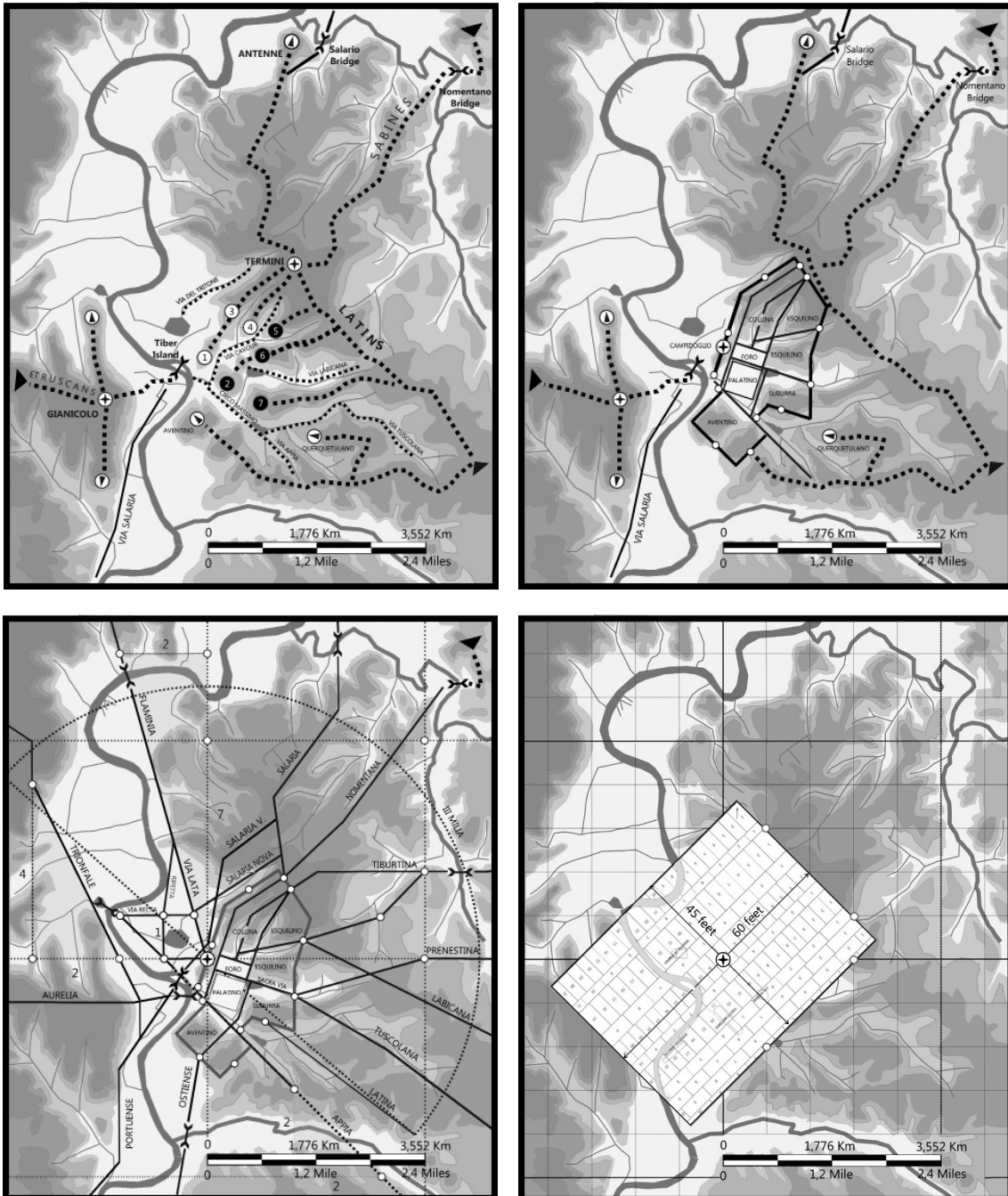
Figure 5. The planned expansion of Campo Marzio. The straight roads are traced on a hypothetical geographic system oriented on the cardinal axes (after Cataldi, 2006, p. 125).
Figure 6. The layout of the marble *Forma Urbis Romae* of Septimius Severus (146-211 AD). The geometric center of the map coincides with the hypothetical center of the geographic system (after Cataldi, 2006, p. 123).

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Figure 7. The walled Aurelian city (270-275 AD) (after Cataldi, 2006, p. 125).
Figure 8. . The geometrical layout of the Aurelian Walls (270-275 AD): (A) Porta Flaminia; (B) Trinità dei Monti; (C) Outside Porta Salaria; (D) Porta Tiburtina; (E) Santa Croce in Gerusalemme; (F) Porta Metronia; (G) Porta Appia; (H) Porta Ostiense; (I) Testaccio; (L) Trastevere; (M) San Pietro in Montorio; (N) Tridente di Ponte (after Cataldi, 2006, p. 127).
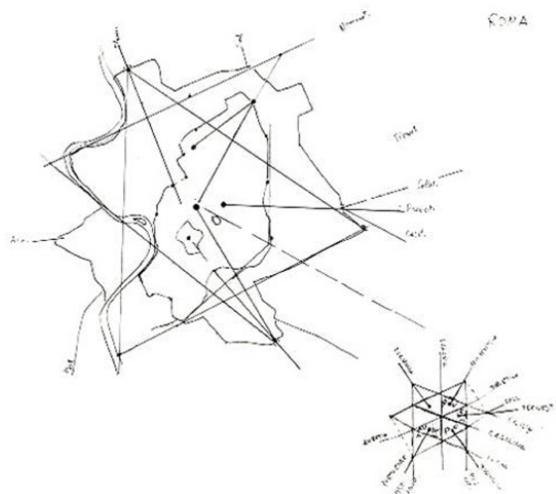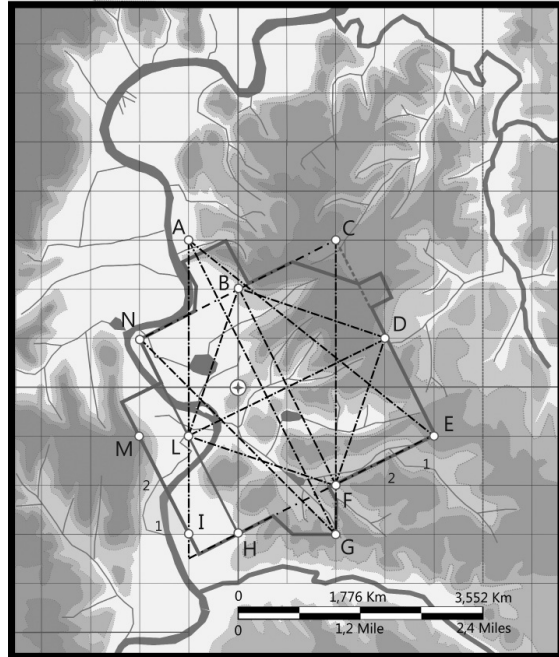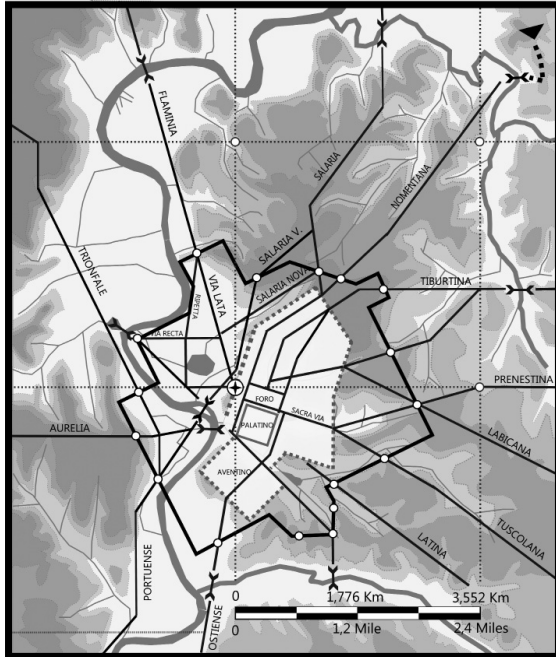
Figure 9. The geometry of Rome in a drawing from the early 1960s by Muratori (after Bollati S., 1984, p. 55).
Figure 10. The territorial distribution of the basilicas 'fuori le mura' ('outside the walls') in the last age of Empire coincident whit the first age of Christianity (late fourth-century).

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Map of Rome after the nineteenth-century papal cadaster (after Muratori, Bollati R., Bollati S, Marinucci, 1963, edited by Bollati S.).

The territorial distribution of the first Christian basilicas

During the first half of the fourth century Christianity became the official cult of the Empire. The first great basilicas of the emperor Constantine were constructed over the places of martyrdom and burial of the forefathers of the new religion. For the pilgrims who started flocking in from the many provinces of the Empire, temporary settlements were erected in a radial pattern outside the walls, along the consular roads. These proved to be short-lived due to invasions and the subsequent fall of the Roman Empire. What is left is archaeological evidence of their existence, with the main church oddly reminiscent of the stadium typology (Krautheimer, 1965) (Figure10).

The reconstruction of Rome in the Middle Ages

Rome was almost entirely depopulated following the barbarian invasions. Figure 11, reproduced from Muratori, Bollati R., Bollati S., Marinucci, 1963, shows the nineteenth-century papal cadaster. The map is a product of maps of Campo Marzio in the imperial and medieval periods. Major public and private buildings (for example, churches, convents and houses) took up sites that had been occupied by the ruins of major Roman complexes that had been designed to contain special functions (notably religious, political, athletic and theatrical). Such site succession is a widespread feature of medieval cities that have inherited a Roman colonial pattern.

Gianfranco Caniggia's Como: *lettura di una città* ('Como: the reading of a city'), with an introduction by Muratori (Caniggia, 1963), is the first book openly dealing with the

Figure 12. As example of 'medievalization', on the previous map were highlighted the curvilinear medieval paths, related to the Roman regular planned structures of western side of Campo Marzio.

phenomenon of 'medievalization'. It was highlighted by Muratori and his collaborators during their reconstruction of the development process of Rome's historical centre.

Analysis of the medieval city clearly exceeds the scope of this paper. However, a brief mention of Caniggia's theory of 'medievalization' highlights Rome's double urban life cycle. Caniggia's theory develops the theme of the duality of public and private construction, focusing on the spontaneous intervention of private citizens who, in the absence of regulatory action on the part of city authorities, tend to reuse for their own building purposes planned structures of public interest. This has had a number of major consequences for the dynamics of urban transformation (Caniggia, 1976) (Figure 12).

1. Basic buildings tend to replace special buildings.
2. The fabric of the Roman *domus* is either converted to palaces or, commonly, is parcelled into the smaller fabric of row houses.
3. The planned straight paths tend to turn into organic curvilinear paths, owing to the buildings facing them progressively occupying the public ground.
4. The city walls are flanked outside by ring roads (as Via del Muro Torto). In combination these act as fixation lines within the pattern of subsequent city growth and change, and give rise to fringe-belts (Conzen, 1960, pp. 56-65.

Conclusion

In Rome the 'substratum permanent structures', more than in any other city, played a key role. This is mainly due to the perfect integration of the natural geographical structure – alternating as the imprint of a hand ridges and valleys bottom – and the planning geo-

metrical structure of Campo Marzio plain. The main phases of ancient cycle constitute therefore the steps of a process that will be retraced in reverse, in very different historical circumstances, in subsequent medieval and modern cycles. These steps can be summarized as follows:

1. The proto-urban Rome of seven Latin and Sabine settlements on ridge.
2. The urban foundation of the *Roma quadrata* by Romulus on the Palatine.
3. The Etruscan Rome of the Servian Walls, divided into four regions and polarized on the first Forum.
4. The urban "doubling" of Campo Marzio, planned area assigned to special building uses.
5. The Imperial Rome with completing of the process of uniting Campo Marzio with the Republican city.
6. The late Imperial Rome of the Aurelian Walls.
7. The first Christian Rome with the abortive attempt of territorial basilicas outside the Walls.
8. The Medieval occupation of Campo Marzio, as the result of the attraction exerted by the new Vatican Citadel, that determines the spontaneous reuse for residential purposes of ancient monuments, gradually transformed in the urban fabric of the current Rome historical center.

This process should steer the subsequent study of the form of medieval Rome.

References

Bollati, S. (1984) 'Saverio Muratori progettista (dall'anno 1956 al 1973)' in *Storia Architettura 7*(1-2), 51-8.

Caniggia, G. (1963) *Como: lettura di una città* (Centro Studi di Storia Urbanistica, Roma).

Caniggia, G. (1976) *Strutture dello spazio antropico* (Uniedit, Firenze).

Caniggia, G. and Maffei, G. L. (1979) *Composizione architettonica e tipologia edilizia. 1. Lettura dell'edilizia di base* (Marsilio, Venezia).

Carandini, A. and Cappelli, R. (eds) (2000) *Rom: Romolo, Remo e la fondazione della città* (Electa-Mondadori, Milano).

Carandini, A. (2000) 'Variazioni sul tema di Romolo', in Carandini, A. and Cappelli, R. (eds) Roma: Romolo, Remus la fondazione della città (Electa-Mondadori, Milano) 95-150.

Carandini, A. (2006) *Remo e Romolo* (Einaudi, Torino).

Cataldi, G. (1970) 'La viabilità dell'Alto Lazio dalle origini alla crisi dell'impero romano', in *Quaderni di ricerca urbanologica e tecnica della pianificazione* 4, 3-29. [yes, this is a journal]

Cataldi, G. (2004) 'Attualità e persistenza delle strutture pianificate antiche nella periferia di Roma', in Cassetti, R. and Spagnesi, G. (eds) *Il centro storico di Roma: storia e progetto* (Gangemi, Roma) 78-89.

Cataldi, G. (2006) 'Attualità e persistenza delle strutture pianificate antiche nella forma di Roma', in Cassetti R. and Spagnesi G. (eds) *Roma contemporanea: storia e progetto* (Gangemi, Roma) 116-29.

Conzen, M. R. G. (1960) *Alnwick, Northumberland: a study in town-plan analysis*, Institute of British Geographers Publication 27 (George Philip, London).

Cristofani, M. (ed.) (1990) *La grande Roma dei Tarquini* ('L'Erma' di Bretschneider, Roma).

Krautheimer, R. (1965) *Early Christian and Byzantine architecture* (Pelican History of Art, Harmondsworth).

Muratori, S. (1967) *Civiltà e territorio* (Centro Studi di Storia Urbanistica, Roma).

Muratori, S., Bollati, R., Bollati, S. and Marinucci, G. (1963) *Studi per una operante storia urbana di Roma* (Consiglio Nazionale delle Ricerche, Roma).

Nolli, G. (1748) *Pianta grande di Roma* (1984) Portfolio of facsimiles, with an introductory essay by Ceen, A. (Aronson, Highmount, NY).

Studies for an anthropology of the territory.
New achievements from Saverio Muratori's archive

Nicola Marzot
Faculty of Architecture and the Built Environment, Technische Universiteit Delft, The Netherlands

Abstract

Since May 2015, the Municipal Biblioteca Poletti in Modena, Italy, enriches its impressive collection of Saverio Muratori's research work. In fact, his personal archive has been added, thanks to the important donation of his family. Many unedited territorial and architectural design drawings, and related written documents, will help both students and colleagues to cast a new light on a complex profile who still deserve a truly international attention and recognition. Saverio Muratori's main intellectual achievement is to consider the natural landscape as the deep "substratum" whose memory is still evident and alive at the base of every process of anthropization. As such, the landscape acts as the matter humans transform in order to define their own territorial field and the related settlements and buildings. Being valueless in its original state, it becomes meaningful through the operational attitude of the living beings themselves. By making the approach to its use repeatable and conventional, the human mankind arises through space and time. In Saverio Muratori this justify the fundamental importance of the specific scalar patterns human beings used and still use to approach the landscape: in fact, by reflecting the human agency through a specific collective subjectivity, the above mentioned patterns clearly express and historically embody the specific community's shared values at a logical, economical, socio-political and cultural level.

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Introduction

The official opening of Saverio Muratori's archive in 2015 offers the possibility to question the author's legacy, after his scholarship has been widely established (Capelli, 1991) and internationally recognized (Cataldi, 2013). In that perspective, the municipality of Modena, Italy, decided to tribute to its fellow citizen a prestigious location, the Poletti library within the Palazzo dei Musei, where gathering all the research contributions deriving from his teaching activity; unpublished territorial analyses and his design activity as a practicing architect. The original body of this impressive collection started with personal donations from all those who were acquainted with his theoretical works, later on internally ordered according to generations and scale of interest by Giancarlo Cataldi, a former Muratori's pupil and assistant. This process started on occasion of an international conference hosted in Modena in 1991 and intended to investigate Saverio Muratori's role within the Italian debate on architecture and urban design at the end of the XX century (Capelli, 1991). In 2014 Alessandro Giannini, a former pupil of Saverio Muratori, donated to the same institution an unpublished territorial analysis, known as *Studi per una operante storia del territorio* (Muratori, Bollati, R. Bollati, S. Giannini, Marinucci, 1968-73), which clearly witnesses Saverio Mutatori's last years increasing interest for an holistic vision of the built reality, shared with his main collaborators. Finally, in 2015 the heirs decided to donate the author's personal archive, which gives the possibility to cast a new light on his wide and impressive design activity. As a result, today students and researchers have the possibility to additionally investigate a key figure within the international panorama, who hardly fits into a specific disciplinary framework. In fact, the main fascination of Saverio Muratori derives from his capacity to cross over disciplinary boundaries to elucidate civilization processes made possible as the result of well established cultural improvements. Thanks to his consistent philosophical background (Pigafetta, 1990), Muratori succeeded to achieve unprecedented results, encompassing at least geography, archeology, history, architecture and urban design (Cataldi, 1991). Considering the wide spectrum of interests shown, one can assume that the entirety of his work implicitly aimed at building a new anthropology, where the human being progressively achieve his maturity by constantly confronting himself with site specific conditions, either natural or cultural. The result of this cultural process is the assumption of the "type" as a concept, which has the capacity to encompass all the cultural values already shared by a newly established community. Based on that concept, human groups can reflect on their own experience, progressively activating a civilization process. This is achieved by instrumentalzing the "spontaneous consciousness" derived by the experience itself, whose applicability implies the self-conservation of the above mentioned values and their enduring resistance to new expectations, also coming from abroad. The occurrence of a change can lead to a state of "crisis", that Saverio Muratori identifies as a self-evaluation process, leading to a state of "critical consciousness". As a consequence, we come to the conclusion that Saverio Muratori, at the end of the '60 implicitly introduced the discussion about post-modernity as the embarrassing legacy of a pure state of rationality, prompted by Modernity, which was paradoxically obliged to question its foundation. From this reflective point starts our discourse.

The nature as a "substratum" and the culture as a "phenomenon"

Saverio Muratori's criticism towards Modernity is grounded on a precise definition of nature the author derives from his fascination for philosophical "Existentialism" (Muratori, 1967). Functionalism was based on a prejudicial reduction of man to his biological restrains. This reduction presumes that, at this originating state, human beings behave as animals, reacting to the environment according to basic instincts. Since instincts are automatic reactions to environmental stimuli, through this reduction Functionalism avoids questioning the issue of will and intentionality implicit into any human action and consequently leads to identify universal principles of rationality upon which human beings unconsciously behave. One of the expected side effects of this presumption is to control

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behaviors by planning the environment into which the man is supposed to be "centered", leading to Determinism. Martin Heidegger offered the philosophical foundation to question this assumption, bringing to the fore all Functionalism aporias (Agamben 2002). In fact, by distinguishing the *Umwelt* (environment) from the *Welt* (world), Heidegger separates unintentional and spontaneous reactions to the environment from intentional and critical positions with respect to it. While the former condition is appropriate to describe animals, the latter is specific of human beings. Moreover, since human beings do not automatically react to the environment, but have to adapt to it to survive, the relation between the environment and the human being is fundamental to man's construction and definition. Heidegger's Ontology therefore identifies itself with an Anthropology which is not based on universal principles. The human being is the result of an unstable relation between site specific conditions and decisions related to that condition. The more those decisions become conscious and shared, the more the human beings become aware of themselves. Since the result of this interaction is unpredictable and can also be dramatically unsuccessful, Ontology offers the possibility to comprehend, paraphrasing Heidegger, the entire process "On the Way to Language" (Heidegger, 1971). Saverio Muratori recognizes within the definition of the *Welt* (world) the unavoidable necessity of human beings to orientate themselves through the specific site conditions, not having clear clues about how to behave. Nature therefore manifests itself as a persistent state of uncertainty, instability and indeterminacy from which human beings have to emancipate by assuming an endless sequence of decisions. It is the process of emancipation by this originating panic condition that progressively lead human beings to make experience, to systematically reflect on it and to stabilize the corresponding outputs in order to construct a proper culture. As a consequence, according to Muratori, cultural awareness is always deeply rooted into the local natural *substratum,* where the term encompasses all the aspects- orography, hydrography, climate, flora and fauna- which affect the experience. But this is not enough to explain Saverio Muratori's foundation principles. Since the "phenomenon," deriving from the greek verb *phainein*, implies the relation between the human being and the environment and since the relation changes accordingly to the human being position within the environment itself, the body and its movement through the *Umwelt* incisively contribute to the experience itself. Accessibility to and through the environment becomes therefore e theoretical obsession of Muratori.

The territorial forming process "On the Way to Language"

The complete terminology Saverio Muratori uses clearly refers to the human being body as the archetypical instrument through which he makes experience of the natural *substratum*. Not by chance, the basic criteria he always mentions in his research activity is the "way trough which" human beings, by constantly assuming decisions, start orienteering themselves into a natural environment which is intrinsically inhospitable and hostile since it does not imply the human being's presence as such into its domain. Because of this paradox, Muratori explicitly pays his debts to Husserl and his Phenomenology, progressively distancing himself from any superficial Humanism or possible reminiscences of religious afflatus (Husserl, 1950). In fact, Nature is not "centered" around the human being but, on the contrary, the human being is literary "de-centered" with respect to the Nature. But Muratori, systematically pursuing his fascinating interplay between philosophy and anthropology, does not refuses the role of Rationality. He simply postpone its appearance regarding to the Nature's appearance. In that perspective, he does not confuse Nature's Rationality, the greek *phisys*, with the human being Rationality, the greek *logos*. While the former is a "brutal fact", independent from the human being's presence, the latter is its "interpretation", made possible by the human being's appearance on the "original scene". Since each interpretation is a necessary limitation of any possible sense and senses, Saverio Muratori considers the experience of the environment as a "work in progress", made of trials and errors, through which the human being temper and culturally root themselves. Which is the ultimate result of this process? Man and his language. In such a way Saverio Muratori literary succeeds to embody Heidegger's "On the way to

Figure 1. Table a B12: "Pianoro". The drawing represents a small "territory" in the nearby of Bologna, Italy. It is characterized by the presence of a main Promontory settlement bounded by two Valley-Bottom system. The territorial plot arrangement, made for cultivating the land, perfectly represents the relation between the human being presence and the local landscape morphology, which is made of gently sloping hill, easily accessible from the Main Ridge Route, and easy reaching piedmont area, accessible from the river Valley-Bottom Routes. Two different strategies coexist while expressing alternative solutions to the necessity of anthropization processes.

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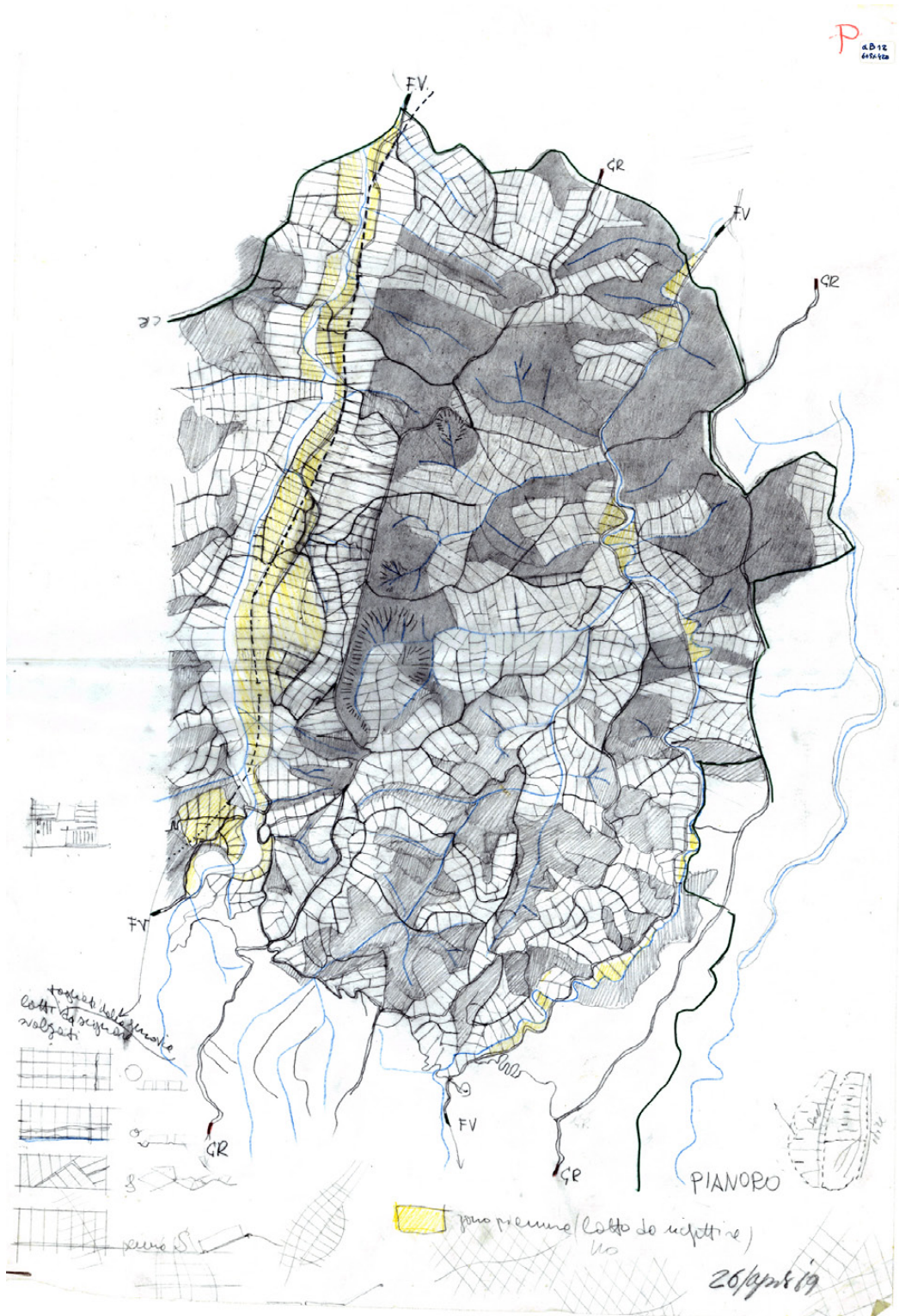
language". By experiencing the Nature; by assuming the Nature as his behavior horizon; by progressively limiting Nature's unlimited field of possibilities, the human beings acquire a "site specific" rationality. Universal is therefore solely the capacity of emancipation from natural indeterminacy, which belongs to all human beings and distinguishes themselves from the other living organisms. On the contrary, human rationality is always particular, i.e. affected by local conditions of experience. Humanistic Rationality is therefore the result of an achieving process, neither a presumed hypothesis to be demonstrated nor a metaphysical assumption that excludes the human being's responsibility, delegating it to other Subjects, alternatively God and/or History. In addition, Humanism acts as a sort of symbolic threshold between Ontology, i.e. the "being of things" and Gnoseology, i.e. what we know about the "being of things", not confusing them. But that kind of site specific rationality requires a cultural shift from the individual experience to the collective one. Structuralism, namely its anthropological branch, offers a bridge to fill the gap and a possible explanation (Levi Strauss, 1966). By introducing the ritual as the reactivation through the use of memory of a real expedience regarding the "discourse on the origin", i.e. the Myth, the endless repetition of actions and decisions about the Nature's use and transformation assumes a specific value, becoming a value as such. The convention becomes therefore a value guaranteed by the possibility of repeating certain actions and decisions, upon which there is a general agreement and consensus among the members of a community. From this assumption derives that men are responsible of the specific conditions under which those conventions are valuable, and symmetrically conventions represent the agreement as such. By stressing the importance of men's responsibility regarding the conditions under which something is valuable and/or valueless, Structuralism justifies the emphasis on the role of the Type. According to Saverio Muratori, the type definition is twofold, simultaneously acting as an *a posteriori* analysis and as *a priori* synthesis (Muratori, 1960). In fact, on one side the Type acts *a posteriori* with respect to the repeated experience of the nature, being the result of a process made of trials and errors, potentially resulting into an agreement. On the other, the Type is the form of that agreement, and as such it acts as the idea, the greek term *eidos*, to be applied in order to establish an expectation's horizon coherent with the matured experience. Furthermore, the Type is implicit within the phenomenon's appearance and explicit within its result application. In Saverio Muratori's theoretical system the Type therefore acquires a symbolic value, relating experimentation to convention; human being to man; nature to culture. However, it is fundamental to remind us that the two terms are not mutually reversible. In fact, the latter cannot ever be reduced to the former, simply representing its own interpretation and conscious limitation. Existentialism prevents this possibility, constantly claiming that the Umwelt always transcend the Welt, not forgetting that men need to build their own world to live in because they are endlessly "de-centered" with respect to nature and not automatically orientated by it in the way they do behave.

The ritual relation between the design and its materialization

Saverio Muratori is fully aware of the fact that, being intrinsically "de-centered" with respect to nature, men always have to transform the nature, to adapt it to their necessity. If the body is originally instrumental to human orientation through the natural "opacity", rationality becomes the technique through which men can literary superimpose their own domain, acquired through nature experience, to the nature itself. Since the type represents the domain men have to project onto the nature to transform it and since that project always preserves the traces of the previous experience of the nature, its application onto the nature transforms the nature into a "working ritual" of its original experience to be repeated. The territory becomes therefore a literal and metaphorical reflection of phenomena on themselves; of human beings on themselves; of practices on themselves. This self-reflection is, according to Saverio Muratori, strategic to explain the built reality. Through self-reflection, in fact, the human beings reach that level of self-consciousness which distinguishes themselves from any other form of living organism, which are missing this possibility. Muratori derives this philosophical background from Hegel's Idealism. He-

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Figure 2. Table a E24: "Emilia-Romagna: Fusione". The drawing perfectly represents the roman colonization process of the Po Valley, the so-called Pianura Padana, in the north-east part of Italy. Its main interest lies in the fact that it represents the relation between two different ideas of the "territory", the Villanovian/Etruscan one and the Roman one. While the former develops downstream, trough main Ridge-Top routes, secondary Ridge-Top routes and promontory, local Cross- ridge-Top routes, Syntetic Cross- ridges and urban nuclei; the latter develops upstream, trough main Valley- Bottom routes, Pass Routes, Secondary Valley Bottom routes and Consolidated local Cross-ridge-Top routes. When the first cycle of antropization falls into crisis, the new roman cycle literary "re-cycle" it, repeating its process by reversing its main routes, settlements, productive areas and urban centers. The territorial survey confirms therefore a strategic shift in perspective. The corporal experience of the environment does not privilege the mountains and the related horizon, but the main valley and its perspective. The famous Via Emilia, an highly artificial infrastructure used by military troops, carriages, farmers and merchants, within the new cycle of anthropization plays the corresponding role of the natural Appennino Tosco_Emiliano mountain chain, which offered the first entrance to the area many centuries before.

gel is the first who clearly identifies human rationality with the capacity to literary translate and re-address the natural laws, the greek *physis*, which is intrinsically aimless and indifferent to human needs, as Spinoza whose already stating, to his specific purposes and intentions, without changing them. This self-reflective capacity, which nonetheless requires sacrifice, time and many attempts to be obtained, is therefore the highest technique ever reached, and is carried on by the type definition itself. The type is not solely a cultural project. Through its embodiment within the territory, at all scales and grades, by the means of the human work, the type acts as a *principium individuationis* and transforms itself into a "working history". Showing an impressive analogical relation to the type definition, also the body acts according to a twofold perspective. At a phenomenological level, it supports and sustains the never-ending experience of the Nature, defining its specific space and time. At a rational level, it carries on and promote a cultural project performing it in coherence with an already established structural framework. This also explain why Saverio Muratori, paraphrasing Hegel, believes that "what is rational is real and what is real is rational" (Hegel, 1987).

Figure 3. Table a G10: "Italia: unificazione". The drawing represents the italic peninsula after the roman colonization processes. The system of the main Ridge, which originally were used as main Routes to access it, maintaining a defensive position and taking advantage of wider horizons to control the less hospitable mostly flooded Valley-Bottom areas, are now perceived as limits defining different territory: The Po Valley, The Etruria and the Apulia. All of them are crossed through a networks of infrastructure, the most important of which develop further into the adjoining territory via a Pass.
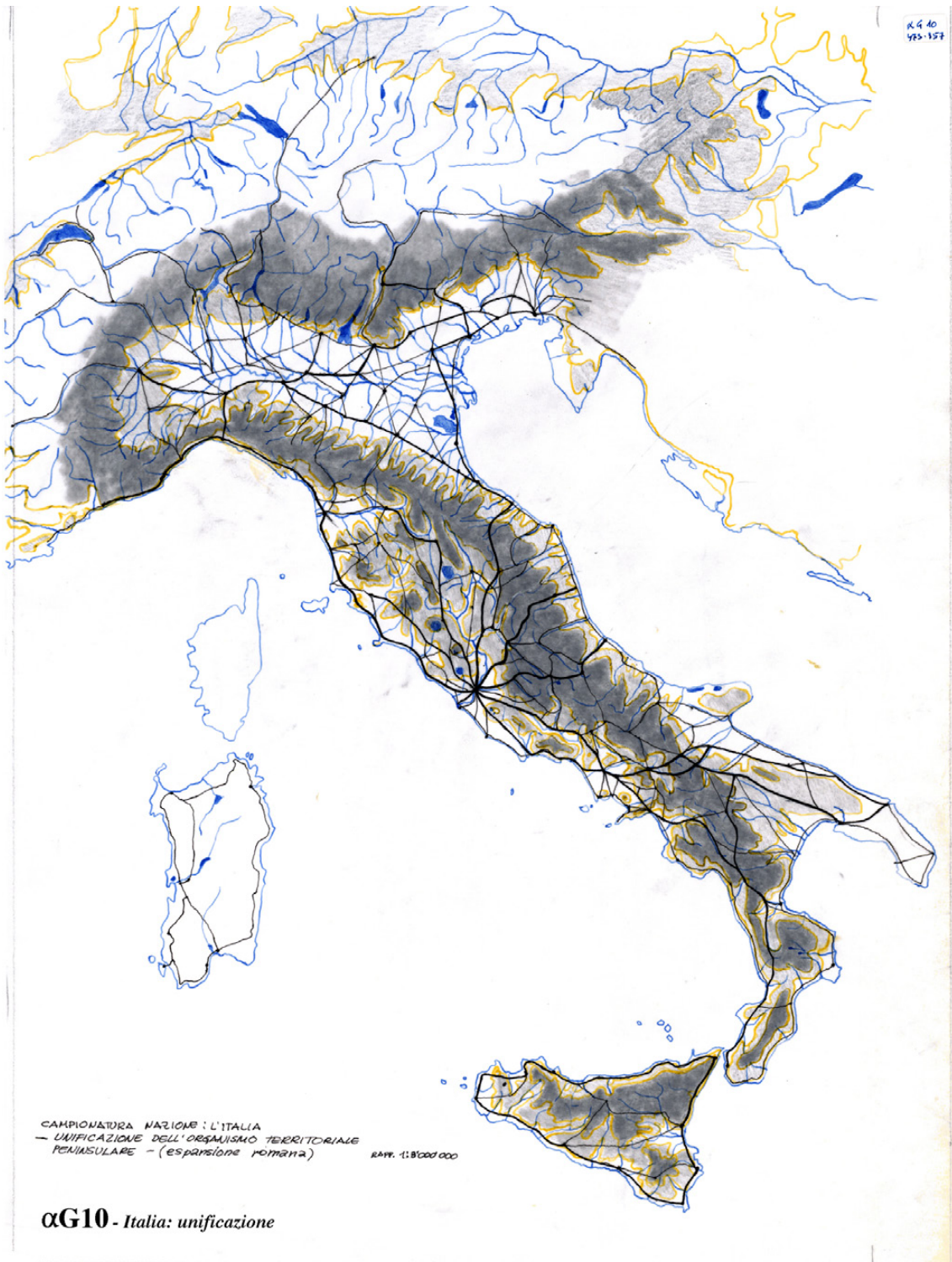
Figure 4. Table β F24: "Ecumene: orditure e linee di sviluppo". This drawing by Saverio Muratori represents the main access routes through Europe at the climax of the Roman Empire. It immediately offers a glimpse of an effective and strategic infrastructural network through which it was passable to conquer and connect highly different "territory", bringing them to unity. It is notable to remind that everything was planned in coherence to the military troops daily capacity to walk. Accordingly, urban nuclei were settled to feed them and offer repair and rest. A conquest literary tailored in compliance with a very specific corporal experience of the landscape.

βF4 - *Ecumene: orditure e linee di sviluppo*
(Dis. di Saverio Muratori)

The raising of History and its fall

We already explained why, according to a phenomenological approach, the human being is literary and metaphorically "de-centered" with respect to the existing environment (*Umwelt*) and how, in order to survive this hostile, unpredictable and unexpected situation, he is doomed to start adapting the nature to its desires and aspirations, conceiving, planning and building his own world (*Welt*). Saverio Muratori, assuming this condition as the foundation of his method of urban and territorial analysis, also recognizes this not solely being the origin of any process of anthropization. Moreover he discovers its repeated occurrence, whatever and whenever a civilization process fall into a condition of crisis. Reasons of the crisis depend sometimes by natural cataclysms, like earthquakes, volcanic eruptions, pestilences and famines; by external agents as wars, migrations and cultural colonisations or by internal shift in perspective, like socio-economic changes within the community. As an immediate consequence, the crisis progressively liberates energies that, not supporting anymore decisions and actions coherent with an already established cultural project, represented by the Type, become available to potentially support other perspectives for the near future. But time is required to absorb the effects of the change, and conveying the old world into the new one, not considering the event of a failure. The crisis progressively leads to a vacancy. Saverio Muratori cannot find a proper term to describe this dramatic condition into his theoretical framework. The unique systematic attempt made in this direction is offered by his pupil Gianfranco Caniggia and Caniggia's research fellow Gian Luigi Maffei who later on, will introduce the concept of *rendimento* (yeld) to describe the time needed to re-establish a condition of equilibrium

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after a build context has been affected by a change (Caniggia, Maffei 1979). It is important to remind that this apparent aporias plays a crucial role within the entire production in the field of morphological and typological analysis (Marzot, 2014 i). Nonetheless, Saverio Muratori has the capacity to elucidate what is happening in the due curse of a crisis. By comparing and relating archaeological evidences, historical sources and building surveys, he is able to find out that the products of a former world have been partially or almost completely "metabolized" within the latter (Muratori, 1960). This result is of the upmost relevance, especially in the territorial analysis. The apparent material continuity which seems to bridge the gap between two epochs has been highly misunderstood. In effect, Saverio Muratori describes in details the transformation of former buildings into the latter ones. However, only a phenomenological approach can help to cast a proper light on it. According to the *principium individuationis*, the systematic application of a Type concept to all scales and grades within a coherent antropization's cycle, affects all the building products, conferring to them a specific role within the territorial ensemble. That role represents conventions, but conventions need to be literary embodied and supported. The type definition and its embodiment within each individual building manifestation acts, therefore, as the "two faces of the same coin", where the "material" is the indistinguishable result of a type/matter relation. Because of the vacancy prompted by the crisis, the building "materials" tend to loose their own instrumentality. As an immediate consequence, matter and type reciprocally disconnect and deviate. Matter is more resistant to change. It can be transformed into a ruin, and to remain as such for an endless period, or be reused as a preliminary condition to experiment new behaviours and, eventually further on in the process, as a renovated vehicle to convey new meanings. However, what is going to happen to the type itself? The type does not anymore represents values, since one assumes that we are witnessing a condition of crisis of those values. The Type therefore becomes meaningless, but still preserve the coherence of its inner logic or composition. Its intrinsic law is not anymore a cultural one, or a project, acting at a "semantic" level and showing an intentionality. It is basically reduced to a pure principle of logical aggregation, acting at a "syntactical" level. Because of the crisis, the deconstruction of the "material" and its bifurcation leads respectively the matter and the type, even for different reasons, to return to the condition of Nature, but a "second one" that, with respect to its first manifestation, which originally appeared to the human beings, is of course enriched by the antropization's cycle coming to an end. The apparent "logical continuity" which is bridging the gap between the two world (*Welt*) is in the reality a "semantic discontinuity" between them. The antropization's cycle implies therefore identity and difference, as Hegel was masterly describing in his masterpiece, the *Phenomenology of the Spirit* (Hegel, 1933). From Hegel's Idealism therefore Saverio Muratori derives the dialectical relation between Nature and Culture, where at the conclusion of the civilization process one paradoxically encounters its originating state, but sublimated through the "sacrifice" of the civilization itself. If the Nature, according to its phenomenological premises, expresses a persistent condition of indeterminacy, instability, and unpredictability, since it does not implies the human being presence and "centrality", the "second Nature" deriving from the civilization process crisis unfolds the same condition of indeterminacy (the Hegelian "identity"), but augmented by the related self-awareness (the Hegelian "difference"). Since the crisis reliefs and liberate the matter/life from the responsibility to support and promote any established value/type, the matter/life returns to its state of "absoluteness", which literary is that "freedom from any kind of constrain" generating panic. Once again the human being process, or the Hegelian Subjective Spirit, identifies with the decision of emancipating from this embarrassing condition through a sequence of decisions and actions. The becoming of the "Being" expresses therefore the process through which the human beings, through trials and errors, tend to new form of conventionality, the Hegelian Objective Spirit. However, Saverio Muratori implicitly distinguishes himself from the philosopher, who ambiguously tends to consider the Absolute Spirit, or the Logic who re-encounters itself at the level of the synthesis, reaching an higher level of consciousness, as the driving force which is literally guiding the human being to cross over from any period of crisis. On a most humble

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level, Saverio Muratori seems to recognize how, on the contrary, any dialectical synthesis implies a discontinuity and how any discontinuity paradoxically "reprograms" the man, using a genetic metaphor, to its dramatic originating state of human being, forcing him to discover again the unavoidable necessity to re-establishing a new orienteering, via trials and errors, and creating the possibility of a new cycle.

An agenda for the time being

Saverio Muratori's widely established legacy offers to us as a literal and symbolic donation. Today we have the possibility to claim it as an heritage. However, we have to be aware that, on a more general basis, claiming the role of heir implies to assume the responsibility of making a choice, regarding what is meant to be preserved and rearranged in order to achieve new possible results, that inevitably will leads to different conclusions with respect to the author's ones. In that perspective it seems possible to consider what was delivered by Saverio Muratori as the first complete, consistent and all-embracing post-modern position in the field of architectural criticism, showing less impact at an international level with respect to Manfredo Tafuri's (Tafuri, 1973) and Alan Colquhoun's ones (Colquhoun, 1981) just because of a missing deplorable English translation. In fact, he consciously introduces a new time dimension after the eternal one, which is ubiquitous and sizeless; the natural one, which is cyclical and the modern one, which is linear: the spiralling dimension. The current discussion on the subject matter of the "recycle", crossing through all the disciplines, can therefore potentially benefits from Saverio Muratori's legacy, mainly recognizing him as the first who explicitly introduced the issue, incredibly anticipating of many decades a debate which is still in progress (Marzot, 2014 ii). In addition, by putting at the centre of any process of anthopization the human being's body, and by assuming its "scarcity" and "limitation" as its main quality, Muratori puts the basis of a revolutionary road in the field of anthropological studies. In fact, by assuming the human being forced to transform an hostile environment to survive, not having any chance to rely on automatic reactions to its unpredictable stimuli, he explicitly recognizes in the human being's passions, emotions and fragility the originating energy producing the world (*Welt*). The human being therefore becomes the creator of his story, and through it, of History, grounding its principle on a corporal experience of the nature which is ever-changing in relation to his not predictable decisions and consequent actions. To develop further those assumptions can terrify, considering Saverio Muratori's competence, but paraphrasing Bernardo di Chartres, we can accept the challenge simply considering that we are like "dwarfs standing on the shoulders of giants".

References

Agamben, G. (2002) *L'aperto. L'uomo e l'animale* (Bollati Boringhieri, Torino).
Capelli, A. (ed.) (1991) *Saverio Muratori Architetto (Modena, 1910-Roma, 1973)Sullo stato dell'architettura italiana verso la fine del XX secolo* (Collegio San Carlo, Modena).
Cataldi, G. (ed.) (1991) *Saverio Muratori Architetto (Modena 1910-Roma 1973). Il pensiero e l'opera* (Alinea Editrice, Firenze).
Cataldi, G. (ed.) (2013) *Saverio Muratori Architetto. Modena 1910-Roma 1973 a cento anni dalla nascita* (Aiòn Edizioni, Firenze).
Colquhoun, A. (1981) *Essays in Architectural Criticism, Modern Architecture and Historical Change* (The MIT Press, Cambridge).
Muratori, S. (1960) *Studi per una operante storia urbana di Venezia* (Istituto Poligrafico dello Stato, Roma).
Caniggia, G and Maffei, G.L. (1979) *Composizione architettonica e tipologia edilizia 1.Lettura dell'edilizia di base* (Marsilio, Venezia).
Hegel, G.W.F. (1987) *Fenomenologia dello Spirito* (La Nuova Italia, Firenze) (first ed., 1807).
Hegel, G.W.F. (1987) *Lineamenti di filosofia del diritto. Diritto naturale e scienza dello Stato in compendio* (Laterza, Roma-Bari) (first ed., 1821).
Heidegger, M. (1971) On the Way to Language (Harper and Row, New York) (first ed., 1959).

Husserl, E. (1950) *Idee per una fenomenologia pura e per una filosofia fenomenologica* (Einaudi, Torino) (first ed., 1913).

Levi Strauss, C. (1966) *Antropologia strutturale* (Il Saggiatore, Milano) (first ed., 1958).

Muratori S. (1967) *Civiltà e territorio* (Centro Studi di Storia Urbanistica, Roma).

Muratori, S. and Bollati, R. and Bollati, S. and Giannini, A. and Marinucci, G. (1968-73) *Studi per una operante storia del territorio* (Unpublished research).

Marzot, N. (2014 i) 'Beyond the typological discourse. The creation of the architectural language and the type as a project in the western modern city', unpublished PhD thesis, Technische Universiteit Delft, The Netherlands.

Marzot, N. 'PERI_KYKLOS. Un manifesto per il riciclo in cinque tesi', in Marini, S. and Rosselli, S. C. (ed.) (2014 ii) RE-CYCLE. OP_POSITIONS II (ARACNE Editrice S.r.l, Roma) 73-79.

Pigafetta, G (1990) *Saverio Muratori Architetto. Teoria e Progetti* (Marsilio, Venezia).

Tafuri, M. (1973) *Progetto e Utopia* (Laterza , Bari), English translation Tafuri, M. (1976) *Architecture and Utopia. Design and Capitalism Development* (The MIT Press , Cambridge).

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Heritage and Historical Fabric

Historical Urban Fabric
Modern and Contemporary Design in Historical Cities
Architectural Heritage
Modern Architectural Legacy

Chair_Pisana Posocco
DiAP Department of Architecture and design, "Sapienza" University of Rome,
53A, via Gramsci, 00197, Rome, Italy
Co-Chair_Antonio Camporeale
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

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Abandoned villages, from conservation to revitalization

Rossella de Cadilhac
Dipartimento di Scienze dell'Ingegneria Civile e dell'Architettura, Politecnico di Bari, Via Edoardo Orabona, 4, 70125 Bari, Italy
Keywords: Abandoned villages, conservation, revitalization

Abstract

The abandonment suffered by many minor historical centres, whether they are the result of a spontaneous transfer or of a forced evacuation following a calamitous event, is an opportunity to reflect on the meaning and the reasons for the restoration of the neglected villages. Their slow and progressive disappearance requires urgent conservation and proposals to assign a new role and meaning, without excluding "a priori" a possible conversion into places of contemplation and sedimentation of the collective memory.

Studying ancient villages means increasing interest and promoting the operational competences related to the preservation of historic buildings, the typological, formal and constructive values, which are the signs of identity of an urban organism to which is recognized the value of unrepeatable individuality, an organism, therefore, to be protected in view of its transmission to future generations.

The study of the abandoned village of Craco (MT), beginning from the most representative buildings, is the first step along the road of developing a research project for the conservation and enhancement of the urban organism that, in accordance with the character of places, cannot ignore the critical geological conditions and the making safe problem.

The partially collapsed buildings facilitate the anatomical study of building sections and materials, promoting constructive understanding of architectural organisms at risk of slow, but sure disappearance.

Only the intimate knowledge of the buildings in their constructive anatomy, the awareness of their real state of preservation, the identification of their functional vocations can direct (through protective measures, instructions, regulations, constraints) the restoration project based, hopefully, on the criteria of minimum intervention, compatibility, recognizability.

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Introduction

The state of abandon which affects a lot of minor old town centers is a chance to think about the meaning and the reasons of restoration of abandoned villages. Their slow and gradual disappearance calls for urgent action for conservation and proposals aimed at assigning a new role and meaning, not excluding a priori a possible conversion into places of contemplation and sedimentation of collective memory. The act of studying ancient villages means to increase the interest and to encourage operational skills related to the protection of historical buildings, typological characters, formal and structural values, which are the marks of identity of an urban organism to which a character of unique value has to be recognized, and if possible to revitalize, with a view to its transmission to future generations.

The fate of abandoned minor old town centers, is widely discussed by the restoration field and is the framework within two educational experiences took place gained around the case study of the abandoned village of Craco in Matera region (S. Belmondo et alii, Research Thesis, 2015; S. Belmondo et alii, Final Workshop, 2015; C. Bisceglia et alii, Research Thesis, 2014; C. Bisceglia et alii, Final Workshop, 2014).

Craco is only one of many abandoned centers in Italy for landslides movements, likely to be physically deleted due to progressive degradation, inevitable consequence of disuse and of a not constant maintenance action.

Understanding the current state of ruin requires to retrace the historical events of the urban fabric and individual buildings, study the morphology, understand typological structure, recognize materials, analyze construction techniques of historical buildings, study character of built environment, assess the state of conservation; This does not mean to accept fatalistically the *status quo*, but to evaluate the possibility to develop a preservation and promotion project of built heritage, differentiating the degree and impact of individual interventions.

The village, Medieval style, for obvious reasons of defense, perched atop a ridge path elongated in northwest-southeast direction, bounded by the river Bruscata southwest and by the river Salandrella northeast. The urban fabric is physically bounded northeast by the side of the cliff and stretches up the steep slope southwest up to the State Road 103, parallel to the contour lines.

The Norman tower, which stands on the highest and most stable part of the hill is the tangible evidence of the first settlement that has developed, at first, along the ridge path, the current Via Alfieri, to the Carbone-Rigirone Palace, before falling down, on the southwest side, rapidly on the steep slope favoring the contour lines.

The sources to document the life of the community crachese are fragmentary and insufficient at the present time. The settlement is mentioned for the first time in a seal dated 1060, where *Cracum* appears among the possessions of the Bishop Arnaldo Tricarico whose diocese counted, between the eleventh and twelfth century, thirty *Universitas* (municipalities). The first feudal lord, Eriberto di Craco, is mentioned in a document drawn up between 1154 and 1168 (B. Capasso, 1870; T. Pedio, 1967; D. D'Angella, 1986). While Roberto di Pietrapertosa is the name of a royal executioner who holds Cracow between 1176 and 1179 (A. Russo, 2011). Another information documents that in the twelfth century Craco, along with Cagnano, was among the feuds of the principality of Taranto. A century later, precisely in 1239, Goffredo, lord of Craco, was in the list of the barons to which from Federico II was given the job to guard some Lombard prisoners (G. de Francesco, 1996). It is likely, therefore, that the first nucleus of what local historians call the "castle", presumably encompassing or coincident with the tower, perhaps with a jail cell, was the seat of the feudal lord.

The tower is the first defensive work carried out in Craco oriented on strategic control of the territory. The documents so far traced are silent about the exact date of foundation, based on the above, is due to the first half of the twelfth century. Nor is it known if the tower was originally isolated, or if it was equipped with secondary service rooms, not communicating with the tower, placed in adherence to the portion of the first level, and if could answer, at least initially, for purely military needs or, again, if took place the dual

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function of residence and administrative center of the feudal lord, as well as a fortress, from which to impose to the city the payment necessary to guarantee the safety of cultivated small plots of land.

The old village of Craco, hit by a severe hydrogeological risk, triggered by slow but progressive landslides, was evacuated in the sixties of the twentieth when an eviction order moved the majority of inhabitants few kilometers away from the ancient settlement in Peschiera (A. Balboni, 1964; E. Beneo, 1967; W. Brugner, 1964; M. Corrado et alii, s.d.; A. Cucari, 1980; A. Moretti, 1968). Nowadays the ancient settlement is in a state of advanced decay, accelerated by a lack of maintenance that, even more than the landslide, albeit slow but unstoppable, undermines the survival of the village. However it is the decadent aspect that, paradoxically, is the added value of Craco inextricably linked to a great beauty natural landscape. The fascination of a city in a state of ruin, suspended in a timeless dimension, addressed Craco towards an unexpected artistic vocation, becoming an attraction for artists, the filmmakers and later, a cultural tourism seduced by the high and evocative power of the place.

Methodology

Craco is a paradigmatic case sending a challenge against a still open Italian problem: the hydrogeological risk. The question is: is there a real chance not only to secure but also to recover to life settlements in landslide risk areas, severely proven by natural disasters and now in state of deterioration?

Today, two antithetical visions are opposed: one that considers a recovery option possible, at least in part - that here we want to test - and one that considers any initiative to readmit the urban fabric to the normal life unfeasible.

The instability, sparked by landslides, has worsened over time due to the state of deterioration that - due to the absence of maintenance - has challenged settlement survival premises. Added to this is the old village isolation, which certainly suffers a marginal condition in the regional context, marked by a lack of infrastructure network of which, however, suffers from the entire Basilicata. In order to draw up the Guidelines for the conservation and enhancement old village and - in the later in-depth analysis - the project for the restoration of buildings chosen as sample, it is necessary to have to deal with the specific difficulties of Craco, summarized in:

- geological nature of the soil, highly irregular due to clays (with interbedded sandstone and sandy banks), especially clays deep and clay/sand conglomerates on the surface;
- upward tectonic movements with perforation of the upper layers and leakage, from the deeper layers, of boulder conglomerate;
- rain water flowing, on the surface, outcrop clay soils creating deep furrows and trigering erosion.

Therefore, it is necessary to face a very critical condition, the Craco one, and at the same time highly suggestive descending from its ruin condition. This is the charm of ruin exercised by decadent town inextricably tied to a landscape of high naturalistic component, with native vegetation species, of mountains, plateaus, hills and landslides that alternate in a succession of gorges, ravines and streams that, for a karst phenomenon, eclipse in soil depth reemerging unexpectedly, to reach the two seas that bathe the Basilicata, the Tyrrhenian and Ionian sea.

The state of deterioration experienced by the old town and its condition of ruin, as mentioned, have become, over time, reason for seduction from which drew heavily cinematic arts ("Il Vangelo secondo Matteo" by Pier Paolo Pasolini, 1964; "Cristo di è fermato ad Eboli" by Francesco Rosi, 1979 and "The Passion" by Mel Gibson in 2004) until Craco became attraction place for cultural tourism.

Moving from the premises and conviction that criticalities of the village may become elements of strength and opportunity to redeem the settlement from the state of neglect, in any case not changing the overall image of the old village, a determination was reached that possible strategies to rehabilitate an abandoned and in a progressive degradation urban fabric, as Craco is, need synergistic relationship between complementary disciplines as Architectural restoration, Architectural Survey, Typological and morphological architecture, Structural Engineering, Architectural Design and Estimate are. This has become a very favorable circumstance that allowed an open debate between the studying fields, which, thanks to the level of their services, have helped to achieve a high quality work, from the preliminary studies to the project itself.

The Architectural restoration had the task of developing a critical exegesis which allowed to interpret all the data emerging at various stages, in a continuous stream of information, without, at the time of design synthesis, that one could definitely affect the other. At the same time allowed to orient design choices respecting local identity characters, preserving the historical stratifications without sacrificing the contemporary expressive

language, whereas required a difficult creative synthesis (such as the reintegration of wide gaps).

The contribution offered by Architectural Survey was crucial for acquiring all relevant knowledge data of each architecture and to analyze their general condition, focusing on the exact geometrical shape, construction features as well as anomalies that helped the students to the formulation of hypotheses around the main construction phases, from time to time corroborating or disproving what was assumed in theoretical.

Typological and morphological architecture has allowed a study on all scales, from the territorial, studied in its historical and processual evolution, to the urban and building one analyzed, also by comparing the aggregation and building systems in the same geographical and cultural area.

The Structural Engineering, recognizing the methodological and conceptual unity of the restoration, allowed to combine demands of conservation with structural safety, respecting '*firmitas*', '*utilitas*', '*venustas*', inextricably linked qualities combined to define individual architectural organisms and to avoid a favor of only one of physical, architectural, historical, aesthetic value.

A special thanks goes to Structural Engineering for its contribution in the study of representative buildings such as the Church of Saint Nicholas the Bishop, the "so called" Saint Barbara chapel, Grossi Palace, Carbone-Rigirone Palaces and, particularly, the Norman Tower, the oldest building of Craco with a strong symbolic identity, the conservation of which is of fundamental importance in the presence of phenomena and dynamic forces.

For the Norman tower was taken the opportunity to use a non-destructive methodology, important to perform a correct evaluation of these forces in order to propose an accurate design through rehabilitation techniques and risk mitigation actions. Has started a campaign of experimental tests, resorting to the use of piezometric accelerometers, with the aim of a direct monitoring of environmental vibrations. Results achieved after this first survey campaign, if compared with those that may be obtained from acquisitions made at a later date, will provide information on the health of the tower, to evaluate the actual risk of collapse and to avoid the structure can suffer damage as a result of dynamic forces caused by landslides.

The combination both of new and old, where there are large gaps, using punctual interventions, was the outcome of critical revisions that have found helps and guides in design process, always careful to the historical data and to the expressive originality of the work, to which was left a high symbolic value.

All the various disciplines have taken into account the outcome of a SWOT analysis, needed to verify the real resources and opportunities offered by the area, not forgetting the fragility and vulnerability of the environment, in addition to the population needs and expectations. The data obtained from the *on field* survey was acquired to focus, at the same time, on possible solutions aimed at recovering some buildings with respect of functional vocations and at satisfying the plurality of requests expressed by residents, tourists and *opinion leaders*.

Forming process

The state of deterioration into which the medieval village lie can offer a starting point for an overall project, unitary and coherent, putting the urban organism in the fruition circuit, in line with municipal strategies aimed to the recovery of their ancient building heritage, which respects the enhancing character and the functional vocations. The idea moves from the conviction that it is possible for one side to exploit the criticality of Craco, turning them into strengths, and on the other hand to value the local resources. The aim is twofold:
  - promoting Craco as a place to carry out research on the topics of soil conservation and buildings restoration in landslide areas;
  - combining the environmental and landscape values with the world of art and culture, attributing Craco the film set feature, widely experienced in time, but also as studios and workshops for young artists and craftsmen.

Figure 3. Craco (MT), view from southwest. In foreground Carbone Rigirone Palaces at the end of via Alfieri (Credits S. Belmondo, M. A. Catella, M. Intini, M. Madio, G. S. Orofino, P. Vitucci, 2015).

The data obtained from the SWOT analysis arise in perfect harmony with the objective that Municipality of Craco (with which dICAR of Polytechnic of Bari started a scientific collaboration relationship) says it will pursue combining landscape and environmental values (which are a sure attraction for tourism), already widely appreciated by cinematic arts, with the world of art, craft and culture. A shared objective that can be achieved:
- promoting Craco as scientific research field on the topics of soil conservation and building recovery in landslide risk areas [by establishing a Center of Excellence for the study of landslides and to test safety and consolidation demo actions];
- making Craco a place where to make artistic and cultural productions (with the possibility to set up a movie set in the context of the so called "Parco Scenografico dei Ruderi", to realize workshops for young artists and artisan shops, by rehabilitating some rooms on the ground floor of old residential units), offering also a place where to stay for tourists.

The planned monitoring system has provide data on the landslide in order to formulate Guidelines to implement measures for the safety and restoration of building in the village, summarized as follow:
- slopes hydrogeological solutions and landscaping with experimental and demo measures (i.e. by planting native vegetation);
- works for rainwater retention (drainage):
- securing visit paths center
- ruins consolidation and conservation for the sole scenic purpose;
- restoration, after targeted consolidation actions, of a small number of buildings which can offer security and stability guarantees, for the purpose of their re-use for cultural activities (such as for Church of Saint Nicholas the Bishop, Grossi Palace, the Norman Tower, Carbone-Rigirone Palaces, Saint Barbara's Chapel), for scientific and teaching activities (such as Grossi Palace partly used as Center of Excellence for the study of landslides and partly as educational and recreational activities space, including those dedicated to working with clay) and artistic activities (workshops) and artisanal (shops) expected in some spaces on the ground floor along Via Alfieri.

Therefore two areas as case studies have been identified: the first along the first part of visit path, goes from the south-west tip of the village, passing through Largo Machiavelli and Grossi Square, to the point marked by the Norman Tower (C. Bisceglia et alii, Research Thesis, 2014; C. Bisceglia et alii, Final Workshop, 2014); the second, called after Via Alfieri, going through Corso Umberto, Via Mauro Pagano, via Onorati, following the ridge path,

passing near Saint Barbara Chapel, reaches Carbone-Rigirone Palaces, in the vicinity of which is planned the northwest exit, just over an ancient city gate, nowadays no longer existing (S. Belmondo et alii, Research Thesis, 2015; S. Belmondo et alii, Final Workshop, 2015).

Some specific choices, compared to an initial operational forecast, have been changed under the new data obtained during the complex, albeit risky, survey operations of the second case study area.

Unlike an earlier operational forecast prefiguring the possible allocation of temporary residential activities in houses along the described path, subsoil instability conditions led to exclude this possibility, guiding the project in favor of a more realistic conservation and enhancement of the ruins with the exception of three residential units, at the base of the Norman tower, which by their physical form, conservation status and stability conditions of foundation soil offered a basis for full return to the type of traditional Craco building. The project, while respecting the ancient volumes, shapes, rhythm of openings, materials and traditional building techniques, would not constitute a slavish imitation of the antique, but an openly contemporary intervention for the sober character obtained by the simplification of forms and decorations.

The overall project, which therefore sees a resized housing function, entrusts its distinctive trait to the tour of the village.

The task to guide the visitor is given to the path, solving accessibility problems, connecting physically and visually episodes of formal completeness, no longer recognizable fragments of ancient presences and architectural gaps. The visit itinerary, thus conceived, is the result of a project that makes own the antinomy between the ruins transience along Via Alfieri, of which the conservation is thought, and the substantial integrity of buildings, such as the Church of Saint Nicholas the Bishop, Grossi Palace, the Norman Tower, the houses at the base of the Tower, the Saint Barbara Chapel and Carbone-Rigirone Palaces, for which a recovery intervention has been prefigured. In the first case the consolidation is expected, by securing, doing maintenance and, at the same time, enhancing the ruins within the museum arrangement; in the second one, by restoring using the minimum intervention criteria, distinctness, compatibility and reversibility to make again those important buildings enjoyable, offering nowadays a sufficient guarantees of stability, giving compatible uses, selected with the support of a multicriteria analysis.

Anyhow, the planned action, shall be conducted with the utmost caution and should be preceded by careful analysis that, starting from a scrupulous survey (defined as one of the tools of historical consciousness and then of restoration), will be able to know the geometry, materials, bonds, construction techniques, recording anomalies and irregularities useful to the overall understanding of the building. The study will use the survey, understood also as a means equally effective, for the analysis and evaluation of the crack, which can be extended over time in the form of monitoring, that is, of constant monitoring of the evolution of the phenomenon of degradation, such as to facilitate the reading and interpretation of failures. Knowledge, therefore, is an essential precondition both for the purpose of reliable assessment of the current safety, both for the choice of an effective and at the same time respectful restoration, based thereby on criteria of minimal intervention, compatibility and recognition.

The acquisition of information about the materials and construction techniques is certainly useful to discern the weak points of the structure, and this in order to achieve integration compatible with the existing and properly to consolidate what both has now become crumbling and has been heavily tampered with. The purpose of consolidation is to return to the building static-structural requirements lost over time, taking into account the ethical limitations imposed by the historical and aesthetic implications which, in the achievement of a newfound technical efficiency of the building, arise to guarantee the preservation of an undisputed symbol of collective memory.

The architectural gap topic, well expressed by some building, of which the casing wall remains almost intact, will be solved by a restoration of the image, through volumetric inserts, which will not give up the expressiveness of the contemporary language, using well distinguishable materials, such drystone light elements, therefore, easy to remove, entrusting the task to evoke the ancient spatiality, in respect of the physical and authen-

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Figure 4. Craco (MT), view from northwest. In foreground Carbone-Rigirone Places (Credits S. Belmondo, M. A. Catella, M. Intini, M. Madio, G. S. Orofino, P. Vitucci, 2015).

ticity of the consolidated existing building. Image reintegration will offer the opportunity to consider the possibility of making inside available those same buildings through the introduction of functions of a temporary nature, in line with the provisional condition dictated by unstable hydrogeological conditions.

The idea of including, thus takes consistence, within those buildings, workshops for young artists and artisanal shops with the aim of strengthening the cultural vocation of the site safeguarding the identity character: material and immaterial.

The above mentioned criteria will be extended to the reintegration of the image within the tower inner spaces has been subjected, in relatively recent times, to manipulations which compromised the overall conservation status. Dates back to 1949 the demolition of the barrel vault and of the staircase to make room for a municipal water tank, cylindrical-shaped, concrete made, which undermined the stability, the typology and functionality of the building and also the identity of the most representative monument of Craco (A.A.P.B., S.N.,1949). This is disrespectful intrusion against which are imposed a removal that is not be postponed and a necessary return to the *status quo* for which it is necessary to use materials and traditional construction techniques.

The above mentioned criteria will be extended to the reintegration of the image within the Carbone Palace, where the spaciousness of a originally turned room returns, but also outside, at the end of ridge path, with the evocation of the ancient city gate near the Rigirone Palace for which use of materials and construction techniques with characters of reversibility is well hoped.

Similar criteria are respected in the proposed restoration project of the Carbone Palace, whereas is intended to return the spaciousness of an originally tripartite and vault space, located on the first floor of the south side. The project includes the demolition of the cement mix roofing (in addition to the concrete stairs connecting the roof) built to replace the ancient vaults, readable along the entire longitudinal development of the space. The idea moves from the desire to evoke the ancient space redoing the entire

roof system with a steel supporting structure along with a light steel structure, which follows the outlines of the vault system.

The above criteria will be extended to the external in order to provide, at the end of the ridge, the re-enactment of the ancient city gate, no longer existing, near the Rigirone Palace. Sources document an arched entry gate, of which does not remain any material trace, due to ground sinking in that point. The project, in line with the principles of recognition and reversibility, replenishes the urban gap recalling the ancient city gate reachable by a ramp that connects the area where the arch is set and the area immediately next to the Rigirone Palace entrance.

Contiguity relations link the final part of the visit itinerary to an abandoned school building which, due to its small value, becomes an opportunity for a critical revision, in order to create new aggregative-recreational space, able to accommodate hospitality and refreshments functions.

Conclusion

The choices made and the criteria used, here exposed synthetically, are the result of a complex process as a rigorous methodology that has seen, as shown, the constant confrontation between disciplines, which complement each other, able to stimulate the scientific investigation of the topics addressed and the critical and creative ability of the students called to a synthesis project coherent with the whole development of analytical research.

Hoping all the proposals, with this remarkable experience, will lay the foundation for a respectful recovery of the village, able to make Craco a strategic pole not only for tourism but also for scientific research, provided that it not is put at risk the conservation and enhancement of a site of great and undeniable charm.

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References

Balboni, A. (1964) 'Trasferimento dell'abitato di Craco',in *Relazione tecnica*.
Belmondo, S., Catella, M. A., Intini, M., Madio, M., Orofino, G. S. and Vitucci, P. (2015) 'Antico e nuovo nel recupero dei borghi abbandonati', unpublished research thesis, Polytechnic of Bari, IT.
Belmondo, S., Catella, M. A., Intini, M., Madio, M., Orofino, G. S. and Vitucci, P. (2015) 'Progetto di conservazione e valorizzazione del borgo medievale di Craco', unpublished Final Workshop thesis, Polytechnic of Bari, IT.
Beneo, E. (1967) 'Sulla stabilità dell'abitato di Craco', in *Relazione tecnica*.
Bisceglia, C., Calitro, C., Colonna, P., D'Ercole, A., Pepe, M. and Santarcangelo, A. (2014) 'Centri storici minori in stato di abbandono. Problemi di conservazione e valorizzazione', unpublished research thesis, Polytechnic of Bari.
Bisceglia, C., Calitro, C., Colonna, P., D'Ercole, A., Pepe, M. and Santarcangelo, A. (2014) 'Progetto di restauro del borgo medievale di Craco (MT)', unpublished Final Workshop thesis, Polytechnic of Bari.
Brugner, W. (1964) 'Sulle condizioni di stabilità dell'abitato di Craco (Provincia di Matera)'. *Relazione Tecnica* (http://www.cracoricerche.net/home/node/44) accessed 11 September 2015.
Capasso, B. (1870) *Sul catalogo dei feudi e dei feudatari delle prov. Napoletane* (Napoli).
Corrado, M. et alii 'Linee guida per la salvaguardia dei beni culturali dai rischi naturali', *Analisi per la valutazione del rischio da frana nell'area di Craco (Matera)* (http://www.afs.enea.it/protprev/www/cases/craco/craco.htm) accessed 11 September 2015.
Cucari, A. (1980) 'Sulle condizioni di stabilità dell'abitato di Craco, in conseguenza dell'evento sismico del 23.11.1980 verificatosi in Basilicata', *Relazione geologica*.
de Francesco, G. (1996) *Catalogus baronum neapolitano in regno versantium qui sub auspiciis Gulielmi Cognomento Boni ad Terram Sanctam sibi vindicandam susceperunt*, (Braidense National Library).
D'Angella, D. (1986) *Note storiche sul monte di Craco* (Pisticci).

D'Elia, S., Lepore, L. and Solimena V. (1949) 'Lavori per la costruzione del serbatoio di Craco e delle relative condotte di arrivo e di partenza'. Verbale di consegna, in *Archivio dell'Acquedotto Pugliese di Bari* (A.A.P.B.).

Moretti, A. (1968) 'Sulle condizioni di stabilità di Craco (MT)', in *Relazione tecnica*.

Pedio, T. (1967) *Feudi e feudatari di Basilicata* (Matera).

Russo, A. (2011) 'La fabbrica dell'ex convento di S. Pietro a Craco: dal rilievo al restauro', unpublished reasearch thesis, Faculty of Architecture "G. D'Annunzio" di Chieti, IT.

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Learning Process from Historic Urban Fabric of Ula and Adaptation in Akyaka

Feray Koca
Department of City and Regional Planning, Mugla Sitki Koçman University, Mugla, Turkey
Keywords: Ula, urban fabric, architecture, character

Abstract

Urban architecture of the city provides us to understand the past and to form the future of the cities. According to the approach of Aldo Rossi (1991) towards understanding the city, urban form can be grasp just from the relations of the physical entity of the city. In time, function may change according to society, however urban form tells much about the essence of the settlement. Therefore, learning process from urban fabric of historical towns includes understanding the existence of being of its form.

The case area of this study, Ula is a historic district of Muğla Province in the Aegean Region of Turkey. The district is settled in a wide fertile plain and approximately 600m high from the sea, whereas Akyaka is tourism town center of Ula district 19km far from Ula and locates on Gokova Bay. Akyaka is an adaptation project of Nail Çakırhan, who first started to form the urban fabric of the town with a reference to traditional houses of Ula in 1970s; from then on, Akyaka has featured a distinctive architectural character. However, imitated reproductions of the buildings and building details in the last decade have damaged naive and distinctive urban fabric of the town and the essence of the settlement.

The aim of this paper is to assert the reading and learning process from historic urban fabric of Ula on behalf of Akyaka. Therefore, it first introduces the historic urban fabric of Ula, and then compares with the newly created urban fabric of Akyaka and presents the positive and negative consequences of this adaptation process.

Introduction

Urban architecture of a settlement is a result of relationship between man-made structures and culture that constitute the historical urban fabric. The city as a work of art is object of nature and subject of culture. Therefore, it is necessary to understand architectural values and cultural continuity of urban environment.

This essay addresses determinative role of historic urban fabric on settlement character, which can be adapted on new town designs. If the true architectural forms and cultural values can be grasped and understood from historic urban fabric, this information can be used as an adaptation project for lately designed settlements.

There is a tendency for many urban design approaches to discuss the historic urban fabric as a model or structure to be copied on to the newly designed settlements. There are much to learn from historic urban fabric, however this should not be a copying process of one traditional architectural asset without understanding the existence of being of the whole settlement. On the contrary, the essence of historic urban fabric should be grasped and used as a source of inspiration and adaptation project.

Historic urban fabric is an outcome of both physical formation and socio-cultural relations; therefore its essence lies in the interrelatedness of all its components. The essence of it is not visible but can be understood. The components may change with changing conditions of modern world, but the essence of historic urban fabric is the combination of the relations of the components. The existence of being is the way of understanding entity as entity in terms of temporal dimensions: past, present and future. In this essay, it is found necessary to evaluate urban design approaches dealing with the essence of settlements initially; therefore, the entity and its essence are first discussed. The discussion of these approaches helps us to make inference for our case study.

Heidegger refers to the human being in the world with the German word 'Dasein' or 'being-there' because human being is aware of other things. Access to what appears defines what those things really are. Therefore, the being of entity rests in the understanding of entities with consciousness. Dasein determines the character of the beings in an awhileness of temporal particularity. "…Dasein in its being there for a while at the particular time" (Heidegger, 1999, p.5). It does not mean an isolation of self from other individuals. The being of individual depends on the existence of others and the surrounding context. Dasein is the concrete expression of being in a cultural and historical context regarding to community's practices and shares. Heidegger focuses on a new way to care for human nature and environment because the desire for a place can be only obtained when the material problems are resolved. Place construction should be about the recovery of roots, the recovery of the art of dwelling with nature (Harvey, 1993). Dwelling is the basic character of being. Heidegger defines 'dwelling' as "The way in which you are and I am, the manner in which we humans are on the earth, is 'Baun', dwelling. To be a human being means to be on the earth as a mortal. It means to dwell "(Heidegger, 1971, p.147). He defines the world as the house where mortals dwell. Here, 'dwell' means to stay in a place. Human being is a mortal staying (dwelling) on the earth. 'On the earth' has a meaning that includes belongingness of all the beings to one another.

Places are qualitative totalities in which a concrete phenomenon constitutes the whole. As these concrete phenomena are interconnected in Gestalt theory that they cannot be held isolated. "A place is therefore a qualitative, 'total' phenomenon, which we cannot reduce to any of its properties, such as spatial relationships, without losing its concrete nature out of sight" (Norberg-Schulz, 1980, p.8). He points at the place as an integral part of existence. The concrete things that have material substance, shape, texture and color determine an environmental character as the essence of place.

According to Conzen (1960, 2004), culture and character are in strong relationship with form and history of a place. Every place gains its own soul, culture and historical character in time, which reflects the past and todays actions of the community and their shared values. Cultural settlements are the objectivized pattern of the essence of community and although this pattern is formed with different layers of history, it has traces of the past and has distinctive character.

Figure 1. Locations of Ula and Akyaka.
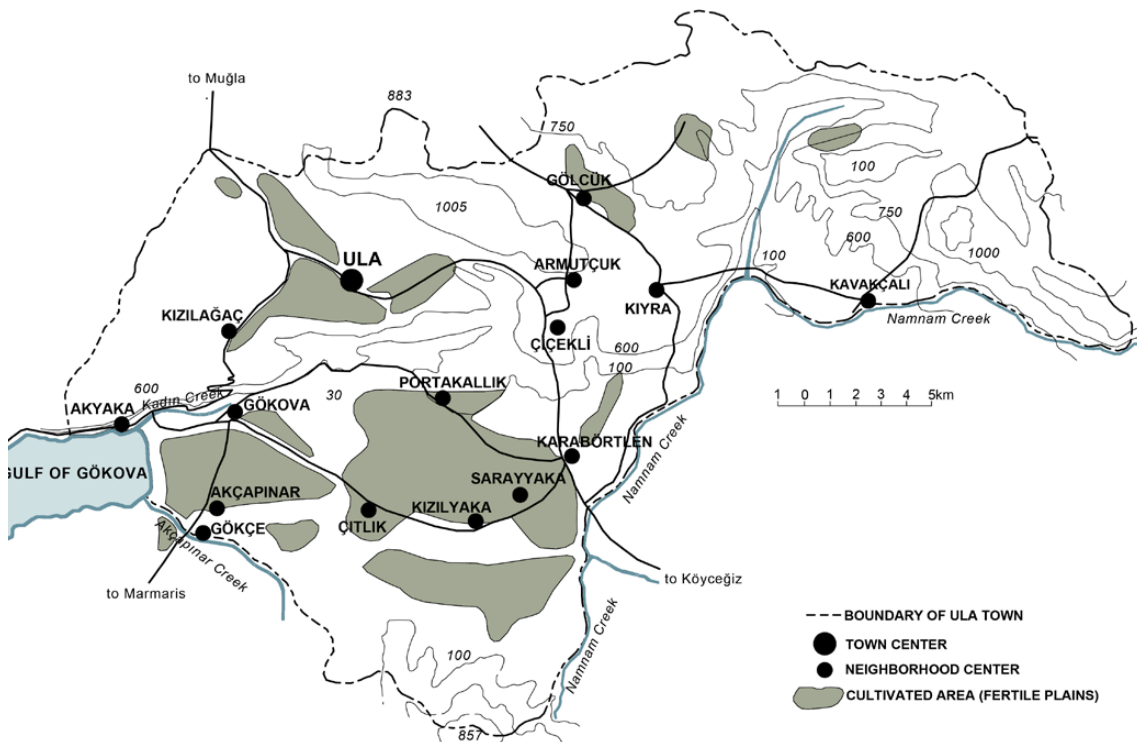
Cullen (1960) defines the settlements as 'the art of relationships' in his book 'Town-scapes' by remarking the interaction in the society. He asserts that the components of the urban environment should be evaluated in a whole with their distinctive character and values. The essence of a settlement lies in the spatial relationships among its components. Every component may change in time, but its value, its soul and its architecture can only be understood from those relationships (Özaslan, 1995).

Urban form is a result of the bringing together of many elements in a composite totality and constitute urban pattern. The visual essence of patterns depends on complexity of a number interrelated motifs rather than a total composition, therefore they are parts of a continuum. They are the veritable traces of community, imposition of the cultural artifacts of society on earth (Lozano, 1990; 38-39).

According to Rossi (1991; 29), the city is a man-made object and a result of urban artifacts of history. Architecture of the city, its form is the total character of urban artifacts. On the other hand, he indicated that architecture is one of the determining factors of urban form.

"Architecture gives concrete form to society and is intimately connected with it and with nature, it differs fundamentally from every other art and science. This is the basis for an empirical study of the city as it has evolved from earliest settlements. With time, the city grows upon itself; it acquires a consciousness and memory. In the course of its construction, its original themes persist, but at the same time it modifies and renders these themes of its own development more specific." (Rossi, 1991; 21).

Buildings are the elements of the city, parts of a whole. Therefore typology of buildings has a close relationship with urban morphology. Typology differs from model with its vaguelessness and its collective character. It does not imply imitation or copy of objects and does not have precise rules. Type is the very idea of architecture, that which is closest to its essence.

With technological development, functions of the urban environment may change, therefore it is essential to grasp the essence of architectural values and urban fabric and adapt this essence to our contemporary designs in other to avoid imitations of past forms

Figure 2. Residence of Nail Çakırhan.

Nail Çakirhan Residence
Plan
1. Divanhane Porch   4. Shower Room
2. Gathering   5. Kitchenette
3. Living / Sleeping   6. Lavatory
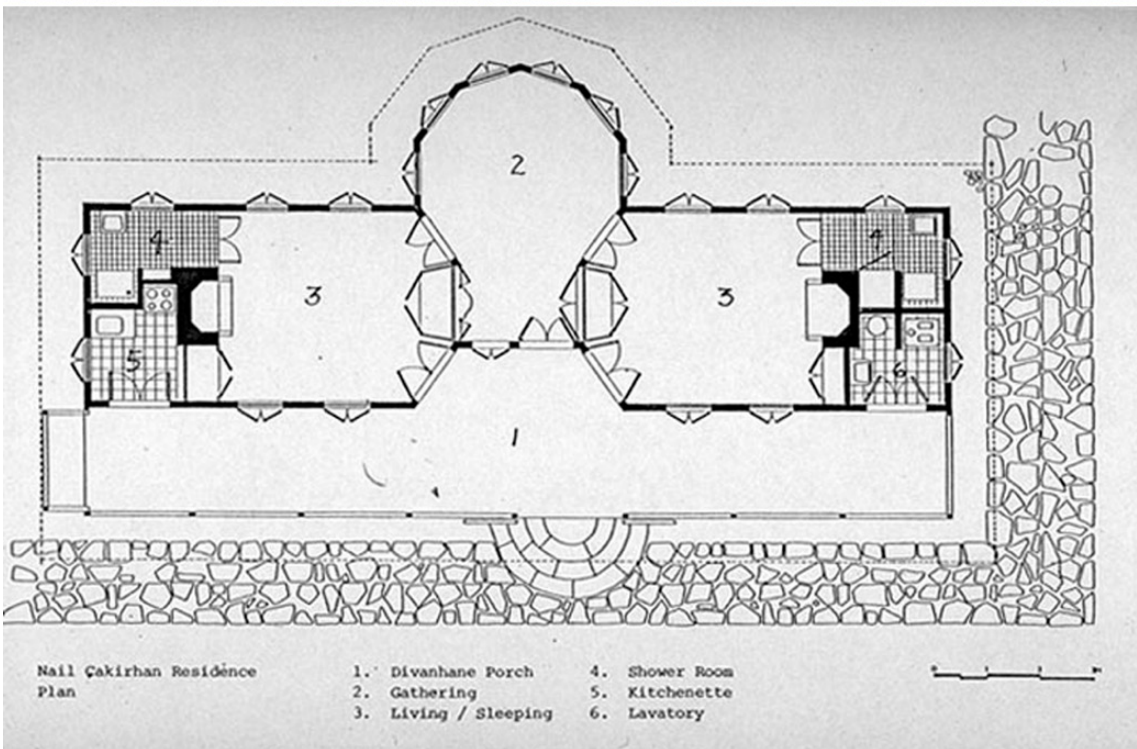
and to provide a meaningful settlement character. "If urban artifacts were constantly able to reform and renew themselves simply by establishing new functions, the values of urban structure, as revealed through architecture, would be continuous and easily available" (Rossi, 1991; 47). Therefore, significance of an urban artifact would be formed by its place in the continuity of its spatial and temporal environment. Inherited environment creates the image of the city. The man-made environment should be evaluated with its

Figure 3. Garden door without walls in Akyaka.

own entirety and continuum. Learning process from historic urban fabric should be the integrity of esthetic feeling revealed in a continuum of forms, not the integrity of the past (Kuban, 1983).

Traditional architectural values are not the end products of a settlement; they are the result of a long-term formation including physical, social, cultural, economical interactions. Therefore, this essay analyses the essence of historic urban fabric and spatial formation on the case of Ula, then criticize the adaptation of architectural qualities of form in Akyaka learned from Ula's experienced urban fabric.

Historic Urban Fabric of Ula and Newly Created Urban Fabric of Akyaka

Ula is a historic district of Muğla Province in the Aegean Region of Turkey. It is administratively one of the thirteen countries of Muğla. The district is settled in a wide fertile adjoining plain fifteen kilometers beyond the town of Muğla and approximately 600m high from the sea. Ula locates between two mountains: Alçın and Laleli. Ula is situated in a small highland valley. A single creek dry in summer months passes through the large plain.

Ula is an Anatolian town in which a single road passes through the center of the town. It has a linear town development. There are four neighborhoods in the town center: Demirtaş, Köprübaşı, Ayazkızı, Alparaslan. Every neighborhood displays occupational homogeneity and includes small, integrated communities. There are sub-neighborhoods called with the name of extended family residing in the locality for generations. Land use in the town is distinguished according to different urban functions such as commercial, religious, administrative, education and so on. Society gains their livelihood from agriculture therefore, around town center, patchwork of tobacco fields; vineyards and gardens extend across the plain.

The main commercial street locates in the densely nucleated town center and there is a string development of stores, workshops, storage depots, administrative offices and recreational spaces. Administrative structures, banks, schools extend end upon end from the old commercial center of Ula. Residential neighborhoods surround the commercial

center radially. Commercial center acts as a nodal point where in the meantime functions as a transition to the surrounding neighborhoods, thus provides the continuity in the townscape. Most of the spacious residences of landlords once took place in Alparslan Neighborhood because in the Ottoman era, prominent landholders first settled in this area. All the residential neighborhoods display similar architectural characteristics as they are in uniformity. However, choice of building material and size of house changes according to prestige and income of the owner of the residences. The houses are generally constructed of trimmed stone, poured concrete blocks, or brick, and has tiled roof (Benedict, 1974).

Traditional houses of Ula have an invert oriented plan characteristics similar to traditional houses in Muğla and in close districts however, the workmanship is more sophisticated in Ula. They are generally single story houses with two rooms and a polygonal *sofa*[1]. The residences of prominent landholders are two-storey buildings with *sofa* in the front, side or middle. The exterior of the houses are plastered over and whitewashed. Each house has a garden or courtyard encircled with a whitewashed stonewall providing privacy. In every courtyard there is a well providing the required water. This water taken out with a pump and is used for irrigation. The surplus water is collected in small pools to be used for house works. There is no window on the ground level on the street side, rather they face out upon the courtyard. Access to the courtyard is through a garden door made up of wooden. Because of high courtyard walls, no activity in the courtyard is seen from the street (Benedict, 1974).

Ula was an administrative center of thirteen villages and district with an area of 407 square kilometers (Figure 1). After the province of Mugla became a metropolis in 2014, all the villages of Ula were registered as the neighborhoods of Ula. Akyaka is one of these neighborhoods situated 19km far from Ula town center to the northwest of the Gulf of Gökova (Kerme). Once, it was a neighborhood of Kozlukuyu Village. After assignment of a mukthar in 1971 and establishment of municipality in 1992, it became a town center. Today, this village became a tourism center with its natural and architectural qualities. The town center is settled on the north side of Gulf of Gökova, behind pine forest-clad mountains steepens to 1000meters. In the east side of the settlement, there is Kadın Creek where cold and fresh water boils. Along the seashore of Gulf of Gökova, a large marshy plain locates. In 1989, this plain with the creeks are registered as the 'Specially Protected Environmental Area' in Turkey (Oğuz, 2010).

In ancient times, Akyaka port was the commercial transit point between island-states and city-states in the Aegean Sea because this location was the easiest route for the ships to land. The rock tombs found in the district are the evidences of an ancient life (Çınar, 2014). For centuries, coastal plains of Akyaka have been the lowlands of Ula town. From antiquity to the beginning of the twentieth century, endemic malaria was a threat for the expansion of settlements on the coastal plains of Akyaka. Life has been tolerable on the coastal lands thanks to transhumance between Ula town and Akyaka. Town residences spent the summer months in highlands (*yayla*) of Ula; therefore, there has been a seasonal dependency between Ula and Akyaka for centuries (Benedict, 1974).

Akyaka is an adaptation project of Nail Çakırhan, who first started to form the urban fabric of the town with a reference to traditional houses of Ula in 1970s; from then on, Akyaka has featured a distinctive architectural character. Nail Çakırhan was poet, journalist and a master builder, a self-educated architect. In 1970, he settled in Akyaka with his wife. In 1980, he built a naïve example of single storey Ula house on two decares (dönüm) land. The house was in great harmony with its forestry environment, climate and cultural background of the settlement. (Figure 2). The house had independent rooms, which do not have passages to each other. It was located on a sloping area with sea view. Its garden was large and full of fruit trees. His intimate friends and some touristic investors requested from him to design and built new houses and buildings for them. He designed for each and began to structure the urban fabric of Akyaka neighborhood with individual buildings. In 1983, he was honored with Aga Khan International Award of Architecture. He was the first person who was presented with this award although he was not an architect. The Grand Jury Decision was as follows:

[1]It is a kind of porch or hall like room.

Figure 4. An imitation of sofa as balcony with too many ornamental details.

"For the simplicity and elegance arising from reflection and maintenance of the traditional life style to design and decoration. The design of the house goes well beyond the simple reproduction of past models; its ornaments are judicious, sober, and genuine. Its extraordinary harmony with nature, as well as its multipurpose use and the ambience of its inner space, gives it great distinction. This airy and attractive house deserves special attention for its sensitive revival of craftsmanship and cultural sensitivity as a whole......
The simplicity and elegance of Çakırhan's architecture results not from imitation but from the direct continuation and reflection of traditional values. He has succeeded in reviving a vernacular architecture not merely at the superficial level of appearances, but by convincingly reintroducing the compact multivalent spatial organisation of old Turkish houses. At the same time he has demonstrated successfully that the form and construction of his houses continue to make economic sense."

Of course, he was not the single designer of the town; the community interiorized the adaptation project of Nail Çakırhan. Since then, architecture of Akyaka is registered and has been implemented as a plan provision in all planned buildings (Çınar, 2014).

Imitation of Past or Adaptation of the Essence of Historic Urban Fabric?

Today, Akyaka is a tourism resort center. The naïve and environment-friendly images and forms of domestic architecture of which are initiated by Nail Çakırhan constituted the urban fabric and the main character of the settlement. Newly constructed buildings inspired from traditional domestic architecture of Ula were adapted in a harmony to sloping geography of Akyaka, which is a coastal settlement in the meantime. The location and orientation of the houses were chosen in a manner that each have sea

view and breeze. Till 1990s, houses were constructed on large plots with large gardens. 'Sofa's which are essential component of traditional Ula houses have been constructed more spacious than the closed spaces. By this way, a common place for collective use and social activities was planned. Moreover, timber-framed houses of Akyaka constitute harmony with its forestry environment. Timber is a local traditional material used in many examples of domestic architecture in the district.

Nevertheless, after 1990s, with popularity of summer holiday and summerhouses Akyaka became summer place of many residents coming from various cities of Turkey. With dense construction activities of the tourism, architectural images and forms could not preserved their meanings. Instead of adaptation by understanding the essence of traditional, the densely implementation of imitations of the past started to lead a chaos. It became impossible to read the urban fabric of the settlement. Use of some traditional architectural objects unnecessarily without considering its function causes emergence of funny and meaningless designs. Domestic architecture started to be implemented on hotel and pension plans. However, this implementation includes stylistic imitation of some architectural elements, which are unadapted to the needs of the buildings. These eclectic details destroyed the integrity of essence of urban fabric.

In the original Ula houses, the main building in the garden is hardly visible behind the garden walls in order to provide privacy. A visitor can enter to the garden from a wooden garden door, which is connected with the surrounding walls. The first examples in Akyaka were as it was in Ula thanks to Çakırhan's adaptation project. Nevertheless, in the following years, these garden doors started to be reproduced with the same size and wood-working handcraftship without garden walls therefore they are not providing privacy in present (Figure 3). Moreover, today, because of high land prices, construction area per lot and the number of storey is so increased that the garden sizes shrinked. Traditional architecture is copied to apartment buildings without gardens. The soul of single-storey traditional domestic architecture in Akyaka started to be vanished.

In similar with garden doors, *sofas* are transformed into apartment balconies with their all ornaments. Some of these balcony examples are the minified imitations of the sofas, however with this minimization, the function of a sofa could not be adapted into the balcony. In general, a sofa is supported on wooden columns with decorated capitals and contains a traditional raised seat where the breeze is strongest. Some minified copy of these sofas in balcony having raised seats where even one person cannot sit. These meaningless copies are creating confusion on the façade of the buildings (Figure 4).

Akyaka became a resort center; therefore it is now full of summerhouses, guesthouses, pensions and hotels. While it is very crowded in summer months it is quiet in winter months. The town started to sprawl through cliffs according to increasing construction activities. The architecture of the settlement destroyed with dense constructions and imitations of the past.

Conclusion

The newly created urban fabric of Akyaka has initially been an inspiration project depending on the reading and learning process of historic urban fabric of Ula. However, in time, with speculative tourism developments, this inspiration started to be destroyed with simple imitations of past forms.

In creating contemporary urban space, the 'new' should be based on the understanding process of inherited values, which are adapted to the period of time they belong. Briefly, the essence of historic urban fabric should be understood in order to grasp true architectural qualities. Perceiving and understanding historic urban fabric necessitates meaningful and identifiable coherence of the architectural qualities and structure of the settlements. The connection between past and future can only be established with accepting historic urban fabric, as an inspiration and adaptation project not a model to be copied.

References

Benedict, P. (1974) *Ula: An Anatolian Town* (E.J. Brill, Leiden).

Conzen, M.R.G. (1960) *Alnwick, Northumberland: A Study in Town Plan Analysis*, Publication No:27 (Institute of British Geographers, London).

Conzen, M. R. G. (2004) *Thinking About Urban Form – Papers on Urban Morphology: 1932-1998* (Peter Lang, Bern).

Cullen, G. (1961) *Townscape* (Architectural Press, London).

Çınar, A. A. (2014) *Ula: Hayata Açılan Kapı*, Ula Belediyesi Kültür Yayınları:2 (book) (Publication of Ula Municipality, Muğla).

Harvey, D. (1993) *The Nature of Environment: the Dialectics of Social and Environmental Change*, (http://socialistregister.com/index.php/srv/article/view/5621) accessed October 20, 2010.

Heidegger, M. (1971) *Poetry, Language, Thought*, tr. by A. Hofstaedter (Harper and Row Publishers, New York).

Heidegger, M. (1999) *Ontology: The Hermeneutics of Facticity*, tr. by John van Buren Bloomington (Indiana University Press, Indianapolis).

Kuban, D. (1983) 'Conservation of the Historic Environment for Cultural Survival', *Architecture and Community* (Building in the Islamic World Today, The Aga Khan Award for Architecture) (Aperture, New York) 32-37.

Norberg- Schulz, C. (1980) *Genius Loci, Towards a Phenomenology of Architecture* (Academy Editions, London).

Oğuz, M. (2010) *Muğla Culture and Tourism Magazine*, May-June, (2) (Publications of Muğla Directorate of Culture and Tourism, Muğla) 51-56.

Özaslan, N. (1995) 'Historic Urban Fabric: Source of Inspiration for Contemporary City Form', unpublished MSc Thesis for a DPhil Degree, Institute of Advanced Architectural Studies, University of York, UK.

Rossi, A. (1991) *Architecture of the city* (Cambridge, The MIT Press).

Chair_Renato Capozzi I Fabrizio Toppetti
Dipartimento di Architettura, Università di Napoli "Federico II", Naples, Italy
DiAP Department of Architecture and design, "Sapienza" University of Rome,
53A, via Gramsci, 00197, Rome, Italy
Co-Chair_Elisabetta Barizza I Cristina Tartaglia
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

Historical Urban Fabric
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The 'consecutio temporum' in the contemporary-historical city design

Fabrizio Toppetti
DiAP Department of Architecture and design, "Sapienza" University of Rome, 53 A, via Gramsci, 00197, Rome, Italy
Keywords: urban growth, historical city, co-evolutionary process

Abstract

The city is a community with a stable and defined territorial basis. Since its origins, the city grows around and above itself; it is therefore always the result of a stratification where the parts that are being built are juxtaposed to, interposed on and overlap the ancient city nucleus. The city has an evolutionary inner character, a strong inclination to metabolize the novelty, with this last determining its relative present in return. At the same time it is characterized by an inherent resilience ensuring its tendency towards stability, defined by Aldo Rossi as "permanence of the plane" (Rossi, 1966). However, there is a genetic difference between the pre-modern city and the newer forms of urbanity. The former grows according to a continuous shaping process, whilst the latter overlap and are interposed in hybrid and unprincipled ways. Since the early twentieth century, early urban geography studies show that the deterministic model, related to physical laws is no longer suffice to describe a model of comprehensive development of modern cities. As a matter of fact, such cities clearly do not reflect the tight relationship between the organism's growth, its internal structure and its external shape (Geddes, 1915). This has led to negatively consider certain instances of recent mutation as pathologies, and to the employment of the metaphor of chaos, despite this being an order which is just not known (Miller in Quaroni, 1967).

Nowadays, it is clear that the city as a whole is an open system with a multifaceted and porous structure. It lives off the relationship with its territory and the material and immaterial networks that transcend, feed and substantiate it. The city is forged over time and functions as a gathering place for matter and anthropogenic actions. Nevertheless, today its fringe is elusive. The new forms of urbanity, as GMOs, cannot acknowledge themselves as further developments of the original settlements, and no analogical figurative theory can explain the contemporary city.

The uncontrolled expansion, the realization of infrastructures, the intangible networks and the instability of the community have changed the meaning and the role of the historical city – even in the instances when its morphology has been preserved – and have turned it into new raw material open to new interpretations and significations. This change places any potential design in a new condition as it forces the designer to deal with unprecedented co-evolutionary aspects that have broken up the rhythms and modalities of the pre-modern Darwinian process. Recognizing this condition means acquiring a systemic and inclusive vision. Methodologically, it implies accepting the coexistence of layers and the overlapping of the interpretations as the only effective – although improvable – instrument to grasp the complexity of the phenomenon. Only the empirical project, as both ontological and operational practice, is able to redefine a dynamic and unstable balance which could go beyond nostalgic rhetoric and the utopian rapprochement.

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Introduction

This paper takes on the topic of contemporary design for the historical city. Before entering into the matter, it's necessary to explain the reference to the latin locution *consecutio-temporum* in the title. *Consecutio-temporum* is literally "the correlation of times". This locution denotes the set of norms that, inside the narration, regulate the relationship between the tenses of the verbs in subordinate phrases, that for us is the project, and the narrative context, that for us is the city. This is in a relative, not absolute, manner. This reference alludes to the necessity of the project to establish a sequence with the city formed in the past and is in any case contemporary to the project's action. It's important to note, that this relationship, according to the rules of *consecutio-temporum*, is not deterministic.

This notation also explains the reasons behind the apparent oxymoron in the definition of "contemporary-historical city": the city is the context and a context is always contemporary to the design's action. The historical city, if it continues to exist as a city, with a social component – that in latin we call *citivas* – and a physical component – that in latin we call *urbs* – is necessarily contemporary. Without this compresence, the city is another thing. This vision leads to the arguments dealing with the two central questions: What is the historical city today? What should the conduct of the project be?

The Time of the City

The city is a community with a stable and defined territorial basis. It is, together with its morphologic evidence, the material footprint of events that built it up. Since its origins, the city grows around and above itself; it is therefore always the result of a stratification where the parts that are being built are juxtaposed to, interposed on and overlap the ancient city nucleus.

In time, these parts will acquire their own statute through additions and transformation. Because of this statute they will be acknowledged their full belonging to the city as a complex but unitary phenomenon shaped by history. The development of Ferrara under Ercole I d'Este, the urban restructuring under Sixtus 5th in Rome, Paris after Haussman design are crystal clear examples because they are the result of streamlined actions, of a natural inclination to digest and appropriate novelty which lawfully determines and represents, within the urban scene, that *specific time* it is referred and belongs to, and inevitably marks the future time of the city. This inclusive attitude is so much rooted and powerful that it can even withstand and support invasive actions that are often the result of an approach being far from the rules that have operated in time to shape and structure the urban organism.

The city has an evolutionary inner character, a strong inclination to metabolize the novelty which determines its present: its *relative present*. At the same time it is characterized by an inherent *resilience*; in time it can offset deficit and traumas in a propensity to a dynamic state of equilibrium. Today the word resilience is very trendy but in terms of morphology it's the same concept that Aldo Rossi defined as *permanence of the plane* (Rossi, 1966). However, there is a genetic difference between the pre-modern city and the newer forms of urbanity. The former grows according to a continuous shaping process, whilst the latter overlap and are interposed in hybrid and unprincipled ways. It's not clear if this change represents a real rift between the past and the present, or if it's the result of an acceleration of a process that was already written in the DNA of the city, and was caused by exogenous factors.

The contemporary city, in any time in history, is always an approximate, flawed and instable result of this co-evolutionary process, made up of continuity but also of rift and deviations, often determined by exogenous factors. Therefore, in its whole, it is a construction determined along history and placed in a defined perspective which takes shape because of the presence of man, creator and driver of its transformation. It can only exist in the overlapping of the physical and social components which are its primary raison d'être and which make it true and substantive. It can only exist in the contingent time dimension. If one considers the unique and yet extreme urban nuclei of foundation:

Figure 1. Armelle Caron, Les villes rangees, Paris, 2011.
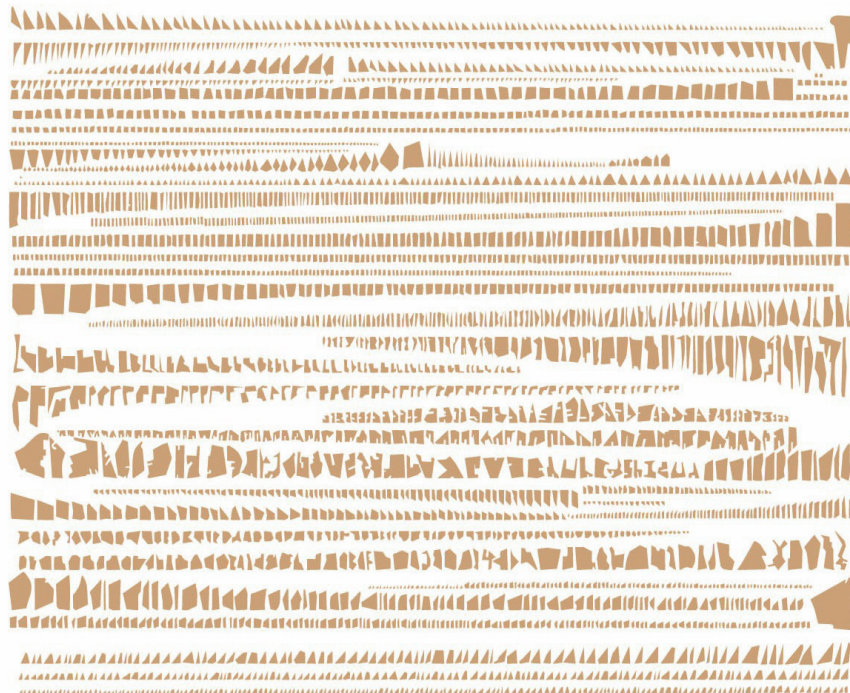
in their architecturally defined morphologic shape, they are the result of a unitary time and design. It is known that in order to become a city, some time was needed, as well as some hybridization with life and customs which allowed to overcome their design abstractness and their fixed time.

Figure 3. Armelle Caron, Les villes rangees, Istanbul, 2011.

Between the historical city which was grown according to an ongoing and organic shaping process and the contemporary city that is overlapping and interposed to it, there is a genetic difference. However, does a rift really exist? If so, can points in time be established? Or are we facing an unintentional acceleration of the forces of change induced by exogenous factors, which were however already written as a sort of reaction in the genetic code of our cities? Which are the triggering factors? Is it the Industrial Revolution, which induced for the first time new elements and upset the balance between the parties? Is it the ideology of the Modern Movement which fully reconsiders the city, and delocalizes it in and alternative dimension of the existing city? Is the emergency of the After-War period, which actually redesigned the geography of the real city? Is the pattern of the US-style city which is moving forward and contaminates the European city? Or the rise of a placeless city of the digital era?

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It is difficult to identify a watershed. It is easier to define a period when the progression of the growth of the urban settlements lost linearity and seemed to obey to other rules. This interval is not easy to identify and coincides with a substantial change of paradigm: limits were lost, and the warning signs could be detected in the great landscape design of the 18th c. This condition involved the elimination of the fundamental characteristic of the traditional city: i.e. introversion. The city was projected beyond the urban border, and encroached on the dimension of a substantial *artificialisation* and continuity of the human environment.

Theories

In the past, the city was dealt with by using an organicistic metaphor, like a body. This is an approach that belongs to a long tradition: there are some famous examples from Leon Battista Alberti, Filarete, and Scamozzi. Based on an automatic process, we are still driven to bring it back to a set composed of heart, tissues, arteries, lungs. We name and identify the single parts of the contemporary city in a summation of a series, without considering that this similitude has by now become inadequate.

In the early 20th c. already, the first urban geography surveys highlighted how, at least starting from the industrial revolution, the alleged deterministic model of a biological matrix solely based on physical rules was no longer sufficient to describe the development of cities which seemed to grow without clear and predictable rules that have little to do with the tight relation between growth, structure and shape relevant to the organism. In 1915, Patrik Geddes in *Cities in Evolution* (Geddes, 1915), took into consideration the case of London and dealt with the uneven growth of that city as a living body, which stretches out and grows swallowing neighbouring villages and the countryside. His conclusion was that a total revision of the ideas and methods for reading new forms of urban settlements were needed.

At the time already, the city was a complex urban settlement that changed fast towards a future hybrid and totalising organisation, as a result of a probabilistic process influenced by a large number of variables. A reality where the traditional city vs. countryside scenarios, between nature and artifact, are seemingly fading out and foreshadow sequences featured by varying degrees of anthropic density and action. Geddes was educated according to the typical British principle of rationality, which led him to systematization. As an expert, he realized he could not fully grasp the ongoing phenomena and even less where these ones could lead. With a great far-sightedness, he understood that this was a genetic mutation, at its onset at the time, that would break out all over Europe four decades later with the beginning of the post-war reconstruction. When implicitly admitting his powerlessness, he is one of the first who proposed a multidisciplinary approach and who noted the strong need for a new approach to face the issues that not only acquire a different dimension, but even just for this reason, shape a substantial change of paradigm, that will require new interpretation tools and additional envisioning capability.

The city that had been shaped in history remained as a place where energy, matter and vitality would aggregate. However, its contours fade out, new polarities are generated, a network system is generated where new forms of settlements can not be identified as a further growth of an original nucleus since they are no longer shaped on the basis of pure mechanical and linear effects, differently from a given urban-and-sociological tradition which interpreted and reduced them into a single scheme (Aymonino, 1965).

Centrality can not be referred to space proximity but to the belonging to a network (Dematteis, 1991). It is displayed according to thematic areas, which do not necessarily coincide with the consolidated urban settlements (Storchi Armanni, 2010). The historical and monumental centre is other than the shopping area or the business centre. Their partial overlapping does not mean coincidence. Stratification of thematic centrality gives rise to high density cores with a strong emission of meaning and icons, and to parts of a lesser city deprived of architectural representation, in a system of instable configuration connected to market, to fashion, to gentrification of trendy neighbourhood, that are only partly due to the inherent real estate quality.

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In large cities, the historical centre is not recognized as an autonomous part, and in the case of smaller towns, the icon of stone in the walled and towered citadel is diluted within hybrid and non-scalar landscape, where the simultaneous presence of monumental presence and infrastructural systems wins, between manufacturing districts, archaeology and industrial archaeology, between metropolitan deserts and parks, thematic parks and natural landscape, farming landscape and shopping centres. In the continuity of the anthropo-geographic environment, the first condition for survival in the historical city lies in the recognition and the care-taking of didactic relations of non opposition between the various and multiple urban and non urban parts.

The development of new forms of urban settlements, the design and building of infrastructures, the tangible and intangible networks, at least for the morphological aspect, deeply modify its meaning and role. Pasolini as first – in his short film "La forma della città", 1973 – grasped the deep change of the small town of Orte when the motor-road was built. Today we know the extent to which the future of a small town can be influenced by its proximity to an airport, or symmetrically, its definitive isolation. All this produces relevant effects on the social fabrics, and on the perception of the place, and thus on the capability to absorb change and innovation. Similarly, the presence of a seamless horizontal city under the upper town of Bergamo radically modifies the positioning vis-à-vis the territory, but also the symbolic features which make it implicitly permeable to modernity. Much the same way, mobility within the city, the new kinds of dwellings, migration flows, global mobility due to labour, give a relevant contribution to the loss of the feeling of belonging, of the identification between *civitas* and *urbs* right in the historical city.

This has led to negatively consider certain instances of recent mutation as pathologies, and give them a negative countersign, and to the employment of the metaphor of chaos, which – as Ludovico Quaroni recalled in *La Torre di Babele* in his quotation from Henry Miller, is only a non recognised order. (Quaroni, 1967).

Everything is City and all the City is Historical

Even though the modern and contemporary city was developed in separate parts, and according to Laws other than those of the ancient settlements, the porosity of urban materials, the homogeneous geomorphologic support, the continuity of the main historical connection layouts, the complementary components, and especially the urban living style fostered inclusion and mutual contamination mechanisms which made discrete elements converge into an overall phenomenon. Therefore, in spite of all, the city is, as a recent Franco Purini title describes, "unique and unitary" (Purini, 2015). As soon as in the sixties, Aldo Rossi already recognized in the city as a whole the characteristics of temporal and spatial continuity. Concerning time continuity: "the foundation of our studies was the city, seen for the first time in its entirety and in its continuous line of evolution". He added: "this contrasted with the narrow moralism that presided and unfortunately still presides in the majority of urban studies" (Rossi, 1968/1975 p. 335). Relatively to space continuity, Rossi wrote: "Accepting spatial continuity of the city means accepting something as facts of homogenous nature without supposing that there is a fracture between them: all those elements that we find in a certain territory, or better yet in a certain urbanized area". Rossi itsef suggest immediately after that such proposition may be very controversial: "for example it is not accepted when stating that between the historical city and the city as it appeared after the industrial revolution, there is a quality improvement" (Rossi, 1966 p. 69).

In *L'architettura della città*, Rossi chooses to refer to Lévi Strauss' definition, "the city is the human project for excellence" (Rossi, 1966), it implicitly contains these two fundamental aspects.

Lévi-Strauss approach (Lévi-Strauss, 1955) was clearly shared by Aldo Rossi and is based on the assumption that a city, in its wholeness, and in whatever configuration is a phenomenon dignified of interest per sé, independently from the inherent qualities existing in each specific case. It is always a system of elements related between them for which a single understanding is possible, independently from each single episode.

Figure 1. Armelle Caron, Les villes rangees, Manhattan, 2011.

The fact that the city is a unitary phenomenon doesn't imply that it functions as an organism: the nature of organisms is syntactic and not paratactic. The reciprocal relations of necessity and solidarity that tie the components assign them a specific role. The whole constitutes a set with purpose. The contemporary city is the result of an expansion without coded and predictable rules that have little to do with the relationship between growth, structure, and the respective forms of the organism. It is not, therefore, an organism, but it's surely an organic artifact.

Morphologies and network

Since the studies of the historical city – from the school of Muratori and Caniggia (Muratori et. al. 1960, Caniggia Maffei, 1979) to the school of Aymonino-Rossi (Aymonino,

1977) –, and starting in the nineties, the focus has moved to the study of the new form of urbanity like sprawling city as if it were a different thing (Choay, 1992).

Now it's the moment to evaluate the phenomenon of the contemporary city in its complexity, to consider the reciprocal interactions between the various components of the city and the urban landscape.

However, this doesn't mean that the city, that for brevity's I'll define as consisting of *urban fabric*, is an obsolete text. On the contrary, it persists as a privileged structure which the project must necessarily confront. In the historical-contemporary city the variables which it must confront multiply, and so do the possibilities of the project.

To be able to understand the urban phenomena that have a part in the creation of city and metropolitan landscapes involves a change in our way of perceiving. The context is a polysemic construct, this condition implies the necessity of more refined and creative interpretations. It means not only examining and knowing how to analyse single aspects but to understand the connections between them. Physical space becomes subordinate to the idea of a complex, integrated environment, where symbolic, social elements become more significant in determining the consciousness of a place. Above all, in order to make a proper assessment of the phenomena, it is important to place oneself outside the traditional, reassuring distinction between what is urban and what is not; to accept the fact that landscape is continuous on a geographical scale, inside which different and contradictory elements can be seen to appear in the relations between topography, building, object, architecture, uses and place; it is important to trace this continuity in the construction of landscape also as far as regards more recent interventions that have seemingly nothing to do with 'history', and which are often cursorily dismissed as errors, and to avoid forming a relationship with the city which depicts it as a physical space that is exclusively the realm of urban theories and architectural techniques. In other words, to come to terms with the city as it actually exists, and abandoning the bird's eye view from far above, to travel through it to form a sense of its rhythms and its heartbeat.

Nowadays, it is clear that the city as a whole is an open system with a multifaceted and porous structure. It lives off the relationship with its territory and the material and immaterial networks that transcend, feed and substantiate it. The city is forged over time and functions as a gathering place for matter and anthropogenic actions. Nevertheless, today its fringe is elusive. The new forms of urbanity, as GMOs, cannot acknowledge themselves as further developments of the original settlements, and no analogical figurative theory – Analogous City (Rossi, 1966), Archipelago City (Ungers et. al. 1977), Collage City (Rowe Koetter 1978), Generic City (Koolhaas, 1995) – can explain the contemporary city as a whole.

The uncontrolled expansion, the realization of infrastructures, the intangible networks and the instability of the community have changed the meaning and the role of the historical city – even in the instances when its morphology has been preserved – and have turned it into new raw material open to new interpretations and significations. This change places any potential design in a new condition as it forces the designer to deal with unprecedented co-evolutionary aspects that have broken up the rhythms and modalities of the pre-modern Darwinian process.

Design

The previous statements about the city, as a matter of principle shared by those who study it, present significant consequences in the operative sphere attributable to the unconditional assumption of three general points that can be taken as postulates.

The first is that the historical center (and in general the historical city) cannot be thought of outside of its belonging to contemporaneity. The second is that it cannot be treated separately from other, more recent urban components. The third is that it cannot be considered as if it were a morphologically stable and defined urban fact independent from its status as a place to live.

I think that It's necessary to insist upon these considerations, apparently taken for granted, because their implications for the project are strong and unequivocal.

In Italy, at least since the after War period, the difficulties to fully understand the outreach of these statements blocked the culture of design for the existing city. the general approach was actually short-sighted and focused on the protection of the material assets as such. This attitude was also a useless pretext.

To simplify, there are two main reasons why its has not been possible to apply the above mentioned principles: in the early Sixties especially, a pervasive and totalizing culture of conservation was focused on an absolute opposition to counter building speculation. However, there has been an objective difficulty to understand ongoing urban phenomena and connect them to the past. The first fact is broadly known, as it is instrumentally called the simulation of opposites. It can be associated with a more general cultural climate that was not a prerogative of the design sector. The second is on the contrary strictly connected to the theoretical and operational practice of studies on the city, and this is the element worth to be explored. For architecture, it is not possible to reduce the problem to linguistics, this issue has been overcome – at least under the scientific viewpoint – otherwise this would bring the debate back to the Sixties.

Recognizing this condition means acquiring a systemic and inclusive vision. Methodologically, it implies accepting the coexistence of layers and the overlapping of the interpretations as the only effective – although improvable – instrument to grasp the complexity of the phenomenon.

Today, the *forma urbis* of the contemporary city derives itself from the sum of its different dimensions. However, the *forma urbis* for the architect, according to Massimo Cacciari's definition that uses latin terms is a *fieri* and not a *factum*: it's in evolution and it exists to be modified (Cacciari, 1992). The critical and methodological vision, expressed by a long duration, by the themes of the palimpsest and of sedimentation, by continuity and by the consistency of anthropic action, guides us in recognizing the processuality of the slow evolution of the historical city.

Here, it's possible to recognize the specificity of the culture of our country. The "Italian difference" has deep roots in Benedetto Croce's teachings: "Life is reality and history is nothing more than history" (Croce, 1938). However, the risk is the squashing of continuist and finalist historicism into a way of thinking that sees the "linear evolution of time" as the only possible perspective. It's clear that this is a critique of the reassuring Crocian model that is the specificity of the Italian culture.

The project is a cultural and physical process of modification of an urban context: it disassembles it in simple elements or relations; then recomposes it to be projected with a different meaning. It develops a history, going in other directions and eliminating other possible scenarios. It's always forced. Using two words held dear by Giulio Carlo Argan: the *project* rips the place from its *destiny* and is inserted in the space between objective facts and possible interpretations.

The reference to *consecutio-temporum* is by now crystal clear: it is an ethical duty of the design project to be contemporary: its relation with the past is causal and not deterministic and, on the basis of all the necessary knowledge, it is legitimated to act and to take into consideration all possible options.

Only the empirical design, as ontological and operational practice, is able to redefine a dynamic and unstable balance which could go beyond nostalgic rhetoric and the utopian rapprochement.

References

Geddes P. (1915) *Cities in evolution* (Williams, London).
Croce B. (1938) *La storia come pensiero e come azione* (Laterza, Bari).
Lévi-Strauss C. (1955) *Tristes tropiques* (Libraire Plon, Parigi).
Muratori S., Bollati R., Bollati S., Marinucci G. (1963) *Studi per una operante storia urbana di Roma* (Centro Studi di Storia Urbanistica, Roma).
Argan G.C. (1965) *Progetto e destino* (Il Saggiatore, Milano).
Aymonino C. (1965) *Origini e sviluppo della città moderna* (Marsilio, Venezia).
Rossi A. (1966) *L'architettura della città* (Marsilio Padova).

Quaroni L. (1967) *La torre di Babele* (Marsilio, Padova)

Rossi A. (1968) 'Architettura per i musei', in AA. VV., *Teoria della progettazione architettonica*, (Bari), now in Rossi A. (1975) *Scritti scelti sull'architettura e la città.1956-1972* (Clup, Milano).

Aymonino C. (1977) *Lo studio dei fenomeni urbani* (Officina, Roma)

Ungers O.M., Koolhaas R., with Riemann P., Kollhoff H., and Ovaska A. (1977) *The city in the city. Berlin: a green achipelago*, critical edition by Hertweck F., Marot S., Lars Müller, Zürich 2013.

Rowe C. Koetter F. (1978) *Collage city* (MIT Press, Cambridge).

Caniggia G. Maffei G.L. (1979) *Lettura dell'edilizia di base* (Marsilio, Venezia).

Dematteis G. (1988) 'La scomposizione metropolitana', in AA. VV., *Le città del mondo e il futuro della metropoli, XVII Triennale* (Electa, Milano).

Cacciari M. (1992) 'Sul metodo di Polesello', in Zardini M. (ed.), *Gianugo Polesello. Architetture 1960-1992* (Electa, Milano).

Choay F. (1992) *L'orizzonte del posturbano*, edited by D'Alfonzo E., (Officina, Roma).

Koolhaas R. (1995) *Generic city* (Monacelli Press, New York).

Storchi S. Armanni O. (2010)(edited by) *Centri storici e nuove centralità urbane* (Alinea, Firenze).

Purini F. (2015) 'La città unica e unitaria', in Toppetti F. (ed.) *Vivere la città: Living the city. Vivir la ciudad* (Il Poligrafo, Padova).

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Shapes and Layers

Kornelia Kissfazekas
Budapest University of Technology and Economics, Faculty of Architecture, Department of Urban Planning and Design, Műegyetem rkp. 1-3 K. 293. 1111, Budapest, Hungary

Abstract

Within the group of historical cities that have undergone a more or less constant orga- nic change thoughout their history, towns where a large-scale construction project has resulted in significant, traumatic morphological changes constitute a special category. Among these are Hungarian towns where the state socialist government placed its new institutional building compounds in or near the town centre; partly for logistic reasons and partly because they were meant to symbolize the new social order. The research this paper is based upon was not originally intended to have a morphological approach. It was primarily focused on the urban environmental interactions of architectural com- plexes and the questions of urban design and architectural quality, with special regard for historical towns and new constructions.

This question is appropriate in many cases, as the relationship between modern and historical settlement parts is often controversial. However, in towns of former state socialist countries, this problem is even more acute. This research deals with the question of context by analysing post-World War II changes in the historical centres of 16 Hungarian county seats, reaching an urban morphology-style comparative analysis as a result as well.

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Introduction

Between 1945 and 1990, during the state socialist era[1], several new central building complexes were planned in Hungarian towns, with widely varying urban planning qualities. Existing towns responded to these new buildings very differently; however, it is noticeable that the level of acceptance was not directly depending on the architectural quality. Architecturally indifferent buildings often found their place quite well within the town, and not only functionally, but also regarding their spatial connections. In other towns, however, otherwise excellent buildings developed an awkward, dissonant relationship with their new urban environment. It is obvious that quality is not only determined by the level of architectural excellence, but also the spatial and structural relationship with the historical city, the quality of the urban context – which in turn has several layers and interpretations and the considerations and priorities of which are fundamentally influenced by the scale (the degree of „zooming in or out"). (Moudon, 1997; Lamas 2000)

This is strongly connected to spatial, morphological issues.

The goal of this present research was not to analyse certain urban situations morphologically or to apply already well-tried (morphological) methods using case studies. The goal was to understand well-recognizable, everyday urban planning situations, to discover causalities. The realisation that this most closely resembles a morphologically based research logic only came towards the end of a long research process. Therefore, it somewhat differs from traditional morphological analyses, but is closely related to them. Regarding its intentions and characteristics it is, on one hand, based on the research attitude named „descriptive" and mostly tied to the French school of thought by Moudon. On the other hand, it is also linked to the general morphological study approach also described by Moudon, with its focus to „assess the impact of past design teories on city building"(Moudon, 1997).

Morphological changes in post-socialist towns is a topic that appears frequently in international literature (Nuissl, Rink, 2005; Hirt, 2006; Stanilov, 2007; Sýkora, Ouředníček, 2007; Milerius, Tornau and Dranseika, 2009). Most often the topic of reseach is the processing of the socialist legacy and its relations to later periods. However, it is notable that for example on the latest ISUF Conference, only a very small proportion of the wide range of research topics was related to the issue; Cirtautas analysed processes in suburban areas of Baltic cities (Cirtautas, 2014), Deptula mentioned the state socialist era as a key period in the historical morphological development of a specific Polish town, Torun (Deptula, 2014), while Statica dealt with questions regarding the post-industrial heritage of post-socialist cities, using Bucharest as an example (Statica, 2014). However, seeing the impact the urban planning processes of the era had in several different countries, the topic plainly deserves greater attention locally (nationally, regionally) and internationally.

The nearly 50 years of state socialism brought strong – and, in several places, traumatic – changes in Hungarian urban development processes. The buildings, located centrally according to unique settlement policies, impacted the complete settlement structure, as from the early '50s, primarily due to industrial policies, new towns were constructed and some towns were heavily developed in a short time. The number of New Towns was not great, fewer than twenty (Kissfazekas, 2013), but the sudden appearance of a few new towns with populations between 40.000 and 60.000 clearly rearranged spatial relationships and power balance in the sparse Hungarian urban structure, which has only around 3.000 settlements in total.

At first, in the early '50s, the newly planned centres of New Towns were designed to be strongly ideological, socialist realist complexes. However, usually these were never completed for several reasons (lack of funding, other political priorities). Therefore, many New Towns were working for a long time without a real new institutional town centre. These missing centres were eventually created in the 1960s and '70s, but with a more low-key institutional programme, and – due to the changes in public sentiment (after all,

[1]The era of state socialism in Hungary is considered to have lasted from the appearance of new power organizations in 1944-45 until the 1990 change of the Constitution.

we are after the 1956 Hungarian revolution against the Soviets) – with a less politicized approach, according to modernist principles.

The modernist approach did not only appear in the design of centres of socialist New Towns. The political leaders of the period had a quite ambivalent relationship with history. The phrase „No more tradition's chains shall bind us"[2] reflected on the real intention to re-arrange the contemporary social and political order and its institutional structure as well. The young socialist state wanted to have its own institutions, created with new, „modern, up-to-date" architectural tools. These expectations could be met mostly in the centres for Budapest districts and in county seats[3], as these were the ones eligible for significant funding from the central state financial fund. As the town centre is the most prominent part of the settlement in almost all aspects, the most important new „socialist" institutions – usually placed in compounds consisting of several adjoining buildings – were meant to be concentrated here as well.

The institutions that were particularly meant to be placed near the historical town centres were the ones viewed as determinant or emblematic for the new social order. Thus, the construction of institutions and the choice of location were determined by both functional and representational reasons.

Some Hungarian settlements are still dealing with the consequences of the presence of these buildings and building complexes, which is often a very complicated heritage. Therefore, the intention to assess the problems and environmental conflicts generated by these constructions is understandable. The research this paper is based on originally analysed the urban effects of the commonly distributed institutional buildings, designed to be „emblematic", from the state socialist period, using Hungarian towns as examples. As these prominent buildings were generally constructed in a central location, a basic aspect of their analysis was their spatial, structural and urban relationships with the pre-existing historical centres, the question of context.

Methodology

Even though the methodology was basically and admittedly non-morphological by approach, it still is connected to its classic methods in many aspects. The research, study-ing the question of context by analysing the post-World War II changes in the town cen-tres of 16[4] Hungarian county seats, reached an urban morphology-style comparative analysis as a result of studying the relationships between the historical and new centres.

It introduced multilayeredness, one of the most important elements of leading Euro-pean schools of morphological thought, the idea of interpretations of different layers and the three main morphological elements (building, plot, street). The analysis of urban fabric, interpreted as „relationship between urban fabric, buildings and open spaces" by Rob and Leon Krier and Aldo Rossi; the analysis of streets as morphological elements (Moudon, 1997; Lamas, 2000; Panerai, 2007) and the structural frame they create, and the urban analytic scale known from typo-morphological studies (Moudon, 1994; Kropf, 1996, 2006; Samuels, 2008) were all particularly important for the topic.

Why county seats?

As the research goal was to find certain general characteristics and qualities, a major consideration while choosing subject settlements was that they should not be so-called interesting cases, judged uniquely and subjectively, but examples sharing a common characteristic, while still fundamentally different. The obvious choice was the group of county seats, raised to a prominent role with outstanding financial opportunities by the centralized and hierarchical state socialist urban politics. The diversity of the chosen

[2]Quote from The Internationale (American version).
[3]Counties are the traditional administrative subdivisions of Hungary, their prominent cities being the county seats.
[4]There are 18 county seats in Hungary outside of Budapest. The research also contained the analysis of 2 Hungarian New Towns, which are irrelevant regarding this present paper, and there-fore are not included.

towns guaranteed the objective „sampling", the diversity of possible cases. Nevertheless, the processes happening in county seats can also be perceived in other Hungarian settlements, with a lower intensity – which means that general conclusions can be reached.

Why town centres?

How town centres are treated is very telling of a period'sthoughts about urban planning, approach towards cities and idea of the past and future. The historical city core, as one of the most important spatial imprints of urban development, a symbol of continuity, has always been a point of reference. Central functions, centre-forming elements naturally sought the presence of each other and the historical core. They took advantage of the favourable geometrical situation within the urban structure, the good accessibility, the presence and attractiveness of other central elementsand, most of all, the inherited bond and consciousness, the mental centre-picture of citizens.

Historical heritage does not only manifest itself as tangible elements, but also, among others, as functions attached to places and as traditional customs kept through generations. The main location for this within the urban context is obviously the centre. State socialism did not deny the importance of town centres either, however, as previously stated, it wished to redefine it in many aspects. This shows itself conspicuously in the morphology of settlements.

Why does the idea of context appear?

Context is a recurring phrase when interpreting buildings from the urban planning aspect, usually used when assessing the building and its connections. The most easily relatable form of context is the quality and characteristics of the relationship of the building itself with its built architectural environment and immediate neighbourhood. However, this personally experienced context is part of a town-level context as well, a system of connections that can only be perceived when watching from „further away", in the larger urban fabric. The historical centre is an especially important part of town in the contextual aspect as well. Here, the different layers and unique elements of the urban past have blended and matured together, creating not only coherence (connections) but also cohesion, where different historical institutional buildings, created according to – and therefore strongly connected to – the demands of their time, but often significantly different from each other in style and scale, all find their places.

Context – one of the most multifunctional key concepts in textology, meaning both the internal structure clarifying the meaning of linguistic elements within a text and the system of connections encompassing out-of-text pragmatical factors and the physical, social, cultural and historical environment, has also been a widely used idea in urban planning for a long time. The coherence, conceptual and grammatical correctness of neighbouring words is very important in a text. However, the actul meaning of words and sentences only becomes fully clear when embedded in a complete text.

The effects of the appearance of a builing or building complex; its location and spatiality within the urban corpus and its connections to the urban fabric;its relatonships regarding urban planning, spatiality and masses – these are all different-depth interpretations of the same context. This paper highights the following three layers as most important from the urban connection point of view:

- *the context of urban corpus*, as a characteristic of thespatial position of pre-existing and new;
- *the context of urban fabric*, the connections in urban structure and building pattern;
- *the context of urban planning* (co-text[5]), the spatial connection of the building with its immediate surroundings.

This structure is naturally connected to Kropf's way of thought, wich designates several levels of analysis when analysing the urban form, combining Conzen's „urban morphology" approach with the „city context" of the Italian way of thought.(Kropf, Radwin 1996).

[5]In textology, context is interpreted as a term concerning the communication environment and composed of physical, social and mental manifestations while co-text is the term used for the lingual environment of the words making up these manifestations.

Tools of analysis
    Figures showing the building fabric and urban structure have been created for each settlement. The goal of these is not to correctly define the boundaries of the historical city core or to depict the town centre within specific borders, but to highlight the spatial complex defining the centre, the central urban structure and fabric characteristic of only that specific city.
    The distinctive colours indicate institutional – and, in a few cases, specially located mixed-function (commercial and residential) – buildings that were constructed in a central location during the state socialist era. The basic selection criteria for these buildings was whether their construction had substantial (structural) effect within the existing urban structure. The analysis was not based upon the architectural quality of the buildings, only their role in the urban structure, their location and their connections to both historical buildings and their „contemporaries".

Figure 1. Hungarian county seats; historical city centres - building structure.

Figure 2. Hungarian county seats; historical city centres - street network.

Békéscsaba   Debrecen   Eger   Győr

Kaposvár   Kecskemét   Miskolc   Nyíregyháza

Pécs   Szeged   Székesfehérvár   Szekszárd

Szolnok   Szombathely   Veszprém   Zalaegerszeg
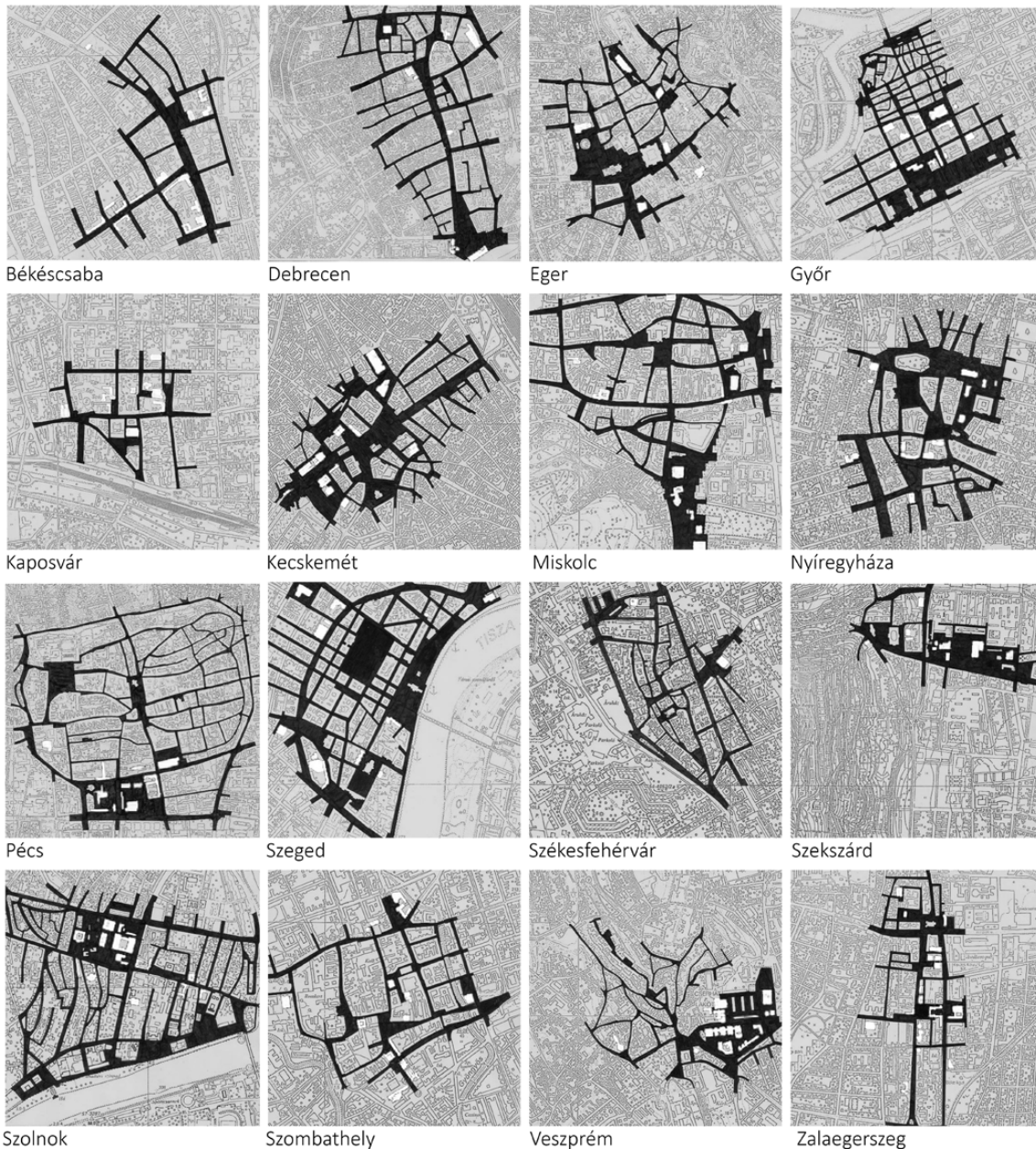
Forming process: context ofurban corpus/spatial relationships of pre-existing and new central areas

New institutions have a fundamental impact on the spatial dimensions, external connections and internal functioning of the town centre. This is especially so if not only one building, but a whole group of new buildings appear in town, as it happened in the period in question. Therefore, town-scale spatial connections are a very important factor in building institutions with central functions.

When comparing the spatial relationships of new, centre-forming buildings of the state socialist period and the pre-existing town centres (in other words, their urban corpus context), some basic types can be identified. Naturally, these types are mixing, in certain towns several are recognizable, but each settlement has a single most typical, characteristic one. Typical situations of centre-forming buildings in the context of urban

corpus are the following: a) entering the historic centre b) built outside of the centre, in close proximity to it c) sticking to it, d) interwoven, e) equivalent to the old centre even in extent, f) scattered, diffuse.

Context of urban fabric–connections in urban structure and building pattern

Zooming in on city maps, different interpretations of context are becoming most prominent. While in the case of the city-scale analysis the spatial connections of old and new and their consequent relationships are most striking, in this scale urban fabric becomes the main feature; the internal structure and building pattern of newly built-in areas – their own fabric and its connections to their surroundings – become recognizable. Achitectural compounds do not only „bring their own" architectural stylistic tools, but also have their own compositional logic, rules and building pattern as well. On this level of interpretation the existence or non-existence and quality of context is shown by the internal structure (if there is one) of the newly inserted elements, the building character– or, in other words, the fabric or 'tissue' – of the new area and the relationship of all these to the corresponding elements of the surrounding area. However, this paper does not treat this urban feature entirely the way as Conzen and Moudon do – who state that „Plan units or 'tissues' are groups of buildings, open spaces, lots and streets" (Conzen, 1960; Moudon, 1997), as this present research does not include the plot system in the analysis.

State socialist town centre constructions following the socialist realist style usually kept the routes of existing structural elements (streets), but often redefined blocks and the plot structure. This resulted in changes in the proportion of built-in and open areas, the air space ratio of public spaces and the scale of new buildings. The change of scale in the street-block ratio – in the level of plane morphology – obviously affected the conditions of height morphology as well. The caracteristic types are as follows: a) based on independent principles; b) following the historical structure or its compositional logic.

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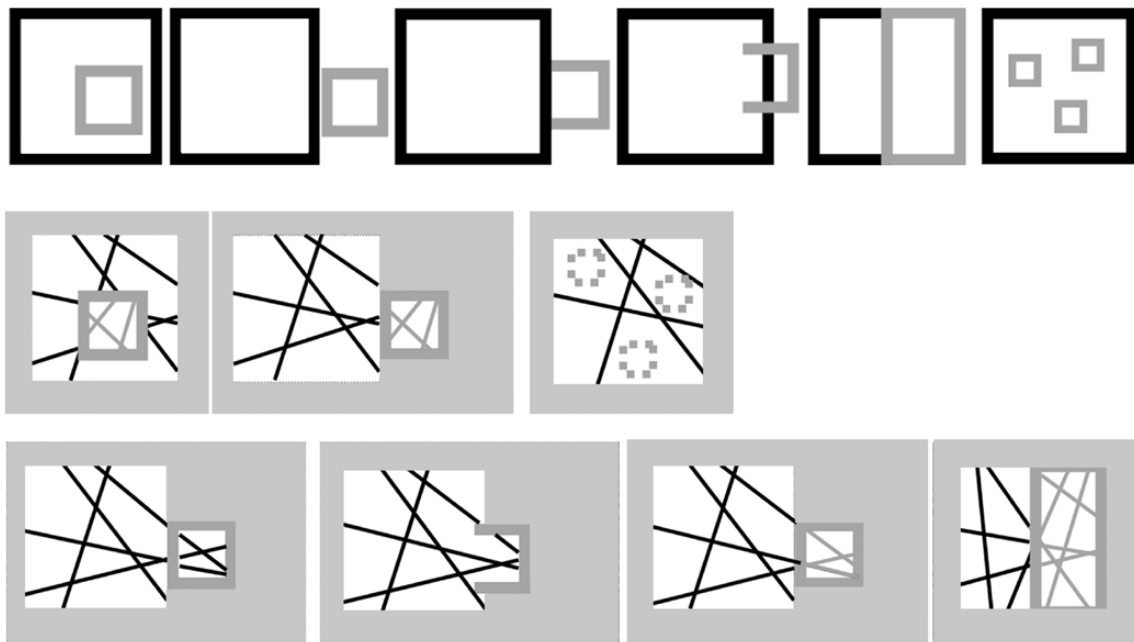
Figure 3. (above) Relationship schemes of old and new town centres within the urban corpus
a. Veszprém, Szolnok; b. Pécs, Miskolc, Székesfehérvár; c. Kecskemét, Nyíregyháza; d. Győr, Békéscsaba; e. Zalaegerszeg, Szekszárd f. Eger, Debrecen, Szeged, Kaposvár, Szombathely.
(below) Simplified schemes of structural relationships between old and new centres:
a. Veszprém, Szolnok, Pécs; Szombathely, Eger, Debrecen, Szeged.
b. Kecskemét, Nyíregyháza; Győr, Békéscsaba; Miskolc, Székesfehérvár; Szekszárd, Zalaegerszeg.

New institutional compounds were constructed with their own designed order, according to their internal (modernistic) compositional principles, going against the traditional urban spatial order, block-square-street ratio. The areas appearing as islands inside the urban fabric were placed within a closely interwoven web of threads (history, social relations, functional connections and structural bonds) within the town centre, bringing their own set of structural rules, tearing this fine web apart, highlighting boundaries sharply. The most typical characteristic of institutional complexes constructed next to centres, on the other hand, is not the breaking of historical bonds but separation itself, alienation from its environment. The complete accessibility of the block was part of the concept in all cases, making the role of surrounding streets even more undefined and confusing. From the aspect of the urban fabric context, the most characteristic feature of enclaved, island-like institutional compounds is that they appear to be standalone, „removable" elements that could be transported into any other situation (town, neighbourhood), which results in the fragmentation of the surrounding urban fabric.

Cases where the new and old structures are spatially overlapping are more fortunate, as this made it possible to develop a connection between them. Owing to the open structure of the so-called clustered town centres, a strong spatial connection can develop between old and new and the structure can be expanded in a more organic way.

Historical towns where the central area expanded significantly during the state socialist era, but with new central areas built as the continuation of the very small historical core and becoming equivalent to the former centres in other ways beside their size form a separate, but rare, group. In these cases the new central parts were organized according to their own internal principles, but based upon the pre-existing, formerly unused, potential in urban structure.

In the case of diffuse centres, built in scattered pieces, there is no real internal structural connection between the new buildings to talk about. The new constructions fit certain points of the historical urban fabric individually, their local connections to the surrounding fabric is the determining factor.

Context of urban planning / Urban unit–Co-text

Of the institutional buildings that become typical and often emblematic of certain periods, there are always some that receive special attention due to their extraordinary architectural or urban planning quality, the fame of their designer or their own values.

This research analysed some of the basic situations used by state socialist urban planning, which were in several cases combined, but are clearly identifiable. These are a) point-like, located in space; b) point-like, located in block; c) bounding, located in space; d) bounding, located in block. The third analysed level of context exists within the urban culture, on a smaller scale, and stands on the border of urban design and architecture. Its view of the settlement is wide enough to register urban connections, but close enough to make details, separate buildings visible and identifiable within the urban fabric. This is
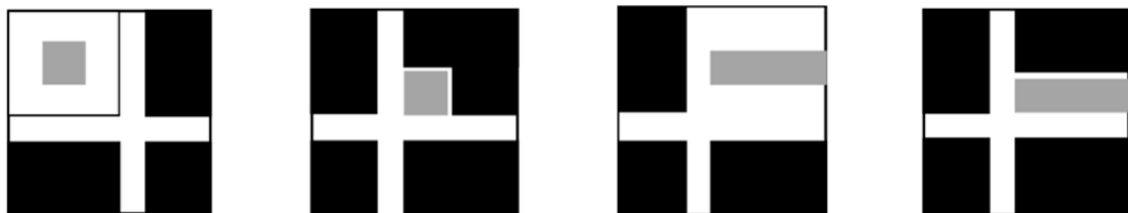
Figure 4. Simplified schemes of typical urban planning situations:
a. Debrecen, Eger, Győr, Szombathely.
b. Debrecen Győr, Kecskemét, Veszprém, Szeged, Salgótarján, Szolnok, Szombathely, Zalaegerszeg,
c. Békéscsaba, Kaposvár, Kecskemét, Nyíregyháza, Szekszárd, Szombathely, Veszprém, Zalaegerszeg.
d. Békéscsaba, Kaposvár, Kecskemét, Szombathely, Veszprém Zalaegerszeg.

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the scale, the level of magnification where the expression urban design can take its real form most completely and specifically, where the relationships between spaces, streets and buildings can be outlined. Spatiality is an important part of structure, as buildings appear with their true shapes, together with their heights – structure actually becomes spatial and three-dimensional. Therefore, this is also a layer of context, dealing with relations of new and new, new and old, but from the aspect of spaces and bulks. This is the layer that can connect to building-scale analyses according to „classic" (street/block, plt, building) morphologic layering (Conzen, 1960; Caniggia and Maffei, 1979; Kropf and Radwin, 1996; Çalişkan and Marshall, 2011). However, this analysis emphasised the town centre-scale effect of buildings instead of their impact on their immediate environment.

Conclusion

The research is originally based on the analysis of an urban planning problem that is still around today: what is the reason behind the general (functional, architectural, social etc.) devalorization of buildings and compounds standing in the most characteristic area of towns – their centres? The buildings of the analysed period are still defining features of all Hungarian town centres, big or small. The analysis was based on situations classified from 3 aspects. Today, these buildings cannot find their role and place in most town centres. The cultural code of state socialist constructions of central institutions is tangibly alien, illegible for today's citizens, failing to fit either the traditional, generations-old code or the contemporary trends. Their presence is not justified by their quality, either. Something basic is often missing: not its matching the public taste or quality but its fitting above functionality, the feeling of relevance and attachment. That which can be summed up by one expression, often ignored by the era: urban context.

One of the most important indings of the research is that the quality of the expansion of town centres could have been guaranteed by matching the cotext on all three levels of urban corpus, urban fabric and urban planning, that is, a morphological planning approach. However, detailed research concluded that this never happened in most analysed towns. One of the possible ways of moving forward could be to formulate the morphology-based recommendations for planners still missing from Hungarian planning practice.

References

Caliskan O. and Marshall S. (2011) 'Urban Morphology and Design', *Built Environment*. vol. 37.4.

Caniggia, G. and Maffei, G.L. (1979) '*Composizione architettonica e tipologia edilizia. Lettura dell'edilizia di base*' (Venezia).

Cirtautas, M. (2014) 'Changing form of the Baltic cities: resurrection of the suburbs' in Oliveira, V; Pihno, P; Batist, L.M; Patatas, T; Monteiro, C. (eds) *ISUF2014. Our common future in Urban Morphology*, Vol.2 ; 121-134. (http://isuf2014.fe.up.pt/) accessed 03 April 2015.

Conzen, M. R. G. (1960) '*Alnwick, Northumberland: A study in town-plan analysis*' Institute of British Geographers Publication 27, (George Philip, London).

Hirt, S. (2006) 'Post-socialist urban forms: Notes from Sofia', *Urban Geography* 27(5), 464–488.

Kissfazekas, K. (2013) 'Metamorphosis of public spaces in Hungary' *Journal of Architecture and Urbanism* 37. (3) 182-193.

Kropf, K. (1996) 'Urban tissue and the character of towns', *Urban Design International* 1(3), 247-263.

Kropf, K. (2006) 'Crisis in the typological process and the language of innovation and tradition', *Urban Morphology* 1, 70-73.

Kropf, k. Radwin, L. (1996) '*Urban design Tissue and Character of Towns*' (London, E & FN Spon).

Lamas, J.M.R.G. (2000) '*Morfologia Urbana e Desenho da Cidade*' (Fundação Calouste Gulbenkian e Fundação para Ciência e Tecnologia, Lisboa).

Milerius, N., Tornau, Ū. and Dranseika, V. (2009) *Urban Change in Eastern and Central*

Europe: Social, Cultural and Architectural Transformations (Vilnius University Press, Vilnius)

Moudon, A. V. (1994) 'Getting to know the built landscape: typomorphology', in Franck, K. and Scheekloth, L. (eds) *Ordering space: types in architecture and design*, 289-311. (New York, Van Norstrand Reinhold).

Moudon, A. V. (1997) 'Urban morphology as an emerging interdisciplinary field', *Urban Morphology* 1, 3-10. (http://www.urbanform.org/online_unlimited/um199701_3-10.pdf) acessed 10 May 2015.

Nuissl, H. and Rink, D. (2005) 'The „production" of urban sprawl in Eastern Germany as a phenomenon of post-socialist transformation', *Cities* 22, 123–134.

Panerai, P. (2006) *Análise urbana* (Universidade de Brasília, Brasília). in Botechia, F; Thompson, A: Urban morphology of streets in central area of Vitória (ES) in: Oliveira, V; Pihno, P; Batist, L.M; Patatas, T; Monteiro, C. (ed) *ISUF2014. Our common future in Urban Morphology*, Vol.2 ; 36-47. (http://isuf2014.fe.up.pt/) accessed 08 April 2015.

Samuels, I. (2008) 'Typomorphology and urban design practice', *Urban Morphology* 12, 58-62.

Stanilov, K. (ed.) (2007) *The Post-Socialist City: Urban Form and Space Transformations in Central and Eastern Europe after Socialism* (Springer, Dordrecht).

Statica, I. (2014) 'The re-appropriation of industrial sites in the urban form of the post-communist city' in Oliveira, V; Pihno, P; Batist, L.M; Patatas, T; Monteiro, C. (eds) *ISUF2014. Our common future in Urban Morphology*, Vol.2; 940-948. (http://isuf2014.fe.up.pt/) accessed 07 April 2015.

Sýkora, L. and Ouředníček, M. (2007) 'Sprawling post-communist metropolis: commercial and residential suburbanisation in Prague and Brno, the Czech Republic', in Razin, E., Dijst, M., and Vazquez, C. (ed.) *Employment Deconcentration in European Metropolitan Areas* (Springer, Dordrecht), 209–233.

A Comparative Study on Morphological Evolution of Inner-city Residential Blocks in Tokyo and Beijing

Guan Li[1], Wu Zhouyan[2], Ariga Takashi[3]

[1]Department of Architecture, Waseda University, Japan
Bldg. Hirayama Shoji 301, Nishi-Waseda 3-5-10, Shinjuku District, Tokyo, Japan
[2]Department of Architecture, Tokyo University, Japan
Room 225, Faculty of Engineering Bldg.1, the University of Tokyo, Hongo 7-3-1, Bunkyo District, Tokyo, Japan
[3]Department of Architecture, Waseda University, Japan
55N-07-06A, Okubo 3-4-1, Shinjuku District, Tokyo, Japan
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Abstract

This paper presents a comparative analysis of residential dominated mixed-use blocks in Tokyo and Beijing inner city. Through a morphological comparison between two cities' evolution processes in case study areas, this research aims to modify the urban patchwork of rigidly preserved historic blocks and redevelopment projects in Beijing old city, and fill in the gap between overall preservation strategy and detailed authentic building preservation. By going through the urban form in different scales, this paper examines how physical components (street, block, plot and building) work together to make an area integrates with contemporary context while maintaining its comfort, richness and historic atmosphere instead of solely protecting the authentic buildings, and how this process relates to the lifestyles in the area. In conclusion the research suggests new visions for the renewal of historic blocks in Beijing.

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Introduction

In historic cities like Tokyo and Beijing, areas around palaces or castles are the earliest habitats of residents. The preservation and renewal of these mixed-use blocks in Beijing has been a dilemma dealing with the relationship between authentic historic features and contemporary urban function. There have been several conservation plans and regulations made for Beijing old city since 1954. And after the *Conservation Planning of 25 Historic Areas in Beijing Old City* was carried out in 2000, the importance of preserving areas rather than independent buildings has been widely accepted. Since the first 25 Historic Areas in Beijing Old City was determined in 1990, 43 historic areas for conservation has been set, accounting for 17 percent of the Beijing old city's area. The conservation areas are determined mainly based upon unique historical spots and authentic buildings with better construction quality. Highlighting the importance of historic authenticity and heritage intact, systematic strategies for building authenticity protection and infrastructure improvement were set.

However, the gap between the overall target and those elaborate measures towards individual buildings seems to be vague, as guidelines concerning larger scales including plots, blocks and streets are insufficient. Moreover, outside the conservation areas, traditional blocks of lower construction quality or poorer infrastructure condition are replaced by gated communities and highrise apartments gradually. Under these circumstances, Beijing inner city has grown into a patchwork of historic blocks and redevelopment projects. With the former carefully preserved as antiques, and the latter breaking away from the historic context, a walk in the old city is a trip shuttling back and forth between ancient and modern. Two poles hardly integrate with each other in terms of layout, scale, building type etc., which disrupts the cityscape as a whole and produces disconnected lifestyles.

On the other hand, many historic blocks in Tokyo have been burnt down several times due to earthquake and war. Buildings inside them were upgraded at least once, resulting in that few historic authentic buildings could be found. Even though historic atmosphere could be perceived in a delicate manner, which is largely accomplished by the intricate streets and finer scale. More importantly, this kind of blocks integrates with its surrounding context in a more natural way. With no big interruption being brought about, the sequence of moving around the city hasn't been turned into an experience through a collage of fragments from different ages. People could unconsciously cross through the blocks without noticing artificial "Historical Areas". Therefore, this research is an attempt to reveal the forming mechanism of present mixed-use blocks, and to generate suggestions to repair the urban patchwork in Beijing through a morphological comparison of the evolution processes of case study blocks from two cities.

A morphological reading of the built environment identifying physical elements of urban form has been established in the field of urban morphology: the building, the plot and the street (Conzen, 1960; Caniggia and Maffei, 1979; Korpf, 1996; Caliskan and Marshall, 2011). Conzen's methodology consists of three physical components: the town plan, a cartographic representation of towns' layout; the building fabric, made up of the town's buildings and the open spaces; and land and building utilization, which is basically land use viewed at a smaller scale (Conzen, 1968). Caniggia's method reads the urban landscape at four scales: the building, the building fabric, the city, and the region. The different scales imply a hierarchy of the urban landscape: buildings are the units that make up building fabrics, building fabrics in turn are the units that make up cities and, finally, cities are the units that make up regions. At all four scales, instances of the modules can be grouped into types on the basis of certain shared characteristics. Utilizing methodologies from this field, this paper examines the way physical elements work together (the street, the block and the plot) to make a historic area better integrated with its surrounding environment, while maintaining its comfort, richness, and historic atmosphere except for solely preserving the authentic buildings. An in-depth analysis of layout, scale and type is applied here. Diagrams are adopted to make the evolution pattern comparable, based on which reasons are analyzed and suggestions are given.

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Methodology

Case study areas

Yotsuya case study area in Tokyo is selected for its organic relationship with surrounding urban context. The area is bounded by Yasukuni Dori, Shinjuku Dori, Gaien Higashi Dori and Sotobori Dori. Having gone through earthquakes and wars, this historic area has managed to retain historic atmosphere without preserving authentic buildings. Xidan case study area is chosen as a microcosm of the whole Beijing old city area, which is a patchwork of traditional blocks and redevelopment projects. Located out of the historic conservation areas, the area is bounded by Taipingqiao Dajie, Picai Hutong, Xidanbei Dajie and Fengsheng Hutong. Two cases used to be mixed-use areas dominated by residential of middle and higher classes, whose similar physical and social positions enable a feasible comparative study.

Historical maps containing details including outline of blocks and plots are utilized with regard to historical periods, social events and planning events that made an impact on urban form. Due to tolerances during the work of historical map digitalization, a certain amount of inaccuracy has to be allowed. The measurements of drawings could only be taken as approximations.

Data Collecting

Going step by step with different scales of physical elements, the analysis starts with the street system, to the layout of the blocks, then deals with plots, and finally building types in the area.

Analysis of street system is held first to evaluate the relationship between the area and its surrounding environment. Number and length of streets and cul-de-sacs at different ages are extracted to imply the connection and transition between the area and the city.

Afterwards a study of block pattern examines the evolution of whole area's layout. Diagrams of the fragmentation and consolidation of blocks are first illustrated, which reflects the degree of blocks' subdivision. Blocks' perimeters are extracted to reveal the ability an area could interact with the city, as well as providing possibilities for various functions. Longest segments of blocks are collected to test the degree of separation, and the accessibility for residents. A direct comparison of block size is also made to give an intuitive impression of different scales of two areas.

For the purpose of examining the human scale experience inside blocks, plots alongside streets are investigated. Side length adjoining streets are extracted, based on which the intuitive experience of scales along the streets could be illustrated and compared. Due to the absence of historic materials containing property outlines in Beijing, the analysis of Xidan area takes building's side length as substitute at this level.

In order to reveal the lifestyles in the area and reflect the role an area plays in its urban context, a study of building typology is made. Based on the reading of historic drawings and fieldwork, different types of buildings at initial and current stage are mapped. Since building typology is also related to uses and functions, through the reading of that the effects of morphological evolution on lifestyles could be understood.

Morphological evolution process of case study areas

Evolution of street system

The enormous increase in the number and length of streets and cul-de-sacs implies that a richer and denser street system was developed in Yotsuya (Figure 1). The diagrams suggest that, the growing cul-de-sacs work just as capillaries of a human body, linking spaces hidden deep to the city. The natural transition from public to private brought by different hierarchies of streets enables an organic connection between the area and the city (Figure 1). It also should be noted that since the 1920s the area adjusted itself to the new trunk road to the west through modifications on its street system.

On the other hand, the street system in Xidan remained steady until 1988, yet was significantly simplified afterwards. Thus the whole area failed to improve its interactive

Figure 1. Evolution of street system.

1883

1919

1937

1954

1990

2007

Yotsuya

1750

1930

1954

1988

2003

Xidan

Evolution pattern of street system

Numbers and total length of streets and cul-de-sacs
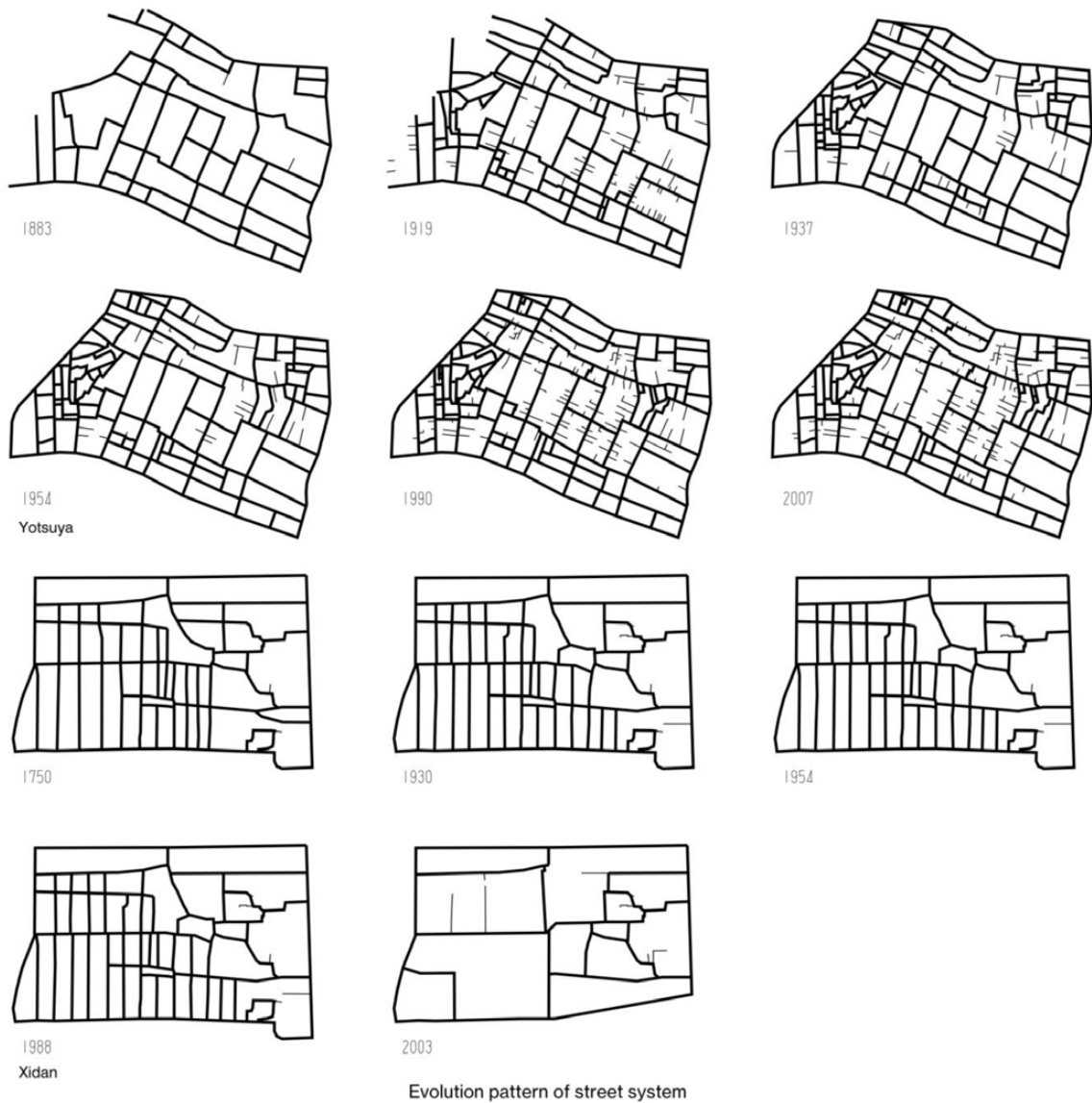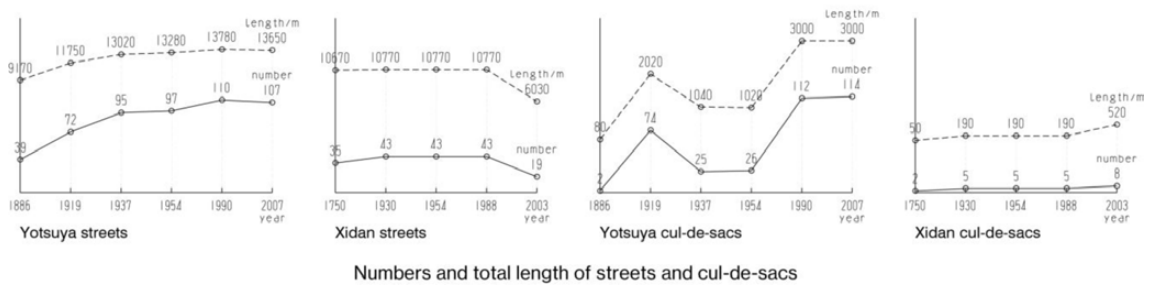
Figure 2. Evolution of blocks.
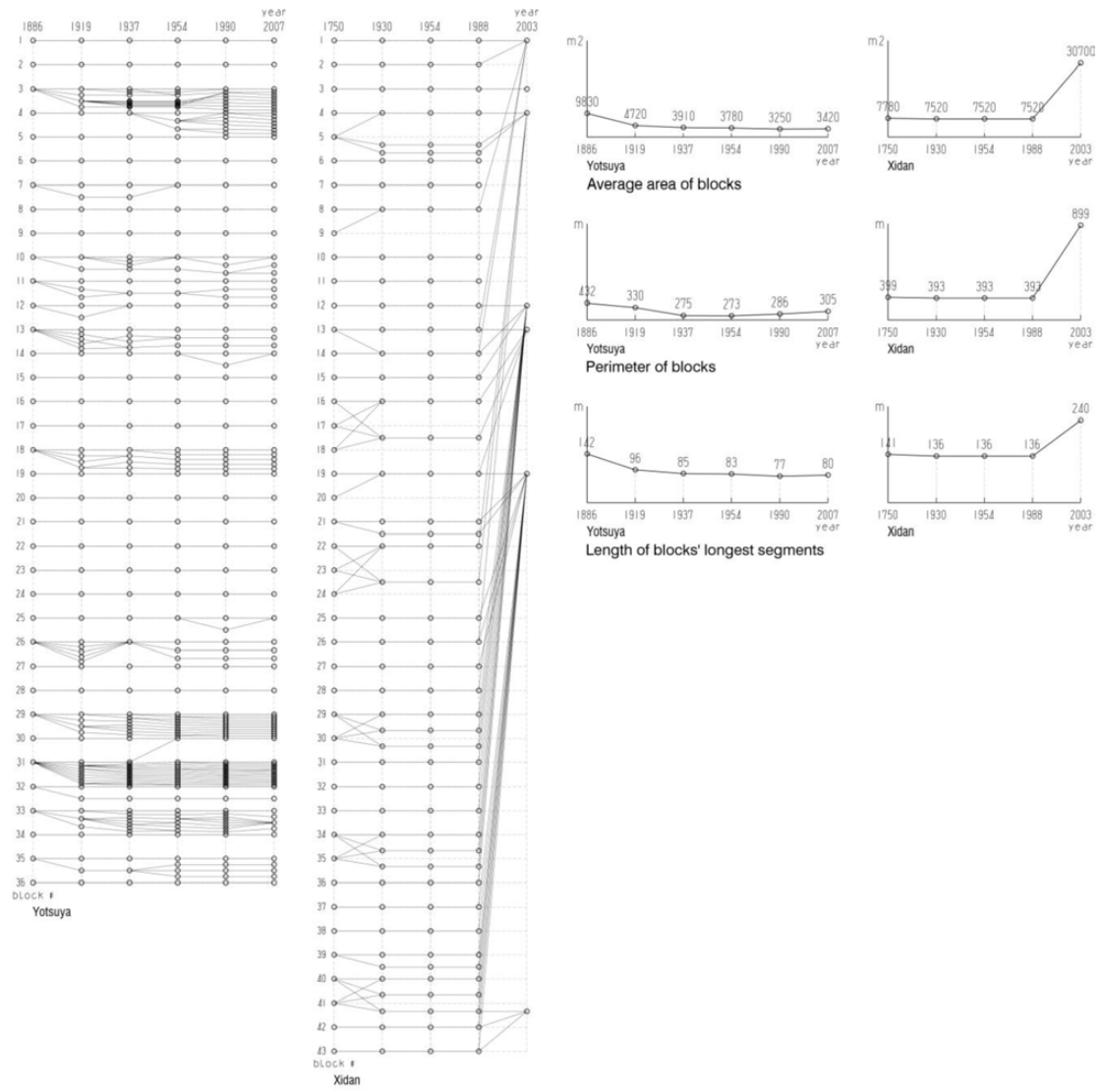
Fragmentation and consolidationg pattern

Evolution of block pattern
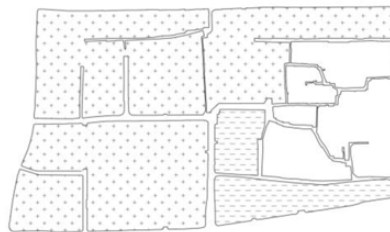
Mapping of block transformation

relationship with the city, and the connection was discouraged with gated communities being built one after another.

Evolution of block pattern

The most obvious regularity in this section is that Yotsuya underwent a constantly and progressively changing process dominated by fragmentation, while Xidan blocks seem to be less active until 1988, after which time massive consolidation took place (Figure 2). The current block layout in Yotsuya is the result of various adjustments on the original layout, which makes the area more adaptable to emerging events (Figure 2). Gigantic differentiation could be observed in the average area of blocks after 2000: the number of Yotsuya is 3420 m^2, while the number of Xidan, 30700m^2, is in another magnitude (Figure 2).

The accumulation of blocks' perimeter at Yotsuya increased enormously, indicating the area grew better anchored with the city. Larger interface of blocks provides greater potential for a diversified variety of functions to develop over time, which contributes to a sustainable neighborhood better interacted with surrounding urban context. The decrease of blocks' perimeter at Xidan suggests the area turned monotonous and isolated over time since 1988 (Figure 2).

Reduction of longest segment's length at Yotsuya implies that, the area is getting less obstructive in the busy inner city, and providing better accessibility for local residents. The increase at Xidan shows that closed communities built after 1988 separates the urban space to a large extent and produces inconvenience for people outside the communities (Figure 2).

Evolution of plot layout

Continuous plots running through the case study area are selected here to reveal the human scale along streets (Figure 3). Diagrams infer that Yotsuya has maintained a finer scale in the blocks. Actually the historic modules planned in Edo period could still be distinguished at many segments (Hidenobu, 1995) (especially around the low-ranking warrior's habitation in the middle area), which sticks to the history of the area. Scales of different ages overlaps with each other, adding to the uniqueness of the place. The inheritance of plot scale implies another possibility of preserving the historic atmosphere other than keeping authentic buildings. Unfortunately the random scales along streets in Xidan area disrupt the sequence of walking through the area, and there is also no clear relationship between today's scale and historic scale. The drastic contrast between scales of different ages not only tells the shift of perception, but also implies the loss of historic information.

Evolution of building typology

The evolution process of building typology at Yotsuya demonstrates that, although no historic authentic buildings are preserved or rebuilt, and no building types were directly inherited from the Edo period, the area managed to maintain a role similar to what it played in the past and uphold diversified interactions with its context (Figure 4).

Back in the Edo period, the Yotusya blocks comprised feudal lord's land, low-ranking samurais' residence, and commercial-residential buildings accommodating merchants' and artisans' family based business (Figure 4). As a result of the rigid hierarchy of social classes, three types of buildings were clearly assembled and divided: feudal lord's manor occupied a small hill in the west; commercial-residential buildings densely aligned main streets; and orderly planned samurai residences covered the middle. The blocks not only served as residential area of different classes, but also attracting users and visitors through an abundant number of professions and trades.

By 2007, the clear-fringed layout had been taken over by a highly mixed-up pattern of different building types. And brand new types such as highrise office building were constructed on the peripheries bounded by main trunk roads. Yet parallel function clusters could still be noted: the central part, where used to be samurai's residential area, became occupied by detached houses and collective houses; commercial area along Shinjuku-dori in the south is featured by restaurants, bars and office buildings today; for-

Figure 3. Evolution of plot scale.
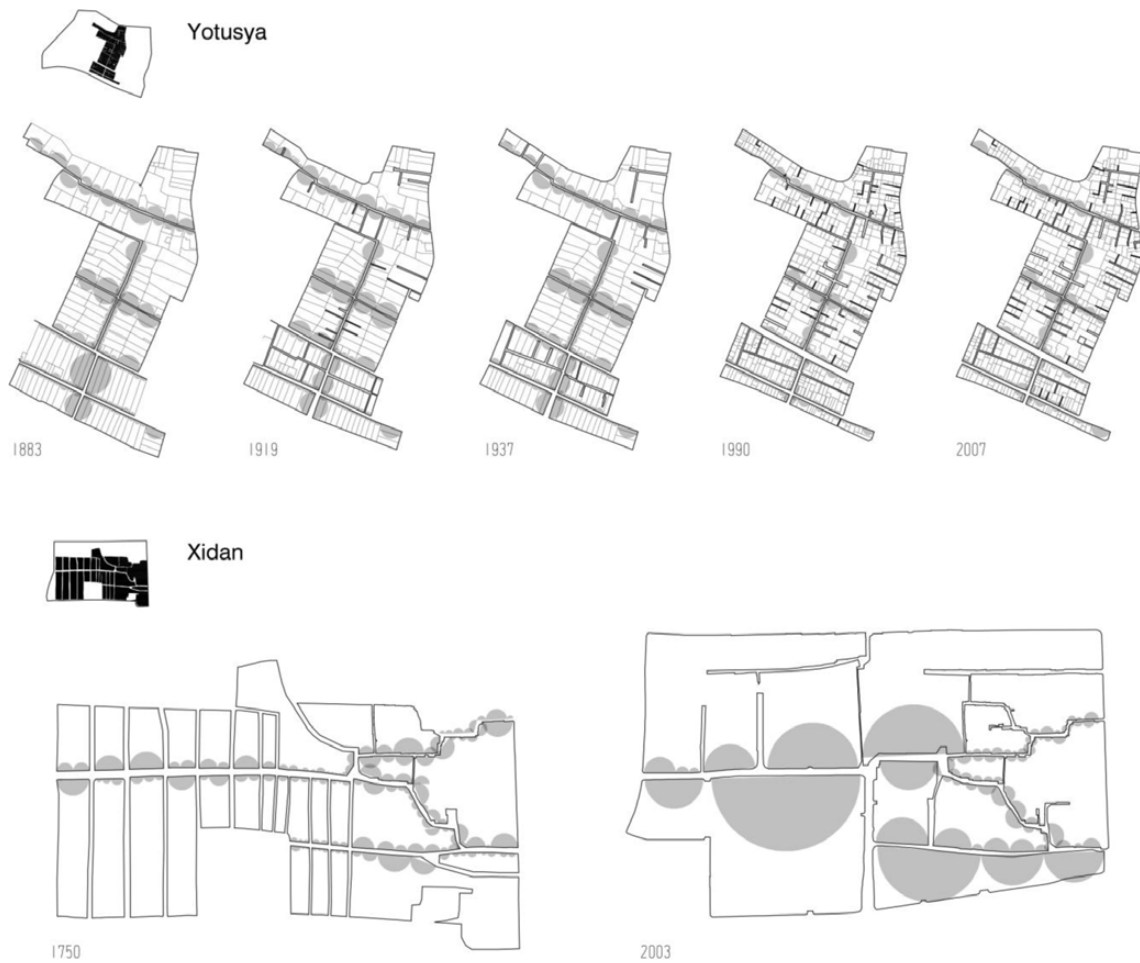
mer Daimyo's property was converted into a mixture of fine grained restaurants, bars and housing.

With scales being largely preserved in Yotsuya, traditional building types were totally replaced and modernized to accommodate higher density and contemporary lifestyles: new residential building types were developed to appropriately and comfortably house core families and bachelordom which make up the majority of contemporary social structure; replacing former shops and ateliers, the restaurants and bars continue to attract not only local people but also foreigners today. In doing so, the area is still livable for residents and attractive for external users.

Xidan area witnessed a polarization in its evolving, in which the west half was developed into gated communities, and the east half generally inherited quadrangles by adding unplanned modifications. The isolation between these two parts is, indeed, a miniature of the whole Beijing old city area. Based on that, homogenized architecture types and centralized function clusters wiped out the rich characters of the area.

It could be observed that at initial stage Xidan area consisted of quadrangles of similar width and layout, which only varies in Jin (numbers of courtyards in longitude direction). Although few documents marking the usage could be originated, a general knowledge of usage is identifiable referring to the diagram-like 1750 Complete Map of Peking and Wanshoushengdianchuji: Quadrangles with facades facing the street were adopted as commercial-residential units of merchants and artisans, and those with facades only facing the courtyard were solely for residing. Names of streets (e.g. Nanqianzhang Hutong got name for Tofu production, Kuache Hutong is for carriage manufacturing), also give

city as organism | new visions for urban life

Figure 4. Evolution of building typology.

Distribution of Building Types at Xidan Area

Xidan (1750)

Xidan (2003)

Building Types in 1750

Residential Quadrangle   Commercial-residential Quadrangle   Temple

Vacant Lot

Unknown (Due to Damage of Historic Maps)

Building Types in 2003

Dazayuan   Historic Authentic Building as Museums   Multi-storey Office Building / Hotel   Multi-storey Apartment Building (in Gated Communities)   High-rise Office Building   Vacant Lot (Under Construction)
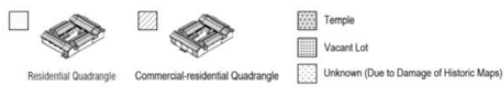
Distribution of Building Types at Yotsuya

Yotsuya (1886)

Yotsuya (2007)

Building Types in 1886

Commercial-residential Building   Low-ranking Samurais' Residence   Daimyo's Property   Temple

Building Types in 2007

Detached House

Temple

Vacant Lot

Park

Parking Building   Multi-storey Apartment Building   "Biru"   School and Factory   High-rise Hotel and Office Building
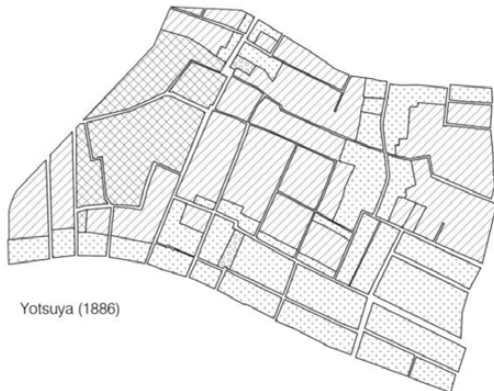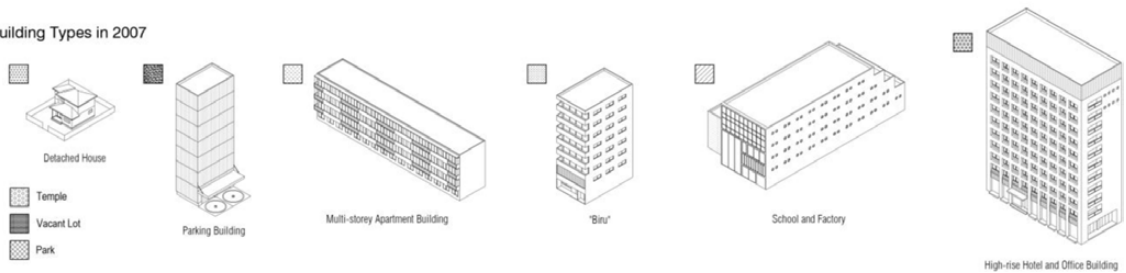
clue for the varied occupations in the area. With most parts covered by commercial-residential quadrangles, the area provided a variety of daily necessities, making it an inevitable part of citizens' life in old Beijing inner city.

By 2003 the area was predominantly occupied by residential buildings except for a few office buildings and schools. Besides it broke into two halves. Totally breaking away from the traditional courtyards, the west was developed into some of the earliest gated communities in Beijing after demolishing existing neighborhoods. Apartment buildings stand as close as possible in these communities, with the distance controlled by a building code of sunlight hours. Being less reactive to emerging events, the east became dominated by Dazayuan, which basically inherited traditional quadrangle with spontaneous modifications and extensions to accommodate the booming population and family structure changing. The former, although equipped with better construction quality and infrastructure condition, produces closed units that physically and socially separate with the urban context, where the residents lead an isolated life from the surrounding environment. While the latter responds passively to the deconstruction of extended families and population expansion, as new building types were not introduced or developed, which together with lack of infrastructure renovation had reduced the area to a less livable place. On top of that, houses of great names in history are revived to its original condition as museums. All these types of different scales and architectural languages stand next to each other without any transition, reaching a misfit of big and small, new and old, closed and open.

Due to the centralization and simplification of function clusters, Xidan area lost its rich interactions with the urban context over time, and became less attractive for people not living or working in it. The inert evolution of architecture types brings issues of physical livability in contemporary era, whereas the leap of architecture types harms the continuity of historic townscape. Moreover, the patchwork of these two poles, which could be found all over Beijing old city, gives rise to disorders both spatially and chronologically.

Conclusion

Yotsuya case study area maintained a variety of interactions with the city, as well as its historic atmosphere by maintenance and gradual improvement of its street system, block layout, and plot scale. On that basis, emerging architecture types ensured each part to function well in contemporary age. In Xidan case study area, to renew and to preserve tend to be independent aspects as fossil and mutation confront each other from place to place. The area lost its rich characters over time with the deconstruction of traditional streets, block and plots. A collage of half leaping and half stagnant architecture types not only gave rise to livability issues, but also blurred the meaning of old and new.

This research argues that the renewal of historic blocks in Beijing inner city is above all based upon acknowledging them as an organic constituent of the city, which would prevent the area jumping out of the urban context. Secondly, renewal and preservation efforts should complement each other, and be conducted hand in hand to prevent fossilized historical blocks. Then concrete and systemic strategies at larger scales, including street system, block, plot layout and architecture type should be made prior to single buildings:

1) Streets not only function as a transportation system, but also form a natural transition between the city and buildings inside blocks. They are the basic framework of urban space of an area and precious carriers of history. Street system should be gradually refined to provide persistent convenient transportation, as well as organic inter gradation between public and private.
2) Blocks should be well planned to provide better accessibility for local residents, and more importantly offer more possibilities for an area to interact with the city.
3) Scales of plots should be controlled to keep the blocks friendly at human scale, which also helps to maintain the historic fabric of an area.
4) Prior to renovation or rebuild of historic buildings, an initiative upgrade of building types should be undertaken in responding to the new lifestyles of the society, which adapts the area to the changing urban context and needs of contemporary lifestyles.

References

Caniggia, G. and Maffei, G. L. (1979) *Architectural composition and building typology: Interpreting basic building* (Alinea, Firenze).

Caliskan, O. and Marshall, S. (2011) 'Urban morphology and design: Introduction', *Built Environment* 37, 381-92.

Conzen, M. R. G. (1960) *Alnwick, Northumberland: A study in Town Plan Analysis*, Publication no. 27 (Institute of British Geographers, London).

Hidenobu, J. (1995) *Tokyo, a spatial anthropology* (University of California Press, Berkeley and Los Angles, California).

Kropf, K. (2014) ' Ambiguity in the definition of built form', *Urban Morphology* 18(1), 41-57.

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Figure follows type. Notes above contemporary project in compact urban fabric

Manuela Raitano
DiAP Department of Architecture and design, "Sapienza" University of Rome, 53 A, via Gramsci, 00197, Rome, Italy
Keywords: Rome, Compact fabric, Type, Form, Figure

Abstract

Working inside a compact urban fabric is a challenge for contemporary architects. It means to define the identity of urban spaces through the differentiation of vertical surfaces, emphasizing the individual character of the façade of each single building. Otherwise, working in low density areas means to define the identity of urban spaces through the differentiation of the shape of the horizontal surfaces, emphasizing the expressiveness of the planimetric figure.

If we only think about Rome, we can notice that the figures of the most famous districts realized after World War II, they all look like very different, as if every architect would design a logo to distinguish his authorial work from another. Settlements such as Tuscolano (Muratori, Libera, De Renzi), Casilino (Quaroni) or Decima (Libera, Moretti) realize different urban patterns, so first image that comes to mind is the floor plan. As Purini writes, the view from above comes to be a real fifth façade and become so prominent to overshadow the visible parts of vertical planes.

Conversely, working at the architectural scale designing façade plan, it is the specific theme of compact urban fabric. This means to experience with the vertical surface, which can be regarded as a plane-surface, or as an area with a thickness.

Therefore, the paper will try to demonstrate how contemporary architecture in compact cities (historic/consolidated cities) is forced to establish a direct relationship between type and figure, jumping totally the moment of the definition of the form.

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Urban fabric in the city of Rome

Nowadays, Rome represents a sort of impressive *collage city*. The reasons of this particular *forma urbis* can be understood retracing quickly some steps of the city growth process.

After the unification (1870) Rome had to absorb masses of employees who asked new houses; but had also to equip itself with the structures for the new national government. Facing this double priority, it was decided to put the accent on the second one, emphasizing the rhetorical role of guide of the newborn Kingdom of Italy, without starting a real modernization process (Insolera, 1962; Vidotto, 2001). As a consequence, in the late nineteenth century Rome didn't consider residential fabric as a foreground element, unlike what happened in other European cities such as Barcelona (plan Cerdà, 1858); or in other Italian city such as Turin (piano Antonelli, 1852), Bari (piano Trotti, 1867) or Milan (piano Beruto, 1889).

As a matter of facts, in the 1883 Rome city plan (piano Viviani) as in the following 1909 plan (piano Saint Just), the form of the city is planned like a sort of efflorescence: a series of regular urban textures interspersed by the vast emptiness of the historic *villas*. Indeed, it was precisely the presence of these dense wedges of green to avoid these residential fabrics may fuse along the urban circumference. As it happened, for instance, in Milan, where new districts were planned like a sort of carapace around the old core of the city.

In Rome, the presence of the natural element has been so relevant, to direct the growth of the city. Indeed, Rome grew not following an unitary design, but adjoining independent parts along the *consolari* roads. In this context, each residential district had its own scale, its rules, its shape and so on; while urban policies, accentuating themes of rhetorical nature, gave further impetus to this way of planning the city by juxtaposing in a paratactic manner independent fabric.

As a result, looking at a contemporary aerial view of Rome, we can see the compact post-unification districts interlacing with the many shapes of modern public neighborhoods, parted by the voids of huge *parks* and *villas*. Among all these, repeated as a sort of stamp, stay huge fields of the so-called *palazzine romane*.

Thus Rome, although growing in dimension, retained a *forma urbis* featured by an interesting balance of low density part of city, characterized by voids, with high density ones, characterized by urban compactness.

We can take as example the northern sector of the city, because it includes all types of fabric that compose Rome contemporary's *forma urbis collage*: in the south part, a piece of the inner historical city faces a dense fabric built in late eighteenth century, made of residential/office blocks; then, from east to west, the compact intensive high rise fabric of Flaminio district and the modern district of Villaggio Olimpico (Libera and Moretti, 1960) face each other; between them stands a line of *palazzine*; this type characterize also the hill of Parioli, in the south/western part. Then a massive, important, natural element as the *villa Glori* hill arrests the urbanization and many outstanding architectural buildings (such as the Piano auditorium, the Hadid *Maxxi*, or the Nervi Stadium and *palazzetto*) conclude this micro scale *collage-city*.

In this context, the juxtaposition of Villaggio Olimpico and Flaminio describes two antithetical models for building up the city: "the one an accumulations of solids in largely unmanipulated void, the other an accumulation of voids in largely unmanipulated solid" (Rowe and Koetter, 1978). They synthesize the contrast between two different ideas of urban growth: the first one, proper of public commitioning, free from speculative logic, characterized by the design of its planimetric footprint; the second one, proper of private investors, characterized by the size of its planimetric grid step, certainly not by the planimetric form.

The first model represents what we in Italy use to call *città consolidata*. 'Consolidated' is an adjective that sounds as permanent, settled, steady; it stands for something that has no room to change anymore; a part of city comparable to the historical center for its characteristic of compactness and density, although devoid of its monumental value. By the other side, we use to refer to the second model calling it *città moderna*, referring to its language rather than to its rules. But, if we try to look at both models by the point of view of their physical consistence, we simply will call them 'discontinuous' rather than 'compact'.

Figure 1. Four types of urban growth. Bari, Turin (above); Milan and Rome (below); (source: author).

Discontinuous fabric *vs* compact fabric

In Rome, the distance between these two ideas of city is stellar. In no other Italian city the modern social housing neighborhoods were characterized by a such intense volition to design an impressive rooftop view. The cultural influences of the Scandinavian coeval researches, joint to the wish to give a proper identity to any single settlement, brought to emphasize the expressiveness of the planimetric view trough the differentiation and declination of many kinds of shapes. As a proof, you can see the panel showed in an exhibition held in Ara Pacis Museum in 2011 (supervised by Piero O. Rossi and F. Castelli) now exhibited on the floor of our Department as a sort of big carpet: there you can distinguish in grey the whole city of Rome in which arise, marked in orange, the many profiles of public residential neighborhood. But I think that, even in black and white, would all be easily distinguishable from each other due to the clear differences of their respective shapes.

So, proceeding in chronological order, passing from INA Casa management, to INCIS, till IACP direction, in neighborhoods such as Tuscolano II (Libera and De Renzi, 1952/1956), Decima (Moretti, 1961), Casilino 23 (Quaroni, 1962/1964) or Vigne Nuove (Passarelli, Lambertucci, 1972/1975) the first image that comes to mind is the profile of their horizontal layout. This layout, as an heraldic arms, comes to identify the settlement with the communicative synthesis of a *logo*.

To the other side, residential intensive blocks, having to respond to a speculative, capitalistic logic, occupy the entire lots touching the edge of their perimeter: they form a sort of *carpet layout* characterized by planimetric uniformity, trough the aforementioned category of compactness. An attribute, the latter, that can be extended from Rome historical fabric to all that parts of city built up between the end of the nineteenth century and the beginning of the last century. Parts of town where the aerial view isn't so communicative, being conceived as an undifferentiated pattern. In this kind of fabric, only the architectonic quality can redeem the identity of the urban places.

Figure 2. From east to west, compact fabric and discontinuous fabric in Flaminio district in Rome (source: author).
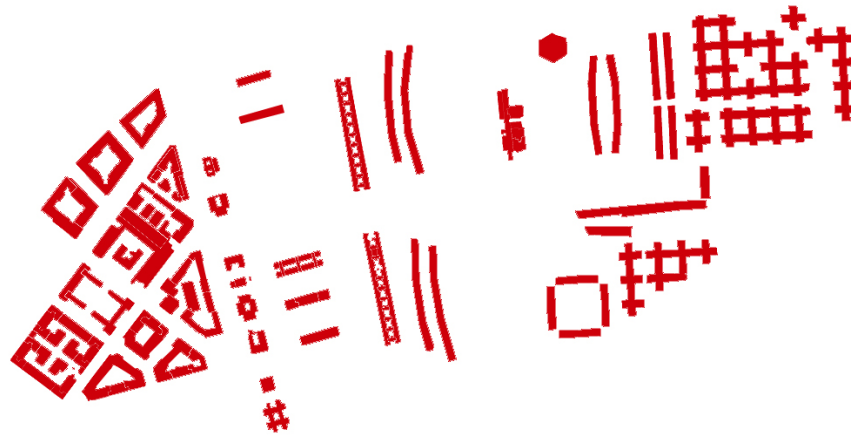
So, we can say that in discontinuous patterns the identity of a place is managed mainly at urban scale, while in compact fabric identity is managed mainly at architectonic scale.

This implies a corollary: to any different kind of fabric corresponds a different way of conceiving the relationship between type, function and form.

Type, form and figure

First of all, we must now specify what we intend here for type. We call type that special "distribution and conformation principle, to use with the widest freedom" (Quaroni, 1985).

We don't intend type as "a collection of geometrical, technical and historical data which forms the basis of every project" (Rossi, 1985).

To be clear, we don't mind about quantitative data, we mind about that special relationship between programs, regulations, habits, natural conditions and so on, who all contribute to conform that transmissible principle of settlement that we use to call 'type'.

So, in compact fabric the size of the lot, as well the ratio between lot/street dimensions, are the starting point for every project. Then, urban morphology will be defined following a deductive process that descends from type (De Solà-Morales, 1978).

In this context, residential intensive city blocks can be considered the most diffuse type that constitute compact fabric (in Rome as in other European city). It's a type able to conform all principle of the speculative edification proper of private investors. It maximizes the cubature in relationship to urbanistic rules and to the form of the lot. By the other side, this kind of edification doesn't allow to conform residential fabric who presents high levels of comfort (difficulties in natural ventilation and lighting are the other side of the compactness). Now, this is the task of contemporary architecture in compact fabric: to modify, infill, complete or substitute part of this fabric without undermining their compactness, but solving their weaknesses.

Returning to the analysis, looking at them by a distributive point of view, city blocks differentiate in two main categories: first one, typical of historic city, is constituted of series of independent units served each by a single staircase (*row houses*); second one, typical of modern blocks, is constituted by a distribution of two or more apartments around a common staircase, similarly to what happen in a section of linear housing. In both case the distributive model doesn't impact to the shape of the block, that remains unitary, as compact as possible. Differently to what happens in modern figuration, in which every principle has got its own formal expression.

So, first of all, we can say that type does not have repercussion on the shape. Form does not follow type, nor function.

On the other hand, we can affirm that the first category (*row houses* aggregation),

Figure 3. Urban design for 'città moderna' in Rome. Tuscolano, Decima (above); Casilino, Vigne Nuove (below); (source: author).
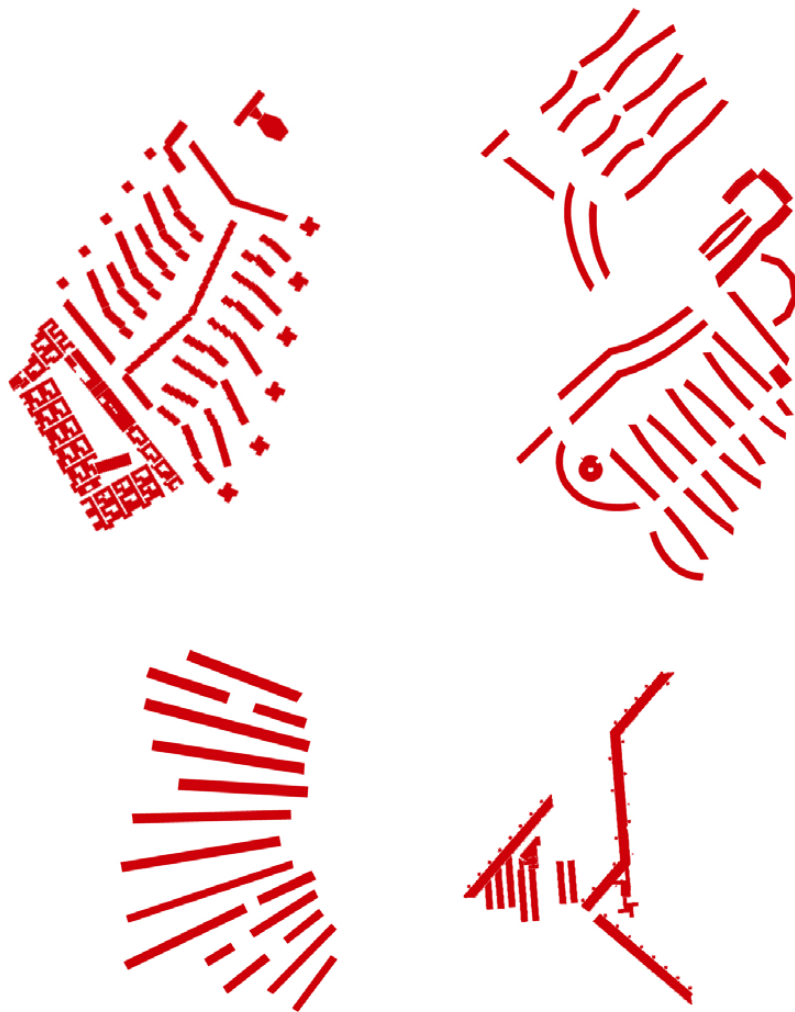
typical of historic fabric, conduce to a more fragmented image, in which every single independent part declines its own small part of façade; while the second model (apartment houses) is typical of modern expansion and conduce to a strongly unitary image, often monumental, in which every single part aims to belong to a whole. The difference is clearly readable comparing any historic block with, for instance, the magniloquent scale of *umbertini* blocks in piazza Vittorio (conceived in form of *Palazzo*).

Thus, secondly, we can affirm that in compact urban fabric type has got repercussion directly on architectonic scale and image. Figure follows type.

To be clear, every time an architect must set his work into a defined grid, following the perimeter of an urban lot and obeying to the rules of the maximum cubage, he has to cut off the problem of the definition of the form, being the plastic defined - obviously with good approximation - by the ratio between the shape of the lot and the maximum permissible height. In this manner, he comes directly to 'formalization', or the process that conduce to give a peculiar image to an established form.

Therefore, if we can not translate type and program in a form, where is the architectural invention? Does the architect play the role of the mere decorator?

In my opinion, if we figure as pure decoration the inventive role of the architect in compact fabric, we reproduce the same error made by a great part of modern architects who, with a moralist point of view, were often disinterested to work in pre-existent

Figure 4. Four different figuration for urban vertical surfaces (source: author).
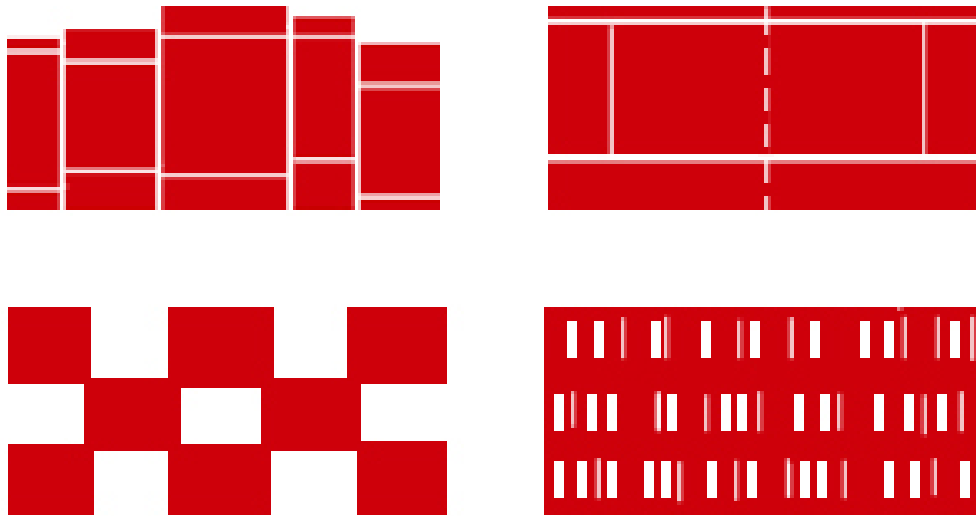
parts of cities, being interested only to new part of towns. Nowadays, the time to expand the city is over, so the problem to rehabilitate entire parts of consolidated city is urgent. Inner historic core cannot become an open air museum, as well other intensive districts need now to be retrained.

From Modern to Contemporary: strategy for compact urban fabric

But is it true to affirm that modernity was completely disinterested in this kind of topic? If we consider Le Corbusier work, we can understand how he tried to give an answer also to the problem of the edification in the form of the block. *Immeuble villa* could be the paradigmatic manner to operate, if only it had been realized.

Indeed, we can consider *Immeuble villa* as a sort of lost icon of modernity. It had a minor echo than *Unitè d'habitatiòn* just because it was never realized directly by its inventor: we can count five physical incarnations of *Unitè* realized between France and Berlin, so this model had such a big impact with the critics to flatten the modern idea of town on itself. Conversely, the façades of the *Immeuble villa*, continuously alternating solids and voids, show another way for the modern city. Finally, it's a way of building the city still marking the difference between inside and outside: a difference that is characteristic, in summary, of compact fabric city blocks.

Yet, through the idea of urban villas superimposed (an idea reminiscent of monastic Italian architecture), Le Corbusier realized in *Immeuble villa* a visual permeability, as well good hygienic conditions, that the block of nineteenth century did not allow. He brought the nature directly on the vertical plan of the building, though it's of course a mineralized nature. So, *Immeuble villa* is the example who helps us to restore that fatal fracture that separated the theme of city block from the researches of modernity.

In fact, I think a line of continuity is possible; this is a statement which may seem strange only if we continue to fall into the critical ambiguity that conceive this two models of city trivially opposites: the compact city, made of directionally oriented *rue corridor* and the modern city, made of isolated *Unitè* resting in an isotropic space. Actually, the modern movement - via the hand of Le Corbusier - had already found the key to 'redeem' the type of block from its original sin, that is his excessive introversion. It was not else but open the can of tuna!

Immeuble villa shows us a strategy of porosity who tries to exceed the absolute limit of the façade vertical plan, to bring the inside outside, involving the urban space in the core of residential block and vice versa.

Finally, let's return to the case study of Rome. We never have to forget that the ability to draw impressive footprints of urban spaces, differentiating their planimetric parts and defining them hierarchically, is a central point of our identity as Italian architects; however, in this specific skill there is also a downside: in Rome modern planning the planimetric system approached to bidimensional values, putting the focus on rooftop shape; in this way, as Purini wrote, the view from above came to be the real fifth façade and became so prominent to overshadow the visible parts of vertical planes (Purini, 1981). Now, if it led certainly to qualified urban researches, it didn't lead to equally qualified researches at architectural scale. If in the Olympic Village (correctly in my opinion), the architectural scale is solved using an unifying gesture (ribbon windows and yellow bricks), in other cases have been used etymons that re-evoke anti-urban environments. Coming, sometimes, to a trivialization of the issues of tradition in architecture.

Conversely in compact buildings, as we already said, we do not pass for a process of definition of form but we land directly on a process of formalization, that means to define the figure of the lot working on the two-dimensional plane of the façade. It is a matter of figure, not anymore a matter of form, intending the figuration as the process which adds descriptive content to form.

So, working at the architectural scale, designing vertical surfaces, it is the specific theme of compact urban fabric. Finally, we can distinguish two ways to work on urban façades in history of architecture:
- vertical surface as an addition of parts / use: residential / type: row houses / figure: differentiation and identity / small scale.
- vertical surface as unitary design / use: both residential and public buildings / type: *Palazzo* as well apartments block / figure: unity and symmetry / large scale.

Contemporary architects are making interesting experiments with this topic, which can be synthesized in further two ways:
- vertical surface as a texture / use: prevalent residential buildings / type: housing as well multi-purpose buildings / figure: motion and vibrations / medium or large scale
- vertical surface as an interface / use: both residential and public buildings / type: housing as well hybrid buildings / figure: stratification and layering / medium scale.

In both instances, the common denominator of contemporary researches is the same: the cancellation of the domestic scale of the window, that can be read as a part of a wider scale composition, not as an individual element. In first case, the window disappears in the rhythm of colored panels facade or it is so repeated such as to seem a continuous needlework laid down on vertical plan; in second case, façade is an area with a thickness and windows are hidden behind the shadows of *loggias* if not behind *brise soleil* self-moving elements, or rather are embedded in hanging frames (perhaps reminiscing the research of Giuseppe Terragni in Casa Rustici and other works).

All we said is at the opposite of the post-unification manner of treating the block, when in Rome and generally in Italy prevailed uniformity and monumental scale, differently to what happened in Barcelona, where Cerdà lots were variously declined in small sections (*casa Batllò* is an example). This monumental approach in the city of Rome is the main reason of the ostracism that suffered this design issue, still considered anti-modern. With the consequence of the overcoming of the *palazzina* model.

Now, I want to conclude remembering that in Italian language we use the word *isolato* to describe the city blocks. As you can see, the etymology comes from the latin word *insula*. Thus the block of houses can overcome the status that comes from its etymological root of *insula* and become rather a *peninsula*, tightening ties with what it has around, opening up its ground zero spaces, hosting in the core of the block, why not, also public functions and defining the identity of urban places through the differentiation of its façades: vertical porosity or stratification one hand, emphasis on 'individual character' of the single part, on the other hand.

In this way, citing Serlio, a city shaped as a 'tragic scene' (closed, rhetorical and monumental) will pass, using the same type of building – but revised in a 2.0 version – in a city shaped like a 'comedy scene', that is anti-rhetorical and episodic, more suited to contemporary lifestyles.

References

AA.VV. (1999) 'The dense city. Dopo la dispersione. After the sprawl', in *Lotus Quaderni Documents*, 22.
AA.VV. (2003) 'Densità, infill, assemblage', in *Lotus International*, 117.
AA.VV. (2007) 'Housing differentiation', in *Lotus International*, 132.
Bandini M. (1992) 'Some architectural approaches to urban form', in J. W. R. Whitehand, Peter J. Larkham (a cura di), *Urban Landscapes. International Perspectives* (London).
Corbellini G. (1990) *Uniformità e variazione. Lo spazio urbano nei quartieri contemporanei*, (Venezia).
De Solà Morales M. (1978) 'Verso una definizione. Analisi delle espansioni urbane dell'800', in 'Il quartiere come forma urbana', in *Lotus International*, 19.
Insolera I. (I ed.) (1962) *Roma Moderna* (Roma).
Quaroni L. (1985) 'Dieci opinioni sul tipo', in *Casabella*, 509-510.
Purini F. (1981) *Luogo e Progetto* (Roma).
Rossi A. (1985) 'Dieci opinioni sul tipo', in *Casabella*, 509-510.
Rowe C. e Koetter F. (ed.)(1978) *Collage City* (Cambridge University Press).
Vidotto V. (ed.)(2001) *Roma Contemporanea* (Roma).

Chiaramonte Gulfi, an experience of urban morphology

Renato Capozzi
Dipartimento di Architettura, Università di Napoli "Federico II", Naples, Italy
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Abstract

The paper illustrates a design experience for the city of Chiaramonte Gulfi,during the International Laboratory of Architecture_LId'A coordinated by Laura Thermes. In one of the laboratories –directed by the author with Federica Visconti and in relation to those coordinated by Carlo Moccia and Marco Mannino– the teamworked on the redefinition of a "wall belt". It was determined by the construction of a continuous strip in relationship to agricultural divisions and peri-urban plots during the seventies. The huge strip determined, on one hand, a new "urban artifact"(Rossi, 1966) of morphological value – even if of limited architectural value –as a kind of town walls to the ancient city, on the other it opposed the typical nebulized growth of sprawl-city. The project aims to propose a comprehensive reformulation for this wall, working in the significant points, highlighting discontinuities and openings to the landscape and establishingnew relationships between the valley and the perched character - as in an acropolis - of the medieval center, reentering portions of nature still existing in the urban fabric. The project combinestwo ways of composition, the stereotomic and the tectonic and develops the theme of the bastion corresponding to a hiatus of building curtain proposing a new condition overlooking open to the vision of the landscape of the Comisovalley and simultaneously founding itself as one of the elements of a distinctive and interconnected system of "places"able to establish long distance relationships (Monestiroli, 1998 – Giedion 1969) and summarize the whole urban morphology and geography of Chiaramonte.

Keeping your eyes open is not enough to see a city is. First you must discard everything that obscures its sight, all the received ideas, the preconceived images that continue to clutter the visual field and the ability to understand. Then you must learn to simplify, reduce to those that are essential the enormous number of elements that the city put under the eyes of the beholder every second, and connect the scattered fragments in an analytical design and unified whole, like the diagram of a machine, from which you can understand how it works [...]The ancients represented the spirit of the city, with a certain vagueness and precision involved in this operation, evoking the names of the gods who had presided at its foundation: names that were correspondent to personifications of attitudes of the vital human behaviour and should ensure the profound city vocation, or personifications of environmental elements, a stream, a contour, a type of vegetation, which should ensure its continuation as an image through all the successive transformations, as an aesthetic form but also as a symbol of the ideal society. A city can go through catastrophes and dark ages, can see different races succession in its houses, can see its houses changing stone by stone, but it must, at the right time, in various forms, finds once again its gods. - Italo Calvino

Introduction

This paper is aimed to describe a project for the city of Chiaramonte Gulfi elaborated during the International Laboratory of Architecture_LId'A coordinated by Laura Thermes. In one of the laboratories – directed by the author with Federica Visconti and coordinated to those by Carlo Moccia and Marco Mannino – the team worked on the redefinition of the "city walls". Over the 1970s, it resulted from the construction of a continuous line of buildings in relationship to agricultural divisions and peri-urban plots. The thin strip determined, on one hand, a new "urban artifact" of morphological value – even if of less architectural value – as a kind of city walls of the ancient city, and, on the other, it opposed the typical nebulized growth of the sprawl-city. The project aims to propose a comprehensive reformulation for this wall, working in some of the significant places, highlighting discontinuities, openings the city to the landscape and establishing new relationships between the Comiso's plain below and the perched character – like in the acropolis – of the medieval centre, re-entering portions of nature still existing in the urban fabric. The project combines two ways of architectural composition, the stereotomic and the tectonic, and develops the theme of the bastion corresponding to a hiatus of the wall, proposing a new condition overlooking towards the landscape of the Comiso plain and, at the same time, representing an element of a distinctive and interconnected system of "places" able to establish long distance relationships and summarize the whole urban morphology and the geography of Chiaramonte.

Methodology and Forming process

The territory's form: from the Hyblean mountains to the Comiso's plain

As is well known, the form of the land, its whole natural geography and the hydrographical system largely determine both the position and the nature of the settlements that are located in it. The plateau of the Iblei Mountains and its typical slope towards the Comiso's plain characterize and structure the small towns that dot this territory. A territory marked by olive groves, vineyards and the wood on terraced slopes, a plateau built by large cornfields lined by walls of dry stone and measured by manor farms that is really a 'world' that, as Laura Thermes stated, "must be continued to prevent the fact that the speed and pervasiveness of globalization, with their strong ability to homologate, injure the local identities" (Thermes, 2014). A place of convergence of different forms and uses of the land characterized by a complex landscape that, starting from Chiaramonte Gulfi, develops along the Ippari river surrounded by the villages of Comiso, Vittoria, Acate up to the sea. Thus, the chain of the Ibleis (Aa. Vv., 2006) looks like a large amphitheatre, corrugated and opened to the south, dominating the province of Ragusa and the plain

Figure 1. The masterplan with the four interventions.

of Comiso and Vittoria. This system has in Chiaramonte, which is positioned on one of the first layers of the promontory, one of its reference cornerstones, able to dominate at the 668 meters quota above sea level, up to the Arcibessi mountain, the entire south eastern arch of Sicily (Pecora, 1974). It is not a coincidence that the small town is called "the balcony of Sicily" (Cavallaro, 2013) being able to embrace, thanks to its position, a visual spectrum that ranges from Gela to the Etna, from the Erei to Caltagirone, from the Ippari's valley to the sea. The plateau, crossed by the orographic and hydrographical system, presents in many points some headlands like in the case of Chiaramonte that has been elected as place for settlement since ancient times from the Bronze and Iron Age to the peopled centres in the Greek and Hellenistic periods and later in the Roman, Byzantine and Medieval. All the ancient populations confirmed the choice of this exceptional site and its strategic dominance in the system of the hinterland connections. The oldest colony called *Akrillai* (Manfredi, 1996) was founded by the Syracusans at the foot of Chiaramonte's plateau, then destroyed by the Carthaginians and by the Romans, and was founded once again with the name of *Acrillœ* inscribing it in this territorial and geographical system, crossed by the *via Selinuntina* which connected Syracuse, Gela and Agrigento.

Chiaramonte Gulfi: a case study of urban morphology

The settlement of Chiaramonte, after the destruction of Acrillae by the Arabs in 827, was placed, with the name of Gulfi (pleasant land), at the foothills of Arcibessi Mountain, on a headland with a trapezoidal slender shape. After the Sicilian Vespers and the conquest of Angioni (1299) and the complete destruction of Gulfi, the Aragonese count of Modica, Manfredi Chiaramonte, dislocated the surviving population in the "Baglio" nucleus surrounded by walls and dominated by the castle. There were later *extra mœnia* enlargements with the construction of "Burgo" and "Salvatore" neighbourhoods (Morando, 2000). The wall system that contained the district Baglio presented only two entrances to the north and the south: the "Porta di la chaza" and the "Porta di Ragusa". The evolution of the urban core from the first medieval settlement of Baglio (rebuilt on the same land after the 1963 earthquake) characterized by a series of long and narrow

Figure 2. The *bastion* designed by Renato Capozzi and Federica Visconti, planivolumetric.
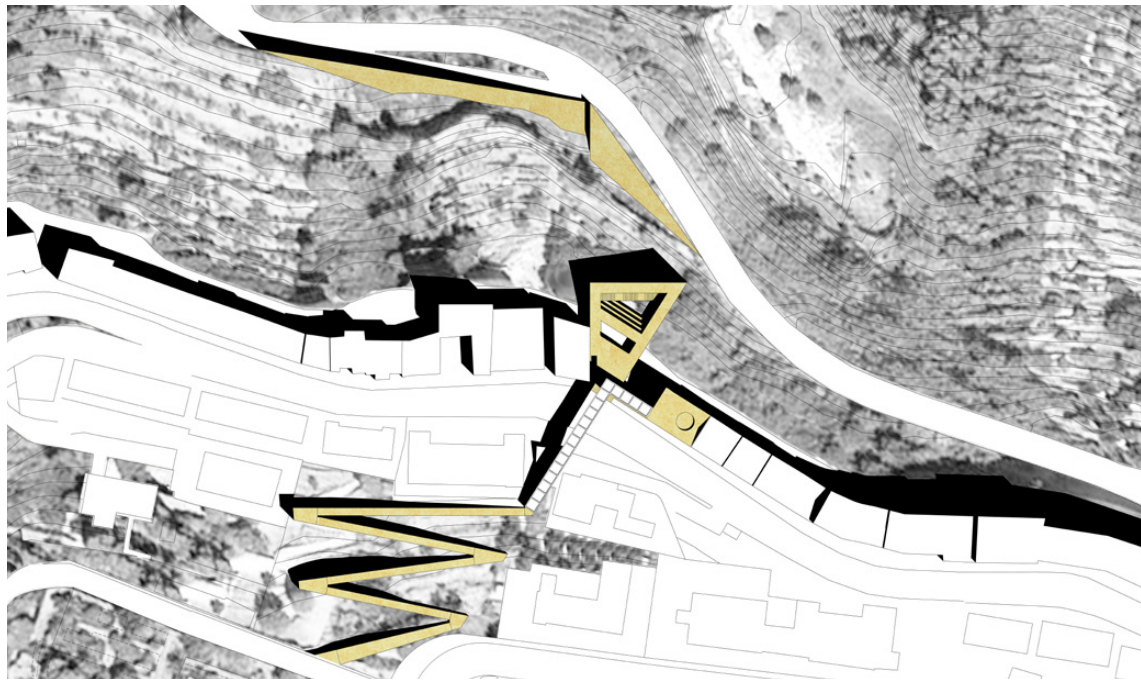
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blocks (Muratori, 1965) articulated on two rows near to the castle and the Church of San Giovanni makes evident that the city was built through morphologically identifiable parts, strictly related to geography and orographic system. The town, after numerous additions that occurred over its history, presents itself as a compact and slender settlement placed on the crest (Muratori, 1967) of the promontory that wrinkles the corrugated terraces of the plateau. Within this compact urban organism, it is possible to identify, in addition to some natural spaces, three urban recognizable parts and an element at the large scale that envelops them. An urban part, defined by a sequence of large public spaces, aristocratic palaces and monastic complexes, is placed near to the original nucleus of the "Baglio", grew up around the castle and related to the presence of the church of San Giovanni, characterized by a clearly legible layout that cleverly exploits the steepness of the soil through roads towards the two ancient ports. On the other hand, it is possible to identify the linear expansion organized along the nineteenth century axis of Corso Umberto that measures the greater extension of the promontory, scattered by civil and burgher houses ending in the public garden. In the twentieth century, the large linear system of the "city-wall", a huge continuous wall is added to these distinctive parts. As Ottavio Amaro writes «Built since the 70s, it is characterized by "line-type" buildings of 5 or 6 floors, changing and somewhat distorting the scale of the existing buildings in a relationship of strong verticalization. From the morphological point of view, it looks like a real limit that measures and contains the old centre, representing an insurmountable limit to the countryside. The relationship of strong frontality linked to the rigidity of the artificial wall is lightened by the natural and continuous sign in the background, characterized by the strip of oaks forest that establishes the boundary between the mountains, the foothills and the line sloping down to the sea" (Amaro, 2014). Thus Chiaramonte, in a kind of "synchronic frame", summarizes different and juxtaposed ideas of city (the medieval, the one of the Renaissance and Baroque and of the nineteenth century) that are all summarized, recognizable and reunited in the second half of the twentieth century by a large primary element that, in his morphological continuity, encircles these distinctive parts proposing an unprecedented overall unity of *forma urbis* compared to the landscape, in this way counteracting the dispersion and fragmentation that are typical of the recent widespread landscapes. As clearly stated Carlo Moccia "Chiaramonte Gulfi is a beautiful

Italian town built on the slopes of the Ibleis. Here there are not extraordinary buildings. The architecture of its churches and its palaces not reach the magnificence of the forms of the Cathedral of Ragusa or of the Scicli's buildings, its houses have an ordinary appearance, sometimes also modest. The beauty of Chiaramonte Gulfi is determined by the form of the city and the relationship that the city determines with the form of the Earth. In the centre of Chiaramonte, churches and convents are built in the right places. The orientation of streets and squares interpret the orographic characteristics of the place: the Corso is aligned with the public garden ending in the place of the big podium from which it is possible to overlook the plain; from the Piazza della Cattedrale we can look to the forest above, beyond the podium-churchyard of San Giovanni. Chiaramonte Gulfi is a city that is not scattered in the landscape but remained definite and recognizable, defined, in its compact form, by the the new "walls" built thirty years ago. It is not important that these modern "city-walls" are made through the combination of repeated ordinary "condominiums". In the open and expanded size of the Comiso's plain, the form of the mountain relief, which is the background of the slightly modelled cultivated countryside, is enhanced by the location of the city acropolis. From the city, situated "in sheer drop over the nature", the look can measure the extent of the plain up to the sea. "(Moccia, 2014). Similarly, Marco Mannino, comparing the condition of Messina and Chiaramonte, underlined that "The uniqueness of the places fixes, for these cities and their territory, a complex relationship between forms of the nature and forms of construction, including the anthropic landscape and conformation of the countryside: the relationship between these two systems is the reason of the beauty of these places. Analysing the topography of the territory and the settlement system, it is evident, both for Messina and Chiaramonte, the complexity of this relationship, it is clear that some monuments take "sense" according to the form of the territory and the city spaces. Looking at Messina from the sea, or reaching Chiaramonte Gulfi, the "landscape" of these places – a landscape that requires the vision of the panorama, but also of a space bordered by the human eye, a part of the territory subtracted from the totality of nature – is suddenly understood: nature and architecture together. I think in these cities it is still possible to read the topographical idea and the "tension" of the Greeks' space". (Mannino, 2014).

The point of view of the project at the city (urban fabric) scale

Starting from these premises and through the recruitment of a city built by recognizable parts, at the same time unitary with the construction of the new, but adequate city-walls, the project, developed as part of the International Laboratory of Architecture for the city of Chiaramonte Gulfi coordinated by Laura Thermes (X LId'A International Laboratory of Architecture, 2014) intended, coordinating with the laboratories directed by Carlo Moccia and Marco Mannino, to work together on the redefinition of a new "city-wall" determined through the reconfiguration of the continuous line of buildings erected in the seventies in relation to the possible re-emersion of the agricultural divisions and peri-urban plots. The project proposes a comprehensive reformulation of this city-walls working in some of the key points of its length, highlighting some discontinuities and openings to the landscape. Moreover, it restores some relationships between the valley, the countryside and the acropolis condition (Monestiroli, 1998) of the consolidated centre including some 'pieces of nature', still present in the urban dynamic. This methodological approach does not pretend to reduce also the boundary wall - resulted in any case from a building speculation - to a process of organic evolution which would complete the process of saturation but it assumed the linear system, in conjunction with the principal monuments, the still existing natural parts and the vast openings to the landscape outside the consolidated core, as the fixed points of a possible new urban dynamic able, on one hand, to counter the incipient senseless dispersion in the plain and, on the other hand, to define, through precise interventions in hiatuses or in the joints of the wall system, new opportunities to overlook and establish distance relationship, through some "urban rooms" arranged between the inside of the city and the outside of the landscape. The wall system, with the planned inserts and the vision and limit devices that they offer,

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renews its role, as basement for the ancient city and, at the same time, becomes the means of the relationship that the city can and has to establish again with its vast natural environment. This is a realist point of view (Monestiroli, 1979 - Capozzi, 2013), therefore, able to select and choose some dialoguing procedures, with the formal aim of reconfiguring the entire town centre and providing it with a new synthetic figure able to renew its relationship with the territory and the hinterland and to provide services and cultural facilities for the historical centre of Chiaramonte. The city is seen, in this way, like the Acropolis and the Greek conception of space (Giedion, 1961 – Mannino, 2014), as a condition where monuments stand out and polarize the settlement structure of the different parts, where the inner nature has the role to distinguish and define these parts and the external nature represents its counterpoint to watch and re-introduce and insinuate the consolidated city, and the boundary wall emphasizes and reiterates the role of embankment *versus* meaningless and rhizomatic homogenizing dispersion of single-family houses - like no structure urban sprawl (Indovina, 2009) - that dots the plain fortunately not yet in a hopeless manner. The general project, as written by Federica Visconti, ultimately "aimed to deal, as a whole, with the refurbishment of the 'walled city', not through limited retrofitting interventions but recognizing the value of basement and *limes* of the city and identifying those points where this relationship could be further clarified [....] for the design of distinctive places of the wall, with different orientations but all able to solve the issue of accessibility from the plain and to represent, on the opposite side, a projection into the landscape" (Visconti, 2014).

Conclusion

The themes: the tower, the bastion, the embankment
    The general project shared by the three groups selected along the length of the wall system some urban architectural themes that were able to point out some specific individuality both in relation to the change of sides and to the corresponding urban parts, identifying three positions that coincided respectively with three buildings named: the *tower*, the *bastion*, the *embankment*. In addition to these projects, placed in sequence to the north, along the city-wall and to the southwest, the three laboratories produced another proposal that, in some way, synthesizes the others in the area of San Vito near to the first medieval core. The *tower* stands as the cornerstone and the beginning of the wall system, measuring through its height the entire thickness of the wall directing it to the pine forest that surrounds the city to the north; the *bastion* takes advantage of a gap in the curtain to propose an unprecedented protention to the plain; the *embankment*, in connection with the geometry and some of the alignments of the southern cusp, measures the different orientation of the promontory in the open side on the area of San Vito that, in the last project, is reconfigured close to the homonymous church to provide an adequate opening to the plain with water courses and, at the same time, to be substructure and base to the oldest part of the city to which is reconnected. The pentagonal *tower* designed by Marco Mannino stands as a new architectural "cornerstone" of the whole system by defining the mixtilinear form starting from the turn of orientation of the contours and the fittings with the neighbouring urban parts. The *tower*, which is rooted to the ground through a further crepidoma that emphasizes changes in the morphology of the ground, contains parking lots and a large spiral ramp that it is independent from the wall mass that presents few horizontal and vertical to the surrounding landscape exalting the stereotomic character. The *bastion*, designed by the author with Federica Visconti and that will be described after in detail, takes advantage of a gap in this new boundary wall to determine a protention outward. Also in this case, the form is determined by the orientation of the contours and of the arrangement of urban plots to achieve a conspicuous place overlooking the plain. Similarly, the *embankment* designed by Carlo Moccia, is placed in a point where there is a significant rotation of the contours producing a fault line between two hillsides. Its form is determined by the interpenetration of two rectangular forms of which one flared in the direction of the cavity that allows the ascent to the Villa Comunale and the other stair in counterslope, both crossed by wide openings

Figure 3. The *bastion*, plants of various underground and above ground levels.
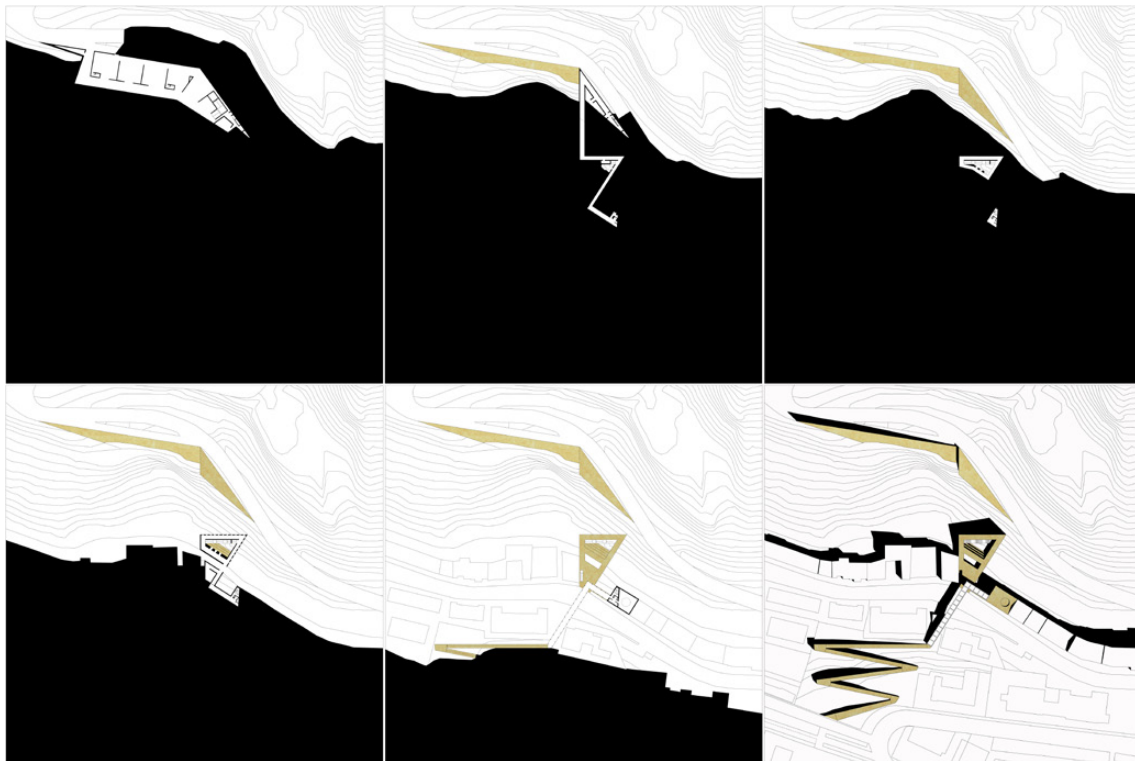
and excavations that host the statue of San Vito protector of the city. Finally, the project for San Vito's area summarizes the issues probed by the three projects reconfiguring the urban field near the homonymous church, today unsolved on a morphological and formal level: too big related to the religious building, without a defined and adequate form, filled only by a fenced playground. Once again, this is a place of extraordinary overlooking characterized by the presence of a church dear to the inhabitants of Chiaramonte. The project aims to define the right measure and form for the churchyard while a wider terrace assumed the form of the field with its ramparts connecting through a ramp system the new public space with the stratified and enveloping the city behind. (Capozzi; Mannino; Moccia; Visconti, 2015). The four projects ultimately assumed and put in common - in addition to the specific ways of representation and drawing – above all some compositional strategies: the conciseness, the finiteness, the massive character, the connection of different quotes from the bottom of the settlement up to its higher parts, the role and relationship with nature. From the point of view of the function – welcoming the many themes offered by the seminar and the related research (Thermes; Amaro, 2013) – the projects also shared the opportunity to equip Chiaramonte with certain facilities related to accessibility (parking along the access road SP8 and climb system through escalators, lifts and stairs) or services for tourists (panoramic terraces, restaurants, accommodation facilities). The intervention of the bastion, as will be described after in this text, reconciles many of these options conjugating both the connection to ample parking at the foot of the promontory and the related ascent to the higher part of the city and the possibility of panoramic views towards the sea, as well as a system of lifts and overpass leading – crossing and valuing a 'piece of nature' still present – at the higher quota dominated by the convent and the Church of Carmel (Cultrera, 2003, 2005). Each intervention, despite specified on a purely architectural way, had the ambition to determine the location and the form of a new morphological arrangement able of enhancing the role of the news walls, really as an "urban artifact" (Rossi, 1966) and, at the same time, selecting as counterpoint, its main points, the gaps, the openings, the endings, the singularities.

Indeed, as Aldo Rossi reminded us "the territory and the cities are built through defined facts, a house, a bridge, a road, a forest. All these facts constitute the city and the territory and there is the integrated design of some of these facts".

The architectural choices for the bastion: character and construction

The project of the bastion – that here will be specifically described – is placed in a middle position related to the development of the the Palazzata in the point where it is still possible to identify the structure of the lots originally intended to peri-urban vegetable gardens for citizens living in the city centre. As was previously seen, line buildings combined on a steep slope that, as a whole, produced a continuous and impenetrable curtain strip that surrounded one of the terraces of the consolidated centre, occupied these lots, thanks to a building liberalization allowed by regional law. The place of the project is located in the only "interruption" of this continuous system where you it is possible to find out the view to the landscape of the plain to the sea. The positional condition, the complex orographic stratigraphy and the irregular geometry of the plot influenced the main choices of the project both in terms of composition and of expression and character. The main difficulty of the project, in other words, consisted in finding appropriate and proper forms able to describe the different parts related to their topological condition and clear explanation of the relationship systems that each of them established with the other related to the acclive morphology of the places. A "confined and conditioned" project within a narrow bounds, but that could and should open up a wider horizon projected to the vastness of nature, but being able to reconnect also the parking system in the plain with the ancient city through the ramps to reach the villa Comunale and the convent of Carmel with Santa Teresa Church. These constraints and aims determined largely the project's logical choices. "The geometrical centre of the composition is the bastion – assumed as a" hiatus" in the continuity of the wall – that uses a gap of about thirty meters in the curtain, defined by the absence of one of the building, where an exceptional natural presence penetrates. Starting from some initial hypotheses that relied on a geometrically pure form with a clear analogical reference to San Patrizio's well, the project proposed, based on a more detailed knowledge of the specific characteristics of the place, a bastion with a trapezoidal shape able appropriately to support and reaffirm the existing arrangement of plots but also the main direction of the contours that define the landform. This particular configuration causes a rotation and a range of directions that can greatly expand the place of overlooking through the plain. The trapezoidal shape, with clear similarities to some studies of the painter Emilio Schiavoni (Schiavoni, 2013), is fixed by the juxtaposition of two right angles which define the two assumed directions: that of the plots and that of the land morphology. The obtained pinnacle shape allows the bastion to offer downstream a massive but slender counterfort able to measure, in the outer vertex, the maximum difference in height between the internal road below and the access road above. The facing area of the bastion positioned at the same quota of the road above expands toward the landscape, leaving large part of the free plot to allow and enhance the penetration of the natural system of the ridge (Muratori, 1967) that already strongly denotes the break in the undifferentiated continuum of the curtain» (Capozzi; Visconti, 2014). As was anticipated, the geometrical layout of the plot, largely defined the nature and the character of the bastion, resulting in a massive construction in Comiso's stone which deepens in the ridge, able to offer a plurality of points of view both from upstream and from downstream, arriving to obtain, inside the compact construction of the walls, different distinctive points: for lifts, for cross, for the overlooking and for staying. The volume is furrowed by the passage of a service road placed halfway to which a staircase in adherence to the blind side of one of the neighbouring building blocks approaches. Inside the prism, a large hole (also trapeze) of considerable height is formed. It contains – underlining the conformation of the contours – a sequence of sloping terraces restricting the void that the volume gradually creeps in ground to reach, in the background, natural rocky soil. The outer volume, with a homologous form to that the overall, includes the lift systems and connects with the highest level of the parking below. The same arrangement of the latter volume, that is presented as a cusp described by the

Figure 4. The *bastion*, perspective from the valley.
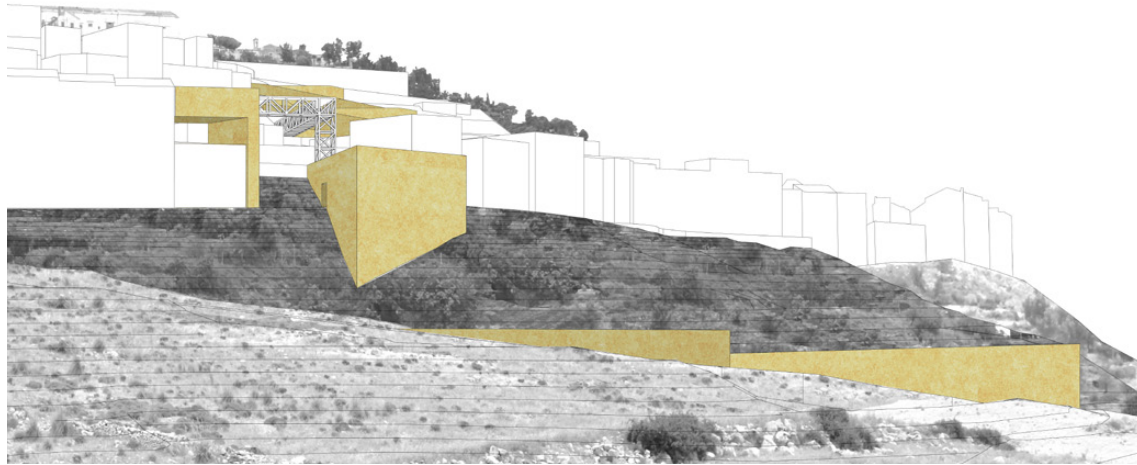
union of two very lengthened triangles in the visible part, is established by the prolongation of the directions of the two extreme sides of the bastion. Its mixtilinear figure emerges as an additional, erected halfway bastions, only for the portion strictly necessary to define the buttress along the way, restoring, in its extrados, the original topography of the ridge interrupted by the existing quarry. In addition to pedestrian path that crosses the deep and countersunk court an additional mechanized link is provided corresponding to the substructure of the adjacent plot to the bastion. The added building, containing stairs and elevators, along the higher road, reassembles the curtain proposing a volume that bypasses and overcomes the pre-existing one-story building destined to civic hall and exhibition, aligned with the ridges of the adjacent buildings. If the added volume and the bastion are characterized by stereotomic decisiveness of the massive walls system, on the opposite, the connection to the apical part of the city in correspondence of the Villa Comunale uses a different expressive and constructive system: a trestle metal bridge that allows, on one side, the overpass of the road and, on the other, the connection with other systems of mechanized lifts placed in the substructure building. "Also the bastion [like other buildings described above] is a stereotomic architecture to which comes near, as counterpoint, the framed bridge that crosses the road [...]" combining *in præsentia*, without any attempt to mediate and confuse, "the two modes of composition, the plastic-wall (rips, 2014) and the tectonics of the elastic system (Doimo, 2012) that are explored together in relation to the theme" (Capozzi; Mannino; Moccia; Visconti, 2015). The grating-bridge, which is founded in the narrowest corner of the bastion, also defines towards the Comiso's plain, the particular condition of the idyll (ε□δύλλιον), a sort of framework that circumscribes and select, in an accomplished image, a defined part of the wide landscape, which, from the farer and opposite corner of the bastion, can be seen for all its vastness up to the horizon. The paratactic articulation of the parts ends with the pedestrian ramps system – also determined by the "generative directions" of the bastion – that, preserving the latest portions of *natura naturata* still present and mindful of the original and mythical *Clarus montis* (Clairemont) of which the city holds the name, lets reach the entrance of the Villa Comunale framing Santa Teresa church that, in the profile from the plain, is the apex and the reference, at a distance, for the whole composition and the system of relationship that it establishes.

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References

Aa.Vv. (2006) *Il parco degli Iblei* (EdiArgo, Ragusa).
Amaro, O. (2014) 'Il Luogo', in Aa. Vv., *Dossier Lld'A 10. Il progetto dell'esistente e il restauro del paesaggio. Chiaramonte Gulfi: continuare un mondo*, Thermes L. e Amaro, O. (eds.),

(Dottorato di Ricerca in Progettazione Architettonica e Urbana - Dipartimento DArTe, Università degli Studi Mediterranea di Reggio Calabria - Comune di Chiaramonte Gulfi).

Calvino, I. (1995) 'Gli dèi della città', in Id., *Una pietra sopra*, p. 340, (Mondadori, Milan).

Capozzi, R.; Mannino, M.; Moccia, C.; Visconti, F. (2015) 'Lettura e progetto della morfologia urbana di Chiaramonte Gulfi. La cinta muraria: la torre, il bastione, lo spalto', *U+D urbanform and design*, 02.

Capozzi, R. (2013) 'Cosa non può essere una architettura realista'. in Malcovati, S.; Visconti, F; Caja, M; Capozzi, R; Fusco, G. (eds.), A*rchitettura e Realismo. Riflessioni sulla costruzione architettonica della realtà*, (Maggioli, Sant'Arcangelo di Romagna).

Capozzi, R.; Visconti, F. (2014) *La cinta muraria: il Bastione*, notes on the project for Chiaramonte Gulfi.

Cavallaro, F. (2013) 'Il balcone di Sicilia amato da Sciascia tra ulivi e vigneti', *Corriere della Sera*, ed. 08 Giugno 2013.

Cultrera, G. (2003) *Artisti e artigiani. Aspetti e momenti dell'architettura religiosa a Chiaramonte Gulfi*, (Grafiche Castello, Chiaramonte Gulfi).

Cultrera, G. (2005) *Il segno e il rito. Edicole, cappelle e luoghi sacri nel paesaggio umano di Chiaramonte* (Utopia edizioni, Chiaramonte Gulfi).

Doimo M. (2012) *Sulla tettonica nell'architettura contemporanea. Appunti per tre temi di ricerca* (Canova, Treviso).

Giedion, S. (1961) *Architektur und das Phänomen des Wandels. Die drei Raumkonzeptionen in der Architektur* (Ernst Wasmuth Verlag, Tübingen).

Indovina, F. (2009) *Dalla città diffusa all'arcipelago metropolitano*, (Franco Angeli, Milano).

Manfredi, V. M. (1996) *I Greci d'occidente* (Mondadori, Milano).

Mannino, M. (2014) *Edifici che guardano lontano. Un'esperienza didattica sull'area del Tirone a Messina, raccontata al workshop di Chiaramonte Gulfi*, notes on the project for Chiaramonte Gulfi.

Moccia, C. (2014) *A picco sulla natura*, notes on the project for Chiaramonte Gulfi.

Monestiroli, A., (1979) *L'architettura della realtà* (Clup, Milano).

Monestiroli, A. (1998) "L'arte di costruire la città", in Macchi Cassia, C. (ed.) *Progetto del Territorio urbano* (Franco Angeli, Milano).

Morando, G. (2000) *Chiaramonte medievale e la contea di Modica* (Flaccovio, Palermo).

Muratori S. (1959) 'Studi per una operante storia urbana di Venezia. I: Quadro generale dalle origini agli sviluppi attuali', *Palladio*, n. 3-4, 1959, then (1960) published in volume, (Istituto Poligrafico dello Stato, Roma).

Muratori, S. (1967) *Civiltà e territorio* (Centro Studi di Storia Urbanistica, Roma).

Pecora, A. (1974) *La Sicilia* (Utet, Torino).

Rossi, A. (1966) *L'architettura della città* (Marsilio, Padua).

Rossi, A. (1975) *Scritti scelti sull'architettura e la città, 1956-1972*, edit by Bonicalzi R., (Clup, Milano).

Schiavoni, E. (2013) *Composizoni*, tecnica mista su tela.

Strappa, G. (2014) *L'architettura come processo. Il mondo plastico murario in divenire* (Franco Angeli, Milano).

Thermes, L.; Amaro O., (2013) *Tematiche architettoniche, paesaggistiche e urbanistiche del territorio di Chiaramonte Gulfi_Recupero dell'ex albergo "La Pineta" e dell'area circostante*, Convenzione tra il Comune di Chiaramonte Gulfi e l'Università degli Studi Mediterranea di Reggio Calabria, Rec.n.234/ R.s.P., Team Group: Laura Thermes, Ottavio Amaro, Alessandro De Luca, Leonardo Garsia, Francesca Schepis.

Thermes, L. (2014) 'Progetto dell'esistente e paesaggio: il seminario di Chiaramonte Gulfi', '*ANANKE*, 74.

Visconti, F. (2014) 'X Lid'A. Laboratorio Iternazionale di Architettura. Chiaramonte Gulfi: Continuare un mondo.', '*ANANKE*, 747.

X LId'A, Laboratorio Internazionale di Architettura (2014) *Il progetto dell'esistente e la citta' meridionale* (http://www.lida.unirc.it/home.html).

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The post-liberal city of the 19th century as a resource

Ida Pirstinger
Architektur Stadt Raum St. Peter Hauptstraße 29c/14, 8042 Graz, Austria
Keywords: post-liberal city, urban density, redensification, urban living

Abstract

Reuse, transformation and redensification of existing building stocks are long acknowledged sustainability strategies. Nevertheless, this policy has barely been applied beyond the scale of singular edifices until now.

The conceptual model Gründerzeitstadt[1] 2.1 is a visionary urbanistic and architectural approach, viewing blocks and urban quarters as the basic urban unit for redensification instead of singular buildings. By combining analytic, empirical and design methods evidence was found, that the post liberal city expansions of the 19th century alike those in the Austrian city of Graz could be a highly convenient resource to meet the demands of growing cities, both in quantity and quality, without questioning the cultural heritage of the historic town.

The design concept is to overwrite and reinterpret the perimeter block by annexing a circumferential addition to the top, as a rim that surrounds the entire perimeter block as a unique contemporary architectural structure.

Focusing on blocks and quarters as whole entities instead of singular edifices does not only come up to the nature of the old buildings, which were designed to band together and simulate grandeur, but leads to more and better energetic and infrastructural synergies. The possible variety of new, different floor plans becomes much larger and opens more opportunities as well. It provides a serious housing alternative to the single family home in the outskirts. Urban growth is no longer allocated to suburban sprawl and high infrastructure costs. It can happen in a sustainable way.

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[1]German term for the post-liberal city of the 19th century.

Introduction

Throughout history, the ability and willingness to constant change has become one of the most characteristic features ascribed to cities and made cities the driving force of economic, cultural and social development. Before scaling up in surface, cities have always been transformed, converted, and densified until all their spatial reserves were fully exhausted. This used to be a successful sustainability strategy and still could be.

Town planning efforts of the past decades changed this attitude towards more wasteful land consumption and thus caused sprawl. The motive of the city as a social community was eclipsed by the modernist call for light, air and sun for everybody and the predomination of individual interest, finding its expression in a separation of functions and endless carpets of single family homes in the suburbs. Today, gradually running out of building land and other resources, we wonder how we could make our cities more compact and use well established public infrastructure more efficiently. Starting to retrospectively densify our cities from their central cores seems self-evident. Here, in the old city centers, we also find those urban morphologies people tend to accept as an inner urban place to live in, because here they find what makes dense cities livable: proximity, diversity and density, history and identification (Haeussermann, 2007, p.28).

Graz, a strongly growing medium sized city in Austria with about 300.000 inhabitants, serves as a case study. Its medieval city centre has become an UNESCO world heritage site due to its harmonic overlay of architecture from all centuries and epochs and its roofscapes of red tiled roofs[2]. This core is surrounded by a ring of 19th century building blocks, which for the bigger part are highly distinguished as urban residential areas. A local heritage protective law[3] aims at preserving the exterior shape and appearance of these areas as an urban typology as well. But since loft conversions are permitted, the roofscape is a matter of subtle transformation anyway. The conceptual densification scheme GRUENDERZEITSTADT1 2.1 (Pirstinger, 2012; 2014) suggests a mind shift concerning these roofscapes. It shows a methodology for an urban expansion within the morphologies of historism as an alternative to suburban sprawl.

The post-liberal city of the 19th century as a modern and versatile urban typology

The historicist city was a commercially successful bulk product, aimed at quickly meeting the increasing demand for new housing space within the rapidly growing towns of its time. Usually, the new mass tenements did not include considerations about individual preferences or needs (Stuebben, 1890, p.16) but were constructed by property developers and speculators (Eitelberger and Ferstel, 1860, p.17). Town planning itself mostly was not left to civil developers but became an official affair, executed by local authorities, for the city – the urban space itself - was still understood as commons. Sanitation was a crucial issue to be solved, but most cities did not only concentrate on building standards in hygienic and technical terms but also gave specifications according to proportions and decoration.

Paris was the role model everybody tried to imitate – the most glamorous and beautiful city of the time, forcefully planned and built under Napoleon III and his prefect Haussmann as a display of power and splendor (Jordan, 1995). The city Haussmann created, and all its emulations across Europe were composed of a simple combination of well-known elementary parts. The new urban pattern was defined by a hierarchical network of streets, boulevards and circular roads. (Fig. 1) The basic part giving the city its framework is the urban block (Stuebben, 1890, p.15), interlocked with the street grid carrying transport and public interaction. This abstraction of functions to the most elementary

[2]UNESCO World heritage list, City of Graz, Date of inscription 1999, extension 2010 (http://whc.unesco.org/pg.cfm?cid=31&id_site=931), accessed 8 June 2015.

[3]GAEG 2008 – Grazer Altstadterhaltungsgesetz 2008: Protective law for the old town of Graz (https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=LrStmk&Gesetzesnummer=20000162) accessed 8 June 2015.

Figure 1. Schematism, fragmentation and togetherness. top left based on the cadastral map of Graz - courtesy of BEV 2014, T2014/106957. Parts of all images first released in Pirstinger (2012). All images previously released in Pirstinger (2014).
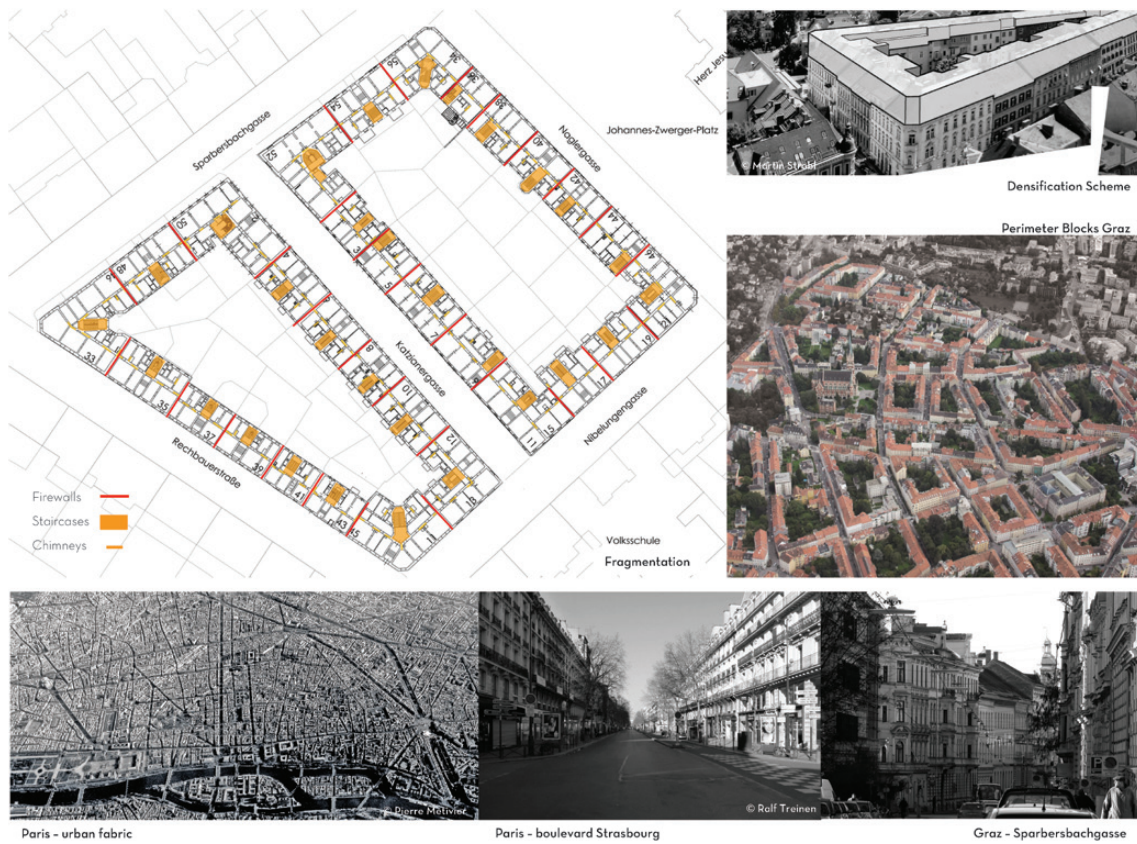
(Czech, 1996, p.132) makes the concept of the post liberal city highly tolerable until today. It is an easy to read and use urban typology. In contrast to the strict separation of functions of the modernist era it still allows a certain degree of mixed use due to a rather undetermined layout of rooms. The blocks are arranged to form the city by combination and addition and thus create a continuous fabric. They themselves are put together by similar smaller pieces to shape the ensemble of the block, which again is just a module of a bigger whole. The facades of the buildings had to sum up to the whole of the block by congenial horizontal outlines like cornices and balconies of historicist style (Wagner-Rieger, 1970, pp. 97, 155, 207). Due to their schematism the buildings simplify the overall image compared to the older blocks which show much more visual variety. Still, this simpler image of rectilinear streets and similar facades on both sides creates an overall urban likeness because the built city is more about scale, regularity and concurrence than about the individual building (Czech, 1996, p. 134). The street facades form the separation line between the public and the private. They divide and connect at the same time, for while they form the external walls of the buildings they are also the inside walls of the city and frame public space (Franck, 2009, p.201). The buildings have a front and a back side, defining the exterior and interior of the block, which is representative of a hierarchical differentiation of public, semi-private and private spaces. The simplicity and readability of this urban fabric provides familiarity and security. So the insula of the building blocks are setting their stamp on the historicist city, not the decorated facades. In former days criticised for their overpopulated and unhealthy living conditions as well as their minor architectural merits – Otto Wagner (1896, p.86) even called them Potemkin villages for their historicist tinsel and glitter facades – they nowadays are largely acknowledged as livable residential areas and even referred to as archetypes for future urban development. In

Figure 2. Three cities compared / densification schemes. © Ida Pirstinger.

Berlin   Wien   Graz

Vertical densification 2.1

2,47   2,54   1,31

Horizontal Densification 2.1

Prenzlauer Berg
36,200 inh/km·
Density 2.47
Building Footprint 0.48
Courtyards 0.29
Public Space 0.23
Floors: 5-7
Eaves height: 22m

Josefstadt
36,800 inh/km·
Density 2.54
Building Footprint 0.58
Courtyards 0.16
Public Space 0.26
Floors: 2-7
Eaves height: 6.5-23m

Herz Jesu Viertel
25,500 inh/km·
Density 1.31
Building Footprint 0.42
Courtyards 0.34
Public Space 0.24
Floors: 1-5
Eaves height: 6-18.5m

spite of schematism and similarity in concept and form the blocks and their buildings are able to come up to individual needs, different uses and different social, spatial and economic requirements today. Within their generic fabric as an urban typology they are open and robust to changes without changing their own characteristics.

Density and urban life

The described scheme applies to most cities and quarters of this time, each having their local peculiarities due to cultural, political and economic background. Berlin for example - at the time the big expansion started the young capital city of Prussia – had the strict regulations of Hobrechtplan (Geist, 1984) and nevertheless was built for optimized land use and maximum profit. Vienna, the old imperial city of the Habsburg Empire, hardly managed to keep planning efforts up with the speed and dimensions of urban growth (Goldemund, 1902, pp.102-103). Even though it developed in a less methodical way, the results were just as commercially oriented, yet appearing more heterogeneous. Both became known as those European capitals with the most overcrowded living conditions at the beginning of the 20th century (Hegemann 1930; Stuebben, 1890, pp.25–26). Today their large historicist city expansions are approved as valuable living areas. Since the occupancy rate strongly decreased compared to the date of origin, the rather high built density seems to have become easily acceptable. This combination of former disaffirmation and present approval qualifies the local typologies of both cities for comparison with the situation in Graz. (Fig. 2)

Especially the aspects of urban density and its agreeability are of concern, for the question is if the densification of historicist blocks like those in Graz is a realistic option for further urban expansion.

The urban development of Graz was not so much affected by pressure and speculation but more by its civic middle-class builder-owners and a farseeing local authority (Hoffmann, 1928, p.69; Lengger, 1978, p.146). So the blocks in Graz are not so densely packed with buildings. Their courtyards contain abundant private gardens and the buil-

ings are less high. The much lower population density and floor area ratio of only 1.3[4] are obviously not high enough to economically support commercial life on street level, as an empirical comparison of three urban quarters from Berlin, Vienna and Graz illustrates. The percentage of street related business spaces is much lower in Graz, resulting in unhurried public spaces, committed to car-parking and traffic.

There are high potentials for retrospectively densifying the blocks and adding housing space, increasing population density and foster urbanity and busy street-life. Potentials were not only evaluated statistically but also in an explorative way by test designs to ensure urban and architectural quality. Adding an average of two floors to the perimeter blocks turns out to be the most advisable way of improvement by quantity and quality. It increases built neighborhood density to an amount of 2.1-2.2 in average without affecting the existing buildings and greenspaces and promises a high diversity of new housing space. Grossing up to all perimeter blocks within the city of Graz this approach clearly has urban dimensions. It could produce dwellings for about 84,000 additional inhabitants, covering a population growth of 28%. Densifying only the most appropriate blocks would still provide flats for 36,000 new citizens, enough to meet the growth of 10-15 years[5]. To reach the same quantities by horizontal densification, high rise buildings inside the courtyards with 12-17 floors would be necessary, causing the total loss of greenspace and obstructing daylight as well as view in the existing buildings. (Fig. 2)

Rooftop extensions as a model for retrospect densification

Especially the current sustainability discourse and the continuous demand for new residential space in prospering cities call a modernist claim back to mind: the utilisation of all surfaces of the city. In his manifesto „Five Points of Architecture", Le Corbusier (1948, pp.128-129) proclaimed flat roofs the ideal style of roof, for they could be used as gardens and action space, serving as a replacement for built up land. Now that society deals with austerity problems and is running out of resources and greenspace, this old but scarcely executed proposition suggests itself as a possible solution, gaining a new and powerful meaning. Roofs can even become more than ceilings, weather protection, gardens and action spaces. They can house solar power plants and windmills and liberate their inhabitants from their dependency on oil and gas, at the same time providing fully developed free space for urban expansion and densification.

Preconceiving rooftop-extensions to the historicist perimeter blocks as a basic continuation of each single premise quickly comes across some design-relevant determinants on account of stereotype existent buildings. (Fig. 1) Simply continuing staircases and load bearing systems result in similar types of dwellings, making rooftop additions not much more than an uncritical copy and paste process without a contribution to contemporary building culture. It also means the renouncement of further spatial potentials and synergies included by a more open minded approach.

The benefit from synergetic effects rises with the size of a construction area and the amount of building measures. One single loft conversion usually cannot sustain a new elevator or lots of other refurbishment works, many could. Vertical access systems and spatial capacities maybe are sufficient enough to provide private open spaces for the new flats, but a roof-top extension for the whole ensemble of the block could generate enough space to provide the whole of the housing community with a roof garden. However, achievable synergies outreach aspects of economy and spatial efficiency by far. They could also have an impact on their surroundings. Conceptualising the usage of the roofs at a larger scale - across blocks or even neighborhoods and quarters - as a multistorey addition makes it an urbanistic approach, for size, mass and density generate and change urbanity, whereas the single building approach will always remain an individual

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[4]Built density: Floor area ratio (FAR) or floor space index (FSI) = gross floor area (m²)/plot size (m²). Instead of building lots only, urban space is included here as well to get more relevant figures.

[5]City of Graz population growth, forecast 2012-2013 (http://www1.graz.at/Statistik/bevoelkerung/Bevoelkerungsprognose_2011_2031.pdf) accessed 8 June 2015.

matter. Virtually abolishing property lines between the buildings, which means to break through the constraints of firewalls and staircases, enables a generous viewing of the block – as if it were one plot – and thus an optimized exploitation of synergies. It seems self-evident to take advantage of the popularity of historicist quarters as urban residential areas, their excellent public infrastructure, clear urban fabric distinguishing between the public and the private and the intimacy and secureness of the green courtyards and make them an ideal residential area for families with children as well, trying to outrival the family home in the outskirt.

Design approach Gruenderzeitstadt 2.1

Present-day building practice is restrained to densification projects on a plot-wise scheme of loft conversions and extensions bound to the individual building. Additions to whole blocks are known only in those rare cases when one large building fills out the block. So there is no way of evaluating real life examples. As a consequence some 35 test designs were elaborated by architectural students at Graz University of Technology, Department of Building Typologies[6] under close guidance of their teachers as a research by design approach. Several principles and goals were established. The headnote was "Try to make every change an improvement," for the existing building stock and its inhabitants should be spared as well as possible. The main objective was to explore, if and under what premises the historicist perimeter blocks in Graz could serve as inner-city resource for additional high quality housing space for all kinds of potential dwellers. To include proposals and new forms of inner urban family housing as an alternative to detached suburban houses was an explicit mission. This made private open spaces in direct connection to each apartment a compulsory. Spatial economy and cost effectiveness was another premise. The new rooftop extensions should by no means be intended as costly luxury homes, affordable to the rich only.

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Of course the complexity of the task affords intense preoccupation with the existing block and its characteristics, exacting contextuality between the old and the new. The results show a tremendous variety of possibilities and proof of the overall concept and idea. Suspending the fragmented horizontal sections and fire zones (Fig. 1) above the eaves by ignoring the plot boundaries, enlarges the operating range of the planner across the scale of the single building unit and means a more flexible handling of floor area and its arrangement. Differences in elevation encourage unconventional off-system floorplans, allowing for manifold apartment sizes and layouts, appealing to any interests, lifestyles and user's conceptions. As complex the topography of the unusual building plot appears due to its staggering ceiling heights, as versatile the variety of new apartment types will be.

The chance to act across borders includes a whole range of economic access solutions adapted to actual needs in contrast to extending all staircases and retrofitting each with an elevator. Instead of 16 vertical access units per block only four to six are actually needed, saving space, investment and maintenance. Horizontally, access balconies, gangways across the roofs and inside the building provide various ways of routing. (Fig. 3)

The current attics are partitioned by large surface consuming brickwork chimneys, which could almost immediately be set out of use and dismantled, resulting in more floor area and more flexible space. Within the original floors they could remain as tubes for installations. The multitude of contrivable apartment types and dwelling forms is extraordinary. In spite of restrictions inflicted by the existent buildings, everything from small studio apartments to large residences is feasible. Especially maisonettes prove promising for several reasons. Splitting surface area up into several floors provides large apartments on a small ground area, which makes them well adjustable to the fragmented block-layout and its changing elevations. They allow bidirectional floor plans and thus optimal ventilation and daylight exposure. At the same these terraced houses with garden above the city are to be credible family homes.

[6]ProjektUebung Gruenderzeitblock 2010/11 (Gangoly, Lechner, Fruehwirth) Available at: http://lamp.tu-graz.ac.at/~gl/wordpress/wp-content/uploads/2010/09/2010W_PUE_grUenderzeit.pdf.

There are almost no limits to exterior design, elsewise building laws make restrictions. Building silhouettes can have various shapes and be anything from totally straight horizontal to terraced or slightly rolling like the hills of a real landscape.

All this makes the new roofscape on top of the perimeter blocks a true alternative to the detached house in the suburb, a factor promoted by the proximity of nature inside the blocks. The open landscape of the courtyards provides secure greenspace on the doorstep, moreover if they are converted into a semi-private space. They can be playground, sports facility, park, garden and many things more. The flat roofs can generate private terraces attached to individual flats or just as well become another neighbourhood space. They present a new experience and view towards the city. The now existing roofscape which is only visible from the elevated perspective of a near mountain or aircraft would become accessible, tangible, and utilisable. It would be charming, delightful and quite unique.

The old and the new - In what style should we build?[7]

In Graz, the will to preserve the traditional built environment and its symptomatic forms of appearance comes into conflict with the needs and requirements of the present. The arising question is about priorities and (intangible) values - about which architectural properties are absolutely essential for the overall image and character and have to be preserved. In opposition stands each generation's right to create their own environment (Posener, 2010), including the replacement of the old, which in the case of Graz is no option.

There are two mayor policies to deal with this issue: Conserving a status quo as true to original as possible presupposes very clear and indispensable regulations and their execution. In some cases this approach tends towards the musealization of old towns. Contrary to that is the strategy of a pro-active handling of the built cultural heritage by not only preserving it but to use it as an active agent for further development. It means to continue to build on the old city in a self-confident contemporary way, a strategy, Graz has been following for ages and several stylistic periods in its UNESCO World Heritage medieval city center. This could also be a promising approach at for new regulations, preserving the characteristics of the 19th century blocks from the base up to the eaves, but using the space above for a focused and efficient inner urban expansion.

Annexing two floors to the perimeter blocks - maintaining the greenspace in the courtyards - is the most purposeful method of densification as was verified earlier. Doing it in an unconventional way, ignoring plot boundaries, and attaching one circumferential rooftop extension to the whole of the block leads to numerous synergies. Other than that, what exactly accounts for this methodology of densification and sets it apart from established approaches? Is Gruenderzeitstadt 2.1 also an appropriate response to the architectural values of this building typology?

The 19th century building block is an assembly of similar basic parts. As a whole it follows the same stylistic and monumental attitude as large palaces and other representative buildings of its time. Horizontal linear ornaments did not only serve to subdivide facades and give them proportions but were meant to act together to add perspective to the assembly of buildings within the block to make them seem as one (Wagner-Rieger, 1970, pp.101; 155). A circumferential rooftop addition is another horizontal element - a rim, banding all component parts together. (Fig. 1+3)

The pivotal stylistic and creative basic methodic principle is to look at the block as a whole, keeping its monolithic attitude in mind. This allows viewing the block as a unity, as a single object instead of a sequence of resembling individual buildings determined by allotment. As a discretely autonomous architectural intervention it underlines the monumental appearance and the uniqueness of the block without counterfeiting it. It complements togetherness by one perfectly fitting impartible piece, entirely embracing the

[7]Quoting the title of the book by Heinrich Huebsch, et al. (1828) In What Style Should We Build? The German Debate in Architectural Style, Karlsruhe, in which he distanced himself from neoclassical style in favour of a new and more original style.

Figure 3. Design Approach / Variety. © Ida Pirstinger.

Roofscape – before and after

© Stephan Brugger

Variety– Access Systems

Variety Silhouettes
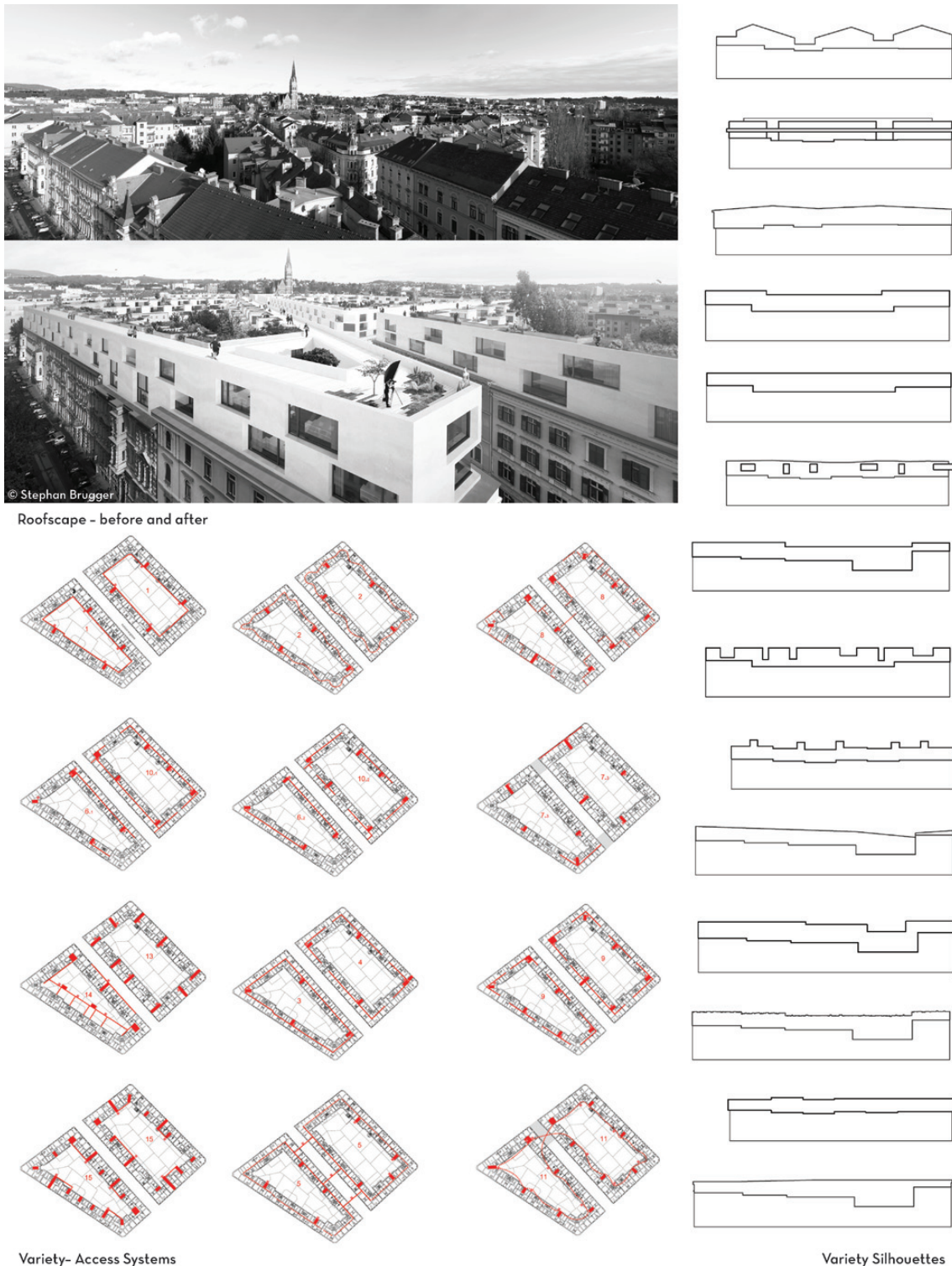
perimeter block. Instead of pointing out the individuality of each single building it accentuates its homogenous appearance without degrading the old building stock or its values, functions and characteristics worth preserving. By this method it allows contemporary architectonical and functional solutions to a high degree, but still remains liable to the generally accepted traditional image of the city.

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In this sense, block spanning loft expansion means no derogation, impairment or even damage of the block but is a long term measure for preservation and resource efficient further use. The existing building block forms the pedestal for something new and in this way can be conserved in its present form. So simultaneously the desire for protection of the old buildings and the need for permanent development and renewal of the city can be fulfilled. The precondition to successfully satisfy these high claims is the assurance of architectural quality. As in the case of Graz an expert advisory board is already reviewing all building applications within the areas of heritage protection, including the 19th century urban expansion, prior to permission. But before legally permitting the concept of block-spanning vertical additions to the perimeter blocks several general regulations like protective laws and building codes need to be adapted.

Synergetic effects and compensatory measures

The basic principles of economic viability (contrary to cheap building) aim at maximum synergetic effects by the blockwise approach. No less important is to compensate or completely avoid interferences evoked by densification and building measures. The advantage of as few as possible but subtly placed vertical access systems was already mentioned and saves expenses but also surface area. So the amenity of an elevator benefits all new dwellings while the access to the present apartments remains mostly unchanged. Other building services can be treated in a similar way, because in contrast to the single approach not each house needs to have its own private access points for electricity, gas, district heat, etc. The block can be viewed as an infrastructure alliance, installing collective connections only at a few strategic points and thus saving access costs, pipeline and cable lengths. Actually, the upgrading of overaged technical infrastructure within the old buildings is understood as an intrinsic part of the densification concept and should be made a principle rule for realization. For example, all buildings should be connected to an eco-friendly central heating system or district heating (now, many people still have their individual heating solutions with oil, coal or wood), reducing energy consumption and air pollution at once and thus being of benefit for the whole city.

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Another reasonable measure is to provide outdoor spaces like balconies, terraces or gardens for the existing flats. Daylight exposure on ground level will undoubtedly slightly deteriorate. Changing flats between upstairs business offices and ground floor residences could help to avoid habitation with minor daylight and at the same time stimulate street-life. Even more beneficial to urban life is increasing population by densifying the city. More inhabitants have more daily needs, facilitating retail and other supplies and services. Assuming relevant dimensions, the entirety of old and new spaces together leads to socially mixed neighborhoods for all generations. Hence urban densification as described here not only suits the purpose of preserving historic buildings and their upgrading but also the enhancement of urban qualities.

Conclusion

Old building stocks are always a valuable resource due to the raw material and energy they embody but also because of their immaterial cultural and historical value and the identity they create. The same is true for urban quarters and their fabric at a larger scale. To remain appropriate in the long term, the buildings as well as the urban fabric have to stay amenable to future changes, because habits and demands of their users are a matter of constant changes as well. The post-liberal city extensions of the 19th century are in close accordance with this requirement due to their clear and easy to read layout and hierarchical urban pattern, which makes them a long term typology and valuable resource for the future.

In cases like Graz, where they have moderate density and include plenty of greenspace, they can even become a mayor reserved area for inner urban expansion. Adding new floors to perimeter blocks according to the conceptual densification model Gruenderzeitstadt 2.1 is an appropriate measure for densification, resulting in high-quality

housing space. It also is a strategy to preserve the buildings and blocks in the long term, updating them in a sustainable way. The loss of the old gabled roofs is counterbalanced by a new roofscape of terraces and gardens, accessible to the community of the block.

By upgrading and stimulating urban quarters through densification, an alternative to further suburban sprawl is set. Being an all architectural intervention, circumferential rooftop extensions of perimeter blocks comprise capacities both in quality and quantity making them relevant on an urbanistic level, even more if they are applied to whole neighbourhoods or quarters.

References

Czech, H. (1996) 'Elemente der Stadtvorstellung', in Czech, H.(ed) *Zur Abwechslung: Ausgewaehlte Schriften zur Architektur* (Loecker, Vienna) 131–138.

Eitelberger, R. and Ferstel, H. (1860) *Das buergerliche Wohnhaus und das Wiener Zinshaus* (Karl Gerold's Sohn, Vienna).

Franck, G. (2009) 'Raum als Luxus? Ueber Raumqualitaeten als Indikatoren fuer das gute Leben', *Wissenschaft & Umwelt Interdisziplinaer* 12, 197–202.

Geist, J. F. & Kuervers, K. (1984) *Das Berliner Mietshaus: 1862-1945* (Prestel, Munich).

Goldemund, H. (1902) 'Die bauliche Entwicklung und Stadtregulierung', in Weyl, T. (ed.) *Die Assanierung von Wien*, (Wilhelm Engelmann, Leipzig) 102–128.

Haeussermann, H. (2007) 'Phaenomenologie und Struktur staedtischer Dichte', in Magnago Lampugnani, V. Keller, T. and Buser, B. (eds.) *Staedtische Dichte* (Verlag Neue Zuercher Zeitung, Zurich), 19–30.

Hegemann, W. (1930) *Das steinerne Berlin: Geschichte der groessten Mietskasernenstadt der Welt* (Kiepenheuer, Berlin).

Hoffmann, K. (1928) 'Das Stadtbild', in Stadtgemeinde Graz (ed.) *Die Stadt Graz: aus Anlass der Achthundertjahrfeier 1128-1928*, (Selbstverlag der Stadtgemeinde, Graz) 68–80.

Jordan, D. P. (1995) *Transforming Paris: The life and labors of Baron Haussmann* (Free Press, New York).

Le Corbusier and Jeanneret, P. (1929) *Le Corbusier: Oeuvre Complete de 1910-1929* (Les Editions d'Architecture, Zurich).

Lengger, A. (1978) 'Die linksufrige Stadterweiterung von Graz', unpublished PhD thesis, University of Technology Graz, Austria.

Pirstinger, I. (2014) *Gruenderzeitstadt 2.1* (Verlag der Technischen Universitaet, Graz).

Pirstinger, I. (2012) 'Gruenderzeitstadt 2.1. Ein Modell zur inneren Stadterweiterung als Beitrag zu einer kompakten gruenen Stadt', *GAM.08 - Graz Architecture Magazine* 8 - Dense Cities: Architecture for Living Closer Together, 222–237.

Posener, A. (2010) *Bitte abreissen!* (http://www.welt.de/kultur/article10945156/Nachkriegsarchitektur-steht-nicht-unter-Naturschutz.html) accessed 12 June 2015.

Stuebben, J. (1890) *Der Staedtebau* (Verlag von Arnold Bergstraesser, Darmstadt).

Wagner, O. (1896) *Moderne Architektur* (Anton Schroll & Co., Vienna).

Wagner-Rieger, R. (1970) *Wiens Architektur im 19. Jahrhundert* (Oesterreichischer Bundesverlag fuer Unterricht, Wissenschaft und Kunst, Vienna).

Athens urban transformation

Anna Ntonou Efstratiadi
Architecture Department, University of Patars, Greece, Iras 17, 26441, Patras, Greece
Keywords: Athens, historical cities, urban transformation, crisis

Abstract

The research aims to explore the urban transformation of the city of Athens and the factors in economy, in social and political sphere which have created the most influence in post-crisis periods at the beginning of the 19th century. Their interactions and various intensity have created Athens urban form in direct or indirect way. Athens, the capital of Greece is at the same time an old city as well as a modern city, and can be identified as a major European city. Generally characteristics have been depended on the historical circumstances within the sphere of economic, social and political organization of the city. Economy was directly dependent on the state organization and the level of political development while the urban planning indicated the economic power of the society, the commitment to strategic planning and the effectiveness of urban policy and legislation (Biris 1995). The urban design of Athens was the product of the consent and synergy of the state and the bourgeoisie, in an era of ideological, cultural and economic extroversion of Greece that simultaneously was the first period of economic globalization. The city was re-designed according to the morphological patterns of neoclassicism (Filippidis 1984) when in the meanwhile, the State acquired a capital city that epitomized optimally the national ideology for its imposition to the country and its projection abroad. The current discourse aims to understand more precisely the way larger scales of political, economic and geographical forces affect the shape, structure and culture of the contemporary historical city after a crisis.

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Introduction

The research aims to explore the urban transformation of the city of Athens and the factors in economy, in social and political sphere which have created the most influence in post-crisis periods in the 19th century. Their interactions and various intensity have created Athens urban form in direct or indirect way. Athens, which was proclaimed capital of Greece just after the economic crisis of 1827, was at the same time an old city as well as a modern city, characterized by unplanned development and backward technical infrastructure.

Generally characteristics have been depended on the historical circumstances within the sphere of economic, social and political organization of the city. Economy was directly dependent on the state organization and the level of political development while the urban planning indicated the economic power of the society, the commitment to strategic planning and the effectiveness of urban policy and legislation (Biris, 1995). During the economic crises of the 19th century Athens urbanization, being under structure procedures, relieved the crises with creating new fields of exploitation. Real estate transactions soared from the moment Athens was declared the capital. The market, the commodification of real estate property, was introduced by unproductive populations who realized large profits by mere land transactions and low-quality building. This was consequently a speculative land and housing market (Bastea, 2008).

The financial crises are not just economic, but also social, environmental, political and spatial crises (Castells and Burkhalter, 2009). After the defaults on sovereign debt obligations in 1843 and 1893, the State acquired a capital city that epitomized optimally the national ideology for its imposition to the country and its projection abroad (Burgel, 1976). The urban design of Athens was the product of the consent and synergy of the state and the bourgeoisie, in an era of ideological, cultural and economic extroversion of Greece.

Critical factors of urban transformation in periods of crisis

Economic and political factors

Greece has defaulted on its external sovereign debt obligations three times during the 19th century. Between 1821 and 1850 the downside of Greek economy was due to the country's war of independence. The inability of the country to cope with the payments of the foreign debts, excluded it from the European capital market between 1833 and 1878, making the foreign capital inaccessible precisely the time when the country had the strongest need for the payments of other loans and for industrial development (Bastea, 2008). It was impossible for Greece, through the maze of antagonism between the Great Powers, to establish an autonomous political will. The weakness of forming a strong and single central authority with nationwide economic growth objectives was mainly a result of the action of the external forces. The foreign capital requested also the political tutelage of Greece due to its financial interests. And it is precisely this kind of penetration of foreign capital that has consolidated the structure of the Greek economy and society to the spurious limits of compradorism, with the dependence of the country, the continued lending and the political dynasty of the wealthy (Houmanidis, 1990). The economic crises of the 19th century are purveyed by the forces of the inter-national market in which the country had a disadvantageous position.

At the same time the scarcity of public capital was, and it would continue to be for the entire 19th century, one of the major constraining factors of development. The Greek state of the 19th century faced the crises in undevelopmental and fiscal spirit with only aim the procreation of power. The state, acting competitively to the private sector about the redistribution of social income, appears as a direct caterer and creator of the crisis (Sakellaropoulos, 1994). It was a leading undevelopmental agent which maintained the chronic crisis of subproduction and underemployment of the productive forces of the society. The national and international economic and political situation in the last quarter of the 19th century differed considerably from the situation in 1830. Greece had been incorporated into an international system. Though, the penetration of capitalism in Greece appeared only when Europe sought raw markets for its manufactured goods in back-

Figure 1. A view of the city of Athens around 1830.
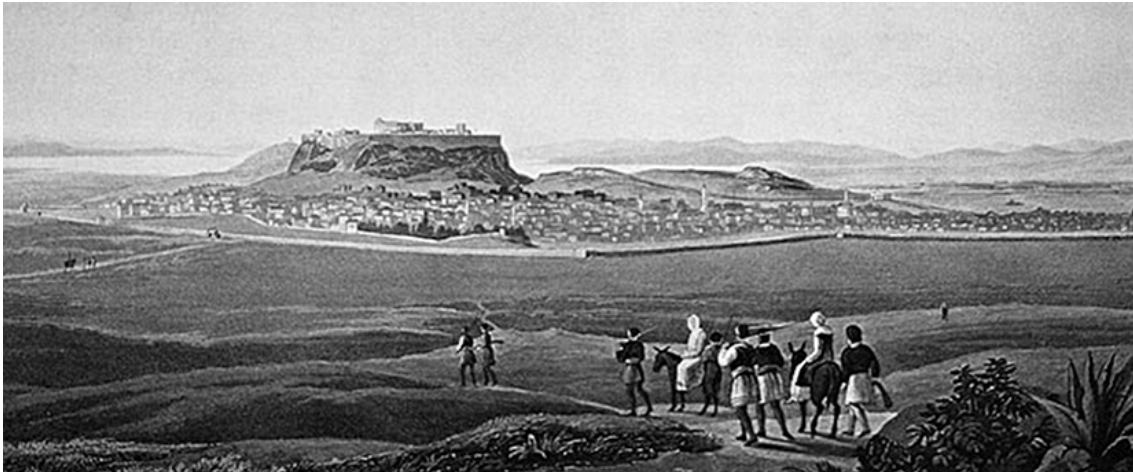
ward lands (Bastea, 2008). Until 1880 there was very little direct capital investment in the national territory. The only sector of the wider investment, demonstrating unusual vividness was the construction. The phenomenon of massive capital outflow into the housing market, as a mean of resistance to the effects of an economic crisis, is repeated in any such opportunity throughout the 19th century. It is generally true in the economic theory that during and after a crisis there is unused surplus capital. A disaster, a war, inevitably leads to the emergence of a plethora of funds which remain potentially and temporarily inactive (Sakellaropoulos, 1994). A further proof of unused funds existence should be sought in building orgasm of these years. The investment in housing market required accumulated large amounts of money which had been hoarded. The main source of these funds was the Greek comprador bourgeoisie who financed the Greek economy with remittances, donations and cultural buildings. In this context the Greek comprador bourgeoisie started to invest within the national territory and got involved in the building of railroads, canals and ports along with European 'Protective Powers", especially British capital (Bastea, 2008). Greek economy was going through a transitional period. Reforms were made in the distribution of land, cities were turning into active economic centers, industry was being developed, metropolitan transport network was expanding, capital was increasing, credit institutions emerged to stimulate entrepreneurship and savings and loans were increasing (Houmanidis, 1990).

Urban factors

During the critical economic and political conditions of the 19th century, Greek urbanization was under structure procedures. From the 1830s until the first decade of the twentieth century, there was a concern for the settlement of the small territory which was then Greece. The first urban legislation was concerned especially with city plans, as well as the creation of the urban agglomerations. Athens was the funnel where the landless homed in on, while urbanization caused even higher than normal rate of population growth (Houmanidis, 1990). Athens population grew rapidly, with 10.000 inhabitants in 1820, 65.000 in 1860, reaching in 1903 the amount of 220.000 residents. The population was one of the most influential factors in shaping urban form. The urban legislation promoted the creation of a homogeneous urban area. Though, the lack of staff and financial resources resulted in a moderate and uneven implementation. The work carried out in Athens from the time it was chosen as capital of the Modern Greek state until the end of the 19th century could justly be characterized as colossal. In fact, a new city was created on the ruins of the glorious Athens of classical antiquity (Marmaras, 1999). In an era with endless internal and external problems, the new urban development plans and buildings were the only beacons of hope, perhaps the only promises of a better future.

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On the one hand, there was the promise of a better future, and on the other the reality of a difficult, problematic and tangible present (Leontidou, 1989). There were mainly the plans proposed and magnificent buildings constructed which filled all with hope and patriotic pride.

Who built Athens of the 19th century; private financing covered the costs of many public buildings that would normally burden the state, which due to the un sufficient resources for the costs of reconstruction, welcomed the generosity of the expatriates (Bastea, 2008). At that time the perception of Greek comprador bourgeoisie about the urbanization process was not speculative. It stressed the monuments and the ornament (Leontidou, 1989). Their activity in Athens intensified in the 1840s and 1850s and involved cultural, welfare and educational buildings. A sum total of quality projects, a connecting tissue of structures, public and private, which through the high level of their architecture, distinguished one of the most attractive urban complexes of the period, as foreign visitors to the new capital generally conceded (Biris, 1999). The unstable and difficult political and economic situation of the country was hid behind a precise, monumental architecture.

Later on the city-building process changed as the repatriation of the comprador bourgeoisie created a resident bourgeoisie in Athens in 1870s. This situation was reflected by the quality and the large number of private buildings. At the end of 19th century many urban planning projects had been proposed for the reshaping of Athens to a great capital city, which remained barren due to the fact that the government did not have the political stability or the economic power needed for the execution of the inspiring projects. Athens saw its plans reformulated several times, experienced the triumph of the speculative land and housing market and also the rapid uncontrolled urban expansion over planning and housing policy (Bastea, 2008).The competitive land market and housing capitalism, the commercialization and the speculative exploitation of urban area, appeared in the comprador period of Athens, before the development of industrial capitalism.

Periods of crisis in Athens during the 19th century

The crisis of 1827 - The planning of Athens as state capital

During the early nineteenth century, Greece was under the Ottoman rule. The Greek War of Independence began in 1821 and targeted the end of Ottoman authority, which had ruled for centuries. In the course of the Greek War, the Greeks obtained two loans, in 1824 and 1825, secured on the London Stock Exchange to continue the fight. No interest payments were ever made to the bondholders on these two loans and so in 1827 the Greek government was forced to declare bankruptcy. The War of independence was mainly characterized by foreign interference. During the war controversies, England, France and Russia had ordered their fleets to enforce truce. When the sultan explicitly refused to subdue, the Triple Alliance fleet attacked the turkish-egyptian troops in the great battle of Navarino on 8/20 October 1827 (Bastea, 2008). The victorious Protective Powers involved in, recognized Greece as a free and independent state under their superintendence by signing the Protocol of London on 3rd February 1830. Athens was declared capital city of the newly established Greek State in 1833 (Leontidou, 1989). The first Royal Decree was issued "Reconstruction of the city of Athens and the transfer of the seat of Government" and the plan for the new city of Athens was approved by King Otto. The urban plan of Athens had to nominate the city as the seat of a centralized, modern European monarchy, to honor the antiquities and to respond to the needs of the existing city and its inhabitants (Marmaras, 1999). However, at that period the city of Athens was a forlorn spectacle, the picture of abandonment and neglect.

The need to find financial recourses and the technical organization required to rebuild a town that found itself virtually in ruins after the adventure of its fight for independence, was a decisive factor for the future of the city. Greece received a loan of 60,000,000 francs, guaranteed by the Protective Powers. The terms of the loan, however, burdened the state and contributed to the continuous economic dependence of the state on foreign capital (Houmanidis, 1990). The crisis of 1827 gave rise to the first major shift of operators and funds towards a national center. The speedy progress of the Greek economy

Figure 2. General view of Athens in the 1870s (above) and at the turn of the 20ᵗʰ century (below). View from Acropolis.

is understandable and construable. The destruction and the chronic underemployment of the productive forces caused by a war or a revolution, designates immediately after, when order and security are consolidated again, a wave of economic growth as a result of the resurgent of the factors in the production process (Sakellaropoulos, 1994). It is argued that the decision of declaring Athens as capital of the state was directly related to the interests of Fanariotes, who sought to increase the value of their real estate property. Real estate transactions multiplied by the time Athens was proclaimed capital (Leontidou, 1989). In addition, the news that Athens had been designated capital of Greece motivated many inhabitants of the province, both well-to-do and otherwise, as well as eponymous figures from Greek colonies abroad, to move to the new capital. People from different parts of the Greek countryside, as well as Greek from abroad, began to arrive in Athens in order to make their homes there. During the same period, civil authorities and military garrisons established themselves in the fledgling capital. Initially the situation was chaotic owing to the absence of accommodation for either the new administrative services or the new inhabitants. The government was forced to resort to stern measures to bring the situation under control (Marmaras, 1999). In the meanwhile Greeks and many foreigners bought large areas of the city with future prospect of selling them at an over-estimated land price. English and Americans mainly dominated the land market. Later on they created major issues and prevented the implementation of the street plan of the new city, demanding enormous amounts for expropriation (Stasinopoulos, 1963). The bourgeoisie of the communities didn't appear to be involved in this speculative urban land market. It had pumped its wealth in the market of large rural areas of the exiting Turks, the construction of expensive mansions, the donations of infrastructure and the embellishment of the area of their residence. The locals, on the contrary, speculated causing continuous revaluation of urban territory. They bought land with purpose to resell in inflated prices or to sell after the development (Leontidou, 1989).

During the first decade of King Otto's reign several town planning concepts for Athens were considered; some of them were partially implemented, others remained in the realm of pure theory. These concepts not only differed in regard to the basic layout of the new town but also treated the problem of the spatial relation between new and old, between built and unbuilt areas, in various ways. The basic option of these plans was the direct juxtaposition of the new city with the old town (Papageorgiou-Venetas, 1994). While neither the economic opportunities existed, nor the state political power was enabled to impose the solutions the town planning gave, the city plans provided engravings in the body of the old town that could be expressed only on a basic, abstract ideological level and only on the overestimation of the city as an administrative center of the state (Lefas, 1985). The state construction activity at that time was extremely limited and was primarily conducted by the private initiative. The initial reconstruction of the capital was generally characterized by private rather than public architecture. One way or another, the land that belonged to the state was totally inadequate to meet the current needs and in addition, there were insufficient funds in the state coffers at that period to meet the expense of constructing attractive edifices. Though between 1835 and 1840, the orgy of building in the historic center of Athens was unprecedented, and the first houses were just beginning to be built outside the old town, on the street plan of the new city. Despite the fact that in April 1836, an elementary building code was issued by Royal Decree, the first development activity was generally anarchic and morphologically deficient, as it was intended to satisfy the urgent need to house the influx of newcomers (Biris, 1999). The haste with which the government was transferred in Athens, the high demand for housing, the delayed completion of the first projects, as well as the state inability of obtrusion over land owners whose properties were expropriated, played an important role in the subversion of the city plans and the revival of the old town (Lefas, 1985).

The crisis of 1843 - Urban infrastructure projects and massive building construction
    A public debt crisis broke out in 1843 and resulted in the first Greek bankruptcy. The politics and not the economy caused the economic crisis of 1843. The politics and the absurd financial requirements of the Great Powers exacerbated the financial crisis and

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deterministically led either to full subordination of the country or to bankruptcy. The re-fusal of the Greek state to pay its debts, shut the country out of the international capital markets for decades (Bastea, 2008). In the meanwhile the riots and the revolutionary events of 1848 in major European countries, such as France, Italy, Austria, suspended the economic activity. For Greece the period following the crisis of 1843 was a phase of a long-term economic decline. The wheat shortage in 1851 and 1853, the grape phyl-loxera, the Crimean War in 1853, the occurrence of outbreaks of cholera and the anglo-french occupation in 1854-1857 extended the crisis until 1857, the year of the first interna-tional economic crisis (Sakellaropoulos, 1994).

In the years that followed, up to the end of the century, Greece benefited from the capital era of European economy, which had widely opened the access to loans. The purpose of loans use was the modernization of the country (Romaios, 2012). The proposal development aimed to support the economic reforms, to strengthen the financial inter-ests and to induce the internal reorganization. Priority was given to infrastructure projects. Large public infrastructure works carried out in the years after the crisis of 1843, created the basis for a rapid modernization of public transport and communication systems and tech-nological infrastructure. Private funds, government loans and financing, were disposed to modernize the infrastructure and the city itself. The growth of the capital city involved also the state in undertaking infrastructure works in the city. The public infrastructure projects made a great contribution to the building orgasm, which dominated Athens after the crisis of 1843. It was thus natural, with the rebirth of the new capital of Greece the Athenians would hasten with unprecedented enthusiasm and zeal to contribute to the reconstruction of the city's public buildings. Athens became the focal point for the national feeling (Biris, 1999). The city was perceived as a sum of independent buildings. The first plan of Athens was characterized by dispersal public buildings throughout the city (Lefas, 1985). In about 1870, no significant urban planning initiatives were taken, nor were there any real changes in the way the city was organized. Interventions which were promoted were mainly of a corrective type and extensions of the official city plan (Marmaras, 1999). Many of Athens' public buildings were built with the financial assistance of wealthy Greeks, chiefly overseas Greeks, who thus adorned the city with magnificent edifices.

The wealthy Greeks from aboard were now seeking to move to Athens permanently. They built large mansions and transferred their mainly stock-market-related businesses. The expatriates repatriated to establish banking and brokerage firms and to allocate a large part of their income in donations, house and land buying. The comprador bour-geoisie was involved in business activities, which exacerbated the imperialist depend-ence and the direct export of surplus. Their economic activity gradually changed the Greek development model (Leontidou, 1989). The massive repatriation after the crisis of 1843 was also an attempt for the expatriates to improve their competitive position against European capitalists. The exponential invasion of European capital in the Middle East and the rise of nationalist movements, forced the Greek comprador bourgeoisie of Diaspora to retract mainly in Greece (Tsoukalas, 1977). The comprador bourgeoisie, along with the European powers of the time stressed their sovereignty and the state cen-tralization of Greece by investing in building and construction. The resulting increase for accommodation and investment led to the overvaluation of urban land and a wave of general land speculation (Marmaras, 1999). During the decade of 1870-1880 the com-prador bourgeoisie, the bankers and brokers, the raisins traders, the industrialists and squires constituted economic and social groups with specific class interests. They were facing the state mechanism not only as a source of wealth with the assignment of major projects and access to loans, but also as a mechanism to promote and protect their own interests (Romaios, 2012).

The crisis of 1893 - Modernization and utopian urban visions
After the Greek government settled outstanding defaults in 1878, the global capital market opened once again to Greece. From 1879 to the bankruptcy of 1893 foreign banks provided seven loans of a total value of 630 million Drachmas, from which only part of the two loans were used in productive and developing works. The borrowing in-

Figure 3. Economic fluctuations in Greece during the 19ᵗʰ century.
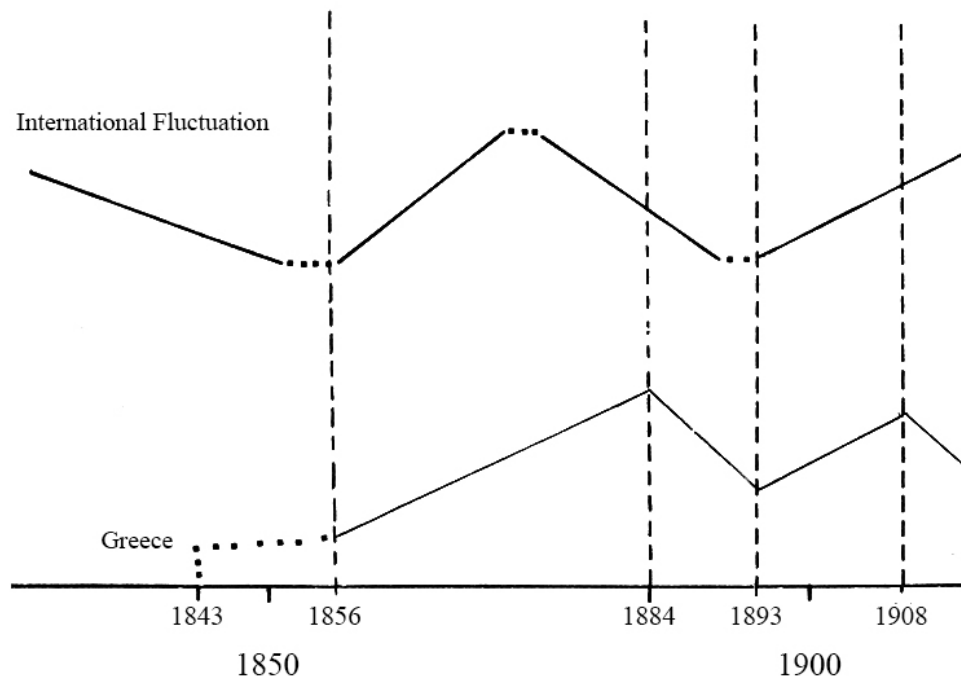
creased to unsustainable levels and the government suspended payments on external debt in 1893. The successive financial crises between 1882 and 1884 in France and in the United States, the panic of 1893 in America and the so-called "Baring crisis" in England caused serious consequences for Greek economy, such as the sharp drop in exports, the falling of exchange rates and the collapse of the whole traditional agricultural trade production system of the country (Romaios, 2012). The economic retrogression was further aggravated by the unfortunate Greek-Turkish war of 1897 and the currency's devaluation (1896-1910). The imposition of an International Committee for Greek Debt Management in 1898 sealed the economic crisis. In order to deal with the growing problems, the government was forced to take out foreign loans on extremely onerous terms.

This economic situation led to the final demise of provincial cities. The comprador and domestic capital established their new enterprises in the most developed urban center, Athens. The Greek urbanization approached a strongly centripetal model. The economic growth and the expansion of the national borders accelerated Athens urban growth (Leontidou, 1989). The integration of new regions in the Greek state and the outbreak of industrialization, were the main factors which led to Athens population growth. By the turn of the century the population of Athens was over 220.000.

Apart from the more general problems it was facing, Athens at the dawn of the twentieth century was suffering from the absence of basic infrastructure work. The limited infrastructure of the country did not provide any financial incentives for industrial investment. The decade after 1910 saw the capital becoming the object of new planning policies. Wide investments gave the city the opportunity to create the conditions for an unstoppable development. In contrast with the recent past, the attempted modernization of the city was systematic and dynamic. Unprogrammed extensions of the city plan virtually ceased, while at the same time a scheme began to take shape for drawing up a master plan for the capital as a unified whole, not broken up into small urban formations (Marmaras, 1999). A considerable number of master plans, aiming at both the rehabilitation of the central Athens area and at orderly expansion, have been elaborated by private experts, town-planning advisors appointed by the government, and also by

municipal and state city-planning administrations (Papageorgiou-Venetas, 1994). The practice applied in the city planning sector included small-scale adjustments having to do more importantly with new extensions into its surrounding suburban zone. The construction activity was directed toward the city limits, where the land prices remained low, resulting in a continuous spread of the capital. This plethora of planning proposal for Athens, was also accompanied by architectural developments which made a decisive contribution to changing the image of Athens and paving the way for the city to develop its modern profile. The transition took place gradually: first, from low-rise buildings to multi-story blocks, accompanied by innovations of a structural kind in the constructed environment which made clear the lack of a building regulation and, second, from a historicist aesthetic outlook as variously expressed through a succession of different phases to the modernist conception of urban space, with simpler configuration of building volumes (Marmaras, 1999).

Conclusions

The entire history of Athens from the 19th century is a history of intense pressure in order to prevent any state intervention in speculative real estate market, a history of property owners, of owners and operators who were undermining their planners and imposing unlimited real estate transactions, causing the speculative revaluation of land (Leontidou, 1989). The type of city that emerged should be attributed to the inability of the state to impose on land owners regulations for the sound planning, organization and construction of urban real estate. The proliferation of unplanned development, which prevailed through the last decades of the 19th century, created a negative impression of the city.

References

Bastea, E. (2008) *Αθήνα 1834-1896.Νεοκλασική πολεοδομία και ελληνική εθνική συνείδηση* [*Athens 1834-1896. Neoclassical urban planning and Greek national conscience*] (Libro, Athens).

Biris, K. (1995) *Αι Αθήναι από του 19ου εις τον 20ον αιώνα* [*Athens from the 19th to the 20th century*] (Melissa, Athens).

Biris, M., Marmaras, E., Fessas-Emmanouil, H., Papageorgiou-Venetas, K., Schina, A., and Axiotis, G. (1999) *Αθήνα κλεινόν άστυ* [*Athens: The Famed City*] (Militos, Athens).

Burgel, G. (1976) *Αθήνα, η ανάπτυξη μιας μεσογειακής πρωτεύουσας* [*Athens, the development of a Mediterranean capital*] (Exantas, Athens).

Castells, M. and Burkhalter, L. (2009) 'Beyond the Crisis: Towards a New Urban Paradigm', in The *4th International Conference of the International Forum on Urbanism*, Amsterdam.

Houmanidis, L.T. (1990) *Οικονομική ιστορία της Ελλάδος. Από της Τουρκοκρατίας μέχρι του έτους 1935* [*Economic history of Greece. From the Ottoman Empire till 1935*] (Papazisi, Athens).

Lefas, P. (1985) *Αθήνα, μια πρωτεύουσα της Ευρώπης: μια σύντομη εξιστόρηση της εξέλιξης της Αθήνας από την ανακήρυξή της σε πρωτεύουσα του ελληνικού κράτους έως σήμερα* [*Athens, a European capital: A brief chronicle of the development of the city of Athens from the its proclamation as the capital of Greece until today*], (Dodoni, Giannena).

Leontidou, L. (1989) *Πόλεις της σιωπής, εργατικός εποικισμός της Αθήνας και του Πειραιά 1909-1940* [*Cities of silence. Working-class colonization of urban space, Athens and Piraeus 1909-1940*] (ETVA, Athens).

Marmaras, E., Biris, M., Fessas-Emmanouil, H., Papageorgiou-Venetas, K., Schina, A., and Axiotis, G., (1999) *Αθήνα κλεινόν άστυ* [*Athens: The Famed City*] (Militos, Athens).

Papageorgiou-Venetas, K., Marmaras, E., Biris, M., Fessas-Emmanouil, H., Schina, A., and Axiotis, G., (1999) *Αθήνα κλεινόν άστυ* [*Athens: The Famed City*] (Militos, Athens).

Romaios, G. (2012) *Η Ελλάδα των δανείων και των χρεοκοπιών* [*Greece and the sovereign debts defaults*] (Pataki, Athens).

Sakellaropoulos, T.D. (1994) *Οι κρίσεις στην Ελλάδα 1830-1857. Οικονομικές, κοινωνικές και*

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πολιτικές όψεις: 1845-1857 [*The crises in Greece 1830-1857. Economic, social and political aspects: 1845-1857*] (Kritiki, Athens).

Tsoukalas, K. (1977) 'Το πρόβλημα της πολιτικής πελατείας στην Ελλάδα του 19ου αιώνα' [The problem of client politics in Greece in 19th century], in *Κοινωνικές και πολιτικές δυνάμεις στην Ελλάδα* (Exantas, Athens).

The architecture of the city contended between history and contemporary

Giovanni Multari
Department of Architecture of the University Federico II, Via Forno Vecchio 36, 80134, Naples, Italy
Keywords: City, history, contemporary

Abstract

The research carried an analytic study on one of the founding moments of the city of Naples and its architecture: the Greek-Roman period. An accurate analysis of the layers stratified through history drove to a deep understanding of that common ground for contemporary architecture and for contemporary design that looks for its renewed rules into the fabric of the historical city. Naples shows a unique situation in the whole world, an ancient town made of such a peculiar sequence of public and private spaces, elements and layers (streets, courtyards, cloisters, monasteries, fortification walls, and archaeology) that never ceases to evolve and to adapt itself to new social needs, in a constant process of mutual exchange between architecture and city life. The use of "private" spaces for public purposes reflects that principle of light and dark contrast typical of the historical centre and of Naples itself, with the renewed role of regeneration catalysts for such a stratified urban fabric. It means therefore to rediscover the measure of public space in the Greek-Roman fabric, a welcome return to the discipline, the theory, the design and construction that, through the research on via Tribunali, rediscovers the contemporary dimension of an ancient place such as the Decumano Maggiore.

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Introduction

The theme of contemporary architecture in historic centres is today the subject of the most advanced European cultural debate. The interest on "old and new" begins immediately after WWII, when a new way of understanding the relationship between modern architecture and tradition began to take shape. In 1955 E.N. Rogers wrote "*the first manifestations of the International Style were limited to isolate phenomena and aimed at an objectivity of expression that was to represent each architectural product as itself, within the limits of its autonomous individual existence* [...] *you can say that the problem of historical continuity (the conscious historicizing of modern phenomena respecting those of the past and yet permanent in our lives) is a fairly recent acquisition of architectural thought*". (Rogers, 1955)

Today, when current conditions are completely different compared to back then, we aim to recreate them, working together to build a complete theory of the project drawn by the action and practice, the key-elements of the Master's degree course in Design for Historical City held by the University of Naples. A theory capable of restarting a speech interrupted for too long now, a debate on architecture, on its necessity, on it being done.

In this way the historical centre of Naples, with his Greek and Roman foundations, became an excellent field of inquiry and experimentation, a common ground for architectural design that leads to a method able to build an architecture that is adequate and strictly bond to our time. An architecture for our time, therefore clear and understandable, that is able to point out the problems and suggest solutions, giving directions in a definite and shared field.

Working on the historical city means working on the body of the city with an adequate level of awareness, fostered by a piece of shared and communicable knowledge.

This means also to take a clear and definite position based on awareness and plausibility. It should say yes to innovation but don't dissipate the collective memory carried by our cities, aiming to design practices that work to define a collective point of view.

In this sense, the extraordinary historical centre of Naples and Naples itself offer us the testimony of a great book that must be read through a critical reworking of the cultural heritage, offering architecture the chance of being a unique contribution. The process must be based on the ability to acquire a genuine awareness of the building processes and of that knowledge that focuses on issues of great importance such as the relationship between Architecture and Town, the Old and the New, Civis and Civitas, Public and Private Space, including Individual and Collective Dimension.

The classical monument is not a valid concept in Naples. In its place are the complex processes that transform difference and contrast into the visible vitality that has come to characterize the city's tradition and history. The historical dimension of this development is best described by quoting Adorno: "*Against the verdict of obsolescence stands the awareness of the substance of that which renews it*". (Adorno, 1958) So we speak of a continuous process that has built the essence of the *Forma Urbis* of Naples and continues to do so today, a form of contrasts in the city, in its places and at different scales, whose identity is in that urban fabric that has remained intact through the different historical periods.

This is the background of the research project of the Department of Architecture of the University of Naples Federico II, in the Applied Research: "Sustainable Redevelopment of public spaces within the Great Project of the historic centre of Naples as UNESCO site" in 2013 that defined the value and direction of Design in ancient *Neapolis*. It is a historical stratification of languages and architectural techniques that undoubtedly has its roots in *the ancient* that still shines prominently through the works and that is a peculiar and perhaps unique element. Therefore, as claimed by Roberto Pane resuming Croce's thesis: "*the distinction between poetry and architectural literature finds a significant confirmation in our recognition that the atmosphere of our ancient city is not created by a few monuments, but by those many works that contribute to define a particular local character*". (Pane, 1959)

The main purpose of the Research is to provide the regeneration of part of the historical centre of Naples not through a simple recovery of the built tissue with punctual
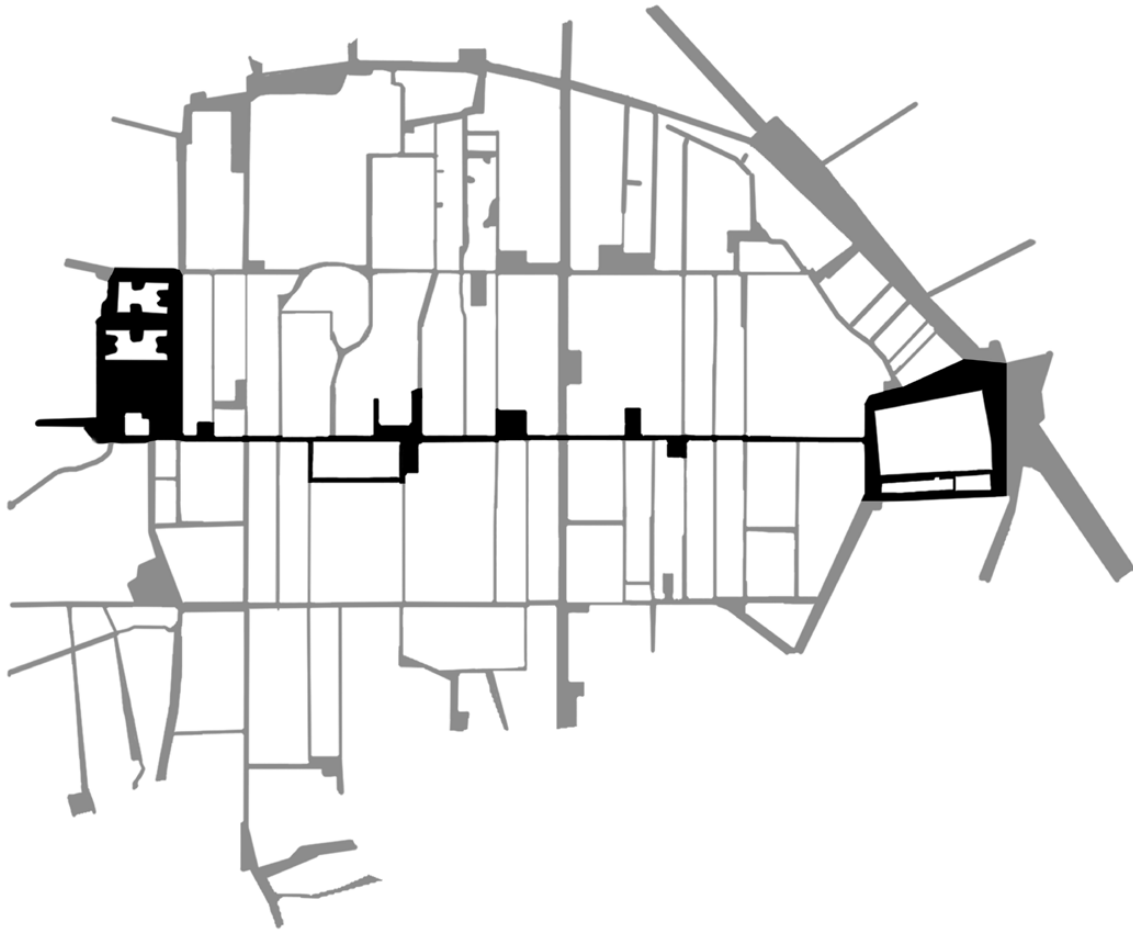
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interventions, but with a wider action on the built tissue and on the social, environmental and cultural system that constitute Neapolitan tradition, preserving the heritage of the ancient pattern.

Architectural design for ancient city

Research by Design aims to bring the architectural design process back to that state of science that operates rigorously and methodically in order to build a scientifically well-founded tale, a project of the present, of its time.

Conceiving a project guided by the contemporary image of the ancient helps to see, select and penetrate themes and meanings beyond the mere scientific reconstruction of the ancient city. The goal of the research is to make the stock of the mutual knowledge relationship between Architectural Project and Ancient City, starting from the phenomena of longer duration. These phenomena reflect the complexity and the constant change process that is the result of those two elements, in a slow but continuous progress of the urban scene based on the Hippodomean Pattern that "*demonstrates the importance of the form of urban artifacts, that is to say, the architecture of the city* [..] *Such a transformation could not have occurred except within or around the ancient cities, since they represented a man-made complex, a halfway point between artifice and nature which* […] *man could not easily disregard in the course of his development. In the utilization of the bodies of the old cities, there is at once an economic and a psychological rationale. They become both a positive value and a point of reference*". (Rossi, 1966)

Figure 2. (above) Agorà, the reconstruction of the ruin on Vico Maffei / Applied research on the historical centre of Naples, Unesco Project, 2013.
(below) Acropolis, the Croce di Lucca Church and the Greek Walls / Applied research on the historical centre of Naples, Unesco Project, 2013.
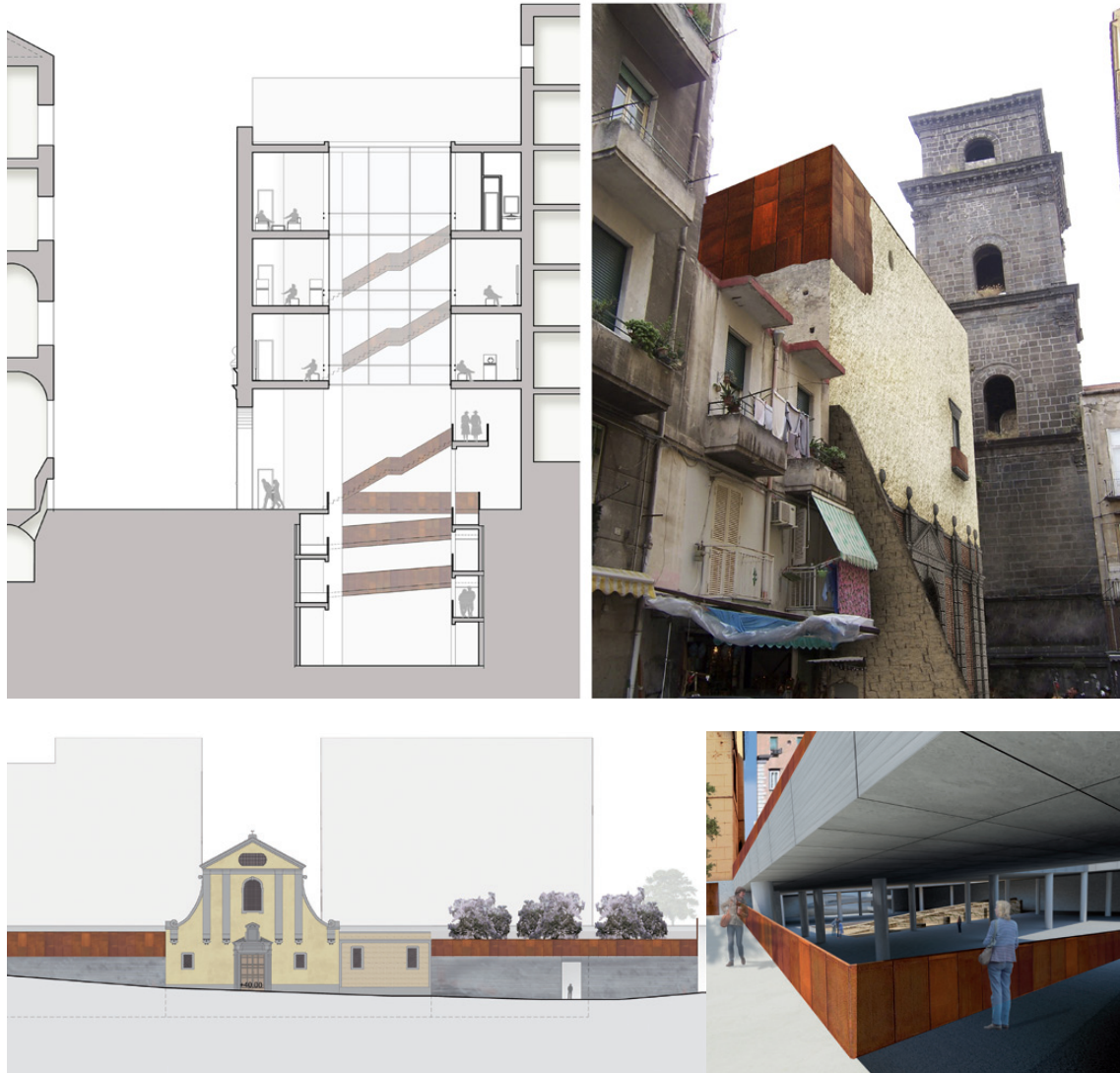
The location of the research and of the project is via dei Tribunali, the *Decumano Maggiore* of Greek-Roman *Neapolis*, that from Port'Alba (where the first Greek walls of the historic centre of Naples emerge), cuts through the entire urban structure up to Castel Capuano. The street has been called 'Strada dei Tribunali' since the sixteenth century, as the Castel became the city court. Piazza San Gaetano, centrally located at the intersection with the *cardo* of San Gregorio Armeno, corresponds to the area that hosted the Greek *agorà* before and the Roman *foro* later, location of another important building of the ancient city: the Tempio dei Dioscuri. Built in the first century A. D., it was transformed into a Christian church dedicated to St. Paul between eight and ninth century. The *Acropolis* is in the area currently occupied by the hospital, the west gate of the ancient city, whose construction in the late nineteenth century caused the demolition of a huge amount of historic buildings, mostly monastic cloisters. A complex system of fortifications, combined with the natural defence of the valleys which extended along via Constantinopoli and via Foria. The east-end of the long *Decumano*, corresponding to Castel Capuano, indicates the presence of the largest Necropolis of *Neapolis*.

The research identified three systems, on via Tribunali, in which the public space suggests possible actions both in relation to the entire structure of the *Decumano Massimo*, both to particular contexts in which these systems belong.

The first system is the area of Piazza Miraglia, the ancient *Acropolis* where the space in front of the Policlinico, the Croce di Lucca church, the Cappella Pontano, the church and monastery of Santa Maria Maggiore converge. In this area, the void resulting from the demolition of one of the three main hospital buildings is now a space that requires a measure in continuity with the ancient city, a place for the ancient walls to emerge. The writings of Ettore Ebrici before and writings of Bartolomeo Capasso in comparison with Beloch later, testify to a secure presence of the Greek walls along the grounds of the Croce of Lucca church. The area of the excavation coincides with the area currently dedicated to the main parking lot and replicates the spaces of the old town: courts and cloisters. Revealed spaces and existing spaces are "*rooms without ceiling*" as claimed by Renato De Fusco, places illuminated by a light that penetrates from above and brings out the beauty of the gardens or of the single trees that dominates the space, the magnificence of the light and dark contrast of the cloisters' arcades and the ancient statues. The space system thus reveals the most ancient past of Naples, just like the Greek-Roman theatre, imprisoned between the *insule* of via Anticaglia. The shape of these spaces is born from the drawing that has traced the shape of the city. A space that follows the alignment of *cardi* and that assigns a renewed role to the Church of the Croce di Lucca.

The second system is the area of the original *Agorà* corresponding to the area enclosed by the complex of San Paolo Maggiore (which stands on the site of the ancient Tempio dei Dioscuri), Piazza San Gaetano, and a nearby building in ruins. The research project explores the relationship that exists with the subsoil, rich in significant archaeological remains, around which are placed extraordinary architectural presences: the convent of San Gregorio Armeno and the church of San Lorenzo. This context includes the reconstruction in a contemporary way of a ruined building located on the corner of Vico Maffei that calls into action the different layers of the city, from the archaeology to the extraordinary system of existing public spaces, up to the highest point: an observation point on the entire heritage. The ruins on Piazza San Gaetano represent a great opportunity for the regeneration of the *insula* Tribunali-Vico Maffei. The reflection about the placement of a new function within the building must necessarily take into account the characteristics of the area, intended as central point of the historical and archaeological reality of the ancient centre. The project aims at enhancing the ruin as a common good and at its inclusion in the process of enhancement of artistic, cultural and environmental heritage. The space between the walls of the ruin becomes a vertical space that drills underground and connects to the archaeological complex of San Lorenzo Maggiore. This new access to the archaeological heritage is articulated through exhibition spaces and services that reinforce the organization and hospitality.

The third system, the ancient *necropolis*, corresponds to the footprint of Castel Capuano, ancient Norman fortress, later the seat of the Court. Castel Capuano occupies an area on the edge of the eastern side of Naples: its Greek foundations run below the western sector of the building, the main façade, while in the eastern one, built on the valley of via San Giovanni in Carbonara, hides the oldest *necropolis* so far investigated in Naples. As the eastern gate of the historic centre, Castel Capuano takes the role of gateway to the *decumano*, with its four monumental courtyards and opens the way to the ancient *Neapolis*. An ancient city strong of its fundamental characters and elements that, despite the issues of use and practices and the ways through the built tissue and its spaces have been adapted over time, continues to maintain that civic presence and that ability of architecture to act in continuity and in accordance with the place and the dwelling.

In this sense, a project is a research when not only involves a comparison with the physical presence of the built tissue, its size, its terms of materials and, therefore, with the ways in which it presents itself but also a comparison with the values, ideas and the memories that its spaces and its architecture put in place by weaving other stories. Carlos Marti Arìs describes the condition of the research, defining "The Architecture of the City" as a systematic study on the relationship between architecture, understood as type, size

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Figure 3. Necropolis, Castel Capuano and the north-western excavation / Applied research on the historical centre of Naples, Unesco Project, 2013.
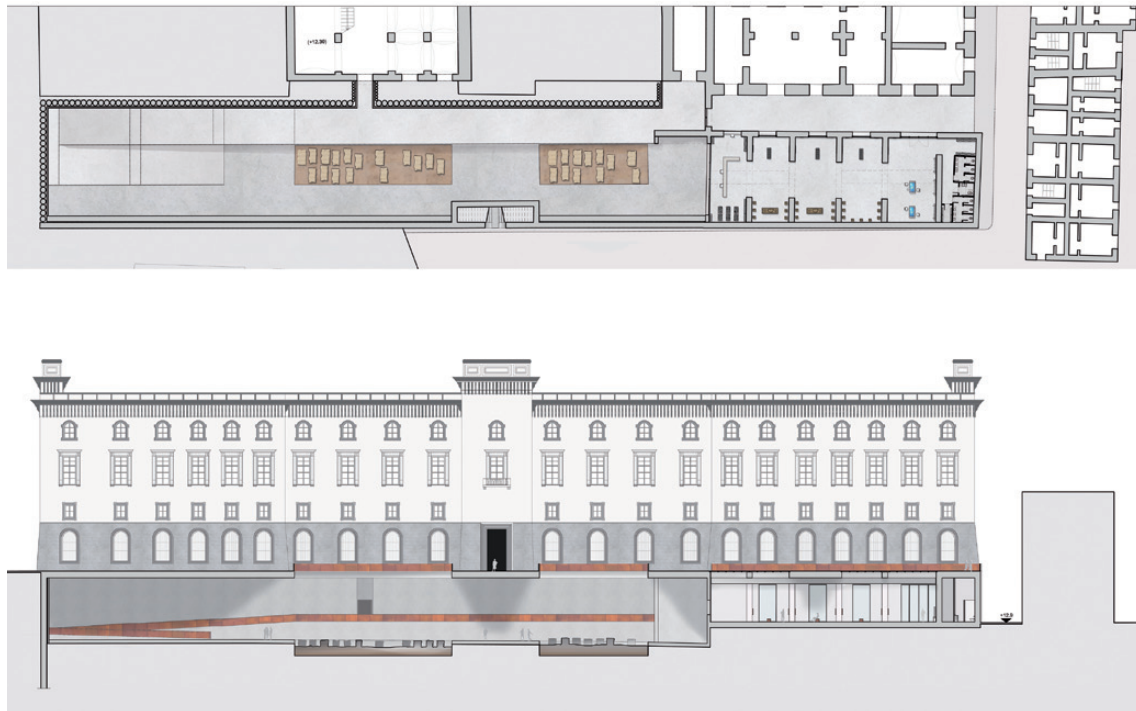
and generic architecture, that identifies the particular, singular, concrete aspects: "*Rossi analyses monuments with the attitude of one who examines the features of a face, trying to reconstruct the various vicissitudes that, over time, have marked every expression and crossed every line. And it is precisely in this strong bond with architecture, in it being rooted in a place that assists the passage of so many events and the succession of so many experiences, that Rossi found the real reason of what he calls 'the individuality of the urban artifacts'*". (Arìs, 1990). The ancient city has proved indispensable reference to operate on via dei Tribunali and turn its spaces into an asset for our times, preserving the richness and identity of these places, through a possible continuation of that wonderful process of transformation that has ensured the vitality in time. The urban structure and the strong physical presence of its architecture are such that working on via dei Tribunal required a constant research of equilibrium between the individual buildings and the entire body of the city, even assuming a form of dependence between the physical and the social structure of city. Over time it has meant that the Greek-Roman plan was able to guide and support the many developments in the city and form its common reference, allowing the stratification of the layers of different periods.

The Hippodomean Pattern, made of *cardi* and *decumani* arranged on degrading plans, takes the form of an interaction between nature and artifice, between a formal pre-set order, imposed from the outside, and a formal order that comes from the peculiarity of the places. The clarity of the route of the *decumano maggiore* acquires density and takes its measure right from the great architecture of the place. It is the very structure of the system that gives it the strength to support both the porosity of the underground (a subterranean labyrinth made of caves, tunnels, aqueducts, necropolis and shelters, a sort of city within a city in direct continuity with the outside world) and the surface density of the built, a heterogeneous and compact urban fabric, generated by the complex relationship and stratification of the *insulae* in plan and elevation, but so interconnected as to limit the total perception of their forms. A building in the heart of Naples is part of an extraordinary volumetric composition that has a defined spatial location but also blends the limits of its spaces as undefined and permeable in a continuous mingling between

private and public life. Domestic sphere and civic sphere are mutually supportive as the houses project themselves on the road, taking possession of it as allowing the road to get inside the houses. These identifying characteristics and a strong and lasting physical presence have allowed and still allow the buildings and open spaces always to respond to new needs and changing conditions. The measures and relationships brought by the Hippodamian Pattern have always dictated the ratios of the parts among themselves and against all, and have never been eliminated from the body of the ancient city even when its built tissue has reached levels of density and such complexity that seemed to have subverted any principle of order. The clarity and specificity of its typological structure always matched a capacity of ongoing metamorphosis of its spaces.

The centre of Naples came out over time as a system of buildings and spaces, mirror of the ways of life and relationships of people with their environment. And it was the ability of the Pattern to endure, that has ensured over time the conservation and reinterpretation of that complex of ideas, values, conditions and intangible assets that have been and are the urban structure of the places.

An architecture based on principles and reasons that need to be retrieved in contemporary practice. The ancient Naples shows clearly the importance of the dialectic between continuity and change, a renewal process based on an unchanged core. The old centre is mix of ages and eras, and at the same time of order and disorder, a complex in which the ancient city is not obliterated, but incorporated and transformed in the present city. Its vitality and its authenticity over time come from the ability to renew its relationship with the places and of continuing their culture. A process that requires to deal with what came before us, keeping it as a substrate on which to place new materials, customs, rituals and forms with continuous exchanges of quality and dimensions between worlds and eras, transforming events and potential occasions in great richness for the city and for architecture. A search powered by the knowledge that, as recalled by the words of Ernesto Nathan Rogers, "*No work can be truly modern f it doesn't ground its foundations in tradition, nonetheless the ancient works have meaning today until they are able to resonate through our voice; so, outside from history and from a no less abstract idealism, broken the conventional boundaries, we examine the architectural phenomenon in its being: in its historical concreteness*". (Rogers 1953)

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With this awareness and with these objectives, the project research on via dei Tribunali questioned the reality of the place and verified the possibility of new links with present times, taking stock of their complexity and their persistence. The regeneration plan of the *Decumano Maggiore*, connected to the whole historical centre, takes its complexity and persistence as a grounding base for a harmonious development and transformation, motivated by the possibility of change and structured by memory and experience in these stratified locations. A number of different actions aimed at probing, regenerate and develop the nature of urban spaces of via Tribunali have been thus developed. Combining a need for knowledge and clarity with an attitude of listening and care for public spaces, a dialectical relationship between the historical and the contemporary has been sought. Interventions and actions have been developed in response to specific issues and conditions and, even within a certain autonomy, seek complementarities and synergies not only among themselves but also with other projects currently ongoing in the historical centre, in particular, with the necessary regeneration of the *cardi*. The rules for regeneration of via Dei Tribunali are written in its construction, in the Hippodamian Pattern, in its complex system of buildings, in the continuous dialogue and complementarity among streets, plazas, courtyards and cloisters. The relationship between the architecture and the life of the city and the coexistence of landscape, buildings and archaeology cannot be left aside. In this sense, making some considerations on via Tribunali means to immediately enter into the merits of a project program. A first consideration, therefore, concerned the nature of via Tribunali as path: it is not, as we have seen, a straight axis, with a set of homogeneous façades, but a way more articulate part of the city. This is clearly visible by just observing the variations of the facades of the single or double *insulae* that sometimes step back from the street line or create little widening or corner squares on via Tribunali. Actually, the path of via Tribunali is strictly related to the

rhythmic scansion created by *insulae* and *cardi*, but gains a much more important role when it intersects building entrances, open spaces, convents cloisters, building courtyards and gardens.

Considering these elements as parts of the path results in a real system of expansion of the open space that makes via Tribunali a multi directional and variable space. The projects theme is then the extremely fascinating task of working on a further stratification of some of the spaces, of *acropolis*, *agorà* and *necropolis* to make their millenary presence strong and visible again on via Tribunali. It is to consider that this expanded open space connects with the interstitial areas between closed and open spaces but also with the interior of the buildings that show interesting spatial quality and layout.

Via Tribunali is configured so as a permeable urban continuum, intermediately crossed from the south and north; in this interpretation the role of the eastern and western "front doors" is not questioned, keeping their role of starting points for the aforementioned spatial dynamics. The eastern side of via Tribunali is closed by Castel Capuano, a building arranged on a series of courtyards, a crossable space that leads who comes from the train station (and from others important eastern urban spaces) directly on the street. Even Castel Capuano, a place of stability related to judicial functions, could undergo a process of functional modification. But today, apart from introducing the crossing of the courtyards, a simple access system connected to the courtyards could immediately and fully enhance the space along the ancient footprint. Via Tribunali could then become a connection place for different layers: the underground archaeology and the fascinating aboveground courtyards and public squares. The western side shows a more complicated situation; the demolished Policlinico building created an oversized void at the entrance of via Tribunali, around the entrance to San Pietro a Majella: a place for a great urban project to be developed over time, aimed to enhance the archaeology and the adjacent urban spaces. The ancient monasteries forms are recalled in the new typological elements, a series of courtyards that open the vision on the foundations of the ancient city. The courtyards give the measure of the urban composition that was the original whole for the now isolated Croce di Lucca church and at the same time is given a tectonic meaning to support the existing University buildings that are being turned into new places for culture, education and hospitality.

Conclusion

In the early nineties Giancarlo Alisio, in the preface of the book on the historical centre of Naples by Lidia Savarese, stated: "*it may appear lazy, and I would say almost superfluous, to propose a new study on the oldest part of Naples, the Greek-Roman area, after the large number of studies that have analysed environments and monuments* [...] *and the continuous series of possible actions often solicited by the huge focus of economic interests on this area*". (Alisio, 1991)

In the last twenty years the large number of studies and projects on the historical centre dramatically decreased. Looking at via Tribunali with new eyes, also starting from the historical and urban analysis of the second half of the twentieth century is very important, especially if the operative tool is research by design.

We reckon that the proposed architecture can provide a contribution that, besides taking care of the places, can intensify the quantity and quality of physical, cultural, economic, social, and symbolic connections between the city and its historical centre. The research aims to promote reflection and to provide a contribution on how to recover the ability of architecture to perpetuate the city. An action aimed to rescue that whole field of choices that should belong to architecture and, therefore, to its tools and its disciplinary corpus for reconsidering the continuity and oppose to the current conditions of the city a renewed culture capable of being a valid alternative. We understand then, for our work to make sense, it is necessary to intend a transformation practice that must find its trust in thoughts, knowledge and experience meant as the body of the design, with no distinction between Research and Project. Everything starts from the awareness of the indissoluble link between means and purposes, that mastery of practice able to

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Figure 4. Agorà, the ancient Foro as a contemporary public space / Applied research on the historical centre of Naples, Unesco Project, 2013.

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ask itself ethical questions as an act of intellectual responsibility. We should support a critical practice, able to tell by itself the extraordinary potential of architecture as the fixed scene for life.

The theme of the historic city has, in this sense, such a density and complexity of meanings and so broad contextual implications to require a research program based on a method suitable for the meaning and the dimension of the issues. A research work of great complexity that produces significant results in terms of knowledge leads to projects with a great conceptual clarity and a strategic effectiveness of which only the ancient city is a witness. Rediscover the meaning of our actions dealing with the city and the environment is a welcome return to the discipline, the theory, the design and construction that, through the research on via Tribunali, called into action the contemporary dimension of an ancient space such as the *Decumano Maggiore*. A classic innovative hypothesis, in line with the logic that aims today to rediscover in the historical city that potential that modernity had attributed to the modern city, rediscovering measure of public space in the fabric of the Greek-Roman city.

References

AA.VV. (1996) *Proposta di varianti per il centro storico e la zona orientale. Comune di Napoli*, Dipartimento assetto del territorio, Servizio pianificazione urbanistica (Napoli).
AA.VV., (1955) *Dalle rovine del '45 alla realtà del '55. Documentario della ricostruzione di Napoli* (Milano, Edizioni Comunità).
AA.VV., (1986) *Il recupero urbano - Napoli 1981-86 città in trasformazione* (Napoli).
AA.VV., (1989) *Presenze 1900/1945*, catalogo della mostra (Milano-Napoli).
Adorno T. N. E. (1958/1967) *Parva Aesthetica* (Frankfurt, Suhrkamp).
Alisio G (1991) 'Prefazione', in Savarese L. *Il centro antico di Napoli, analisi delle trasformazioni urbane* (Napoli, Electa).

Augé M. (2014) *L'antropologo e il mondo globale* (Milano, Raffaello Cortina Editore).

Belfiore P., Gravagnuolo B, (1994) *Napoli - Architettura e urbanistica del Novecento*, (Bari, Laterza).

Belli A. (1985) *Il labirinto e l'eresia. La politica urbanistica a Napoli tra emergenza e ingovernabilità*, (Milano, F.Angeli).

De Fusco R. (1994) *Napoli nel Novecento* (Napoli, Electa).

De Lucia V. (1997) 'Il processo di pianificazione a Napoli', in *Urbanistica*, n.109.

de Seta C. (a cura di) (1986) *Napoli '85. Cartolina da Napoli* (Napoli, Electa).

Doria G. (1952) *Storia di una capitale* (Milano – Napoli, Ricciardi).

Giannì R. (1997) 'Un'urbanistica austera', in *Urbanistica*, n.109.

Gravagnuolo B. (1994) *Napoli. Architettura e Urbanistica del Novecento* (Roma-Bari, Laterza).

Guidi L., (1986) *Napoli: interventi edilizi ed urbanistica tra le due guerre* (Napoli, Electa).

Martì Arìs C. (1990) *Le variazioni dell'identità, il tipo in architettura* (Milano, Clup).

Monaco A. (1995) *La vicenda urbanistica "Napoli": 1965 - 1995* (Monteroduni, Edizioni Cep).

Multari G. (2013) *Architettura della città: Napoli lo spazio della città che cambia*, in EDA esempi di architettura on line _ july.

Multari G., Izzo F., Corvino V., (2013) Yearbook 2010/2011, *The architectural project for the historical city* (Napoli, Paparo Edizioni).

Nathan Rogers E. (1953/1954) 'Editoriale', in *Casabella-Continuità*, n.199.

Pagani C. (1955) *Architettura italiana oggi* (Milano, Hoepli).

Pane R. (1959) *Città antiche edilizia nuova* (Napoli, ESI) 1959, 50.

Rossi A. (1966) *L'architettura della città* (Padova, Marsilio) 122-126.

Rykwert J. (2003) *La seduzione del luogo* (Torino, Einaudi).

Siza A. (1998) *Immaginare l'evidenza* (Roma, Laterza).

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New architecture in the ancient city. The typological-procedural approach of Caniggia, Bollati and Vagnetti groups in the competition for the extension of the Chamber of Deputies

Illy Taci, Cristina Tartaglia, Giancarlo Salamone
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy
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Abstract

In 1967 the Chamber of Deputies advertises a national competition for a preliminary plan for the extension of the italian Parliament. It symbolized one of the most important and complex contests among those advertised in the postwar period and represented a great opportunity for the most important personalities of Italian architectural culture; it was, also, an important venue for comparing the different approaches of various competitors to design thinking in the historic center.

The Chamber of Deputies, dropped the plan to transfer the functions incompatible with the environmental nature of the historical center in more suitable areas and decided to stay within the stratified urban fabric of Rione Campo Marzio for its prestige and historical significance.

The announcement proposed as a design area an empty space in the heart of the stratified and consolidated urban context in the roman historical fabric, left by the demolitions of the medieval and baroque fabric carried out, since 1908, for the construction of the new parliamentary building by Ernesto Basile.

Fifty years later, for a design of national importance, which is the extension of the Chamber of Deputies, no new demolitions of the historic fabric were carried out, but an undefined area, in the heart of the city, became a place of historically congruent transformations.

The outcome of the competition, which ended with 18 ex-aequo, provides the evidence about the great uncertainty that becomes apparent every time we have to deal with ancient urban fabric.

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The Formation Process of the Chamber of Deputies Area

Before carefully delving into the project proposals, it is due analyzing the morphological context of the urban fabric in which the Chamber of Deputies lies.

The area between Missione street and Campo Marzio street is, up to the present day, one of the many "urban voids" in the historic center of Rome, as well as Gaetano Miarelli Mariani would call it in his publication "Centri storici: note sul tema". An "urban void", as previously stated, generated from post-unification demolitions performed into a particular area, already been through many shape-changing transformations since Roman ages. These changes led to the ultimate form of the historical center as we know it nowadays.

Some brief history about the area. At the time of Rome foundation, the area is north of palus caprae and sits at the slopes of one particular hill. Future events will name that hill "Monte Citorio". The name of this quite low cliff stands for "mons citatorius", literally "Mt./Hill of the Assemblies". Others claim the name comes from "mons acceptorius", because it was literally formed by the wastes piled up in Campo Marzio.

Ever since the republican ages, Lata street passes tangentially in the area of Chamber of Deputies: that axis is a continuation intra moenia of the Flaminia street, which still puts Rome in communication with Rimini. The importance of this axis allows us to understand why the urban fabric on the current Corso street was used as path matrix for the plant and connection paths, which followed in the future.

The period of transition between the Republic and the Empire is a very important step for the understanding of the formation process of the area and deserves special attention: during the second half of the first century BC, Marcus Vipsanius Agrippa built the Pantheon (along with the complex of the Basilica of Neptune and Saepta Julia) then all will be rebuilt by the Emperor Hadrian, because of a fire that destroyed the complex a few decades before. This temple is in palus caprae, where, according to archaic sources, Romulus, founder of Rome, transfigured in Quirino and ascended to heaven during a ceremony in the campus martius.

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A few years later, the sister of Agrippa, begins the construction of Porticus Vipsania, later completed by the Emperor Augustus, whose remains are most likely equal to those found during the construction of the Galleria Sciarra.

The Emperor Augustus built:
- His funerary monument, also known as the Mausoleum of Augustus;
- The Horologium Augusti at the foot of Montecitorio, the largest sundial of ancient times, whose gnomon, obtained by an Egyptian obelisk made of red granite from the city of Heliopolis, was rebuilt after its discovery, in Montecitorio square;
- The Ara Pacis on Lata street, at a symbolic distance of a mile from pomerium, following roman tradition: after crossing a mile from pomerium, in fact, a Consul returning from a military campaign had to let his dominance on the army fall, and suddenly could return to his citizen duties and powers.

It is possible to see a connection, in the Augustean period, through paths, between the Pantheon / Horologium Augusti-Ara Pacis / Mausoleum of Augustus.

The Pantheon of Agrippa, although different from the Pantheon Hadrian, had the same setting and circular unhedged. This was set to remind the ascent into heaven of Romulus, the founder and first King of Rome; although connected with the Basilica of Neptune south, a northern entrance of the temple can be figured. The Mausoleum of Augustus, built on the northern side, has an oriented entrance, albeit with some degree of error, with the axis of the Pantheon.

The reconstruction of the positioning of the Horologium Augusti (by Buchner, 1982) and the digging news reported by Rodolfo Lanciani in his Forma Urbis concerning the paved road found in the excavations of December 1872 under Campo Marzio street justify the existence of a diagonal path linking the Sundial of Augustus with the connection path Pantheon / Mausoleum of Augustus. It was built diagonally probably because set on the slopes of Monte Citorio. All these theories can be confirmed if related with the Augustus intention to present himself to roman people as the new "Romulus". This peculiar intent was pursued by Mussolini too, during the twenty years of italian fascism, albeit

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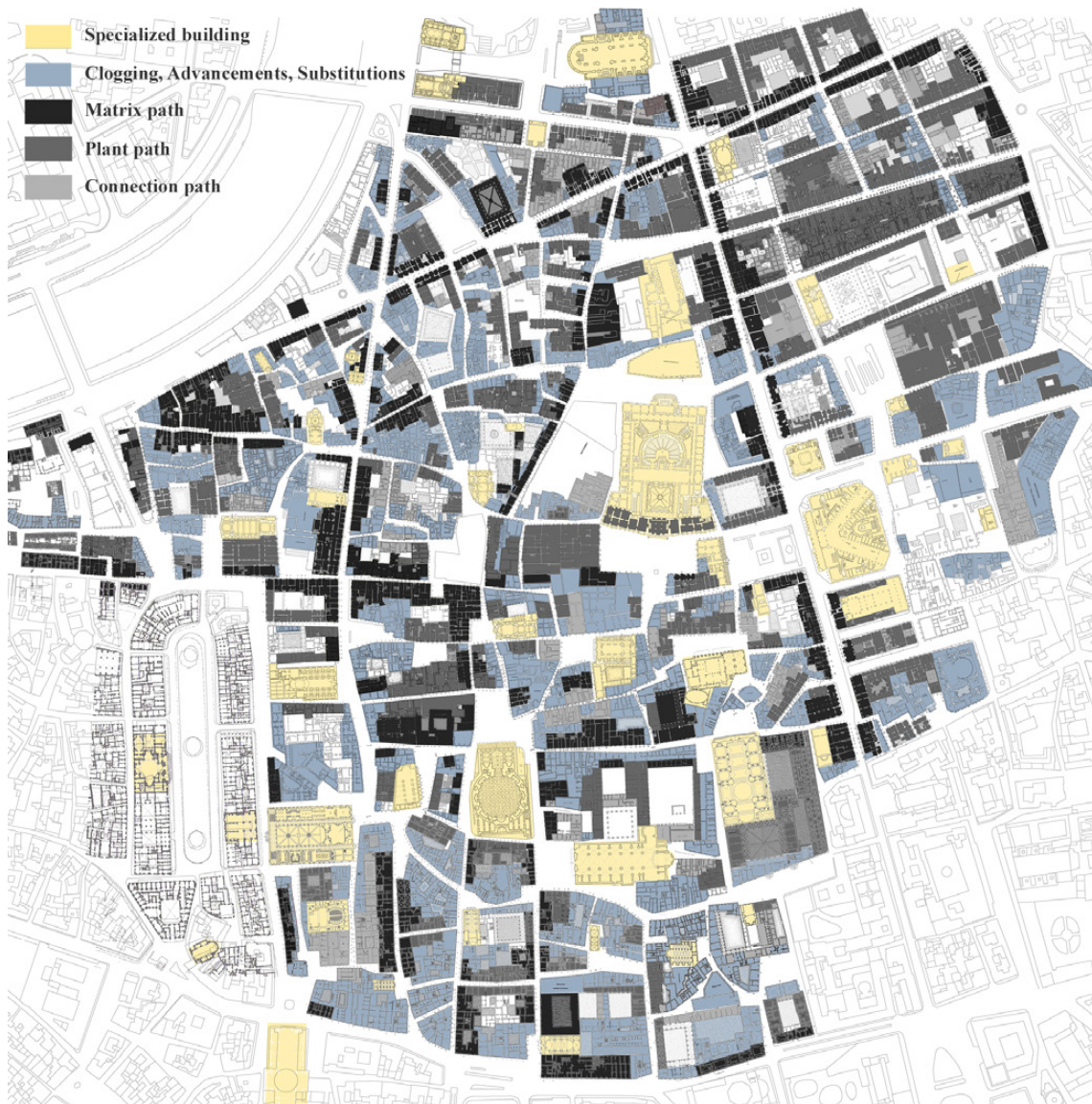
this time Mussolini attempt was set to imitate Augustus path itself.

In the southern area of Recta street (now Coronari street) between the second half of the first century AD and the second half of the second

- the Emperor Nero builds the Neronian (or Alexandrian) thermal baths;
- Domitian builds the stadium, which will be named after him and today corresponds to Navona Square;
- Hadrian reconstructs the Pantheon and builds the temple of Matidia;
- Antoninus Pius finishes the construction of the Temple of Hadrian in honor of his father, literally made a pagan God after his death.

All these monuments are related by the peculiar trait of being arranged in a similar fashion to already existing monuments: they are in fact perpendicular to the Recta street and they don't follow, of course, the same orientation of the Lata street.

The setting of the monuments changes in the northern part of the Recta street in the second half of the second century AD: Antoninus Pius builds the Ustrinum Antoninorum (whose column will be found in 1703 in the center of the Lusitanian oratory, between Campo Marzio street and Missione street) and Marcus Aurelius raises his tomb whose fu-

Figure 2. Caniggia Group Design - Fontanagrande.

nerary column still resides in Piazza Colonna. Both monuments have arrangement, unlike to those placed in the southern part of the Recta street, perpendicular to the Lata street; graphic reconstruction of the colonnade of the Ustrinum Antoninorum shows that this monument doesn't invade the axis Pantheon / Horologium Augusti reported by Lanciani, but it'is not aligned with it.

In the following ages, until the final annexation to the Italian Kingdom, the roman area of the competition of 1967 is closely linked to the development of the monastery of Santa Maria in Campo Marzio and to the transformation of the the fabric leading to the formation of the Palazzo di Montecitorio.

The monastery of Santa Maria in Campo Marzio finds its origins in the eighth century AD, when Pope Zacharias gives the ancient small church already existing in the area to basilian nuns, which were fleeing iconoclastic persecution of emperor Leo III of the East. The church, which by that moment will be known as St. Gregorio Nazareno, existed prior to that time and is remarkably tangential and perpendicular to the hypothetical axis of junction between the Pantheon and the Mausoleum of Augustus. The monastery and oratory that will be constructed after will obviously have arrangements concerning the church. In the '500 the complex is adorned by a cloister - orthogonally arranged with the church - and by the church of Santa Maria in Campo Marzio.

The entire block of the monastery, analyzed from the typological point of view, presents some anomalies justifying its construction occurred in different stages. As stated before, while the original church, the convent and the portico all lie on the hypothetical perpendicular conjunction axis Pantheon/Mausoleum of Augustus, the remaining urban fabric is set on the Campo Marzio street axis.

By consulting historical maps, Gregorian land registries and highlighting the characteristics of the fabric on the western front of Campo Marzio street it's possible to assume that this is the result of the advancement on the road of the Convent front. The axis, previously reported in the Urbis Lanciani form, lies in the rear of S. Gregorio's Church and the aforementioned progress. The eastern front of Campo Marzio street appears to have been involved by the usual process of developing with cells of the same size of about 6 meters,

variable depth, back private cultivated area and clogging at the intersection with Uffici del Vicario streetand Prefetti street.

Concerning Palazzo di Montecitorio, Innocent X commissioned to Gian Lorenzo Bernini the construction of a residence for the Ludovisi family between Corso street and the convent of Santa Maria in Campo Marzio. The baroque architect realized the facade of the building, based onto a polygonal that follows the curved facing road. After a series of interruptions, the construction of the building is brought on by Carlo Fontana, under commission of Pope Innocent XII, who decides to install the functions of the Papal Curia itself in the building. The most important transformation of the area took place during the post-unification period, when, as a result of the demolition of the fabric in the north part of Missione street and of Impresa street, the Papal Curia, which is now the seat of the Italian Parliament, is further expanded.

The "urban void" proposed by the competition in 1967 is, therefore, the result of the demolitions at the intersection between Campo Marzio street and Parlamento square, due to the enlargement of the Chamber of Deputies designed by architect Basile in the first quarter of the '900.

Methodology: the typological-procedural approach of Caniggia, Bollati and Vagnetti groups

Among the various proposals, some projects are distinguished for their typological-procedural approach rather than a self-reliant one. These projects can be traced back to the school of thought that developed in the name of Saverio Muratori: Caniggia, Bollati and, to some extent, Vagnetti groups.

Through a careful and passionate reading of the urban structures of the center of Rome and of the fundamental characteristics of the area, these projects positioned themselves in continuity with the formative process, trying to create historically congruent transformations.

The case considered more congruent from an historical-procedural point of view, was that of the typological interpretation of the roman palace, with all its specific attributes:
- matrix-cell with constant size of about 6 m and variable depth: it was the grid of the base-building, which has constituted the first fabric plant and, after successive recasts and specializations of the original cells has created a more evolved type: the palace;
- direct relation with the urban fabric: the distribution system of the palace can be looked at as an urban aggregation whose structuring paths have been folded into the building and privatized; the main path in axis with the entrance behaves as a matrix path, the orthogonal paths acts as a plant path, and the parallel path as a connection path;
- the main block, containing the entrance and the most important rooms, overlooking as a rule, the square or the most prominent street;
- stairs normally located on the main path, sideways to the entrance, in antinodal position;
- internal courtyard, if possible, of regular shape, rectangular or square, structurally connected with the system of lodges and with the axis of the building;
- through axis: indicates the through distance axis, that allows to access, running from the main entrance through the courtyard, to the area behind the building; in the case where it's absent the axis is underlined by the presence of a fountain or of a niche, becoming a reaching axis;
- strictly axial façade, centred on the main axis of the building;
- hierarchy in overlapping of floors, through the division of the front in the three fundamental elements: basement, abutment, crown;
- façade treatment hierarchy, through the accentuation of the building mass from top to bottom;
- prominence of the structural knots, such as floor marking bands, windowsill markers, window frames, pilasters and so on;
- rhythm wall: the inceptive formation of the palace is made from the expansion of row houses, creating a unitary block and not an aggregation of heterogeneous elements by blending the different facades in a rhythmic wall with equidistant windows

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Figure 3. Bollati Group Design - Campomarzio.

independent to the internal distribution.

Reasons such as the area availability or the irregularity of the site determine the synchronic variations we, often, encounter in the examples of existing buildings and, more specifically, in the three projects considered for the competition of the Chamber of Deputies.

According to Caniggia, in an irregular site, the architectural design will result from a compromise between intention and ability to carry it out. He, also, asserts that the possible solutions to a conflict of edge directions in the boundaries of the lot may be restricted to three:

1) Gesuiti Palace Type: the acceptance of an orthogonal grid cut by a diagonal route and residential fronts trapezoidal rather than orthogonal on the street side;

2) Cancelleria Palace Type: the introduction of a secondary grid set orthogonal to the oblique sides. The irregularity resulting from the intersection of the two alignments is resolved within the lot;

3) Consulta Palace Type: the use of the bisectors angles and of a grid perpendicular to these bisectors.

In the project proposed by the Caniggia group it is noted the predominance of boundary directions orthogonal to Campo Marzio street, which in the past was the predominant alignment, since the Missione street was formed chronologically after.

Instead, on the Missione street, for which continuity of its original route has changed due to the intervention of Basile and is currently cutting the boundaries of the existing properties, the designer opted for the solution already analysed in the Cancelleria Palace: rotating the building block to the front road.

The irregularity resulting from the two directions of warping is solved inside the building thorough a triangle, in which are located minor rooms, such as the toilets, the stairs and the group lifts. In this way, he manages to design a courtyard with a regular shape, that follows the direction of Campo Marzio street and with a through axis linking with the main entrance thus creating a symmetric façade.

As in the roman palace type, the through axis, starting from the main entrance and through the courtyard, covers lengthwise the organism and it's accentuated by the presence of the baroque fountain, which was previously located in the courtyard of Montecitorio palace.

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Another entrance is opened in the first part of Missione street, maybe following the example of Piccolomini Palace in Pienza: as it overlooks both the matrix path and the main square, were created two entrances (on the main street and on the square), so the stairs was placed perpendicularly and not at the end of the matrix path.

The main front of the building overlooks Parlamento Square and it's divided in the three fundamental elements: basement, abutment, crown.

Caniggia group referred to typical elements of the roman palace also in the treatment of the façade: hierarchy in overlapping of floors, rhythm wall, continuous wall of brick with nodal accentuations, such as pilasters, floor marking bands, windowsill markers and window frames made of travertine.

The project proposed by Bollati group was born from a comparison of different schemes, analyzing the advantages and disadvantages of the various solutions, from an organic-procedural and functional point of view:

- Type A - Plant scheme unrelated from the urban fabric
Advantages:
- Greater detachments from the urban fabric;
Disadvantages:
- Volume reduced;
- Reduction of useful rooms;
- Discontinuity with the urban fabric;

- Type B1 - Open-block scheme: boundaries on Campo Marzio street direction
Advantages:
- Greater detachments from the urban fabric;
Disadvantages:
- Reduction of useful rooms;
- Minor continuity with the urban fabric;
- Excess of the interior service spaces;

- Type B2 - Open-block scheme: boundaries on Missione street direction
Advantages:
- Greater detachments from the urban fabric;
Disadvantages:
- Same as above;
- Interior spaces reduced;
- Architectural spaces irregular;

- Type C1 - Closed-block scheme: boundaries on Campo Marzio street direction
Advantages:
- Continuity with the urban fabric;
- Frontal Symmetry;
Disadvantages:
- Excess internal courtyard;

- Type C2 - Closed-block scheme: boundaries on Missione street direction
Advantages:
- Continuity with the urban fabric;
Disadvantages:
- Excess internal courtyard;
- Front off-axis;

- Type C3 - Closed-block scheme: boundaries on three directions direction
Advantages:
- Continuity with the urban fabric;
- Maximum distribution and lighting;

Figure 4. Vagnetti Group Design - Curia Innocenziana.

- More useful rooms;
- Courtyard on the bisector axis.

The most suitable choice and the most consistent in historical-procedural terms and efficient in the use and distribution of spaces, is the plant with a closed-block scheme, with boundaries on three directions: Campo Marzio street, Missione street and the courtyard axis, that intercedes the first two directions.

The Bollati decided to solve the irregularity of the site through the central trapeizodal element, in which is located the square courtyard, surrounded by rooms and services. In this way, the through axis would create a not symmetrical façade; therefore they chose to rotate the axis consistent with the main entrance succeeding to create a symmetric façade, although this led to the formation of irregular rooms and to the particular hexagon lengthened shape of the covered roof-terrace.

The design is characterized by a central axial distribution both inside the square courtyard, and in the serial rooms of offices all around.

Also in this proposal the typological components of the design are constituted by a re-interpretation of the roman palace type: hierarchy in overlapping of the floors expressed in basement, abutment and crown; continuous plastered wall with predominance of solids on voids; rhythm wall; nodal accentuations such as pilasters, windowsill markers and window frames made of travertine; hierarchy in the design of the windows size from bottom to top, central axis representing the interior empty space, enhanced by the sides adjacent double pilasters and characterized from the covered roof-terrace.

In the project proposed by the Vagnetti group, the architect, to satisfy the enormous requests of the announcement of competition to be placed in a small and irregular area, designed a compact volume sacrificing the internal courtyard for the first two floors of the building.

As in the example analysed in the Consulta Palace, the five-sided volume is inserted on the axis of symmetry corresponding to the bisector of the angle formed by Campo Marzio street and Missione street; however, while in the latter the direction of warping is perpendicular to the axis bisecting, in the expansion of the Chamber of Deputies the ar-

chitect chooses to rotate the grid once towards Campo Marzio street and once towards Missione street, in order to get regular rooms and not trapezoidal rooms. In this way, the irregularity of the site is resolved within the internal courtyard and minor rooms, such as services and the restaurant, located on the bisector axis.

Reinterpreting the typological components of the roman palace type, he conceives a volume detailed with a pseudo-portico in a basement area and the volume above with a wall of brick, scanned by the repetition of solids and voids and by floor marking bands, windowsill markers, and window frames made of "peperino".

The punctiform concrete structure is evident in the ashlar pillars in the main building front and in the pseudo-portico on the adjacent streets, in the robust rafter above them and in the final crown band.

Similar to a typical Roman skyline, characterized by chimneypots and by covered roof terraces, the volume of the crown, is enliven by large terraces, which create chiaroscuro effects, and by bands made of "peperino" that mark the plain tiled roof cover according to the structural distances.

While in the Vagnetti group proposal the concrete structure is, in a more modern meaning, much more explicit, in Caniggia and Bollati group is adopted, as far as possible, a continuous and supportive wall, without the split between trellis and curtain wall.

Conclusion

Among the proposals submitted in the competition for the new offices of the Chamber of Deputies, the projects that aroused more enthusiasm and achieved critical acclaim, were those who tried to introduce the international and spectacular architecture in the historic center.

As a result of one of the most ruthless demolition of the historic center the shape of the design area proposed by the competition had become progressively inorganic. An area deprived of its own identity, in which "a genuine organism has been replaced with an academic organism"[1] and the historical-procedural links of the urban fabric have become unreadable, really needs proposals that create an openly dialectic relation with the context and that, while unable to communicate with a compromised environment affect the area with self-referential signs?

Maybe these are just the places, fragments of apparently inhomogeneous and disorganized tissue, that need a critical approach, an analytical study of the historical-typological processes of the context and transformations that restore unity and sense to the heterogeneity.

The three groups studied have attempted to rationalise the complex urban structures of the center of Rome and of the fundamental characteristics of the area, trying to create designs in continuity with the formative process and historically congruent transformations.

The study and comparison of these projects could be an opportunity to put the urban analysis at the core of the strategic choices about the area, without becoming a tendentious prefiguration of the design.

Our historical centres should be valued in their character of an "ongoing process", as places of historically congruent transformations.

The contemporary project should not result in a simple imitation or repetition of inherited characters, but should constitute a continuation and an update, with contemporary means, of what it's inherited.

References

Tafuri M., (1968) 'Il concorso per i nuovi uffici della Camera dei Deputati', (Edizioni Universitarie italiane, Roma).
Tafuri M., (1986) 'Architettura italiana 1944-1981' (Storia dell'arte Einaudi, Torino).

[1]La Fiera Letteraria n°50, Leonardo Benevolo, *Viva il Parlamento nel cuore di Roma – un problema che non riguarda soltanto la Capitale*, 12/12/68

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Klaus Koenig G., (1961), 'Montecitorio valle di lacrime', pp 16-45, in *Casabella* 321.

Benevolo L., 'Viva il Parlamento nel cuore di Roma. Un problema che non riguarda soltanto la capitale', in *La Fiera Letteraria* n°50 (12-12-1968).

Zevi B., 'Dodici Parlamenti per una Repubblica', in *L'Espresso* n°33, (19-11-1967).

Melograni C., 'Una sede moderna per il Parlamento', in Rinascita, (22-12-1967).

Cataldi G., Rossi M., Mandelli E., (2000) *Luigi Vagnetti: architetto (Roma, 1915- 1980): disegni, progetti, opere* (Alinea Editrice, Firenze).

Caniggia G., Maffei G. L., (1984) *Moderno non moderno. Il luogo e la continuità* (Marsilio Editore).

Piperno L. (a cura di) (1995) 'Grandi concorsi italiani tra il 1945 e il 1986', in *Rassegna* n.61, anno XVII, pp.7-74.

Morelli M.D., (2001) *Architettura italiana anni '60. I concorsi, i manifesti, le parole, i documenti* (Napoli).

Carbonara G., (2011) *Architettura d'oggi e restauro. Un confronto antico-nuovo* (UTET).

Rogers E.N., (1968) *Editoriali di architettura* (Einaudi, Torino).

Caniggia G., Maffei G. L., (1996) *Composizione architettonica e tipologia edilizia, Lettura dell'edilizia di Base* (Marsilio Editore).

Strappa G., Ieva M., Di Matteo M.A., (2003) *La città come organismo, Lettura di Trani alle diverse scale* (Adda Editore, Bari).

Strappa G., (1995) *Unità dell'organismo architettonico. Note sulla formazione e trasformazione dei caratteri degli edifici* (Edizioni Dedalo, Bari).

Conzen M.R.G., Cataldi G., Maffei G.L., Maretto M., Marzot N., Strappa G., (2012) *L'analisi della forma urbana. Alnwick, Northumberland* (Franco Angeli).

Strappa G., (1989) *Tradizione e innovazione nell'architettura di Roma capitale, 1870 – 1930* (Roma, Kappa).

Strappa G., (1990) *Tracce nelle città* (Roma).

Mercurio G., Strappa G., (1996) *Architettura moderna a Roma e nel Lazio, Atlante* (Edilstampa, Roma).

Strappa G., (1996), 'Nodi nelle città', in *Area* N°27.

D'Amato C., Strappa G., (2003) (a cura di) *Gianfranco Caniggia. Dalla lettura di Como all'interpretazione tipologica della città* (Bari).

Maffei G. L., Maffei M., (2011) *Lettura dell'Edilizia Speciale* (Alinea Editrice, Firenze).

Strappa G. (2012) *Studi sulla periferia est di Roma* (Franco Angeli, Milano).

Strappa G. (2015) *L'Architettura come Processo* (Franco Angeli, Roma).

Miarelli Mariani G., (1992) *Centri storici: note sul tema* (Bonsignori, Roma).

Carandini A., (2012) *Atlante di Roma antica* (Electa, Milano).

Lanciani R., (2007) *Forma Urbis Romae* (Ed. Quasar).

Cimbolli Spagnesi G., (2003) *La Basilica di San Pietro, il Borgo e la Città'* (Jaca Book, Milano).

Buchner E., (1980–82), 'L'orologio solare di Augusto', in *Rendiconti della Pontificia Accademia di Archeologia* 53–54.

Urban Tissues and Masonry Plastic Language. Emanuele and Gianfranco Caniggia's Houses in Via Trinità dei Pellegrini, Rome

Antonio Camporeale
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy
Keywords: Reinforced Concrete, Architectural Language, Urban Scale, Formative Process, Construction

Abstract

This paper focus its attention on the relation between reinforced concrete and architectural language, not so deeply studied until now. It is the relation that, continually in time, tied tightly the constructive technique to its architectural expression, by a necessity link that supported the coherence of the final form, visible in its material construction. With the incursion of this new material, balances that regulated this relation come slowly in crisis: the reinforced concrete construction opens up new possibilities that the Modern Movement interprets according to the "Gothic" tradition of the wooden elastic structures (Muratori, 1980).

Indeed, next to the experimentation of the "official" modernity, we can recognize the "plastic" traditional approach (Strappa, 1995), that sees, in practice, the possible recovery and maintaining of that organic relation. We can consider, among others, the work of Auguste Perret, seeking a confrontation with the classical language, but using reinforced concrete. In Italy, while the work, intellectual and practical, of Pier Luigi Nervi contributes to the development of an organic approach to the use of reinforced concrete (Nervi, 1955), related to the "plastic" language, there was as much silent as continuous updating process in architecture, which reworks the styles, still trying to find cohesion, albeit difficult, between a linguistic coherence and a constructive one.

The Emanuele Caniggia's Houses in Trinità dei Pellegrini, conceived with his young son Gianfranco, demonstrate and make visible the entire process of the coherent transformation of the "plastic" language in its modern updates, thanks to the long duration of the phases of project and realization, that went on for more than twenty years; a sort of heritage transmission that tries to update the construction technique and, together, the architectural language. The paper will present, in its critical form, this complex urban project that includes all the intermediate steps of each cultural period that it passed through, and ending with the reading of the building closing the courtyard, an example of architectural continuity, coherent linguistic expression of reinforced concrete.

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Introduction

This paper focuses its attention on the relation between reinforced concrete and architectural language which until now, has not been studied in depth. The relation strictly ties the constructive technique to its architectural expression continually in time, through a necessity link that supports the coherence of the final form, visible in its material construction.

Formative process and diffusion of reinforced concrete

Concrete as a construction material was developed by the Phoenicians. As it is known, the Romans re-start this technique by introducing the use of hydraulic *pozzolana* in the conglomerate, which is usually formed by sand, aggregates and water which cooperate homogeneously contributing to make a compact and robust paste.

Architectural organisms such as Trajan's Market, Domus Aurea and Pantheon, are the spatial and constructive result of the coherent use of such material. In those buildings, the plastic potential of the *opus caementicium*, working by compression and form-resistant to the horizontal thrust, is converted directly into construction. The structural conception is not separated from the necessity of a spatial hierarchization. Thrusting structures are conceived in concrete and define a "served" space distributively, that is more important from a typological point of view; load-bearing structures, through the construction of great and thick walls, at the same time, accommodate loads directing to the ground and define "serving" spaces distributively. The structures are at the same time load-bearing structures and closing spaces: they define spaces plastically and definitively at once.

In the second half of the eighteenth century, Jacques-Germain Soufflot and Jean-Baptiste Rondelet used a large amount of iron bars in an entirely dressed stone structure: the Pantheon in Paris[1]. In the same years, in England, engineer John Smeaton designed the Eddystone lighthouse, and rested it on a base built with large concrete blocks, not yet reinforced: this is the modern upswing of concrete.

After almost a century -when the Industrial Revolution began- the first experiments of the magical[2] union between concrete and iron took place, which created a whole new material, resistant to compressive and tensile strength, potentially malleable in all possible forms. Then Joseph-Louis Lambot built a boat by using concrete reinforced with iron rebars and mesh, a few years earlier, Joseph Monier worked on reinforced concrete containers for flowers.

The first architectural construction made entirely of reinforced concrete dates back to 1852, a residential building constructed in the outskirts of Paris by Francois Coignet. A plastic construction, in which space and structure derive from an organic concept: the wall boxes are simultaneously load-bearing structures and closing spaces, the static function coincides with the spatial distribution, in the manner of the building tradition which was widespread up until that point, especially in the Mediterranean area.

At the end of the century patents related to reinforced concrete were deposited in rapid succession. That process of disintegration, that will concern the unity of the architectural organism, had started: beams, floors, pillars will achieve in time an ever greater autonomy of conception and design. Finally reaching the Hennebique system that ties the various elements creating what will be defined, with broad and successful dissemination, "structural skeleton", definitively legitimased by Le Corbusier Domino Houses.

Through a processual reading, this means that the static structure, a necessary part of any architectural organism, has achieved full autonomy. Until then the approach to

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[1]A complex organism made with organic material such as stone, assembled in thrusting systems, compression structures like domes and vaults, in turn set to discrete and serial supports as columns. The use of the iron made possible the elimination of horizontal thrusts and the "visual" lightening of the stone organism.

[2]"Reinforced concrete is the most beautiful building system that mankind has ever found. Being able to create fused stones, of any form, superior to the natural ones, due to their resistance to traction, is in itself something magical". (Nervi, 2014)

the project necessarily involved the fusion of structure and space and was a unique and organic designing moment. And then it split into at least two stages, temporally subsequent: firstly thinking about the structure, about the static function of the building that should convey loads to the ground and must stand, and only later to the closing system of the spaces. A "Gothic" attitude is back (Muratori, 1980), with greater freedom to define the closing system prescribed by Le Corbusier free plan[3].

With the Modern Movement, crossing the ideal borders of the North-European area, which meanwhile had become a "load-bearing" area, from an architectural and cultural point of view, the reinforced concrete skeleton is codified in an "elastic" way. The areal differences started becoming less distinguishable when, following the 1932 exhibition, the successful publication of Hitchcock and Johnson, *The International Style*, spreads and consecrates the elastic-Gothic approach as a modern designing practice. It eradicates local building traditions by breaking down those ideal boundaries that kept them anchored to the territory in which they have evolved. The disconnection between space and structure is definitive: those two moments, conceptually and necessarily inseparable, are now programmatically distinct in stages. First of all, by designing the structure, generally set to a regular mesh of slender pillars connected to the horizontal beams and braced by slabs, and subsequently by defining the closing system of the space, according to the needs.

Next to the experimentation of the "official" modernity, we can recognize the "plastic" traditional approach (Strappa, 2014), that sees, in practice, the possible recovery and maintaining of that organic relation. The Mediterranean area, having become "peripheral" during the cultural polarization of the Nordic area, welcomed with suspicion and caution the new approach produced by the Modern Movement. Rome is the center of a constructive parallel culture, close to its built reality. The innovations of reinforced concrete are an important step to be taken towards a renewed architecture, but the attitude remains "plastic" too, resilient to the cultural heritage that generations of builders have slowly been updating during the course of centuries. Despite the total breaking with the constructive tradition that the Modern Movement has procured, the contemporary Roman architecture represents an alternative "modernity", not less important and incisive concerning architectural production. Therefore, the reinforced concrete skeleton blends and cooperates statically with the load-bearing wall structure: conceptually there is no difference between static structure and built space. It continues to conceive architecture as a space necessarily not separated from its construction[4].

The experimental works of Pier Luigi Nervi and Sergio Musmeci, internationally recognized, are a continuation of the process of renovation in reinforced concrete designing. Analyzing his built works, we can place Nervi at the beginning of a process, in line with his experimentalism. His facilities, as much organic they are in relation to the concept of close collaboration of elements, however, cannot be considered a unique "plastic" organism, in which the structure is both load-bearing and closing spaces. In other words, Nervi conceives organic structures, even thrusting, but everything is still, on time, "gothic" and discreet. Nervi's effort contributes to the organic conception of the use of reinforced concrete, but it does not reach the maximum degree of plasticity.

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[3]"Gothic" architects such as De Baudot, Perret, Moser, in line with their own cultural area, contributed to the renovation process of the Nordic contemporary building culture, producing works such as the Church of Saint John in Montmartre, the Church of our Lady in Nancy or, slightly later, the Church of St. Anthony in Basel. All of them express, in varying degrees, the internal design diachronicity of this approach, clearly denounced by direct reading of the load-bearing structure of pillars and the closure of the stained glass windows.

[4]An example of this approach is given by the Church of the Sacred Heart of Christ the King in Rome by Marcello Piacentini. This masonry organism incorporates the "elastic" reinforced concrete structure, phagocytising it in an organic, structural and constructive unity. Concrete elements specialize so much that it can be impossible to recognize the classic "elastic skeleton" composed of discrete parts and almost similar to each other. We identify supports with much wider section, lightened Vierendeel beams and a reinforced concrete cap-dome closing horizontally the central space of the church. The wall structure and its constructed space are related by a necessity link, synthetically expressed with a masonry plastic language.

The work of Sergio Musmeci, on the contrary, although starting from the same premise of reduction of the material used, tends to a greater plasticity. The "structural minimum" is not pursued by discretizing the entire organism in elements which become smaller and smaller, albeit organically unique, and by merging them, reaching the constructive unity of the different elements. He reaches the structural continuity by testing on plastic potential of reinforced concrete structures and not on the assembly of prefabricated parts. Even here, however, it is necessary to stop and identify how the Musmeci experimentation is in a very early stage compared to the total recovery of an organic and, together, "plastic" conception of space, that we're trying to locate. The projects are to be ascribed to the category of structures like bridges, grandstands, partial elements of an ideal full body, built of plastic reinforced concrete.

Wooden elastic/Masonry plastic

This study and analysis is based on the processual method of reading architectures, developed by Saverio Muratori and deepened by Gianfranco Caniggia. A complex theoretical framework that establishes a new way of understanding the history of architecture: not as a static sequence of events, but "active" and incisive on the ongoing dynamics. The transformation of territories, cities, buildings, are projected over time, linked by a common line of which you can read the marks on buildings, built by man over centuries. Contemporary architecture is merely an intermediate step in this process: constructions of an ever active and dynamic present, that recover and transform the legacy of the past, preparing it for future changes. Another fundamental aspect is the close processual relation between the different built realities and languages that they encoded. This makes built reality divided in two major cultural areas[5], united by common characters.

A "wooden elastic" world, geographically coinciding more or less with the Northern European area, which expresses, through language that has developed over time, typical architectural features related to the transformation of matter present in large quantities in the same area, the wood. The huts on piles are the processual result of the man who recognizes, in the material "wood", the attitude to be used, with minimal effort of transformation, as a building material. The vertical fibers, that is to say its intimate composition, suggests the vertical use of the pole that, as roots of a tree, will affect the soil in depth and concerning special points. In a second stage, the structure is "closed" by sand reinforced with straw. This elastic structure features the Nordic built world, "readable" in supporting and bracing elements, distinct in material from the opaque closing system.

The same type of process can be identified in the "masonry plastic" area, the Mediterranean. The available matter of this area is stone, which man recognise can be used as a building material. Its internal homogeneous conformation and the process of stratification which characterizes its natural deposits, suggest the horizontal development of the masonry which affect the soil for minimum depth and areal support. In this case the structure coincides with the closure of the space. The typical distinct regressing levels of the facade are the processual and expressive result of the material collaboration between the wall structure and vertical reinforcement erects (Caniggia, 2008). The different structural way of aggregating individual elements, so far described, determines the character, on a larger scale, of the urban fabric and thus of entire cities.

It can be possible, therefore, identify "elastic" cities, in which fabrics are formed by smaller scale elements that can be substituted, added or modified, without producing a new urban configuration. Typical characters "readable" in historical urban tissues of northern cities, where buildings underline their independence by placing the top of the roof perpendicular to the path. From the static point of view, structures remain autonomous and, when aggregated, are juxtaposed with those of the adjacent building, without producing significant stress on a larger scale. New York, like all big cities, is the contemporary "elastic" city par excellence, in which serial and discrete elements, sky-

[5]"Cultural area" can be define as a portion of a territory in which it is possible to recognize a high number of common characters in materials, elements, structures of buildings (Strappa, 1995).

scrapers, determine punctual transformations that do not involve, if not only for the specific area they affect, the entire structure of the city, which remains the same.

"Plastic" cities, by contrast, are characterized by elements, in a smaller scale, which, when replaced, added or changed, produce new urban configurations. Mediterranean cities, for example, are characterized by urban tissues in which the aggregation of more buildings involves their physical aspect: the perimeter wall is shared and is statically affected by loads of more contiguous structures and defines, at the same time, spaces it closed up. It is easy to see how, whenever trauma, changes or substitutions occurred, more or less extensive, urban tissues of these cities have adapted their structural setting, necessarily modifying itself at different scales. The city is configured as a result of overlying layers that have incorporated, remerge "plastically", and finally codified in time always new urban configurations.

Rome is the plastic city par excellence: Roman urban tissues are the product of slow transformations that determined its typological character. Different ages substrates have formed the basis of overlapping buildings, taking advantage of existing structures to generate new ones. Once completed and reached the volumetric limit, transformations have affected same buildings, aggregating individual cells by setting overturned and unifying routes, remelting more housing units through physical openings in shared walls. Concrete modifications materially involve buildings that are in physical contiguity and urban tissues they form. Roman urban fabric transformations produced a typical language, precisely "plastic" because it consists of architectural elements directly derived from constructive habits, typical of masonry area. The horizontal architectural stratification of fronts in basement, elevation, unification and conclusion, represent the most widespread example. Continuous elements, such as the "marcapiano" (floor stringcourse) or "marcadavanzale" (windowsill stringcourse), make legible the remelting of more building cells in a new unitary organism.

The plastic use of reinforced concrete, inhibited by a diffusion, rapid and global, of the framed structure, has not produced a shared and coded masonry-plastic-matrix architectural language, although attempts in this direction are quite widespread and geographically dispersed. Thinking of architects such as Auguste Perret, who were able to update the architectural language, staying within the wooden-elastic-matrix formative process: concrete buildings, where the frame, the connections between columns and beams, closures between structural load-bearing elements, are coherent and processually derived from traditional wooden buildings.

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Reinforced concrete, at once "elastic" and "plastic", has not reached, in my view, a complete and coherent architectural language codification, which is the direct or indirect expression of the construction, especially considering masonry plastic areas. I will attempt, in the following paragraphs, to analyze the relations that link together urban transformations and masonry plastic architectural language.

Trinità dei Pellegrini Houses: Project and Process

Before considering the architectural scale it is necessary to interpret the formation process of the block[6] in which the houses are located, identifying the changes that have characterized different urban layers. Starting from the Roman one, the oldest one, who defined paths on which the building stood and provided the material base to medieval structures that have been consolidated on it, statically weighing on ancient walls and forming an organic and cooperative unity with all buildings of the block. The new great Holy Trinity Convent acquired more units, remelting them plastically, through an unitary project. As a constructive habit, the wall structure underwent plastic transformation processes: not destroying existing buildings but transforming their structures, in line with new spatial and distributive needs. It is a "plastic" process that involves all building structures, as constructively and organically linked. This necessity link binds elements in unity and it is the deep nature of these urban tissues. Under the fascist regime, the block in question

[6]The block is defined by via San Paolo alla Regola, Via dei Pettinari, via del Conservatorio and via delle Zoccolette.

Figure 1. The "plastic" formative process of the block. Elaboration by the author.
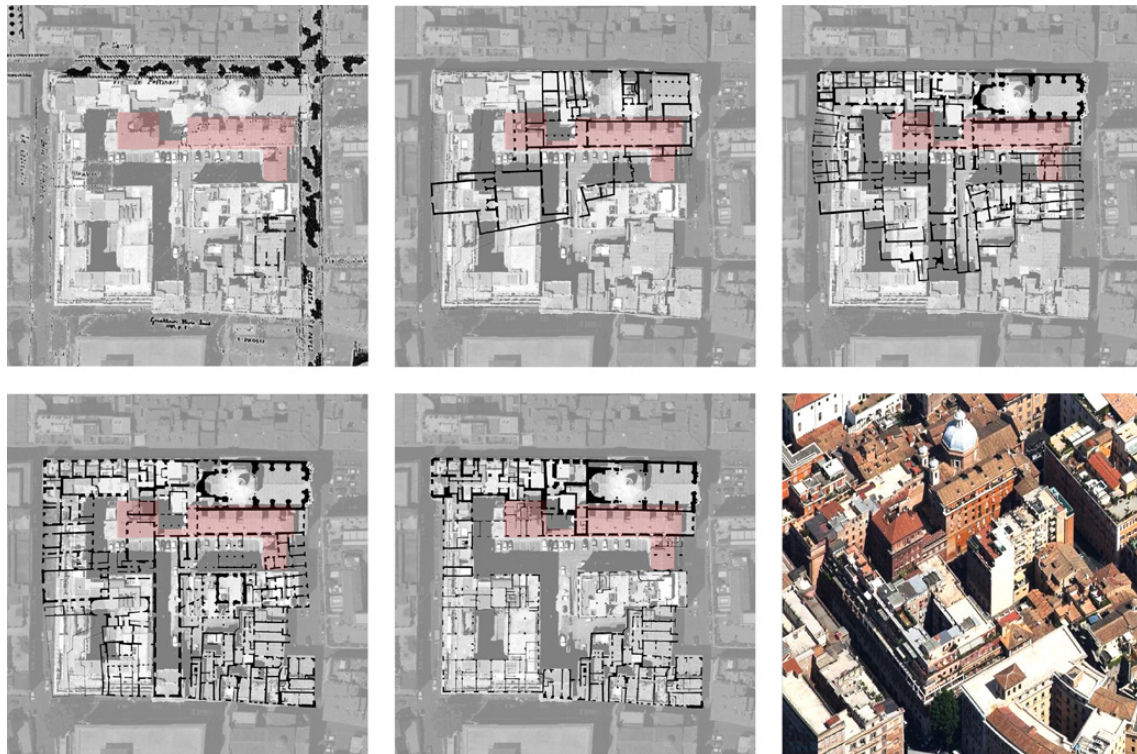
underwent a replacement transformation: an operation that, not involving consolidated urban fabric, opposes to it a new and different typological structure. An "elastic" operation in a plastic context.

The work of Gianfranco Caniggia is in continuity with the processual dynamics active at that time: the project, in fact, follows the General Plan directives which were in force, which prescribed a kind of block clogging with private housing complexes and the opening of an access path. From the beginning the father Emanuele[7] allowed the active participation of the young son, then a student of architecture, to help with the layout of the project, that, subsequently, would inherit the direction and end after a long process of gestation. In the first planimetric setting, it is possible to read some important references related to the research that Gianfranco was assimilating under the wise guidance of Saverio Muratori in the School of Architecture of Rome.

The first project dates back to 1955 and was distinguished by the hexagonal shapes and diagonal lines of the planimetric drawing. Facades are characterized by the presence of balconies and by an overabundance of horizontal elements, such as "marcapiani" (floor stringcourse) and "marcadavanzali" (windowsill stringcourse).

The subsequent projects renounced diagonal lines and hexagonal shapes and almost reach, at least on plans, the final configuration. It is possible to see now the unity of the in-line residential building, with the common stairwell placed in a peripheral position in relation to the path and the serial spaces of rooms standing on the principal front. The duplex residential units assume a stable configuration that will be preserved, unless of minor changes, until the realization of the project: the stairs are parallel to the path, occupying an anti-nodal position, away from the main facade on which stood small rooms and services.

[7]Emanuele Caniggia (1891- 1986) graduated in 1924 in the School of Architecture of Rome. His basic formation remains anchored to the Academy and to the "drawn architecture". Among his most important works it is necessary to mention San Camillo hospital, built in Rome between 1928 and 1929. Thanks to the enthusiasm of his son Gianfranco he resumed, after the Second World War, to design and build several buildings in Terni, Subiaco and Terracina.

An interesting aspect that should be highlighted lies in the synthetic character that the Trinità dei Pellegrini Houses represent in relation to the cultural baggage that the author, because of the long period of construction, was first assimilating in Saverio Muratori's courses and later developed independently with his personal typological theoretical view[8]. It is possible, in fact, to "read", through the different facades of various proposals over the years, a sort of "internal" process that the architect materially experimented in the construction of the Houses[9]: the first (1955), the farthest from the architectural and linguistic maturity, in all probability, influenced by the father figure, more experienced, it is still linked to the *Beaux-Art* approach and presents horizontal elements that serialize the facade minimizing the hierarchy that will be achieved, however, with the latest project; the second proposal (1956) introduces vertical elements, coinciding with the ducts of the flues, which extend for the whole height of the two duplex; overhanging and reduced size balconies take up the width of the openings, not yet aligned vertically; the in-line building façade is characterized by the presence of an overhanging volume, which co-incides with the stairwell of the last three levels.

The 1957 proposal seems to suggest a more effective presence of the young Caniggia, in the last year of the School of Architecture: balconies are transformed into door windows, flues are inserted in the thickness of the outer wall and constitute the dividing lines identifying duplex units, more visible thanks to the regular disposition of openings, now vertically aligned. To denote the typological particularity that differentiates the duplex, continuous elements represented by "marcadavanzali" (windowsill stringcourse), are inserted on the facade. Horizontal readability echoed on in-line building façade too, on which, however, still insists the overhanging volume of the stairwell of the top three floors.

The 1958 proposal, the year of his graduation, is the definitive one for the duplex building: it is now clear the readability of double heights, indicated by horizontal bands, corresponding to "marcadavanzali" (windowsill stringcourse); serial units readability, given previously by the lines of chimneys, is now punctuated by parastas, coincident with the reinforced concrete supporting structures, perpendicular to the facade. The unification is given with the retreat of the top floor. The in-line building, despite a certain compactness achieved through the elimination of overhanging elements and through the vertical alignment of windows, presents still some uncertainties in composition, resulting from a lack of horizontal hierarchy of different levels, grouped in pairs of two with horizontal "marcadavanzali" (windowsill stringcourse); the presence of a dividing line, a full on-axis that not allows to reach the desired organicity.

The "internal" process of the architect now seems clearer, acquiring consistency as his cultural formation turns more practical, making explicit the stages of this project-process.

[8]Among the publications that contain the results of its theoretical research we have to mention: "Lettura di una città: Como" (1963), "Strutture dello spazio antropico" (1976); "Composizione architettonica e tipologia edilizia: 1. Lettura dell'edilizia di base" (1979), "2. Il progetto nell'edilizia di base" (1984); "Moderno non moderno. Il luogo e la continuità" (1984); the last three in collaboration with GL Maffei.

[9]"The first project concerns three buildings at the Trinità dei Pellegrini in Rome, and it is a sort of "curriculum", representative of the uncertainties typical of the architect in the early accomplishments, also due to the continuation of the construction site from 1958 to 1966 and at different moments in which each building was built. It was necessary to fill a void left by the last destruction of the old hospital, implemented around the 40s and designed by Piacentini, and the reconstruction immediately following. The first of the buildings show "neo-Liberty" intent: there are mentioned linguistic influences of the context, but it was tried a transcription in "new" forms, technologically justified. The second, redesigned around the 60s, waives of the transcription and refers explicitly to a rediscovered and re-used language to interpret structural distribution of the building, raising of the ancient remaining lane, as prescribed by the original plan, implemented with frames perpendicular to the front and duplex apartments. The third building, redesigned in '63, is the most consistent with other contemporary and later works, appears more by language and techniques, and is based on eighteenth-century Roman solid experience. The basic theme is the same for the three buildings and for many jobs that will follow: how to make "transparent" and homogeneous involucre to the structural-distribution presences, without sacrificing technological apparatus linguistic of continue walls.", (Caniggia, 1984).

Figure 2. On the left, view of the in-line angular building; on the right, elevations sequence for different proposals. Elaboration by the author.

This ends when, having reached concurrently sufficient professional maturity and an intense academic experience, he designed the latest version of the in-line building in 1968, setting the central axis of symmetry that characterizes its organic unity and defining a clearer horizontal hierarchy with the distinction of: basement, elevation, unification and conclusion.

From the "constructive" point of view, this project-process, with a temporal extension relatively more reduced, denotes the transition from an original load-bearing structure defined by a metal frame, to that realized in reinforced concrete. The iron load-bearing system defines an elastic structure, composed by linear elements, vertical pillars and horizontal beams, which define high degree of seriality: in hindsight, it is possible to recognize a minimum level of structural hierarchy, due to the use of a Vierendeel beam, inserted at the level that statically affects the walls of the underlying existing refectory. The reinforced concrete built structure, however, cannot be considered a mere serial framed skeleton: transverse portals are organic units, composed by elements, specialized for form and function, connected between them by integral joints that define their necessary cooperation. In this step the influence of the young Caniggia is perhaps of little importance because of a lack of experience and technique.

Figure 3. On the left, view of the in-line closing-block building; on the right, section, internal view and structural plan of the concrete "basement". Elaboration by the author.

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Urban Tissues and Masorny Plastic Language

Reviewing the various proposals, we can see how the reinforced concrete was critically used in the final architectural outcome. Forming the load-bearing structure of the duplex, built on the old refectory pre-existing walls, and having to merge with it "plastically", the concrete readability is mediated on the facade by the use of architectural elements such as parastas and "marcadavanzali" (windowsill stringcourse), that denote the real intersections of structural portals with the perimeter wall. At the same time, the typical distinct regressing levels of the facade makes recognizable the closing walls of the new building. All this organic structure, then, is "plastically" readable by a layer of uniform tint plaster. On the in-line building façade the level of mediation of the structural readability is lower: the horizontal structures can be identified by reinforced concrete "marcapiani" (floor stringcourses). The exposed brick closing walls, as collaborating structure, incorporate within its thickness the elastic reinforced concrete supporting structure. The building that closes the block presents a more direct degree of readability. The entrance, made by exposed reinforced concrete, identifies the *basement* on which the elevation is set, made with a framed concrete structure and collaborating, closing masonry brick.

Figure 4. Axonometric view of the "basement" drawn by Gianfranco Caniggia. Image courtesy of Giuseppe Strappa.
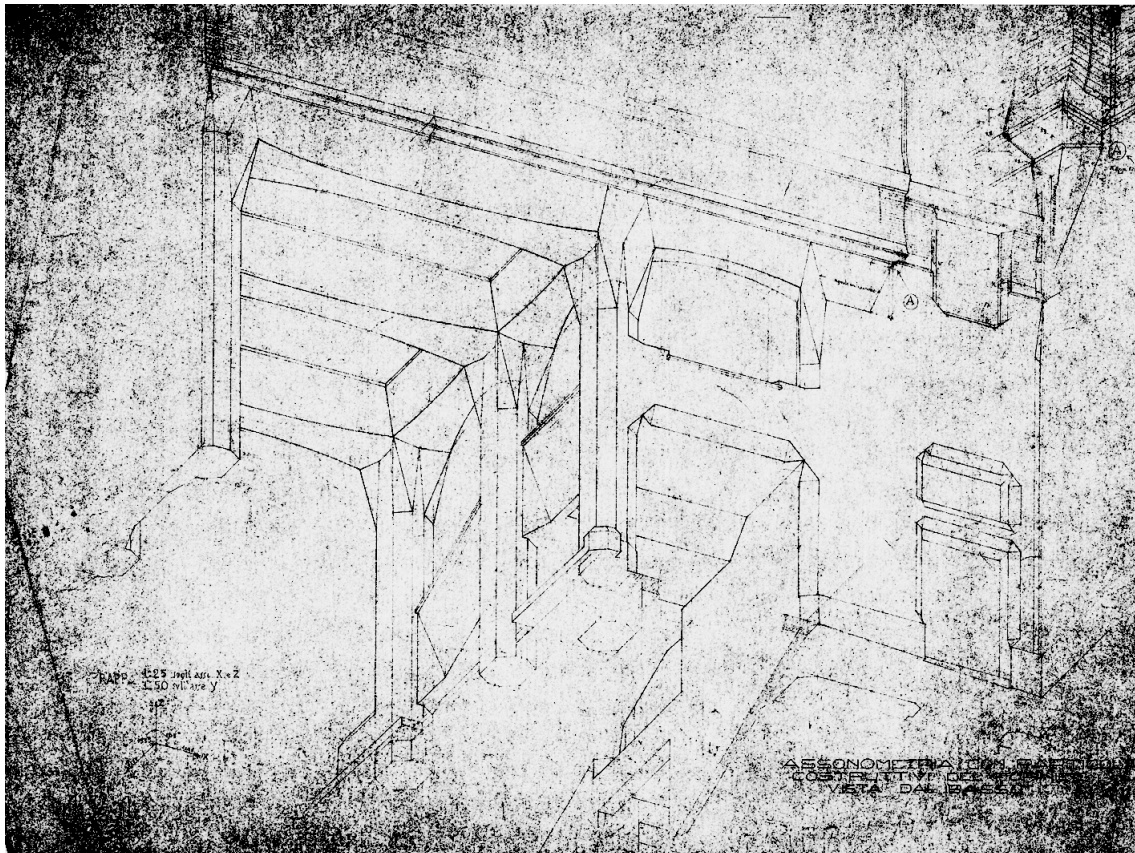
The traditional language, typical of Roman urban tissues that Gianfranco Caniggia had learned to read and interpret and that now experienced for the first time using reinforced concrete, is updated. Not, therefore, a simple frame structure, composed by slender pillars and horizontal beams, but a solid "plastic" structure whose pillars have considerable sections which, through connecting elements assimilated to large "capitals", bind to horizontal beams with variable section in relation to the internal forces distribution. Consequently, the space for the slabs is minimally reduced and this increases its plastic character, from the constructive point of view. Furthermore, starting from the extrados of the basement, pillars of the upper structure stand out with a certain degree of static and constructive autonomy. Vertical wires above do not coincide with the lower ones. Not-centered verticals confirm the "plastic" character of the basement, conceived as a massive "carved" stone that must withstand the loads of the upper structure, lighter, framed and buffered with cooperating brick wall structure. This constructive sensibility derived from the interpretation of the Roman urban tissues formative process: from the stratified formation of a shared "order", composed of basement, elevation, unification, conclusion, to the collaboration of masonry horizontal layers with vertical reinforcement structures encoding typical distinct regressing levels of the facade and parastas.

The transition to reinforced concrete, through the filter of an "elastic" area development, has produced a general oppositive detachment between architecture, readability and context. The Caniggia's Trinità dei Pellegrini Houses represent a coherent use of plastic reinforced concrete, derived from the interpretation of the plastic transformation processes of roman urban fabrics. An intervention in dialectic continuity with the context of which it "plastically" tries to receive their solicitations, including and reproposing them through a renovation process.

city as organism | new visions for urban life

Conclusion

As seen until now, this leads us to consider, as necessary, the relation between buildings and urban transformations and formative processes of Rome. Contrary to the case described, the contemporaneity and the present, together with the widespread culture of the ephemeral and temporary, have decreed a slowing of the transformation process of "plastic" cities. Importing Nordic "elastic" models, not critically and not properly processed by a "plastic" architectural culture, has produced a sort of "hiatus" that will must to mend it.

Caniggia's attempt is, in this sense, a small step towards the recovery of the bond with an areal building tradition and the bond with an architectural language that codified it. The "plastic" use of reinforced concrete makes readable the character of real masonry transformations in roman urban tissues. The plastic properties of concrete make it a perfect material for a possible upgrade that, judging the outcome of the experimentation analyzed here, Caniggia had already begun, proposing - among many - a possible way to achieve consistency with the tradition that he calls, in the Roman context, masonry plastic.

References

Caniggia, G. and Maffei, G.L. (2008) *Lettura dell'edilizia di base* (Alinea, Firenze).

Caniggia, G. and Maffei, G.L. (2008) *Progetto nell'edilizia di base* (Alinea, Firenze).

Caniggia G., Maffei G. L. (1984) *Moderno non Moderno. Il luogo e la continuità* (Marsilio, Firenze).

Collins P. (1965) *La visione di una nuova architettura. Saggio su Auguste Perret e i suoi precursori* (Casa editrice Il Saggiatore, Milano).

H. R. Hitchcock, P. Johnson (1932) *The International Style: Architecture since 1922*; ed. It. a cura di Berdini, P. (1997) "Lo stile Internazionale" (Zanichelli Editore, Milano, 1982).

Muratori S. (1980) *Storia e critica dell'architettura contemporanea: disegno storico degli sviluppi architettonici attuali (1944); Saggi di critica e di metodo nello studio dell'architettura (1946) / Saverio Muratori*; opera postuma a cura di Guido Marinucci (Centro Studi di Storia Urbanistica, Roma).

Nervi P. L. (2014) *Scienza o arte del costruire? Caratteristiche e possibilità del cemento armato*, introduzione di Aldo Rossi (Nuova Edizione, CittàStudi Edizioni, Torino).

Nervi P. L. (1955) *Costruire correttamente: caratteristiche e possibilità delle strutture cementizie armate* (Hoepli, Milano).

Pietrangeli C. (ed.) (1972) *Guide rionali di Roma: Rione VII - Regola; parte prima* (Ass. Antichità, Belle Arti e Problemi della Cultura, Fratelli Palombi Editori, Roma).

Proia A., Romano P. (1935) *ARENULA (Rione REGOLA)* (Tipografia Agostiniana, Roma).

Regazzoni Caniggia A. (ed.) (1995) *Emanuele Caniggia 1891-1986* (Libreria Dedalo, Roma).

Strappa G. (2014) *Architettura come processo. Il mondo plastico murario in divenire* (Franco Angeli, Roma).

Strappa G. (1995) *Unità dell'organismo architettonico* (Dedalo, Bari).

Valeriani E. (ed.) (1987) *San Paolino alla Regola. Piano di recupero e restauro* (Edizioni Kappa, Roma).

Vasco Rocca S. (1979) *SS. Trinità dei Pellegrini* (Istituto di Studi Romani, Fratelli Palombi Editori, Roma).

Chair_Manuela Raitano I Karsten Ley
DiAP Department of Architecture and design, "Sapienza" University of Rome,
53A, via Gramsci, 00197, Rome, Italy
Fakultät für Architektur, RWTH Aachen University, Aachen, Germany
Co-Chair_Pia Marziano I Giuliano Valeri
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

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Transformation and specialization of the historical center of Santiago of Chile: the evolution of the urban fabric around the "Plaza de Armas" square

Pia Marziano
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy
Keywords: urban fabric, urban transformation, "Plaza de Armas" square, Santiago of Chile

Abstract

The urban transformation of the historical center of Santiago de Chile, is presented as a case study of Spanish American colonial city evolution model, based on a grid that was imposed on the territory with in the center a main square, "Plaza Mayor". This initial configuration has lead the continuous modification of the urban fabric, which shows significant morphological and typological changes during the process of modernization in the second half of the nineteenth century and throughout the twentieth century, period characterized for the specialized buildings and the subdivision of the blocks through passages and galleries, proposed as an interior public routes. At this stage take a leading role the "Official Development Plan of the Municipality of Santiago", proposed by architect Karl Brunner in 1930, which applied functionalist urban concepts that allowed to modify the "closed block", consists mainly of "courtyard houses", into "open block", understood today as urban unit organization of the historical center and, in turn, as the container of various architectural typologies developed over a constant process which has changed the perception and the way of living in the city center.

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Introduction

The urban fabric of the historical center of Santiago of Chile, like most Hispanic American founding centers, takes the direction of the initial urban structure. The urban grid as the general order and the block as unit subdivision are the elements that define the regular city and its evolutionary process. These being the axes of the urban transformation of the twentieth century, a period of modernization and homologation with European capitals.

As mentioned by the architect José Rosas, a specialist in the subject, the urban culture is strongly linked to the idea of regular city and the possibilities offered by the orthogonal urban grid as design mechanism, being the regularity and rationality of the urban structure the guides that govern our design practice. It is interesting to observe how, despite foreign influences, "*we have privileged a kind of eclecticism to adopt and reinterpret the outside at the local, mixing shapes from the most diverse contexts, styles and sources, that however have the peculiarity of being regulated by the attributes and laws of the quadrangular matrix*"[1] (Rosas, 1987:2).

The "Plaza de Armas" square, the heart of the founding center of the Hispanic American cities, along with the blocks surrounding it, have recorded the whole process of transformation. They posses the first paths and constructions, the best evidence of the fusion generated over time. This is why the following research will look into the stages that characterized the transformation of these blocks, passing from the colonial center to the modern center, being able to verify how, starting from the patio-house, certain relationships were established between the morphology of the lot subdivision and building typology, which are the fundamentals aspects of the typological process.

At the same time it is possible to observe how this urban grid that dominates the architecture, then gives way to a stage where the architecture will be the one that will generate a new grid compatible with the existing. At this stage, the "Official Plan of Transformation of Santiago" will take an important role, proposed by the Austrian architect Karl Brunner, which proposes the main strategies of modernization of the city, to change the "closed block" urban structure to the "open block", characterized by interior galleries and public passages.

The initial urban configuration

To understand the configuration of the historical center of Santiago, it is important to know the beginning of the urban transformation process. The geography and the soil fertility of the "Central Valley" allowed the establishment of the first pre Hispanic American settlements in the year 12.000 BC. Most of the archaeological discoveries have been found in the area between the two arms of the "Mapocho" river, being precisely from this area where the development of the city began. Recently some hypothetical reconstructions of the first urban planning have been made, corresponding to an Inca Center that dates from the year 470 AD, which provides a geographical and administrative center in what is now known as the "foundational triangle" (Lopez, 2013). The center, structured by the "Kancha" -the main meeting place-, the buildings that surround it and the Inca Trail, was the basis for the layout of the Hispanic American city. Lots of research assure that the "Kancha" is superimposed to what would later become the "Plaza".

The classic model of colonial Hispanic American city was based on the "Leyes de los Reinos de Indias", which determined that each new city in America had to have a regular grid through streets in north-south direction. The center, from where these streets were born, had the name of "Plaza Mayor" square -current "Plaza de Armas" square-, around it is the main church, the Governor's House and City Hall. The streets establish a grid in the territory with regular blocks of equal or similar measure, allowing the urban development starting from a module (Figure 1).

[1] My translation of this citation: "hemos privilegiado una suerte de eclecticismo para adoptar y reinterpretar lo externo en lo local, mezclando formas provenientes de los más diversos contextos, estilos y fuentes, que sin embargo tienen la peculiaridad de estar regulados por los atributos y leyes de la matriz cuadricular".

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Figure 1. Evolution of the urban grid in the territory (Authors' drawings).

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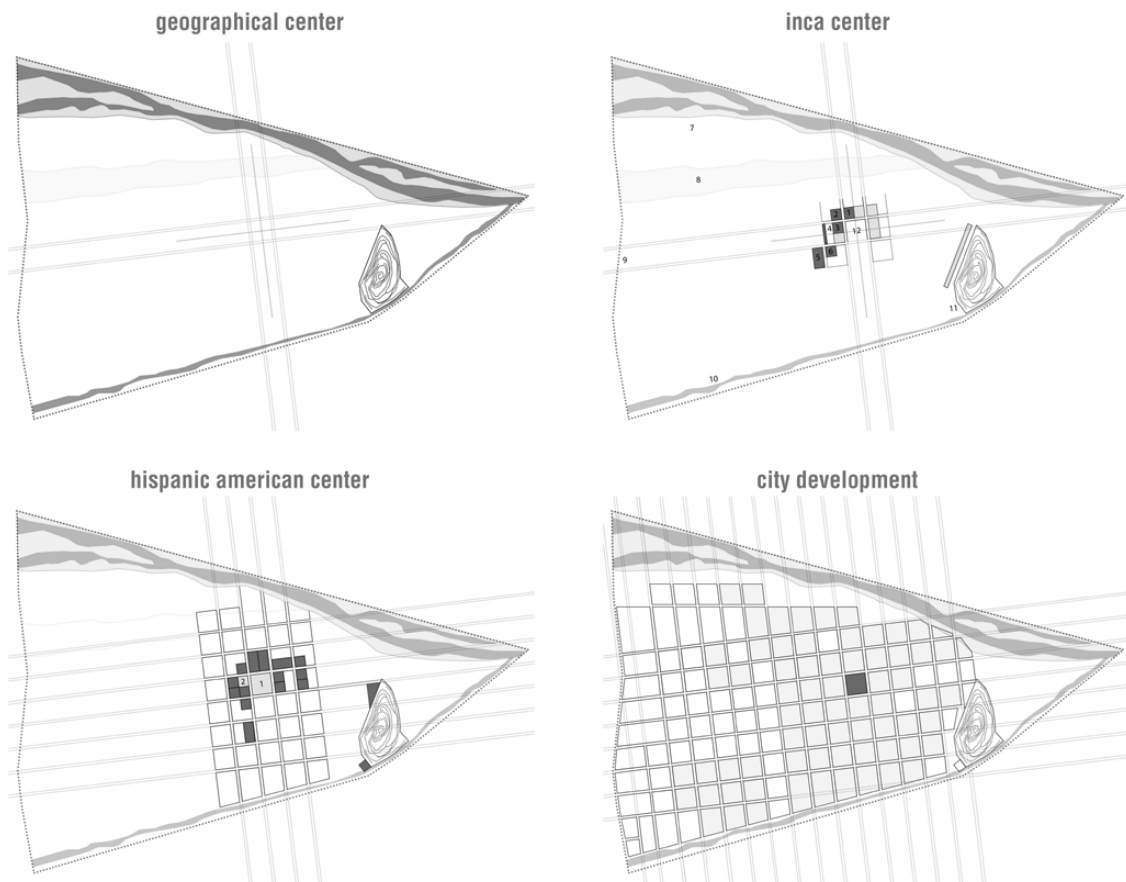
Santiago of Chile, founded in 1541, corresponds to this model, made up of square modules of 115x115 meters and streets 10 meters wide (Martínez, 2007b:18). Each block is divided into four "solares". This is the first lot subdivision that will condition the urban form, "*the primitive plan could not have exceeded the quadrangle between the streets 'Santo Domingo', 'Agustinas', 'Mac Iver' and 'Bandera', with a total of 16 blocks, because all solar concessions until 1552 were among those limits*"[2] (Martinez, 2011:58). It is interesting to see how, starting from geographical spot in the territory -which then transforms into an administrative Inca center-, the Hispanic American city manages to merge and imposes an order to guide the urban growth (Figure 2).

The first buildings were conditioned by the shape of the block and the type of "solar" assigned. The patio-house, as the base unit, along with the division of the block into four "solares", came to be the space organizers of the colonial city; they are what initiate the typological and morphological development of the historical center. During the period between 1600 and 1850, the patio-house resulted in more complex solutions, due to the densification of the housing into the property and the subdivision of the block into four "solares" that were on the one hand too large for such housing, and on the other hand constantly valued (Rosas, 1985). Thus the closed block is configured as the model of formalization the urban fabric. The buildings that stand out in this period are: in the south-west block, the "Aduana" palace; in south-central block, the "Sierra Bella" portal and the "Matte"

[2]My translation of this citation: "la planta primitiva no puede haber sobrepasado el cuadrángulo comprendido entre las calles Santo Domingo, Agustinas, Mac Iver y Bandera, con un total de 16 manzanas, ya que la totalidad de concesiones de solares hasta 1552 se encuentran entre esos límites".

Figure 2. Development of Santiago between 1552 and 1575 (Author: Thayer Ojeda, T., Source: Memoria Chilena - Biblioteca Nacional de Chile).
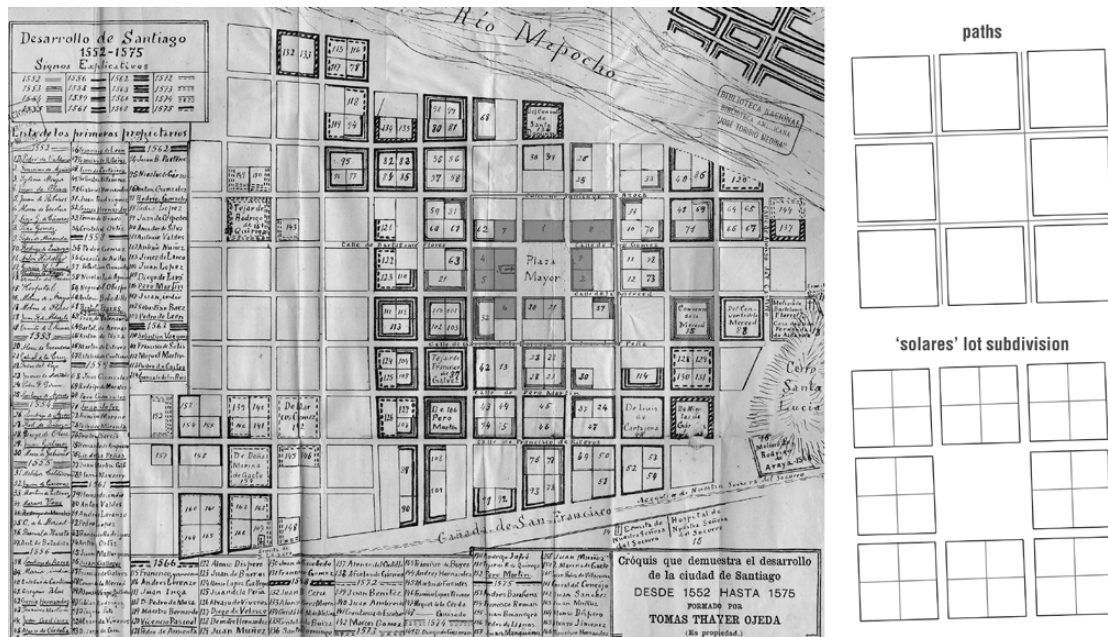
passage; in the south-east block, the "Casa Colorada" house; in the central-east block the "Tagle" portal; in the north-east block, the "Monjas Clarisas" convent; in the central-north block, (previously the Governor's House) the "Cabildo", the "Real Audiencia" palace and the "Gobernadores" palace; in the central-west block, the Cathedral.

Urban transformation process

The foundational configuration rapidly begins to transform and expand, emerging in 1872 (Martinez, 2007) the first major Transformation Plan of Santiago by Vicuña Mackenna, in order to carry out an renovation of the capital, intended to give order to his plan layout, beautify their spaces and answer to the problems caused by the incipient urban growth.

During this first period, between 1870 and 1915, changes were observed in the urban structure around the "Plaza de Armas" square. While the blocks were still set mainly by patio-house, the first specialized buildings in height -as is the case of the "Chilectra" building- in the south-west block- and public buildings began to appear, which carry crossings and ruptures of the block, integrating itself to the city through "halls" or "portals", as is the case of the "San Carlos" gallery (1865, previously the "Tagle" portal) and the "Fernandez Concha" portal (1871, previously the "Sierra Bella" portal), both buildings of mixed nature -commercial and residential-, establishing new models of lot subdivision. It is interesting how the evolution of these two blocks is conditioned by the public nature that characterizes these buildings from their origin. Moreover, in the same block of the "Fernandez Concha" portal, the remodeling of the first gallery of Santiago built in 1852 -which was known as "Matte" passage in 1870-, takes great leadership. This gallery initially conformed a cross inside the entire block, setting the beginning of the new configuration that dominated the city center in the early twentieth century (Figure 3).

In 1930, the "Official Plan of Transformation of Santiago", proposed by the Austrian architect Karl Brunner, based on the "functionalist scientific Urbanism", encouraged the creation of new external streets, passages and galleries as restructuring mechanisms of the closed block, leaning for it on a legislation which resulted in increased constructability, hygiene and comfort, *"it tries to introduce the concept of `Viennese 'hof','` as a means of reproduction and development of social solidarity through the revitalization of neighborhood relations*

and group identity of the neighborhood. For this, it proposes a lattice of open spaces within the existing blocks and blocks fusion deriving from the analysis of the surface recovery needs of the inner courtyards and hierarchy of the road network and parking"[3] (Gurovich, 1996:12). In the case of new buildings, they should contemplate building perforations for public use.

The second period, between 1930 and 1960, gives way to the opening of the block, through a new internal grid. This time being buildings that incorporate new public elements that modify the occupation and lot subdivision models. These are: in the south-west block, the "Agustín Edwards" gallery (1946-1948); in the center-south block, the re-modeling of the "Fernandez Concha" portal (1928-1933) along with the expansion of the "Matte" passage (1927-1932); in south-east block, the "San Antonio" gallery (1953) and the "España" gallery (1959); in the center-east block, the "Phillips" passage (1930), the "Presidente Bulnes" portal (1932) and the "Santiago" gallery (1952); in the north-west block, the "Plaza de Armas" gallery (1930), the "Capri" gallery (1947) and the "Consistorial" gallery (1957). The peculiarity of these elements is that they achieve, through architecture, to create a grid of interconnected internal relations. The galleries are connected to each other, allowing an alternative path to the street. Most of the galleries are set to the south and east, driven by the blocks were the first portals and commercial galleries, observed in the previous period, are located. In turn, the opposite phenomenon occurs in the rest of the blocks, because the private and institutional characters of these (Cathedral, Municipality) are not compatible with this new public path (Figure 3).

After the year 1970, new elements as passages or outside streets appear, introducing other reference systems within the orthogonal urban fabric. While these elements are not present in the blocks around the square -except for the Passage Phillips-, appear another characteristic architectural element of the period: the towers, high density volumes, more autonomous from the context and block laws. In the south-east block, the "Opera" building (1989) arises; in the central-eastern block, the "Bahia" building (1970) and the "Pasaje Phillips" building (1980); in the north-eastern block, the "Santo Domingo" building; and in the north-west block, the "Galeria Plaza de Armas" building (1982). This new element, along with setting a new urban image of the historical center, maximizes the internal grid to contemplate on the ground floor a commercial plane that allows the development of other galleries that connect to existing ones. This way there is a growth of the network of galleries that approaches to sixty in the historical center, and of these, eighteen around the square (Figure 3).

In the 70s', when the center of the city stopped being the main space of sociability, began a period of decline and abandonment of the commercial gallery. In many cases they changed their commercial use by others that boosted their deterioration. However, although today they try to survive the new consumption patterns, they remain the path chosen by a third of the people running through the historical center (Mora and Esponda 2015:7), indicating that these urban elements result from the evolution of a structure with well-defined laws and an architectural process linked to an own way of living in Santiago.

Case study: "Museo de Arte Precolombino" block and "Pasaje Phillips" block

The transformation of the blocks in the historical center of Santiago, like those around the "Plaza de Armas" square, can be summarized in three outcomes: the block where the construction of the galleries affects the morphology, creating a continuous buildings perimeter that leave a volumetrically covered central area; the block where a mixture of continuous and isolated buildings is generated, leading among them the galleries and passages; and the block which has an imposing institutional architecture that maintains a closed block structure. The first two of these cases will be announces, because they are the most frequent.

[3]My translation of this citation: "intenta introducir el concepto de `hof´´ vienés, como medio de reproducción y desarrollo de la solidaridad social mediante la revitalización de las relaciones vecinales y de identidad grupal del barrio. Para ello, propone un reticulado de espacios abiertos al interior de las manzanas preexistentes y de la fusión de manzanas derivándolo del análisis de las necesidades de recuperación de superficies de los patios interiores y de jerarquización de la red vial y los estacionamientos".

Figure 3. The evolution of the urban fabric around the "Plaza de Armas" square (Authors'drawings).
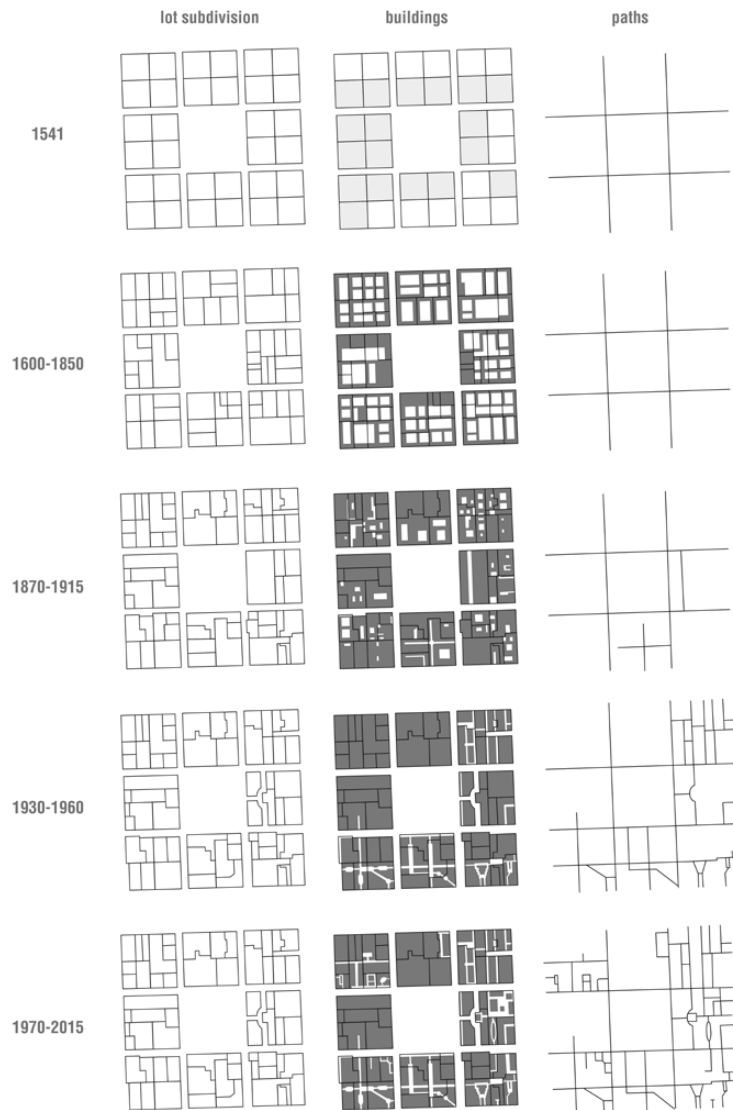
The south-west block, corresponding to the first case, exemplifies the transformation of a block that was originally constituted entirely of patio-houses to a block with a built border that leads to the internal gallery system. The particularity of the evolution of this block is that in one corner was a patio-house type construction of the fifteenth century, where the school "Convictorio San Francisco Javier" originally was. The building is characterized by opening, during the following years, one of its interior corridors to be transformed into a public passage. It now houses the Museum of Chilean Pre-Columbian Art.

The first building construction that was carried out in this block was a building in the corner on the square, which initially corresponded to "Chilectra", an electricity service company. Then in 1930, adjacent to this, the "Real" theater was built. Finally, between 1946 and 1948, it gives way to the construction of the "Agustin Edwards" gallery, which crosses the entire block with a the shape of a cross, then opening a diagonal toward one corner. The central zone has four levels and the borders three. The internal structure has a plan that grows in several directions with six outputs that let you interact with the galleries of the environment. It is interesting to see how the superimposition of this new grid to the lot subdivision it would seem to follow the order of the latter, even respecting the cross generated by the original subdivision into four "solares" (Figure 4).

Figure 4. Hypothetical reconstruction of the development of the blocks (Authors' drawings).

South-west block: 'Museo de Arte Precolombino'

| 1845 | 1900 | 1930 | 1946-1948 |
| Courts and Supreme Court (now 'Museo de Arte Precolombino) | "Chilectra" building | Cine-Teatro Real | Agustín Edwards Gallery |

Central-east block: 'Pasaje Phillips'

| 1865 | 1930 | 1952 | 1970-1980 |
| San Carlos Gallery | Phillips Passage | Santiago Gallery building | New Towers |
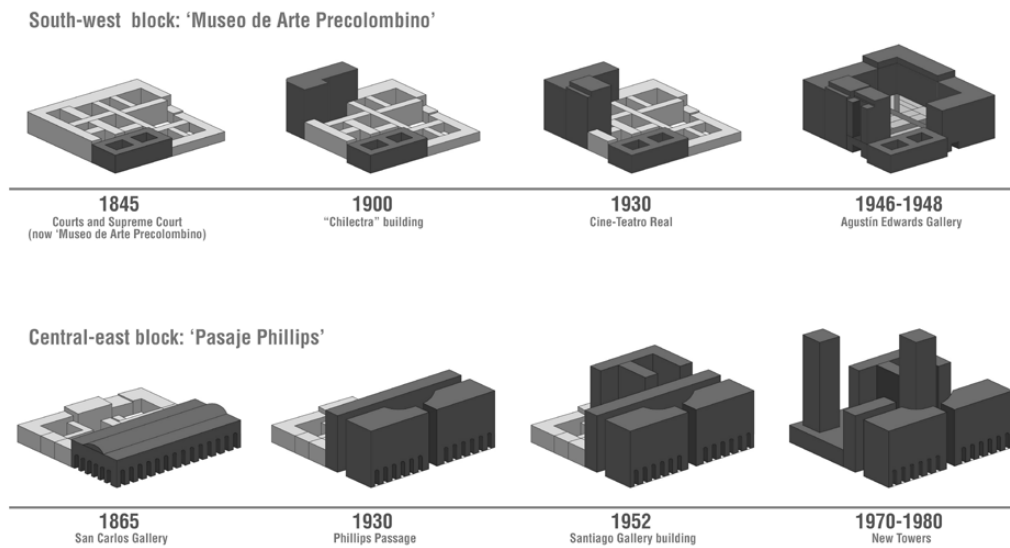
The second case is the center-west block, which unlike the previous case, exemplifies a process of transformation of a block that originally had buildings of public character along with patio-houses. This fact leads it to evolve into more complex solutions that include the partition of the block and the inclusion of isolated elements. On the place were a market originally was, the "Tagle" portal (1850) was built, then the "MacClure" portal (1864) along with the "San Carlos" gallery (1865). Finally in 1930, on the site of the gallery the "Phillips" passage was built, and in the border the "Bulnes" portal (1932). The "Phillips" passage is one of the most significant walkways passage of the historical center, and one of the few that breaks the orthogonal grid structure to work with a curved central space that is connected to the square and two surrounding streets blocks.

In 1952 the "Santiago" gallery was built, the "L" shaped gallery runs through the inside of the corner, but does not connect with the other galleries in the block. Then in the 60s', the "Bahia" gallery is built. Certainly, after the construction of the "Phillips" passage, the greatest transformation of the block happens between 1970 and 1980 with the construction of the "Caracol Galeria Plaza de Armas" and two towers: the "Bahia" building and the "Pasaje Phillips" building, which are connected on the ground floor to the gallery circuit (Figure 4).

The construction of commercial galleries and the inclusion of the towers sets new systems and morphologies. Unlike the previous case, where the entire block has a unitary character, in this case it seems that every corner develops in a diverse and isolated way. However it is interesting to note that this transformation process follows the laws dictated by the lot subdivision, leaving two "solares" to the "Pasaje Phillips", one to the "Santiago" gallery and other to the "Bahia" gallery. Finally, by establishing the "Pasaje Phillips" building in the center, an internal connection is generated to the "Bahia" gallery, allowing to cross the block in two directions.

Conclusion

The modernization of Santiago, driven by Vicuña Mackenna and Karl Bruner, responds to urban models, which while based on European thoughts, are able to complement with the existing urban fabric, maintaining a constant relationship between the rectangular lot structure, inherited from the "solares", and the new buildings that offer an internal grid. The layout of galleries and passages introduced in the blocks surrounding the square consolidated formal possibilities for modifying the baseline grid, from patio-house to complex solutions from an urban scale, characterized by buildings with an average height of 30 meters and towers of 50-60 meters.

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Through the analysis of the urban transformation process, it was found that the soil use for the first solares around the square determined the minor or major future development of the new grid of galleries. Thus portals originally settled in the south-central and east-central blocks evolved in solutions that boosted the commercial nature of these blocks, radiating to the surrounding blocks. In turn, in the two case studies it can be seen how the internal evolution of each block follows the rules of the regular grid structure despite reaching morphologically different results.

This way an interconnected spatial network is created around the square, enhancing its public and symbolic character, where the perforation on the block allows a way of inhabiting the city based on internal paths that have become important elements in the collective memory of the citizens.

References

Aguirre, B. and Castillo, S. (2004) 'El espacio público moderno. Sueños y realidades de Karl Brunner en Santiago de Chile, 1929-1934'. *DU&P. Diseño Urbano y Paisaje Journal* 1(3), 2-21.

Aguirre, B. (2006) 'Piezas de un itinerario memorable: los pasajes y galerías del centro de la ciudad de Santiago'. *Diseño Urbano y Paisaje Journal* 3(8), 1-21.

Aguirre, B. (2009) 'Los pasajes y galerías de Santiago de Chile, como tránsito urbano hcia la modernidad. 1930-1960. Un proyecto patrimonial', unpublished PhD thesis, Universidad de Sevilla, España.

Brunner, K. (1932) *Santiago de Chile. Su estado actual y futura formación*. (La tracción Press, Santiago).

De Ramón, A. and Gross, P. (1985) *Santiago de Chile: características histórico ambientales, 1891-1924* (Nueva Historia, University of London, London).

De Terán, F. (1998) 'La Plaza Mayor de la ciudad hispanoamericana: transferencia cultural y lógica formal', in *La plaza en España e Iberoamerica. El escenario de la ciudad* (Ayuntamiento de Madrid, Madrid), 87-97.

De Terán, F. (1999) 'El urbanismo europeo en America y el uso de la cuadrícula. Cerdá y la ciudad cuadricular'. *Ciudad y Territorio. Estudios Territoriales* 31, 21-40.

Gurovich, A. (1996) 'La venida de Karl Brunner en gloria y majestad'. *De Arquitectura Journal*, 8, 8-13.

Ibarra, M. and Barrientos, M. (january-july, 2011) 'La manzana de la Catedral en Santiago de Chile: expansión y contracción urbana, 1874-1913'. *Historia Journal* 4(1), 91-129.

López, A. (2013) *El secreto de Santiago. La sagrada función del cerro Santa Lucía y la fundación de Santiago* (Sociedad Chilena de Historia y Geografía, Santiago).

Martínez, R. (2007a) 'Santiago, los planos de transformación.1984-1929'. *DU&P. Diseño Urbano y Paisaje Journal* 4(10), 1-14.

Martínez, R. (2007b) *Santiago de Chile. Los Planos de su Historia. Siglos XVI a XX. De aldea a Metrópolis*, (Ilustre Municipalidad de Santiago de Chile, Santiago).

Martínez, R. (2011) *Santiago: historia, arquitectura y urbanismo en la ciudad* I (Universidad Central Press, Santiago).

Mora, R. and Esponda, C. (2015) *Estudio de Flujos. Fic-Santiago Lateral* (http://www.stgolateral.cl/wp-content/uploads/2015/03/Flujos-Stgo_lateral.pdf) accessed 10 november 2015.

Nicolini, A. (2001) 'La ciudad hispanoamericana en los siglos XVII y XVIII'. *Actas III Congreso Internacional del Barroco Americano: Territorio, Arte, Espacio y Sociedad*, 1085-1100.

Rosas, J. (1985) 'La partición de la manzana: Cómo se modernizó Santiago de Chile. La Forma Edificada', *UR Journal* 3, 29-38.

Rosas, J. (1987) 'Santiago centro fundacional'. *ARQ Journal* 12, 2-15.

Rosas, J. (1999) 'La vivienda moderna en el centro de Santiago'. ARQ Journal 42, 56-61.

Stehberg, R.; Sotomayor, G. (2012). 'Mapocho incaico'. *Boletín del Museo Nacional de Historia Natural, Chile* 61, 85-149.

Thayer Ojeda, T. (1905) *Santiago en el siglo XVI* (Cervantes Press, Santiago).

Vicuña Mackenna, B. (1869) *Historia crítica y social de la ciudad de Santiago: desde su fundación hasta nuestros días (1541-1868)*. (Imprenta del Mercurio, Santiago).

The Planning Concept of Heritage Buildings at Baluwerti Surakarta, Central Java, Indonesia

Nafiah Solikhah Thoha
Department of Architecture, Faculty of Engineering, University of Tarumanagara, Indonesia
Keywords: planning concept, heritage building, traditional environment.

Abstract

Baluwerti was originally a residential area for family and courtiers of Kasunanan palace. Decision of Surakarta's Mayor Number 646/116/1/1997 stated that Baluwerti was a conservation area then developed into tourism villages. One common factor in livable cities is culture. Most of the landmarks in Baluwerti are experience shift physical and functional. Emotion's ties of Baluwerti's resident with the Kingdom began to decrease. Servant's settlement in the house of Prince (Magersari) reduce visual aesthetic. The problem is conservation activities that have been implemented in Baluwerti not synergize yet between new function with the potential of area and still confined to the physical aesthetics and not attention yet to non-physical aspects (social, economic, cultural). Therefore, Baluwerti require the planning concept which capable to increase the economic activity with reference to socio-cultural and environmental aspects. This study aims to give an idea of the planning concept of heritage buildings based on the principle of conservation which contextual with Baluwerti area. Indicators that will be analyzed are the physical development, changes in function, economy, social values, status of ownership, and understanding from Baluwerti people to preservation activity. Analysis techniques that used is a triangulation of data sources from empirical fact, reference, and opinion of competent experts. The results of this stage is structuring criteria which used as the basis to formulate the planning concept of heritage building in Baluwerti Surakarta to create a heritage building that is not only beautiful but also contains the meaning and provide a place for economic activity.

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Introduction

Traditional spatial structure has the character as an identity that is generally referred to sense of place. Abstracted from Lynch (1960) there are elements forming region's identity, including: paths, edges, districts, nodes, and landmarks. Traditional environment will change shape and function with the dynamics of the time. Structuring the use of elements associated with historic value. Our ability to create cities that are not only comfortable but also inspire and connect us with history and future (Allison, 2011). Physical intervention mass of new buildings in the theoretical approach are Architecture in Context (Brolin, 1980) and Adaptive Use (Fitch, 1992) and also by zoning management in efforts to establish street experience on regional identity.

Baluwerti: Traditional environment as 'kampung Karaton' of Kasunanan Kingdom, Surakarta, Central Java

Baluwerti derived from Portuguese *Baluarte* which means fort. At the beginning of the period (1745), Baluwerti just consists of a *Kedhaton* that is shelter for the King and his family. In 1755, Pakubuwono (PB) III as King began providing settlements for courtiers in the eastern of Palace which is considered a sacred area using grid pattern. Excerpted from Solikhah (2010), a characteristic forming spatial concepts of the city of Javanese Mataram Kingdom, namely: the system of the Javanese traditional symbolic classification and gradation pattern of sanctity, the defense area, and patterns of ritual movement (Figure 1).

Configuration of spatial pattern of Baluwerti formed by the elements forming the identity of the region influenced by the the city concept of Javanese Mataram kingdom. That element are the circulation path as *path*, fortress of Baluwerti as *edges*, typology of residential as a *district*, regional node as *nodes*, and some heritage buildings as *landmarks* (Solikhah, 2014a).

Baluwerti decided as Heritage Area of Karaton Surakarta with Decision of Precident Republic of Indonesia Number 23/1988, Decision of Ministry of Tourism and Culture Number 03/PW.007/MKP/2010, and Decision of Surakarta's Mayor Number 646/116/1/1997 that stated Baluwerti was a conservation area then developed into tourism villages. Most of the landmarks in Baluwerti are experience shift physical and functional. Emotion's ties of Baluwerti's resident with the Kingdom began to decrease. Servant's settlement in the house of Prince (*Magersari*) reduce visual aesthetic. The problem is conservation activities that have been implemented in Baluwerti not synergize yet between new function with the potential of area and still confined to the physical aesthetics and not attention yet to non-physical aspects (social, economic, cultural). Therefore, Baluwerti require the planning concept which capable to increase the economic activity with reference to socio-cultural and environmental aspects. This study aims to give an idea of the planning concept of heritage buildings based on the principle of conservation which contextual with Baluwerti area.

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Figure 1. (a). A characteristic forming spatial concepts the city of Javanese Mataram Kingdom (Source: Behrend, 1982; Santoso, 2008; Tanudjaya, 1982 in Solikhah 2014 a); (b). Map of Baluwerti (Source: Author, 2015).

Methodology

Type of this study is descriptive-evaluative study. Indicators that will be analyzed are the physical development, changes in function, economic, social values, status of ownership, and understanding of Baluwerti resident toward preservation activity. Analysis techniques that used is a triangulation of data sources from empirical fact, reference, and opinion of competent experts. On second phase, each heritage building will classification based on criteria below:

a. *Fix*: do not change function and physical.

b. *Addition*: merging the beginning functions with the current function, additions of extensive, the addition of ornaments, adding room with no changing physical concept and the original function of the building.

c. *Change*: changes in function and physical on the part of the building (replacement of the floor, the roof changes, and or shape changes that can affect the physical concept and function of the building).

Respondents were selected based on Interest, Importance, and Influence to the shift in the spatial pattern of Baluwerti, namely: *Conservationists* (Ir. Rizon Pamardhi Utomo, MURP/ Urban Designer and Heritage Expert - REKOMPAK), *Management Agency of Kasunanan Kingdom Surakarta* (Drs. GPH. Dipokusumo). The scope of the area study are Baluwerti Village, Sub-District Pasar Kliwon, Surakarta City, Central Java Province, Indonesia. Sample will be analyzed are 40 (forty) heritage buildings as Baluwerti's landmark (Figure 2). The results of this stage is structuring criteria which used as the basis to formulate the planning concept of traditional environment at Baluwerti Surakarta to create a heritage building that is not only beautiful but also contains the meaning and provide a place for economic activity.

Development of Heritage Buildings in Baluwerti

The physical development

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In City of Mataram Kingdom Period (1745 – February 13, 1755), Part of the Kasunanan Palace (Kori Kamandungan and Stage of Sanggabuwana) became a major landmark and the element that is known by the public. At the end of the Pakubuwana IV (1820), began to set up the house of Prince with joglo forms and main gate that become a regional landmark.
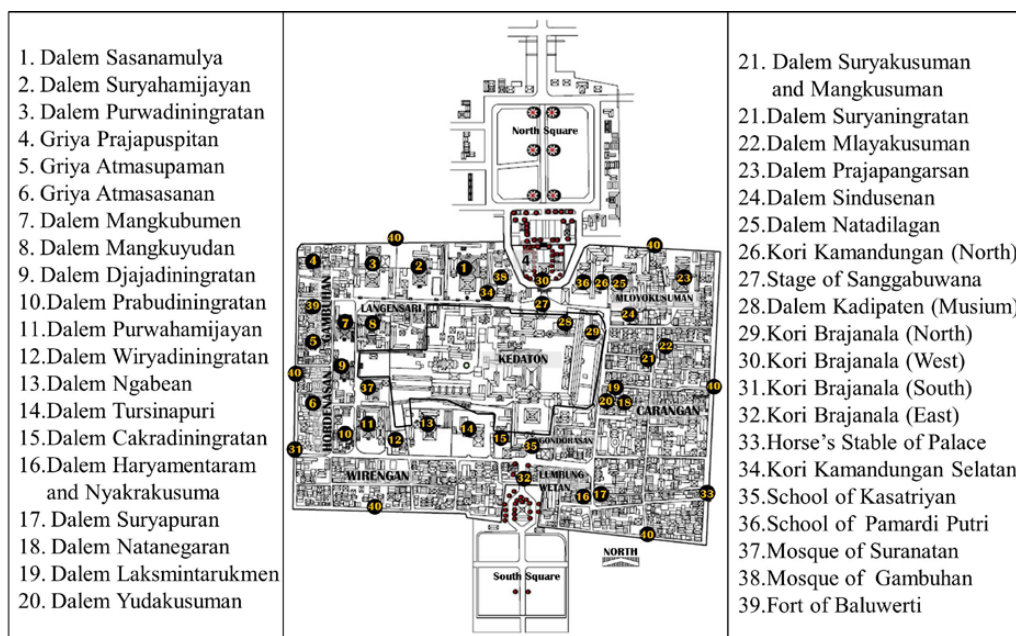
Figure 2. Map of Heritage Building in Baluwerti (Source: Author, 2015).

At the end of the period established public facilities of Kingdom (Kasatryan School, Pamardhi Putri School, mosque, etc) which develops as a regional landmark. Pakubuwana X (1893-1939) extending Baluwerti region 30 meters to the east and west as well as the construction of arches in the Kingdom complex and the house of Prince with a large gate. Expansion the territorial of Baluwerti add main circulation paths pattern. Functions the fortress of Baluwerti for the Dutch is to control the Kingdom activity. As for the Kingdom, fortress as territorial boundaries of power and defenses area.

Nowadays, Landmark region increases with the development of the house of prince and the typology of the house that resembles the concept of house of prince in the Kingdom but on a small scale.

Physical development of Baluwerti region is no longer adheres to the traditional pattern, not considering the sanctity of gradation, and not in context with the kingdom's rule. Most of the landmarks in untreated condition. Skyline façade and exterior spaces that form a hierarchy evolved into no rhythm. (Solikhah, 2014b).

Excerpted from Cohen (2001), there are five criteria to assess the physical quality of the object to be conserved, namely: clarity physical limits of the tread, the locality, the strength of the relationship in diversity owned, style and architectural design, and special characteristics of the material. Physical Intervention of new buildings in heritage area can be done through approaches based on the following theories:

1) *Architecture in Context* (Brolin, 1980); designing a visual connection of the new building to the old neighborhood. This approach can be done for example by taking the ornamental motifs that is consistent with the existence of the original buildings in Baluwerti area, using the same basic form or a new form that has the same visual effect, and abstract forms of the original concepts adapted to the changing times.

2) *Context and Contrast* (Hedman, 1984); giving a visual connection between the existing and new buildings to create an overall effect through the mass form, the silhouette of the building, the distance between the buildings, a setback from the road, the proportion of windows/doors, the placement of the driveway, material, surface texture, scale buildings, architectural style, as well as processing landscape.

3) *Adaptive Use* (Fitch, 1992); use of historic buildings to function in accordance with the consideration of the development needs (saving the past but adapting to the future). For conservation area, this concept can be done to control the designation shift function of the building. For example, by utilizing pendhapa as a dance studio and traditional arts.

Based on interview with Rizon (2010), revitalization need contextual emphasis on the physical and non-physical aspects based on the characteristics of the local area as an identity or character of the area. Study of Preservation Kotagedhe Yogyakarta shows public interest in the uniqueness of the building (the typical form of the Javanese houses) by maintaining his characteristic building.

Classification restoration of historic buildings in Jakarta Province based on Region's Regulation of DKI Jakarta Province Number 9/1999 by classified historic building into three class, namely: Building class A (must be maintained in the original form without any addition or subtraction), Building class B (must be maintained figure, addition or subtraction should be done selectively so that does not eliminate the original character of the building), Building class C (may be demolished, but construction should pay attention to the harmony back to the surrounding environment).

Changes in function

Landmark began to occur some changes in the function. There was a shift in the new function is non - cultural (not related to the palace) in the elements of region and building. Some houses of Prince as landmark have additional not contextual element, such as the use of zinc in the sun shading (previously using wood with certain ornaments). Most of the landmarks in the area are not well maintained condition and changed into boarding, warehouses, stores, workshops, etc.

Revitalization according to Law of Republic of Indonesia Number 11/2010 is aimed at the development of activities to foster the values of the heritage with the adjustment of

the function of the new space that does not conflict with the principles of conservation and cultural value. Conservation should emphasize on improving the cultural values. Urban planning policy interventions need to be creative and innovative, as it relates to the interests of the community at large (public needs), and involves the process of structuring urban land awoke increasingly limited.

Based on interview with Rizon (2010), changes in the function should have a limit on the scale and intensity, to ensure that the character has not changed. So that it is necessary zoning regulation associated with new functionality. According to Dipokusumo (2010), revitalization Baluwerti must meet the elements of conservation, development, and the injection of new innovations to ensure the sustainability of the region by inserting traditional values into modern activities or certain activities injected into it.

Conservation strategy of Krapyak Stage, Yogyakarta include strategies within the macro (city), the scope of the meso (regional) as well as micro scope (rehabilitation/restructuring object for new functionality). Singapore's Urban Redevelopment Authority (URA, 1980) made the preservation guide for each district (Chinatown, Little India and Kampong Glam) based on the uniqueness of each region and conserve historic buildings adapted to the use of the new functionality.

The function control of conservation area to preserve the image of the region include the following: First, the zoning of land use and intensity of development allowed through forms of urban land management; Second, an increase in physical and visual quality of urban design. Classification of the heritage building by maintained figure. Addition or subtraction should be done selectively so that does not eliminate the original character of the building. The most appropriate way is the adaptive reuse.

Economic

Baluwerti was in the midst of the economic center of the city of Surakarta (Klewer Market, Kliwon Market, Gading Markets, and Coyudan), thus indirectly many traders who rent/buy a house in Baluwerti well as a place of business (generally employers convection) and using regol walls to billboards. Community Baluwerti utilize his house as a place of business, but not in context with the area, so there has been exploitation of the heritage areas for economic activities of citizens. Some of the business began to grow the scale and intensity.

Conservation should include the value of emotional, historical-cultural, as well as provide economic benefits to the community in order to get the totality of the results to the community. Adaptive use is the most effective way to preserve the historical and aesthetic value is economical and provides a new standard for historic buildings. Thus, local communities can meet modern needs in the traditional sense, and historic heritage of the city is continuously maintained. Based on interview with Dipokusumo (2010), revitalization of heritage buildings in Baluwerti must meet the relevant aspects of the economy: cost, benefit, profit, and product, as well as the need for heritage's management. Not just beautification, but should increase economic activity with reference to the socio-cultural and environmental aspects. Preservation focuses on efforts to create a creative utilization, generating heritage of the new products, the implementation of programs participation, economic analysis, as well as economic and cultural activities in the conservation area.

Social values

Nowadays, Kori Kamandungan and Sanggabuwana's stage still as a major landmark of Baluwerti area, where the appreciation of a occation by ceremony and ritual of Kasunanan Kingdom is still be the main attraction of citizens. Emotional bond between citizens Baluwerti to the Kingdom began to decrease because the Kingdom is no longer a holder of government in Baluwerti region and the presence of families conflict who also have an impact on the loss of sympathy for the citizens of the cultural values of Kasunanan Kingdom. Emotional bond between people also began to fade with passing generation of people who inhabit the area, so there is no difference the social strata between who live in Baluwerti and who living outside (Solikhah, 2014a).

Conservation should emphasize and give attention to increasing the value of cultural communities. As the sample, in Preservation of Kotagede Yogyakarta people still maintaining the elements that remain in use in the socio-economic activities and cultural communities every day. Bring several groups concerned with conservation issues and to bridge between the community and external parties. Abstracted from Allison (2011), groups have the potential to maintain the continuity of the revitalization program. So the priority areas of economic activity to support the sustainability of historic objects, including the social and cultural life of society.

Based on interview with Rizon (2010), the revitalization activities, functions and role of the community is very important. This is related to the need to make the perception of the revitalization activities between community or with academia and government. According to Dipokusumo (2010), revitalization of heritage buildings in Baluwerti must meet the relevant aspects of the economy: cost, benefit, profit, and product, as well as the need for heritage's management. Not just beautification, but should increase economic activity with reference to the socio-cultural and environmental aspects. It should also involve public participation to create an emotional bond between the people of the palace.

Status of ownership

There are several types of buildings ownership status in Baluwerti, namely: *magersari*, tenant, *anggaduh*/the provision of the king to the courtiers and soldiers, *pituwas*/ the king's giving the servants and soldiers that can be inherited palace, *lungguh*. Since independece of Indonesia conflict status of land and building unclear, ownership status is valid for house building, while the land in Baluwerti remain the property of the Kingdom. The existence of a community effort to keep caring of some heritages building by renting it to take care of the old building. Ownership status affects bond and sense of belonging to the region. They will also be influential in implementing the control rules. As the sample servant's settlement in the house of Prince (*Magersari*) reduce visual aesthetic because less sense of belonging (Solikhah, 2010).

According to Zahnd (1999), if the sense of belonging in an area not owned by the local community, the sense of identity to a place a bit, so the impetus to develop the good in accordance with the development community to be not so great. Although it can be said that the sense of 'having shared' is not only influenced by the factors of land and home ownership status in the urban areas, but by factors such as the sight of the place or a sense of community in a developing environment. It needs to consider the sustainability of the old building functions that can benefit future generations.

Code	I1	I2	I3	I4	I5	I6	Fix/Addition/Change	Code	I1	I2	I3	I4	I5	I6	Fix/Addition/Change
1	-	-	-	-	-	-	Fix	21	√	-	-	-	-	√	Addition
2	√	√	-	√	√	√	Change	22	√	-	-	-	-	√	Addition
3	√	√	√	√	-	-	Addition	23	√	√	-	√	-	-	Addition
4	√	-	√	√	√	√	Change	24	√	√	-	-	-	-	Change
	√	√	√	√	√	√	Cange	25	√	√	-	√	√	√	Change
6	√	√	-	-	-	-	Addition	26	√	√	-	√	√	√	Change
7	√	-	-	-	-	-	Addition	27	√	-	-	√	-	√	Fix
8	-	-	-	-	-	-	Fix	28	-	-	-	√	-	-	Fix
9	√	√	-	√	√	√	Addition	29	√	√	√	√	-	-	Change
10	√	√	√	√	√	√	Change	30	-	-	√	-	-	-	Fix
11	√	√	√	√	-	-	Addition	31	√	-	√	√	-	-	Fix
12	√	-	-	√	-	√	Adition	32	-	-	√	-	-	-	Fix
13	√	√	√	√	√	√	Change	33	-	-	√	-	-	-	Fix
14	-	-	-	-	-	√	Fix	34	-	-	-	-	-	-	Fix
15	-	-	-	-	-	-	Fix	35	√	-	-	-	-	-	Fix
16	√	√	-	√	-	√	Addition	36	-	-	-	-	-	-	Fix
17	√	√	-	√	-	√	Addition	37	-	-	-	-	-	-	Fix
18	√	-	-	-	-	√	Fix	38	-	-	-	-	-	-	Fix
19	√	-	-	-	-	√	Fix	39	√	-	-	√	-	-	Addition
20	√	-	-	-	-	√	Fix	40	√	√	-	√	-	-	Addition

I1. physical development	I3. economy	I5. status of ownership	Fix= 45%; Change= 22,5%
I2. changes in function	I4. social values	I6. understanding from Baluwerti people to preservation activity	Addition= 32,5%

Table 1. Assessment of Heritage Buildings in Baluwerti. Source: analyzed by Author, 2015.

Understanding of Baluwerti resident towards preservation activity

Although it has a strong emotional attachment, mostly elderly people who do not understand what and how the benefits of revitalization activities. The differences in the perception of the meaning and purpose of community revitalization activities between practitioners and academics. Only a few people who can understand and respect the cultural heritage of the palace.

Preservation in Kotagede Yogyakarta as case study, Information is actively conducted by the conservation agency. This conservation bodies provide guidance to communities on how to preserve the region. They have several groups who care about this issue and to bridge between the community and external parties, which are Center for the Study and Documentation of Cultural Arts Kotagede and Kanthil Foundation. Groups such as these have the potential to maintain the continuity of the revitalization program. Government support is very powerful and must be balanced with the readiness of the local government to give special attention and appreciation. Based on Allison (2011), preservation required the backing of the community to be successful.

Based on interview with Rizon (2010), there are 3 things that affect people's understanding of conservation, namely: aspects of communication (common perception among the public premises or academics and practitioners), aspects of leadership (need a leader who can be role models in conservation activities), and aspects of education (associated with education level and parental education).

So it is necessary to cultivate appreciation 'sense of belonging' to the community Baluwerti. Socialization to the community revitalization effort is needed to build public understanding of the benefits of conservation After discussing about development of heritage buildings in Baluwerti, 40 (forty) heritage building will assessed based on indicator and classification into Fix/Addition/Change.
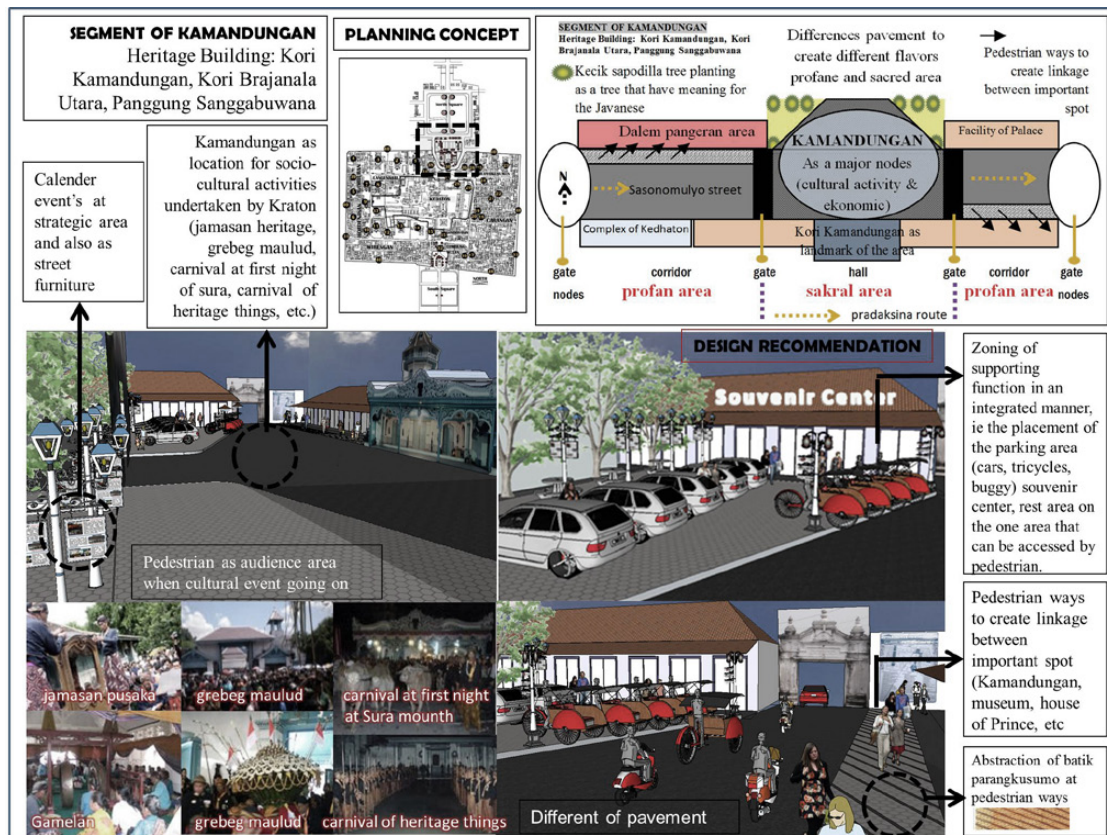
Figure 3. Planning Concept and Design Recommendation of Kamandungan Area (Source: Author, 2015).

Figure 4. Planning Concept and Design Recommendation of Pendapa (Source: Author, 2015).
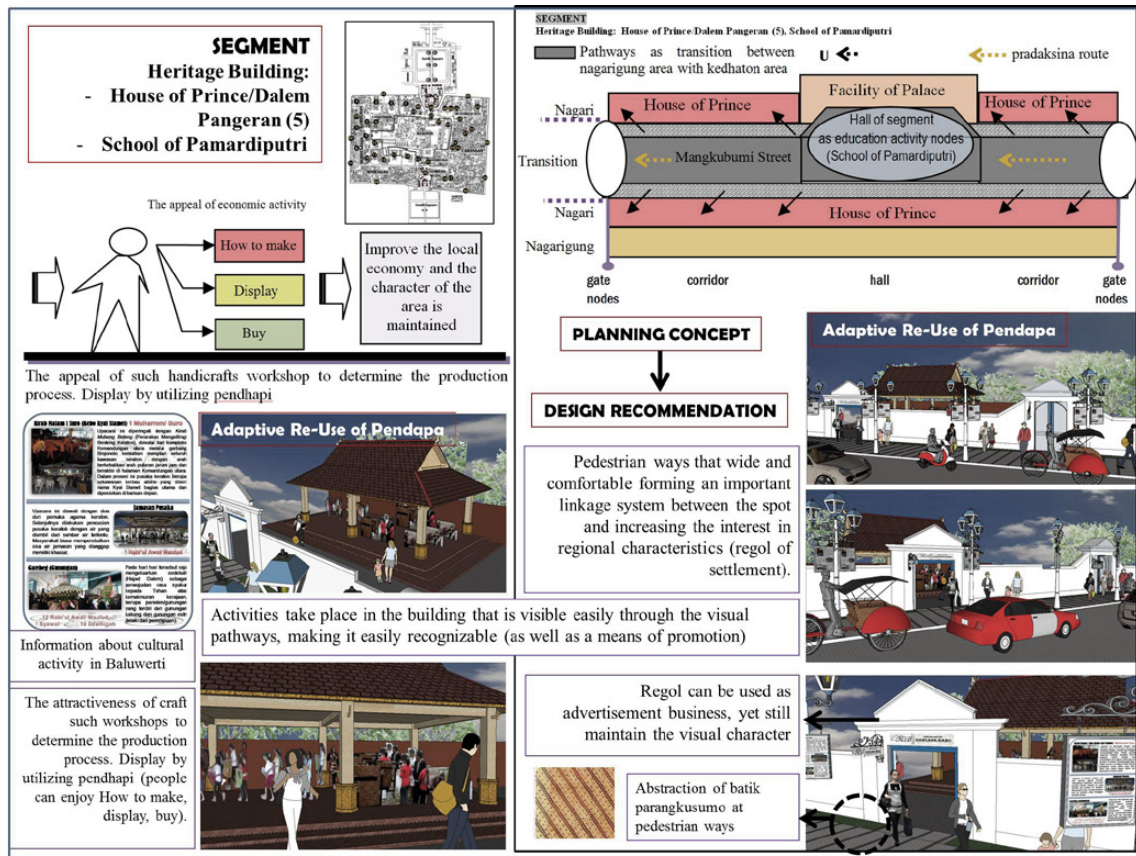
The Planning Concept of Heritage Buildings at Baluwerti Surakarta, Central Java, Indonesia

Criteria is used as the basis to formulate the planning concept of heritage building in Baluwerti Surakarta to create a heritage building that is not only beautiful but also contains the meaning and provide a place for economic activity. The planning concept became the basis for developing a design idea to the heritage buildings in Baluwerti (Figure 3 and 4). The planning concept is divided into 3 (three) phases:

First phases: the physical intervention

Criteria for zonings of street management experience are: Zoning based on the characteristics of the segment and still have linkage between segment, harmonization skyline and the building facade on the corridor, visual clarity to show gradations sacredness, open buildings forming impressions heritage tourism.

Criteria for the establishment the hierarchy of outdoor spaces to reinforce the spatial regions are: the signage at the gate and hall, spatial's differences between the corridor and the hall, interventions should refer to the traditional concept (*mancapat-mancalima*, imaginary North-South, *pradaksina* route), Kamandungan as a major nodes (cultural activity and economic), Sanggabuwana stage as the highest reference of building in Baluwerti, maintain concept of regol, visual clarity to show gradations sanctity.

Criteria spirit of locality in the form of architecture are: abstraction forms and the local element of Baluwerti (roof, regol, texture, color, ornaments, and decorative elements). Physical intervention criteria appropriate level shifts are: to maintain the physical characteristics and adjusted to the level shift (Fix: maintained without any addition or subtraction, Addition: adaptive reuse or re-architecture, Changes: Physical intervence to equate visual character by incorporating elements of the locality).

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Criteria design for new functionality of building in Baluwerti are: new functions must be contextual to the existence of the palace, the new function should not change the visual characteristics of the area, new functions are prioritized to accommodate arts and cultural activities.Should increase public awareness and interest in the old building (over 50 years) by the rate of change (fixed, additions, alterations).

Second phases: economic rehabilitation

Criteria accomodation of economic activity to support the characteristics of the region are: Economic activity should support the sustainability of traditional and should not change the characteristics of the visual pathways, restricted dimensions and types of economic activity commodity contextual with the neighborhood (indicated give socio-environmental impacts), mapping the region's economic activity in new and old buildings. Structuring criteria supporting economic potential are: Proximity to the crowd of heritage buildings as the physical potential, creating lingkage system between important spots to accommodate the existence of traditional crafts (wayang beber, batik, blangkon, keris) and traditional vehicles (buggy, tricycle) as the region's economic potential. Creating creative concept to improve the economic activity and the caracter of the area (how to make, display, enjoy).

Third phases: social rehabilitation

The public participation strategy are engage the community in the maintenance of urban heritage in Baluwerti and increase public awareness (sense of belonging). The strategy of cultural activity are accommodate cultural activities as well as living culture as an industry that has a economic value (jamasan pusaka, carnival at first night at Sura mounth, grebeg maulud, carnival of heritage things, grebeg syawal, etc). Accommodate 'srawung citizens' to increase the emotional bond between citizens must be accessible to pedestrian way, the planning area should accommodate Baluwerti living culture and social values. Provision various cultural performances in large areas and in accordance with the sanctity of the event to accommodate visitors, accessible by a pedestrian ways that are not disconnected, engaging the public to stimulate a sense of belonging. Provison of cultural activities and traditional crafts must have connectivity between important spots, accessible by a pedestrian ways, open a visual impression, reviving the social and economic structure (Craft: How to make, display, buy; Socio Culture activity; enjoy, active), Improve the local economy, thus increasing the social value and character of the area is maintained. Laying of information and cultural activities should be easily accessible to pedestrian ways and visually through pathways.

Conclusion

The criteria applied to the revitalization Baluwerti means more visible feature of territory, by absorbing the conflict interaction between human activities and the environment. Each element of the physical, human, cultural, social, and economic into equal parts. The planning concept of heritage buildings in Baluwerti used is the synergy of physical, economic, and social aspects to create a heritage building that is not only beautiful but also contains the meaning and provide a place for economic activity.

References

Allison, E. and Peters, L. (2011) *Historic Preservation and the Livable City* (John Wiley & Sons, Inc., Hoboken, New Jersey).
Brolin, B. C. (1980) *Architecture in Context: Fitting New Building With Old* (Van Nostrand Reinhold Co., New York).
Cohen, N. (2001) *Urban Planning Conservation and Preservation* (The McGraw-Hill Companies Inc., New York).
Fitch, J. M. (1992) *Historic Preservation: Curatorial Management of the Built World* (The McGraw-Hill Companies Inc., New York).
Hedman, R. and Jaszewski, A. (1984) *Fundamentals of Urban Design* (Planner Press, American Planning Association, Chicago, Illionis).
Lynch, K. (1960) *The Image of The City* (MIT Press, Cambridge).

Pemerintah Provinsi Daerah Khusus Ibukota Jakarta, Dinas Kebudayaan dan Permusiuman (2007) *Guidlines Kotatua* (Pemerintah Provinsi Daerah Khusus Ibukota Jakarta-Dinas Kebudayaan dan Permusiuman, Jakarta).

Solikhah, N. (2010) 'Konsep Revitalisasi Tata Lingkungan Tradisional Baluwarti Surakarta', unpublished thesis, Magister Program of Architecture-Urban Design, Sepuluh Nopember Institute of Technology (ITS) Surabaya, Indonesia.

Solikhah, N. (2014a) 'The Development Study of Spatial Pattern in Baluwerti Village, Surakarta City, Central Java Province, Indonesia', *Proceeding of International Seminar on Vernacular Settlements (ISVS)-7 2014: Re-Assessing Vernacular Architecture: Theories and Practices: Traditions, Identities and Globalization (Volume II)*, Faculty of Architecture, Istanbul Technical University, Turkey, ISBN: 978-975-561-448-9, October 15th – 17th, Istanbul-Turkey, 541-554.

Solikhah, N. (2014b) 'Development of Baluwerti Settlement In Surakarta, Central Java'. *DIMENSI Journal of Architecture and Built Environment*, Petra Christian University-Surabaya; Vol 41, No 2, December, 95-102.

Zahnd, M. (1999) *Perancangan Kota secara Terpadu* (Penerbit Kanisius,Yogyakarta).

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Repairing urban fabric with large-panel system buildings – urban redevelopment in historic cities during the last decade of the GDR

Malte Nettekoven
Facoltà di Ingegneria Civile e Industriale, Sapienza Università di Roma, Italy
Keywords: pre-cast concrete slab construction, post-war reconstruction, socialist postmodern architecture

Abstract

During the 1970s architects and planners began to doubt about the principles of modern urbanism according to the 'Charta of Athens' not only in West Germany (FRG), but also in the socialist East Germany (GDR) (Urban, 2007). Although first renovations of 19th century districts (Arnimplatz, Berlin) were carried out mainly for economic reasons, soon the socialist government in 1976 ordered redesign of the historic city centre of Berlin (Sophienstraße, Gendarmenmarkt, Nikolaiviertel) respecting the history of the place. Its motives were, on one hand, propagandistic ones - exploiting the German history, culture and tradition for the legitimation as the true German nation - and on the other hand, indeed, the growing belief in the economic and social value of the compact city.

The contribute describes and analyses the treatment of the historic fabric and weighs role and values that were attached to it by planners in the 70s and 80s. Further, it focusses on the question to what extent concrete slab/ panel buildings complete historic urban fabric or are in continuity with it.

Especially in the 1980s the formerly rigid prefabrication systems were more and more adapted to the urban fabric of the 19th century (Berlin, Jena), of Baroque times (Potsdam, Greifswald) or even Medieval times (Rostock, Stralsund) assuming an angular geometry, and an appropriate subdivision and dimension of building corps. Also in the architectural language was tried to create a relation to historic architecture by attaching bricks on the concrete panels, introducing specially formed panels for slope roofs, gables or entrances. Günter Stahn, the architect of the Nikolaiviertel said: "The concrete panel simply was the brick of our times."(Krüger, 1986)

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Introduction and Methodology

Architects and town planners in the GDR brought historical town centres into focus during the so-called third period of reconstruction (Beyme, 1992), at the beginning of the 1970s. At that time cities that had not been destroyed during World War II, were in a serious state of neglect and decay.

In the third reconstruction period planners continued to pull down large parts of urban fabric in order to construct completely new buildings without any relation to the historical urban form. But in comparison to previous planners now they tried to adapt the new buildings to the irregular 'ground plans' of historic cities. Large panel system buildings by industrial prefabrication were the only available construction technique. And therefore planners were forced to find solutions to adjust their rigid modular system to the irregular course of historic streets.

Today the large-panel system building era is considered to have come to an end. Architecture and construction technique of the so called 'Plattenbauten'[1] have completely been abandoned after the reunification of Germany. However, recent publications of different branches show a topical interest in exploring this phenomenon under various points of views.

The present paper tries to analyse the relations between the 'Plattenbauten' and the historical urban fabric with its various types of historic buildings.

Pars pro toto three significant examples – two in Berlin and one in Potsdam – will represent the numerous parallels realised all over the GDR[2].

Historical context

"Sixteen principles of urbanism" were passed together with the reconstruction law on 14th of September 1950, a short time after the founding of the GDR. They declared "the economic and social value of the 'compact city' and asked to respect historical urban development and regional construction traditions in town planning (Beyme, 1992). Last not least the 'principles' should be a "counterweight to the 'Charter of Athens' " (Durth, Düwel, and Gutschow, 1998). Few projects were realised in the first phase of redevelopment, amongst them the famous Berlin Stalinallee, the Lange Straße in Rostock and the Dresden Altmarkt.

In 1955 the "16 principles" were mainly abandoned in favour of industrialized social housing that fulfilled again the idea of aligned blocks set in parallel ('Zeilenbau'), the same sunlight exposure and aeration for all and the construction with pre-cast concrete boards. The turning point that marked the end of the first reconstruction period had been Nikita Khrushchev's decree "On liquidation of excesses" from November, 1955. He ordered the Soviet Union and its satellite states, like the GDR, to start a sole industrial production for building.

Khrushchev's speech was published in the GDR with the programmatic title "build better, cheaper and quicker". The leaders of the socialist party of the GDR had obeyed and had started the construction of a city – Hoyerswerda-Neustadt – in the same year, using exclusively the prescribed building techniques (Richter, 2006).

Finally with his seven-year plan (1959-1965) the leader of the socialist party Walter Ulbricht made the industrial building production a governmental doctrine (Hannemann, 2005). During this second period of reconstruction most of the 691000 apartments were built in the periphery of the cities. At the same time a lot of 19th century residential districts were pulled down, whose tenement blocks ('Mietskasernen') were regarded as a symbol for the capitalistic oppression of the working class. After that these areas were 'reconstructed' by large-panel system buildings. Beside ideological reasons (Richter, 2006) those demolitions were legitimised by the idea, that every building lasts only a determined time (lifespan). After that

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[1],Plattenbau' is the German colloquial term to indicate pre-cast concrete board buildings (technical German term 'Gebäude in Großtafelbauweise') even though a slab (=Platte) is actually only the horizontal board, by opposition with (wall)panel (=(Wand-)scheibe) for the vertical boards. In order to simplify the text the shorter German colloquial term will be used.

[2]There are interesting examples in Rostock, Halle a. d. Saale, Erfurt, Jena and Gera.

it becomes inappropriate to up-to-date requirements (obsolescence) and the building has to be substituted, without considering its conservation state (Urban, 2007).

The third reconstruction period started on 1st of January, 1973, when Erich Honecker published his housing construction schedule for three million apartments. Till 1990 it should put an end to the housing shortage that had been unresolved since the end of World War II. In this occasion a new large-panel system called 'Wohnbauserie 70 (short: WBS 70)' was developed, that should increase efficiency and variability of apartments and façades[3]. For the housing construction principally huge new areas outside the cities were exploited. Nearly the half of today existing 'Plattenbauten' was realised in this system[4].

The schedule also provides the renovation of old buildings in order to achieve more quickly the demanding aims. The number of building demolitions decreased constantly after when in 1973, for the first time, a whole 19th century district around the Arnimplatz in Berlin was renovated instead of being pulled down. Not the idea of cultural heritage preservation saved the buildings, but the economic argumentation of saving resources by 'extending their lifespan' till their certain substitution after the end of the housing shortage. But in the end the renovations contributed more to an image change and the rehabilitation of the tenement blocks than to a reinforcement of economy.

A decree of the 'Politburo', the government of the GDR, from 1976 concerning the redevelopment of Berlin's city centre in view of its 750th anniversary in 1987 reveals that urban requalification was again used for propaganda aims. Evocating German history and culture by using architecture has been a tool to present the GDR as an autonomous nation according to Honecker's political goal to create two sovereign German states. As historically wrong the declaration of the existence of two German nations was as superficial and scientifically incorrect as the reconstruction approach to Berlin's city and architecture. "The unspecific ancient impression" (Urban, 2007) of the new 'old town areas' is the result of intentionally avoided critical consideration of history[5].

This decree prepared the ground for a state-wide law, adopted on 29th of May, 1982 that declares housing construction inside historical town as main objective. Basically the law resumed some of the main points of the 'Sixteen Principles' from 1950 (Richter, 2006). Since 1980 design studies by architects of the 'Bauakademie der DDR' had started to develop new elements and different design solutions for the most modern large-panel system 'WBS 70', published in the 'Grundkatalog' in 1984. The crucial proposals were individual apartments instead of standardized ground plans and the transformation of the 'Zeilenbau'- types into the traditional block perimeter development. Further adaptabilities consisted in: additional elements with different conical and right- angled geometries to follow non right-angled street courses, variable building depth in a range between 9,6 and 14,4m, integration of shops at the ground level (storeys also realised in in situ concrete), pitched or (very frequently) mansard roofs and historicizing elements for the façade like oriel windows, French windows and many different materials for the surfaces of ordinary concrete panels. The main features of the construction as constructive details, the modular system in plan based on a 1,2m grid, the standard story height of 2,8m and the principal widths of façade panels (2,4; 3,6 and 6m) remained unaltered (fig. 1).

Case Study I: Berlin – Spandauer Vorstadt – Sophienstraße

Towards the end of the 18th century Berlin becomes a tenant's city because the majority of people that immigrates to the Prussian capital were relatively poor. The Prussian

[3]At the end of Walter Ulbricht's period as leader of the socialist party a debate arose on the monotony of new housing districts (Richter, 2006).

[4]Designed by Wilfried Stallknecht and Achim Felz the first WBS 70 block was built in Neubrandenburg, till the end of the GDR 644900 apartments (42% of all Plattenbauten) were constructed.

[5]The decree provided the requalification of parts of the district Spandauer Vorstadt, in which the first two case studies are located) and the reconstruction of the Gendarmenmarkt, of Friedrichstraße as a commercial and pleasure district and the 'Nicolaiviertel' totally destroyed by bomb attacks during World War II. The 'Nicolaiviertel' became the most famous example for those reconstruction activities all realised in large-panel systems.

Figure 1. The territory of L'Aquila after the earthquake of 6h April 2009.

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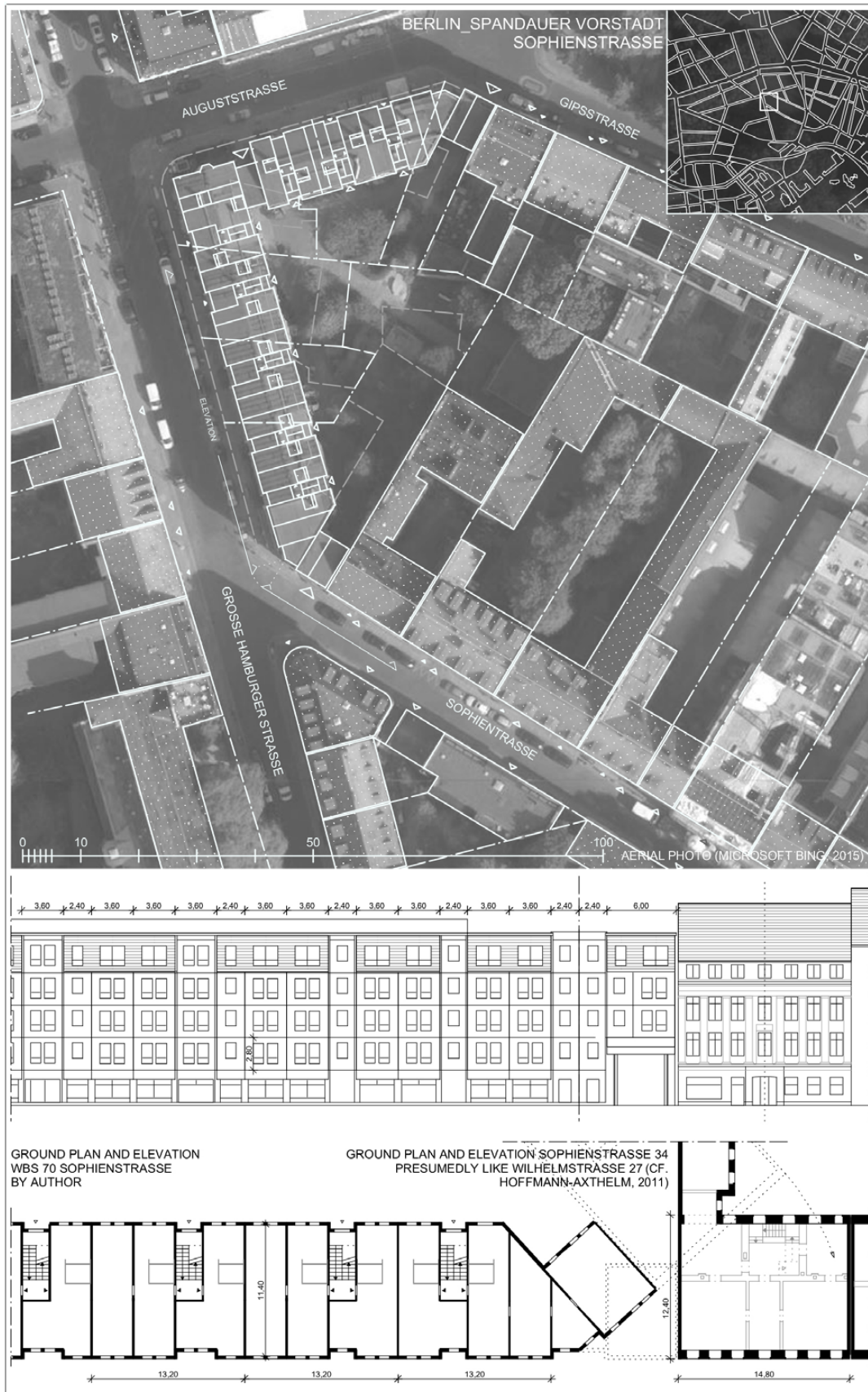
civil law, amended in 1791, creates the social conditions for the bourgeois society that rises after the Prussian reforms of 1808 and for the interlinked typological development of the tenement. Hoffmann- Axthelm uses the term "pre-modern tenement" for the housing type being formed during the reign of Friedrich II., because it represents the starting point for the development of all tenement types till the end of 19th century.

The streets around Sophienstraße in the district 'Spandauer Vorstadt', in the north of Berlin's city centre and outside the modern fortifications, are prevailingly characterised by houses, whose origins go back to the period of the so-called enlightened absolutism before 1806 (Hoffmann-Axthelm, 2011).

With the intense growth of population during the reign of Friedrich II (1740-1786) the sparsely populated district outside the town gates was brought under a stronger governmental planning control. At this time the rough urban lay-out was already fixed by ancient suburban streets and a parcelling out based on the agrarian plot subdivisions. In comparison to other contemporary planned urban expansions the streets are right angled only exceptionally.

The governmental planning decisions concentrate principally on the subsequent regulation of existing buildings and on house projects. The lay-out of new buildings were determined by governmental standardized building types, the building laws and aesthetic demands, accompanied by a governmental financing offer for the financially weak population: house building was "widely a product of governmental administration" (Hoffmann- Axthelm, 2011).

The typical entrance to the two storey tenements of the Spandauer Vorstadt lies in the central axis. For this reason the ideal façade shows an uneven number of window axes. According the parcel's width there can be five, seven or nine axis[6]. From the large entrance corridor one reaches the triple- run staircase with a wide quadratic stairwell in the rear, where it extends the corridor's width to two window axis. At the same time the corridor is a passage for vehicles to the inner courtyard. Frequently the symmetry is abandoned, mainly at the narrow five axis type. There the entrance corridor lies in one of the outer axis. Accordingly a rear building ('Hinterhaus') is present only along one border of the parcel. The typical rear buildings, initially used as utility rooms like stables or workshops become part of the living area.

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The mixed construction in brick masonry and timber frames is characterised by a bearing brick wall in the middle with integrated chimneys that braces the house diagonally and supports the storey ceilings tensed from façade walls two the middle wall. The need to protect wooden ceilings from ascending humidity forms widespread basement stories that protrude one-third- high over the street level and receive natural light. When at the beginning of the 1830th shops become more common, the basement stories were abandoned in favour of ground-level entrances.

The urban fabric around Sophienstraße undergoes a constant transformation during the 19th century. Until 1830 the perimeter of the blocks is completely closed and a third storey is added to nearly every house, around 1840 a forth storey (Hoffmann- Axthelm, 2011). The Spandauer Vorstadt evolves towards an inner city district where the Sophienstraße tends to be a subordinate street, whose houses suffer less strong transformations. The beginning of the street as part of a craftsmen's and petit bourgeois' district is still recognisable by the scale of its houses.

The Spandauer Vorstadt belongs to the best preserved districts of Berlin's urban fabric before the 19th century, thanks to few war damages. The construction works in the area of Sophienstraße executing the Politburo's decree from 1976 began in 1983. They include the restoration of 32 historic buildings and the closure of gaps in the northern block perimeter development towards Auguststraße, with 'Plattenbauten' of the WBS 70 system (fig. 2). The gaps had been owed to bombing attacks during World War II (Aust, 1986).

The parcelling out strongly influences the urban form: Next to possessory interests subdivided parcels point out the autonomy of a design project and the chronological independency of its realisation. Thereby it determines the houses' scale and its proportions.

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[6]Obviously there are many exceptions to this ideal type, for instance the four window axis type that characterise the medieval Berlin.

Figure 2. The C.As.A. Initiative: C.A.S.E. complexes covered by the survey.

In the present case a single design project occupies six parcels of endemic size for a private tenement. The inserted 'Plattenbau' is a large residential building type that unites several house units with proper staircases, so called "sections"[7] in a single, relatively large scaled building structure. For this reason it represents an anomaly in the widely homogenous urban fabric of small parcels. Significantly bigger parcels in this district are reserved for public building types.

The origin of the applied WBS 70 as an explicitly modern 'Zeilenbau'- type is undeniable in this project: The normally parallel set oblong buildings are simply aligned to the course of the streets[8]. There are neither rear buildings nor an addition of private open areas to the single 'sections'. Both sides of the building are equally dedicated to public space as it is common for a 'Zeilenbau' building. This fact is emphasized again by the equal treatment of the front and rear façade. The decision to provide the several house units with entrances exclusively in the inner block courtyard is contrary to the conception of the historic city. Next to the three big entrances to the courtyard there are only few entrances to shops at the street side, accordingly long street portions seem nearly deserted. This may result from determinations in the ground plan which had not much been modified in comparison to the standardized ground plan types of the WBS 70 "Zeilenbauten".

The 'Plattenbau' reconstructs the historical front building ('Vorderhäuser') respecting urban volume, number of stories and void/hole balance of the façade in an unexpectedly similar way. At the same time the number of the 'sections' corresponds to the number of historical tenement on an equally long street portion. One could argue that the insertion of the 'Plattenbau' is successful, because its spatial dimensions are near to the ones of the royal Prussian lower middle-class tenement.

In order to adjust the extremely long façade to the tenement' house scale, it is interrupted by 60cm- recesses in the façade panel axis, with staircases behind. These recesses have an effect like separating joints between sequences of two or three panels, that – being topped by a mansard roof – at first glance seem to be individual buildings. Although there is an approximate accordance between the dimensions of 'Plattenbau-sections' and historic tenement parcel, a façade design that distinguishes single 'houses' and is coherent to the ground plan, is not possible without causing ambiguities. At second glance the impression of autonomy of these 'houses' gets lost, because house entrances are missing. The result is a purely formal allusion that is born of the demand to design houses suitable to the history of the place (Urban, 2007).

Case Study II: Berlin – Spandauer Vorstadt – Alte und Neue Schönhauser Straße

Today's urban fabric around the crossway of Alter and Neuer Schönhauser Straße, Münzstraße and Weinmeisterstraße is referring completely to its status at the end of the 19th century. Earlier building constructions along the street go back to the era of Friedrich II. But most houses were transformed or substituted later. These vast urban transformations are due to Berlin's entrance into the period of high industrialisation and the founding of the German Reich in 1871, interlinked with an economic boom. James Hobrecht's master plan for Berlin from 1862 is the planning basis for controlling the very rapid expansion. The district of Spandauer Vorstadt in 1860 is an inner city shopping street with combined business and apartment houses. On street level the ground floor shows wide shop windows strengthened by cast iron pillars, the protruding basement storey has been eliminated. The tenement types of the so-called 'Gründerzeit' – although grown in number of window axis and storeys – still have the similar configuration in their ground plan. Only the social differentiation inside the city as well as inside a single house increases due to the high density of urban fabric and the different quality of apartments depending on their position and alignment. Different types are far better identifiable by the social class for

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[7]The term 'Sektion' is taken from vocabulary of the GDR planners.
[8]The project reminds housing complexes in Germany of the 1920th, in which the block perimeter development has not already been dismissed; only the block corner was exempt of buildings higher than one storey.

which they had been destined. Gustav Assmann's "Grundrisse für städtische Wohnge-bäude" from 1862 gives a summary of typical ground plan solutions, from which client and mason made their selection according to the individual needs. In high social class districts as in the Spandauer Vorstadt façades are getting equipped with oriel windows to valorise the building. Corner buildings are remarkable because of their chamfered corner, sometimes designed as a risalit.

In this case (fig. 3) the 'Plattenbauten' close another four gaps originating from war damage (Aust, 1986). In comparison to the case before the merging of parcel is moderate and could have happened in the 19th century as well. The 'Plattenbau' on the southern side of Neue Schönhauser Straße occupies two parcels as well as the 'Gründerzeit'- building on the same side towards Münzstraße. Both 'Plattenbauten' on Weinmeisterstraße take only one historic parcel, because the corner buildings had already reached remarkable dimensions in the 19th century.

The new building complex on Alte Schönhauser Straße ignores the borders of three parcels, nevertheless they don't exceed customary building dimension at this place: A double dividing wall separates it into two autonomous houses[9], giving structure to an endless seeming sequence of concrete panels.

The 'Plattenbauten' correspond to a town house type aligned to the block perimeter and was probably designed for this project only. Many solutions have been realized which the "Grundkatalog" of WBS 70 provided for inner city housing, among those: the eye-catching oriel windows in the façade as a direct reference to the neighbouring houses, the increased building depth of 14,4m in order to exploit better the parcel's area – despite the absence of rear buildings – and the corner house type. Especially the corner type means a renunciation of classic modern urbanism that wanted to eliminate the block corner building. The modern achievements regarding building hygiene standards however are respected in the ground plan configuration where every apartment opens to both building sides.

On the whole, the "sections" are smaller than the 19th century tenements, the corner buildings instead show the double number of housing units/ staircases keeping the same building dimensions[10]. In comparison to the apartments of adjacent houses that occupy a whole storey, including also rooms in the rear building, in the 'Plattenbau' the staircase gives access to two apartments on every storey. The subdivision of the 'Plattenbau' is much greater than in the historical houses that were obviously built for a richer social class. The façade confirms that impression by significantly more compact storeys.

The oriel windows in the street façade distinguish clearly the back and rear of the building. Rainwater pipes lie sometimes in front the transverse walls that separate the "sections". Together with the oriel windows they structure the façade in a similar way as in a 19th century façade composition.

Again a single passageway leads to the only entrance to the 'sections' in the inner courtyard. This entrance might belong to the opposite street of one's apartment. Therefore, façades copying those of differently organised buildings just remain formal allusions to the streetscape.

In this case the remarkable wastage of building ground would astonish any 'capitalistic' investor, meanwhile the planning socialist architect didn't bother about it at all. Nevertheless the conic elements of the WBS 70 were still too rigid to admit smaller angular differences.

The construction methods of large panel systems are strongly different to those of traditional masonry, but both of them use the panel or the closed cell as a structural unit. Despite of thinner walls, the affinity to historical urban fabric is closer than for instance a skeleton construction. But due to the parallel transverse wall principle the direction of stress of the storey ceilings of WBS 70 is rotated 90 degrees in comparison to the old tenement. Furthermore the WBS 70 system rejected for the first time a bearing middle wall to increase flexibility in the ground plan, once characteristically in old urban fabric. At least the double building partition wall is missing which creates a superordinate rhythm in the city ground plan.

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[9]In elevation the autonomy of the building is less clear due to the aligned storeys.
[10]Corner buildings with two staircases exist only in lower-class tenements to give access to more and smaller apartments on the same floor- level.

Figure 3. Geographical narrative of earthquake: the places of death.

BERLIN_SPANDAUER VORSTADT
ALTE UND NEUE SCHÖNHAUSER STRASSE

WEINMEISTERSTRASSE

ALTE SCHÖNHAUSER STRASSE

ELEVATION

MÜNZSTRASSE

NEUE SCHÖNHAUSER STRASSE

10   50   100

AERIAL PHOTO (MICROSOFT BING, 2015)

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GROUND PLAN AND
ELEVATION
WBS 70
ALTE
SCHÖNHAUSER
STRASSE
BY AUTHOR

GROUND PLAN AND
ELEVATION
ALTE
SCHÖNHAUSER
STRASSE 29
PRESUMEDLY LIKE
'GRUNDRISSE
BLATT 4'
(CF. ASSMANN, 1862)

2ND FLOOR

1ST FLOOR
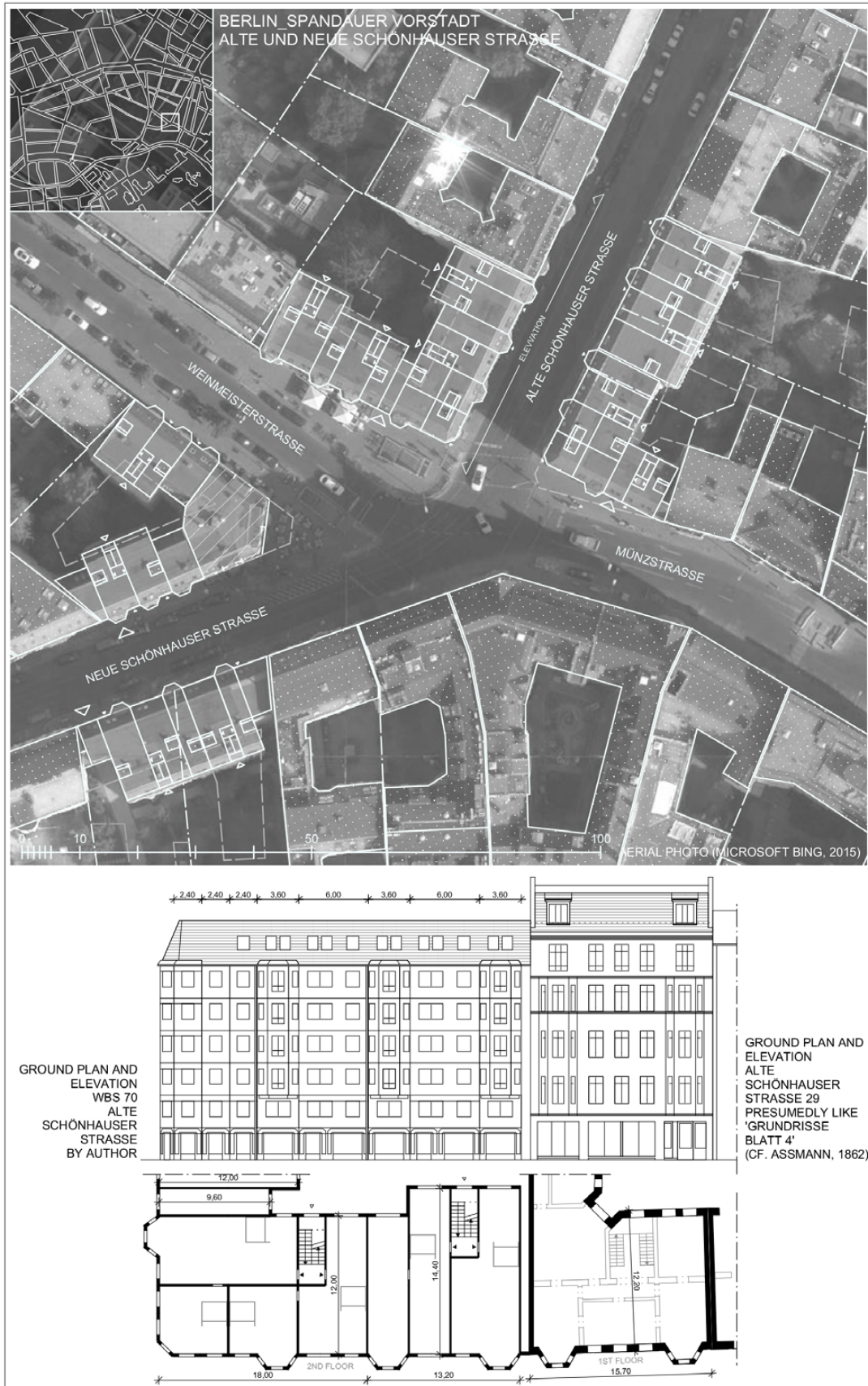
Potsdam – Second baroque urban expansion – Gutenbergstraße

Gutenbergstraße (fig. 4) in Potsdam is located in the area of the second baroque urban expansion, that had been established northward the city according to a precise plan by order of king Friedrich Wilhelm I in 1733 and the subsequent years. Three parallel streets orientated approximately east-west and eleven streets tending to north- south create 23 large scale blocks. As some north-south directed streets have already existed, not all of the blocks are right-angled. The two-storey buildings with a lengthwise pitched (or hipped) roof close the block perimeter continuously. Every four block corners are opened by a so-called fire alley ('Brandgasse') that permits the fire brigade to fight fire from two sides. By that measure planners avoided a corner building type. The whole district is thought as a harmonised ensemble: not only the houses themselves are strictly standardised, the two differently wide parcels are distributed along one block side fol- lowing a central mirror axis (Zieler, 1912). The central house got a special use, like a shop (Mielke, 1972). The standardised house types have got five or seven window axis. The entrance is always in the central (mirror) axis that is highlighted by a relatively big dormer.

In 1770 the unity of the ensemble is disturbed when massive three-storey buildings were constructed, unifying adjacent parcels. Transformations continued in the 19th and 20th century, when the inner block areas are getting occupied by rear buildings and many fire alleys are closed. World War II has brought only few damages. The disregard and decay of many houses during the GDR period create circumstances that lead to vast demoli- tions and the closure of gaps by large panel system constructions (Gegenbauer, 1991). Obviously a substitution rather than of repairing urban fabric has taken place here[11].

In order to substitute the Potsdam's baroque standardised house types, the large block system IW64 from the 1960s was reapplied. Being a kind of efficient masonry construction with big concrete blocks it repeats actually a previous system to the 'Plattenbauten'. The 'Blockbau' 'IW77/Brandenburg/Potsdam' was designed to be realised exclusively in the area of the baroque urban expansion. One 'section' of this 'Blockbau'- system cor- responds within few centimetres precisely to the dimension of the historical house and its parcel. Surprisingly the modular system based on 2,4m and 3,6m wide elements fits in the historic five axes as well as in the seven axis type. This dimensional correspondence would have permitted the substitution of every historic house independently of each other. Con- sidering this possibility and the effort of designing a special type for a small district, it seems probable, that GDR planners intended to replace the whole historical urban fabric.

Although there is this geometrical correspondence fortunately, in practice the substitu- tion has not always been executed respecting historic parcels. Despite of one house (Her- mann- Elflein- Straße 36), the 'section' that replaces the five axes house was realised with the consequential loss of the sophisticated mirror symmetry of blocks in the city's ground plan – yet weakened by previous transformations. The ensemble suffers an additional dis- turbance by the entrance axis of the replacing 'sections' that is asymmetric in compari- son to the parcel's middle axis. But nevertheless one must concede that GDR planners were more respectful to an original urban concept than most of their predecessors, espe- cially regarding the building dimensions. Their motives were rather practical than driven by cultural heritage convictions, as the reestablishment of the fire alleys shows that nearly everywhere had been closed. The two practical reasons were firstly giving undivided ac- cess to the public inner block area, secondly avoiding a corner house type.

The 'IW77/Brandenburg/Potsdam' does not provide many changes in comparison to the IW64, but the two main adaptions – the mansard roof looking towards the street side and the recreated dormer above the entrance – have given enough impact to adapt the house to the streetscape.

In Potsdam building with industrial prefabrications seems to be more natural than in the previous cases. The urban fabric of Potsdam is based widely on right-angled geo-

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[11]In the GDR a cultural heritage preservation law was adopted on 19th of June, 1975 during the European year of cultural heritage preservation. Nevertheless the law has never really been practised.

WOHNBAUSYSTEM 70 (WBS 70)

GROUND PLAN AND ELEVATION TYPICAL WBS 70 BLOCK WITH FOUR 'SECTIONS'

TYPICAL WBS 70 APARTMENT

MODULAR SYSTEM IN GROUND PLAN

CONSTRUCTION SYSTEM IN VERTICAL AND HORIZONTAL SECTION

ALL DRAWINGS FROM ALLISAT, 1997

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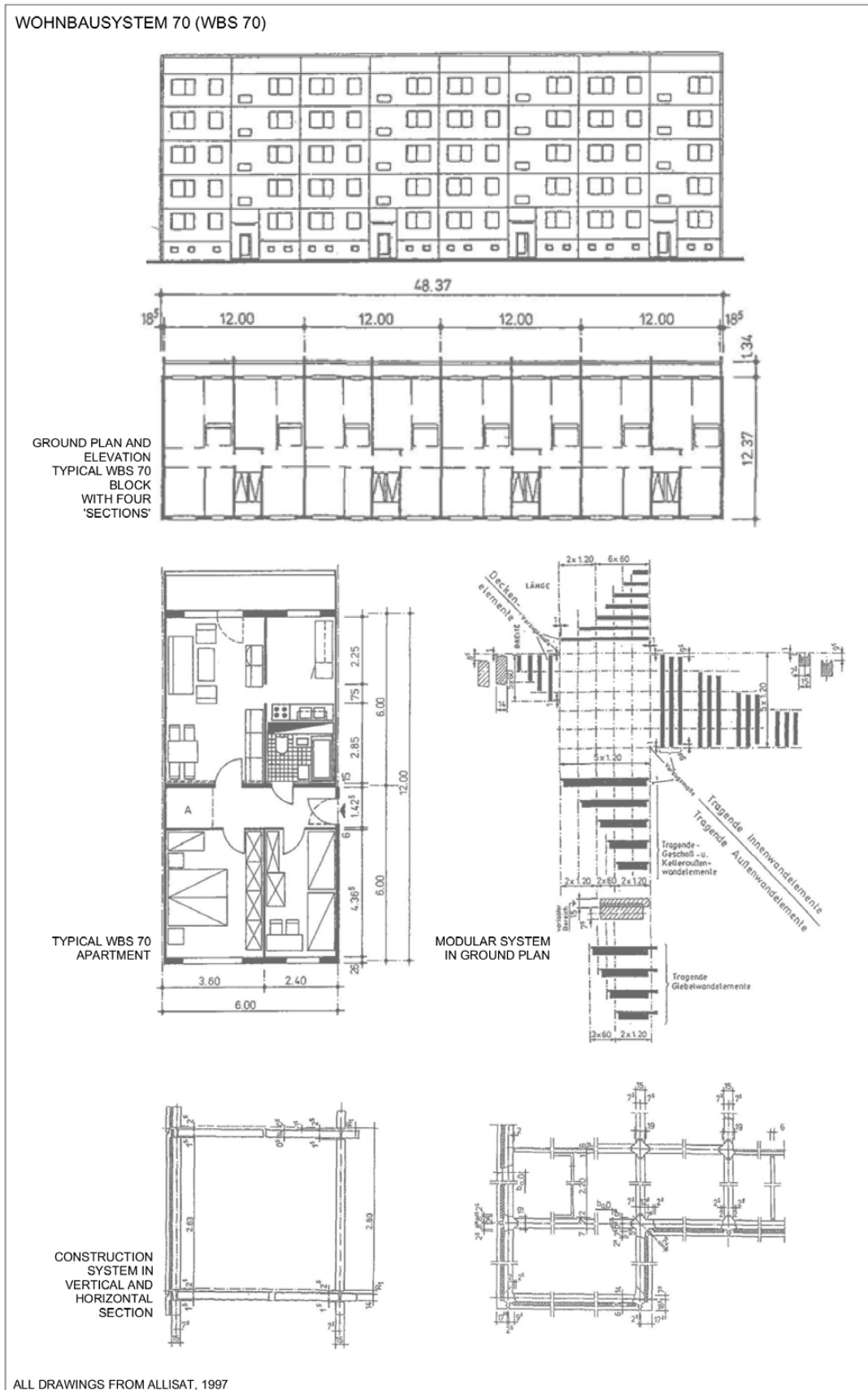
metric sites and was built in a serial, repetitive way like the 'Blockbauten' – even though without using industrial production methods. Insofar there is a certain affinity regarding technical planning conditions.

Conclusion

In the context of historical cities 'Plattenbauten' do not intend to resume any morphological or truly architectural characteristic of historic urban fabric – in spite of the adaptation of building volumes and some superficial formal allusion in the façades. If there are characteristics in common, they are owed more to practical needs, social demands and conditions on building sites rather than to a wilful subordination to the rules of an existing structure. 'Plattenbauten' are clearly recognisable as results of specific social and production conditions. More important than their (relatively low) architectural quality is their role as precious witnesses for the historic epoch in which they had been created, and for the reason why and how historical city centres have changed.

References

Allisat, G. (1997) *Leitfaden für die Instandsetzung und Modernisierung von Wohngebäuden in der Plattenbauweise Wohnungsbauserie 70 - WBS70 6,3t*, Institut für Erhaltung und Modernisierung von Bauwerken e.V. (ed.), (IRB, Stuttgart).
Assmann, G. (1862) *Grundrisse für städtische Wohngebäude* (Ernst & Korn, Berlin).
Aust, B. (1986) *Städtebauliche Entwicklung Berlins seit 1650 in Karten* (Der Senator für Stadtentwicklung und Umweltschutz (ed.), Berlin).
Bauakademie der DDR, Institut für Wohnungs- und Gesellschaftsbau (IWG), Lehmann, G., Leibl, W., Schulze, D., Kress, S. and Pajonk, S. (1984) *Innerstädtischer Wohnungsbau in Plattenbauweise WBS 70. Grundkatalog* (Institut für Projektierung und Standardisierung (ed.), Berlin).
Beyme, K. von (ed.) (1992) *Neue Städte aus Ruinen: deutscher Städtebau der Nachkriegszeit* (Prestel, München).
Durth, W., Düwel, J. and Gutschow, N. (1998) *Architektur und Städtebau der DDR* (Campus, Frankfurt am Main, New York).
Geist, J.F. and Kürvers, K. (1984) *Das Berliner Mietshaus. 1862-1945* (Prestel, München).
Gegenbauer, C. (1991) 'Die zweite barocke Stadterweiterung', in Deutsche Gesellschaft für Denkmalpflege e.V. (ed.), *Kulturbauten und Denkmale*, vol. 2, 8–10.
Hannemann, C. (2005) *Die Platte: Industrialisierter Wohnungsbau in der DDR* (Schiler, Berlin).
Hoffmann-Axthelm, D. (2011) *Das Berliner Stadthaus: Geschichte und Typologie 1200 bis 2010* (DOM, Berlin).
Mielke, F. (1972) *Das Bürgerhaus in Potsdam* (Wasmuth, Tübingen).
Richter, P. (2006) Der Plattenbau als Krisengebiet, unpublished PhD thesis, Universität Hamburg, GER.
Schulze, D. (1995) *Wohnbauten in Fertigteilbauweise (Baujahre 1958 - 1990), Übersicht*, Institut für Erhaltung und Modernisierung von Bauwerken e.V. (IEMB) (ed.) (IRB, Stuttgart).
Urban, F. (2007) *Berlin/DDR neohistorisch, Geschichte aus Fertigteilen* (Mann, Berlin).
Zieler, O. (1912) *Potsdam: Ein Stadtbild des 18. Jahrhunderts* (Wiese, Berlin).
Schulze, D. and Kress, S. (1997) *Städtebauliche und hochbauliche Planungen des industriellen Wohnungsbaus - 1959 bis 1989*, Institut für Erhaltung und Modernisierung von Bauwerken e.V. (IEMB) (ed.) (IRB, Stuttgart).

Four improving strategies for the current historical heritage renovation. Case study of Suzhou Creek, Shanghai

Huang Lu, Li Zhenyu
College of Architecture and Urban Planning, Tongji University, No.1239, Siping Road, 200092, Shanghai, China

Abstract

Taking Suzhou Creek, Shanghai as an example, this paper reviewed the course of the historic area along the Suzhou Creek and the background of urban renewal development. Through the analysis of the reuse practice of industrial heritage, it pointed out many problems in the practice at the present stage: (1),the lack of meticulous investigation on the current situation has caused historic buildings out of protection; (2), single development body and imbalance of regional development also have posed a severe damage on the cross-strait landscape.

Then it further brought forward the overall strategy of multi-element association renewal based on the following aspects such as historical context, spatial pattern, ecological and social factors.The historical block protection zone should be divided into different regions ,then the original function of historical buildings could be continued while some of them could be combined with the construction of residential district or developed into creative industry parks. In addition, to construct the urban riparian ecological landscape was also a very important point.Finally, it explicated the view of seeking organic renewal of industrial heritage. This paper will be subsidized by the NSFC (Natural Science Foundation of China). The project's name is "Research on the Typological Identities of the Contemporary Chinese Housing" and its authorized number is 51278337.

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Background research

Introduction
   Suzhou Creek originated from the Guajing mouth of the Taihu Lake. It is comprised of 59 tributaries of different sizes with 12km overall length. As the largest tributary of the Huangpu River, the urban district of Shanghai is gradually expanding from the old town along the Huangpu River and Suzhou Creek. Some scholars said that if the Bund was the elevation of Shanghai, the Suzhou Creek was the section of Shanghai. (Figure1)
   Suzhou Creek developed from east to west, from south to north in early stage.
   - The first construction upsurge is around1870s with a batch of 'Linong' emerging for production, living, warehouse, trade etc. and bridges constructed to communicate both sides.
   - The second construction upsurge is in the late 19th century and early 20th century with a large number of 'Linong', factories, warehouses emerging and the construction of docks, revetment, road and bridge along the river.
   - The third construction upsurge is in the nineteen thirties and nineteen forties. It is not only the golden age of Shanghai but also the decisive period of Suzhou Creek. A large number of 'Linong' were transformed into new 'Shikumen' houses, at the same time, some warehouses made of reinforced concrete flat slab or frame structure were built up along the river.
   - The fourth construction upsurge is in the late 50's and early 60's after the founding of the PRC. Numerous factories and workers villages were build up, flood walls were constructed or reinforced, new bridges across the river were added. Buildings were more and more intensive, higher and higher. Moreover, the water quality decreased year by year, water pollution was becoming more and more serious.

Historical heritage renovation along the Suzhou Creek

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   As the mother river of Shanghai, the economic and cultural prosperity had left rich historical heritage. According to data from Shanghai City Planning Bureau, among the 632 Shanghai outstanding historical building list, 63 buildings are located along the Suzhou Creek, of which 28 are included in the protection list of provincial cultural relics protection units or outstanding modern historical architectures and 37 are well preserved such as office apartments, 'Linong' and warehouse.
   With the development of the times, people have new insight on a certain level of the city historical heritage protection in traditional sense. How to find a balance point between "protection" and "development" and how to find the path and direction for the historical heritage which is most suitable for its development are both hot topics of city development nowadays. The relationship between protection and development should

Figure 1. Suzhou Creek in November 1957.

city as organism | new visions for urban life

be a dynamic balance. The development is the inevitable law of all things' survival, is the basic starting point to a new life source of the historical area. In simple sense the protection based on the traditional form seems feeble in society today. After all, we live in a new period with rapid development and the demand for the life quality keeps increasing. The historical heritage protection should be based on the principles of sustainable development and has the features of temporal spirit and exploratory. There is inevitably friction between traditional and modern, so on the way to the search of historical heritage protection only having an innovative and developmental vision to the city and the land we live on, can we be well prepared to face a series of problems in the process of urban development in the future.

Reflections on reuse of historical heritage along the Suzhou Creek

Gains in the reuse practice
   In 1997, Shanghai government started to comprehensively harness the Suzhou Creek in different ways. With the improvement of water quality, the value of the waterfront along the Suzhou Creek doubled. The Suzhou Creek had suffered a new round of development and protection. But in the early stage of development, the problem between protection and development came one after another. Therefore, Shanghai City Planning Bureau issued related policies in 2002 and 2006.
   Outstanding historical buildings along the waterfront had been well protected. Moreover, from the 'Renhai Flower City' at the beginning, a large number of residential communities stood up along the Suzhou Creek such as 'Zhongyuan Two Bay City', 'Dahua Clear Water Bay', 'Shanghai Salon Court' and so on. People paid much attention to the Suzhou Creek and dreamed to own a house which had a good view of Suzhou Creek. (Figure2)

Losses in the reuse practice
   The environment along the Suzhou Creek has been improved, land value is continuously rising, and a large number of high-rise residential buildings were building up along the river. At the same time, a series of new problems appeared.
   - The lack of meticulous investigation on the current situation has caused historical buildings out of protection. As shown in the figure (Figure3), there are 105 historical buildings along the Suzhou Creek, 63 of which are well protected. And the rest which are not

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Shanghai | Zhongyuan
Salon Court | Two Bay City
Dahua Clear Water Bay

Figure 2. Residencial communities along the Suzhou Creek.

Figure 3. Statistics about historical buildings along the Suzhou Creek included in the Shangai outstanding historical building list.

Classification	Number	Date of the Building	Address	Original Name	Current Name	Building Function Switching	Publishing Date
Office	1	1916	No. 20, Huangpu Road	the Russian Consulate/the Soviet Consulate	The Russian Consulate		First Batch
	2	1925	NO.250-276, North Suzhou River Road	Shanghai Post Office	Shanghai Post Office		First Batch
	3	1937	No. 23, East Zhongshan Road	Bank of China	Bank of China, Shanghai Branch		First Batch
	4	1843	No. 27, East Zhongshan	Jardine Matheson	City Foreign Trade Bureau		First Batch
	5	1910	No. 29, East Zhongshan	Calyon Bank	China everbright bank Shanghai branch		First Batch
	6	1911	No. 106, Huangpu Road	Consulate General of Japan, the United Nations Relief Administration	Commercial Land Company		Second Batch
	7	1893	No. 24, East Zhongshan Road	Yokohama Bank	Industrial and Commercial Bank of China, Textile Group Corporation		Second Batch
	8	1872	No. 24, East Zhongshan 1st Road, 1#, 8# buiding	United Kingdom Consulate	City AA		Second Batch
	9	1922	No.2, East Bejing Road	Glen Line Building	Radio Shanghai		Second Batch
	10	1908	No.100, Dianchi Road	Yan Kee Company	Chamber of Shipping Sevice Company		Second Batch
	11	1908	No.120, Dianchi Road	Industry Wide Real Estate co., LTD	TV magazine agency		Second Batch
	12	Unknown	No.81, East Bejing Road	Foreign Firm	Old Summer Palace Restaurant	Office--Hotel	Second Batch
	13	1933	No.342, East Bejing Road	Guohua Bank Building	Huangpu District Tax Office		Second Batch
	14	1933	No. 128, Huqiu Road	Christian Literature Society Building	City Sports and Culture Import & Export Company		Second Batch
	15	1925	No. 59, Hongkong Road	HKAB building	Aijian Company		Second Batch
	16	1908	No. 59, Yuan Ming Yuan	Amp Co.	Shanghai Advertising Limited		Second Batch
	17	1933	No. 133, Yuan Ming Yuan Road	YWCA building	Municipal Engineering Design Institute		Second Batch
	18	1930	No. 209, Yuan Ming Yuan Road	Baptist Publication Society Building	Baptist Publication Society Building		Second Batch
	19	1917	No. 26, East Zhongshan 1st Road, 1#, 8# buiding	Yangtze Insurance Building	Agricultural Bank of China, Shanghai Branch of the Foreign Exchange Office Building		Third Batch
	20	1932	No. 20, Huqiu Road	The Museum Building	Qingdao ICBC		Third Batch
	21	1920	No. 161-175, South Suzhou Road	Etsong Building	Shanghai Seagulls Camera Machine Sales co., LTD		Third Batch
	22	1927	No. 185, Yuan Ming Yuan Road	Lyceum Building	Standard Chartered Bank Shanghai Branch		Third Batch
	23	1921	No.232-240, East Bejing Road		Shanghai Building Materials Group Corporation		Third Batch
	24	1933	NO.470, North Suzhou River Road	Shanghai General Chamber of Commerce	the South Building of Electronic Components		Third Batch
	25	1905-1907	No. 595-607, Middle Sichuan Road	Shanghai YMCA	Puguang Building/Puguang Middle School		Fourth Batch
	26	1921	No. 484, Middle Jiangxi Road	The British Water Company Building	Zilai Building		Fourth Batch
	27	about 1888	No. 464-466, Middle Jiangxi Road	The British Water Company Office Building	Zilai Building/Tap Water Pipeline Management Company		Fourth Batch
	28	Unknown	No. 473, Middle Jiangxi Road	Yuanyuanchang Bank/ the East Enterprise Inc	Residence	Office--Residence	Fourth Batch
	29	1931	No. 450-454, Middle Jiangxi Road	Hengfeng Building	Hengfeng Building/ Shanghai Waterway Bureau Office		Fourth Batch
	30	1935-1936	No.230, East Bejing Road	The National Commercial Bank	Shanghai Construction Group, Shanghai Materiel Administration, Beijing West Road Ticket Office		Fourth Batch
	31	1932	No.239, 255, East Bejing Road	Zhongken Building	Shanghai Municipal Electric Power Company (North), Shanghai Building Materials Supply Company, Shanghai Airlines Casting and Forging Company		Fourth Batch
	32	1924	No.270, East Bejing Road	Zhongyi Trust Building	Zhongyi Building/ Shanghai Transportation Corporation		Fourth Batch
	33	1931	No.280, East Bejing Road	Yien Yieh Building/ Yien Yieh Commercial Bank	Shanghai Changjiang Electrical Group		Fourth Batch
	34	1910	2nd, No.1094, West Bejing Road	Daxin Tobacco Company	Shanghai Torch Factory Staff Dormitory	Office--Residence	Fourth Batch
	35	1910	No.511, Jiangning Road	Gordon Road Police Station	Shanghai Commercial Accounting School, Jing 'an Campus	Office--School	Fourth Batch
	36	1931	NO.1028, North Suzhou Road	the National Industrial Bank of China	Flea Market	Office--Commerce	Fourth Batch
Hotel	37	1935	NO.2, North Suzhou River Road	Broadway Mansions	Broadway Mansions Hotel	Residence--Hotel	First Batch
	38	1907	No. 15, Huangpu Road	Astor House Hotel	Astor House Hotel		Third Batch
Commerce	39	1928	No.146, Huqiu Road	Capitol Theatre	Foreign Trade Hall		Second Batch
	40	1934	No.780, East Bejing Road	Lyric Theatre	Huangpu Theatre		Fourth Batch
School	41	1879-1923	No.1175, Wanghangdu Road	Saint John's University	East China University of Political Science and Law		Second Batch
Industry	42	1922	No.17, West Guangfu Road	China MINT	Shanghai MINT		Second Batch
	43	1933	No.21, Guangfu Road	Sihang Warehouse	Warehouse		Second Batch
	44	1932	No.216, Yichang Road	Yichang Road Fire Institution	the Third Fire Detachments of Yichang Squadron		Third Batch
	45	1913-1921	No.120, Moganshan Road	Fuxin Flour Mill	Shanghai Flour Company		Third Batch
	46	1935	No.130, Yichang Road	Shanghai Beer Co. Ltd. Shanghai Beer Factory	Shanghai Beer Co. Ltd. Shanghai Beer Factory		Third Batch
	47	1912	No. 447, Macao Road	Shanghai Zhonghua Printing Factory	Shanghai Zhonghua Printing Factory		Third Batch
	48	1902	No.1295, South Suzhou Road	China textile Construction Company, Fifth Warehouse	Shanghai City Textile Materials Corp, Xinzhaqiao		Fourth Batch
	49	1920	No.57, Xintai Road	Hualian Xintai Warehouse	Hualian Xinta Road Warehouse of Bailian Group		Fourth Batch
	50	1932	NO.1040, North Suzhou River Road	Bank of China Warehouse	Maolian Silk Shopping Mall	Warehousing--Commerce	Fourth Batch
	51	1912	No.423-433, Guangfu Road, No.101, Changan Road	the Factory and Warehouse of the No.1 Fuxin Flour Mill	the Warehouse of Hualian Group Electrician Lighting Equipment co., LTD.		Fourth Batch
	52	1874	No. 1384 Lane, Wanhangdu Road	Plant and Warehouse	Shanghai Hardware Warehouse		Fourth Batch
Residence	53	1935	NO.340, North Suzhou Road	Riverside Apartment	Riverside Apartment		Second Batch
	54	1924	No. 131, Huqiu Road	Youth Association Building	Huqiu Apartment	Office and Residence--Residence	Third Batch
	55	1938	No.136, Changhua Road	Yide Tang	Young's Garden House		Fourth Batch
	56	1882	No.2, Kangding Road	Zhang's Garden House	Kangding Garden		Fourth Batch
	57	1930	No. 18, North Sichuan Road	Rikang Apartment	Rikang Apartment		Fourth Batch
	58	1920	No.1-15, 17-25, 27-37, 41-51, 229-239, 251-261, 267-277, 291-301, 307-317, 381-391, 397-407, Lane 660, Macao Road	Lane 660 House in Macao Road	Macao Community		Fourth Batch
Others	59	1906	the Bund	the Waibaidu Bridge	the Waibaidu Bridge		Second Batch
	60	1927	Zhapu Road	the Zhapu Road Bridge	the Zhapu Road Bridge		Second Batch
	61	1922	the Middle Sichuan Road	the Sichuan Road Bridge	the Sichuan Road Bridge		Second Batch
	62	1920	No.500, North Shanxi Road	Seymour Road Synagogue	the Shanghai Education Bureau Hall		Second Batch
	63	1935	in the Zhongshan Park of Changning Road	marble Pavilion	marble Pavilion		Third Batch

Figure 3: Statistics about historical buildings along the Suzhou Creek included in the Shanghai outstanding historical buildings list.

included in the protection list are mostly industrial buildings. What is more, it is more difficult to protect the historic buildings integrally and continuously.

- Single development body and imbalance of regional development also have posed severe damage on the cross-strait landscape. The development body is either the government or the developer. As the fund from government was limited, it was difficult to play scale effect. However, developer had to construct residential buildings higher and higher to make up for the loss of creating better external environment, which leaded to cross-strait landscape suffered greater losses and losing the original continuity and publicity. Although Shanghai City Planning Bureau issued relevant documents in 2002 and 2006, it still did not play a good role. For example, 'Zhongyuan Two Bay City' is a residential community with ultra - high density which makes waterfront landscape seriously damaged. High-rise buildings along the Changshou Road also make the surrounding areas shrouded in the shadow of buildings over a long period of time.

Four multi-element renewal strategies

The long history created by Suzhou Creek brought up rich historical heritage. That how to reuse it is an important topic in the development and construction of historical heritage. Through years of vicissitudes, many historical buildings had gone through function conversion for several times. So at present the most direct and realistic problem in the protection and development on the historical area along the Suzhou Creek is how to find suitable functional position to make it adapt to the development of modern city as well as to maximize its value. On the basis of some relevant policies and documents such as "Controlled detailed planning for the Suzhou Creek waterfront area" (Figure4) released in October 16, 2006, "Protection ordinance for Shanghai historical and cultural zone and outstanding historical architecture" released in July 25, 2002 and so on, four multi- element renewal strategies are proposed as follows.

Stratege1: Establishing historical block protection zone in sections
The plan of protection and utilization for Suzhou Creek is relatively concentrated in 4 sections where historical buildings are mainly distributed.
    - The estuary historic district
The Suzhou Creek estuary historic district is located in Hongkou District of Bund Historical District, west to Henan Road, south to North Suzhou Road, east to Daming Road, north to Tiantong road- North Sichuan Road - Wuchang Road- Wusong Road- Tiantong Road, the land area of which is about 16 hectares. The geographical location of estuary district is excellent; historical and cultural resources are rich; and the Shanghai post office building, Shanghai Mansions and other municipal-protection buildings are all located here.

As an opportunity of starting up "Waitan Yuan" project, we should make full use of its geographical and cultural advantages, preserve the height of the buildings along the Suzhou Creek, continue the characteristics of waterfront landscape, finally construct an international-standard urban leisure complex embodied the characteristics of Shanghai.
    - he warehouse industrial building protection zone (Zhejiang Road to Wuzhen Road)
The area(from Zhejiang road to Wuzhen Road) was the Shanghai financial warehousing centre in history, and brought a group of representative European warehouses together such as Sihang Warehouse, Guang'er Warehouse and Market for industrial goods, witnessed the early stage of the development of Shanghai financial warehousing industry. These buildings along the river will be reserved in the future development forming Shanghai top leisure entertainment area which combines functional business centre, senior residential and cultural center together.
    - The modern industrial building protection zone (Changhua Road)
The area along Changhua Road was the industrial zone in the west of Shanghai where characteristic industrial buildings and warehouse buildings were relatively concentrated. Fuxin flour mills, Shanghai brewery and Mint were all branded with the mark of modern industry, witnessed the changes of national industry. According to the plan, while developing residential function along the river, buildings worth preserving will be hidden in

the large green forming the modern industrial building protection zone with cultural and recreational function.

   - East China University of Political Science and Law

   East China University of Political Science and Law is located in the Wanhangdu Road No. 1573, against the Suzhou Creek. The college was formerly known as St. John's University. The campus preserves many European style buildings: magnificent Gothic hall, unique tower at the top of "Huai Shi Tang". The entire buildings all are blended into one harmonious whole; the campus is full with lush trees and parkland. In the future development originally closed shoreline can be open to the Zhongshan Park to form a vision of transparent waterfront landscape.

Stratege2: Continuing the original function of historical buildings

   Many historic buildings along the Suzhou Creek have their profound historical background. Building's original function determines its architectural form and style, but is also the reason for its vitality and profound connotation. In the baptism of wind and frost for years, building's structure and appearance suffered some damage, but the original building can still function well so far and be reused to revitalize the historical buildings.

   So far, as shown in the figure (Figure3), within the scope of plans, there are 63 buildings along the Suzhou Creek which has been included in the Shanghai outstanding historical buildings list. They are located in an important position, have high research value and historical significance. Along the Suzhou Creek transportation was convenient, resources were abundant, various activities gathered here, thus all types of buildings had been built. Due to the passage of time, social change, business operations and other reasons, the function of some buildings has been changed once or more times. Among them, there are 36 office buildings, 31 of which maintain the original function; 2 hotel buildings and only 1 maintains the original function; 2 commercial buildings and 1 school all maintain the original function; 11 industrial buildings, 10 maintain the original function; 6 residential buildings, 5 maintain the original function; 5 buildings with other function all maintain the original function.

   But there are a lot of outstanding buildings along the Suzhou Creek which are not included in the list, such as the German Gothic new Tian'anTang near the Waitanyuan and Zundeli on the Xiamen Road. To protect these historical buildings, using the original architectural functions is one of the most effective ways. When reusing them on the basis of continuing the original functions, we can choose to adjust space to a lesser extent to meet the new space requirements. Or we can choose to add some function to improve the quality in use, but the buildings are still based on the original function while the new function serves the original. In both cases, it can better preserve their original style while the change is relatively small to the originally spatial pattern, facade, architectural detail and so on. Those with a certain historical value of their functions which can reflect the cultural historical characteristics in a certain period can choose to continue the original function to prolong the service life, so they can sustainably develop with a new attitude on the foundation of inheriting and continuing the history.

Stratege3: Combining historical buildings with the construction of residential district or developed into creative industry parks

   - Combining historical buildings with the construction of residential district

   Urbanization, modernization is an "evolution" of latter-day city. However, the human is unable to get rid of the influence of history. Residential historic districts reflect the latter-day living environment and the folk customs carrying on, which are the main elements of city characteristics. The features constitute the basic system of urban architecture environment, and are an indispensable link in the urban history change. On the other side, there is a long historical process to form inhabitancy style for residents. The existence, development and maturity must have its inherent rationality. During this period, human connection, family values, living space level, the relationship between man and nature and some others have gradually formed. Especially people having lived here for a long time established close social tie, the invisible social network is power and support for peo-

Figure 4. Analysis of the Suzhou Creek.

ple's life. But the process of modern city removed life mode from the normal track, and people have no basic communication with each other nowadays. We should find a way under the modern demands in the market to realize harmonious coexistence between the historical heritage and residential construction.

It can be said that the residential pattern of 'Linong', as early as more than a hundred years ago, was an ideal way about 'modern life'. And workers villages in large quantities construction after the liberation drew on the Soviet model in the building unit, then evolved a series of their own pattern types, which completely broke away from is the "traditional" way of life in function use. Even so, in response to a large number of housing needs at that time, for efficient land use, they also took the "fishbone" general layout pattern, which came from the residential pattern of 'Linong' - to make land use efficiency maximized. This is another way proved the rationality of layout combined with the market and the effectiveness coping with the huge social housing demand pressure.

However, after the reform and open until today, residential pattern has been fixed to a certain stereotype of " a few rooms a few halls", which can not reflect the characteristics of any local residential culture; constantly increasing gated communities cut off the networks of inner city, and the city will be cut into pieces of island; following the function partition of modernism also result in the extreme loss of diversity in small area. The city is moving toward large-scale, rapid direction, while moving away from the pleasant walking scale.

To maximize land use, residential neighbourhood can be well associated with the traditional way of life; contrast to the current high-rise residential, this combination and balance do not get enough attention. But anyway, 'Linong' reflect the modernity, the reasonableness of the market product supply, the unique combination of traditional and modern, even the natural diversity brought through the development of small-scale plots; all of these can be beneficial to the future of urban development.

However, after several years of uncontrolled construction, the situation becomes quite

complex ultra-high-density shantytowns housing under harsh condition, ultra-high-rise, high-density, new residential lacking historical connotation, common low-rise residential communities without features constructed during the planned economy. In the current situation it can be divided into the following categories for consideration:

a) For shantytowns under harsh condition, we can choose to tear them down and build low-layer &high-density waterfront residential.

b) For existing high-rise residential, the government may join with other developers to transform the environment leaving the industrial or other historical mark.

c) For some common low-rise residential communities, we can transform the facade and environmental landscape to be unified with the historical environment.

- Developed into creative industry parks

In Shanghai, many famous artists and designers have chosen historical heritage (especially industrial buildings) as their own studios, which proved to have great results and play unique effect. As inspired by them, more and more artists and designers started to do like this, which gradually were gathered into creative industrial parks. (Figure 7)

For choosing industrial buildings, there are mainly three reasons:

a) Although most factories, warehouses along the Suzhou Creek were built in 1930s, at that time as used for production, so most of them were chosen to use the frame structure of reinforced concrete and steel with bent structure which had a long service life. Meanwhile, these structures had a distinct feature of industrial architecture: large span space, generous ceiling heights, wide application of skylight, large area lighting glass windows, to ensure the requirements of industrial production-- stretch space and open circulation. It is these characteristics that contain potential and great possibility of economic use. In Shanghai such a crowded metropolis, space is a luxury, let alone, such industrial plants with tall and open space may be met without resort.

b) For people engaged in visual culture and art industry, owning a huge area of personal space and trying to divide it into different parts according to their needs are not only of great enjoyment but also a necessary condition for their own career development, so choosing these industrial buildings as their studios is real and necessary.

c) In addition, transforming the irregular space into spectacular living or working space reflects the creativity, vitality and pride, which is also a significant reason for artists to choose it. This great charm of industrial building lies not only in available, but also in those large space, bare walls, huge metal frame windows, an array of no-beam columns, and a variety of distinctive characteristics of modern industrial components inside the plant which all help inspire the cultural and creative personnel; these buildings witnessed and recorded glorious modern industrial history, their magnificent structure and unique romantic, often attract attention of people in all cultures.

Based on the three points above, the industrial heritage has left a vast space to the development of creative industry parks, attracting a large number of artists, designers stationed from various industries.

Stratege4: Constructing the urban waterfront ecological landscape

After decades of uncontrol and destruction, Suzhou Creek had come into a "stinking sewer" that people don't want to mention. Despite the government has promulgated relevant regulations on the comprehensive management, there are still a lot of problems about this "stinking sewer" without vitality.

- Poor hydrophilicity

Greening and landscape sketches along the Suzhou Creek are mainly distributed as linear strip type, and a relatively large dot waterfront greening and landscape sketches concentrate in a few regions on the estuary, the middle and western part. But waterfront features are not prominent while hydrophilicity is also poor. The first reason is that roads on the vertical direction of Suzhou Creek are enough while they basically belong to the crossing type. Since most people walk to reach the waterfront area, if there is no special, suitable road, most people will only choose to pass through rather than walk along the river. Secondly, the flood control dike is higher than the height of normal sight. People walking along the waterfront road simply cannot see the waterfront green space and

plaza landscape, let alone the open river. It is hard for them to feel the presence of the river from the visual, and in some green template section these problems are also not solved very well. Finally, waterfront landscape doesn't well imply the presence of water, and waterfront placeness is also not strong. Waterfront unique atmosphere is not formed among the Green, architecture and open spaces. (Figure 8)

To improve the hydrophilicity, the first is to establish a system of waterfront pedestrian traffic. Through vertical and parallel walking path the city hinterland and the waterfront area can be connected with each other. A method for keeping sight corridor into the water is also very important, such as, according to flood control, road section design, so that people can freely enjoy the scenery. Only owning the roads to the waterfront is still far from enough, how we can connect the people's daily activities with waterfront area closely together is also of great importance.

- Poor continuity

Just a 6km river actually includes nine big bends forming nine peninsula riverfront areas. But unfortunately, among those nine peninsulas, eight of them are real estate. Only one is public green - "Meng Qing Garden", where lawn mixed with large tracts of forest brings the entire park so green, the mix of seasonal plants makes the whole island such as spring in four seasons. (Figure 9) Although hydrophilic green on other peninsulas has also been carefully designed and furnished, they are occupied by different separate large residential communities. Waterfront green space on both sides of the river no longer has publicity characteristic, and only a few owners living here can enjoy those separate gardens, which lead to the interruption on public green space. On the other hand, since there are many waterfront roads parallel to the Suzhou Creek and most of them are broken roads for mobile traffic, the link among the open space, the residential area and the river has been severely cut off. Overall, the bridges on the Suzhou Creek are basically designed to meet the need of motorized transport. The number of pedestrian bridge is insufficient, the distribution is uneven, and the mutual connection between the two sides is affected. And some waterfront shorelines are occupied by factories or newly developed residential communities, which also undermines the continuity of the waterfront open space.

Waterfront landscape features continuity, "Meng Qing Garden" is just a representative of the Suzhou Creek waterfront green space for future. Focusing on the construction of Suzhou Creek bend landscape transformation will greatly improve the ecological environment along the Suzhou Creek and accelerate the pace of historical heritage transformation in Shanghai.

Conclusion

Historical heritage is increasingly fragmented and scattered, and can even be erased directly in the rapidly modernized metro construction. For the massive construction on the historical area along the Suzhou Creek, it is an urgent task to seek organic renewal strategies. From the perspective of the protection and reuse of historical heritage and subject to the defects of the existing urban plan and construction, those four organic renewal strategies stated above aim to achieve the geographical features of historical heritage in the optimization of integrated objectives, planning design, architectural design and landscape design, and provide referential theoretical and technical guidance to enhance geopolitical identity, highlight geographical cultures, upgrade city quality and shape new urban zones with geographical diversity.

However, many problems, such as how to carry out evaluation of effectiveness after optimization, are beyond the scope of this paper and await further study to make this theory system more reasonable and more widely and further apply it to design practices.

References

Jane, J. (ed.) (2006) *The death and life of great American cities* (Yilin Press).
Sherban, C. (ed.)(1989) *Re-architecture: old buildings new uses* (Abbeville Press).
Nahoum, C. (ed.)(1999) *Urban conservation* (MIT Press).

Kirkwood, N. (ed.)(2001) *Manufactured sites: rethinking the post-industrial landscape* (Spon Press, London).

Kanaujia, K. (ed.)(2012) *Cultural industry and the making of heritage sites* (LAP Lambert Academic Publishing).

Zheng, S. (2014) 'Reflections on the basic situations of contemporary Chinese architecture', *Architectural Journal* 3, 96-98.

Ruan, Y. (ed.)(2005) *Analects of urban heritage conservation* (Shanghai Science & Technology Press).

Li, Z. & Chang, Q. (2014) 'Change in ten years', *Urbanism and Architecture* 28, 7-9.

Li, Z. (2011) '7 questions to Chinese housing: bold and hesitant', *Urban Environment Design* 1, 78-81.

Zhu, W. & Liu, B. (ed.)(2011) *Survey, research and conservation of Chinese industrial architecture heritage* (Tsinghua University Press).

Zhang, S. &Li, Y. (2012) 'Discussion on the overall protection planning strategy of the industrial heritage area -- Taking Yangpu District of Shanghai as an example', *Architectural Journal* 1, 18-23.

Defining Traditional Nigde House Typologies and Their Morphological Language in Ancient Inner Castle Area Nigde-Turkey

Muge Ozkan Ozbek, M. Korcan Ozbek
Mimar Sinan Fine Arts University Faculty of Architecture, City and Regional Planning Dept, Istanbul, Turkey
Keywords: Turkish House, urban form, morphology, typology.

Abstract

Settlements in Anatolia which stratified over ten thousand years had carried out their traces both in cultural and physical dimension till today. In this sense, Turkish House has an effective form with its common spatial typology which never disappears even in different geographies. The effect of its proportion and equilibrium schemes on plan and facade design which integrates urban morphology is very strong. Structural base what differentiates from different climate conditions and material usages does not show much difference in house plans because of the common language of traditional Turkish culture.

Formation of traditional Turkish House and its structural specialties are an important architectural heritage. Turkish house which located in Anatolian typological features with their patterns what formed by articulating with each other, create an important effect in morphological angle. In this paper, Central Anatolia Region what we can call as Kayseri Regions Turkish House and its structural form on region is tried to be addressed.

In Traditional Turkish House what reveals as an introverted life style, relations with public space appears in indirect way by the impacts of social and cultural life styles. In our research area in Nigde Houses this can be seen clearly. The house structures their urban development by articulating in a proper system. These kinds of Turkish House typologies has brought some features like expansion of urban starting from inner house through outside which plot orders, urban form and relations are detected by the directions of streets contrast to western cities.

In a single structure, room, sofa, courtyard and garden like elements what construct a Turkish House had been tried to analyze in "Nide City Inner Castle area" what hierarchic development of houses create a form, from private space to public and which also create morphological tissue in their spatial situations from the reason what it shows differentials from typical Turkish House character. We can see spatial impacts of antiquity times in Nigde Houses.

In this concept, first of all Nide house will be describe from its spatial and schematic approaches and its comparative definitions as defining its place in traditional Turkish House. As for the second step in this research, the relations in a larger scale of Nigde House will be analyzed like; in neighborhood scale, house-street scale, public space relations and expanding through to all settlement by exploring its unique morphological spatial specialties.

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Introduction

Settlements in Anatolia which stratified over ten thousand years had carried out their traces both in cultural and physical dimension till today. In this sense, Turkish House has an effective form with its common spatial typology which never disappears even in different geographies. The effect of its proportion and equilibrium schemes on plan and facade design which integrates urban morphology is very strong. Structural base what differentiates from different climate conditions and material usages does not show much difference in house plan because of the common language of traditional Turkish culture.

Formation of traditional Turkish House and its structural specialties are an important architectural heritage. Anatolian harbored many kinds of different social and cultural layers for centuries what left as rich, cultural structural traces behind. Turkish House, what transforms and develops by differentiations of social life styles in itself had emerged with different structure types and plan schemes in every part of Anatolia as well as beyond the borders in Ottoman era. Turkish house which located in Anatolian typological features with their patterns what formed by articulating with each other, create an important effect in morphological angle. In this paper, Central Anatolia Region what we can call as Kayseri Region's Turkish House and its structural form on region is tried to be addressed.

In Traditional Turkish House what reveals as an introverted life style, relations with public space appears in indirect way by the impacts of social and cultural life styles. Urban growth in the understanding of traditional world living types had sustained in Turkish House by articulating in itself a proper system which can be seen these structural expansion clearly in Nigde Houses.

Turkish House, housing patterns had brought some features like expansion from inner house through urban area what relations, forms and plot orders had detected by directions of streets contrast to western urban settlements.

Methodology

It's been tried to search the juxtaposition character of morphological tissue of Nigde House, expanding through private space to public by analyzing the hierarchy of articulated elements like room, sofa, patio and garden that construct plan scheme of Turkish House in a single house scale.

In this concept, first step will be to expose different types of plan schemes in the frame of main elements of Turkish House. Overall in this paper, structural and spatial specialties of Nigde house will be discuss with comparative examples. Basic instruments of Nigde House has been tried to extract what we see in generally which doesn't exhibit totally different character then typical Turkish House but ancient time traces could be seen in details as ornaments. As for the second step, relations/ interface of traditional Nigde House in upper scale like next door-street-square-district and the unique features of the emerging urban morphology will be examined.

Urban tissue in morphological readings

"*Space and life, provides all the elements expressed as Genius Loci since the ancient times. Space, then life is the world's holistic manifesto and architecture as an instrumental art as an art of space*" (Norberg Schultz 1971)

Holistic perception of residential environment holds an important place in the context of morphological analysis. Nominative tissue that shapes the space, show the ones belongs to settlement, in other word exposes the dynamics in its own, such as considering urban sustainability patterns (Ozkan, Ozer, 2014).

Paths, squares, all objects, such as buildings forming the settlement pattern, offer a multitude of meanings. This situation forms the core of the morphological readings. Simultaneous and diachronic reading of settlements, changes that have occurred in tissue, typological features of buildings give clues about the physical structure of the urban fabric.

It is very important to make these readings in the traditional settlement. Because changing social needs and technologies during the period had shaped the settlements and in morphological analysis they've represent us traces of their periods. Rational structure of the traditional world is effective in the formation of all the objects that create the physical layout. Topography, socio-cultural factors, production technology have an active role in this process. Understanding formation of squares, open-close spaces, patio houses etc. cause and effect relationships of spatial organization emerge with these morphological analysis. This analysis which is examined in this paper will be analyzed specificity of the urban fabric in Nigde Castle district and results of buildings typological analysis that feed the district in its subscales.

Formation and Development Stages of Anatolian House

Considering the traditional Turkish Urban system, we face with uncertain borders of diffuse urban system. This dispersed settlement reveals a significant difference from European cities. Radial, born from a single center development seen in the medieval city, doesn't occur the same way in traditional Turkish cities. It doesn't show annulated rational growth. On the contrary, with too many icons places (mosque-bazaar-trade center, etc.) it is devoted to urban section. Yet in Turkish city there is no square design of the administrative structure or systems seen in European cities. So a more random settlement plan and organic street structure in the city texture can be read. In this sense, spaces with large openings like cemeteries, orchards, shrines form the city's open space system and hold an important place in the city layout differed from European Cities because of becoming continuation of the urban system. Until the Nigde's Republican Period the only major urban open space was the cemetery space which has been located in the city center.

Houses both in Anatolian and in neighboring countries under the influence of Ottoman have developed different housing typologies because of their culture, geography and regional specialties but with same rational traces.

Anatolian housing settlements show similarities both in planning principles and spatial organizing. Regional characteristics in the formation are factors of settlements to become sparse or not sparse. One of the salient features of the Anatolian house is the relationship established between urban morphology and architectural types. In its relations with public spaces as an interface, garden / patio have a natural trail that identifies the parcels. House's expansion through urban topography by following the same logic, continues in a more detached and eclectic free form layout. Housing type expands with family size and by this articulations street between them transforms into a semi-public cul-de-sac.

Patio and Garden Design in Anatolian House

The survey conducted in Nigde inner castle region, when we look at the typological features of the buildings, patio houses appear in first place. It should be noted that this type of architecture has a special subjectivity what holds an important place in Anatolian traditional urban tissue. Patio house in typological process, has presented itself such an important indicator of architecture in Anatolia like in many parts of the world.

Basic simple house called as first simple cell, presents itself as a central area where plan surrounded by a wall. Articulated typology of patio houses side by side with the advent of such fundamental cell is a decisive subject of traditional Turkish urban fabric.

On the meaning of Patio house have many of articles in many cultures. For example, it is said a patio of an Arabian house resemble a paradise garden (Petruccioli 2008). Patio house type actually become a local housing type where transforms independently in different regions from Egyptian-Sumerian civilization to Mediterranean, Anatolia and till upper Indus valley.

There is no strict hierarchy established in the typological structure of patio house with settlement. Depending on the length and depth of the parcel patio may be replaced. The relationship with street can be direct or indirect in the patio. Petruccioli in this patio

house typology mentions that built area have relations not with the settlement but itself only, patio plays a mediator role between inside and outside and rules the plan distribution. Patio houses don't have relationships with outside and even illumination on light from the patio of the house.

When you look at the general description of the plan of Anatolian house typology, patio or garden which is an important interface with other building, have an effect surrounding the house plan but doesn't keep centripetal place. In the street pattern this patio or garden walls can be read as a surface forming the continuity. In Turkish urban typology these patio or gardens allow the solid void equilibrium in the settlement and form a successful universal structure as a determine border and a facade on articulation of buildings.

From the street you enter to garden or patio. Patio where family life centered is enriched with stables, baths and elements such as tandoor house. Even in the settlements where heavily housing monitored, use of herbal plants in the patio overflowing the streets and from patio walls reflects the respect and shown the importance given to nature. A stone wall that combines these places separates the patio from the street. The ground floor of the house and patio walls intersects. The ground floor is devoted to the service volumes, while upstairs to living spaces. While maintaining privacy, wall facing the street of ground floor is stoned mostly, relationship between the patio and the interior were strengthened by opening windows overlooking the patio walls.

Spatial Organization in Nigde Houses

Traditional Nigde Houses in the terms of spatial organization is divided into two main types of plans as with patio or without patio. In architectural plans, in the terms of basic planning, approach no difference can be found both in functional and formal substance what is separated with patio and without patio. Same materials and constructing techniques apply for both of them.

To be deployed in the harsh climate of Anatolian interior, had affected Nigde House both in material supply and orientation of plan scheme. In ancient times, 'Treeless Country' called Nigde's main building material is stone where located in a volcanic region. Majority of houses was used indigenous yellow trachyte stone. Due to the robustness of black basalt stone was mostly used in ground floor corners, in the door jambs and cantilever that carry bay windows.

The building was built in masonry systems wood material can be seen only for to pass over the space openings or to be used in main room's or sofa's embellishments. Generally carrier walls of houses built as a two-storey, are built in three different types on the basis of depth as 50 - 60 cm basement walls out onto the subbasement level with thickness of 60-100 cm which is built with rubble masonry as a sturdy type of basalt stone, is made of sturdy enough to carry the loads from the ground floor which passed over with arches and vaults. Rooms are usually formed in square and rectangular form. They are equipped with washing, sleeping and to meet their needs, such as eating for each nuclear family part of the patriarchal family.

Whether in the examples with a patio or without patio, sofa, determines the plan. As an elaborately decorated place, sofa is where the whole family comes together for living, hosting the guests and for use as circulation area, it is the main component of the focal point of indoors space organization. Examples of the two-story houses stairs locate in the sofa and in the sofa located in second floor can be divided into two parts as above and below of bench. In these kinds of examples space below bench plays the role of sofa as for distribution to rooms and also allocates for living functions like sofa as well.

Patio Houses

Patio house type widely used of in the city what mostly belongs to Muslim Turks. Ground floors are the main living functions contained places, the most important element affecting the formation plan is patio where a major part of the daily life pass through and where establish the connection with street. Patio that forms the focus point of the plan, it

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Figure 1. Four main housing types in Castle area.
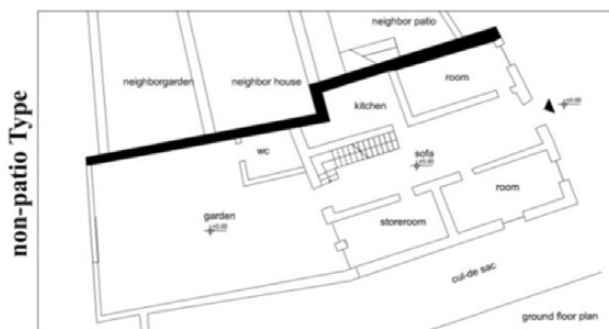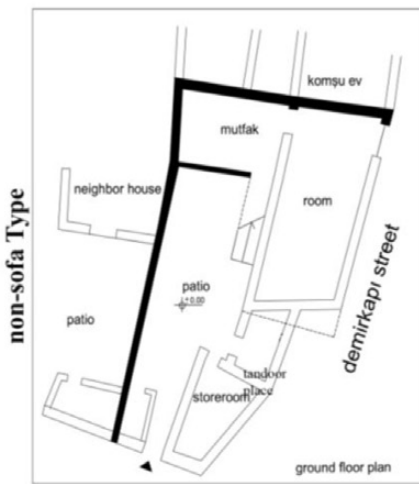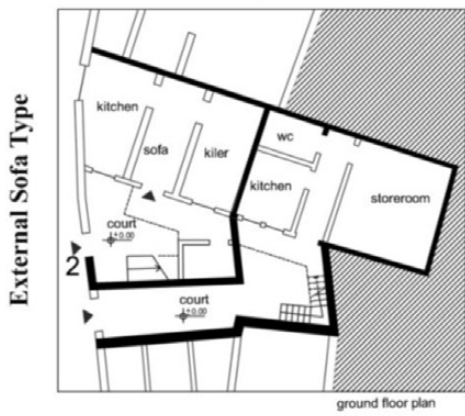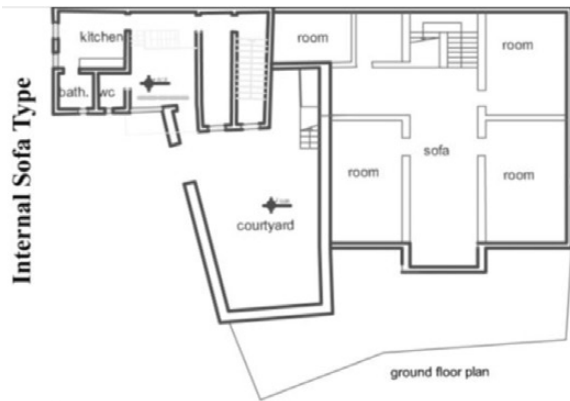
Figure 2. Topographical structure in Castle area.
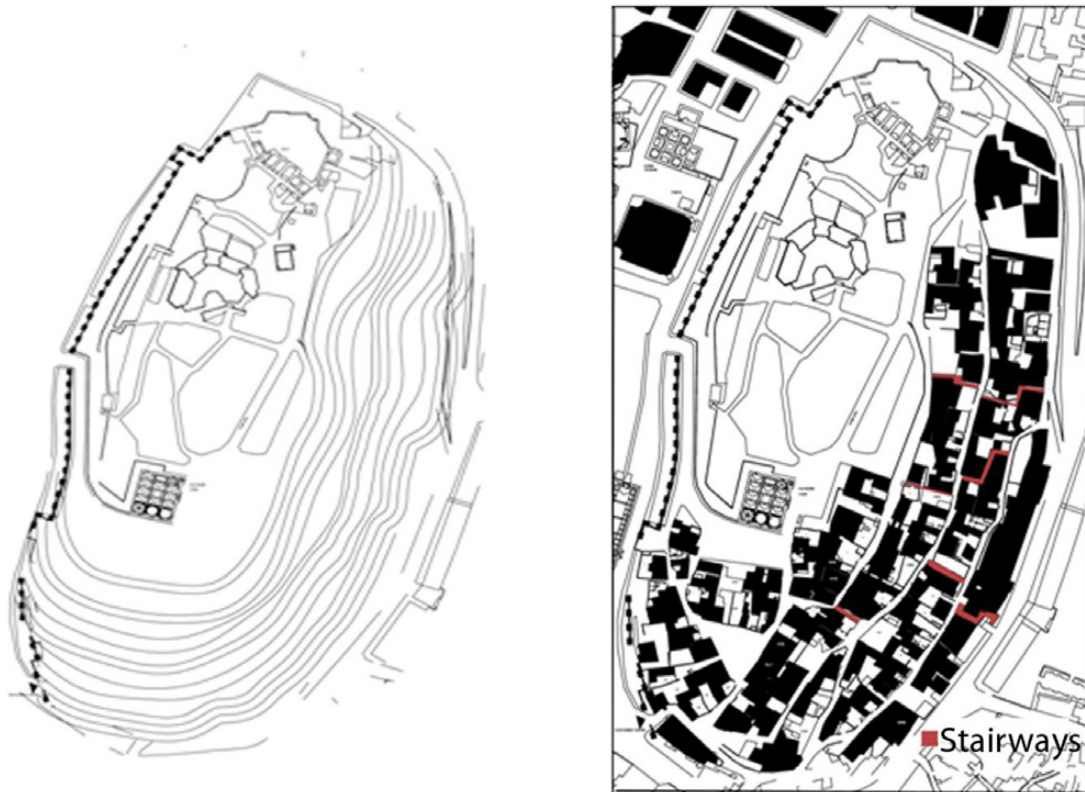
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varies according to the size and shape of the lots. It can be planned, square, rectangle or trapezoid shape.

Three indoors spaces which consists patio, sofa and room are bordered with service spaces and thick walls that separate patio from street. These service areas can be considered as closets, toilets and tandoor house. Unlike many traditional houses in Anatolia that ground floor contains service areas, in Nigde patio type houses it can be observed that main living floors are the ground floors.

There are two patio plan type commonly used in Nigde house which are inner sofa types and outer sofa type houses. Apart from these though numbers is found so slightly non-sofas examples can be observed too. Figure 1

In inner sofa type houses, sofa is located in the middle of the plan and rooms are located on either side of the sofa. In inner sofa sample, it offers its dominant position with meticulous craftsmanship and functionality. In this plan scheme, second floor connection is made through the sofa. While rooms in the ground floor open to the patio or sofa, in

Figure 3. On the left Plan division of houses in the area on the right their sofa,patio relations.
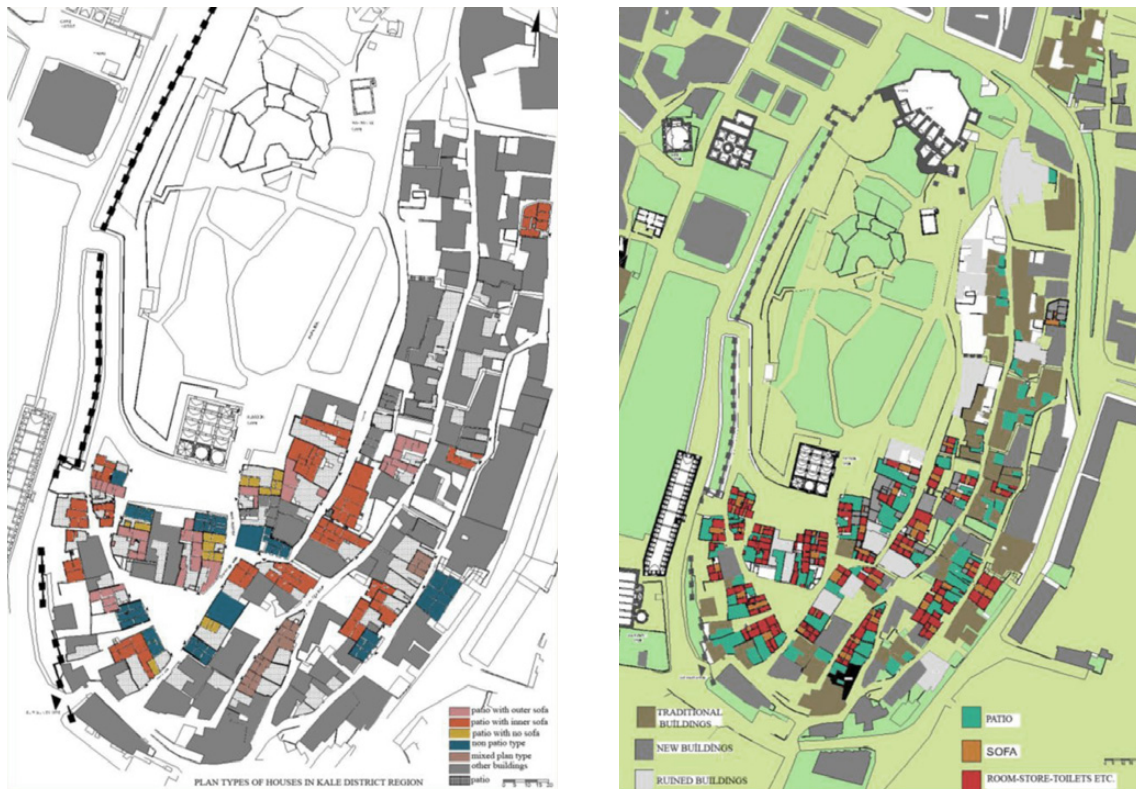
upper floor rooms open to sofa. Kitchens are designed to serve both to outer and inner space. Toilets also designed to a closer point to entrance in the patio considering keeping the distance far from house as possible.

In outer sofa type houses, sofa is in the nature of a balcony and rooms are arranged beside the sofa. Sofa lost its importance as in the inner sofa types and has become such a stark transition terrace. Upstairs connection types are available from the patio contrast to those in the inner sofas.

Medium sofa or centered sofa types appear mostly in Istanbul. Ones outside of Istanbul were built by the provincial administrators sent from Istanbul. This type emerged in the 18th century, but became widespread in the 19th century.

In non-sofa types, this distinction was created belonging to place and shape of space called sofa of what provides circulation inside the house. This very primitive type as non-sofa type is the type mostly appears in warm climate regions as an archaic plan type. In this house consisted of juxtaposed room to room system connections are provided with by patio. (Eldem,1955)

Non-patio Houses

Examples of non- patio houses were usually belong to minorities and mostly arranged in two floors and with inner sofa type.

Designed in the principle of extroverted form, examples of non-patio housing had solved the relations with streets in two ways. First type is an example ground floor has leveled up nearly for 1 meter where they store their products in basements for habitants with a way of life based on agriculture. Thus, basement provideds with light and air and ground floor designed of facing the street is leveled up from the eye distance to protect the privacy of house. In these examples, upgraded interior sofa is entered from the street, with few steps. This place is usually a circulation area that provides the connection with room, kitchen, and first floor and with street (Buyukmıhcı 2000). There is also a second

Figure 4. Relations of open space and inner space.

type that relationship with street provided from the same level where this time sofa serves as the entrance of the house.

Topological Structure of Residential Area of Alaadin and the Castle District

Detection of terrain carries an effective duty in terms of positioning in creation of urban structures. Castle District is located in the highest peak of Nigde city called Alaaddin Hill. Extending on both ends of the hill in the southern northern ways, Aladdin Mosque is located symbolizing religious and military power on the city. Interior Castle put the structural boundaries of the field in the northern and southern directions. In the western border of this area identifies with thick structural walls. The area of the eastern boundary determine by streets and housing structure which settled on topography and its natural inclination lines.

Street system consist parallel to housing pattern, it expands towards to lower elevation parallel to the slope. In vertical direction, these streets connect to each other with stair ways that follow the boundaries of the parcel where located next to (Figure 2).

Typological Structure of Residential Area of Alaadin and the Castle District

Houses in this area are one, two or three stories belong to land slope. Location of the patio verifies, according to relations with neighboring parcel and different plot shapes - size and streets -. This situation leads to the emergence of different types of house plans

in patio house typologies. This case can also change both the size and form of the patio and next it affects shape, location and design of sofa as the main determent element of inner space.

When we look at the housing system in the settlement, houses where settled on the peak level facing the square in front of Alaaddin Mosque have designed as one storey only with a more simple plan scheme. The reason is that the parcels are narrow here and buildings are not increased of being around a mosque in the monumental nature of the building. Both south and east direction when going to lower elevations it can be followed that housing plans evolve simple through complex plan schemes. When parcels grew increasingly they permit houses to expand horizontally while the slope of the topography paves the way for growth in the vertical direction. This spatial differentiation is remarkable even in back to back houses. As the area goes to lower levels it's still valid this spatial expansions for patios too. In general, it can be said that, the houses surrounding the square have small patios rather the ones in the lower level of topography. Logical explanation is that parcel sizes are narrower around Alaaddin Mosque because of the spatial value. However, areas in lower levels where parcel sizes are similar have been observed with larger patios. The reason is the difference of relationship with public space between the lower areas where houses give facade to narrow streets and houses give facade to Alaaddin Mosque. Smaller the public spaces in front of the house mean larger public space inside. This situation is both to protect the privacy of the desired distance and is also due to the integrated nature of the lifestyle and habits of the people of Anatolia. It is remarkable that houses without patios are mostly settled around two squares on the higher level of settlement (Figure 3).

Morphological Structure of Residential Area of Alaadin and the Castle District

Houses in the inner Castle area, have settled towards south and southeast direction by being gradated not to cut each other's view. The houses were built side by side parallel to the slope generally separated from street or neighbor by a patio wall.

In Inner Castle area settlement, it can be observed that the house settles freely in its parcel to orient through the view and sun what overlapped to general ideas of traditional Turkish House morphological types.

Except the open space around Alaaddin Mosque, it can be observed that most of the open spaces are formed by patio and street patterns. Patios describe the street border with their walls which are opened to streets. Patios come across as interfaces between street and house. With this feature, it creates physical boundary between street and house but being an extension of open spaces what can be entered freely, patio take the role of socially unifying and softens the meaning of border. As proof of this is enough to say that the patio doors open all the time, especially in the summer times. This dialectical structure of the patio can be described as, semi-public, semi private area. It can be said that Patio space is one of most important step in the hierarchy of public and private space we see in traditional Turkish Cities. With this dual structure, it has a crucial role forming both morphological and typological settlement because of its effects on street pattern and inner space. On the upper scale this hierarchy expands through square from street, in the lower scale continuous in the house from patio. If we count this hierarchy from up to bottom; square, street, cul-de sac, patio, sofa and room can be said.

Conclusion

When we look at the evolution of typological types of buildings that forming a settlement, it can be seen that buildings undergoes more changes than its surroundings which means while building types change, parcel tracks, streets and borders carry more traces to remind the public morphology of the settlement. In this context, when analyzing the typology of buildings in traditional settlements, it is correct to provide an approach from urban scale towards subscales. Indeed, all the parts that makes up the structure of the settlement bears the subjective clues that place.

Sometimes a fountain or a religious center is located in the neighborhood that surrounds the square formed by streets, reflect the settlement's property. Streets comply with topographical features and are generally wide enough for an pack animal and its owner to walk with. In some settlements, overflowing fringes of houses onto the streets create intimate, indoor and variable perspective effects on space. Free flow layout of the buildings, describe the holistic system from a single building scale and this situation enables organic development of the traditional Anatolian cities. These organic streets determined by houses, according to regional characteristics of settlement, bordered with buildings with wood pillars or stone bay windows or sometimes with patio and garden walls. While patio is the main element guiding relations with street and location, sofa is the main determinant for the formation of indoor. Though Turkish house rooms designed both open (cool) and closed (preserved) independent units they all have connections to sofa and patio spaces.

In Castle area, spatial hierarchy can be read easily by the terms of privacy. When going towards to lower elevation spatial expansion and complexity in functions is valid for their patios too. In general, patios of the houses surrounding the square on the hill have designed smaller than the houses on lower spaces. It has been observed that interior public space becomes larger when public space of the plot in front the house is reduced. From this meaning it's easy to understand why houses without patio mostly settled around open spaces (Figure 4).

References

Altuncan, M. (2003) 'Geleneksel Niğde Evleri, *Journal of Türk Arkeoloji ve Etnografya* 3.
Büyükmıhçı,G. (2000) 'Anadolu'da Konut V: İç Anadolu Bölgesi'nde Yer Alan Taş Sivil Mimarlık Örneklerinin Ortak özellikleri', *Journal of Arkitekt* 487, (Nokta Publications Istanbul.
Conzen, M.R.G. (1960) *Alnwick, Numberland: A study of Town-Planning Analysis*, (Institude of British Geographers Publication) 27.
Eldem, S.H.(1954) *Türk Evi Plan Tipleri* (Pulhan Publication, Istanbul).
Kazmaoglu, M. and Tanyeli, U. (1979) 'Anadolu Konut Mimarisinde Bölgesel Farklılıklar', *Yapı Journal* 3, 29.
Norberg-Schultz, C. (1971) *Exixtence, Space and Architecture* (Publishers, London).
Ozbek, M. O. and Özer, D. G. (2014) 'Spatial integration and accessibility considering urban sustainability patterns: Historical islands of Istanbul', *Sustainable City* IX, Vol. 2, 1649-1660 (WIT Press, UK).
Petruccioli, A. (2008) *Bellek Yitiminin Ardından Akdeniz İslam Dokusu* (YEM Publications, Istanbul) 38.
Rudolf, N. (1991) 'Eski Anadolu Mimarlığı'(Türk Tarih Kurumu Publications) Ankara.

Metamorphoses of Venice. The methodological approach by Giuseppe Samonà and Gianugo Polesello to urban design on the fringe of the lagoon city

Angela Fiorelli, Giuliano Valeri
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy
Keywords: Venice, city-fringe, urban growth, historical city.

Abstract

The idea of fringe in the city of Venice is a singular concept as unique as the morphology of the lagoon city itself. Unlike other cities on the mainland, Venice does not have precise borders; it evolves and grows on the water through the addition of islands, a process which could, potentially, make Venice a city with infinite extension.

The boundaries are primarily represented by the challenges between the artificial and the natural, challenges on which Venice has been founded for many centuries. Moreover, they are always provisional borders which dissolve progressively into the sea.

In Progetti Veneziani Polesello writes about a non-antithesis between terminability/interminability and the indefinite fringe which makes a metamorphic shift from urban edge to urban interior, always tending towards the heart of the city.

In this sense, although Venice is radially dispersed in lagoon waters (think of the historical map by Benedetto Bordone, 1536) it remains an absolute centripetal reference to which everything converges. Giuseppe Samonà in 1974, prompted by Ludovico Quaroni for the publication of the series "Città e Architetture in Italia", began "Libro su Venezia" with Egle R. Trincanato in which his studies of the lagoon city became a landmark for all future scholars of Venice. Designing within these boundaries is a complex and delicate matter, with different interpretations of the borders being given over the years, and these have resulted in the adoption of different design methods.

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Introduction

To understand the methodological approach of Giuseppe Samonà and Gianugo Polesello about the concept of urban fringe in the city of Venice, it is necessary to investigate the link between Samonà and Venice.

Samonà became the Dean of IUAV in 1945 and radically changed the way of teaching adopted until then.

Under his direction of IUAV, he called the greatest exponents of Italian architecture as De Carlo, Muratori, Scarpa, Zevi and later his brilliant students became firstly his assistants and then teachers. This gave rise to a Venetian school which led studies and researches on urban and morphological aspects of cities of which Samonà was one of the most distinguished members in those years.

In this context, the city of Venice became a real laboratory for each thesis and all courses in architectural design. Until the '60s, a duty for all students was to have Giuseppe Samonà as supervisor of thesis. The required for all the thesis was to study at first the city of Venice with its expansion into residential land, motivated initially from a professional work of Samonà, Piccinato and the other young teachers for the settlement INA CASA in S. Giuliano; then study the territory of the port area and the occidental bridgehead, then still open territory, the so-called "urbanized countryside" which evokes the thesis of Costantino Dardi and Daria Meana (1963) and Gianni Fabbri (1965). The thesis of Gianni Fabbri was preceded by a work developed during the last two years in the courses of Samonà. Fabbri remembers the commitment of almost all of the time for in-depth historical, geographical, hydraulic and agrarian studies, followed by a detailed summary exhibition made in the presence of a special guest, Ludovico Quaroni.

In 1968 under his encouragement, a collective of professors of IUAV composed by Gianugo Polesello, Carlo Aymonino, Costantino Dardi, Gianni Fabbri, Raffaele Panella, Luciano Semerani founded the "Gruppo Architettura", they continued the studies of Samonà on urban morphology achieving significant results on the international scene.

In 1974, Ludovico Quaroni invited Samonà to write the book "Libro su Venezia" to be included in the series "Città e Architetture in Italia." Samonà caught this chance to get a synthesis of his researches, teaching and professional works done in those thirty years. Egle Renata Trincanato worked with him on this publication.

Presumably the guidelines used for the publication in the series, derived from the considerations of Samonà which he has developed for the book of Venice. The lagoon city can be considered as a "city-paradigm", "city-figure", "city-space", which allows to make a precise description of the processes of the evolution of the urban form of the city.

In the idea of Giuseppe Samonà the "Book of Venice" was to be divided into three part and the second part was to expose the chronological process of city formation, from the origin to the 19th century. Especially the phase from the beginning until the 12th century requires a thorough study of a historical and geographical nature to form an image of the city which outlines the salient features in terms of urban and morphological.

This research has a lot of points of contact with an interesting hypothesis of Wladimiro Dorigo about the founding of Venice in Roman times and researchers developed their thesis in IUAV about this issue under the advising of Samonà.

During the next phase of research - from the 12th century onwards - the study of the relationship between social and political events takes on more importance and the modification of the structure in the urban fabric becomes gradually very complex and leads to the transformation of the original building structures.

This is described by Egle Renata Trincanato in the book "Venezia Minore" in which she focused on the analysis of the building fabric in the period between '300 and '700. Afterward, she developed the hypothesis of "città nucleare" in Venice which starts from the recognition of the process of morphological modification in the city for insule.

This setting analysis is faithful to the idea of Samonà about the theme of "Unità Architettura Urbanistica" about the importance of the active relationship between building and city. According to Wladimiro Dorigo there is a complex and articulated history of origins of Venice. The aim is to prove "the determining influence of the ancient land sur-

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veying organization on the formation of the street network and built fabric of the city". In his opinion Venetian interiors canals do not follow the natural meanders of rivers and they are not the result of medieval colonization of the lagoon, but they follow a sober design which suggests the existence of a Roman *limitatio* in the Lagoon area. On the basis of pulverized traces identified by him, he constructs the superiority of a system of orthogonal grids, even when they are in fact swallowed by water and slime and they are reduced as invisible or broken lines, capable of organizing – as the other Venetian orders do – only fragments by fragments.

This theory is confirmed in the research of the geologists Bruno Marcolongo and Mario Mascellani about the reconstruction of the system of Roman grids (centuriazion) in the area surrounding the Venetian lagoon in the agricultural area named "Pianura Veneta" (Figure 1).
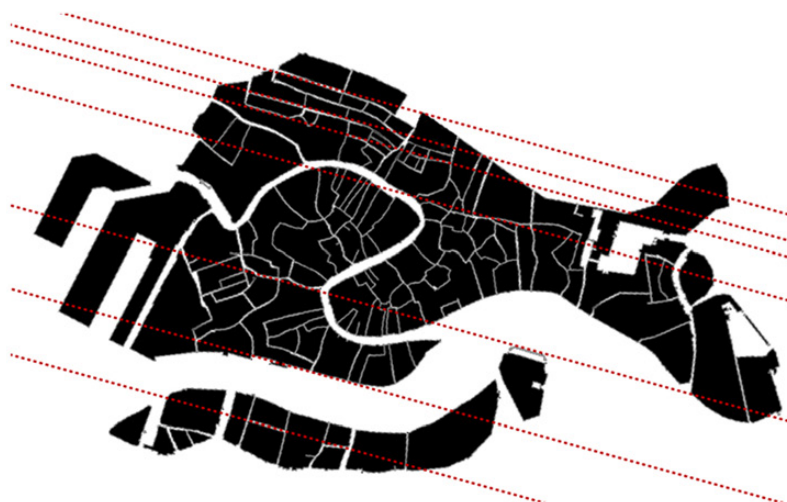
Figure 1. From the top:
- B. Marcolongo and M. Mascellani. Reconstruction of the system of Roman grids (centuriationes) in the area surrounding the Venetian lagoon
- The axes derived from the Roman Limitatio inside the urban structure of the city.

The operative elements which distinguish the Roman *limitatio* from the grid (only one of the possible configurations which the *limitatio* produces) offer the tools for a reading of the non-orthogonal order of Venice, as a space of flexibility which distinguishes between the normative rule and its application to a particular physical reality. Like the *limitatio*, Venice knows and applies not a figure (its representation and its form) but operations: it delimits, defines and connects, combining given rules with the particular conditions of the site, and producing complexity by compromise and ongoing adjustments. Like the *limitatio*, Venice does not build containers, but works by tracing lines, and by marking, solidifying and building its edges. Like the network of the *limitationes*, Venice includes different implementations of its rules, and operates progressively, from the division and consolidation (the making of the islands), to the "paratactic" addition (the connection of the islands), to the construction of a built continuum (city fabric). Islands are first defined and individually organized along the internal pedestrian spine of "*calle*" (alleys); they are then connected by bridges and further landfills; further growth and increments of density produce a connective tissue intricate by internal canals (in Venice water it is not an element of separation but of connection).

In the second part of the studies - from '200 onwards - the map drawn by Ludovico Ughi from 1727 takes on great importance. Samonà thought that this map coincided with the period in which Venice can be considered a "complete urban organism."

The theory developed subsequently by Trincanato of "città nucleare" is derived from this map, highlighting those various "core" which determine interactions between them and which compose the whole. The waterways define first the blocks which are grouped into districts, each of which has particular characteristics. The "*Sestrieri*" interact with each other through the edge which defines them and which are placed in connection with a system of bridges.

This concept can also be found in writings of Sansovino "To those who consider Venice carefully, it shows itself not as one city but as many separate cities, all joined together. Indeed, if you consider its situation, reduced on a plan and without the bridges, you can see that it is divided in many different districts and cities, surrounded by their canals linked by the stone bridges, or more commonly by wooden bridges, which hold it together."[1]

It is possible to say that there are in Venice three levels of fringe: the inner fringe regards the delimitation of the 118 islands that form up the city, the medium fringe relates to the processes and activities inside the city and coincides with "*Sestrieri*", the outer fringe regulates relations of the city to the lagoon and the mainland (Figure 2).

The division of water and building (which in Venice includes also the making of the land) is horizontally sharp and precise, but it remains vertically precarious and continuously variable. The manifold nature of Venice lies in its liquid space of variation, which is neither water nor land, but always both at once, and cannot be defined by a sharp line. In Venice the 'grid effect' is realized by its constant making, in delimiting, constructing, defining and redefining the edge, again and again. This may seem like a deformation, in fact in Venice is never a deviation "a priori" form, but the progressive definition of a form which emerges from divisions and adjustments of the water and construction in progress. The space of Venice lies in the realization (continuous and present) of its form, in its process and negotiation. The complexities which Venice exposes and negotiates, in the grid remain divided and contained by the division of the blocks.

We can find a check of this methodological approach in the project 'Novissime' designed by a group of architects from the IUAV lead by Giuseppe Samonà, produced for the international competition for the master-planning of the Nuova Sacca del Tronchetto in Venice[2]. The 'Novissime' project- this was the motto- was the most provocative proposal of Venetian modern architecture.

[1]Sansovino F. (1581), *Venetia città nobilissima et singolare*, (Venice, Anastatic reprint, Bergamo, Leading Edizioni, 2002). Translation by authors.
[2]Giuseppe Samonà (group leader), with Costantino Dardi, Emilio Mattioni, Valeriano Pastor, Gianugo Polesello, Alberto Samonà, Luciano Semerani, Gigetta Tamaro, Egle Renata Trincanato. Translation by authors.

Figure 2. From the top:
- The formation of the islands which make the city of Venice. In black the first phase, in grey the second one.
- Inner fringe (black circles), medium fringe (red contour, coincides with "Sestrieri"), outer fringe (black dashed line).
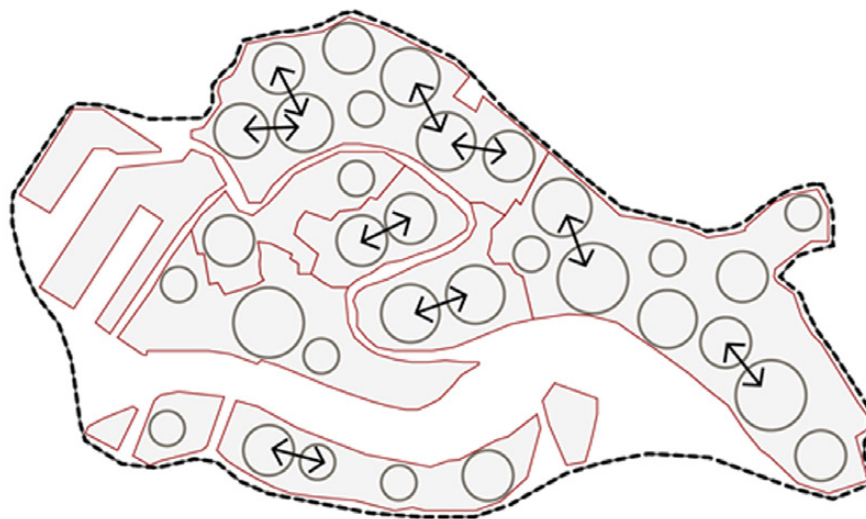
The project (winner of the first prize) polemically returned Venice to its original condition of insularity, severing the 1842–44 railway bridge and the 1923–33 road causeway which connect it to the mainland in "ways which are inappropriate for the very essence of the island city"[3]. Returned to the lagoon, Venice is complemented by two new artificial islands which concentrate its water transport terminus near its north-western edge and which are connected to the mainland by a monorail link. 'Novissime' – Latin for "anew" or "in a very new way", but also "recently" or "at last" – declares its purpose for Venice, through "an adverb which seeks to recuperate within the project, the ancient

[3]Polesello G. in Franceschin M., *Sull'edificare. Venezia 27/ 10/ 2000. Dialogo con Gianugo Polesello*, p. 13. Translation by authors.

Figure 3. Urban layout for the project "Novissime", from *Gianugo Polesello Maestro dell'indecifrabile. Auto-ritratti veneziani*, Giornale IUAV 114, Gundula Rakowitz, Grafiche Veneziane, Venice 2012, p.10.

way of life in Venice and the future of the city". Venice is redefined as an urban condition in which past and future intersect and the past is the second history to be constructed", and an active force in the project for the reinvention of the city. Placing itself within myth of Venice of continuous construction the project proposes a reinvention of the origin of the city every time that it intervenes in it.

"Anew", Novissime works by delimitations, both spatial and temporal, to define itself as a specific moment of the time of the city: "I thought that the city should be interrupted in time, as an island inserted in a complex universe, which would complicate the whole physical, urban and territorial ambit."

Novissime re-enacts the making of Venice, and its addition of "a physical corps to the physical city" takes on the value of an intellectual proposition of a "theory of the city". Venice is considered as an "artefact", a finished architectural element which does not seem to allow modification, and yet constantly re-enacts a work that is permanently in progress.

While Venice is composed of a multitude of interconnected islands, and potentially expandable by further additions, its very existence and survival depends on a finely tuned balance with the surrounding water system – which in the past protected the city from attacks, and today both attracts and filters the invasion of tourists.

This project is a "Manifesto" of research conducted in the 30 years of Samonà in Venice, in which he defined an extremely clear methodological approach.

Gianugo Polesello participates in this competition with Samonà and other collaborators (E. Trincanato, C. Dardi, E. Mattioni, V. Pastor, L. Semerani, G. Tamaro). Polesello was a young architect but he made a fundamental contribution. In this work there are many

principles of theoretical research which were born in those years in the school of Venice and which affect the thinking of Polesello. After, in his studies of Venice, he recognizes Novissime as a "paradigm" for next projects.

Gianugo Polesello was a student of Samonà and Ignazio Gardella. He was a central figure in the school of IUAV. He continues studies about Venice as a city/laboratory for all his activity in the Faculty of Architecture in Venice.

In his opinion the first postulate of the "problem of Venice" is to understand the size of Venice, where the city begins and where it ends.

According to Polesello there are generally two images of Venice, the "compact city" as in the map of Jacopo de' Barbari (1500) and the "lagoon city" which includes Sestrieri, small islands around and the mainland in one complex system as in the map of Bendetto Bordone (1536).

His image of Venice is absolutely the second. He defines the city "A enormous artifact in a geographic scale which takes and rules different and distinct elements inside" which questions about the centrality of a system made of other centralities, conceived as one part out of many of the territory with particular connotations and equally complex relationships to be explored and investigated.[4] "Studying these relations means first studying the borders of Venice. Venice is a city which floats on water and the focus is not merely a problem of accessibility but is the perception of the city from different points of view, the delimitation and the measurability of separeted but united spaces, the meaning of "city gate" and the close relationship between the territory and its morphology, its origin, its evolutionary process. According to Polesello the theme of fringe is an important subject which are mentioned in several projects.

This question concerns many issues, especially interior and exterior fringe, images of the city by different points of views, measurement as a delimitation of a space and finally connections between outside and inside, between the city and its hinterland.

The theater lagoon is dealt through major themes, the commercial port and industrial area of Marghera, Venice as its interior architectural structure through the Canal Grande and its terminus in the area of San Marco, the waterfront of San Marco and a hypothesis of a big architecture in the water with Lido as backdrop, the west end of Venice as a gate of the city into the fringe of the map of Bordone. The aim of the project is to restore the profile of the island as it was at the end of the XVIII century through the recovery of aquatic dimension, creating buffer zones (Canal Grande and Rialto-San Marco axis) and large areas of architectural requalification. A kind of idea of the future of Venice. A visionary description which is based in the very essence of the lagoon city (Figure 3).

In relation to these issues, according to Aldo Rossi the project represents "an interesting contribution to a theory of urban transformation" as through "Venice rediscovers its shape ... the project is already done ... it is a large volume emerging from the water as a solid horizontal line which defines the shape of the city, highlighting the landscape of the lagoon"[5].

In his notes about "Novissime", Rossi anticipates some central themes treated in "The architecture of the City" and these issues had already been anticipated in "Locomotive 2", a project for the Business Center of Turin, in collaboration with Polesello and Luca Meda.

In our research were selected projects which investigate the theme of fringes of Venice by Polesello, starting from Novissime.

The study of "Venezia città - porto" (1973) agains the same issues focusing on two major themes. The first theme is Venice as a city - port, he studies the link between the marine station in the center city and trading and industrial ports in mainland, and the second is an interesting proposal for the area north-east of the historic city, he redesigns the northern front with reference to the plane of Fondamenta Nove by Sabbadino (1557). His aim

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[4]G. Polesello in "Gianugo Polesello, Architetture 1962-1990", a cura di Mirco Zardini, Electa, Milano 1992, pag.119. Translation by authors.

[5]A. Rossi, Concorso internazionale per la redazione del piano urbanistico planivolumetrico per la nuova sacca del Tronchetto. Considerazioni sul concorso. In "Casabella-continuità" n° 293, nov. 1964, pp 2-4

Figure 4. The project "Fondamenta Nove", photo of the original model kept in the IUAV archive in Venice.

is defining the side of the island through a long wharf. His idea is a contemporary image of Fondamenta Nove as a redefinition of the limit through an architecture out of range, a straight line leading from the Sacca della Misericordia until the Arsenale through a continuous pier (Figure 4).

The project for the contest of area of S. Giobbe in Cannaregio (1979) and the next "Venezia Ovest" (1986) instead, although they are chronologically far, insist on the concept of unity of the lagoon as a bipolar unity Venice-Mestre. This union is conceived as a great architecture, an artifact or *fatto urbano* which has its origins in the old project of Rialto by Palladio.

Both projects focus on the linear composition. The line has two important nodes which are the extremes. These extremes are two fundamental polarities for the city, they are the head elements, points of connections with the hinterland and they are in turn fringes.

Polesello analyzes these elements of composition as empty spaces, squares which are distributed around buildings such as the Roman forum. These buildings are composed as measured objects which design the space and which orient the perception of the place. The architecture is a game of pure volumes which are arranged in the urban space with precise mathematical measurements. The architecture calibrates weights and forces in the image of the city.

According to Polesello the design of Rialto by Palladio is the main example in Venice which has inside the power of this language. It is an architecture which contains same time dual meanings: the road and the square, the verb "to across" and the verb "to stop". He calls it a "bridge - Roman forum" where you go and you live. He said "Although Palladio designed the bridge in two distinct versions, visually and architecturally different, both projects have the same" internal "program: building on a bridge a forum, a Roman forum, bordered by arcades, which works as a central place through which people transit and in which people stay, a point joined to the lines which are roads of the city"[6].

The architectural and urban design for Venice has a symbolic and contradictory role because it is located between Continuity and Change, a duality which he calls "a non-antithesis between terminability and interminability. "Designing is a repetition of actions which have always been made in the architecture of the place -Venice "and he chooses two of these actions: "First: cinturiazione, defining an area to build an architecture ..., Second: reusing the cinturiazione repeating the same actions and defining each time new places, new signs, new relationships in a geometry of assemblies". Polesello playing with words when it combines two words in a single one, "Centuriazione" is Centuration, the Roman land division (a division of the land in centum heredia, 100 equal parts), but "Cinturiazione" is a pun, it is the same word with one different letter and with a special meaning: it is a term which carries meanings "to border", "to delimit", "to define".

This word contains the theme of "measurement" and the theme of "demarcation", according to Polesello preliminary actions in which the architectural space takes shape.

References

Trincanato, E.R. (1948) *Venezia Minore* (Edizioni del Milione, Milano).
Samonà, G. (1959) *L'urbanistica e l'avvenire delle città* (Laterza, Bari).
Samonà, G. and Lovero, P. (c1975) *L'unità architettura-urbanistica: scritti e progetti: 1929-1973* (F. Angeli, Milano).
Dorigo, W. (1983) *Venezia Origini: fondamenti, ipotesi, metodi* (Electa, Milano).
Ferrari, M. (2005) *Il progetto urbano in Italia, 1940-1990* (Firenze, Alinea Editrici).
Rossi, A. (1964) 'Concorso internazionale per la redazione del piano urbanistico planivolumetrico per la nuova sacca del Tronchetto. Considerazioni sul concorso.' in *Casabella-continuità*, 293.
Belloni, F. (2014) *Ora questo è perduto, tipo architettura città* (Torino, Accademia University Press).

[6]G.Polesello in "Gianugo Polesello, Architetture 1962-1990", a cura di Mirco Zardini, Electa, Milano 1992, pag.121- 122. Translation by authors.

AA.VV. (1975) *Giuseppe Samonà 1923-1975. Cinquant'anni di architetture* (Roma, Officina Edizioni).

Prandi, E. (2008) *Pubblico Paesaggio/ Public landscape* (Parma, FAE edizioni).

Zardini, M. (1992) *Gianugo Polesello: architetture 1960-1992* (Milano, Electa).

Polesello, G. (1983) *Progetti di architettura* (Roma, Kappa).

Posocco, P., Radicchio, G., Rakovitz, G. (2002) *Care architetture: scritti su Aldo Rossi* (Torino, Allemandi).

Trame, U. (1982) *Tipi architettonici e fatti urbani. Scritti di Pierluigi Grandinetti, Gianugo Polesello, Umberto Trame* (Venezia CLUVA).

Polesello, G. (1995) *Analisi architettonica e progettazione analitica* (Torino, Cittàstudi edizioni).

Rakowitz , G. (2012) 'Gianugo Polesello Maestro dell'indecifrabile. Auto-ritratti veneziani' in *Giornale IUAV* 114 (Venezia, Grafiche Veneziane).

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Tradition as an architectural 'topos': role and interpretation for the contemporary sustainable urban design

Vito De Bellis
Dipartimento di Scienze dell'Ingegneria Civile e dell'Architettura, Politecnico di Bari, Via Edoardo Orabona, 4, 70125 Bari, Italy
Keywords: Tradition, History, Urban design, Sustainability, Cultural identity.

Abstract

This paper aims to offer a critical reflection upon the heritage value of the traditional city, in order to formulate planning hypothesis for sustainable contemporary urban design. The identification of the historical city as constructive term of reference, is due to the fact that the city itself is anthropological (Krier, 1995) being that its spaces, morphological structures and dimensional proportions are commensurate with the human parameter. Starting from the interpretation of the constructed reality as an organism, in which the past of a cultural tradition has been stratified and layered in a dynamic way, this study aims to demonstrate the durability of its genetics potential, highlighting the logical and structural aspects even before the technical and formal ones. The thesis will be developed by analyzing some projects which, during the 20th century, tried to pursue not only the methodological tools of the project, but the inner reason of the construction of the city's space in the historic continuity (Gravagnuolo 1991). At first, the study proposes the elaboration of an ideal dialectic line, characterized by the constant seek of anchoring the project to a prolific cultural furrow, from the 19th century culturalistic approach to the traditional city, up to the theoretical recognition of its complex historical organicity. Then, it is possible to recognise those principles of design coherence, which are the basis for each sustainable operation in terms of material, cultural, social impact on the built environment (Maretto, 2012).

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Introduction

The role of tradition can be effectively perceived as a potential source of a sustainable approach to urban design, and it has re-acquired an increasing importance in the last few years. After Modernism's *amnesia*, the lack of integration of buildings and the context in which they are designed – that *propinquitas* Vitruvius already had stated as vital[1] – has progressively spread while the iper-technological evolution of architecture was leading one to the belief of an overall artificially controlled environment, where mechanical and electrical systems reached a state of development at which they could replace all of the elements of the natural environment in the building. As a result, terms such as *continuity* and *crisis* have come into prominence for the creation of new planning scenarios, where the traditional city could no longer be underestimated in the challenge for the transformation of the built reality, thus representing an obliged reference both for those supporting its genealogical connection and those, by contrast, predicting its end.

Actually, if we recognise that sustainability arises from a balance between anthropic activities and the natural environment, we are likely to find a profound connection existing with the traditional city. In order to explain this hypothesis, it should be preliminarily defined the meaning of such words and the reality they aim to describe, since naming things almost equals to creating them.

In the first place, sustainability has become an overused term generally conceived as a concept regarding energy consumption and ecology on themselves. As a matter of fact, to be meaningful sustainability needs to involve different aspects of human life where the building process itself should be holistically developed, in a strong relationship between architecture, environment, urban functions, and uses. In essence, sustainability should be considered as a matter of harmony and order rather than a piece of technical knowledge (Cadman, 2009).

Secondly, regarding tradition – as it had been conceived up until the 19th century – it could be referred as a varied range of architectural types, which have played a crucial role in building urban spaces over the centuries. To put it in other words, the main feature traditional architecture is modelled on is belonging to a specific cultural area, whose *genius* is evident also in the physical nature of the site, as well as climate, community and local materials, determining their structure, shape and organization. Tradition, therefore, does not identify a historical period in the strict sense, rather a cultural perspective through which to use the past as a guide to interpret the ever changing needs of humans. In addition, the etymology of the word itself, as assessed by T.W. Adorno, originates from the latin *tradere*, which means 'to hand down', implying consequently a sort of connection among generations living adjacent to each other in time and space[2].

The roots of sustainability in the traditional city

In general terms, in opposition to the industrial society's paradigm, beyond the myth of the functionalist urbanism, which was grounded upon the standard's and zoning principles, it is possible to consider the central role played by that cultural perspective based

[1]In his treatise *De Architectura* Vitruvius clearly described the necessity to work with rather than against the climate. In more detail, see Book VI, Chapter 1, 1 according to which buildings «are properly designed, when due regard is had to the country and climate in which they are erected. For the method of building which is suited to Egypt would be very improper in Spain, and that in use in Pontus would be absurd at Rome: so in other parts of the world a style suitable to one climate, would be very unsuitable to another: for one part of the world is under the sun's course, another is distant from it, and another, between the two, is temperate. Since, therefore, from the position of the heaven in respect of the earth, from the inclination of the zodiac and from the sun's course, the earth varies in temperature in different parts, so the form of buildings must be varied according to the temperature of the place, and the various aspects of the heavens».

[2]This concept shows intrinsic connections with the general features of the sustainable development, as defined in *Our Common Future: Report of the World Commission on Environment* and Development (http://www.un-documents.net/ocf-02.htm) accessed 15 April 2015.

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on the fundaments of the traditional city, with its features and fundamental principles. Particularly, within the *fil rouge* of the culturalistic movement this essay focuses on the work of theorists and architects who looked at history to find principles for their contemporary needs, instead of considering it as a mere figurative language to re-use abstractly. Given these points, the planning actions developed through an auto-analytic process of memory, through which finding not only critical and practical tools, but, above all, the *raison d'être* of the collective urban space (Gravagnuolo, 1991).

In this controversial debate, these intellectuals speculated about the value of the city and the techniques for analysing it, its crisis and its possible therapies, working deeply anchored to the real life, through three primary conditions linked each other from the logical and methodological point of view. Alongside the evolution of this line, they produced a hypothesis of assimilating and reinterpreting tradition, creating a sensible and prolific civil growth. Three main features, behind which the presence of the past is implied, characterised their work.

First, they used to analyse the built reality pursuing its hermeneutics through the observation lens of empirism. Secondly, they chose the traditional city as a primary term of reference both for the analysis and representation of planning principles. Finally, they developed a cult for the craftsmanship to achieve the quality and utility of the project. To begin with, we will analyse the anthropological dimension of the traditional city as interpreted by the studies of Camillo Sitte in the late 19th century, aiming to underline how the theme of measurement and size of a space is a preliminary condition to achieve a sustainable environment. Deeply connected to this theme, then, a built example about the concept of the functional integration – which implies the contextual attention to economic, transport and social issues - of the urban fabric instead of the monofunctional fragmentation deriving from zoning is described[3]. It regards, in particular, the work by Mario Ridolfi and Volfango Frankl in the post-war reconstruction of the Italian city of Terni.

Finally, from the subtle roots identified in these former case studies some potential lines are taken into consideration in order to propose a more complex theoretical scenario for contemporary sustainable urban design.

In conclusion, to relate to the cultural principles of the traditional city aims to recognise the ideal continuity of thought surviving to the predominant identification *tout court* of the progressivism as the 20th century's *Zeitgeist*, through which to try to acquire some knowledge for a more humanistic as well as holistic idea of sustainability.

Measurement and vision of the urban space

Generally speaking, the technical development characterizing the 19th century urbanism had introduced a new scale in the cities with wide dimensions and spaces ideologically abstract to define an urban environment structured by self-referential straights, abstractly shaped squares, and monotonous allotments built-up by stereotyped buildings. Urbanism in its pioneering phase, actually, produced a semantic inversion of the city space, which was so relegated to the negative of the city designed by the engineer, as a sort of remaining of the background within he had engraved its form.

Despite the fact that Sitte lived in a historical context in which an explicit sensitivity towards sustainability in the modern sense had not appeared yet, his development of a critical mass of successful urban spaces selected from the historical cities reclaimed attention to the human scale, with all the implied consequences from a planning point of view. His work, in fact, based upon the background of the German Historicism, can be considered one of the most significant achievements on the traditional European city's studies, particularly meaningful for its interest in understanding the deepest urban structures to be re-interpreted in actual projects.

In addition, the methodology to explore the finest examples of successful historical spaces from a three-dimensional point of view instead of a two-dimensional one, allowed him to establish for the first time the vital role of morphology as an analytic as well as a planning

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[3] A clear hypothesis has been explained in *The Charter of New Urbanism* in particular in the description of 'The neighbourhood, the district, and the corridor' (point 11).

Figure 1. The concept of the General Plan
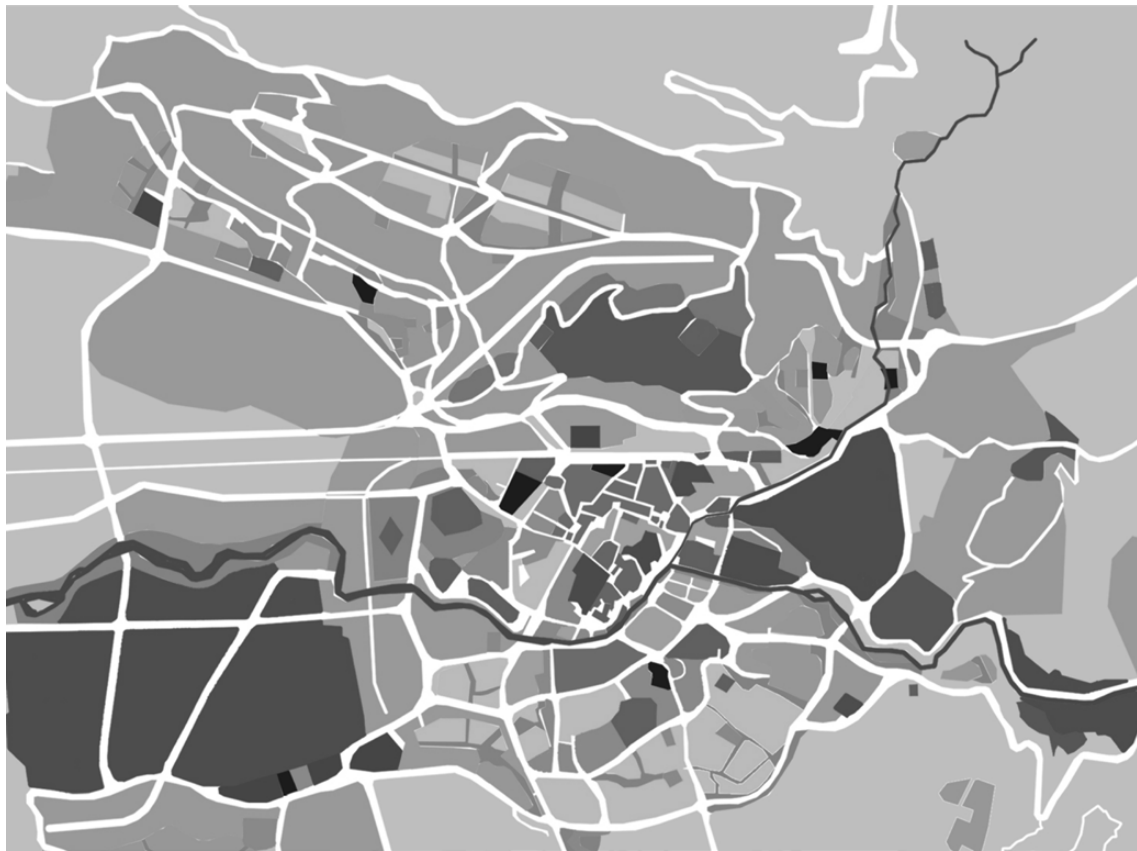
tool through which affirming the spiritual value of a period, linking in a spatial coherence the different artistic expressions. According to this viewpoint, the city's construction should have been integrated in a didactic process grounded on the space's psychology (Smets, 1992).

Despite the transformation hypothesis developed by Modernism, only measured upon the parameter of the car – rigidly expressed by astract infrastructural signs applied upon the historical pre-existence – the heritage of the traditional city space was proportionally organized with modules coherent to the human scale. According to Léon Krier philosophical speculation on the reconstruction of European cities[4], the urban dimension should be linked to the humans one not only in terms of phenomenological features, but also in terms of anthropometric structures because «the forms of the dwellings, work, and social relationship are permanent among men and, thus, are not connected to a specific historical period, rather to the physical condition oh humankind and its lifestyles».

To establish a critical method able to study the complexity of the urban organism Sitte, hence, tried to analytically reduce it through the elaboration of a typological atlas of primary spatial conditions. In doing so, he applied a metonymic method, according to the Alberti's metaphor of the city as a big house, whose *rooms* had to be connected through precise dimensions and proportions between the built and the empty space. Through a methodologically applied form of *perceptual ascesis* the logical matter of history is assumed as a model irrespective of the stylistic influences of the classical artistic categories, finding what Sitte poetically called secret mechanism or the essential. Within this theoretic approach, the mostly investigated places were those traditionally used to

[4]See Krier, L. (2010) *Tradizione non vuol dire medioevo* (http://www.immobilia-re.eu/leon-krier-tradizione-non-vuol-dire-medioevo-servono-case-a-misura-duomo-massimo-tre-piani) accessed 21 July 2011.

identify the collective spirit of communities: squares, urban knots, streets, all places characterized by a profound semantic meaning for the traditional European city, where a *civitas* used to find its own symbol of social identity.

In developing this argument, the research of Sitte gave particular emphasis to empirically analysing each site, acknowledging their morphological features, their causes and the connections with the human psycho-physiological sensation (Zucconi, 1992). Following on from that idea, principles and rules deriving from the psycho-physiological mechanism influenced the metrical and symbolic dimension of the space. As a result, by referring these features to a stable psychological structure, Sitte attributed the theoretical foundations as principles, universal rules to them, moving from the field of the historical sciences to that of the nomothetic ones (Wieczorek, 1994). As traditional city was studied as a whole stratified organism, the research was not addressed towards a particular stylistic trend, perhaps expression of a precise era, while it aimed at the investigation of the inner ratio of the urban space in order to recognise the retrospective specificity of the urban structures (Zucconi, 1992).

The reference to the anthropological principles of the urban space elaborated by Sitte draws the attention to an ideal cultural matrix generating original theoretical horizons: concepts such as *forma urbis*, environmental unity, artistic character of the city enable to overcome the boundaries of a mere piece of historical knowledge creating, on the contrary, new urban perspectives. The curve, the three-dimensional complexity, the measurement, the finitude of perspective, become rich themes. The theme of the space as a experienced reality implies two main logical corollaries connecting human space to sustainable design. The first one regards the movement linked to the distance – and by implication to the time for a path – while the second one regards the movement as extension, implying a problem of dimensional scale. As a result, being space and perception mutually in dependence, the urban space can be described through a synthetic approach as a whole or through the narrative description in an amount of time.

Some features of the traditional city: compactness, functional integration, and a balance between nature and anthropic dimension

By analysing the anthropological nature of the traditional city another key point arises, with regard to the profound relation between urban form and some vital functions for the city itself. Basically, the traditional city can be considered as being poly-functional and compact, succeeding in creating such well-balanced places and urban structures over the centuries. A topical work would be useful to illustrate how fertile the link to the traditional city can be. This refers to the original hypothesis developed from the roots of tradition by the architects Mario Ridolfi and Volfango Frankl who worked for over 40 years in the post-war reconstruction for the city of Terni, in central Italy. They developed a *realistic design approach*, based on the roots of traditional cities, medieval in particular. Throughout the whole reconstruction of Terni they looked at the imprints and ratio of the past, trying to preserve and reinterpret them to recreate a meaningful environment for the community that survived. After working on the Reconstruction Plan in 1945 with also the creation of the *medievalist* street of Corso del Popolo (1957)[5], the architects had the responsibility of developing the General Plan (1955-60) and the following *Detailed Plans* for the city centre (1963-1987).

The general Plan proposed a contained growth, working on the different scale of the architecture to create a built environment in balance with a very complex territory of the *conca ternana* (Figure 1). The idea to set the urban development within the framework

[5]This case study examines the construction ex-novo of an entire street, intended as a piece of great urban architecture which seeks both to deal with and to formulate a hypothesis for the planning relationship with the existing footprint and the value of the architectural sign, within the dialectic juxtaposition of modernity and tradition. In line with the traditional city's nature, the planned street is intended «as a living thing, not as the geometric result of the meeting of a technician's traced alignments. A street is a spiritual and moral actuality: it has its own character, its own features, its own function» (Piacentini, M.(1941) 'La strada', *Nuova Antologia*, LXXXVI, 148-153).

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Figure 3. The Duomo Detailed Plan: the urban park system.

of the compactness paradigm succeeded in facing two urgent themes. The first one regarded the possibility to reduce the overall amount of energy consumption needed for the citizens' movements, implying a containment of pollution – which was a very complex problem for an industrial area like Terni. The second one dealt with the construction of a meaningful relation between the town centre and the suburbs, which were planned as medium-sized nucleuses in order to provide a general variety of urban features. In particular, around the city centre a sort of crown of neighbourhoods was developed, creating a mix of social housing areas and public urban services zones. Following on from that idea, the main planning features can be described as the constraint of land use, the integration of nature inside the city and the development of growth by precise parts having a precise dimension according to what they used to call *500 meters urbanism*.

In particular, with the Detailed Plans for the historical centre they pursued the *regeneration* of the ancient urban fabric, showing some hypothesis to evolve new planning ideas on the roots of the traditional city's principles. In more detail, through the analysis of the *Duomo Detailed Plan* (1963-81) can be underlined the pursuit to achieve an overall regeneration of the ancient urban fabric taking into consideration not only the architectural dimension but also the social, functional, and environmental point of view. Actually, an important element of successful regeneration is that he planning view should make use of the inherited feature of the area, involving what comes from the memory of the place instead of do not consider or, eventually, eliminating it by adding an abstract new concept on the site. The project, therefore, begun with a passionate survey of all the existing buildings, looking at their qualities including colours, materials, period etc as artistically shown in the survey drawings by Volfango Frankl.

After acquiring a great deal of knowledge about the material and typological nature of the historical *urban fabric*, the architects proposed a complex program of interventions. To begin with, they realised the necessity to introduce new urban functions as indispensable complementary activities to make a degraded and fairly abandoned

district a lively part of the urban organism, which should have become so capable of self-sustainment. In particular, as far as such uses like schools, craftsmanship and market, the most striking idea regarded the pursuit to restore the urban fabric and create public green parks within the courts. In so doing, the whole area should have become an urban park system pedestrian friendly, allowing only inhabitants to use private vehicles. The planning aim should have been achieved through public-private financial agreements for demolishing building abuses, verandas and crumbling rooms, which had been built in the back fronts. As a result, new functional uses would have been introduced in the most ancient part of the city, following the theoretical hypothesis developed by Camillo Sitte and Gustavo Giovannoni at the beginning of the 20th century[6]. The architectural restoration, necessary for conferring a positive atmosphere to the built environment, provided the creation of the accesses to the public by opening the main buildings lobbies or by renovating the previous private passages rediscovering a use of the historical blocks coherent with the aim to preserve the ancient one (Figure 2). In essence, the proposed design would have created an environment in balance between buildings and nature, open and built spaces, residential and specialist functions, and, furthermore, between walkability and car traffic. The whole district, in fact, was thought to be a traffic-restricted area, with a widespread network of pedestrian paths connecting the different functional levels of a high integrated city, from the dwellings to the shops, schools, services, and cultural and leisure facilities.

It is noticeable how access and courts were thought as new hierarchical elements of the urban fabric not regarding the morphological aspect but for the meaning they would have assumed within the organism (Figure 3). From this point of view, the reflection upon the architectural type is more linked to formal aspects – with the restoration of a hypothetical *organicity* more than a *processual* derivation. The continuity of the *urban process*, therefore, regards the persistence of the *urban fabric* independently from the *type*, which had been diluted through the transformation over the centuries. The urban elements acquired a new meaning in the new architectural scenario where the typological updating represents an operative key for the urban regeneration: the fragmented inner courts constitute a new collective dimension and the buildings surrounding become a transition system between different dimensions of urbanity.

After that project, Ridolfi and Frankl continued to work on the transformation of the built environment, for example in the *Tacitus Detailed Plan*. Moreover, although the theme and the general conditions were significantly different, they tried to build a human environment based on the same principles. The reflection about the urban form, therefore, was organically connected o the more general cultural aim to achieve, according to the idea of the urbanism as a «mosaic of different disciplines» which need to be set in the harmony of sustainability. Those principles they took from the historical city have continued to represent a meaningful as *trait d'union* in the contemporary speculation on sustainability, for the research of a respectful use of the material and spiritual sources of cities. Some clear examples regard the work by Leon Krier or the philosophy of the New Urbanism Charter, which in different terms have been working on turning the planners focus back to the humans as well as the environmental original needs.

Conclusion: from tradition toward sustainability

The attempt to compose a line of critical references to tradition's features aimed to recognize and reflect upon some meaningful relation between architecture and city, which were inherent in the traditional city, as possible place for a synthesis of the different scale and cultural dimensions involved in the sustainable urban design.

The first relation that can be identified – as the most general – describes the relation of a city as an organism with its component parts, developed as compact nucleuses. These parts,

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[6]Clear references can be recognized in the General Plan for Marienberg by Camillo Sitte and in that by Gustavo Giovannoni for the regeneration of the historical urban fabric in via Emanuele Filiberto in Rome.

morphologically and functional structured, gave a compact dimension to the urban growth within a system of connective graduation well integrated with the surrounding environment.

The second relation regards the multifunctional integration within the city, developed through a progressive scale focus. On the one hand, at the neighbourhood scale, this relation determines the introduction of several complementary functions within the urban fabric, including as well as dwellings, the specialist buildings to catalyse central conditions for activating higher levels of interest, such as the public greening, park, commercial and services centres. On the other hand, to the individual level of integration correspond the integration to the level of the urban block, as primary element in the creation of the city, particularly attributing a new meaning to the pre-existing elements.

Lastly, the relation collecting the space of the city with the architecture through the space of the history, creating a sophisticated system of references between them. This relation implies the election of the square and the streets as the primary terms for the urban design, as they owe the regenerative potentials for the contemporary challenges. Place qualifies especially for being measured, limited, deeply related to architecture and humans behaviour. The dimension of the urban space can be therefore conceived as the architectural corollary of the intrinsic anthropological dimension of the city, theatre of the humans lives where, according to the lesson of the great masters of the past «the actual tradition do not represent the testimony of a concluded past, but a live strength which can animate and shape with itself the present» (Secchi, 2000).

References

Adorno, T.A. (1979) *Parva Aesthetica* (Feltrinelli, Milano).
Burton, E., Jenks, M., Williams, K. (ed.) *The Compact City: A Sustainable Urban Form?* (Taylor & Francis Group).
Cadman, D. (2009) *The Roots of Sustainability* (Seacourt Environmental Printing, Oxford).
Caniggia, G. and Maffei, G.L. (1979,) *Composizione architettonica e tipologia edilizia 1. Lettura dell'edilizia di base* (Alinea editrice, Firenze).
Cellini, F. and D'Amato, C. (2005) *Le architetture di Ridolfi e Frankl* (Electa, Milano).
D'Amato, C. (ed.) *Città di pietra – Cities of stone. L'altra modernità - The other Modernity*, (Marsilio Editore, Venezia).
De Bellis, V. (2015) 'Il progetto urbano nell'esperienza italiana del XX secolo. L'opera di Mario Ridolfi e Volfango Frankl nella ricostruzione post-bellica di Terni', unpublished PhD thesis, Polytechnic University of Bari, IT.
Di Biagi, P. (ed.) (2009) *I classici dell'urbanistica moderna* (Donzelli Editore, Roma).
Gravagnuolo, B. (1991) *La progettazione urbana in Europa. 1750-1960* (Editori Laterza, Roma).
Krier, L. (1995) *Architettura. Scelta o fatalità* (Editori Laterza, Bari).
Maretto, M. (2012) *Ecocities. Il progetto urbano tra morfologia e sostenibilità* (Franco Angeli, Milano).
Nardi, P. (ed.) (1971) *Il fenomeno «città» nella vita e nella cultura d'oggi* (Sansoni Editore, Firenze).
Rowe, C. and Koetter, F. (1978) *Collage City* (MIT Press, Cambridge).
Schulz, C.N. (1984) *L'abitare. L'insediamento, lo spazio urbano, la casa* (Electa, Milano).
Secchi, B. (2000) 'Il linguaggio della città contemporanea', in Neri, R., Viganò, P. (ed.) *La Modernità del classico* (Marsilio Editori, Venezia) 94-103.
Smets, M. (1992) 'Sitte e Buls: la nozione di contesto' in Zucconi, G. (ed.) *Camillo Sitte e i suoi interpreti* (Franco Angeli, Milano).
Strappa, G., Ieva, M., Dimatteo, M.A. (2003) *La città come organismo. Lettura di Trani alle diverse scale* (Mario Adda Editore, Bari).
Zucconi, G. (ed.) (1992) *Camillo Sitte e i suoi interpreti* (Franco Angeli, Milano).
VV.AA. (2010) *Tradition and sustainability* (The Prince's Foundation for the built environment, London).
Wieczorek, D. (1994) *Camillo Sitte e gli inizi dell'urbanistica moderna* (Jaca Book, Milano) Editori, Roma).

Chair_Jean-François Lejeune
University of Miami School of Architecture, 1223 Dickinson Drive, Coral Gables, FL 33146
Co-Chair_Lorenzo Bagnoli
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy

Historical Urban Fabric

Modern and Contemporary Design in Historical Cities

Architectural Heritage

Modern Architectural Legacy

The concept of organism in Louis Kahn's work: why his architecture is still relevant today

Elisabetta Barizza

Draco PhD School, "Sapienza" University of Rome, 53 A, via Gramsci, 00197, Rome, Italy

Keywords: Louis Kahn, Rome, Venice, architecture, concept of organism

Abstract

When talking about contemporary design of historical cities, Louis Kahn's Venice Project (1969) is noteworthy. It allows us to better understand why Louis Kahn's architecture is still relevant today. Kahn wrote at the time: Venice is architecture of joy. I like a place as a whole where each building contributes to the other. An architect building in Venice must think in terms of sympathy: working my project I was constantly thinking as if I was asking each building I love so much in Venice, whether they would accept me in their company. It was at the American Academy in Rome, in the 1950s, that Kahn discovered the value of the city as organism showing the world the way to build places more than buildings for the population of the Global Era. The concept of organism was part of the architectural thought of Louis Kahn from the beginning. In one of his rare note books, dating back to 1943, Kahn wrote about the origins of Architecture and drew the map of the Mediterranean, depicting the cities of the first civilisations with the caption: religious impulse. Kahn was inspired by the essence of the ancient civilisation and understood that different cultures could learn from one another. He showed how integration and invention are the keys to obtaining true completeness. In his work, a creative stroke encompassing space, movement and light, gave life and expressive meaning to essential spaces. Lets see why Italy has been fundamental to Kahn.

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Introduction

Potentiality is infinitely more important than what is done.

Louis Kahn

The subtitle of the XXII International Conference ISUF 2015 *City as Organism*, is *New Visions for Urban Life*. The great architect Louis I. Kahn throughout his life dreamed to design a new city generated by new human agreements. Nathaniel Kahn, talking about the work of his father as an urban designer, said: "He didn't succeed in designing on a big scale in Philadelphia, but he didn't give up – that wasn't his nature – and he was eventually able to built a kind of city in Dhaka, Bangladesh and one in Ahmedabad, India, too. They are mini-cities and I think both places are very much concerned with these *spaces between buildings* that you see so strongly represented in those pastels from his time at the American Academy in Rome in 1950-1951, when he really fully found his voice" (Barizza and Falsetti, 2014). Rome was a turning point in Kahn's work. From the eternal city he realised that *architecture is the thoughtful making of spaces as well as the city is the assembled institutions*. "An institution is the realisation that you have to create a place, or a dedication to something that you cannot live without (...) and somehow you have to involve somebody else as well". Kahn expressly affirmed that architect should always seek to create buildings which will be respected as a lesson of procedure, because "[if] it would become a frivolity, it would not be respected as a lesson of procedure". It was Roman architecture and its historical places that inspired him with the concept of organism: he acknowledged the potentiality of its theoretical and substantial implications for modern architecture. "It's exactly what a [historical] buildings now are: a lesson of procedure. The Art of it is this deep validity; otherwise I believe is "artistic". I believe in having to do with houses for people, it's a question to give them bread not cake. This is an attitude, it might be taken, but I do believe that there it must be a civic aspect of it, which can be cake, such a thing like arcades, connections, gardens, they are civic aspects as well. And so, one can put the weight in the right direction. Make those distinctions because it's about time we revive the "horse sense" [common sense] of before" (Kahn, 1971).

A lot of research work is in progress worldwide which has already been published. However, despite the success of the itinerant exhibition *The Power of Architecture* which began in 2013 and that is still open, there are some important aspects of Kahn's work that deserve investigation. One of them is certainly the notion of *integrity* closely related to the idea of *form* as realisation that evokes the concept of organism. In his lecture at the International University of Art of Venice (march 1971) Kahn declared: "Always looking for the beginnings I could not help but think that the most primitive instinct of man was the instinct of beauty. From beauty came wonder and from wonder realisation. And it is the realisation that is form. And by form I mean the realisation that something is made of inseparable parts, parts that cannot be separated. In other words, it is made of elements that you cannot take one from the other" (Mazzariol, 1976).

This paper focuses on Louis I. Kahn's work concerning the concept of organism analysed from the specific point of view of the PhD school in Architecture and Construction of the Department of Architecture and Design, La Sapienza University of Rome. The aim is to deepen one's understanding of Kahn's architectural design in the context of globalisation.

Note: The choice to immediately include several quotations in brackets is due to a the desire to be as faithful as possible to the profound and intense message of Louis I. Kahn.

Rome's legacy, Architecture of integrity

Following a trimester at the American Academy of Rome, in 1950-1951, Louis I. Kahn started to build his masterpieces of architecture and became an inspirational landmark for generations of students and young architects. Kahn's interest in monumentality of institutions has been misleading for two reasons. The first is related to his idea of form that

Figure 1. Venice Project, first version 1968-1969. Plan View of site Model.
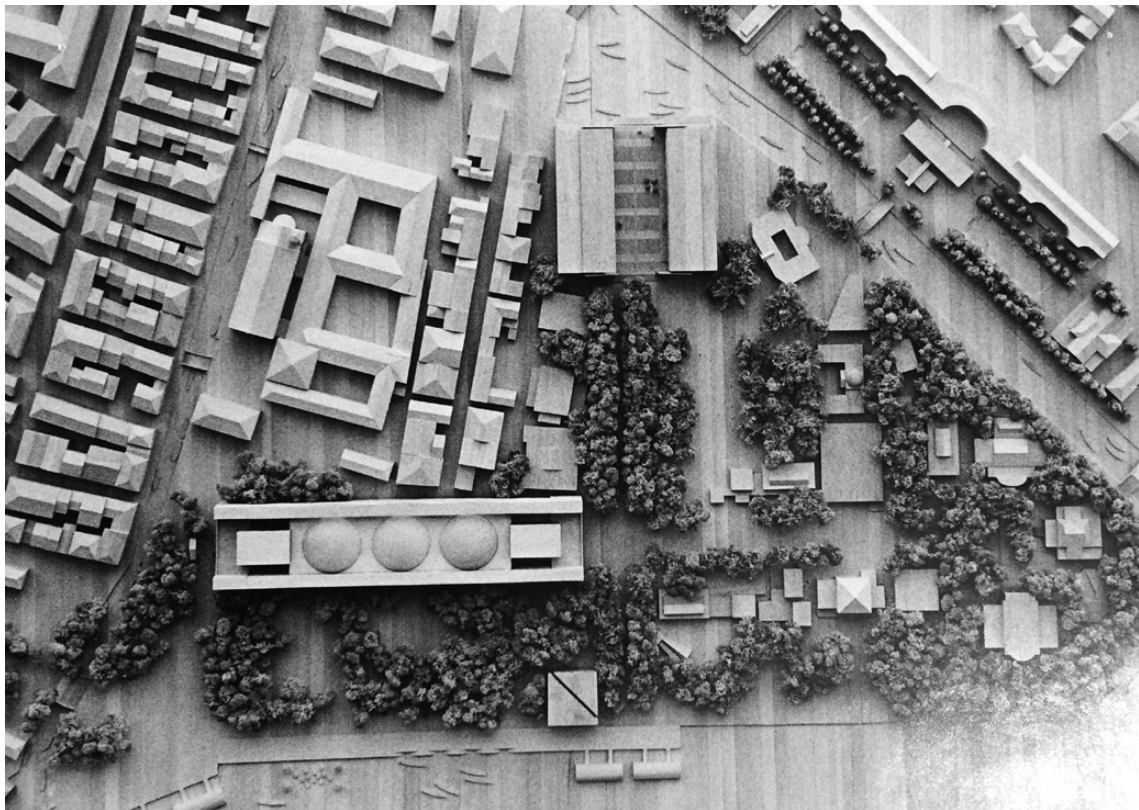
has too often been misinterpreted as formalism whereas it is a very substantial concept. In fact he talks about form in terms of organism and underlines the importance of integrity of architecture as a composition of parts that are undeniable. The second reason is to interpret his work as exclusively inspired by the structural expressivity of the shape of the monumental buildings as past symbols of great civilisations. Moreover, Kahn's love of the Pantheon, Villa Adriana and the Baths of Caracalla depended on the fact that he felt and read – in their order and integrity – the great potentiality of this notion of organism for the future. Furthermore he found out the same inspiring spirit in Mediterranean vernacular architecture of the small villages in the south of Italy and Greece. In 1969 he wrote a foreword to the book, *Villages in the Sun*, written by Myron Goldfinger and considered the definitive study of Mediterranean community architecture: "Prevailance of order | Prevailance of commoness | Being of order (…) The site confirms the possible and encourages agreement on the beginning in the making of man's place. | A mere foothold is confident of the settlement, the first institution of man. | The works of man reveal his nature | The time of a work holds its own validity from which a sense of truth can be drawn to inspire a work of another time. | The city from a simple settlement became the place of the assembled institutions. | The measure of the greatness of a city must come from the character of its institutions established by those sensitive to commoness and dedication to man's desire for higher levels of expression. | The places of the island, the hamlet, the mountain draws us to them for their simple truth. | To leave them for the city must bring revived faith in new beginning. | A city must be ever greater and greater. | Commoness is the spirit Art | A work of art is an offering to Art" (Goldfinger, 1969). Roman and Mediterranean architecture broadened his views on the nature of space: "In a way space induces the project, its not the project that makes space. So we can say that form does not follow function, but form induces use. But I also like to feel that function – which is the realisation of the nature – can induce use. If you can make a building in which you do not name the rooms and they naturally become the function you intended, then you

Figure 2. Venice Project, first version 1968-1969. Perspective View of site Model.
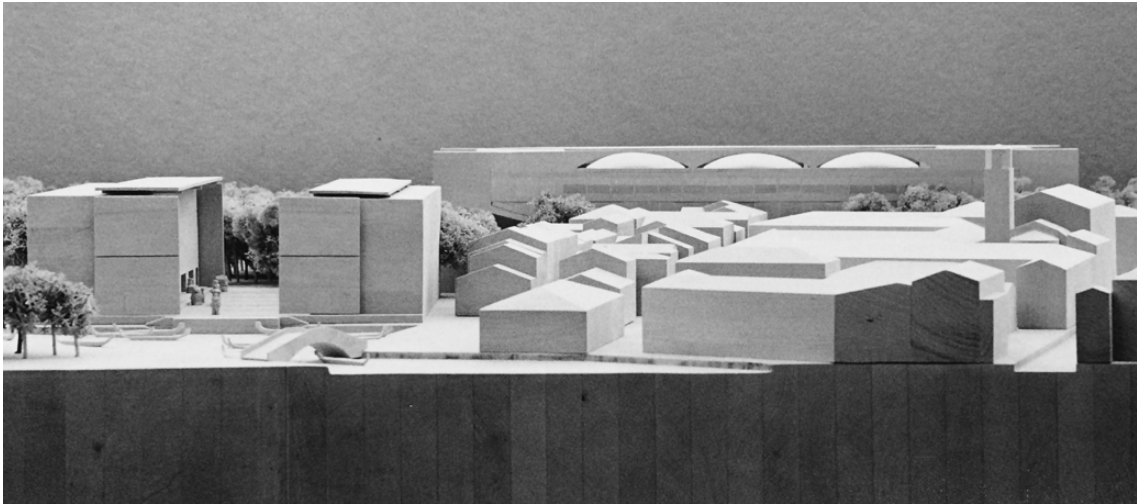
have a very high architectural integrity" (Kahn,1971). Kahn discovered the spatial totality of a Roman brick box and achieved the realisation of a organic plasticity expressive of its functions. In his architecture we can read that "Every system is a world in itself, a coherent and organic whole in which the architect limits himself to creating «what a thing want to be» within the laws of the system. But at the same time everything refers back to its origin, to that desire for life and for being, which preside over every human Institution and over the very realisation of Man's being" (Bottero,1967).

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Paul Cret's lesson, Architecture as living organism

Kahn's research around the notion of organism stems from his architectural background. Kahn emigrated from Estonia to Philadelphia – the city of "brotherly love" – in 1906. At the beginning of the last century several communities of immigrants with different cultures and beliefs built in each neighbourhood institution as reference of their identity. It became a model of integration in a urban development generated by human agreements. Moreover the multicultural and ecumenical context of Philadelphia reverberated in Kahn the values of the "multi–ethnicity" of the city of Parnu and the island of Osel (Estonia) where he spent his childhood and which he never forgot. The lesson of the French architect Paul Philippe Cret strongly rooted in the *Beaux Arts* tradition, in the context of the Philadelphia school, was essential. As Elizabeth Greenwell Grossman well explains, "Although such an approach led to a body of work that is quite varied in style and composition, in studying his designs one recognises a certain consistency: Cret's civic buildings are characterised by an intimate monumentality; by the use of classicism to weave together the individual elements and volumes; by a positioning of stairs so as to dramatise the act of circulation; and by reliance on courtyards, atrium, or double-height spaces to lay open the composition. Although in each case these characteristics seem generated by the problem at hand, they also give his work unity and embody his distinctive attitude toward civic architecture"(Greenwell Grossman, 1996). Cret taught his student how to design an architectural organism starting from a simple geometry and symmetrical plan to achieve the spatial complexity of volumes of elements. "A good plan is one from which may rise good rooms in a good sequence" (Cret,1934). In the editorial of *The National Architect* (December 1914) he mentioned his French teacher Gaudet when he said, after having shown the theory of the origin and logic of certain forms: "you will find numerous exceptions to these rules and some of these exceptions are masterpieces, universally admired, and you must remember, when on one side you have a theory and on the either side a masterpiece, it is a masterpiece which is" Gaudet showed by this that
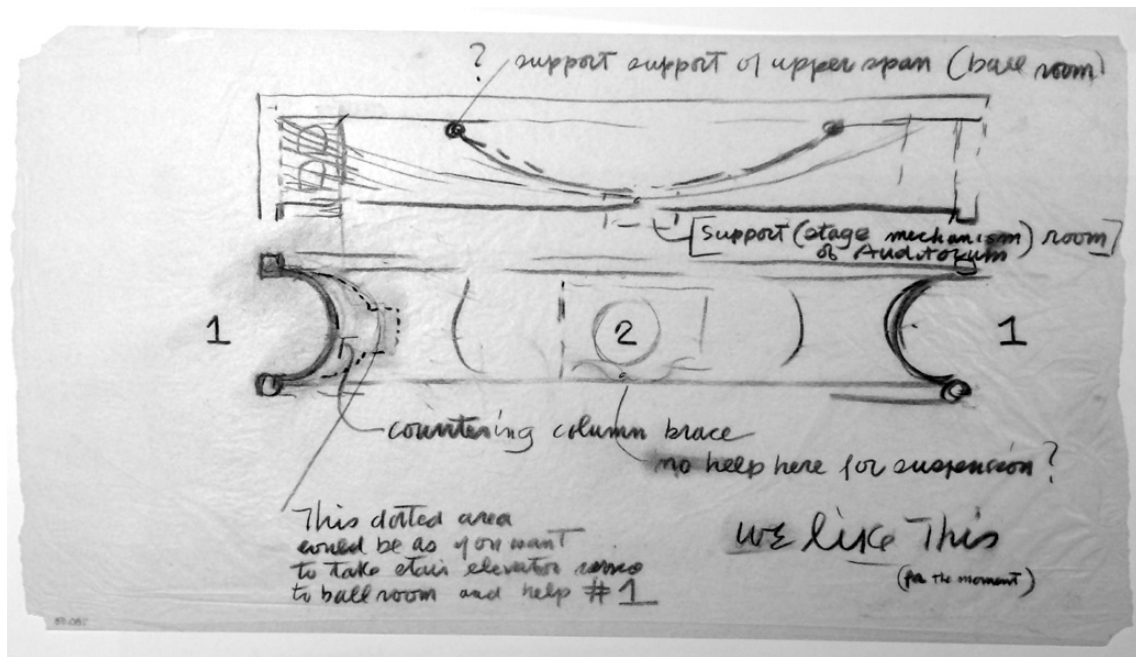
he was an architect". Designing his buildings Paul Cret lived his architecture emotionally from inside: "The quality most essential to an architect is foresight. He must put him in the place of the future occupant of the buildings, as the actor on the stage tries to live the character he is called on to impersonate. He must also foresee the fight against the elements which measures the life of his building. All this is something more than composing a clever picture, and shows that to study design is first of all to learn how to think clearly" (Cret, 1934). Kahn's personal drawing definitely remained the best application of this dynamic procedure. In fact, in his plans, sections, facades and perspectives, the architect very often drew men, women and children living together the "eternal qualities" of spaces which he first lived from inside.

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Reading the city to create «places more than buildings»

The city also must be considered in terms of which way it can be made, not in terms of how we correct what is already made. (Kahn, Aspen 1972)

In Kahn's work, the reading of the site was always marked by a general sense of reverence to the past. Talking with students of the International University of Venice (1971) he said: "Now, in thinking small, I didn't want to take down one of the details of sculpture or stone. Now again, in thinking big, I saw that instead of trying to imitate the charm of the weave of buildings I felt that if you were to make a compound (like a very large palazzo of small buildings), a building of simple geometry with courts and gardens and passages that it would not be trying anyway to imitate the charming results of increment of building. (…) The question is to think in terms of buildings that are places as large compounds and courts where the reading is in and out of the buildings. I think it could be considered as an order which is done with the greatest respect to what's there. In respect to what is, what exists in its characteristic way. (…) Reverence is the word, not respect, because reverence is not to respect, it goes deeper than that and you have a great love for the beginning. And to continue in the same way would be not respectful. (…) It is the same attitude that a restorer has when he does not imitate the column which is destroyed, but he makes it in brick or makes it in a different material than marble merely to show what is

restored and what is not". Kahn realised the value of the concept of organism, lived nature and places always at walking speed. He would never drive because he was afraid of speed of cars and he was against any kind of slavery of cars. Therefore the point of departure for the lecture of places or cities (historical or not) was always a "walking test" to measures spaces before sketching. In the Venice project Kahn was inspired by the typical "itinerant lecture" of the city in sequences of sights "as far as the eye can see" which is the lecture by the gondola from below to above, from the canal to the sky. As he said at the International Design Conference "The Invisible City" of Aspen, Colorado (1972): "Design demands an understanding of the order". And about Venice: "There is a marvellous consistency in all the buildings that were built in Venice. All the craftsmen knew how to do it and the architect was only really present in a large and magnificent building, and the order which seems to be dictated by the major structures seems to have been caught by the craftsman in the minor structures. The framing of the windows in stone the lintel over the window in stone, and also the sill, whether decorated or simple or regular, it is reading the order, it makes no difference if it is decorated or if it is simple, but the fact that the same element is used, which is in the craft and seems to be known by the craftsman. There are many variations but fundamentally it is the same. And then what is understand to be order, the order is not the variations but the simple element of aspect" (Kahn, 1971).

Design and construction, finding a «spark of novelty»

Traditional architecture was much more sustainable because architecture was not made for itself, but was a way of life. (Doshi, 2008)

Designing new buildings in historical places all over the world Kahn discovered that there are elements and spaces that through a modern interpretation can still revealed as the core of a "local culture". He had a talent for identifying the fundamental part that in the unity of an organism of space, could not be disregarded. The court of the school complex of the Institute of Management of Ahmedabad is an example of what Kahn called «a spark of novelty» that help form to became a core of composition: "The inner court will be shielded during certain ceremonies by a large canopy spanning eighty feet. What gave me the courage to do this was the architectural provisions made in the courtyard of the Akbar Palace at Lathor for the same purpose. You know the people in India make wonderful cloth and they have stretched it in greater distances. This court is different from things I have conceived before. It gives such joy to be the one to discover a beautiful way of life that belonged to another civilisation" (Ronner and Jhaveri, 1976). With a deep understanding of the models of different cultures, Kahn designed plans in which he composed the axiality of the western culture with the maze's scheme typical of the east. It was through interpretation, integration and invention that he reached original solutions in where the unity of the organism was always achieved. In Venice these cultural elements are not only the two building of the *Stoà* of the Palazzo della Biennale with the large *piazza* between the main path and the dock at the end of canal; but also the great central sloping floor of the conference hall, inspired by *Piazza del Campo* of Siena, and the structural idea of the bridge of the Palazzo dei Congressi. Those elements, with the three domes over the roof, are the focal points around which the organism found its unitarian structure.

Structural elements for modern plans

To Louis Kahn structural expression and constructional consistency are essential requirements. It is the most important aspect of the lesson of the past. In 1955, he wrote the composition *Order Is*, a procedural program in which he stated: "Design is form-making in order. | Form emerges out of a system of construction (…) Order supports integration | From what the space wants to be the unfamiliar may be revealed to the architect | From order he will derive creative force and power of self criticism to give form to this

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Figure 4. Sketch of Congress Hall in Venice, with the words "desire, need !, valid".
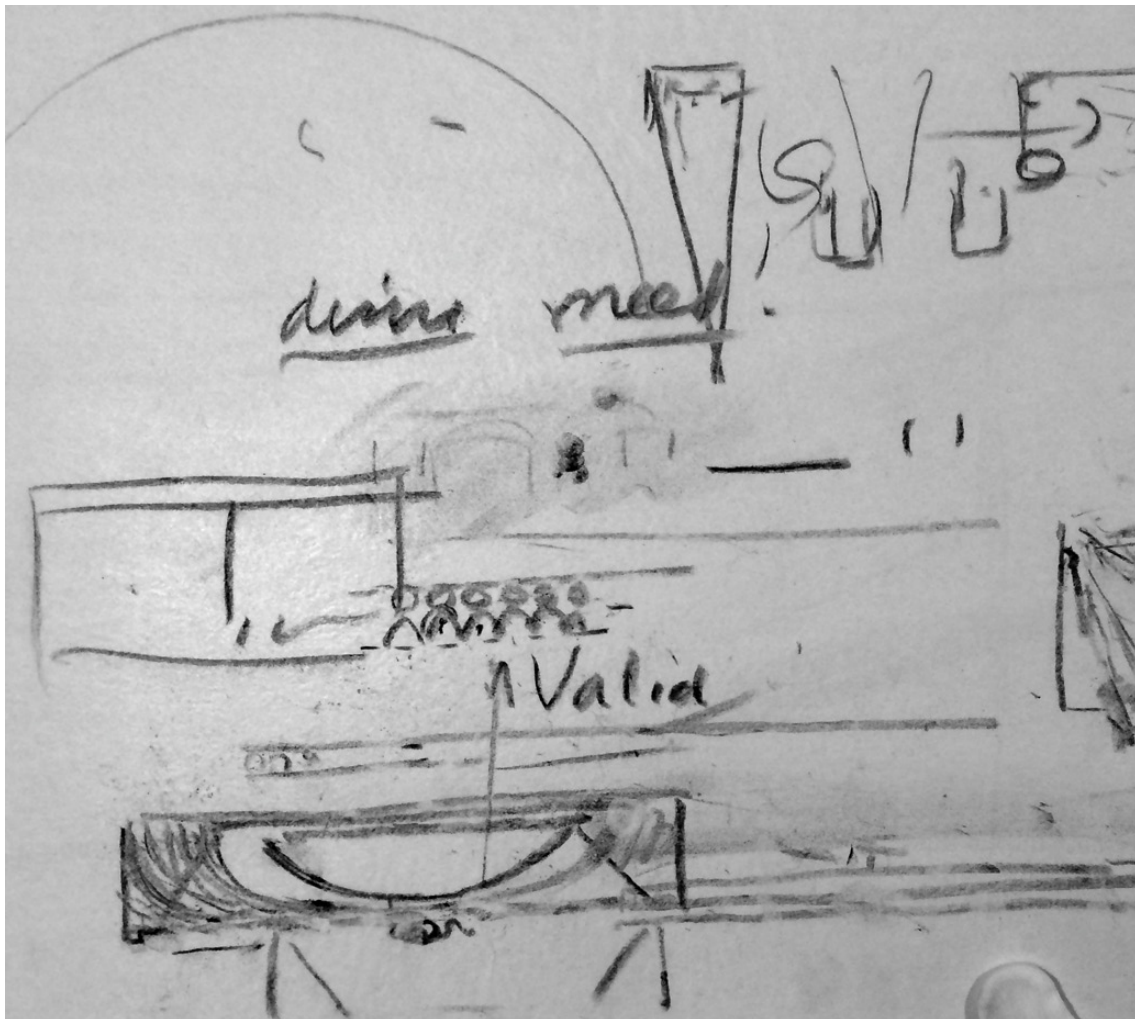
unfamiliar". In Kahn's work, the process of design proceeds from *form* to *shape* in a dynamic movement between *thinking big* and *thinking small*, with no limits to the number of passages of scale inspired by his sensibility for spatiality. The architect has to think in terms of structural because the *shape* that he has to find from *form*, depends on structures and materials. "To think in terms of structural is difficult because it takes some other experiences to begin" (Khan, UIA 1971). Kahn found out the key of the concept of organism that he called *form* or better *integrity*. "The realisation is like sudden attention to a certain integrity. If every part is accountable for, it is completely independent of something else, and there it sits, and then you begin to say it has integrity, but *what is the nature of its parts*? If you don't know that, then you can't decide the integrity" (Prown and Denavit, 2014). Studying Kahn's buildings we can assume design is a dynamic process finalised at the realisation of unity by the composition of units. Singularity and uniqueness of each part is fundamental and verticals and horizontal elements of connections (the joints) have to follow their nature to be *tectonic's nodes*. Talking about hierarchisation in the Venetian's seminar about reviving the city, Kahn confided to students: "I believe that it is in back where I have discovered in its reasons, you might say, that my entire outlook or direction in architecture is based on the "area served" and the "area that does the serving". Because each has its own rights and I think this would make a very clear plan. The first building where I realised that the area served and the area that does the serving are apart from each other was a Bath House in Trenton. There is a hollow column that supports the

roof. I inserted a wall here and the wall here that means that you come in this way, so this becomes a servant of the space, these are storages places. (…) From this, every building that I did after that is the same. Everyone is the same: it is the realisation, I think, of the modern plan" (Kahn, 1971).

Correlation with the Roman school of Formative Process

Nature doesn't speak about ecology, only we do.

Louis Kahn

According to Giuseppe Strappa, who was Gianfranco Caniggia's scholar, more than history Kahn investigated the germinal and secret region of the idea of construction it-self. The background of typological thinking of the Caniggia's school with its scientific's knowledge of the formative process of Roman architecture helps us to interpret better Kahn's approach to the organic order of masonry. If Kenneth Frampton was the first critic to emphasize the tectonic's nature of his monumentality (Frampton, 1995), it was from Italy that started the debate on the meaning of 'Architectural morphology in Louis Kahn' (Bottero, 1967). And it is from Rome that there arises a new comprehension of Kahn's revivification of a *plastic's legacy* and its implications for the future. Talking about Kahn's buildings, Strappa speaks of "a plastic organism reassessed" and observes that it was from an original vision of ancient architecture that he derived by sympathy the practical use of a constructive system which gives shape to the static structures and its spaces. Even though there is a similarity between Kahn's idea of form and the notion of type that Caniggia's school developed in the 1960s, we are faced with different methods and perspectives. As well the intention to extract the order of anthropic principle from architecture of the past, it suggests the existence of elements in common with Saverio Muratori's theoretical approach, although differences are substantial. Kahn's interpretation of form is far from the identification of the formative process. To Muratori, the word *process* means the transformation of the constructed reality in difference stages in which *form* expresses typical and shared characteristics of the construction or even of the project. In Kahn's work the process is all inside the mind of the maker and start from a kind of media-tion, of his interpretation of the world. In his last book *Architecture as a process* Strappa throws into relief the lessons that Rome gives to Kahn of awareness of the validity of the notion of organism to achieve an articulated relation of proportion and congruency between systems, structures and elements. Kahn's institutional buildings present a typical central nucleus connected with collaborative–perimetric structures composed by serial complementary rooms that contributes to the static of organism. These are the keys to integrity: the centrality of plan around a nucleus and the composition of unity of collaborative elements and structures. And the way to reach unity is the "static, distributive, and spatial's collaboration in which each part is complementary to the other connected by a relation of necessity" (Strappa, 2014). Always searching for the principles of discipline, Louis Kahn identified in the integrity of the ruins and the fabric of ancient cities the way to go beyond the Modern Movement, without abandoning the conquests of modern architecture and his faith in the role of structural's invention and technology in changing people's lives.

Conclusion

The architecture of Louis Kahn with its uniqueness bring into being awe-inspiring places in which we can recognise the eternal quality of the great architecture of the past. They speak the universal language of order which is based on the nature of nature to discover the truth. According to Kahn "truth has to do with desire, need, with soul. And that is its spirit, somehow". The spirit of architecture is comprehensible only by the feeling of the eternal qualities that became part of the living aspect of nature. Studying the notion of organism in his work we are encouraged to give these qualities their names, so that concepts like legibility become more attractive to contemporary architecture. Kahn's

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buildings impose themselves as a lesson of procedure because they express substantial consistency. Through a intensive study of the main characters of the great architecture of the past juxtaposed with that of the Modern Movement, Louis I. Kahn gained a way to achieve the main quality which he called architectural integrity. Other properties like durability, sustainability and consistency are the result of not only a deep reverence to the past but also to the present and the future of earth and humanity.

I want to make my last remark in reverence for the work that has been done by architects of the past. What was has always been. What is has always been. What will be has always been. Such is the nature of beginning. The power of accepting the qualities of commonality, of human agreement. It is to be trusted beyond any kind of operational system, to be trusted far beyond the discoveries or the statistical analysis of things as they are. Because things as they are have nothing to do with desire. Desire is the real motivating force for living and expression. Thank you very much.

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Louis I. Kahn

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References

Barizza E., Falsetti M. (2014) *Roma e l'eredità di Louis I. Kahn* (FrancoAngeli, Milano) 65.
Bottero M. (1967) 'Organic and rational morphology in Louis Kahn', Zodiac 17 (Edizioni di Comunità, Milano) 240-245.
Cret P.P. (1934) 'Design', *Book of the School* (Department of Architecture, University of Pennsylvania, Philadelphia) 27-31.
Doshi B.V. (2007) interview 'Bioarchitettura in India' in TV programme RAI Italy (Archive RaiTeche).
Frampton K. (1995) 'Modernity and monumentality in the works of Louis Kahn', *Studies in Tectonic Culture: the Poetics of Construction in Nineteenth and Twentieth Century Architecture* (MIT Press, Cambridge).
Goldfinger M. (1969) *Villages in the Sun, Mediterranean Community Architecture* (Praeger, New York) 7.
Greenwell Grossman E. (1996) *The civic architecture of Paul Cret* (Cambridge university Press) XVI.
Kahn L.I. (1971) *Talking with students* at UIA, International University of Art (Venice), audio transcription by Barizza E., unpublished.
Mazzariol G. (1976) *Proposizioni sulla città* (Neri Pozza Editore, Vicenza) 113-118.
Prown J.D. Denavit K.E. (2014) *Louis Kahn in Conversation* (Yale Press, New Haven) 45.
Ronner H., Jhaveri S. (1987) *Louis I. Kahn Complete Work 1935-1974* (Birkhäuser, Basilea, Boston) 224.
Strappa G. (2014) *L'architettura come processo, il mondo plastico murario in divenire* (FrancoAngeli, Milano) 209-229.
Wurman R.S. (1986) *What Will Be Has Always Been The words of Louis Kahn* (Rizzoli,New York) 50-210.

The 'Three Block Project': Stasis and Transformation in an Urban Megaform

Kevin James Eugene Murray
Faculty of Architecture, Landscape and Design, University of Toronto
Keywords: Core, Megaform, Public Space, Mobility, Vancouver

Abstract

The megaform emerged within architectural discourse and practice of the early 1960's as an innovation in city making. The architecture of the megaform (or me¬gastructure as it is sometimes referred) attempted to both integrate and establish ur¬ban conditions while giving shape to a collective vision of society. The megaform was adopted in Canada as an architectural approach to public projects during the 1960s-1980s and was used as a tool in the creation of social infrastructure such as mass education, social housing and government administrative buildings.

The Three Block Project (later renamed Robson Square) is a multi-functional civic complex designed by Arthur Erickson with the collaboration of the landscape architect Cornelia Hahn Oberlander in the years 1973-1983. The project has made a definitive contribution to the social infrastructure of the city of Vancouver, Canada. The project is notable for its popular success as well as the apex of the megaform phenomenon in Canada. A close reading of the projects preliminary urban scale research and its eventual architectural and three block structure reveal a project that aspired to carefully insert itself into Vancouver's urban fabric. Explicitly building on the analysis from the CIAM 8's Search for a Core (Tyrwhitt, 1952) the project utilized systematic urban form analysis to generate architecture as an urban fragment or civic kernel. Part urban design and part architecture, the project for a core constituted a departure within modernist urban planning and from any ambition to plan a city in its entirety. Yet nearly 30 years after its reception and eager adoption as the core for a city bereft of one, a contemporary formal and use analysis of Robson Square reveals the strengths and limits of project that aspired to be both symbolic architectural monument and a dynamic urban landscape.

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Introduction

A half-century ago, amidst a rapidly suburbanizing built environment, The Three Block Project promised to establish a core for the city of Vancouver, Canada. Designed between 1966 and 1973, by the office of the architect Arthur Erickson and landscape architect Cornelia Oberlander, the Three Block Project (later renamed Robson Square) adopted the architectural language of a multi-tiered megaform, linking three urban blocks into a public, pedestrian precinct.

The Three Block Project emerged within the context of post-war suburbanization in Canada and a public debate over the urban form of cities and downtown cores. Arthur Erickson's early proposals to manage the urban form of Vancouver, primarily through the coordination of mobility infrastructure, continued the project for the core formalized by the Congres International d'Architecture Moderne (CIAM) in 1951, but also situate the Three Block Project within the critical architectural experiments of TEAM X. Robson Square's distinct architectural section realizes a transformation in thinking about architecture and urban design- from strategies that segregated urban functions and architecture from mobilities, to an understanding of architecture as a participant in the continuity of pedestrian movement across an urban ground.

Robson Square's scale, public program, and architectural form distinguish it as an expression of what Kenneth Frampton has termed- the megaform as urban landscape (Frampton, 2010). This paper argues for the contemporary relevance of megaform projects- for their legibility as monumental public forms capable of hosting a diverse and shifting urban program. The vitality and vulnerability of Robson Square's architectural and political project rest less on its formal character- which is rich and well considered across its many scales- but hinge upon its ability to adapt its program to shifting definitions of what is public in a contemporary North American metropolis.

City of automobiles

Like so many North American and European cities during the middle of the 20th century, the shape and content of Vancouver was shifting with suburban sprawl. The rapid growth of suburban housing projects and the automobiles that serviced them, marked a shift in development from the geographic limits defined by the Vancouver peninsula, to new housing that sprawled North and South to the surrounding mainland.

Development in both the historical city fabric and new suburban territories pursued an absolute separation of land use. Significantly, the separation of automobile transportation from its historical relationship to the urban form of the street, participated in diluting the street as the site where pedestrians and other transit types intermingle (Baird, 1995).

In the wake of abrupt physical and social transformations, these decades were also periods of intensified civic engagement across Canadian urban centers. In response to housing, commercial, and transportation development that sought to raze vast swathes of historical cities, citizen-based political and consciousness-raising movements emerged. In Toronto, just a few years after the construction of the Mies van der Rohe's TD Centre, Jane Jacobs would help rally a campaign to stop the Spadina Expressway, a highway that proposed to slice through fine-grained neighbourhood blocks. Vancouver would have a defining citizen movement of its own in 1967, known as the Chinatown Freeway fight. This protest and advocacy movement helped turn political opinion against an eight lane freeway that would have displaced residents, local businesses, and cleaved neighbourhoods apart.

The search for a core

In the years prior to the design of the Three Block Project, the Vancouver Municipal and Provincial government were actively involved in a series of urban redevelopments or what was termed "urban renewal" planning schemes. Like so many North American cities, blocks of downtown Vancouver were reduced to surface parking lots. One particular initiative sought to acquire land for new Provincial Courts, administrative buildings, and a

Figure 1. Land ownership and consolidation of properties and lots for the Three Block Project (source: left- Goad, 1912. right, Erickson, 1972)
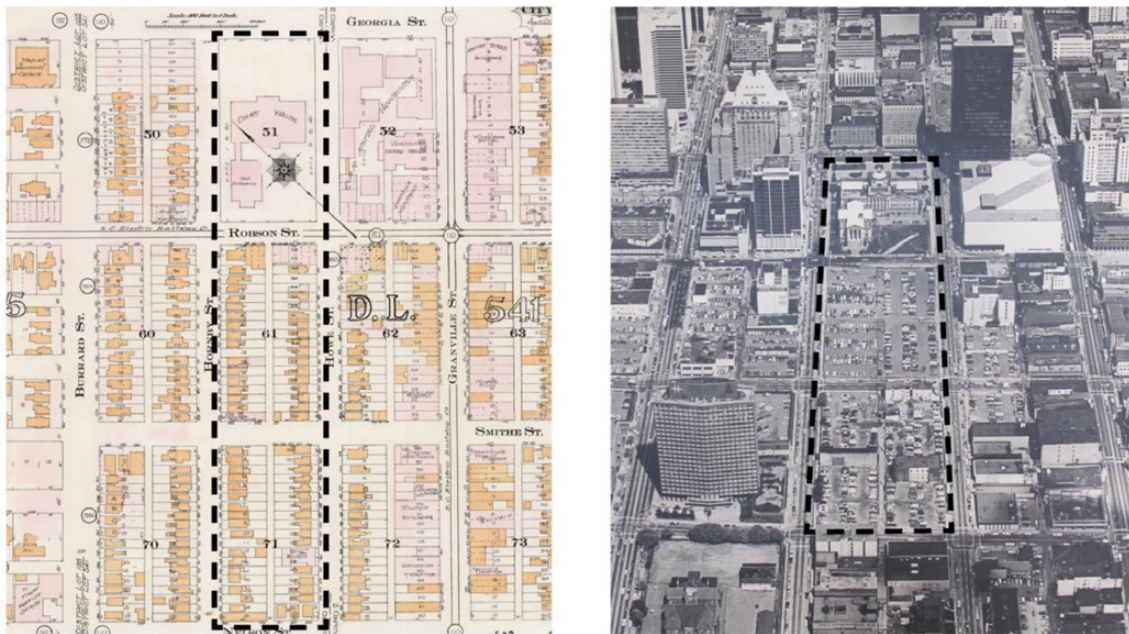
long anticipated public square. By 1965, most of Blocks 61 and 71 had been acquired by a combination of expropriation and private negotiations and what would soon emerge as the Three Block project began to take shape. A few historical images help to illustrate the process of consolidating lots into larger properties and the demolition of smaller commercial and residential buildings to make room for mid and high rise towers. Seventy commercial and residential properties (avg. 25" x 120" lot on a 260" x 475' block) were razed for the Three Block Project.

In a publicly contentious and politicized environment, Arthur Erikson was approached by the Vancouver Community Arts Council to offer an alternative vision for the beleaguered downtown area. The study and proposal that was published in 1966 was entitled *A Plan for Vancouver's Downtown Core*, (see Figure 4). With an explicit claim to being "in concurrence with the most advanced thinking that has been given to the core of cities" (Erickson, 1966), the plan is at times a direct reiteration of the principles of the core established at the Congres International d'Architecture Moderne's 1951 meeting. The Congress and the proceedings published as "The Heart of the City", announced a new agenda for modern architecture: the core. Amidst post-World War II reconstruction in Europe and the runaway success of suburban development in the Americas, the core proposed to provide both historical and new cities with a built platform for a civic culture (Tyrwhitt, J, 1951).

CIAM distilled the meaning of the core as that of a rendezvous, a public meeting place. Invoking the ideals of the Greek agora, the core would ultimately serve a civic function and reframe the European and North American historic city centre as a democratic political space. As the primary symbolic and literal public space of the city, it aspired to collect all types of people, allowing them to re-find themselves through free pedestrian movement and the exchange of ideas. On a functional-bureaucratic level, the civic centers were appealing to governments eager to consolidate services and facilities.

Part urban design and part architecture, the project for a core constituted a departure from an ambition to plan a city in its entirety. Its strategy was geared to fragments of the city, civic kernels against a background of privatized development (D'Hoogue, 2010). Anticipating the consolidating ambitions of the phenomenon of the megastructure that would follow in later decades, the core proposed to condense the public functions and programs of the city into thick, dense nodes.

Mobility infrastructure as a determinate of urban form

The fabric of the downtown is extremely fragile and is constantly subject to outside pressures. For major development to be successful, there must be a structurally sound skeleton into which projects such as the Provincial office building, the new Courthouse…may be incorporated." (Erickson, 1966)

In *A Plan for Vancouver's Downtown Core*, 1966 and the 9 Block Area Development Guidelines, the documents that would set the ambition for the 3 Block Project (1973), Erickson is fundamentally concerned with positioning mobility infrastructure as definitive for contemporary urban life. The Plans not only outline schemes for a civic core of governmental and judicial buildings called for by the municipality and province, they also project urban strategies for the entire Vancouver peninsula, focusing on both mitigating and reforming the overwhelming urban effects of automobile use and infrastructure.

One of Erickson's planning diagrams of the Vancouver peninsula depicts what would become the three-block project at the confluence of four urban districts. The scheme can be seen as a reiteration of the segregation of urban functions defined decades earlier CIAM's Athens Charter, but what is most significant is the area that the plan defines in between, not as a crossroads, but a destination, an attempt to distill the area between the 4 functions into a core for Vancouver.

Erickson also addressed the perception of the destructive effects of automobile traffic on the form and activity of downtown with a proposal for a ring road. A highway was to encircle the downtown peninsula, preserving the interior blocks for only local traffic and a strictly pedestrian oriented core. In the core, the "the conflict" between pedestrians and local automobiles would be resolved by at-grade pedestrian malls, in part claiming inspiration from Milan's Galleria. All transit, service vehicle corridors, and local parking would be placed below the grade of the street. A section produced for the 1966 plan shows the stacking and segregation of mobility's in order to enhance the experience of pedestrians in the downtown area.

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FUNCTIONAL AREAS
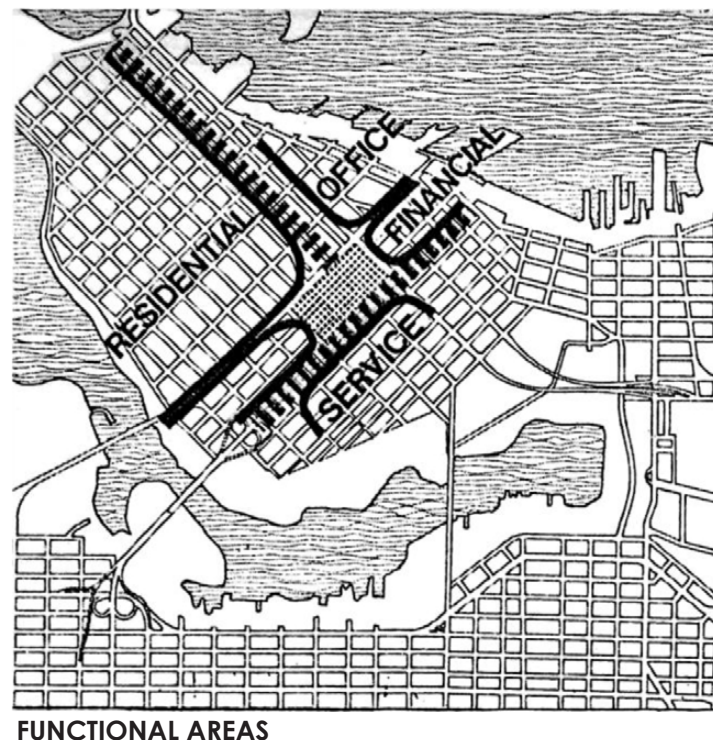
Figure 2. Diagram of a proposal for Vancouver's core (source: Erickson, 1966).

Figure 3. Cross sectional diagram of distribution of interior public program across the three blocks (source: Author and Tam, 2014).

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PARKING
GOV'T ADMIN. OFFICES
UNIV. OF B.C. SATELLITE CAMPUS
VANCOUVER ART GALLERY
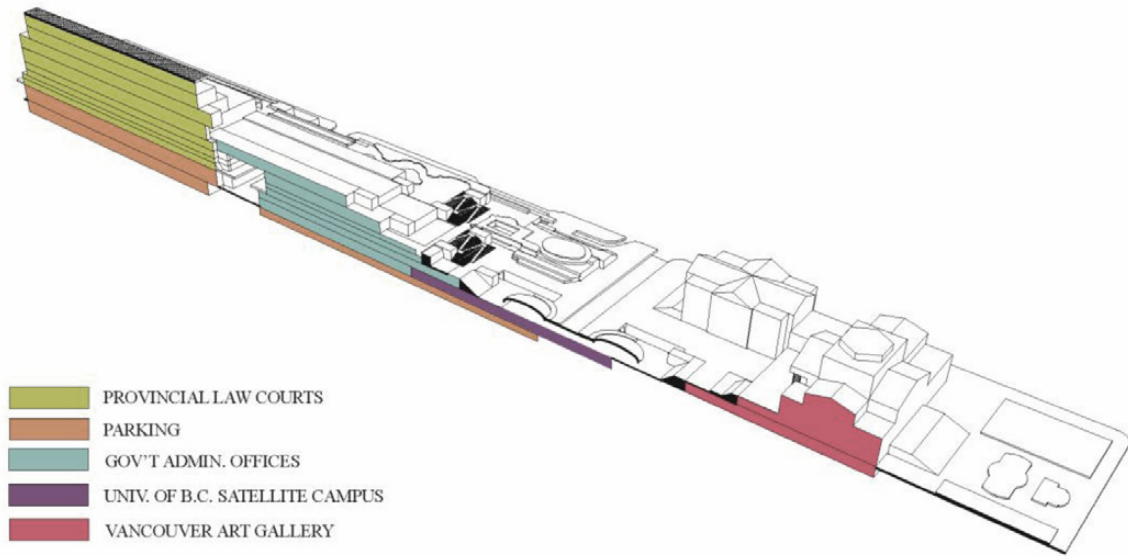
Critically, Erickson's proposed Granville-Robson underground transit artery, that "brings all pedestrians to the very heart of the commercial core", would never receive political backing. Despite the projects sectional layering, the considerable below-grade program is compromised by the unbuilt rapid transit station. The influx of transit passengers and the accompanying commercial program was a missed opportunity for invigorating the sites program of passive leisure and government administration.

None of the planning proposals in the 1966 or 1973 planning documents would be implemented, at least not directly. Instead, the urban guidelines and "spine" that Erickson proposed would be compressed down into three blocks: 51-61-71. The Three Block Project is an assemblage of three blocks, identical in dimension to adjacent city blocks. The new courthouse and provincial administrative complex anchor the south and central blocks. The Vancouver Public Art Gallery, housed in the old courthouse, bookends the project on the northern block. In the centre block, surface plazas, part of a continuous network of publicly accessible open space, crown the provincial government, and social service offices that links all three blocks. The blocks are further integrated through a shared palette of building and landscape materials.

Robson Square as a Megaform

Modern architectures struggle to adapt to rapid transformations in use and context and urgent demands for new infrastructure, manifested in part in the expression of the megastructure phenomenon. As an innovation in city making, the architecture of the megastructure included the ambition of fabricating, en masse, the material and programmatic conditions for urban life. In Canada, between the years of 1965-1980, megastructures were adopted as an architectural approach to state sponsored social infrastructure projects. Colleges and universities, public housing, and government administrative services were built across the country (Drouin-Crespin, T, 2014). In addition to Robson Square, Erickson himself would design other projects within the genre of megastructure, most notable being the campuses for Simon Fraser University and Lethbridge University.

In *Investigations in Collective Form*, likely the earliest writing to systematically come to terms with the megastructure phenomenon, Fumihiko Maki presents a morphological conception of architecture and urban form as groupings of variable density and relatedness. Amongst the three types of 'collective form' that Maki identified (Maki, 1964), The Three Block Project holds its strongest affinity with Group Form. Defined as an additive

collection of similar units, each member (or block) is secondary to the larger identity of the three block "organism". Each block carries autonomous programmatic and architectural elements, offering the possibility that each can be reimagined over time without dissolving the larger assemblage.

In the context of North American urban areas, continuity of the grid plan has proven a remarkably resilient determinate of public vitality. In the footsteps of such Team 10 proposals as Peter and Allison Smithson's 1958 project for Berlin, and partially through the pressure of city of Vancouver traffic planners, the final configuration of the three blocks accepted the existing local road network. Robson is built within, above, and below the street network. In distinction from many megastructures of the era, the decision to not severe the city grid secured that the site is seeded by the flows of the street.

Public Space vs. Public Life

Though the project adopts the basic format of the adjacent blocks, its built form defines a distinct and definitive relationship to the street. With an ambition to assert itself against a sea of automobiles and private development forces, Robson Square partially pulls away from the street. The courthouse and government offices in the west and centre block create a hard edge of limited programming along nearly two/third's of the projects street front. The streets that are adjacent to these blocks are reduced to movement corridors, with little space or reason for social interaction or lingering. In this respect, the project succeeds in its initial ambition of segregating pedestrians from cars.

Crucially, the project does provide open access at grade from adjacent streets through its northern half. The spaces in-between the two anchoring buildings are connected by terraces and plazas, rising up from the grade of Robson Street and the Art Galley in the North, to the 8 storey courthouse in the south. The projects refined spatial and material articulation, including Cornelia Oberlander's landscape plan, succeed in

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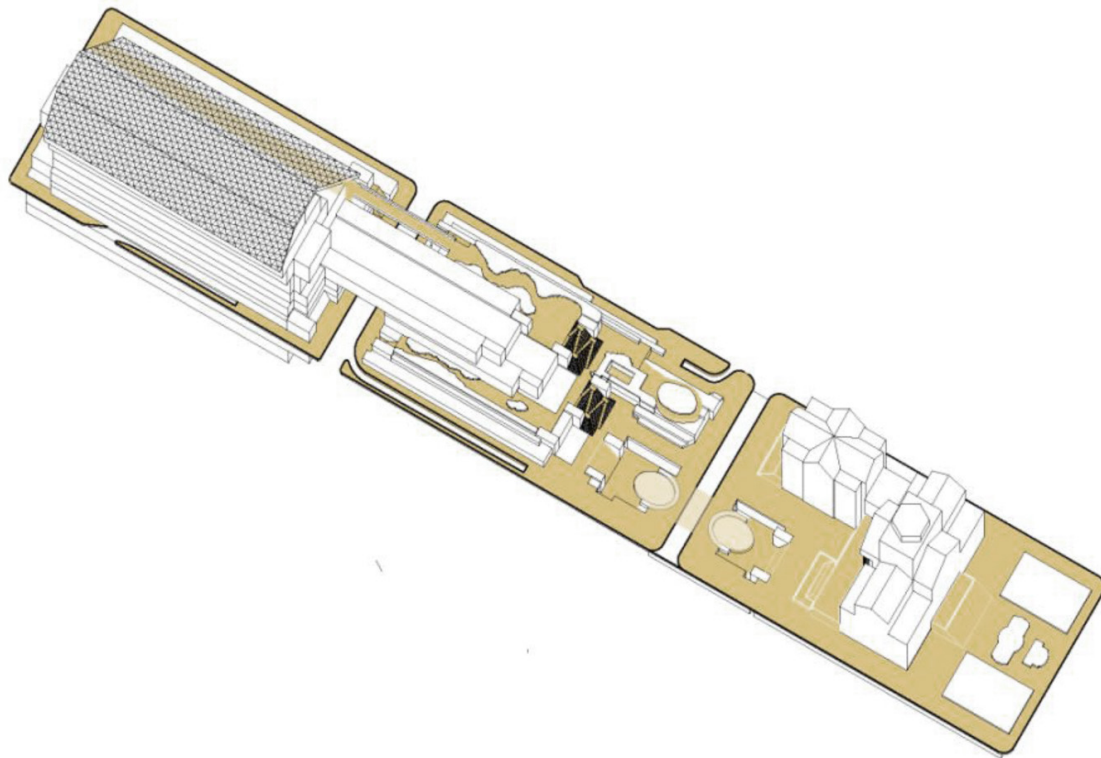
Figure 4. Diagram of pedestrian continuity across the Three Block Project (source: Tam, 2014).

tuning the project to the human scale. In particular, its stairs, stramps (stair + ramp) and plazas offer surfaces for repose, loitering, and urban voyeurism. For those seeking it, the site offers itself as a park-like refuge.

As an expression of a political commitment to the value of free movement and gathering, Robson's surfaces offer an open site for collective gathering. The site host's formal and informal gathering for dancers and ice skaters, lunching government employees and patrons drifting out of the Vancouver Art Gallery. It continues to serve as a site of occupation for political protests in Vancouver.

Plan and sectional continuity with the mobility and cultural flows of the street allow architecture to evolve and react to forces exterior to it. The continuity of public surfaces and programmatic connections to the city, with its unpredictable social, economic, and political dynamics, aspire and at times succeed in interacting with Robson's permanent architectural infrastructure. Ultimately though, it is not the street, with its shifting mix of uses and users that continues across the surface of the Three Block Project, but rather a vast terrain of publicly managed plazas and pavilions.

Recently, spurred on by Vancouver's active tourism trade and the success of an annual street furniture competition, Robson Street, a street that cuts between the middle and northern block, has closed for the summer months to local automobile traffic and transit vehicles. It has been heralded as a re-animator of the square, providing a pause in the urban environment where local office workers and passing tourists can lounge on new bench installations. However, in claiming Robson Square as a strictly "3 block pedestrian precinct", the summer street closure (with current initiatives pushing for year round closure), further severs the projects links with the flows of the street. In this fully pedestrianised version Robson Square, on a site that often evokes the atmosphere of a pre-show stage set, the sites early ambition to manifest as an agora shifts quietly towards the reassurance of contemporary public space. What Rem Koolhaas has perceptively if cynically termed *Public Space TM* (Koolhaas, 2002).

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Conclusion

As an expression of both a search for the core and the megaform phenomenon, Robson Square straddles a middle ground: between architecture and urban design, building and landscape, object and ground, city and park, open aggregation and closed composition. The projects adherence to the adjacent block format and the continuity of open space across three blocks ensures continuity with the flows of pedestrians in downtown Vancouver. But on a quiet day, or on most evenings, with office workers finished for the day, the site is incapable of generating the density and "culture of congestion" that is necessary to seed a metropolis' creative potential. While visually rich and well crafted, the sites great plazas are often empty, silent monuments incapable of fulfilling the promise of the dynamic urban core Erickson and CIAM longed for.

For all the open access provided by the sites plazas and public architecture, Robson Square's program is stabilized by the public institutions that program, administer, and govern the site. The forthcoming departure of the Vancouver Art Gallery, the primary program in the northern third block and currently key to the site's vitality, highlights the complexity of managing Robson Square's numerous "public" interests- two levels of government, public institutions, local residents, and wider citizen base. The paradox internal to the ambition of megaform, is the conflicted desire to fabricate a monumental identity while transforming in response to shifting uses and forces (Banham, 1978). To phrase the problematic specifically for the evolving character of Robson Square, how can a public architectural monument maintain its distinct formal and collective identity while maintaining openness to transformation, new uses, and affiliations? For now, the future of the Three Block Project is an open question.

References

Baird, G. (1995) *The Space of Appearance* (Cambridge Massachusetts, The MIT Press).
Banham, R. (1976) *Megastructure: Urban Futures of the Recent Past* (Harper and Row, New York).
D'Hooghe, A. (2010) *The Liberal Monument* (New York, Princeton Architectural Press).
Drouin-Crespin, T., Fiset, L., Murray, K. (2014) *Megaform as a Public Project: Investigations on Robson Square* (Canadian Centre for Architecture, Montreal, QC.).
Erickson, A. (1973) *9-Block Area Development Guidelines* (Arthur Erickson fonds, CCA Collection).
Erickson, A, Massey, A. (1966) *A Plan for Vancouver's Downtown Core* (Arthur Erickson fonds, CCA Collection)
Frampton, K. (2010) *Megaform as Urban Landscape* (University of Illinois, Chicago).
Goad, C. (1912) *Goad's Atlas of the City of Vancouver* (Goad's Atlas and Plan Company. Toronto, ON).
Koolhaas, R. (2002) *Junkspace*, October, Vol. 100, Obsolescence. pp. 175-190
Maki, F. (1964) *Investigations in Collective Form* (St.Louis, Missouri, St. Louis University Press).
Tam, S. (2014) *Robson Square*, Superstudio. Professor Roberto Damiani. Faculty of Architecture, University of Toronto.
Tyrwhitt, J., Sert, J.L., Rogers, E.N. (1952) *The Heart of the City* (London, Lund Humphries).

From disintegration to reinterpretation: urban design in Montreal, 1950-2014

François Racine[*]
Department of Urban Studies and Tourism, Université du Québec à Montréal (ESG UQAM), Montreal, Canada

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Abstract

When George Baird, architect and researchist in urban morphology, studied Toronto's urban fabric in 1978, he examined the morphological transformations of its central core and showed that the urban fabric in some parts of this North American city was in the process of desintegration (Baird 1978). This phenomenon also affected the urban fabric of Montreal, and the urban design projects, related to a modernistic approach, built in the 1960s, were responsible for these transformations and provoked a spatial discontinuity (Charney et al. 1990). The paper will study projects from the modernist period, but will also include the postmodernist and the contemporary periods to determine the new urban design approach and to evaluate the relationship of these projects with the urban fabric of Montreal. We have endeavoured to study three major urban design projects in Montreal from 1950 to 2014 to determine their role in the progression of the phenomenon of desintegration. With the work of numerous urban morphologists on North American cities (Charney, Vernez-Moudon, Gauthier, Racine) and the impact of this more recent knowledge on the way we intervene on the fabric, this phenomenon should be in regression in Montreal as elsewhere. Our hypothesis is that the reinterpretation of the urban syntax in the process of designing urban fabric in Montreal is a solution to reestablish a dialog between new built environments and the historical fabric of the city. But is this new research for continuity still in a fragile state?

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Introduction

This article studies three exemplary urban design projects in Montreal, completed between 1950 and 2014, in order to identify the theoretical and methodological bases of their conception and assess the impact of their execution on Montreal's morphology. These major projects have been feted and featured in academic journals (Architecture Québec, Canadian Architect, etc.). They were constructed following the establishment of the first municipal urban planning department in Montreal and represent true experimentation and improvement laboratories for urban design as an approach adapted to a large-scale object: the city. The post-war context, the major upheavals of urban form marked by the influence of international trends, and an awakening awareness, as of the 1980s, of modes of structuring of the historical urban fabric would have a decisive impact on the definition of contemporary urban design practice in Montreal. In theoretical and methodological terms, this compels us to reflect upon the discipline of urban history (why) and urban morphology (how) in order to offer an in-depth analysis of this body of achievements around three research objectives: to develop knowledge as regards useful expertise for those who are called upon to design urban fabric and building complexes; to intervene with respect to existing urban fabric and typologies in a context of heritage awareness and sustainable development; and to develop more specific knowledge as regards urban design in terms of the design and execution of physical arrangements enabling the mastery of formal organization of urban growth through permanence and change (Choay, Merlin, 1988).

Methodology

An analysis of the execution of these complexes has been carried out by way of field surveys and a morphological evaluation grid (Panerai, 1980, Pinon 1991, Lévy, 1992, Vernez-Moudon, 1994, Racine, 1999, Allain, 2004), making it possible to unbundle the planned urban fabric in subcomponents: the site configuration, the street network, plot subdivision, the built environment, and open spaces. This breakdown into strata facilitates an understanding of the projects' overall spatial organization. We have also analyzed how the built environment has been implanted so as to establish the relationship between the typology of buildings and the morphology of the planned fabric, i.e. the relationship of the built environment to the implantation site, street network, plots and open spaces. The third part concerns the critical reception of the projects in architecture and urban planning journals throughout Quebec, the rest of Canada and North America. The article concludes with a summary table providing a comparison of how these three fabrics are organized and their respective built typologies in order to retrace the evolution of the relationship of this planned fabric to the morphology of Montreal.

A study of reports filed by designers at the *Centre de documentation du Service d'urbanisme de la Ville de Montréal* (documentation center of the Montreal urban planning department) has made it possible to retrace the development concept of the *Îlots Saint-Martin*, a complex designed from 1966 to 1968 according to a modernist approach (Legault, 2002) (Figure 1 A, B); of the Bois-Franc neighbourhood, built between 1988 and 1993 according to a postmodernist approach (Ellin, 1999) (Figure 1 C, D); and of the *Quartier International de Montréal* (Montreal's international district), inaugurated in 2004 and illustrating an approach linked to the reconstruction of the city (Sokoloff, 1999) (Figure 1 E, F).

The modernist city: Îlots Saint-Martin (1966-1968)

Design concept

In 1966, the *Service de l'urbanisme de la Ville de Montréal* (Montreal urban planning department) designated *Petite Bourgogne* (Little Burgundy), a working-class neighborhood located in southwest Montreal, as an urban renewal zone in order to improve living conditions in a district experiencing de-industrialization and decline. The freshly-

Figure 1. The three urban design projects studied: Îlots Saint-Martin (1966-1968)
(A) Model around semi-public courtyards (Ville de Montréal, 1968); (B) Model showing the integration of existing row houses (Ville de Montréal, 1968); Bois-Franc neighbourhood (1988-1993)
(C) Comprehensive plan (Daniel Arbour and Associates, 1992); (D) Perspective drawing of the project (Daniel Arbour and Assoc., 1992); Quartier International de Montréal (2000-2004); (E) Organization of the different levels of the restructured Victoria Square (Ville de Montréal, 1999); (F) Comprehensive plan (Ville de Montréal, 1999).

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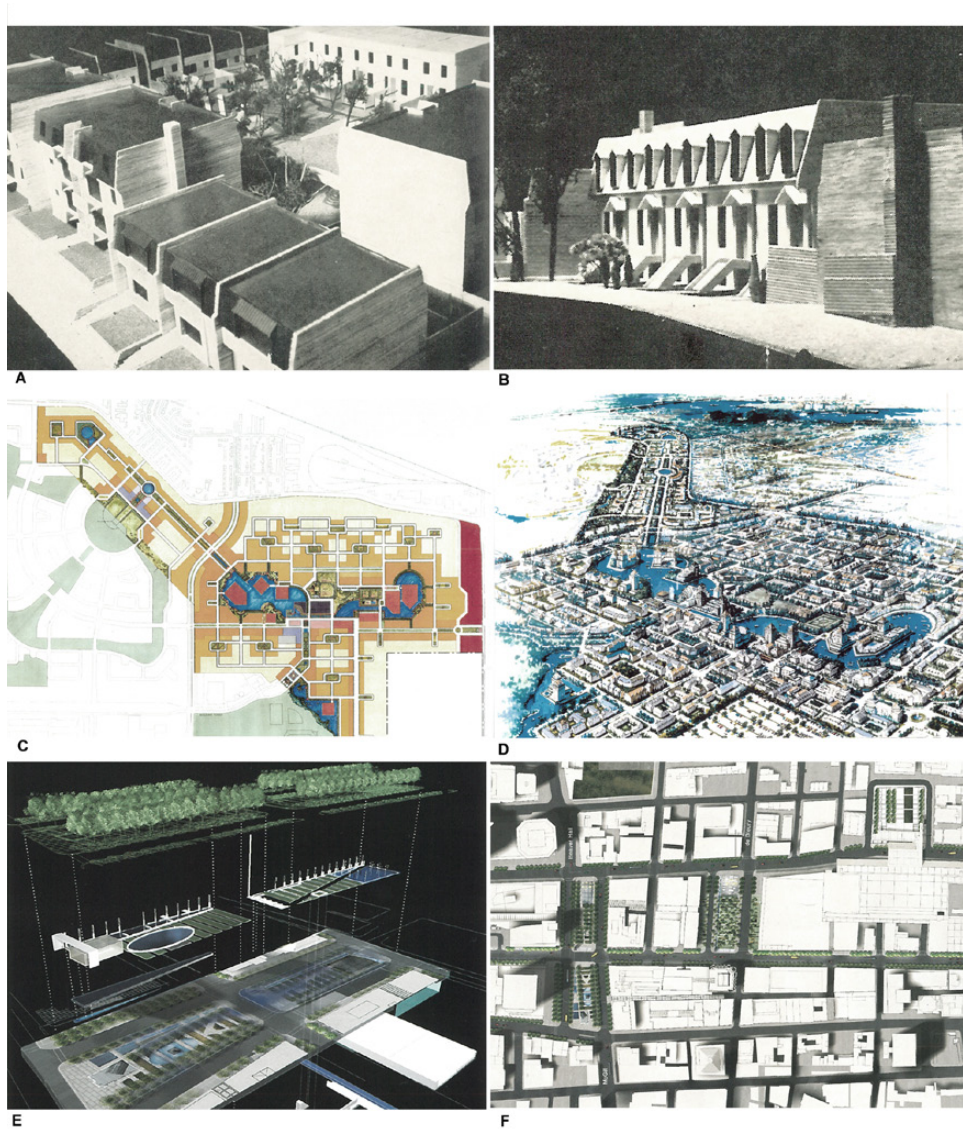
minted *Service de l'habitation* (housing department) was tasked with restructuring two city blocks for the purpose of building 142 subsidized housing units. To do so, it enlisted the services of *Ouellet, Reeves et Alain Architectes* to develop the comprehensive plan. This project reflects the progressive ideology of the Athens Charter and its design principles, which are still firmly rooted in the ideas of architects trained in Quebec's schools of architecture in the 1960s (Legault, 2002). The designers' arguments are largely based on an analysis of local socio-economic data and field observations. In their report (Ville de Montréal, 1966), the architects concluded that rental prices in the sector took up too great a share of available household income. From this perspective, the new housing units represented a solution conceived by public authorities to counter the poverty and perceived physical deterioration of the neighbourhood. Subsidized housing was therefore needed, firstly to financially assist households, but also to improve the living conditions

of Petite Bourgogne's residents. As such, the State took on the mission of mitigating social disparities and the impoverishment of the population in the industrial decline phase of the Petite Bourgogne neighbourhood. Despite the destructive nature of this operation, with all the expropriations and demolitions it required, the project was the precursor of a certain heritage sensitivity since it is integrated four existing rows of neighbourhood-style row houses into a comprehensive project with a social vocation. This concern for heritage is explained by the field survey work carried out during the conceptual phase, which enabled the architects to identify homogeneous building complexes with the potential to be renovated (*Ouellet, Reeves et Alain Architectes*, 1967).

The design process was also based on a study of the make-up of the neighborhood's households and an identification of their needs. This approach is a clear reflection of the era's modernist vision, where housing is one of the primary components of the functionalist city and "machine for living" (LeCorbusier, 1923) required for the population's well being. The proposed housing types included row houses, apartment buildings (offering one-, two- and three- bedroom units), and four- or five-bedroom units on two floors, i.e. the ground floor and basement. The organization of the comprehensive plan reflects a desire to ensure a certain continuity with the character of the sector, firstly by integrating into the project buildings typical of such neighbourhoods deemed by the architects as having sufficient architectural value, and secondly by preserving a former community bathhouse and a community centre. Other factors of continuity include respect for the street network and for the space of an existing square. The architects were seeking a certain architectural kinship between the scale of the neighbourhood's preserved row house typologies and the architectural design of new constructions (continuity of image and two to three floor template). Moreover, the survey used to define the restoration potential for existing buildings enabled the designers to acquaint themselves with the composition of the built vernacular (*Ouellet, Reeves et Alain Architectes*, 1967). This interpretation of the composition mode for the existing built framework, especially at the level of the architectural language of building crowns, remained superficial, however, since the closed figure of the "urban island" and the parceling of lots was erased by a desire to attribute a more collective status to the free spaces of the project.

At the level of architectural language, we note a new approach as regards interventions touching the existing built environment, where the restoration of the neighbourhood's row houses meant giving the qualities of modern comfort to the built vernacular. For new constructions, the designers drew upon the image of vernacular architecture, especially at the level of false mansard crowns, to justify the demolitions required in order to impose a new spatial order on Montreal's existing urban fabric. This desired morphological continuity was based on a reinterpretation of the image of the built environment (volume measurement, horizontal and vertical cuts, materials, etc.) and not by an analysis of the syntax characterizing the fabric of Montreal's neighbourhoods.

Project execution analysis

The architects drew up a comprehensive plan for a free and open area with paths, grassy areas and trees (Figure 2 A), despite the fact that the neighbourhood's existing road network intersected it (Figure 2 B). The buildings' layout was justified by an effort to optimize the level of sunshine for each unit by aligning with the orientation of Montreal's orthogonal grid, although an east-west alignment was favoured, which, according to the architects, would provide more sunshine to housing units with double orientation. This free implementation of buildings was possible by the fact that all the former lots are owned by one governmental owner, the *Office municipal d'habitation du Québec* (Figure 2 C). The hygienist vision of space is also reflected in the arrangement of the houses' courtyards to provide maximum levels of sunshine. According to the tenets of functionalist urbanism, architects prefer to avoid the systematic implantation of housing units along streets. A number of buildings are instead oriented along passageways and six semi-public interior courtyards or over concrete slabs (Figure 2 D). The presence on the site of former row houses on dead-end streets can explain the use of this type of organization to service off-street buildings. The comprehensive plan is characterized by a separation of spaces

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Figure 2. Subcomponents of the planned fabric and building implementation:
(A) Paths, grassy areas and trees; (B) Preserved street network and square; (C) Lots owned by the Office municipal d'habitation de Montréal; (D) Built environment: walk-up (in dark grey), preserved or new row houses (in light grey), former community bathhouse and community centre (in black), concrete slabs (in light grey) and six semi-public courtyards and passageways; (E) Buildings with grassed embankments, support walls and stairs; (F) Porous walls causing a legibility problem of the street; (G) Reinterpretation of the row house typology and preservation of the link to the lot and front and rear yard; (H) Small opening of the facades on semi-public courtyards; (plans from the from the updated cartographic database, Ville de Montréal, 2002 and photos M. Gilles, 2015).

set aside for pedestrian traffic and those reserved for cars. This functional segregation of traffic has created an internal network of courtyards, passageways and footpaths throughout each block and an above-the-street urban design in the northern and southern parts of the project (cars below; pedestrians above).

How the project was received in periodicals and publications

In 1970 the *Îlots Saint-Martin* received the Massey Medal, one of the highest honours in Canadian architecture. In his article, appearing in the journal Canadian Architect in August 1971, the architect Raymond Affleck notes however that there is a contradiction in the execution of the project between architectural excellence and a total negation of the notion of place. In a special issue of the journal *ARQ: Architecture Québec* (April

1998) focusing on the work of the architect Jean Ouellet, the urban planner Michel Barcelo talks about the revolutionary nature of the *Îlots Saint-Martin* as a downtown social housing project. He does, however, point out that this urban design leaves us with an urban composition where street buildings alternate with perpendicular off-street buildings, on new roadways and public pedestrian areas, which are quite difficult to recognize or identify. For him, there is a shortcoming in this urban design project insofar as the movement of pedestrian traffic on the street and inside the project itself was not conceived as part of the same network. In spite of efforts to bring in certain adaptations to the precepts of modernist urban planning, this first urban design and social housing project carried out by the *Service de l'habitation* embodies the values of modernity, comfort and sunlight typical of the functionalist approach, values that remain ill fitted to the syntax of an inherited urban fabric.

The postmodern city: the Bois-Franc neighbourhood (1988-1993)

Design concept
    The Bois-Franc neighbourhood, located in the north-west part of the Island of Montreal, was planned in the era of postmodern urban planning, a period during which the modernist heritage and the functionalist movement in architecture were rejected. The advent of the Bois-Franc project was made possible by the decommissioning of an airport belonging to the multinational company Bombardier. *Bombardier Immobilier* hired the firm Daniel Arbour & Associates for the urban design of the project, and its project manager was Louis Sauer (Sauer, 1994), renowned American architect and urban designer, architectural practitioner, researcher and teacher. He was the director of the School of Architecture at Carnegie Mellon University in Pittsburgh and concluded his career in Montreal.
    When organizing the comprehensive development plan for the neighbourhood, two factors were taken into consideration. First of all, a regulatory constraint imposed by municipal authorities forced the designers to ensure rainwater retention on the site of the project itself. The solution chosen by Sauer and his team was to create a basin system. Created from scratch, this water system became one of the strongest structuring elements of the plan as a whole and its various components. Just like the canals of Venice and Amsterdam, these basins (linked with a network of public spaces) must give a centrality to the new neighbourhood (Daniel Arbour & Associates, 1992). Secondly, the absence of any on-site ordering element provided Sauer with the opportunity to draw his references from an urban ideal, i.e. Savannah, established in 1733 in Georgia. This archetype served as a reference for a system of urban bocks structured around public squares. The rediscovery of the historic form of the city, a tradition from which the designers drew freely (Ellin 1999), clearly illustrates the influence of the postmodern movement.
    The European city served as a model, as did North American cities, given that these forms had re-established a certain pedigree (Ventury et al., 1972). We see here the relevance of this choice for Montreal, where the tradition of squares belongs to the syntax of the borough fabric established at the end of the nineteenth and beginning of the twentieth centuries. These urban blocks provided a concrete benchmark for the basic stitches of the planned urban fabric formed by neighbourhood units of 400 to 600 people. The repetition of this pattern at the Bois-Franc site, stopping at the edge of the basins, ensures a compromise between the regularity of the design and the distortions caused by the geometric shapes of the basins along with the irregular limits of the site. In the proposed comprehensive plan, north-south streets link the various squares and lead to the group of central basins. The east-west links are set out in series, thus ensuring privacy for the neighbourhood units as well deterring transit traffic, thus integrating functionalist considerations into the project. The comprehensive plan includes a vast array of city features, such as promenades, esplanades, squares, and parks, an eclecticism that illustrates the gropings of the postmodernist phase. Only the southern part of the allocated land was completed by adhering relatively closely to Sauer's master plan. Subsequent development phases gradually strayed further from the comprehensive plan, since *Bombardier Immobilier* transferred the land to other developers.

Figure 3. Subcomponents of the planned fabric and building implementation:
(A) A single basin is integrated into the project; (B) Gateway boulevards and avenues forming discontinuous internal links; (C) Large lots on boulevards and avenues and narrow lots on squares, without a transition between the two systems; (D) Built environment: detached, semi-detached and row houses (in light grey); housing in plexes, walk-ups (in dark grey) and apartment buildings (in black) and a public space at the intersection of a boulevard and a avenue; (E) Main facades on basin; (F) Main facades giving form to the streets; (G) Lot size based on the typology and location; (H) Buildings defining neighborhood squares; (plans from the updated cartographic database, Ville de Montréal, 2002, and photo F. Racine, 2012).

Project execution analysis

An interesting aspect of the comprehensive development plan is the importance accorded to the role of the built environment in defining street, avenue, boulevard, and public-square space (Figure 3 A). The choice of built type was also based on the hierarchical level of a given road. Sectional studies of the template of each of the roads were carried out, leading to a certain distribution of space reserved for cars, bicycles, pedestrians and roadside trees within the public right-of-way. This design work reflects a desire to establish a hierarchical road network like those in the traditional city: arterial

roads (peripheral), collector roads (boulevards, esplanades and avenues), local streets (servicing urban blocks), small squares, and private streets (Figure 3 B). Unfortunately this network is cut off, making the road hierarchy harder to follow. A strong connection between built and free space was ensured by building semi-detached housing and by the link between the plot subdivisions, the building type (townhouse, plex housing, apartment buildings, etc.) and both the street and the adjoining open spaces (Figure 3 C, D).

How the project was received in periodicals and publications

The Bois-Franc neighbourhood received no awards or distinctions, although a 1998 article in the journal *Québec Habitation* highlighted the quality and diversity of the 700 units built since the launching of the real estate project. Other elements underscored included the remarkable basin achievement, the sophisticated red brick architecture influenced by Neo-Victorian and Neo-Classical styles, and the closeness of the neighbourhood to major arterial roads, buses, subway stations and suburban trains. In a 2002 edition of the same publication, the author points out that notwithstanding its 3,200 completed units, the neighbourhood squares remain the project's most important components. Another aspect is highlighted: the reduced volume of car traffic, thus improving the quality of pedestrian activity. In a 1996 edition of the journal *ARQ: Architecture Québec*, Börkus Bergmann nevertheless argues that the Bombardier real estate company opted for a conventional and commercial form of urbanity and architecture, hence missing out on a unique opportunity to develop an exemplary, forward-looking project. (It should be noted here that Bergmann's vision of what the project could have been reflects his rather progressive attitude, still linked to the work of Team X of the 1960s and 1970s). The implementation of this ambitious urban design project was hindered by the economic crisis and the complexity of the project's design, which aimed to create distinctive neighbourhoods. The desired centrality exemplified by a collection of basins, leafy promenades, and high-rise towers never materialized. It is as though the plethora of images prevented the site from attaining a meaningful and structuring identity.

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The contemporary city: the *Quartier International*, Montreal's international district (2000-2004)

Design concept

The project, initiated by the urban design firm Daoust Lestage and an architectural firm, Provencher Roy, was undertaken in 2000, by way of a public and private partnership called *Quartier International de Montréal* (Montreal's international district, or QIM). The approach developed by the designers first of all involved an analysis of the problems affecting the urban fabric of this central part of Montreal, i.e. the rupture caused by the Ville-Marie expressway, the many vacant lots and surface parking lots, and the presence of a large, extremely introverted building with few links to its immediate context, the *Palais des congrès* (convention centre) (*Gauthier Guité Daoust Lestage inc.; Provencher Roy & Associés*, 1998). These devalued urban spaces were leftovers, as it were, from the expropriation of the expressway. The approach also involved a formal and historical analysis of the area. To begin with, an analysis of its development and transformation revealed the presence of a network of spaces which, in the past, following the dismantling of the Old Montreal fortifications, embodied the transition between the old city and its first outskirts. Victoria Square, built in the nineteenth, was part of this network. For designers, this was a "*rich historical fabric on which urban redevelopment could be based*" (Daoust Lestage, 1999, our translation) and it justified both a restructuring of the square and the building of a new public square: Place Jean-Paul-Riopelle.

The strategy, marked by a "*desire to draw upon past rules of composition (historical emergence)*" (Daoust Lestage, 1999, our translation), made it possible to reconnect the north-south links severed by the expressway. The approach used was primarily based on a definition of urban space as a backdrop for major real estate investments. The quality of development of these public areas led to an increase in the value of adjacent lots. The construction of new buildings was meant to make funding of these new spaces possible by way of property taxes generated by the value added in the area. The project

Figure 4. Subcomponents of the planned fabric and building implementation:
(A) Public squares with vegetation and trees in rows; (B) North-south road network and express-
sway (in black); (C) Lot division linked to operations at the scale of the "urban island"; (D) Built
environment: towers (in black); intermediate buildings (in dark grey); gallery-buildings (in grey);
row houses (in light grey) and restructured Victoria Square and new Place Jean-Paul-Riopelle; (E)
Adaptation of buildings to the topography by way of a pedestal; (F) Introversion of gallery-buil-
dings; (G) Parts of buildings above streets; (H) Facades of the Palais des Congrès opening onto the
new Place Jean-Paul-Riopelle (photo, S. Poulin); (from the updated cartographic database, Ville
de Montréal, 2002, and photos M. Gilles 2015).
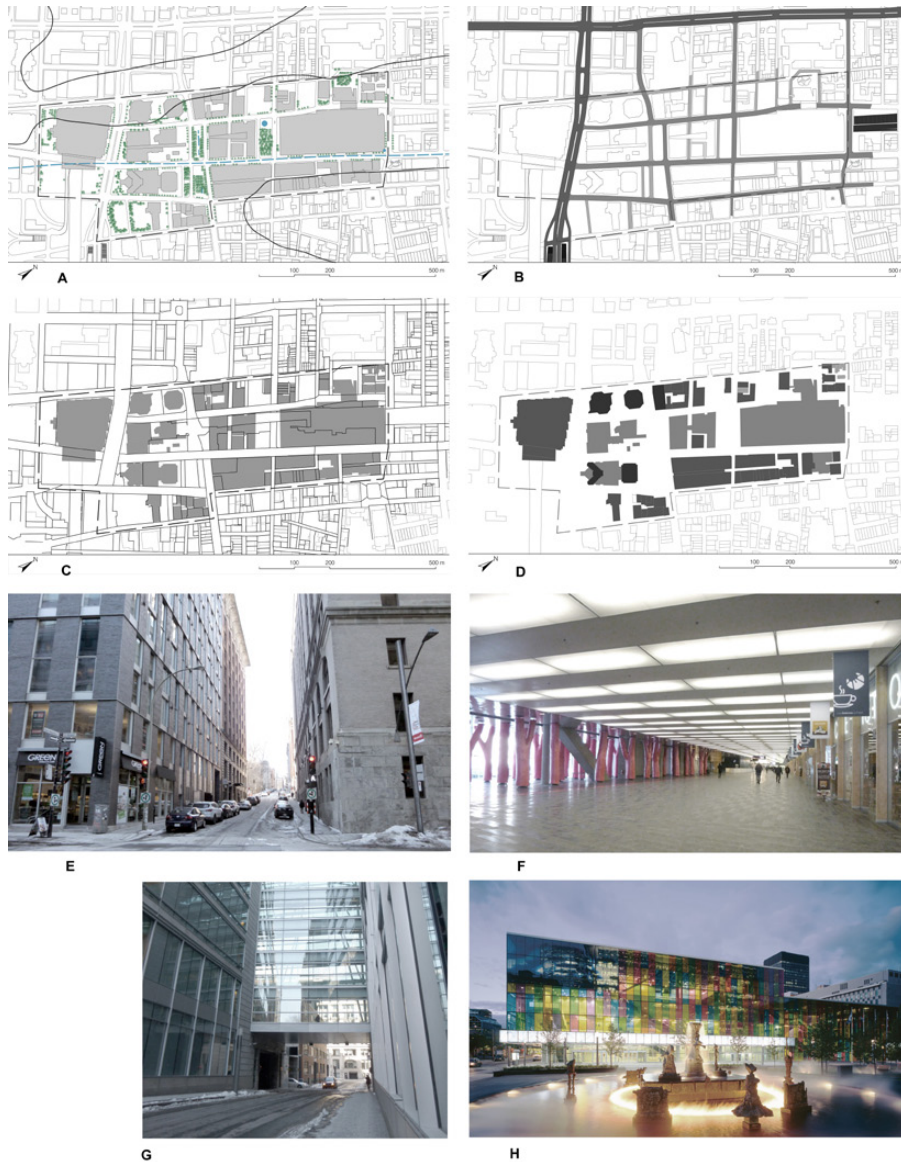
was characterized by a definition of urban voids as emerging forms of the city. The built
environment was conceived as an essential complement to the contours of these reco-
gnizable public areas. As such, the project designers drew upon the building traditions of
traditional European cities.

Project execution analysis
    The urban designers prepared a unified development strategy for increasing people's
access to the area's streets by reducing street sizes and widening sidewalks, by systema-

tically planting public squares and roadside trees, and by using high-quality materials and specific street furniture conceived by the industrial designer Michel Dallaire (Figure 4 A). The major real estate projects were carried out based on the comprehensive plan conceived by the urban designers with an emphasis on the north-south road network that superimpose itself over the expressway (Figure 4 B). The expansion of the *Palais des congrès de Montréal*, with the intention of giving the building an important entrance facade on a new public square and the construction of a new head office for the *Caisse de dépôt et placement du Québec*, rising above the highway, established a set of new blocks giving form to public spaces. These operations often go beyond the scale of the "urban island" (Figure 4 C). Place Jean-Paul-Riopelle and Victoria Square, re-established the north-south public space network of this part of Montreal even if some sides of the urban spaces are still to define (Figure 4 D). An underground network was also marked out to link the two sections of Montreal's underground city, connecting the shopping malls of the blocks of large buildings to the subway stations and to underground parking.

How the project was received in periodicals and publications
The *Quartier International de Montréal* received 20 Canadian and Quebec awards of excellence for its design and the quality of its implementation management. In a special edition of the journal *Continuité* regarding new urban spaces, published in 2005, Renée Daoust, project designer, states that this is the most important restructuring initiative in downtown Montreal. Further afield in North America, Rahul Mehrotra, writing about the project in Harvard Design Magazine, made the following observation about the project: "*First, it challenges the role of the urban designer in the city (…). Second, (…) it involves alteration, repair and preservation, additions - all working simultaneously but reinforcing cohesively the urban form of the place - and in that way it enriches the historic fabric of Montreal.*" The project's main asset thus lies in the urban designers' capacity to cohesively structure the existing fragments of the city while creating an urban fabric which re-establishes the continuity between the city centre of Montreal and its periphery.

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Conclusion

The analysis of these three projects completed between 1966 and 2004 shows the evolution of urban design practices in Montreal over a period of 40 or so years. The comparative table illustrating the configuration of various components of the urban fabric and how the built environment was put in place for the three projects analyzed reveals how the syntax of the planned fabric evolved (Table 1). As regards the five components of the urban design projects, we note a growing sensitivity with respect to the characteristics of the site and a desire to link the projects with the site where they took shape. The structuring of the road network for the projects tended to consolidate increasingly over time and to follow Montreal's existing grid in this regard. Lot demarcation nevertheless remained a major challenge in the structuring of the new fabric. Except for the Bois-Franc project, the scope of operations often far exceeded the logic that governed the structuring of Montreal's typical 7.5 metre-wide lot, even though this modularity was crucial in matching new urban forms to their immediate environment. From the regrouping of lots to the establishing of blocks of buildings, the former division of Montreal's lots tended to disappear as the urban projects took shape. The types of built environments were also being renewed in the projects considered. Notwithstanding the typological diversity uncovered, the tendency was for the proposed types to be deployed horizontally, so as to establish a relationship with the ground as well as with urban space.
Concerning how the buildings were put in place, the role of the built environment in the definition of urban space is highlighted in the projects, with the built environment being a primary characteristic of the site. The relationship between this environment and the street network increasingly became a key aspect in the constitution of the new planned fabric as well as in the consolidation of the existing one. This role included defining a hierarchy of the streets even if the link between ground floors and street space remained problematic. Given that lot division no longer played the key structuring role in forming

Table 1. Comparative table of the relationship of the three projets to Montreal's fabric and typologies.

Typo-morphology	Îlots Saint Martin (1966-68)	Bois-Franc neighbourhood (1988-93)	Montreal's international district (2000-04)
Urban design approach	Modernist with a nascent sensitivity to the heritage of the traditional city, aligned with the street with an internal network, above-the-street urban planning.	Postmodernist with references borrowing from urban tradition, organizational meshing of the built environment with the street and squares.	Contemporary with a study of existing morphology, continuation of the grid, consolidation of and addition to the existing network of public spaces.
Site configuration	Regularization of the slope in order to develop three successive plateaux of semi-public courtyards	Creation of a basin hydrography in order to characterize the neighborhoods.	Reinstatement of a formal (Victoria Square) and informal (Place Riopelle) urban landscape.
Street network	Continuity of the existing streets	Hierarchical roadways made up of boulevards, avenues and local streets that crisscross one another.	Continuation of the peripheral and orthogonal grid of Montreal's road network.
Plot subdivision	Grouping of former lot divisions in one single property.	Network of lots defined according to the hierarchy of roadways.	Important land division according to a logic at the scale of "urban islands."
Built Environment	Apartment block system incorporating and reinterpreting the row houses template	Recovery of the types of cities, plexes, row houses and semi-detached houses and apartment buildings.	Buildings based on an organizational pattern pursuing a more introverted logic, buildings forming "urban islands."
Open Spaces	A network of open spaces made up of an autonomous network courtyards and passageways.	Public squares at the intersection of major roadways and more inward-looking squares.	Creation of a new square and restructuring of Victoria Square.
Relationship built environment / site	Raising of the southern portion of the project, isolating the built environment from boundary roads.	Adaptation of the built environment to the hydrographic network, facades overlooking waterways.	Desire to avoid a disjuncture between the ground floor level and streets and squares.
Relationship built environment / street network	Successive withdrawals preventing buildings from lining up along streets and passageways.	Relationship between the typology, template and roadway hierarchy, a more tenuous relationship along local streets.	Buildings define the boundaries of built "urban islands" and have fewer links with east-west streets.
Relationship built environment / plots	Except for row houses, buildings are put in place without adjacent appropriable abutting strips.	The built typology and its position in the grid determine the lot size.	Buildings go beyond the division and intervention framework of the lots (mega-structures)
Relationship built environment / open spaces	The elevated segment of the fabric has prevented a sustained definition of collective spaces by the built environment.	Urban spaces were defined at the same time as the built environment, no buildings on local streets connecting squares to major avenues.	Buildings serve to define open spaces, public squares conferring a status to buildings.
Summary	Six subcomponents lack of relationship to the syntax of Montreal.	Three subcomponents have a strong link to the urban fabric of Montreal.	Five subcomponents have a strong link to the syntax of the urban fabric of Montreal.

Key	Weak Relationship	Medium Relationship	Strong Relationship

the fabric of city and periphery, more leeway was available with respect to the shape of buildings and the volumetric articulation of the built environment. A fundamental realization emerged from our research work: we have moved from a desire to autonomize the form of the built environment to a perspective of re-giving architectural form a decisive role as a structuring agent of urban space and as an engine for constituting savvy urban fabric projects for Montreal. This has taken into account changes in the method of organizing the planned fabric, increasingly based on a rigorous interpretation of Montreal's urban form, thus helping to structure the urban fabric with an eye to promoting morphological and spatial continuity.

References

Barcelo, M. (1998) 'Profil Jean Ouellet: les îlots Saint-Martin, petite bourgogne', *ARQ architecture-Québec*, 102, 18.

Beaupré, P. (1982) '25 ans de logement social à Montréal', *ARQ Architecture-Québec* 6, 9-15.

Bergmann, B. (1996) 'L'autre Bois-Franc: inflexion pour le temps. Une grammaire urbaine' *ARQ Architecture-Québec* 90, 12-14.

Choay, F, Merlin, P. (1988) *Dictionnaire de l'urbanisme et de l'aménagement* (PUF, Paris).

Daniel Arbour et associés (1992) *Plan directeur de développement: version finale, Bois-Franc* (Ville Saint-Laurent, Montréal).

Daoust, R. (2006) 'Quartier international de Montréal à l'enseigne de l'innovation', *Continuité* 107, 36-38.

Ellin, N. (1999) *Postmodernism Urbanism* (Princeton Architectural Press, New York).

Gauthier Guité Daoust Lestage inc. et Provencher Roy et associés (1998) *Quartier International de Montréal esquisse, présentation intermédiaire* (Ville de Montréal, Montréal).

Gauthier Daoust Lestage inc. et Provencher Roy et associés (1999) *Le projet du Quartier international de Montréal, volet aménagement : esquisse préliminaire* (Ville de Montréal, Montréal).

Gauvreau, B. (1998) 'Ville et vie de famille: une équation plus qu'agréable à Bois-Franc', *Québec Habitation* 15(5), 24.

Lachapelle. J. (2009) 'L'histoire en deux temps des HLM à Montréal', *ARQ Architecture-Québec* 149, 20-23.

LeCorbusier (1923) *Vers une architecture* (Éditions Crès, Paris).

Legault, G.R. & Affleck, R. (1971) 'Ilots Saint-Martin', *Canadian Architect*, 25-28.

Legault, G.R. (2002) *La ville qu'on a bâtie. Trente ans au service de l'urbanisme et de l'habitation à Montréal, 1956-1986* (Éditions Liber, Montréal).

Lévy, A. (1992) *La qualité de la forme urbaine, Problématique et enjeux* I (Ville, Recherche Diffusion, Nantes).

Mehrotra, R. & Rose, P. (2014) 'Incremental urbanism from Montreal', *Harvard Design Magazine* 37, 48-53.

Nolin, N. (2002) 'Marketing: Habitation et golf, une bonne carte?', *Québec Habitation* 19(4), 22-26.

Office municipal d'habitation de Montréal (1994) 'Les 25 ans de l'Office municipal d'habitation de Montréal', *ARQ Architecture-Québec*, 1-23.

Ouellet, Reeves, Alain Architectes (1967) *Petite Bourgogne, îlots Saint-Martin: maisons à conserver. Une étude traitant de leur état et des réparations nécessaires,* (Ville de Montréal, Service de l'habitation, Montréal).

Panerai, P. et al. (1980) *Éléments d'analyse urbaine* (Archives d'architecture moderne, Bruxelles).

Pinon, P. (1991) *Lire et composer l'espace public* (Éditions du S.T.U., Paris).

Racine, F. (1999) 'Degré de discontinuité dans la transformation du tissu urbain au Québec, l'influence des types suburbains' unpublished PhD thesis, Université de Montréal, Canada.

Sauer, L. (1995) 'The public open space urban design framework for Bois-Franc: a new town in Quebec' in Vernez Moudon, A. & Attoe, W. (eds.) *Urban Design: Reshaping Our Cities* (College of Architecture & Urban Design, University of Washington, Seattle) 172-178.

Sauer, L. (1994) 'Creating a Signature Town: the Urban Design of Bois Franc', *Plan Canada* (September) 22, 27.

Sokoloff, B. (1999) *Barcelone ou comment refaire une ville,* (PUM, Montréal).

Venturi R., Scott Brown D., Izenour S. (1972), *Learning from Las Vegas,* (MIT Press, Cambridge).

Vernez-Moudon A. (1994) *Built for Change, Neighborhood Architecture in San Francisco* (MIT Press, Cambridge).

Ville de Montréal (1966) *La Petite Bourgogne, première étape : îlots Saint-Martin* (Service de l'urbanisme, Montréal).

Ville de Montréal (1968) *Les habitations des îlots Saint-Martin. Territoire de rénovation de la Petite Bourgogne,* (Service de l'urbanisme, Montréal).

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Rural Tradition and New Architecture. The Schools of Alfredo Lambertucci

Pisana Posocco
DiAP Department of Architecture and design, "Sapienza" University of Rome, 53 A, via Gramsci, 00197, Rome, Italy
Keywords: rural architecture, school, church, reconstruction

Abstract

Among the first architectural works of Alfredo Lambertucci there are churches and schools. This projects occupied him between 50s and 60s. They were both issues that brought with them a strong sense of renewal, both ethical and architectural.

At that time in Italy the Church was entrusting modern architects whit the design of new sacred building: in those works the desire for a renewal passed often through the recovery of stylistic features and compositive processes borrowed from the rural world. Referring to school in the very same years it was undergoing a radical reform: the need for new schools was real and urgent and architects were encouraged to experiment new functional units which exceed the centrality of the classroom.

Immediately after WWII the architectural debate is aimed to re-define new features for the reconstruction; schools and churches should have been the "monuments" of a community, namely in suburbs and rural areas, public artifacts made to feed the post-war Italy ethically and spiritually. In those years were published the Carbonara's Architettura pratica volumes and featuring, in separate volumes edited one after the other, the topic of "churches" and "buildings for education and culture". Lambertucci, as many other colleagues did, collected this volumes in his library.

He have been studying these issues for a long time and dedicated some essays to the school building, starting from a survey of the small rural schools in his hometown. Both building types, in the work of Lambertucci, are structured as rural households, both in terms of morphological and linguistic features, becoming autonomous organisms and references to the area.

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Introduction

The theme of school construction has always been present in Alfredo Lambertucci's professional career, from the beginning to his latest works. This paper will focus on a group of schools designed and built by the 1960s.

Being an architect in Italy during the Reconstruction period: Alfredo Lambertucci's education

Alfredo Lambertucci was born in the Marche region, at Montecassiano. During his youth he had a passion for painting, encouraged and supported by the artistic and cultural context of Macerata[1]. He devoted himself to painting so much as to choose it as a profession, and in 1947 he went to Rome to attend the Accademia di Belle Arti. Several events brought him to enrol for the faculty of Architecture, where he will take his degree in 1953.

What was Alfredo Lambertucci's background when he took up his first jobs? His youth in the Marche, away from the more lively Italian cultural centres pushed him to compensate the lack of external stimulus with great powers of observation of the context; as a painter who scans objects and landscapes, his curious and careful gaze helped him develop the ability to grasp shades and textures, and to assess the plastic characteristics of a given object individually or in relation with other objects. At the beginning, his surrounding world was his school; the complex agricultural installations and the small urban centres of the Marche constituted his first formal and organizational references, that will leave an indelible mark on his work; also the powers of observation of materials and their traditional uses will be fundamental elements of his work.

This was his background when he started the School of Architecture, that at that time was undergoing some important changes: indeed, after the Second World War and the fall of Fascism, Piacentini and Del Debbio had been sent away, the latest temporarily replaced by De Renzi who taught Interior Design; Lambertucci met him on this occasion and the professor probably nourished his curiosity. In the book *La Facoltà di architettura di Roma, nel suo trentacinquesimo anno di vita* (1955) one can find indications on courses, professors and associate professors of the time, together with images of the best students' works, among which are the drawings of Lambertucci for the course of Interior Design, furnishing and decoration I and II, a course that from 1940/41 onwards became biannual and was led respectively by De Renzi (on the third year) and Ballio Morpurgo (on the fifth year). Some drawings of Lambertucci illustrated also the Course of Architectural Design I and II, in particular, the exams of the fourth and fifth years led by Arnaldo Foschini. In the book Lambertucci also appears among the associate professors of the Course of Design, exam of the third year, led by professor Roberto Marino. The latter, according to Carlo Melograni, was the best design professor until the arrival of De Renzi. The latter was one of the youngest professors, and thus was not anti-modern; indeed he was probably the most open to the experiences of the Modern Movement and the works of foreign architects[2].

Besides the academic courses, Lambertucci, looking for a job, worked in some architect firms owned by his professors, especially the ones of Piacentini and Ballio Morpurgo, but also those of Sacripanti and Perugini; he also drew perspectives for young architects met at the school and who are only a few years older, such as Dall'Olio[3].

To use the words of Tafuri (1986) the studying and education years in Rome provided Lambertucci with two different initial drives, maybe opposed but complementary: a visionary utopia from Quaroni and Ridolfi's empirical realism, which he probably knew through APAO but also through De Renzi, and the professional work in his professors' firms.

[1]Important references are the painter Tulli and the sculptor Peschi.
[2]Indications taken from a conversation with professor Carlo Melograni, that took place on 21 May 2015 in Rome. I owe him these indications and many other suggestion and ideas, for which I am very grateful.
[3]Cfr. A.Bruschi, *Introduzione in Giancarlo Rosa* (edited by), Realtà, disegno, forma. Architetture di Alfredo Lambertucci, (1983).

Figure 1. Alfredo Lambertucci, Studies on rural schools in Marche's countryside villages 1950 (?). He made a census of the different spaces that organise the building: the teacher's house, the classroom, the shelter for animals. These sketches also return the position of the school in to the urban settlement.

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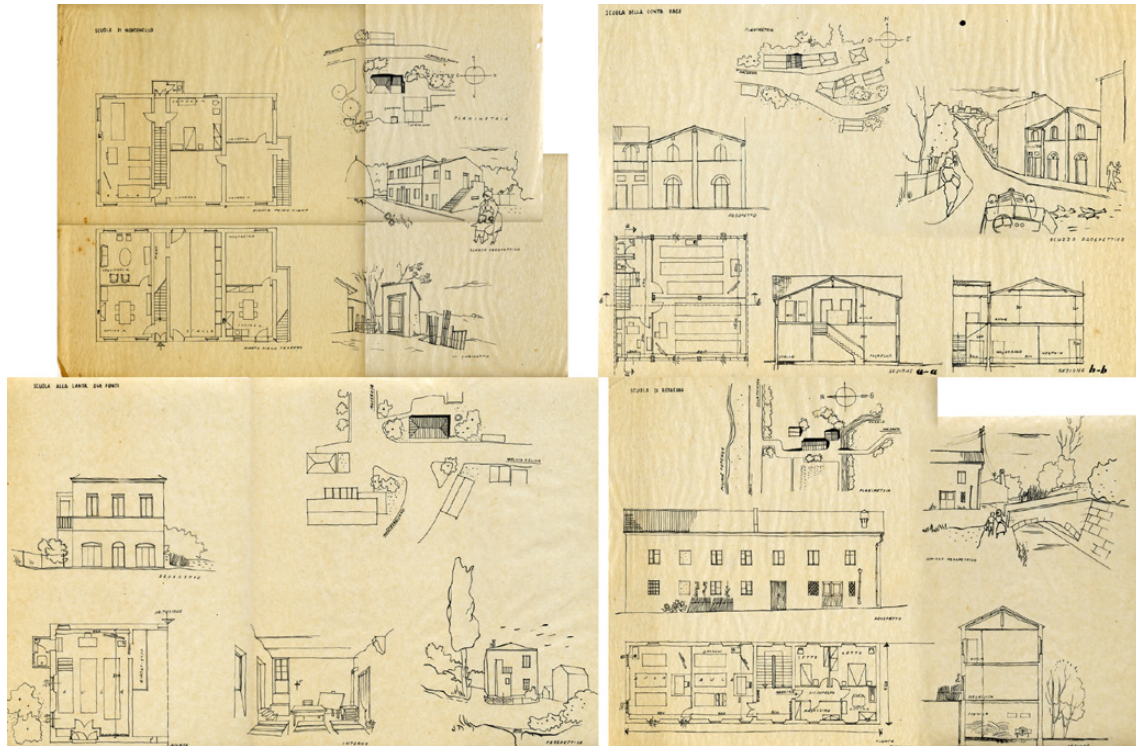
This was his background when, in 1953, after graduating from the university, he decided to enter the professional life.

Post -WWII architecture, especially the Roman one, has often been described as having a neorealist inclination. I do not think we can apply this characteristic to the work of Lambertucci (for reasons of age and personal history: maybe he was too close to the world that neorealism wanted to represent and, in order to reproduce it, a certain distance would have been necessary), but he was nevertheless aligned with the most sensible and engaged way of doing and "conceiving" architecture.

In the introduction to the novel *Il sentiero dei nidi di ragno* (1947), written in 1964, Italo Calvino observed that neorealism or realism, was a known and common language, "the anonymous voice of the age, which comes across more strongly than my own individual inflections which were still rather uncertain"[4]. Perhaps, this brief introduction is more useful than many books on architecture to explain what was built in that period and how. Quoting Calvino once again, and reading the passage as a commentary on architecture, also the one of Lambertucci, "*Neorealism* was not a school. (Let me try to be precise about these matters). It was many voices combined, mostly voices from provinces, a many-sided revelation of the different Italys that existed, a revelation also – and in particular – of the Italys that had been least explored by literature. Without this variety of different Italys, each of them unknown to the other, or which we believed were unknown to each other, and without this range of dialects and local forms of Italian which were to be leavened and moulded by the literary language, *Neo-realism* would never have existed. But it was not simply an updated version of nineteenth-century regional *verismo*. The local setting were intended to give a flavor of authenticity to a fictional representation with

[4]See Italo Calvino, *The path to the spiders' nests,* by Archibald Colquhoun, London, Jonahtan Cape 1998; preface's translation by Martin McLaughlin. Page 8

Figure 2. Alfredo Lambertucci, Consalvi parish complex, Macerata, 1953-60.

which everyone the world over would be able to identify. […] "That is why the language, style and rhythm of what we wrote had so much importance for us – for this realism we stroke for, which was at the same time intended to be as far removed as possible from nineteenth-century naturalism"[5]. Later in the text, when describing his characters, the partisans, some more virtuous than others, he says "Even those who threw themselves into the struggle without really knowing why acted on an instinct based on human solidarity, an urge which made them a hundred times better than you, and made them active participants in the course of history such as you will never be, even in your wildest dream!"[6] and perhaps architects who worked in the Reconstuction period had something in common with the partisans of Calvino.

Perhaps this is the way to look at the works of Alfredo Lambertucci in the 1950s and 1960s.

First projects

His very first projects dealt with specific themes: he took part in a number of contests for commemorative monuments. He won and built one at Solferino, together with a few small funeral chapels. Besides the theme of the monument, an architectural discipline par excellence, he challenged the condition of architecture as a social instrument and a factor of human redemption.

His very first assignment dates back to 1953, the same year he graduated from the university; it was a parish complex at Consalvi, a rural area near Macerata. He started the project when he was still studying at the faculty of architecture. In effect, the first part was the result of the exam of Architectural Design I and II, which he developed under

[5]ibidem page 10.
[6]ibidem page 16.

the coordination of Foschini[7]. The church designed for the exam has several elements in common with the one he built and it could be considered as its origin. The parish priest of the church of Santa Croce in Macerata will help him propose the idea to the Diocese. The works, carried out in subsequent phases, will be completed in 1960[8].

In the following years Lambertucci received many assignments for different kinds of schools: in 1955 with Claudio Dall'Olio he took part and won the competition for the faculty of Pharmacology in Rome and, with Antonio Manzone, he designed a project for a school complex in Cremona[9].

In 1960, the XIIth Triennale di Milano was dedicated to *The House and the School*. These were the years when, in Italy, a debate started on the reform of the national education system. The Triennale launched a competition on school buildings, and in particular, on the relationship between design and education and the relationship between the school institution and the surrounding context. Three different situations were proposed: urban, suburban and rural. Lambertucci won with a proposal for a school in the rural area of Rovigo that will subsequently be completed[10]. The same year, Lambertucci received the commission to build an industrial technical high school at Recanati, where two years later (1962) he would build a primary school at Castelnuovo.

The church in Consalvi and some schools he built in that period were similar in their architectural structure and in particular in their planning. Both approaches involved a deep sense of renewal, both ethic and architectural, and often this urge for renewal passed through the recuperation of styles and design processes taken from the rural world. In those years the prolongation of mandatory school until the age of 14 was under debate; the need for new schools was urgent, and designers were free to experiment new functional units that would go beyond the central role played by the classroom.

The school architectural organism between program and typology

Towards the end of 1950s and at the beginning of the 1960s, school construction was given a great attention. The research was particularly intense in Rome, where it was directly or indirectly connected with the Faculty of architecture. In 1958, the volume III of Carbonara's *Enciclopedia* was published, whose second tome was dedicated almost exclusively to the *Building for education and culture*. The part concerning more specifically the construction of schools will be coordinated by Ciro Cicconcelli, a Roman architect, a few years older than Lambertucci, who was also teaching at the university. After the drafting of the chapter on *Practical architecture*, Cicconcelli's efforts will be fundamental to promote the Centre for Studies on School Construction within the Ministry of Education, which gathered, among others, P. Carbonara, A. Gatti, D. Gatti de Santis, and C. Fera. Their work will result in the publication of the *Quaderni del Centro Studi per l'Edilizia Scolastica*. Moreover, in those years, many magazines published monographic issues about school. Many of the above mentioned books were part of the Lambertucci's library, and some of them were largely consulted[11].

Such a ferment would result in the Law of 1962 on compulsory education. The Centre for Studies of the Ministry will go on studying typical school configurations, and will produce and publish books with model schemes for the various school grades that will be subsequently built. In these books, beside a great enthusiasm about school, which

[7]See page 120.
[8]It will obtain the prix IN/ARCH for the Marche in 1962 and will be published in «L'architettura» issue No.89, marzo 1963, and No. 97, December 1963.
[9]The contest will be published on «Architettura Cantiere» No. 24 of June1960.
[10]The projects for the contest, that tool place in two stages, have been published in «Argomenti di architettura» No. 1 and No. 4, in «Casabella» No. 245. Documents on the contest are in the archives of Lambertucci and the Triennale di Milano.
[11]Among the magazines : «L'architecture d'aujourd'hui», *L'architecture et l'enfance*, No. 25, 1949; «Casabella», *Special issue devoted to school*, No. 245, 1960; «Architettura Cantiere», *La scuola in Inghilterra*, No. 25-26, 1963; among the books: Aloi Giampiero, *Scuole*, Hoepli, Milano 1960; Luigi Romanini, *Costruire scuole*, Garzanti, 1962; Alfred Roth, *The new schoolhouse*, Girsberger, Zürich 1957.

is emblematic of the idea of a physical but also social and moral reconstruction of the country, a dispute arose on the best approach to deal with topic. On the one hand, there was the tradition of the *Distributive features of buildings* which had been classified in historical, functional and typological terms (*ante litteram*) for school construction; on the other hand, a research was starting on architectural models and urban morphology, stemming from the works of Argan, Aymonino and Rossi.

Despite this proliferation of books and researches on types and typologies, when referring to a school building, the term *organism* was most often used, which underlines a gap between the function and the opportunities that the building and its specific configuration could offer. It seems as if a research on the program was allowed to replace a purely functional vision.

The school does not only educate but also shapes the new citizen, therefore it is not only the place where notions are learnt, but also a place where social relationships are started among children that will later become citizens. This approach has an effect on the architectural scale: the school is conceived as a building with a high civic value, that represents a community. In Lambertucci's schools the lesson taken from Quaroni seems to resound: "In the idea of an organic neighbourhood there was a trust and an utopic vision of kindergarten and schools as centres for residential life, for the educational value they would and should have, for the symbolic value they represented, in the shaping of the democratic conscience of citizens towards the elimination of social classes and towards the optimistic, celestial collaboration between these two as well as between peoples, nations, continents"[12].

Furthermore, in the construction of the internal spaces, the role of the classroom is no longer central and unique: the classroom is just one of the cells, and the role played by the common spaces - those spaces for activities not only focused on traditional teaching - emerges as critical. In the new school, special classes, gymnasiums, theatres and the large meeting areas among classrooms, will play an increasingly important role.

The schools of Lambertucci

As already said, Alfredo Lambertucci started to focus on school building when he took part in the competition for the Institute of Pharmacology in 1955: that project, which was done with Dall'Olio, and the subsequent assignment, will be an important occasions for him. However, the topic of university construction can only partially be assimilated to the debate involving school architecture, a debate in which Lambertucci will take part through projects, works and books[13].

In the first seven years after he graduated from university he will design five complexes for primary and secondary schools, out of which four will be built. It can be useful to remember that his mother, Maria Burchi, and his uncles and aunts were well reputed teachers, very much involved in their work and probably, the passion and the engagement for spreading and improving education was promoted firstly in his family environment. A number of drawings has been found in the archives, that seem to suggest a little research on rural schools around Macerata. Lambertucci draws again, with a vivid and caricatural style, the little schools that often correspond to a simple classroom, he gives them an arrangement and a position within the building structure, generally composed of a building which hosts the teacher's house, the classroom and a shelter for animals. These small rural buildings were places of reference for the territory.

In order to better define the architectural activity of Lambertucci and its importance it is useful to remember that the reform on education was voted on 31 December 1962. The

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[12]Ludovico Quaroni, *Politica del quartiere*, in «Urbanistica» No. 22, July 1957, page 7.

[13]Beside the projects, he will write a few articles on this topic: "Edilizia per la scuola" and "Edilizia per la scuola materna", both published in the magazine «Riforma della scuola» No. 5 May1963 and No. 12 December 1963 and "Significato dell'architettura scolastica nella cultura architettonica contemporanea" of 1966. These are the first articles written by Lambertucci, and this fact has a certain importance especially when considering the low number of theoretical texts written by design professors at that time, in particular by Lambertucci.

Figure 3. Alfredo Lambertucci, Recanati primary school, 1960-67.
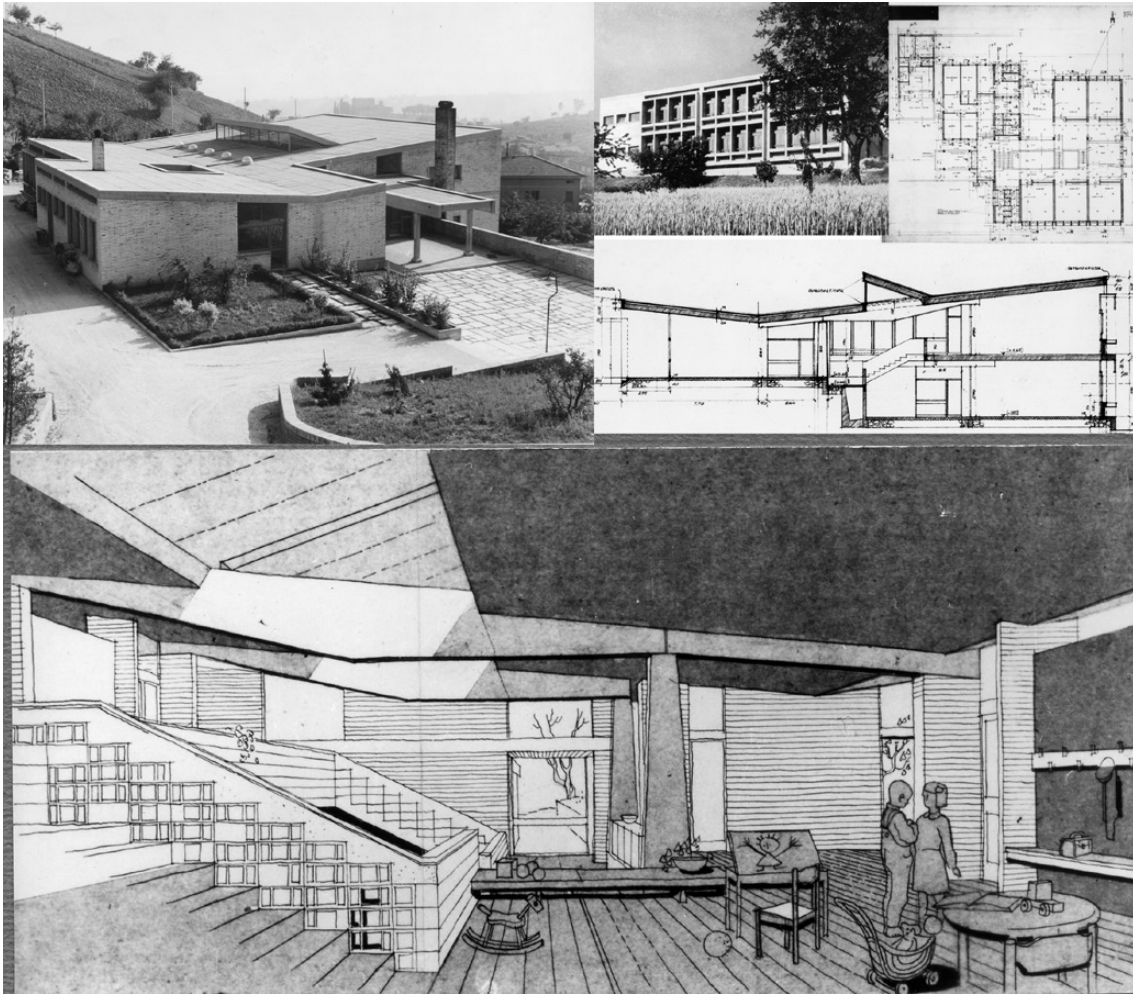
school reorganisation was a much debated issue since the end of World War II: in 1948 the right to education, free and compulsory, was inserted in the Constitution (art. 34), then a number of reforms were made, up to the introduction of the single middle school, rightly in 1962. In those years the number of people taking the middle school diploma will sharply increase, along with an increase in the birth rate. This situation supported the need for new schools. And right in the years when the school reform will experience the liveliest debates, Lambertucci works on it from an architectural point of view.

Lambertucci can grasp the hottest themes and re-elaborate them in interesting ways. In the text written by Cicconcelli for the *Practical Architecture* of Carbonara a few doubts arise on the usefulness of a strictly historical and typological classification: after a review on the evolution of architectural models linked to school construction, the author analyses "the design elements of the architectural organism of the school". Also Lambertucci, since his very first projects seems to take this approach for granted: his schools are never like 'barracks' with a central corridor and classrooms on both sides. Since the start Lambertucci will support school as a place for social promotion and he will also be interested in its urban role and the distribution of schools over the territory as well as the possibilities for an integrated use of schools and public services. He will concentrate in particular on the "value that space [...] has as an educational factor"[14] and he continues: "But how many of the dwellings we build today have a civic value and are the result of a reflec-

[14]See A. Lambertucci, *Edilizia per la scuola materna*.

Figure 4. Alfredo Lambertucci, School complex in Rovigo, 1960.
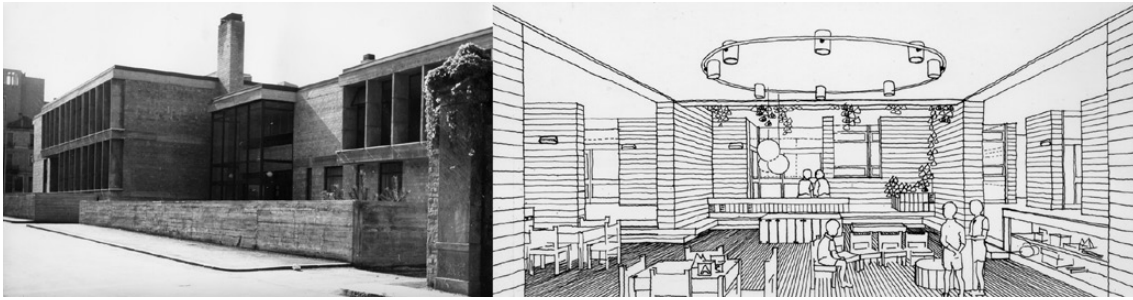
tion which verified them in all their implications which make a work valuable from a social point of view? Isn't the lack of coherence, the same lack of life, humbleness, poetry which characterizes a lot of our towns the same that guides the design of the dwelling where we live and where we would like to raise our children? What has the strongest influence on a child: the town as a whole and his house or the wonderful oasis of the school, and which is the conflict between these two aspects?"

In particular, Lambertucci starts immediately to explore the theme of common space, i.e., the transformation of the functional corridor into a meeting place. The first attempts were already visible in the competition for Cremona, but it is in the contest launched for the Triennale that he will further develop this topic. Special classrooms will be added to traditional classrooms and they are all arranged around large common places that allow for different uses and aggregations. When preparing the curriculum for the competition for an university chair of *Design elements* he adds, to the copies of drawings and photos of projects, some very brief notes. In the description of the project for Rovigo he outlines the "idea of a single functional nucleus within which the two distinct spaces for the first and second cycle are connected through large *meeting* areas". This theme will always be present in his schools, indeed it is one of the most relevant and interesting themes: the whole school complex is built around a meeting space.

This internal space is the pivot of the small primary school of Recanati: "The steep landscape has partly suggested the space and distribution organisation of the internal part, on which I concentrated my attention, in the attempt to give birth to a centralised and compact building, though rich of different elements, so as to make the place easily readable and accessible to children. The main structure is in ordinary solid exposed bricks both internally and externally"[15].

The community spaces take on, from one project to another, important plastic values and in particular the planimetry is associated, when possible, to a refined section work. The most successful example is maybe the one for the primary school of Recanati in which the classrooms give on a common space that replicates internally the sloping ground so that the common areas are placed at different heights; in this way spaces look at each other, with almost a theatrical attitude, and the common space becomes like a small urban place, similar to those little towns of Marche built on the edge of the hills, with little squares and connecting stairs. To strengthen this feeling of architecture that becomes a town, Lambertucci uses and chooses typical materials of local architecture, in particular the typical bricks of the Marche[16]. He uses simple, ordinary bricks and in the primary school of Recanati they are used both for the interior and the exterior. For railings, and with amazing results, he uses perforated bricks, laid out tangentially. The craft way of studying details, typical of the Roman environment in those years, is absorbed by Lam-

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[15]Taken from the curriculum for the competition for a university chair.
[16]Perhaps it is useful to observe that the yellow brick had already been consacreted as a modern material in the Roman context, in 1960, when it had been largely used for the construction of the Olympic Village; among others Moretti, Libera, Luccichenti and Monaco.

bertucci who, following the example of Ridolfi[17] will compose prospective walls working in a traditional way with reinforced concrete shaped and visible, maybe imitating the work of P.L. Nervi, who had been his professor.

He uses different modalities for the common spaces of the industrial-technical institute of Recanati. The project seems to consciously take on the challenge at a larger scale. The institute is built like a portion of town, with the Albertian shape of a palace and the common space for students is like a square, or better like the courtyard of a block of buildings. In the initial project the approach to the building ended in a central courtyard along the different buildings, accessed through a low arcade. The building then appeared as suspended, modern, almost a quote of the Bauhaus building seen as the emblem of rational architecture as appeared in the publication of 1951 of Argan on Gropius[18].

This low building narrows the perspective and shapes the court that is visible from the entrance with its bright colour beyond the chiaroscuro of the arcade. Now the building has been modified and the access arcade has been filled in.

Within the building, near the classes and on the junction sections, some smaller common spaces are added, according to the specific uses by the students of the corresponding classes. Though simple in its style, the building offers some amazing results in the study of light and transparencies: the roofs are articulated and especially in technical laboratories the traditional industrial upper lighting opens the section and transforms its space, as well as the alternating walls of brick and glass, a theme that had already been explored for the Institute of Pharmacology. This design offers unexpected depths and internal perspectives. Common spaces, as already outlined in the schools of Recanati, were perhaps even more deeply elaborated in the theoretical elaboration for the contest of the XII Triennale.

From an urban viewpoint, these buildings could not be compared to the existing ones since they were part of newly built areas in the suburbs. The only project inserted in an urban fabric was the one for the contest of Cremona. The solution found on that occasion follows the projects of Ridolfi, in particular the project for the middle school of via Fratti in Terni, built in 1953/60. Even though the style used by Lambertucci is simple and in line with the craft tradition of Italy during Reconstruction, it is always used with a difference in that it attributes a civic role to the building.

Furthermore, when he could, he tried to elaborate a project according to which the school could become a reference place, even more so a service for the whole community. In the Technical Institute of Recanati, the library section projects from the rest of the structure to engage the road; since the inception the institute had been conceived for the whole community, independently from the school schedule.

Rural tradition and new architecture

This homogeneous group of schools designed by Lambertucci seems, on the one hand to underline his weak interest for typological research and, on the other hand, demonstrates his great curiosity for the aggregation of independent volumes in order to build small nucleuses where architecture becomes the theatre of a renewed civic life, even promoting it.

After the urgency that characterized the first postwar period, it was now time to redefine the quality of the architectural development in order to represent the new Italy, and within this context, religious buildings and especially schools would constitute, especially

[17]Lambertucci pays a great attention to the work of Ridolfi and, as an example, the detail of the tapered pillars of the buildings of Viale Etiopia is used in some of his young projects: in a project for a residential building near the Colosseum, in the project elaborated during the university studies for the Borsa Merci of Treviso and also in the contest for the school of Cremona.

[18]G.C.Argan, *Walter Gropius e la Bauhaus*, Einaudi Turin, 1951. The text, as recalled by in the *Introduction* to the text edited by G. Rosa (1983) was one of the few on modern architecture that circulated at the university immediately after the war, together with the bool by Zevi *Verso un'architettura organica*, 1945.

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in suburban areas, the real public buildings and the *monuments* of the community. For Lambertucci these projects faced the challenge of building places where postwar Italians would grow up ethically and spiritually. Both types follow, in his work, the footprint of rural buildings, from a morphological as well as a stylistic point of view, thus becoming independent complexes serving as a reference place for the territory.

Schools are built as small urban places. They are one of the first public places where a child goes and learn to know. They represent a key to read and shape the idea of space and community. This has been a very important theme for the Modern Movement and, in the meantime, an indicator of the growth of democracy, of a national conscience, and thus overall the idea of public space.

The path followed by Lambertucci shows his knowledge of the contemporary debate, his ability to articulate it with mastery and grace, and his willingness to realise buildings which are both the image and a tool for a growing and developing Italy.

References

AA.VV. (1982) *Architettura urbanistica in Italia nel dopoguerra. L'Immagine della Comunità* (Gangemi, Roma).

AA.VV. (1996) *Ricerca e Progetto* 8, special issue of the magazine 'Alfredo Lambertucci architetto', 1-136.

Calvino, I.(1947) *Il sentiero dei nidi di ragno* (Einaudi, Torino); (1964) Prefazione.

Casciato, M. (2001) 'L'«invenzione della realtà»: realismo e neorealismo nell'Italia degli anni cinquanta', in Di Biagi, P. (ed.) *La grande ricostruzione. Il piano Ina-Casa e l'Italia degli anni cinquanta* (Donzelli editore, Roma) 205-221.

Conforti, C. (1997) 'Roma, Napoli, la Sicilia', in Dal Co, F. (ed.) *Storia dell'architettura italiana. Il secondo novecento* (Electa, Milano).

Reichlin, B.(1999) 'Figures du néoréalisme dans l'architecture italienne', *Les cahiers du Musée national d'art moderne*, 69, 76-41.

Rosa, G. (ed.) (1983) *Realtà, disegno, forma. Architetture di Alfredo Lambertucci* (Edizioni Kappa, Roma).

Tafuri, M. (1986) *Storia dell'architettura italiana 1944-85* (Einaudi, Torino).

Vagnetti, L. (ed.) (1955) *La Facoltà di architettura di Roma, nel suo trentacinquesimo anno di vita* (Roma).

Senza autore (1993) *Alfredo Lambertucci. Progetti e architetture 1953-1993* (no publisher, no ISBN).

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Sacred space in the architecture of Dominikus Böhm (1880-1955). Geometric-functional analysis and structural morphology

Giovanni Carbonara
Consorzio Argonauti: DARC, Roma Tre University, and DICAR, Polytechnic University of Bari

Abstract

At the beginning of the twentieth century in North-West Germany, the Dominikus Böhm's project experience is characterized by the systematic research for a spatial morphology according to the changing liturgical needs of the Catholic Church. He significantly contributed to the definition of new style and functional standards - adopted by the Second Vatican Council - through formal and technical innovative solutions: investigating organic-structural systems, geometric-functional relations and materials technological aspects. He developed a common language, shared with other architects like Martin Weber and Rudolf Schwarz. Special harmony of proportions mattered through shapes that allow a uniform redistribution of the load (it requires no buttresses or other support elements). Generally, his buildings reached acoustically effective outcomes accommodating all the believers and the officiants without visual and acoustic obstacles. Considering he built about eighty churches following building German tradition, within this essay three are main buildings will be focused; five are the morphological categories will be analyzed: i) the layout (unidirectional and multidirectional systems, central and elliptical plans), ii) the internal elevation (according to different geometric configurations), iii) constructive materials (bricks, wooden solutions and concrete), iv) structural elements (bearing walls and pillars), and v) the element of the 'façade' (in its volumetric aspects).

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Introduction

The abundance of imagination and creative force gave Dominikus Böhm[1] an amazing wealth of new space ideas for church buildings to continue his great tradition to have an effect like a "spiritual house of living stones". He understood the church project from the newly conceived spirit of liturgy and faith attitude. With the resources and opportunities of his time's construction by large builder proficiency, he knew how to condense his space thoughts for autonomous expression form of convincing sacred effect.

Besides the self-consciousness in the baroque tradition of his Bavarian homeland, Böhm's early church projects[2] showed an unusually strong contrast effect of the light. Features of his mature works are self-represented. Because he did not allowed to build these projects, he illuminated the solidification of the eclectic Church *Bauform*[3] since Romanticism in the last century.

In the dispute over Modern Architecture, the material and its use were crucial points. In 1927 Ludwig Hilberseimer published an essay "churches in reinforced concrete" in which he accused Böhm to be next A. Perret (Église Notre-Dame in Le Raincy, 1923) and K. Moser (Antoniuskirche in Basel, 1926); their buildings are "without the slightest reference to the new material" and "might is as well as set out in concrete stucco". He sparked violent reactions and published six essays within a year. Schwarz replied, "A church is a religious work and not only a technical exercise". The architecture historian Adolf Behne stated: "The use of new building material (...) acts already a sensation, although neither Perret nor Moser [Böhm was not mentioned] changed the slightest typical spatial structures to the traditional ones".

Light guide

Böhm understands light "as a building material for delicious sacred ordination of space", as "building material that is given us directly from our Lord"[4]. This "mystic light" accesses medieval ideas. For the medieval natural philosophy, which had no concept of energy and waves, light was a substance, it was a divine substance. Böhm's contemporaries could make a similar concept. In 1927 in the widely read essay "The Gothic Church"[5], the art historian Hans Jantzen dealt with the lighting in the Gothic cathedrals and invented the term "Light space" to his interpretation; others spoke about "Light architecture: an architect applied light to create moods".

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[1]Dominikus Böhm (1880-1955) was a German architect who gave German architectures a very distinctive, imaginative personality and was one of courageous pioneers of the new Catholic Church. He came from an old Swabian Baumeister family. In Augsburg he attended the building school (*Bauschule*) and then went to the Technical University (*Technischen Hochschule*) of Stuttgart. He always revered Theodor Fischer like his stimulating teacher. At the age of 27 years Böhm was a teacher at the Building School in Bingen. Hugo Eberhardt appointed him in 1908 to the School of Building and Applied Arts in Offenbach. In 1926 the Mayor (*Oberbürgermeister*) Dr. Konrad Adenauer appointed him head of the Department of Religious Art and gave him architecture class at the Cologne School of Applied Art (*Werkschule*).

His contributions to the Catholic Church were honored by Knight Grand Cross of the Order of St. Sylvester (1952). On leaving the teaching profession, he was awarded the Grand Cross of Order of Merit of the Federal Republic of Germany (1950). In 1954 he was awarded the Grand Prix for architecture of North Rhine-Westphalia. The National Academy of Arts Dusseldorf made him an honorary member.

[2]They have been published before and during the First World War.

[3]*Bauform*: Model, type. *Bauform* is defined as the basic concept of a structure or component. It aims on a building typological classification, i.e. filing of a building in a particular category or group of buildings. *Bauform* is an expression of local culture, their way of life and availability of building materials. Building Construction is based on technology in cooperation with building materials.

[4]op. cit. Stalling, G. (1974)

[5]Hans Jantzen: *Über den gotischen Kirchenraum und andere Aufsätze*. Mann, Berlin 1951, S. 7–20

Figure 1. Dominikus Böhm's Churches. ground floor plan, roof plan, cross-section. © Hoff, A. (1962) Dominikus Böhm.

Köln-Riehl,
St. Engelbert Kirche (1930-32)

Neu-Ulm,
St. Johann Baptist Kirche (1921-27)

Leverkusen-Küppersteg,
Christus-König-Kirche (1927-28)
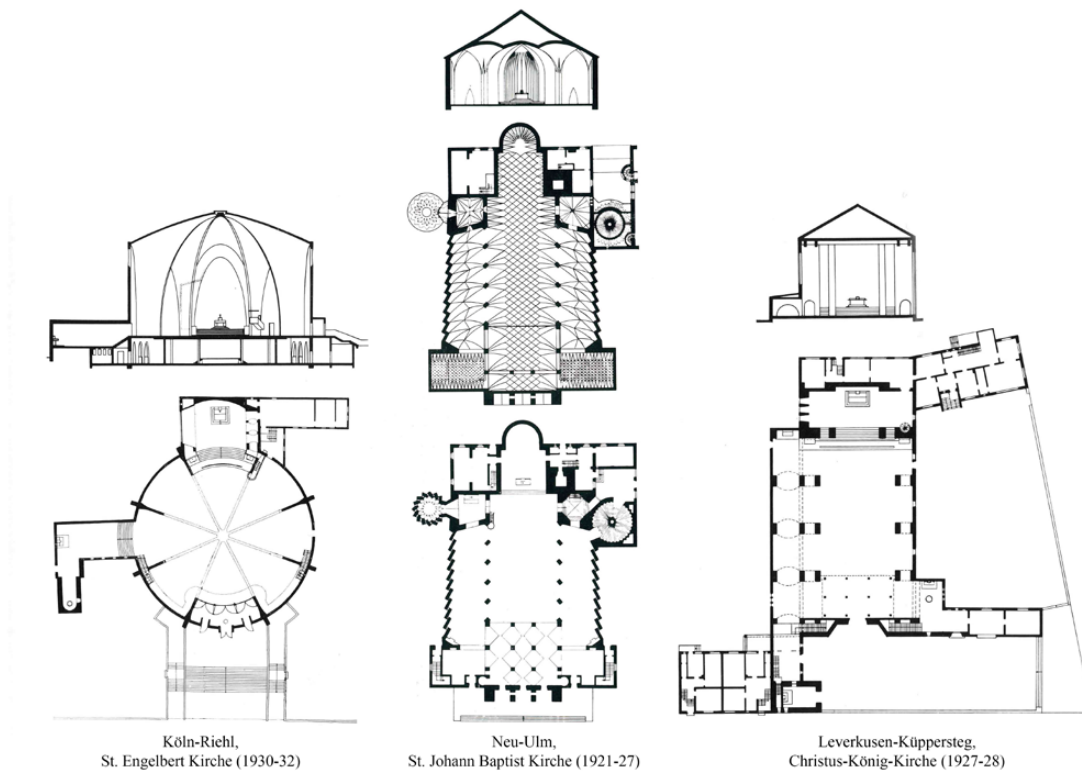
One Room

The "one-room" concept comes from the architectural theory of classical modernism and really means the undivided enhanced by columns or pillars or additions expanded space. Its internal shape is readable on the outer form. Dominikus Böhm plays with the word in the sentence quoted above: "One room, one community, one God!"[6]. The Christocentric dimensional shape symbolizes the unity of the community with God. An one-room is not necessarily a central space. The term is also applicable to the Fronleichnam Church by Rudolf Schwarz. A tendency to unify the space there was in the Catholic Church architecture already in the late 19th century. It corresponds the demand Friedrich Schneider after reduction or elimination of the side aisles. St. Engelbert was, so Lampmann G. 1933, "a - certainly bold and daring - step forward on the way to a determined formation of one-room building" in church architecture.

By Böhm renounced in Küppersteg on a rugged architectural separation of altar and lay space, he realized - consistently so than in his previous church buildings - the idea of the "Christocentric unit space". He obtained it from Johannes van Acken that time widespread treatise "Christocentric Church Art" (1923).

The buildings

St. Engelbert in Cologne-Riehl

The shape of the central building had already been addressed in the controversy, but it was by no new means. In the Protestant Church had even a certain tradition. Since the end of the 19th century Protestant architects took up again the central ground plan for churches. In early twenties, Otto Bartning emerged with his central construction projects for Protestant churches. In 1922 he showed his model of "Star Church" in August

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[6]*"Ein Raum, einige Gemeinde, ein Gott!"* (Böhm, 1923)

city as organism | new visions for urban life

Figure 2. Köln-Riehl, St. Engelbert Kirche. Inner space. © Carbonara, G. (2015)

Hoff's exhibition "*Neue christliche Kunst*" in Cologne Kunstverein: a simple central building on a circular plan with the altar in the center, made in steel pointed arch supports; the space around the altar is divided into segments, about four-sevenths are intended for the church, the seventh behind the priest heard the choir and the organ. Even in the Catholic Church architecture there were centralized or centralizing floorplans. However, these were mostly special building tasks, such as twister pilgrimage church of St. Apollinaris at Remagen, or of those traditional line that led from Byzantium via San Vitale in Ravenna and the Palatine Chapel in Aachen to Ottmarsheim in Alsace. An exception to the Church of Our Lady in Trier from the mid-13th century and St. Gereon in Cologne, which goes back to a late antique tomb. Last but not least also the Romanesque Triconch in Cologne centralizing tendency (Great St. Martin, St. Apostles, St. Maria im Kapitol). For "Christocentric Church Art" of the Catholic Liturgical Movement, the central building should have a special interest, but it was already evident in Dominikus Böhm's letter to van Acken[7], inclined to give up the pure central layouts (circle, square, Greek cross) in favor of centralizing layouts (ellipse, rectangle, Latin cross). For a Catholic architect it was not possible to establish a central building and put the altar in the center as Otto Bartning did. "The altar should be at the center of the circle, according with the nature of space", wrote August Hoff about St. Engelbert in Riehl in 1943.

Böhm explained that "the place of sacrifice, i.e. the chancel, connects to the main room like a big Tabernacle and so this is the target from the main room until the actual highlight. (...) Space is yearning, the fulfillment of the sacrifice." [8][8] Otto Bartning was rigid: "Each built room has an architectural tension. A domed room, for example, the tension from the edge to the center and up into the dome. Every church service action

[7] Johannes van Acken (1879-1936), Westphalian minister and Caritas prelate in Cologne.

[8]*Sehnsucht* is a German noun translated as "yearning" and describes a deep emotional state. *Sehnsucht* represents thoughts and feelings about all facets of life that are unfinished or imperfect, paired with a yearning for ideal alternative experiences.

has a liturgical tension (…), like pulpit and altar. When these two spatial tensions split, the spatial power and Church service power (…) will weaken". The August Hoff's liturgical norms said that the priest celebrated Mass with his back to the congregation. He stood in front of the altar, the altar on the back wall of the chancel. Mass celebration "versus populum"[9] was one of the objectives of the Liturgical Movement. It was introduced in 1964 by the Vatican Council. *Leitmotiv* of St. Engelbert Church is the Parable. In a lot of variants, Parable outlines the shield walls outside, the hollow shape in the vault of the chancel, the passage to the sacristy and the concrete ribs, spherically curved, of the main room. Böhm explained that the parable symbolizes "Overcoming of gravity", "Detachment of the earth", "Area as a whole resurrection".

One could also see a "modern version" of the Gothic lancet arch in the parable. At Christ König Church in Bischofsheim, in 1926 Böhm had outside flashed the portal with a huge lancet arch, inside contrast set behind a vault with a parabolic cross section as the choir of St. Engelbert. This form of curvature corresponds to the technical possibilities of reinforced concrete and was first used by engineers to technical utility buildings, for example since 1914 by Eugène Freyssinet on aircraft hangars and by Robert Maillart on bridges. In 1927 Robert Lill, Director of the German Society for Christian Art, wrote an essay about Böhm's Christ König Church: "The parabolic curvature, as it only enables the reinforced concrete, has something mystical Sliding, mysterious. Light comes in bundles through the space, dividing it into moving compartments that change from light to the darkest. The irrational increases sacred and ritual practice. One feels the Nordic-Gothic procession here." In St. Engelbert is that parable, beyond mysticism, for Böhm's reception of Gothic and modern engineering. "The parabolic vault in reinforced concrete structure needs more than ever the ingenious calculation of light", Lill properly had recognized the danger of the use of forms of civil engineering in the church. Dominikus Böhm was a master of mystification by light. The dramatic effect was intended: "The interior seeks its

[9] The priest stood behind the altar and facing the congregation.

Figure 4. Leverkusen-Küppersteg. Christus-König-Kirche. Inner space. © Carbonara, G. (2015)

highest increase in interior design and lighting in the chancel. We have soft light in the main space, whereas the chancel has a strong sidelight, in such a way that the window can be not hidden. This window is placed on one side only, because in two-sided window arrangement, the effect would cancel each other out" (letter of 6 May 1930). At this conception also was that the high is below the top line would glazed oculus dark color.

Böhm used pumice concrete for the St. Engelbert Church, the supporting truss structure, that can be seen inside like ribs, was reinforced with iron. Perimeter walls are not supporting. To enter the tower on an area of 4 by 6 meters, a height of 40 m, was possible only by securing it with reinforced concrete deposits. Outside Böhm disguised to build with bricks, obscuring the real material. Roof was covered for cost reasons provisionally Ruberoid cardboard which provided metal cover could take place only in 1979. Since the vault also forms the roof, it is not accessible. The planned floor was made by concrete as well as by metallic, criticized non-accessible roof in the opinion of the General Vicariate in 1930. As he set the outside Church on a high base, Dominikus Böhm won space for youth rooms, a parish hall and a library in the basement. He brought a Congregation chapel under the connecting wing to the tower. Since the Middle Ages, the baptistery as a separate room had not been in use in the church. In St. Engelbert, he moved it to the basement of the tower.

St. Johann Baptist in Neu-Ulm

Construction details of other churches, that Böhm had designed 1918-1923, can be found in St. Johann Baptist; e.g. the apse design of Benedictine Monastery (Vaals, 1921), consisting of a radial folded plate made by cast concrete, served as a model. From the three-nave building with flat-roofed aisles, he moved to a three-aisled Staffelhalle (the central nave is higher than the aisles, but has no clerestory) with expressive cell vaulting and gable roof on the exterior.

Despite that tendency to unity space in Modern Church, in 1926 Böhm went his own way and mainly focused in his planning due to the Christocentric design of the chancel.

He let the aisles strive through a slight inclination to the chancel and also led the aisle walls by the lamellar subdivision into tracks on the centre of the Eucharist. Moreover he ended the nave with chancel, while continuing the diamond-shaped vault in the choir. By definition of presbytery and lay space in the form of a lancet arch, altar can be found even more moved to centre stage as a place of the Eucharist.

The inner space expands, stepping out of the dark organ gallery, to a high central nave, which is equipped with a diamond-shaped reticulated vaulting. The building mimics late Gothic net vault like that of St. Vitus Cathedral in Prague (1356, architect Peter Parler). For Böhm, concrete was an opportunity to economically imitate the model of the much older form-vaults. The diamond-shaped cells vaulting extend from the organ gallery to the chancel. All vaults are executed in Rabitz, a brick-plaster structure with wire carriers whose execution looks like an ornamental plasterwork in industrial processes. Here, a layer of plaster is applied on a plaster base made of fireproof wire mesh, which is reinforced with bricks.

In the central nave, the unusual layout of the aisles is obvious. They constrict forward by one meter, which helps the momentum towards the chancel, that Böhm focused in every design details. He gave his request a spirited expression: "The whole room is a great yearning, the satisfaction of which is the place of sacrifice!". Not only the folded side aisle walls converge toward the chancel, but also the same orientation show the covered piers oblique to the direction in space and the complex vaults starting on the staggered edges of the rectangular pillar. The diamond pattern of the nave seems, however, balancing and opens up the space upwards and downwards. Viewed from the central nave, the increased hips of the nave ceiling without duty on pillars are like delicate plant forms. Its peak spreads and forms a bond with the diamond-shaped vault. The nave pillars strikingly slanted formed from outer walls of the earlier building and encased by Böhm.

The diamond vault of the central nave is continued in the chancel and unified by both space parts. The chancel is separated from lay space by a chancel arc. At the eastern end of the aisles join either side chapels with different purposes. Two other large annex rooms on either side complement the choir expansion: the Resurrection chapel and the Baptistery. Resurrection chapel in the Northeast is outside like the aisle walls, Baptistery on the southwest side picks up the rhythm of the aisles, however inner walls have a zigzag configuration. Before you reach the attached chapels, one crosses on both sides of a further small chapel. In the south aisle of the lancet passageway leads first into the Pietà Chapel, in which a Minstrel's Gallery is integrated. The right passage then opens into the baptistery. Distinguished from the chancel, the chapel is explicitly designed and built for the christening, in which the increased importance of the liturgical reform of the baptism sacrament is expressed. Upon entering the chapel, the unusual wall design and the light flux from the circular oculus of the room lend a very special enchantment. On the opposite side, the Resurrection Chapel offers an equally impressive spectacle: here, the light is caused to rotate through narrow embrasures and the radial designed floor within the space, and directed upwards, according to the resurrection idea. Böhm planned similar chapels like in St. Johann Baptist, already in the form of Ideal buildings "Lumen Christi" and "Circumstantes"[10].

Once back at the entrance of the gallery, the visitor can make sure again what were Böhm's main building topics: light and movement. Both elements give this church his individual, rousing dynamic. The movement affected the aisle walls and folded them; they captured the ceiling and culminated in the main room of the sacral events, in the chancel. It gives especially the side chapels a dynamic originality.

Christus König in Leverkusen

The interior welcomes the visitor as a further, flat-roofed hall. Four powerful brick pilasters create a rhythmic sequence of five equally long bays. The pillars have less static function than space psychological one. Depth perspective effect increase not very long

[10]Johannes van Acken established both drafts into his fundamental publication for the modern church "Christocentric Church Art" (1923).

nave and catch the eye of entrants vigorously towards the highly elevated altar. Chancel is particularly distinguished by two free-standing pillars in the room as a sacred area.

Wide pilasters coming into the space actually outplay a simple form of the church hall: side walls and light sources remain the incoming visible, so that the space wins hall-like width and how appears "without boundaries". The indirect light effectively supports the rhythm of piers. The illumination gradient, which is caused by the different window heights in southern and northern wall, also mitigates the severity of the symmetrical space image. In the choir-bay high windows located on both sides. So the altar area experiences a significant increase over the less bright lay space, without the chance to benefit from the well-known theatrical chiaroscuro contrast of many Böhm's churches.

The round-arched openings in the pilasters designated by Böhm like a "procession transitions". They provide an opportunity for an appropriate liturgical practices and, at the same time, rules the visitor traffic at church service. The low confessional joins the north by the church as a sort of aisle. No sooner than a man, a barrel vaulting ascends here without start-up off the ground and create a crypt-like dark room, whose suppressive effect reveals again Böhm psycho-spatial intentions. In their effects, the comparable Confessionals of his churches in Mönchengladbach-Geneicken (1930) and Osnabrück-Schinkel (1932) Böhm had thought as "symbols of the guilty humility, remorse". In the clarity of focus on the high altar is the space to sign for the ordination of the whole world to the Divine and so illustrates the patronal feast of the Church of Christ the King.

Conclusion

In 1927-28 Rudolf Schwarz and Dominikus Böhm strive after heated discussion, to establish their modern churches, their "church buildings in reinforced concrete".

Adolf Behne's accusation does not apply to St. Engelbert. Without the reinforced concrete as a building material, the construction of the vault and the tower would have been impossible. On the other hand, vault and choir are traditional forms in church architecture. The task was to mediate between a modern architecture which had evolved away from the church building and a church architecture that had held for too long at the old outer forms, which no longer corresponded to the modern notions of liturgy. Böhm has found an outstanding solution.

Observations

This paper is part of a wider research on Dominikus Böhm, German architect lived in the 20th century, and deepens the structural morphology and constructive innovation. The working hypothesis focuses on the integration between materials and technologies.

References

Hoff, A., Muck, H. and Thoma, R. (1962) *Dominikus Böhm* (Verlag Schnell & Steiner, München, Zürich).

Stalling, G. (1974) *Studien zu Dominikus Böhm, mit besonderer Berücksichtigung seiner Gotik-Auflassung* (Peter Lang Verlag, Bern, Frankfurt a. M.).

Strappa, G. (2005) *Edilizia per il culto: chiese, moschee, sinagoghe, strutture cimiteriali* (Utet, Torino).

Tagliaventi, G. (1996) *Morfologia strutturale dell'architettura* (Gangemi Editore, Roma).

Voigt, W. and Flagge, I. (ed.) (2005) *Dominikus Böhm 1880-1955* (Ernst Wasmuth Verlag, Tübingen, Berlin).

Lützeler, H. (1950) 'Die neue Kirche zum heiligen Engelbert', *Köln-Riehl. Geschichte des Vorortes und der Pfarrgemeinde* (Luthe-Druck, Köln) 90ff.

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Urban Integrations in historical centers during the Post-War Reconstruction. The Provincial Directorate of Posts and Telegraphs of Florence by Giovanni Michelucci

Lorenzo Bagnoli
Draco PhD School, "Sapienza" University of Rome, 53 A, via Gramsci, 00197, Rome, Italy
Keywords: historical urban tissue, urban integrations, post-war reconstruction, G. Michelucci

Abstract

After the extensive urban demolitions carried out during the fascist period, the rebuilding of new architectures inside the urban historical context was felt necessary by completely innovatory design approaches. For the first time, in that period, architecture has been called to deal with the issues of integration between ancient urban tissues and urban scale regenerations. The city center of Florence hosted, from 1930 to 1966 in the quarter of Santa Croce, an urban void filled only in 1966 with the development of the new headquarters of the Provincial Directorate of Posts and Telegraphs of Florence by Giovanni Michelucci. This architecture is an important historical witness of how Italian architecture has had the ability to relate the new urban scale architectonical graft with the old historical city tissue in the late 60's.

The content of the essay will be developed within the official activity of a Ph.D seminar (Doctorate of Architecture and Constuction; coordinator prof. Giuseppe Strappa) at Sapienza University of Rome and will be completed by analytical original drawings of the project chosen.

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Introduction

Rebuilding in the historical centers
　　The historical element of every city, both it is expressed as a solidification of the urban structure and as an architectural merit of the built, is an identity value of priceless worth able to identify the evolution of the place through centuries of changes. For this reason the historical city centre of every town, particularly in the Italian situation, draws attention to the protection and preservation of the historical architectural heritage that limits or prevents its transformation. The possibility to relate with an urban empty space inside the historical city centre is really an uncommon occurrence that usually emerges after an intricate course of alteration of the building linearity and of its established structure. The architectural presence in this framework is automatically considered as the only opportunity of transformation or integration of the urban grid, as it is able, with its connection, to modify the balance of its structure by then well defined. The exceptionality of the event doesn't highlight only the problems concerning morphological and urban topics of the projecting process; the typological and social aspects themselves press directly on the dynamics of the intervention as the integration is seen as an occasion of transformation. The protection of the historical patrimony has really preserved and saved the cultural and developmental identity of our past time restricting, anyway, those tendencies of adjustments of the city to the contemporary needs it has necessary to relate to. For this reason Building in the built implies an accurate design, fraught with attention to the architectural, historical-social and territorial heritage where we act; a real urban integration that needs to find a constituent coherence and homogeneity with its own surrounding regardless its scale of realization. The urban empty in the city centre, can be identified as one of the prospective resources for the demands of a system that has remained structured and unchanged for centuries. The extent of the destructions, the huge demand for housings, the need to act quickly led, especially in the programs encouraged by foreign public authorities, to bureaucratic applications of characteristics and schemes of settlements taken from the modernistic tradition. During the rebuilding of the post war period the idea of preservation of the patrimony of the historical city centre as an asset to be protected didn't take root in public opinion: rebuilding was meant as a functional "building again" that should simply have filled an absence. But it is in this period that architects as Giovanni Michelucci himself develop their own planning theory, giving an architectural solution in those frameworks strongly peculiar of our historical city centers. Becoming one of the references in the new urban culture, Michelucci's idea recovered in the study of the features of the pre existing town, in the morphological analysis and in the identification of the architectural types, the necessary knowledge for the building and the architecture of the city. In Italy, also thanks to the next publication of *Architettura della città* by Aldo Rossi, a completely different approach to the criticism of the rebuilt town was suggested, causing awareness on the importance of the study of the town, not only concerning its economical and political aspects but above all those architectural and formal ones. The urban empty inside the historicized tissues, testify in this way the architectural complexity, meant as a solution to a great number of requirements that exist inside the Locus (Rossi, 1966) and that necessarily must be satisfied. Notwithstanding the uniqueness of the planning works makes the development of these spaces unequalled and not reproducible facts, the theory of the fundamental ideas of the method and development of these urban interstices is the necessary element to be regarded to have a complete understanding of the design scheme. The saturation of these urban interstices represents an uncommon possibility to adjust the historicized grid to the dynamics of the contemporaneous city.

The healing pick when Florence was the capital
　　In 1859 the Lorena Family abandoned the city of Florence and Ferdinando IV ended the dynastic cycle of Grand duchy of Tuscany With the Second War of Independence Tuscany was joined to the Reign of Savoia in the unified Italy and owing to international agreements in September 1864, the Italian Government presided by Marco Minghetti, decided to transfer the capital from Turin to Florence. The urban planning of the city

Figure 1. Direzione Provinciale delle Poste e Telegrafi di Firenze, corner of Via Pietrapiana e Via dei Pepi, Original Photography, 1968, Bildarchiv Foto Marburg.

was kept mainly coherent with the original one. Florence was still delimited with wall fortifications, principally around the cathedral of Santa Maria del Fiore and the other monumental buildings in a balance between volumes, orchards and gardens (particularly in the areas outside the walls). In 1864, after being appointed as the capital of Italy, the city was submitted to a sudden change of role and function that influenced indelibly its urban structure. The old town underwent a general renovation to comply with interventions of requalification and of organization of the public functions suitable to the role of capital. For this reason The town Council ordered the architect Giuseppe Poggi the realization of a strategic plan for the enlargement and for the urban reorganization (presented on 18th February 1865) that contemplated a great number of punctiform projects as well as at large scale. The main aim was the working out of a new town planning scheme at long term, structured with great works whose purpose was the reorganization of the old tissue of the city and the expansion of the development of Florence outside the city walls. The main targets were to provide new lodging and services for the population increase, to protect the town from the floods of the river Arno and to give the framework a commemorative, modern and bourgeois look in line with the contemporary evolution of the other European capitals. Inspired by the Parisian boulevard, Poggi fulfilled a series of tree lined avenues in place of the old walls; wide squares were built by the old monumental gates of the town, almost all saved. In the realization of the new urban structure, Poggi planned a series of quarters entirely innovative compared with the classical idea of dwelling, characterized by a new regular structural grid skillfully integrated into the original urban texture. The main function of the *viali di Circonvallazione*, was not only as a road artery but also as a welding element between the urban tissue of the old town

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centre and the new perimetric residential neighbourhoods, situated out of the walls. Similarly also the other side of the river Arno was surrounded by a new structure of panoramic boulevard, a tree lined avenue ending by San Miniato al Monte with Piazzale Michelangelo, an open viewpoint over the urban profile of the city.

The fascist demolishing pick
The quarter of Santa Croce arrived unchanged, even if through numberless micro building works, at the end of the 30's, when the fascist government invited the Town Council to arrange a recovery plan because of its high density of population. This was carried out through an uncontrolled demolition of the all existing buildings between via Verdi and Piazza Beccaria and the construction of a new street that linked Via Verdi and I Viali. This work was celebrated as a' healing pick' but it was really a "demolishing pick" that would upset completely the architecture of the whole old quarter. The knocking down started in 1936, but with the approaching of the international pre war problems, it was interrupted after some years. The demolitions began with the buildings situated at

the end of Via Verdi including Teatro Alfieri and the Pharmacy of the XV century, causing the urban empty space where today we can see the debatable palace of the *The Provincial Directorate of Posts and Telegraphs of Florence*. From 1936 to 1967 this "no place" represented not only a wound in the urban structure of the whole quarter but also inside the old town centre, later obliged to integrate "*the new into the old*".

The planning method between the idea and the perspective

The resource of the urban empty spaces inside the old town centers
The integration of a new architecture inside the historical city centre is one of the main subject that we have been referring to since the postwar period; the projects didn't have to be planned any longer inside a contemporary urban system, but inside the body of the city and the tissues marked by centuries of evolution. It is necessary to understand, as Franco Purini in *The didactic architecture* (Architettura didattica, 2002), magisterially underlines "*if a city is alive, it is also subjected to developments that modify and deform it*".
The old town centers represent from this point of view, the highest level of *possibility* for a good realization of the contemporary project, useful, if not necessary, to protect and to strengthen the original shapes and the identity of their heritage. The value of uniqueness and of exclusivity of a site inside the old town centre, both an empty space and an urban interstice, needs a careful planning even before a specific design. The functional destination of the urban soil inside a historicized area, may be mainly directed towards the choice of a macro model with a specialized functional or multipurpose destination according to the particular situation. Each of the two destinations has got direct implications on the perception of the space and indirectly on dynamics of its use. The specialized polarity that would be inclined to increase the inequalities in the use of the urban space and in the landed values among areas with various functional activities, would encourage an overall reading of the city as an unitary body. A more fragmented line without a predominant, defined function, would homogenize undoubtedly the structure of the quarter allowing, however, a more local and divided vision of the urban area. In the case of the quarter of Santa Croce plenty analyzed by Michelucci for its recovery plan, a clear tendency to direct these central urban spaces towards specialized functions in order to create real poles of attraction, is evident. The choice to support this position must be understood as the first step towards a wider vision of urban requalification as a whole, a vision that took shape with the drawing up of the recovery plan and a careful treaty concerning it. (Michelucci, 1968) In addition to the functional, relational and also indirectly architectural subject, the analysis of the historical system is of priority importance: the untouchable coding that identifies the area with a precise urban model. The new architecture must find a mutual formal and perceptual relationship with its context, including those peculiarities of the place that characterize it and make it an unique element in its urban system. Building in the built doesn't mean giving up to architecture, but on the contrary the comparison between the new and the old emphasizes the intense expression of the one and the other.

"*We know also that a not self-sufficient architecture that must be read and valued in a setting wider than that one for which its designer has been called to modify, has nowadays few or no probabilities to succeed; unlikely it will be able to transform the paths, the fruition of the city; the modifications of the tissue where it has been inserted will deprive it of its original verve. The insurmountable boundaries of the private property, the pace of urban transformation, unpredictable for any individual logic, do a prompt justice of every project that goes over its own limits of commission. Perhaps this is one of the reasons for which the integration of a building in the historical setting, with its slow and comprehensible transformation is often more evocative and more effective than in a new setting*" (Belluzzi, Conforti, 1986).

Since the 60s of the last century on, also in Italy we have had the debate concerning the ways of intervention in the old city center; a lot of Italian architects-from Giuseppe Samonà to Ignazio Gardella, from Mario Ridolfi to Roberto Gabetti and Aimaro Isola, operate in consolidated urban contests, realizing works where the contemporary architecture

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keeps its own identity, establishing an advantageous relationship with the preexistences. During this period, even though there were various modalities the project of contemporary architecture inside the historical tissue was carried out with, important interventions were recorded to promote requalification processes of entire parts of the city. The uniqueness of the integration inside the historic centre, becomes an unequalled and unrepeatable possibility to rearrange and organize situations strengthened with the passing of time. This densification of the territory, in other words the building in those remaining spaces of the urban tissue, both interstices and empties, may be decisive in making a better urban connection both from an architectural and above all from a social point of view.

The urban survey as a mean of structural analysis

The history, following Caniggia's theory, completely embraced by Michelucci, is seen as an active mean of urban study and not as a planning restrain that calcifies its evolution. The understanding of the current state, in fact, is the principal element the planning thought can be taken root on. The understanding of the evolving dynamics that have shaped the city up to now, are the decisive elements to afford a coherent urban integration analogous to the historical structure.

'*If the current structure is conditioned by the pre existing ones, it will have to include more than inert traces of them;: the first one will have to preserve them totally so that the possibility to deduce the preexisting phases from the actual state will have to be adjusted only to our ability to prepare suitable means of investigation: and moreover the possibility to recognize and isolate the phases of development, will be the concrete proof of the existence of actual structure*" (Caniggia, 1963).

In this way the history must be considered an important feature of the planning as it lets us understand not only the past but also foresee the probable future evolving dynamics. The exam of the evolution inside the urban tissue in an old town centre is in this way tied to a temporary analysis of the events that have always existed in that place since its origins. The change of the urban matrix is in fact linked to those events that have modified during the time, for obligation or need, the look of the built and its surrounding. In order to realize this evolution it is necessary to compare to get a complete temporal vision of that natural evolution of the urban area. Coherently to Michelucci's idea, other teachers of the Academy such as Saverio Muratori have embraced and promoted the idea of survey as a legal mean for an effective comprehension not only of the built but also of the whole historical process.

Thanks to the analysis of the built, it is possible to understand all the parts of its process in an overall view, realizing its evolution and its clear structural hierarchy inside the city. The surveying process, not a simple graphical restoration of the urban tissue but rather a study of the structure, has to go through a series of analysis that will lead to a more mature knowledge of the constituent synthesis. In order to guarantee that architectural quality required also from the typological point of view of the built, the survey of the urban texture becomes an absolutely necessary mean of analysis which the development of the project is based on. The integration of a new architecture in the old city centre becomes, in this way, the realization of the study of the urban evolution that should guarantee a coherent volumetric insertion with its well established background.

"*A such survey is directed to examine the reality as a form, that is a reality as a total value and so universally valid and explicit.*" (Muratori, 1959).

Michelucci's thought between method and fusion

"*A person who is set on a 'taste' in his works, on a formal model and on a technique dies with his first work. On the contrary a person is alive when he insists on the research of a current place and so he is always different …because the space is ever changing history ….everything is architecture and has been built for the man, according to his humanity.*" Giovanni Michelucci.

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In Michelucci's work we have always found the simultaneous presence of two different projecting methods, two quite unlike directions, but come up from the same common assumptions. One of these two methods has been the new interpretation of a Modern style later transformed into a personal planning method, the other one has been a steady participation in the research and in the rediscovery of the idea of the built aimed to the realization of an architecture that was defined by Michelucci himself "*as it has always existed*". The friend Leonardo Ricci's words echo his words. He describes his professional figure as a continuous fusion of knowledge directed to the achievement of the highest architectural urban and social realization:

"*I imagine this stuff as the outcome of two or more minerals, as the effort of two things that together must create another one. Just nothing is enough to spoil all: the difference of few grades in the cooking or in the casting, too much or too little fluidity, the insufficient earth pressure. The bronze, this difficult mysterious elusive material. Yes, I say, Michelucci reminds bronze as well as his architecture. His effort has always been to blend two different movements of the soul to turn them into a single one*" (Ricci, 1962).

Figure 4. Direzione Provinciale delle Poste e Telegrafi di Firenze, entrance hall, Original Photography, 1968, Bildarchiv Foto Marburg.

The planning method and the thought that are behind Michelucci cannot be certainly generally codified but kept in a not linear planning approach, suitable ad hoc to any specific developed integration. Bruno Zevi himself speaking of Michelucci defines him "*born not revolutionary*" (Zevi ,1981). The idea of michelucciana architecture may be summarized only in a specified design always according to a 'human space' instead of 'human scale', livable not in the dimension of the buildt but as a whole. In Michelucci we can find the synthesis of the controversial duality of the contemporary architecture that however must be indissolubly linked to the life and to the history of the place. If on one hand his solitary position has made him an isolated figure, on the other one it lets him carry out his research autonomously in the strain towards the achievement of his ideal architect:

"*The architect is the man who has to plan living environments for other men. He is not a' technician' who builds his own model the other men will have to subdue to. He is a man among the men, he gives and receives cordially, he is enhanced by the experience of the others 'life , he offers of himself what he can but simply. He follows the life and from it he takes the needful elements of his own job where he will express his personality, not ambitiously, but as the one who cooperates for an endless work that, started centuries ago, goes on uninterruptedly during the centuries, underlining the ascension or the decay of the man, the expansion or the constriction of his spirituality, intelligence and humanity*" (Brancolini, M. Biagi, 1981).

Planning and structuring processes of the architecture

The Provincial direction of Posts and Telegraphs in Florence: a project for Santa Croce
The project carried out by Giovanni Michelucci for the The Provincial Direction of Posts and Telegraphs in Florence is one of the most important works to express how the Italian architecture in the postwar period was able to relate to the historical framework of the urban realities. This tribute to the architecture is clear with an evident reading of the surrounding tissue showing itself as a part of an uninterrupted city and not simply as a punctiform intervention. The urban empty in Via Pietrapiana due to the' healing pick' in 1936 where the project was developed, was not simply an historical reality but a synthesis of social and economical problems existing in the whole quarter of Santa Croce. Michelucci's project was developed and fulfilled only in 1967 after several alterations, it had to summarize a formal typological solution guaranteeing both a new local identity and a new interpretation of the space perceived by the society as 'an urban empty'. Inside this contest, the project brought *the breath of the commercial street of the bourgeois city* into the surrounding static setting thanks to the solidification of those social dimensions that were present in the quadrivio of via Pietrapiana, via Verdi, via dei Pepi e via dell'Ulivo. The need to fill an empty space was the opportunity not only to satisfy a functional necessity but also an opportunity to reorganize some space and a part of the society that, thanks to this architecture, could start an wider territorial requalification. Planning such an important integration with a clear administrative polarity in a zone that presented symptomatic problems of quality and of urban structure, has been an evident sign of the function this building should have had in the recovery plan of the quarter of Santa Croce. The palace of The Provincial direction of Posts and Telegraphs in Florence has been the first step of a long requalification process that lead Michelucci himself from 1967 to 1968 to arrange an intervention plan for the Town Council of Florence.

From the urban reading to the architectural scale
Michelucci tries to see the architectural space as a descriptive element, making use of a historical shape to record a transformation of the environment. The analysis on urban macro scale of this building points out the urban problems that were present in the empty space of the quadrivio in Santa Croce. The misalignment between Via Pietrapiana and Via dell'Oriuolo, the presence of Piazza Gaetano Salvemini, the particular twisting of the texture of Via Fiesolana (joining with Via Pietrapiana) and the net axis of Via Martiri del Popolo made the area difficulty to be identified with a clear and coherent reading

of the space. The several interventions of the territorial reorganization due to the knocking down of the Florentine city walls in the XII century, have created with the passing of time a chaotic organization of the schemes of the buildt that, as on this occasion, can not relate among them clearly and directly. The empty space that existed in the site, as that is exactly void, reset these peculiarities making this area homogeneous and without any evident structural scheme. Michelucci's project had to synthesize all these features, establishing a plurality of relationships with the preexistences and interpreting the nearby relations of the context in a volumetric decisive solution. In order to understand completely the complexity of the project, it needs to be analyzed both on a macroscopic scale, as a urban seam, and on architectural level, as an specific housing integration. From a general reading point of view the administrative building of Posts and Telegraphs represents, inside the microsystem of the quarter of Santa Croce, an element of completion and of reorganization of the volumetric local structure reconstructed more than once.

Inside this variety of connections between the historical town and the expanded one (the old quarter of Santa Maria Novella and the most recent one of San'Ambrogio and Beccaria) the priority was given to the link with the 'new' part of the town following the texture parallel to Via di Mezzo, Via Martiri del Popolo and Via dell'Agnolo. Michelucci with this structuring and urban completion, demystifies in this way the idea of historical polarity in favour of a more logical and contemporaneous relation of utilization linked to the new infrastructural works by Poggi. Although the buildt plans distinctly, the symmetry with the new urban grid, the historical axis of Via Pietrapiana and the misalignment of Via Fiesolana are inserted in a pitch of volumes in the Façade; the overhangs connect the historical axes hardly perceptibly giving inside the urban system an unique logic perceived above all on a human scale. The same reading of the building on micro scale represents really a continuous contraposition between evocative standards clearly of the XIX century and contemporaneous elements of an evident break. Contrary to the planimetric rigidity, the facades consist of a linear stratification articulated by a plurality of axes that make the prospects vibrant. The choice of material mirrors the planning philosophy of the "palazzo fiorentino" (Florentine Palace) trying to maintain a perceptive coherence inside the historical quadrivio. The rich base covered with grey and pink limestone includes protruding bodies covered with cut stone painted grey; the frames in anodized steel and aluminum, which are in a strong contrast with the perimeter cornice in copper, run a raso all perimetric levels of the building. This realization is an evidence of the attitude of the architect regarding the relation with an urban pre existing tissue: intentionally monumental, the building presents postponements and differences of floors and volumes that clearly try to match with an external context equally characterized by architectures in rapid succession that create bodies of different heights and designs. The reading of the volume has a dimension clearly horizontal, made easier by the continuity of the windows and by the overhangs that intend to show the unity of the system as a linear stratification of surfaces. The overhang of the first floor, corresponding to the offices, seems ,from this point of view, very nearly to the houses of the XV century. Always as a sign of his wish of integration in the context, we can see the gallery on the ground floor, a proper internal street parallel to Via Pietrapiana, marked by big pillars and thought as a place of open rest used by the citizens. Between the inside and outside there is a sharp distinction of composition filtered by an enormous hall overlooking Via Pietrapiana. Notwithstanding the sobriety of the volume receiving the users, the internal pillars remain evident and stress, with a tight and mighty rhythm, the structure of the building clearly visible in the concrete structures. From an overall reading of the project, it is evident as the debunking is searched the architecture as an isolated element in favor of an inclusive reading with its own contest but always on human scale. According to Michelucci, in fact, the important design feature remains the human dimension, kept alive in spite of the great dimensional scale that urges to an urban reading of the system. The logic design aims to a clear urban fusion with the surrounding historical dispositions of volumes but it happens without imposing his architectural language that remains linear and easily identifiable in a neutral idea of the built.

Conclusions

A new project model for historical town centers

   The intervention suggested by Michelucci as an architectural solution for the empty space in Santa Croce, represents completely the idea of urban contemporaneous integration, regardless the success or the failure in the stylistic quality. It is plain that the new built structure is firstly an element of completion of the urban texture, an intervention aimed to sew up that system now steady but not perceived as an unit any longer. The historical evolutions that have made up the substantial development of the town tissue, guarantee a clear vision of the completeness of the system, becoming an essential mean for the planning. The study of the past is meant as an active mean for the real comprehension and the urban development of the contemporary. This logic of linear evolution lets a coherent and well integrated development inside the urban weave, the only real witness of the logical evolutions of the town. Even if from the urban syntax point of view, the intervention may be directed towards a more analytic and later more scientific study of the built, the architectural aspect has a completely different valence. The integration of a contemporary architecture inside a historical reality, however precise and well projected it may be, enters in a contest disagreeing with the current logic designs. The role of the architect is essential, as he is the only interpreter of the whole urban system that necessarily must be able to extrapolate the design guidelines inherent in the place. Michelucci himself, in the project of the Provincial Direction of Posts and Telegraphs, points out that the structure must be able to relate with the surrounding realities through different level of language. The compositional macro level follows a clear logic of relation with horizontal levels of the surrounding architectures; a particular continuity of reading is searched, strengthened also by the development of the basis in harmony with the other historical buildings. Also the choice of the material is extremely coherent with the contest where the use of specific materials tries to respect the chromatic correspondences peculiar to the urban area of Santa Croce. It is evident that the research of the harmony, instead of the desire to be the centre of attention, (without becoming a fictitious mimesis), is the focus feature that characterizes the success or the failure of a kind of architecture inserted in historical realities. The town as a living body, needs to go on with its logics of transformation and, if it is necessary, to realize them also inside the historical urban tissue. In line with those logics of deep comprehension of the evolution and of the perceptive dynamics of the architecture and of its urban system, the project of the Provincial Direction of Posts and Telegraphs in Florence developed by Michelucci can be defined nowadays as one of the most evident proof of integration of the "*the new into the old*".

   "*Architecture must come up from the life, from the observation of the daily life, from the big historical events as well as from the small things dealing with habit, psychology, the particular natural physical and social circumstances*" (Michelucci, 1980).

References

Rossi, A. (1966) *Architettura della città* (Città Studi Edizione, Milano).
Purini, F. (2002) *Architettura didattica* (Gangemi, Roma).
Cresti C. (2010) *Michelucci Architetto* (Pontecorboli, Firenze).
Lugli L., Clemente F. (1966) *Giovanni Michelucci - Il pensiero e le opere* (Patron, Bologna).
Brunetti F. (1981) *Intervista sulla nuova città - Giovanni Michelucci* (Laterza, Roma).
Michelucci G., Borsi F. (1979) *Il linguaggio dell'architettura* (Officina, Roma).
Michelucci G. (1968) *Il quartiere di Santa Croce nel futuro di Firenze* (Officina, Roma).
Koenig G.K. (1968) "Giovanni Michelucci", in *Architettura in* (ERI, Torino). 73-102
Sacchi B. a cura di (1908) *Giovanni Michelucci. La pazienza delle stagioni* (Vallecchi, Firenze).
Fabbrizzi F. (2008) *Opere e progetti di scuola fiorentina 1968-2008* (Alinea, Firenze).
Michelucci G. (1985) *Le architetture recenti 1974-1984* (catalogo della mostra di Macerata).
Caniggia G. (1984) *Lettura di una città: Como* (New Press, Como).
Muratori S. (1960) *Studi per una operante storia urbana di Venezia* (Istituto poligrafico

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della Zecca di Roma, Roma).

Ricci L. (1962) "L'uomo Michelucci, dalla Casa Valiani alla chiesa dell'Autostrada del Sole", in *L'Architettura cronaca e storia* n76, 664-689.

Zevi B. (1981) *Speech during the ceremony of the awarding of honorary citizen of Florence to Michelucci*, 22 May 1981.

Brancolini M. (1981) *Giovanni Michelucci. Una materia viva* (Fantacci, Pistoia).

Michelucci G. (1980) *I Pensieri, le parole e lo spazio* (Officina, Roma).

Postcards from a Dystopian Como: two unbuilt contextual projects by Giuseppe Terragni

Luca Lanini
Scuola di Ingegneria, Università di Pisa, Largo L. Lazzarino 1, 56126, Pisa, Italy
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Abstract

Giuseppe Terragni was among the modern Italian architects the most rooted in the European avangarde and the most inclined toward abstraction, deconstructing his building in layers upon layers of materials, architectural elements and strata conjuring to achieve a delicate and unstable equilibrium between plastic values and dissolution of architectural masses.

His buildings as famously testified by Peter Eisenman- are critical texts of the possibilities of decomposition of architectural forms and typologies as well as they are machines for the contextual transformation of the historical urban form in a subtle, unrethoric but contemporary way.

We analyze two unbuilt projects of the late creative season of the Italian master, two projects where the overlay of the sleekest, most dissonant, modernist language ever and the grid, textures and sense of Roman Como reaches a dramatic peak: the restoration of Casa Vietti and the Cortesella building (both 1940).

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Introduction

Among the modern Italian architects Giuseppe Terragni was the most rooted in the European avant-garde and the most inclined toward abstraction, deconstructing his building in layers upon layers of materials, architectural elements and syntactical strata, conjuring to achieve a delicate and unstable equilibrium between "plastic values" and dissolution of architectural masses.

His buildings –as famously testified by Peter Eisenman- are "critical texts" of the possibilities of decomposition of architectural forms, volumes and typologies as well as they are "machines" for the contextual transformation of the historical urban form in a subtle, unrethoric but contemporary way.

We analyze two unbuilt projects of the late creative season of the Italian master, two projects where the overlay of the sleekest, most dissonant, modernist language ever and the grid, fabrics and sense of Roman Como reaches a dramatic peak: the Cortesella building and the "restoration" of Casa Vietti.

The 1934 Master plan

Although all the buildings designed by Giuseppe Terragni in Como -as well as those designed for Rome and Milan- have an undeniable urban value, the commitment of Terragni to the planning scale is often dramatically underestimated. But the 1934 Master plan for Como is the definitive draft of the guidelines of all projects made by Terragni for his city from 1927 to 1940, of all the proposals made in the previous seven years and the overall strategy for the seven to follow. A blueprint whose comprehension is necessary to understand his true idea of the city. An idea that holds together such diverse projects each and everyone concurring to achieve a urban concept–as well as the architectures that materialize it- strongly oriented by the experience of the European avant-garde and at the same time deeply rooted in the history of Italian cities.

On one hand, the functional separation of urban parts, according to the rules established by the Athens Charter, written with the full – not short of controversy- involvement of Giuseppe Terragni and Pietro Bottoni; on the other the pragmatic reflection on the relationship between New and Old, between new types and the urban morphology of consolidated city. All topics that would later innervate the architectural debate in postwar Italy.

The roots of such a progressive concept for Como are in a crucial trip: the Partis II cruise from Marseille to Athens. Terragni participate -along with Bottoni, Pollini and Bardi- to the IV CIAM in Athens (1933) with an analysis of the urban structure of Como which will serve as the basis for the Master plan of 1934. Three analytical tables where very deep is the influence of van Eesteren's plan for Amsterdam, which he had access to via Bottoni. The Italian unit on Partis II struggles until the end: the issue of contention is about the land property. The ideal of the Corporate City and of Fascist "Strong State" clashes with the liberal and modern city[1].

The following year Terragni, along with Bottoni, Cattaneo, Lingeri, Dodi, Giussani, Pucci and Uslenghi (Group CM, Como-Milan), won the competition for the New Master plan for Como. But for the group CM (Como-Milan) the formal aftermath is substantially different from the vision of the relationship between modern architecture and historical urban fabric that will be hegemonic in the postwar Italy. Como rationalists do not deflect from the clarity of modern architectures that -sometimes quite acrobatically- stood on places and measures of the historical city. The continuity with the urban fabric is always resolved by careful disposition and new relations that modern architecture establishes with the context and never in terms of typological repetition and /or language mimesis.

[1]Nicoloso P., "Analisi urbanistica di Como per il IV Ciam di Atene", in Ciucci G. (ed.) (1996) *Giuseppe Terragni: Catalogo della mostra* (Electa, Milano), pp. 415-418.

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A Contextual Avant-Garde

A distinctive character of the Italian Modern and of the Como Rationalism in particular. A "Contextual Avant-Garde," as Richard Etlin calls it: "Italian Rationalist architecture presents the seeming paradox of an avant-garde aesthetic that was grounded in abstract geometrical forms but was contextual as well. This paradox dissolves rapidly, though, When one considers that Italian Rationalists were not alone in conceiving a contextual architecture according to Functional what they and their detractors considers an "ultramodern technological aesthetic". Indeed, Le Corbusier's avant-garde villas of the 1920's were conceived in the same manner. Furthermore, earlier Italian concepts of modernism were grounded in the idea of ambientismo (Contextualism). [...]. Some of the most important Rationalists, such as Giuseppe Terragni Pietro Lingeri, and Angiolo Mazzoni, were either directly or schooled in this philosophy designed their first projects in this mode, according to Functional the parameters of a modern contextual vernacular or the decorative twentieth century. When they became Italian Rationalist architects, they brought this contextual orientation with them and infused it into their new aesthetic. [...]. They would be contextual buildings in the multiple meanings of the word: Italian in character, specific to their city, appropriate to the cultural history of their building type, and responsive to particular site conditions. Several of these buildings would be rooted to know that their sites to move them elsewhere, even in the same city, would alter considerably their meaning"[2].

The Master plan of 1934 rejects: the logic of the "wrecking ball" (as provided in the Plan of 1919 by Catelli and Giussani), the fundamentalist Conservationism, the ''Contextualism" as theorized by Gustavo Giovannoni, the "tabula rasa" of the European radical

[2]Etlin R. (1991) *Modernism in Italian Architecture 1890-1940* (The Mit Press Cambridge, London), p. 255.

avant-garde. The center of Como and its Roman grid are preserved, some monuments are isolated from incongruous additions, some street routes are corrected with an attention that only the vast knowledge of the urban morphology allows.

The new neighborhoods for the working class designed within a suburban belt are terse rationalist compounds (ie. the Rebbio neighborhood, designed with Alberto Sartoris, with a plan deeply influenced by Walter Gropius). But it is the whole scale of the Master plan to be changed: the context is no longer that of the existing city, but has a broader horizon in which the focus is the scale of Landscape and the infrastructural scheme.

Architect of his City

As Enrico Mantero writes: "For Terragni, the bond with the city takes place, in its architectural form, seeking an identity between history and project. [...]. All this is extremely evident by reading the studies and writings for the Master plan of 1934 where the historic city, the *borghi*, the new residential neighborhoods are supported by a willingness to immediately determine their morphological and typological schemes. The sketches, rather than the final tables of the Plan, are the true testimonial of how pure "rational" concept, that does not rely only on "zoning" but define an urban strategy of interventions outside the historic city. [...]. The projects that reach the soul of this peculiar "contextualization" are the working class neighborhood in Rebbio, the projects for the "risanamento" of Casa Vietti and Cortesella and finally the University of Silk, the first controversially defensive, the second ones truly aggressive towards the practices of the Fascist city. This comparison is to be found in the features of the Architecture of the City, as the only witness of a deep-rooted local culture that has guaranteed a real monumentality (and not a ceremonial display), against the ideology of the Corporate City that fascism was imposing. I dare the following similarities: if a manifest destiny of direct participation and entrepreneurial unites Alberti to Gonzaga as well as Andreani to the rural bourgeoisie of the early twentieth century; Filarete to the Sforza as Sommaruga and Moretti to the industrial bourgeoisie of the early twentieth century Milan; perhaps a fate sealed in the architectural super-

structure unites Terragni to Palladio in the direct reinterpretation of tradition; the "Maestri Comacini" for the first and the Classical World to the other, in building productive city to Terragni and in build the cornerstones of agricultural connective of "city-region" Veneto to Palladio: the modernity they have in common is in interpreting with authenticity and immediacy European rationalism (for Terragni) and Classicism (by Palladio). They seize the analogy of a revolutionary attitude just because superstructural within moments of the construction of the European city. It will emerge an idea of the city eventually as an alternative to the Bourgeois City with all the characteristics of the rationalist typologism, as is the case of working class neighborhood in Como-South and, at the same time, the reaffirmation of the centrality of the historical city with all its characteristics of representativeness, strongly mediated by a vision of the architectural poetics, as is the case of the "risanamento" of Casa Vietti. [...]. Therefore the four mentioned projects, can finally be read in their specific character, as well as architectures of a "rooted local culture". Their specific meaning lies in the relationship between typology and morphology. The working class neighborhood in Como-South uses all the typology of European rationalism, composing a large, unified body that "dialogue dimensionally" with the Walled City, as well as the "restoration" of Casa Vietti uses a very special typology constructing an architectural body which materially "stands" on the foundation of the construction of the medieval city. Similarly, the project for the University of Silk interact with a very progressive typological program regarding the educational spaces, proudly facing the Walled City, as well as the project for the rehabilitation of Cortesella deals with a program divided among directional, housing and public spaces in such a positively disruptive way to the the urban fabric, "clinging" to the three historical squares of the city"[3].

From this point of view, the work Terragni does with projects such as the "restoration" of Casa Vietti or the one for the Cortesella district (summarized in a single, enormous building); or the design for the University of Silk (which stands in front of the ancient city walls) or just sketched solutions for stepped blocks overlooking Piazza Perretta, it is extraordinary and prophetic: the urban fabrics of Como and the remains of monuments from the Roman to late Middle Age complete the project of the modern city and not vice versa.

Countdown to Failure

1919_Masterplan Catelli-Giussani is approved. This design is strongly based on huge demolitions inside the walled city, especially in the Cortesella neighborhood, a medieval settlement that lays among the three major squares of historical Como: Piazza Duomo, facing the main city church, Piazza Cavour, the opening of Como towards the Lake, and Piazza Volta, the heart of the medieval settlement. The idea is to open a broad new straight road ("rettifilo") and a new square to cope with the concerns for public health caused by the narrow and dark streets of the medieval urban fabric.

1927_While the Municipality of Como discuss some variations on the 1919 Masterplan, a controversy raised when a long article by Giuseppe Terragni is published on the local newspaper "La Provincia di Como". Terragni suggests a more sensitive and less disruptive intervention on the historical fabric of Como conserving and using as poles for the redesign of the area several historical building (Palazzo del Podestà, il Macello, Casa Vietti) meant for demolition in the Catelli-Giussani Plan and –more important- tracing visual relations among those buildings and the aforementioned historical squares.

1933_Terragni, along Bottoni and Bardi, are on the Partis II liner on the route to Athens, participating to the IV Ciam. They present an urban analysis about Como based upon its regional and territorial role.

1934_Terragni, along Bottoni, Lingeri and Cattaneo among others, submits their entry for the competition for the New Masterplan of Como. They win.

[3]Mantero E. (1983) *Giuseppe Terragni e la città del razionalismo italiano* (Dedalo, Bari), pp. 7-8. On the macrostructural building for the Cortesella Armando Dal Fabbro wrote illuminating pages, in Dal Fabbro A. (1994) *Il progetto razionalista. Indagine sulle procedure compositive nelle grandi architetture di Terragni* (Mucchi, Modena) pp. 48-52.

1935_A commission is formed to define the detailed design for the different urban areas. Terragni and Cattaneo are among the participants, among the rdeputies of the real estates.

1937_Terragni presents the design for a huge, macrostructural building containing housing and directional space for the Cortesella neighborhood. Attilio Terragni, Giuseppe's brother and fascist major (podestà) of Como since 1933, vetoes his brother's project while a national controversy arises. The real estates moves people like Rachele Mussolini (the dictator's wife) and Marcello Piacentini to counter the "too much modern" Terragni's design. The real reason is that the huge building can't be divided in several functional lots to be given to the various estates participating in the operation.

December 1937_Terragni presents a new design: a superblock stepped in its upper floors with light and ventilation assured by large courtyards. For the first time in some sketches, Casa Vietti, doomed for demolition since then, is preserved encapsulated in the design of the superblock on via Plinio.

September 1938_Speculators prevail. The stepped superblock is transformed in a more conventional building with two courtyards only 8 meter wide. In this revised project Casa Vietti has to be demolished.

October 1938_Demolition of Cortesella Neighborhood begins. A controversy arises about the planned demolition of Casa Vietti and Palazzo del Podestà.

1939_Giuseppe Terragni and the Como Supervisor for Antiquities ("Soprintendente") Chierici succed in stopping the demolition of Casa Vietti. In the meantime, on piazza Cavour the storicistic Ina building, is completed.

1940_A fascist mob squad, probably paid by real estates agents, burns Casa Vietti. A two store loggia is all that remains of the late middle-age/early renaissance building.

On the local press Terragni accuses the leaders of Fascist party in Como to have been corrupted by the real estates agents. In the meantime he completed a design for the "restoration" of the remains of Casa Vietti, inserting them in a new supermodern building.

1941_Terragni submit a new project with a part of the building occupying the area of the demolished courtyard of Casa Vietti. Since September 1939 Giuseppe Terragni is attending his military service. The declaration of war (june 1940) stops every further operation on the Cortesella neighborhood.

July 1943_Giuseppe Terragni dies in Como most likely for an ictus.

November 1947_The remains of Casa Vietti are removed and allocated in the Museo Civico in Como.

1950_The building by C. Cantaluppi on via Plinio occupying the area of the former Casa Vietti is completed.

Building Modern Como

The Cortesella saga clearly shows the different point of view of the Italian avant-garde about the relationship between old fabric-new architecture. They are intertwined, two different form of the Great Beauty of the Italian landscape. It is the profile of Lake of Como that matches the scale the great vertical building imagined for the Cortesella neighborhood, while the blocks on which it is suspended take their rhythm from the blocks of the Roman city by freeing it from the lame XIX century blocks proposed by the 1919 Plan and by its revision in 1927. The building that completes the remains of Casa Vietti envelopes the late Gothic building in a tight sequence of elegant opalescent architectures, making it part of a modern design due to create a three dimensional public space to be perceived by an architectural promenade. As we have seen, around the few blocks that make up Cortesella neighborhood in Como and where stood Casa Vietti, between 1937 and 1938 a very tough fight was fought, that saw a crisis in the relationship between Attilio Terragni and his brother, who in the meantime became mayor (the two were partners in the office in via Indipendenza too), and eventually produced the dissolution of the Gruppo Como (for the tensions with Giussani, Ortelli and Mantero). From the project of July 1937 for the macrostructural building mentioned earlier, Terragni and Cattaneo moved to a isolated block solution surmounted by a stepped body. In

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Figure 3. "Restoration" of Casa Vietti, first project. View from Piazza Perretta (© Luca Lanini e Lyza Rossi).
Figure 4. "Restoration" of Casa Vietti, second project. View from Piazza Perretta (© Luca Lanini e Lyza Rossi).

the meantime an heavy pressure is put to the Municipality by the real estates (even with the direct intervention of Rachele Mussolini) for the demolition of Casa Vietti. Terragni is against it -in contrast to groups that usually support the complete preservation with their antimodernist rhetoric- along with Sovrintendentet Chierici and Bottai (leader of the "left wing" within Fascist party), and therefore is excluded from successive degrees of the design. The Fascist mob squads, probably paid by speculators, burned Casa Vietti in January 1940. Terragni raised a violent polemic against Como Fascist party, which it accuses of being on the roll of real estate agents[4].

The controversy is resolved in a magnificient architectural design in which the portico of Casa Vietti is set in a perfectly crafted crystal building. Terragni, in an unsigned article on "Costruzioni-Casabella", describes it: "Terragni not only has preserved and consolidated –according to the Soprintendenza- the beautiful front porch of the fifteenth-century Casa Vietti, but studied with unscrupulous modernity and Italian fluently the inclusion in a new building that he will build around. He knew that respecting the Old means not to put it down in a cloying and false segregation but to make it participating as a living element in a composition. The counterpoint between the bold elegance of fine antique capitals and crisp modern structures, among the arches and slightly profiled by thin rings of brick lintels and the openings of the large room superimposed, between the ancient stone walls and large glass surfaces the new house, is intended to give an unusual detachment to the ancient monument and, reciprocally, an unusual note of nobility to modern building"[5].

[4]Nicoloso P., "Progetto di concorso per il piano regolatore di Como e sua esecuzione a stralci", in Ciucci G. (ed.), *op. cit.*, pp. 419-428 and especially Consonni G. and Tonon G. (2006), *Terragni inedito* (Ronca, Cremona), pp. 94-189, where in great detail and a large amount of documents, many unpublished, is reconstructed the whole story.
[5]"Como. La Casa Vietti", in "Construction-Casabella", no. 182, February 1943, republished in

In the first project on the ruins of the portico of Casa Vietti is overimposed -without touching it- a terrace and a hall for public events, placed on two levels, staggered not only in height but also in depth. The balcony juts out and shoot forward, so that the light illuminates the loggia from above and thus defining an original public space defined by the circulation running from a new external staircase joint to the old portico.

In the second project the terrace is transformed into a body that extends out even more towards the square that is then centrifuged inside the new complex thanks to a spiral paths defined by staircases. The new pieces are supported by a steel Vierendeel beam (Terragni and Uslenghi thought to copyright it) which measures echoed those of the fourteenth century loggia. A demystifying project to the hegemonic role that the conservationism and historicism took over in the postwar Italian culture: the comparison between modern architecture and the history of our cities could be solved in a different way than the mystifying simplifications of architectural historic patterns exemplified in the second project by Ignazio Gardella for Casa alle Zattere in Venice the it will be the imprint of a large part of Italian architecture of the Reconstruction. Terragni "respects the Old not segregating it but, indeed, calling to participate in the alternative face of the city. It is a lesson of method still valid, is antithetical to the destruction that a fascist team attempted to commit, and that unfortunately was implemented after the war, with the theory of pseudo-restoration. Terragni was using the dialectic clash between two qualities: that inherent the works of art of the past, and that caused by the inventive rush of the avant-garde"[6].

The set of renders presented here, made by Brunello Favilla and Lyza Rossi, to students of the Master Degree in Building Engineering-Architecture of the University of Pisa, shows how rich and progressive would have been those two Terragni's projects if built.

References

Ciabatta A. (2012) *La modernità nei tessuti storici. Gardella, Meier, Terragni* (Aracne, Roma).

Ciucci G. (ed.)(1996) *Giuseppe Terragni: Catalogo della mostra* (Electa, Milano).

Consonni G. and Tonon G. (2006), *Terragni inedito* (Ronca, Cremona).

Cuomo A. (1987) *Terragni ultimo* (Guida, Napoli).

Dal Fabbro A. (1994) *Il progetto razionalista. Indagine sulle procedure compositive nelle grandi architetture di Terragni* (Mucchi, Modena).

Eisenman P. (2005) *Giuseppe Terragni: trasformazioni, scomposizioni, critiche* (Quodlibet, Roma).

Etlin R. (1991) *Modernism in Italian Architecture 1890-1940* (The Mit Press Cambridge, London).

Lanini L. (2014) *L'architettura moderna. Le Corbusier, Mies van der Rohe, Terragni, Niemayer* (Ediesse, Roma).

Mantero E. (1983) *Giuseppe Terragni e la città del razionalismo italiano* (Dedalo, Bari).

Marcianò A. F. (1987) *Giuseppe Terragni opera completa 1925-1943* (Officina, Roma).

Saggio A. (1995) *Giuseppe Terragni. Vita e opere* (Laterza, Roma-Bari).

Zevi B. (1980) *Giuseppe Terragni* (Zanichelli, Bologna).

Zuccoli L., Lanini L. (ed.)(2015) *Quindici anni di vita e lavoro con l'amico e maestro architetto Giuseppe Terragni* (Libria, Melfi).

Mantero E., *op. cit.*, p. 35.
   [6]Zevi B. (1980), *Giuseppe Terragni* (Zanichelli, Bologna), p. 190. On these events see. Ciabatta A. (2012) *La modernità nei tessuti storici. Gardella, Meier, Terragni* (Aracne, Roma), although the chapter on the issue of Cortesella is seriously inaccurate: the stepped solution is predated on the macrostructural building design.

Landscape and Territory

city as organism | new visions for urban life

Chair_Rita Occhiuto
Faculté d'Architecture, Université de Liège, Belgium
Co-Chair_Maesoomeh Arabi
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

Reading Contemporary Landscape

Landscapes and Territories
Urban Landscapes
Metropolitan Infrastructure

For a new organic-city

Alessandra Capuano
DiAP Department of Architecture and design, "Sapienza" University of Rome, 53 A, via Gramsci, 00197, Rome, Italy
Keywords: cities, landscape, urban morphology, organic city

Abstract

Organic= deriving from living matter; relating to a bodily organ; fit together as part of the whole

In his investigation of Europe's architectural identity and crisis, V. Gregotti tries to examine the reasons of this condition and the material circumstances in which nowadays architects act. Among the mentioned causes the lack of thoughtful consideration towards the themes of transformation of the existing fabric instead of fostering the city expansion; the proliferation of specializations and the confining of the profession of the architect in the role of an image maker for the marketing; the rise of comprehensible environmental preoccupations acting as an ideological guise deprived of content. To these we have to add the lack of interest of the politics to take into account the longue durée of the territorial transformation. As a result our cities and architecture are designed through a careful attention in answering numerous building codes regulations as well as strict environmental controls and all sorts of bureaucratic responses, lacking instead the principal goal that is the capacity of "crafting the city". In his more recent contribution regarding the sublime in ours time, Gregotti regards the landscape as a recently recuperated concept capable of nurturing a cultural collective idea of settlement. Yet landscape cannot be confused with sustainable and ecological practices, that per se cannot guarantee design excellence. The reference towards the geographical and historical nature of the landscape implies the acknowledgement of an overall character collectively recognizable in terms of scale, imaginary, memory, morphology. The paper aims at analyzing modern and contemporary urban design case studies with the goal of understanding the new urban design morphologies and principles and to highlight what we can understand as new organic-city. The urban is the site of complex relationships and successful projects are those who accomplish disciplinary knowledge together with sustainable and innovative challenges.

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Organic= deriving from living matter; relating to a bodily organ; fit together as part of the whole.

In his investigation of Europe's architectural identity and contemporary crisis, Vittorio Gregotti[1] tries to examine the reasons of the current critical condition and the material circumstances in which nowadays architects act. Among the mentioned causes the lack of thoughtful consideration towards the themes of transformation of the existing fabric instead of fostering the city expansion; the proliferation of specializations and the confining of the profession of the architect in the role of an image maker for the marketing; the rise of comprehensible environmental preoccupations acting as an ideological guise deprived of content. To these we have to add the lack of interest of the politics to take into account the *longue durée* of the territorial transformation. As a result our cities and architecture are designed paying a careful attention in answering numerous building codes regulations as well as strict environmental controls and all sorts of other bureaucratic responses, lacking instead the principal goal that is the capacity of "*crafting the city*".

In his more recent contribution regarding the *sublime* in ours time[2], Gregotti regards the landscape as a recently recuperated concept capable of nurturing a cultural collective idea of settlement. Yet landscape cannot be confused with sustainable and ecological practices that per se cannot guarantee design excellence. The reference towards the geographical and historical nature of the landscape implies the acknowledgement of an overall character, collectively recognizable in terms of scale, imaginary, memory, and morphology.

Although Europe is not deficient of virtuous and successful recent examples of city enhancement, such as the largely well-known cases of Barcelona, Hamburg, Copenhagen, Lyon, Marseille and some others, the situation in Italy is not as encouraging. In Italy we can count on single interesting new buildings that have been built in the last ten or twenty years, but examples of efficacious and valuable urban requalification are rare. One could think that this corresponds to a lack of urban transformations tout-court. Instead, at a closer glimpse, we realize that Italy is experiencing a quick and heavy soil consumption, since in 2014 the built environment occupies 21.000 km^2 corresponding in percentage to the 7% of its territory, that is almost three times more the quantity engaged in the Fifties, estimated in 8.100 km^2 equivalent to the 2,7% of the total land[3]. My preoccupation in the evaluation of the problem though, is not merely quantitative, but qualitative. What percentage of these transformations can be regarded as the creation of interesting conurbations and creative growth or renovations, and what fraction of it is instead merely banal and conventional development or worse, even environmental devastation? Unfortunately I don't know the answer in terms of percentage, but I am afraid the results are completely pending towards a predictable and conventional design practice, mostly subjugated to the developers' imperatives and the answering to codes, completely left to the market's priorities with no quality obligations imposed by local governments.

If we ask around what makes a good neighborhood, or a good city, apart from the obvious things like having a low crime rate and good schools, one of the most important factors is the quality of space. The place where we live has an important contribution to our well-being. The urban theorist Richard Florida has affirmed in an interview[4] that most psychologists and behavioral economists have said that the two things that make us happy in life are work that we can identify with and that we find challenging, and having great social relationships. Florida thinks that the community we live in happens to be "that incredibly important third part of that triangle of human happiness".

[1]V. Gregotti, *Identità e crisi dell'architettura europea*, Torino, Einaudi, 1999.
[2]V. Gregotti, *Il sublime al tempo del contemporaneo*, Torino, Einaudi, 2013.
[3]ISPRA (istituto superiore per la ricerca ambientale) *Il consumo di suolo in Italia*, Edizione 2015.
[4]Interview to Richard Florida by A. Price in http://magazine.good.is/articles/you-are-where-you-live-what-makes-a-perfect-neighborhood.

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Figure 1. Vittorio Gregotti, University of Calabria, Cosenza, 1973-79. Bird's eye view of the winning project in the competition for a new university of Calabria. The new structure is rooted in the geographical features of the site (a large hilly area that extends down from the Paolan mountain chain towards the Crati river valley).
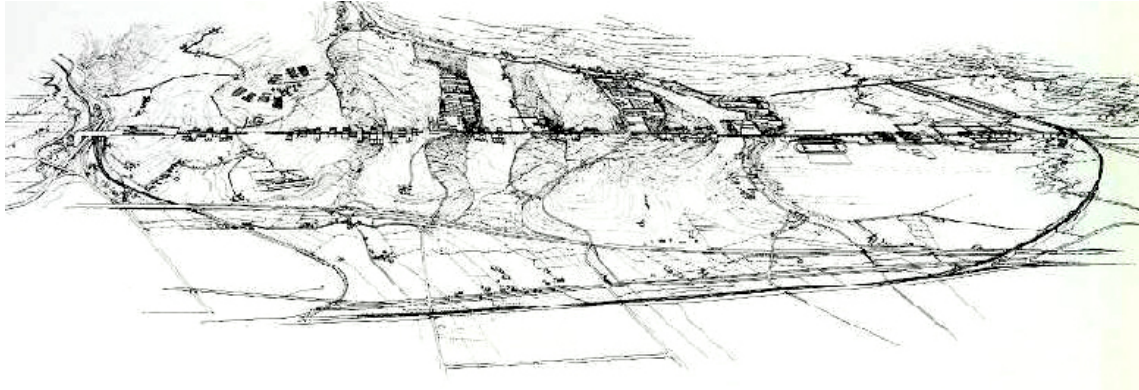
So in essence a neighborhood is not just a set of individuals, but a set of relationships…. And the relationships are fluid. Some are longstanding and some you can plug into and play. And the places that enable those relationships to form are the places that do better.

So the relational qualities are the most important reason why grand part of the human beings live in cities and also the main reason that makes a good neighborhood. How can we enable in the neighborhood these relationships to occur? Being an architect, I think that form, the shape of the space, is not a secondary issue, even if not the only one. Functional answers are also needed to craft space and to create relationships. The city needs in fact to be useful to the lodging of people and to the organization of work, to the problems of garbage and waste, to the issues of water supply and drainage, to the distribution and production of food, to the mobility of people, to well-being and recreation, and so on. Modernist urbanism has fixed standards, believing that quantities could solve the problem. As a result all our governments are concerned with standards, in order to reach certain quantitative levels. But quantities are not necessarily adequate to create relations. Policies and guidelines fix our standards, but no document is engaged with recognizing the problem of relationships and form, because form cannot be established a-priori as a ready-made tool. Form, of course, could also be informal, could also be irregular or unbalanced. But not because of its crooked shape would be necessarily bad, nor it would be good if it is regular and symmetric. I think that a good form depends on the place, and has to do also with relations. What relations we want to establish with the surroundings, with the city, with the past. To think through form means to give an order to space. Implies to contribute to the crafting of the city. Quantities call for policies, qualities need projects. Projects cannot take into consideration only the problem of the form, of the morphology, but certainly the shape would be part of the project. Form is not only about the built environment, but concerns also the voids, the negative space, the space that is used as public space or that is a left over in the city fabric. So if we have to craft the city we have to think how to design buildings for residents and offices, for public and commercial edifices, but we have also to organize streets and mobility, to design opens spaces and parks, together with the organization of services such as waste or water. Yet all of these tasks are not merely functional problems. They have an impact on the form of the city. They have an impact on our future. The way these areas are built induces the establishment of relations among the urban parts. The interactions have an influence at the metropolitan scale of the city or even at the regional one, but they have an effect also at the human scale, so it is important that details would be studied. This means that the urban project needs to be multi-scalar, shouldn't be only functional and responding to quantitative standards, requests to be sensitive to environmental issue, and above all needs to be relational.

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Figure 2. SWA group (Sasaki and Walker Associates), Anning River New South Town, 2008-2010. Bird's eye view of a new district for 95.000 people in Miyi County, China. The firm works in the mainstream of Ecological Urbanism with deep appreciation for nature and natural systems and a strong commitment to design that synthesizes aesthetics and sustainability.

These relational qualities are what I believe can be regarded as "organic". If we search in the dictionary[5] for the meaning of the word *Organic*, it has three main significances: 1. Deriving from living matter; 2. Relating to a bodily organ; 3. Fit together as part of the whole. So "organic" is something that refers to living things and it is something that is cohesive, well combined. If we want our cities and our neighborhoods to be lively places they need to encourage flow and exchange, relations among the parts, and these relations need to be solid, well organized and interrelated. We have to create relations at all levels: among the different parts of the city, between built and non-built spaces, between disciplines, because to craft the city we need many specializations, and expert knowledge needs to dialogue. Our society is based on movement, exchange, physical and immaterial flows. The urban body, like any living matter made of blood, dies if there is not flow. Communication, relationships, connections and associations, these are the important things for the city. Communication intended not in its superficial way, but as the most profound way of exchange. The main reason why cities are grown based on trade. And to make those issues to work well in a project we need to make thoughtful combinations. Which is the essence of the architectural profession. We put together different parts, we design and combine different elements. We make a composition.

In the introduction to his recent book, Giuseppe Strappa discusses the worn-out term "organic", reminding us its excessive use in the architectural discipline, concluding that

[5]Oxford dictionary for the English and Dizionario Treccani for the Italian.

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it is a noble adjective, but vague and elusive[6]. He chooses to use instead "process" to explain the specific quality of architecture in the making. So a project for Strappa is a process that has arrived to a temporary conclusion, waiting to be continued. His main focus for the discussion regards the masonry architecture as paradigm of solidarity between the components that determine the shape of the building. What interests him is not necessarily the material in which a building is built, but the fact that there is an organic unity, a cohesion among the parts, since the stability of the construction, the distribution of space, the expression of architecture form a whole. I have nothing in contrary to masonry buildings, and I fully agree that the Mediterranean tradition has not expired and still has things to say for the transformation of the contemporary environment. And I really appreciate most of the architectural examples examined in the essay. Yet I believe that the quality of single buildings is not enough to make an interesting city. They end up to be at best interesting fragments, isolated elements in a collapsed contemporary urbanscape. Their cultural affiliation to the place, their exemplification of simple and cohesive (organic!) design process is certainly an interesting element of resistance to the processes of globalization, in that same sense that Frampton introduced in 1984 to the attention of the architectural debate with the notion of Critical Regionalism. However where Frampton had introduced certain equilibrium between global culture and rooted culture to take shelter from a nostalgic attitude, the proposal of Strappa to remain allied to the plastic masonry architecture seams to me a strict and anachronistic challenge, not supported by the real cultural processes that our territories are experimenting. The loss of crafting tradition of the workforce, the enormous mingling of populations induced by the phenomenon of immigration that has taken biblical proportions nowadays, the discover of new construction materials that are more economic and easy to produce, all call for the necessity to accept a certain evolution of the building technics and therefore of the architectural language. What we can hope, and this together with what has stated more recently Frampton[7] - and I believe also Strappa would agree - is that architecture continues to promote an ethic demand capable, according to the words of the British historian, of contrasting and giving an alternative model to the dissolute project of Americanizing the entire world, conducted by the hegemonic power of the "universal" western civilization.

This attention towards the ethic dimension seams to raise interest in the contemporary architectural debate since the 2016 Venice Biennale will take distance from the architecture of the spectacle, to give strength to "several battles that need to be won and several frontiers that need to be expanded in order to improve the quality of the built environment and consequently people's quality of life" as stated by Alejandro Aravena, its future curator. Brand architecture is often auto referential and anti-urban in the sense that is not related to the context in which is inserted. This lack of relationship acts at all levels, physical and social. It is architecture preoccupied of its own image and the message it wants to communicate, and in some cases succeeds in transmitting this influence. It can certainly act as a symbolic landmark of the established economic power. But rarely becomes an improvement for the city in the sense of enhancing and upgrading its relational capacity. We cannot say though that many of the brand architecture buildings are interesting pieces of architecture per se, but what is missing is the attitude towards the city – one that is not dependent on the compositional or typological approach. This is why I believe that buildings are certainly an important part of the city, but they are not enough to "craft the city". The city needs to be a network, in order to reinforce and renovate its main relational character. So, to me it is less important if a building is made of opaque masonry instead of transparent plastic, since what I am looking for is the interaction between the building and the open spaces, the collaboration between private and public realms, the communication between different cultures, the possibility of having in the city the benefits of exchange and access to the different potentials that are offered.

[6] G. Strappa, *L'architettura come processo. Il mondo plastico murario in divenire*, Franco Angeli, Milano 2014, pag. 9.

[7] K. Frampton "Verso un'architettura agonistica" in *Domus* 972, settembre 2013.

This to me is the most important meaning I can attribute to the word "organic". Being part of the whole means to connect, signifies to communicate, and indicates the importance of fluidity to be lively, which represents the best condition of "deriving from living matter".

This is the reason why in the last years I have stepped forward towards landscape. And I am particularly interested in all those practices that understand landscape as a condition for acting on the city or on the territory undertaking complex relations at the physical, economic, political, social and cultural level. I believe that this complexity has to be traversed at all scales and disciplines because it is only the ability to have a strategic regard that gives sense to the things. Things are not necessarily good or bad per se, but in relation to others. So the landscape regard permits to understand strategies at a larger perspective. Permits to create the framework within which single projects can fit, single buildings can match. There is a tradition of this approach in the Italian architectural practice of the urban design in the Sixties and Seventies, when with birds-eye view perspectives architects where representing the territory, to understand the relationships established by the new intervention with the context. The approach had that interesting strategic regard which takes into account the problems of the *longue durée* of the urban transformations. Yet, this regard nowadays seems to be a little bit too much concentrated on compositional responses.

This look has found more recently new nourishment in the group of architects engaged with the manifesto of the Ecological Urbanism[8] undertaken by the Harvard School research group. The concern for the environment, for a strategic approach at all scales and disciplines, but at the same time the interest for design excellence and design thinking, not only as important added value to the crafting of the city, but as main direction and control of the territorial transformations, is for me an interesting response to the relational problems of the metropolises and the need of a *new organic-city*. As David Harvey wrote in his recent book *Rebel Cities*: "the question of what kind of city we want cannot be divorced from the question of what kind of people we want to be, what kinds of social relations we seek, what relations to nature we cherish, what style of life we desire, what aesthetic values we hold. The right to the city is, therefore, far more than a right of individual or group access to the resources that the city embodies: it is a right to change and reinvent the city more after our hearts' desire"[9].

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References

Gregotti, V. (1999) *Identità e crisi dell'architettura europea* (Torino, Einaudi).
Harvey, D. (2010) *Rebel cities. From the Right to the City to the Urban Revolution* (Verso, London- New York).
Mostafavi, M., with Doherty, G. (ed.) (2010) *Ecological Urbanism* (Harvard University Graduate School of Design, Lars Muller Publishers).
Frampton, K. (2013) "Verso un'architettura agonistica", in *Domus* 972, september.
Gregotti, V. (2013) *Il sublime al tempo del contemporaneo* (Torino, Einaudi).

[8]*Ecological Urbanism*, edited by M. Mostafavi, with G. Doherty, Harvard University Graduate School of Design, Lars Muller Publishers, 2010.
[9]D. Harvey, *Rebel cities. From the Right to the City to the Urban Revolution*, Verso, London- New York, pag. 4.

Industrial Landscape between Modernity and Tradition: what meanings to accompany change by the project?

Rita Occhiuto, Paul Christian Hautecler
Faculté d'Architecture, Université de Liège, Belgium
Keywords: morphologic actions, narrative dimension, future of the past

Abstract

The industrial landscape is read as a material acted by time and by the joint action between nature and human practices. Geomorphological changes and open dialectics that characterize the landscape of Liège are subjected on one hand, to reinterpretation of readings and on the other hand, to a revival of innovative meanings, activated to respond to new waves of relentless modernity (Gregotti 1993) related to new palimpsests (Corboz 2001) carrying industrial history little known today, even forgotten. Architectural competition, new urban projects and deindustrialization are the new meaning of urban politic blinded by an apparent modernity that transfigured the Meuse valley and de rural context: territories that have been assaulted by early industrialization, emerging as a rhizome.

The proposed study covers in-between area. Permanencies, like blast-furnaces and harbor structures, interspersed workers neighborhoods and "interrupted lands", are both landscape and urban contexts, whose metaphysical atmosphere axpects a becomming, which neither the people nor decision-makers can no longer see the prospects. On the other hand, repeated and interpreted readings permitted the emergence of elements, factors and traces that hold enough potential of re-launching for building new urban and landscape narratives. They accompany typological writings, whose innovative character is not to be found in modernity to achieve, but in the thought in progress, represented by projects that help in understanding and formulating creative combinations of existing materials (Rowe 1978). This work introduces us to the possibilities to reread the prospective potential readings and writings to be extended with new projects.

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Introduction

The metaphor of the city as an organism, while referring to renowned and common urban interpretations, has produced a very diverse level of knowledge of the territory.

The reading of tissues brought about by the anthropization often seems outdated, or even inefficient by virtue of the complexity of materials which characterize the various spheres that nowadays escape us to the point that they become extraneous.

Nebulae, emergences (R. Koolhaas), places of *anthroposages* (A. Corboz), sprawl or diffuse cities (B. Secchi), are the denominations given to the territories which have neither body nor time.

These places are nothing more than the cumulative amounts of *corporeality reduced to the status of the plan*. This reduction of substance, in correlation with the condition of *otherness which provokes* a distancing of the contexts we have nonetheless had a part in creating intrigues us and constitutes the triggering event of our approach. Thus, the attention paid to what *has emerged* is too often limited to the simple description of the situational analysis.

Based on this observation, we were interested in the case of the city of Liege, and more particularly in the dynamics between the city´s growth and the mutations of the geomorphologic characters of its location. The observation was primarily aimed at those parts of the territory that are nowadays rejected, also known as «*junkspace*» (R. Kool-haas). In reality, the research covers vast hybrid areas affected by the industrial decline, leaving them between a state of abandon and a state of future expectations at the same time. This situation today characterises the landscape of the Meuse Valley, up-stream and downstream of the city of Liege (BE).

Since the XVIIIth century, the human being has, in these places, accumulated materials, machines, different products, production surplus and waste as if he were seized with a fever of change or carried away on a path leading towards an ideal of modernity which becomes more and more elusive.

The territory drawn by the rural patterns disappeared in line with the advancement of the industrial tissues which for a very long time represented an entire region´s pride over its economic prowess. However, when the production fever started fading away, and then vanished altogether, the loss of activity gave the landscape the appearance of an injured body, with certain parts amputated. It was soon filled with *scattered objects*, as ignorant witnesses of new incongruous spatial organisations.

The diversity of theses tissues and their abundance of fragments, carrying past and forgotten logics, forced us to reinterpret the process of formation simply to understand what has happened. And hence, maybe also to understand the roots for the forgetfulness and the current lack of interest.

This way of acquiring knowledge has helped us re-establish a narrative which nobody keeps the memory. It has also highlighted both the lack and the need for more open means of interpretation of urban and landscape materials. All this is done so as to stimulate reinvention which is essential to re-launch and nurture a transformation process which contains a plethora of new acceptable, distinctive and sustainable solutions for the future.

Context

In the French speaking part of Belgium, studies on the urban form, developed in the 1980s, have had a particular influence on the architecture during the confirmation of the post-modern movement and on the restoration via the development of scientific analyses applied to the building.

However, in the history of urban architecture and urbanism, these methods have failed to reach the level of consolidation required. Still today, the Walloon territory suffers from a lack of profound knowledge that would be required to rewrite the process of urban and landscape mutations. By integrating time and space, the morphologic approach allows for a better comprehension of the characters of the built and non-built. That way,

we have seized several opportunities as part of our research and our training to have the Walloon and Liege territory undergo the test of interpretative lecture of existing tissues. This was done by adapting them to the time and objectives of the missions[1].

The multiplying observations of trivialisation and illegibility, the loss of value and identify of one type of territory suffering from urban diffusion have led us to reconsider Liege and its anchorage landscape. Starting from a study on Liege's[2] urban growth and the study of the suburban areas of Sclessin-Ougrée-Tilleur[3], we have created a programme of critical lecture with a view to conceiving some hypotheses on the project. Those simultaneous approaches have brought into light less vital specialised functions, such as castles, schools, churches, etc - trickled away and hence invisible. Those two cases of study have served as experimentation fields to gain useful knowledge. With this knowledge, we managed to find new paths or possible scenarios with the objective to restoring to these places their dignity and lost identities.

The particular condition of the industrial tissue due to a progressive overinvestment of available surfaces in the alluvial plain of the Meuse. Upstream and downstream of the city of Liege (BE) clearly was a phenomenon in need for a better comprehension. In fact, the river passes through a city which seems indifferent to the flow of water, following a completely redrawn progression in the XIXth century. From the conceivable difference between the former configuration of the river bed and its current state emanates a curiosity and a desire to better understand the ideas that have driven the change.

On the one hand, the urban growth has already been studied swiftly so as to reach a level of comprehension sufficient to generate development, yet, on the other hand, the complexity of the various forms of intertwinement between the tissues requires in-depth studies - still today. In addition to that, a double phenomenon is to be observed: a movement of abandon as well as of pressure on the premature reinvestment of the places. The parts of territory chosen as study objects are located mostly along the valley of the Meuse upstream of Liege. Up until a few years ago, a majority of the infrastructure and industrial complexes of the region were concentrated here.

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Methodology: Sclessin, readings of a land

Studies conducted in the suburbs of Liege allow to advance the hypothesis that the rise of the modern city is due to a strong technical mastery. This in turn, has lead to the taming of the urban site as well as to a form of early industrialization of its territory. The dependence of the conditions and the richness of the soil and subsoil and the existence of interlacing wetlands and link-ups of rivers play a crucial role in the development and assertion of the city as the backbone of commercial and cultural life. Urban cores in valleys turn into crossroads of exchange and passage while the first industrial towns arise on the slopes and plateaus at the entrance and exits of the old towns. Liege imposes itself as a major exchange platform, supported by its numerous new production sites. On top of

[1]Research conducted for the Walloon Region (BE):
a. «Patrimoine Bâti» as part of «Diagnostic Territorial de la Wallonie - CPDT», R.Occhiuto, P. Haautecler & others, «Vers une politique active du patrimoine bâti dans le SDER nouveau» in the Magazine «Les Cahiers nouveaux» N°81 March 2012 p.17-23. This text offers a summary and a first critical review of a system of interpreting the territorial collectivities which are still lacking a critical interpretation of existing contexts - http://hdl.handle.net/2268/121240.
b. Research initiative for the Walloon region. Research report «Densité, morphologie urbaine et qualité de vie. Une approche par le projet» R. Occhiuto and others, Nov. 2013. «Densification des tissus urbanisés en Wallonie: forme, acceptabilité et modalités pour accompagner la mutation des tissus bâtis» research initiative for the Walloon region. Research report «Densité, morphologie urbaine et qualité de vie. Une approche par le projet» R. Occhiuto and others, Nov.2013 - http://hdl.handle.net/2268/182474.
[2]Occhiuto, R. (2014), Voyage aux rythme d'une ville-paysage, in *Guide architecture moderne et contemporaine 1885-2014, Liège*, collective, Ed. Mardaga, pp.9-27.
[3]Occhiuto R., Hautecler P. Master course, Architectural Project Studio «Architecture, Forme Urbaine, Paysage», Faculté d'Architecture, Université de Liège BE, 2012-2015.

that, the city sits on the rectified bed of the Meuse and heads towards a growth gnawed by the continuous research of modernity as a new form of identity.

The process of substitution and rectification influences all eras who witnessed the rise of their cultural and economic importance up to the end of the XXth century. At that time, the industrial rhythm is disrupted and the crisis the crisis breaks a story that does not know failure, but only a progress on land, a mastery of the water and the exploitation of the Meuse as a long canal of commercial development at the service of the industry.

The XXIst century inherits a city whose tissues, previously described by Victor Hugo as landscapes of fire, are nothing but a heap of rubble, where attempts of reemployment are in vain. A city which is reduced to the simple occupation of a bare and vulnerable territory, here and there sprinkled with warehouses or open-air storage spaces that nobody has shown any interest in for a long time. Just as for a worn down body, the entrance to the cities on the Meuse, beyond the exhibition sites, become the preferred target of new bulky and strictly utilitarian buildings ignoring every trace or history of the site.

Sclessin, neighborhood on the Meuse at the doors of Liege, and Kinkempois, located on the opposite riverbank where housing intertwines with the harbour and the goods station, are territories enclosing the river water. With Ougrée and Tilleur, they become the prey of an uncultivated and incoherent occupation of land. However, these places are full of quality elements: castles, *bourgeois* residences, green wilderness and enclosed agricultural land, evoking multiple values lost backgrounds, both industrial and rural. And on top of that, the river could still have a potential which is to be brought back to the surface.

The method of *re*-reading those lands focused on two types of action: selecting the witnesses of spatial and historical qualities that are still readable *in situ* and, simultaneously, the cartographic comparative research from the Ferraris map (1777) and Van der Maelen (1885). The latter, although not exhaustive, allowed us to identify forms of resistance that the old road alignments still represent. Challenging those layouts against relief, water runoff and multiple soil exploitation types allowed to retrieve establishment patterns like construction and infrastructure ones that show the dependency (still present today) between natural conditions of the soil and the shown anthropization material. The names of lands, places, mines and industries complete the information and play a crucial role in better understanding the dynamics that settled back then between new forms of uses of land and traditions of the past.

From this first reading, we have retained the importance of bringing into the spotlight the potential of interpreting the relations between topography and uses, both old and new, of the soil. Old maps bear the marks that slowly disappear to the benefit of representations devoid of any relief trace and original water runoff. Indeed, since the XXth century, land registry maps seem to tell a story of a tipping movement that inhibits the ability to feed imaginative land organization. Starting from their status as tools that precisely show the transformation of the land and its geomorphic continuity (horizontal look), maps tend to move away from the need to stick to the land and become very powerful means to show simply functions' marks occupying places, than reduced to the status of useful surfaces (vertical look). Indeed, the most recent maps represent the course of the Meuse without any natural roughness, without any relief, woods, new functions (cemeteries, stadiums, industries) or waste-places (slag heaps), but strongly focus on infrastructures and streets. Maps also bear witness to the existence of a functionalist ideology which makes the street-layout prevail for the benefit of a vision which cancels the space of relation between materials, to replace it with a space devoted to movement or vectorial. This leads to a *flattened* consideration of spaces casting into oblivion the physical characteristics of inhabited spaces and to an always more abstracted vision of the territory. This first interpretive reading of maps allowed us to bring forward that as land bears more and more signs of technical mastery (piping, deletion of islands, wells, railroads, bridges, etc.), representations get rid of lines and shadows marking relief as well as water and green wilderness. Alluvial plains, precisely drawn on Ferraris' maps, are replaced by white surfaces ready to receive a new road-layout with new functionalities: land meant for large buildings form isolated blocks or series of warehouses; islands of housing separate one industrial site from the other. It then becomes very clear that the territory at the

southern entrance of Liège owes its characteristics to a continuous division of soil mainly due to a lengthwise infrastructural layout that cuts and isolates linear parts of the land.

The original road layout was based on a street located under the slope (in Sclessin called *rue du Chiff d'Or*, because it lead to a slope covered by vineyards) and a bigger roadway cutting through the plains (*Nouvelle Chaussée de Dinant*). The banks weren't fixed by roads but were part of big properties nesting castles and manors and their gardens that flowed up to the Meuse. Retrieving those groups of properties and villages allowed us to bring into light the *reuse* of existing roads as well as the persistence of old land registry limits. We drew the conclusion that the industrial city reabsorbed roads and buildings and simultaneously created a whole other landscape by reshaping the plains.

The transformation is progressive and confirmed by the study of engravings edited in the book "*La Belgique industrielle*"[4]. Places are often represented by savant contrasting elements showing the values of both the rural environment (the old) and the industrial environment (the new). The persistence of rural characteristics were shown by the introduction in rural territories of group of farmers, their tools and their carts; as the upcoming industries were represented by beautiful XIXth century buildings and their chimneys showing the new world like a group of beautiful properties at the countryside. Everything was topped off with hills covered in ridged fields. The different savant images are proof of the different forces interacting during this historical age of transition.

The reading method uses the differences in maps to complete them with other elements extracted from other documents, charts or pictures. Those elements bear spatial and atmospheric characteristics and allow to deepen the interpretation of *in situ* observations by elaborating concepts and written comments giving the depth of a story (A.W. Spirn) to a place. It tells the story of a land, considered as ugly and suffering from urban development, but also explains that it is only the consequence of a cyclic replacement of exploitation methods that completely ignore the place in itself. The rural landscape is progressively in the company of a constructed armature (road and building) provoking the obliteration and, in time, disappearance of the rural world. The industrial crisis then leads to the eradication of the marks of another exploitation method of the land. A certain need for coherence then appears like the *re*-use of meaningful road-layouts or buildings for the neighborhood: the *Château de Sclessin* and its outbuildings. By focusing on them, the reading allows to pull them out of forgetfulness and give them an active role in renewing the site.

At this stage of the method of reflection, we use the project consisting of an enunciation of hypotheses of spatial transformation putting criteria and concepts in relation with the results of the previous study. As a consequence, the project-hypothesis presents itself as a tool allowing to work on the values having the ability to secure a renewing and requalification of existing spatial systems.

The sites of the castle, of the bridge of Rénory, the heap and the stadium of Sclessin, the fields surrounding the wharf of Vercoeur, the urban country side of Tilleur as well as the site of Ougrée enclosed in between the lands occupied by high furnaces and other disused industrial buildings. And last but not least, the area of Kinquempois. They are the sites where new project hypotheses help demonstrate that there is a potential to be harnessed, provided that the relation between the past of the existing and the future of new adjustments can be kept alive.

These hypotheses emanate from multi-scalar morphologic reflections which help keeping a link between the *reasons for a balance of the territory* on a large scale with those to be brought back to the surface via a project on a scale of architecture and detail. Responding to a double challenge, i.e. thinking at the same time about *the one* and *the other*[5], provides the project with some sort of experimentation power. Here, it serves to try out the possible ways to restore the lost balance at the same time on the scale, for example, of the landscape of the alluvial plain and la balance of the mesh of a small island or of a whole lot of constructions adjoining the shores of the Meuse.

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[4]*La Belgique Industrielle en 1850* (1995), collective. Ed. Crédit Communal.
[5]R. Venturi, *De l'ambigüité en architecture*, Ed. Dunod 1999.

At the same time, these hypotheses offer the opportunity to return to the inhabitants which are nowadays almost living in a state of siege because of the disconnections due to the fast lane along the water or the railway interspersed with only a few sinister underground tunnels. In fact, the discomfort, the relegation and sometimes the loss of remembrance of everything that used to be activity and vitality of the working class and which used to bring life to the streets and corners of the area are today the only factors the inhabitants can remember. The idea of a potential requalification seems impossible to them. The only exceptions, in the face of degradation, are the residual spheres which are re-appropriated for collective vegetable gardens or abandoned land, re-conquered by the natural vegetation or hardly re-polluted and in dire need of new affectation. Those corners are called "little Eden" or "Sclessin country". As their names suggest, they constitute powerful resurgences heralding the beginning of a new historic period which is about to take shape; a period of a new wave of return to the land. In fact, the portions of newly available land are the biggest riches of the area.

The projects thus illustrate how one could have *re*-emerge:
- the values of all the accommodations and services leading to the castle so as to underpin the strength and significations;
- the potential of reusing areas located under the Rénory bridge which, very much like a giant spans the working tissues or the roof-shed covering large industrial surfaces to be reutilised.
- the power of the wasteland, hitherto covered by warehouse structures perpendicular to the water.

These now have turned into dry surfaces which have been transformed by the project into new sports facilities, while benefitting from the southbound position of the new front to be built in relation with the Meuse.

All these hypotheses demonstrate how it is still possible to reveal the characteristics worn down by land planning policies that hurt the primary landscape and environmental values of the places. The hypotheses even suggest new visions allowing those neighbourhoods to be born again by including housing and the care a population can bring to the place where it lives (European Landscape Convention).

The hypotheses of the project focus primarily on challenging the fragmentary liberated by the deindustrialization. The current feeling of incoherence is based on a process of replacement incapable of selecting former writings. On the other hand, operations of reinserting the primary role of road divisions, combined with the reassertion of the castle, the city hall of Ougrée or the stadium, allow to re-establish past logics with new forms of urban development. In the same way, artificial marks such as the slag heap of Sclessin - a vegetated slag mountain - or the highway bridge become artefacts that can find a new reason to coexist with new ways of exploiting the places.

The constraint of the depollution which affects these sites has been transformed into an added value. This is due, on the one hand, to the fact that it marks a stopping stop preventing an immediate intervention. And, on the other hand, it is a condition which forces the factor time to intervene again in the elaboration of the project. Ever since, projects with different temporalities have seen the light. They were conceived as fallow land where one can harness one part of the site to initiate the process of mutation based on the assumption that, following the phyto-purification of the soils, large portions of land will become available for readjustment. From that moment, the waiting period is no longer a limitation but a new asset. Waiting is now synonym to: taking time to reflect, intensifying the efforts to raise the inhabitants' awareness, reconstructing the spheres and neighborhoods, reinitiating the construction of a new and positive imagination. The social cohesion as well as the sustainability of the restoration project will depend on said imagination.

Conclusion

The morphologic interpretation allows us to rediscover forgotten histories which are inscribed in bodies and the soil of the areas and landscapes which have lost all the suggestive power and attraction. This retrospective has allowed us to link the landscape

dimension of the large scale to the production of the smallest inhabited part of the territory. And thanks to interlocking these scales, links between the creating stages of a fragmented identity of the city and the landscape could be found.

In fact, one of the most intriguing aspects of this approach is represented by the free choice of the method used as a means of revealing very powerful traces. At the same time, it is also completed and interrupted by phases of interpretation and of hybridisation which has allowed to adapt it to the current demand for highly flexible solutions. The result is the continuity of an aspect which has gone through all the phases of the territory's construction: the domination over the spheres via technology and a culture of modernity which has evolved over the course of this city-landscape's history. Resorting to the rediscoveries of dormant recitals brings back the interest for implicit projects (G. Dematteis) already existent in the configuration of places. At the same time, this highlights the need for finding a narrative dimension of the places to live in as well as the production time of all those artefact sites whose unconscious creators we are. However, we will have to become actors and guardians of the future of those sites.

The lecture and the materials interacting via the project hypotheses corroborate the importance of regaining the temporal dimension. That way, we can comprehend and recapture the places from which we have distanced ourselves progressively. Moreover, resorting to the project, seen not as an object of consumption but a configuration representing the relations, intentions and all the characters whose development we seek to guarantee in time, will allow us to adopt it like a contract or a means to be put to the test on the field. That way, the interpretation could turn out to be fruitful in specific forms of open projects (U. Eco), thus giving flexibility to places otherwise scarred with rigidity in management and conception.

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References

Conzen, M.R.G. (2012) *L'analisi della forma urbana. Alnwick, Northumberland* (Ed. Franco Angeli, Milano).
Dematteis, G. (1995) *Il progetto implicito. Il contributo della geografia umana alle scienze del territorio* (Ed. Franco Angeli, Milano).
Eco, U. (1965) *L'œuvre ouverte* (éd. Seuil, Paris).
Ravagnati, C. (2012) *L'invenzione del territorio. L'atlante inedito di Saverio Muratori* (Ed. Franco Angeli, Milano).
Secchi, B. (1986), 'Il progetto del suolo', in *Casabella* 520-521, 19-23.
Wiston Spirn, A. (1998) *The Language of Landscape* (Yale University Press, Yale).

Territorial Planning: Vitória-ES, a case study

Aline Nogueira Costa[1], Luciano Muniz Abreu[2]
[1]Faculdade de Arquitetura e Urbanismo, Universidade Federal do Espírito Santo, Av. Fernando Ferrari 514, 29075-910, Vitória, Brasil
[2]Departamento de Arquitetura e Urbanismo, Instituto de Tecnologia, Universidade Federal Rural do Rio de Janeiro, Rodovia BR 465, Km 7, Campus Universitario UFRRJ. 23.851-970, Seropedica, Brasil
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Abstract

This study aims at reflecting on the implementation and results of urban planning policies in the past decade, in the Metropolitan Area of Vitoria, Southeastern Brazil.

We adopted the hypothesis in which, for the study setting, the choices made by the public authorities have not been guided from the perspective of building a fairer city. The combination of industrial structure in coastal areas with the chemical and petrochemical sectors, port and steelwork activity, the increase in tourist activity and the urbanization process of these areas make them fragile to environmental impacts, landscape transformations and territorial ordering. This fact, along with the "incapability" of public authorities to respond, eventually worsens the quality of urban services. Metropolitan areas require planning that takes into account the area's complexity and combines principles of efficiency in economic activity development; quality of life to its residents; urban design, quality control and environmental preservation (Clementino, 2008). These questions seem to have been disregarded in the study area, which has suffered the public authorities' indifference, reflected in the absence or mistaken choices of planning policies to guide soil use and occupation, draining, sanitation, urban mobility, environmental preservation and social justice.[1]

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Introduction

According to *IBGE* (Portuguese acronym for Brazilian Institute of Geography and Statistics), 50.7 million people in Brazil live near the waterfront, which corresponds to 26.6% of the country's population (IBGE, 2010). This coastal zone has average density five times higher than the national density. The combination of industrial structure in coastal areas with the chemical and petrochemical sectors, port and steelwork activity, the increase in tourist activity and its high urbanization process make these areas very fragile to environmental impacts, landscape transformations and territorial ordering. This fact, along with the "incapability" of public authorities to respond to it, eventually worsens the quality of urban services and increases environmental risks.

This study aims at presenting projects and ideas about the planning policies implemented in the past 15 years in the Greater Vitória Metropolitan Area (GVMA), having the City of Vitoria, capital of the State of Espírito Santo, as reference.

Methodology

The methodology employed comprised bibliographical research, documental analyses and field trips so as to investigate more in-depth the theme planning and attempt to relate it to the urbanization process and its impacts.

We base our analysis on two main theoretical frameworks: The first premise concerns the urban planning processes observed in the capitalist world in the past decades. It regards how the local authorities tend to abandon their position of city managers — which was common in the 1960s — to adopt entrepreneurial attitudes and seek promotion of economic development through what Harvey (1989) calls urban entrepreneurship.

This attitude of many local governments started to be very common in Brazil in the past few decades, and the analysis of actions implemented by public authorities in this case under study has highlighted their position as entrepreneurs through the use of strategic planning.

The second premise concerns deeper social and economic implications associated to spatial changes via urban intervention projects, which are more specifically related to Harvey's (1980) Real Income concept.

As Behrens (1981) tells us, "the command power over scarce resources of the community cannot be determined independently from the accessibility to them, independently from their cost" (free translation).

In this regard, as Harvey (1980) summarizes, "the changes in a city's spatial forms and social processes that operate in it cause changes in an individual's income" (free translation).

As far as spatial changes promoted by public authorities are concerned, through spatial interventions, there should be minimization of Real Income inequalities, not their reinforcement, as we have seen in this study case.

Area characterization

GVMA (Figure 1), constituted by Complementary State Law 58/1995, is made up of the Municipalities of Cariacica, Fundão, Guarapari, Serra, Viana, Vila Velha and Vitória. It covers a territorial area of 2,331.03 km², and has a population of 1,884,096 inhabitants, 46% of the total population in the State of Espírito Santo (IBGE, 2014).

Its economy is associated to large natural resource exploration and processing companies such as Companhia Siderúrgica de Tubarão, *Companhia Vale do Rio Doce*, *Aracruz Celulose* and *Petrobras*, among others. It is also worth highlighting the important economic role of port activity at national and international levels, through the ports of Vitoria and Tubarão.

The Municipality of Vitoria, capital city of the state, is totally urbanized and has an estimated population of 352,104 inhabitants and a total area of 98.19 km2, which means density of 3.338,30 inhabitants/km2 (IBGE, 2014).

This high density contrasts to the geographical site in which the city is inserted, with its

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Figure 1. GVMA. Source: Jones dos Santos Neves Institute.

mountainous masses in the central area, and its fringes outlined by the Atlantic Ocean, Vitoria Bay, and mangrove ecosystems. This contrast has given rise to significant pressure on the local environment.

In order to try to better order and direct city growth, the Government of Vitoria has made use of several planning instruments, especially the Municipal Master Plan. However, the localized urban interventions are the real ones to shape the city.

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Brief remarks about the urban evolution of Vitoria

Traditionally occupied since 1551, year of its foundation, the village developed between the sea and the central mountainous mass, outlining the dense Atlantic Forest vegetation and the back of a fairly low hill, where *Cidade Alta* (High Town) is located today (SARTORIO, 2015).

The village did not show great dynamism until the mid-19th century, when its economy was based on sugar cane farming.

Until the early 19th century, the city's layout remained unaltered, and the limits set by the topography and the sea were natural barriers that prevented urbanization advance in the city (SARTORIO, 2015).

The beginning of coffee farming in the state in the late 19th century spotlighted the port of Vitoria, which started to be an output of local production to Rio de Janeiro (BOTELHO, 2005). This increment in coffee farming and port activity brought economic dynamism to the area, thus allowing the City of Vitoria to grow.

Between the late 19th century and early 20th century, several landfills were carried out in the city so as to open new passageways and allow new residential areas to be built around the city center (SARTORIO, 2015).

The great milestone of urban shape transformation in Vitoria in the late 19th century was the project of New Suburbia, which aimed at the urban expansion and detachment from the city's bucolic atmosphere. According to Sartorio (2015), the project also met the interests of the rising coffee elite, since they needed a sanitized and modern area, compatible to their social status.

The project of which engineer Saturnino de Brito was in charge "[...] foresaw a rational city with parallel and orthogonal streets, which corresponded to an area six times larger than the 19th-century Vitoria" (SARTORIO, 2015).

This new rational city would be located between the northeast plains of the island and would be connected to the original city nucleus through coastal ways that would allow more visual contact between the city and the sea.

The project of New Suburbia, besides highlighting the valorization of coastal areas in the city, also introduced an urban expansion axis, east-northeast (Figure 2). However, this project was consolidated only almost half a century later, in the 1960s and 70s, when large industrial undertakings and the saturation of the central area boosted the occupation of new ones. These facts have resulted in abandonment of the central city area, which begins to decay.

From the 1980s, according to Sartorio (2015), "social life was transferred to the northeast of the city, with the growth of the tertiary sector in this area".

The degradation of the central part of the city, according to Botelho (2005) "was seen mainly through abandonment and devaluation of real estate; the moving out of middle class and public authorities; and popularization of commerce.

The economic boom from large industrial undertakings and the opening of Tubarao port in 1966 brought along serious housing problems, because it fostered population growth, but not investments in the housing sector. Between 1960 and 1980, the population in Vitoria grew almost 150%, from 83,531 in 1960 to 207,736 inhabitants in 1980 (CAS-TIGLIONI; BRAZIL, 2008). The housing issue was worsened by the poor infrastructure to meet the growing demand. The structured areas in New Suburbia and the new neighborhoods created in the east and northeast waterfronts were much valorized and therefore unaffordable to the poor for living purposes. Then, the poorer population starts their occupation process on the northwest coast of the city, where there used to be a large garbage dump and the great mangrove ecosystems (SARTORIO, 2015).

Thus, the urban segregation process in City of Vitória is outlined and highlighted in the 1980s. If on the one hand the east and northeast coastal areas were consolidated as places of economic prosperity and high real estate speculation, on the other hand the urban stain — made up of urban poor people — was growing on the northwest waterfront of the city, hidden behind the central mountainous mass and advancing over the mangrove areas. This was when neighborhoods *Nova Palestina* and *Maria Ortiz* started to rise.

The urban march advance process over mangrove areas, mainly in the neighborhoods of *Maria Ortiz* and *Nova Palestina*, is ratified by the municipal government. In the 1970s in *Maria Ortiz*, and in the late 1980s and early 1990s in *Nova Palestina*, the municipal administration, claiming that it was needed to settle the homeless families, promotes landfills on natural
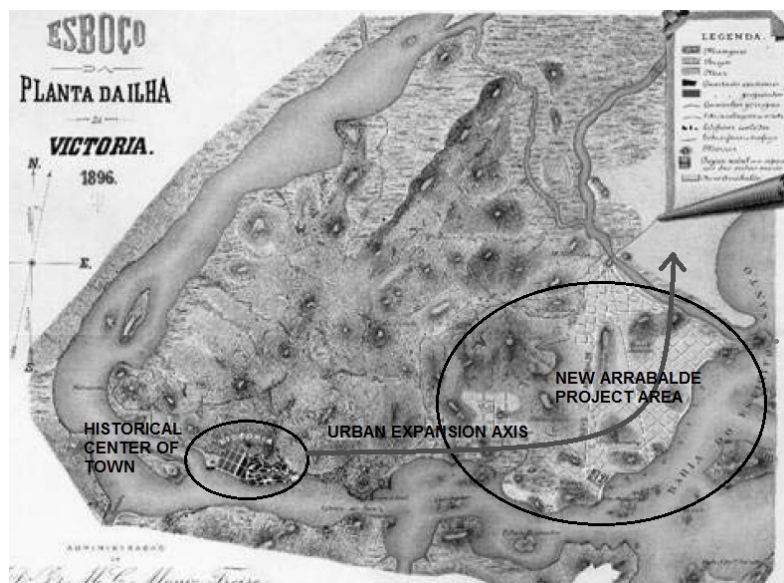
Figure 2. Vitoria Island Plan, 1896. Saturnino de Brito's project for New Suburbia. Source: State of Espírito Santo Public Archives – Modified by the authors.

areas, suppressing the mangrove ecosystem even more (SARTORIO, 2015). In the past 15 years, a series of governmental investments have been made to fight urban problems found in the City of Vitoria and its Metropolitan area. As we will see, these governmental initiatives have been often configured as isolated and shy attempts to tackle the existing problems.

The initiatives are related to mobility and accessibility, housing, revitalization of the central area, urbanization of the waterfronts (in northeast and northwest areas), and sanitation, among others. In the next item, we briefly list and describe the main initiatives of urban transformation implemented or being implemented in the City of Vitoria in the past 15 years.

The transformation taken place in Vitoria

Citizen Sidewalk Project
Released in December 2002 and enacted in 2005 (Law 6.525/05), the project aims at allowing full use of the city by people with disabilities or reduced mobility.

Although sidewalks are a duty of the confronting real estate owners, the project advocates citizen awareness and enforcement of existing laws. Also, the city has implemented the recovery and adequacy of sidewalks of public buildings and areas along important avenues in the city, especially in the northeast area.

Among these, we can highlight the *Fernando Ferrari* avenue project, which provides access into city from the north side and cuts through neighborhoods such as *Goiabeiras*, *Solon*, *Eurico Sales*, and others; as well as the implementation of *Dante Micheline* avenue project, connecting the neighborhoods of *Jardim da Penha* and *Jardim Camburi*, also in the northeast area.

Widening and reformulation of avenues
In 2010, the widening work on *Fernando Ferrari Avenue* (Figure 3) was contracted so as to value space for pedestrians, cyclists and public transportation. After widening, the avenue started to have three lanes on each direction, one of which was reserved for buses to facilitate traffic and access. Besides the preferential lanes, a bike lane and 10 bus bays were built.

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As mentioned in the previous item, the widening of Fernando Ferrari was complemented by the Citizen Sidewalk Project.

Still in 2010, reform work of *Ponte da Passagem* Bridge was contracted, including the construction of a footbridge adjacent to it. The bridge connects Fernando Ferrari Avenue (located in the continental area of the city) to the Island of Vitoria. The footbridge is for pedestrians and cyclists' access. The bridge reform along with Fernando Ferrari Avenue widening is an important investment towards mobility in the city.
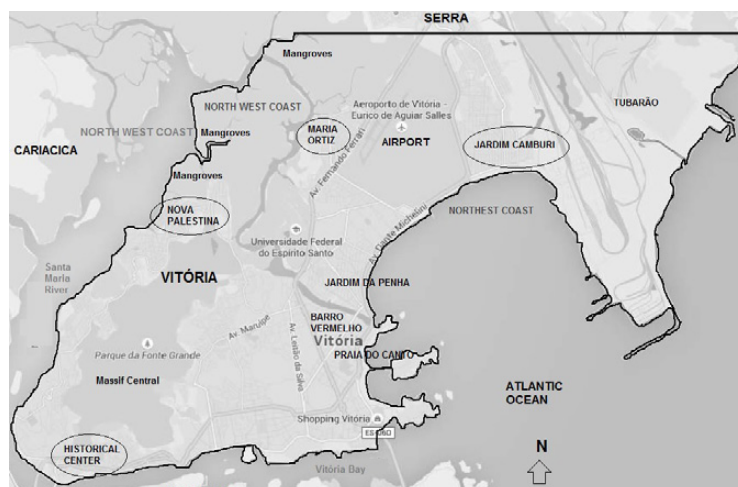
Figure 3. Municipality of Vitória/ES and its sea waterfronts (east and northeast) and riverbank (northwest). Source: Google maps - Modified by the authors.

In 2013, in a partnership with mining company Vale, the Overpass in *Jardim Camburi* was delivered, also in the northeast area of the city. It improves access of vehicles to Tubarao Complex and to the neighborhood of *Jardim Camburi*.

Currently, Leitão da Silva Avenue is under reformulation. It connects *Praia do Suá* and *Andorinhas* neighborhoods. The avenue will have its ditch covered and be widened along almost its entire length, which will provide the avenue with an extra lane, totalizing three lanes on each direction. It will also receive a shared bike lane and have its sidewalks reformed. New streets will also be opened to provide direct traffic in the surrounding areas.

In 2015, the Quay bike lane was opened downtown. The idea was to create a bicycle path system and provide bikers with safety and wellbeing. However, the bike lane is only 800m long, and stretches all along the high sidewalk of Vitoria Port, between Elias Miguel and Getúlio Vargas Avenues.

Transcol Project

The Transcol Project was developed by Jones dos Santos Neves institute in 1984 so as to reformulate e restructure the public transportation service in the Greater Vitoria Area. The project consisted in modernizing and rationalizing the transportation system, replacing the radial system with the feeding trunk route, interconnecting municipalities through urban bus terminals.

In 2008, the *Jacaraipe* (*Serra*) Terminal was inaugurated. In the following year (2009), came the *Itaparica* and *São Torquato* (*Vila Velha*) terminals and *Jardim América* (*Cariacica*) terminal, as well as the reform of *Laranjeiras* (*Serra*) terminal.

Still in 2008, the bus fleet started to be adapted for persons with disabilities. In 2014, 100% of the bus fleet operated with these adaptations.

Basic Sanitation and Drainage

In order to eliminate flooding caused by the rain and to have 100% of the sewage treated in the capital, basic sanitation and drainage works have been carried out in the neighborhoods of *Caratoíra* and *Santo Antônio*, close to the central area of the city; as well as in Barro Vermelho, east area; and Jardim Camburi, northeast coast.

Reurbanization of Waterfronts

Northwest Waterfront

After the consolidation of neighborhoods Maria Ortiz and Nova Palestina, the population growth and increased density started in the 1980s have been continued. There is a need of spaces for equipment implantation and public leisure areas, and most importantly, the need of halting the urban advance over mangrove areas. These facts have led the municipal administration to perform urban interventions in the waterfront of these two neighborhoods. The goal was to stop the city advances over natural areas and provide leisure infrastructure and new urban equipment. In September 2009, the reurbanization work of Maria Ortiz and Nova Palestina waterfront was concluded. In *Nova Palestina*, a sports court, two sand sport fields, a bocce court and two decks designed to help fishermen were built in a 14 thousand meter area. In Maria Ortiz, the interventions covered 18 thousand square meters of waterfront. There are two fenced sports courts with, a new soccer field, children parks, a 976m long sidewalk, and three decks at the main fishing spots.

Northeast Waterfront

Following the consolidation of the urbanization process in the central and continental east coastal areas, the northeast coastal occupation is clearly intensified after the construction of the bridge connecting the island to the continental part of the city (Camburi Beach resort). Camburi Beach resort, which today comprises the waterfront of Camburi Beach and part of Jardim da Penha neighborhood, one of the most valorized place in the capital, only became notorious after the construction of Camburi Bridge, which allowed real estate expansion [...] in that direction (CAMPOS JR., 1988 apud RAMIRES; GOMES, 2002). According to Ramires and Gomes (2002), the initial occupation process in Jardim da Penha took place

via public investments towards popular housing undertakings. The infrastructure provision and proximity to the coast resulted in a series of higher standard real estate investments, and consequent valorization of the area. From then on, we have seen the real estate industry setting the high income occupation standards in northeastern waterfront neighborhoods in Vitoria, and attracting significant shares of public investments.

Within this context and seeking urban infrastructure improvement in the northeast coast both for residents and for tourists, the reurbanization project for Camburi waterfront — last expansible coast redoubt in the city — was performed. In September 2010, the work was delivered. The changes comprised the widening of residential and beach sidewalks, a new bike lane and walking area, in a 2.9 thousand meter section — from Camburi Bridge to Adalberto Simão Nader Avenue intersection. Parking bays were also built to replace the old 400 parking spaces along the sidewalk. The idea was to provide drivers with more safety and comfort; prioritize pedestrians; and visually clear the activities on the waterfront.

City Center Revitalization and Living Downtown Project
The central area of the city, which used to be place of the local elite and then became a place of "prostitutes", "scoundrels" and "vagrants" (BOTELHO, 2005), has been through a series of transformations that aim at spatial "requalification", which in this case could also be called social requalification.

The City Center Revitalization project (2009 to 2014) aims at using the existing infrastructure, stimulate the use of public and private equipment, and increment the social and economic roles of the central area. The ultimate goals is to improve quality of life of its residents, restore and maintain the historical and cultural heritage, increase the offer of socially interesting residential units and reduce the housing deficit in the city.

The Live Downtown project (2009 to 2014), in turn contributes to revitalizing the central area of Vitoria, assigning social roles to abandoned or misused buildings and making them a tool to reduce housing deficit in the capital. The goal is to repopulate the central area, which is already provided with all infrastructure (water supply; garbage detailing; healthcare, education and leisure services and equipment), to decrease housing deficit.

It can be seen that the bottom line of these projects in that they aim at repositioning the city in a global setting by redesigning its image and basing on city marketing and strategic planning.

Conclusion

Despite all the governmental efforts to perform projects aiming at improving quality of life of its residents, what we can see is not yet enough to rank the area as one of the best in Brazil.

As far as traffic is concerned, number of vehicle has increased significantly in the past fifteen years. Since it is the state capital and it is located in the center of the metropolitan area, the City of Vitoria receives a daily flow of vehicles that can cause traffic jams at rush hours. Despite the widening of Fernando Ferrari Avenue and Ponte da Passagem Bridge, the route between the Municipality of Serra and the neighborhood of Jardim Camburi (north access) is constantly run under heavy traffic. The same happens on the way between the Cities of Vila Velha and Vitoria. This access (south route) is made through two bridges, both jammed at rush hour. Widening streets and increasing the number of motorways may not be the most appropriate strategy to solve or mitigate mobility problems. No significant proposal to improve public transportation can be seen, such as the creation of BRT – Bus Rapid Transit or Lightweight Vehicle Wheels systems, or even subway or waterway systems.

With projects "Live Downtown" and "Revitalization of the City Center", public authorities intended to repopulate and revitalize the central area of Vitoria. The initiative is excellent, even though the revitalization project is not made along with devices to ensure the socialization of public inversions so as to avoid elitization or gentrification processes seen several other revitalization projects for historical centers in other capital cities in Brazil. Moreover, "Living Downtown" is restricted. The number of residences incorporated is small compared to the housing deficit in Espírito Santo. The 94 habitation units incorporated with the project are not enough to solve the problem. Finally, as far as waterfront

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Figure 4. Reurbanized Waterfront in Vitoria. From left to right: Maria Ortiz, Jardim Camburi and Nova Palestina. Source: Vitoria City Government.

urbanization projects are concerned, we can see that, once again, most of the investments fall on upscale areas in the city. Sartorio (2015), for instance, points out that the investments made with Camburi waterfront project, on the northeast coast, was about R$50 million. On the other hand, the total investments made in *Maria Ortiz* and *Nova Palestina* on the northwest waterfront summed R$15 million.

Overall, one can see urbanistic projects based on a strategic planning and city marketing policy, with localized interventions that have not been able to solve the urgent problems of the city.

Once again, the actions taken through spatial transformations show the public authority's interest in meeting the needs of local elite. They design a metropolis clearly fragmented that, on the one hand tries hard to sell an image of attractive and modern, but on the other hand has not been able to revert the social isolation of the urban poor persons, as it contributes to intensify this isolation and continues to deny these people their right to the city.

338 **References**

Behrens, A. (1981) 'A distribuição da renda real no contexto urbano: o caso da cidade do Rio de Janeiro'. Rio de Janeiro: IPEA, *Pesquisa e Planejamento Econômico PPE*. Vol. 11, n. 2.

Botelho. T. R. (2005) 'Revitalização de centros urbanos no Brasil: uma análise comparativa das experiências de Vitória, Fortaleza e São Luís', *Revista eure*, Santiago de Chile, vol XXXI, n. 93, 53-71.

Castiglioni, A.H.; Brasil, G.H. (2011) 'Dinâmica Populacional de Vitória', *Agenda Vitória* 2008/2028.

Clementino, M. do L. M. (2008) *Ordenamento e planejamento territorial: a falta que faz o plano metropolitano* (http://www.ub.es/geocrit/-xcol/252.htm) accessed 15 December 2014.

Harvey, D. (1989) 'From manageralism to entrepreneurialism: the transformation in urban governance in late capitalism', *Geofrafiska Annaler*, 71. Estocolmo.

Harvey, D. (1980) *A justiça social e a cidade* (São Paulo, Hucitec).

IBGE. (2010) *Censo Demográfico 2010. Características da população* (http://www.ibge.gov.br/home/estatistica/ populacao/censo2010) accessed 12 January 2015.

IBGE. (2014) *Estimativa da população residente nos municípios brasileiros* (ftp://ftp.ibge.gov.br/Estimativas_de_Populacao/Estimativas_2014/estimativa_dou_2014.pdf.) accessed 04 April 2015.

Município de Vitória/ES. (2015) *Google Maps*, Google (https://www.google.com.br/maps/@-20.2813068,-40.2895396,13z) accessed em 15 abril 2015.

Prefeitura Municipal de Vitória (PMV) (2015) *Digital data* (http://www.vitoria.es.gov.br/) accessed 10 March 2015.

Ramires, J.C.L.; Gomes, E.R. (2002) 'Verticalização Litorânea: uma análise preliminar', *Geografares*, n.3.

Sartorio, F.D.V. (2015) 'Lazer, Cidadania e Desigualdade: um estudo sobre Vitória/ES'. 181f. Master's Thesis (Geography) – Universidade Federal do Espírito Santo, Vitória.

Morphological mosaic of Brabant. Towards an evolutionary approach of regional development

Sukanya Krishnamurthy, Pieter Van Weselmael
Chair of Urbanism and Urban Architecture, Department of the Built Environment, Eindhoven University of Technology, VRT 7.18, Den Dolech 2, 5600MB Eindhoven, The Netherlands.
Keywords: Urban morphology, ecosystem, spatial mosaic, geography

Abstract

In this paper we investigate the co-evolutionary logics of organizational (environment, landscapes, architecture), institutional (governance and policy), and territorial (religion, activities and society) paradigms that have shaped the Brabant region in South Netherlands. The metaphor of a mosaic, the authors' postulate is the layering of socio-economic and spatial paradigms based on an interwoven ecology of soil, economic, infrastructure, religion, and urban settlements. This paper expands on the historical layering of landscapes (urban, peri-urban, and rural) and transitions, attested by the region's agricultural legacy (small scale farms, estates, and various soil types), merged with the legacy of the industrial and post-industrial era transformations (industrial complexes, religious institutions). The paper identifies that the strength of the region lies in its mosaic of urbanity, farmlands and the spread of spatial and economic activities, and its post industrial landscape.

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Introduction: co-evolution of the urban, peri-urban, and the rural regionally

The idea of co-evolution when traced through the field of economic geography can give an overview on the nature of clustering, role of institutions, networks, and spatial growth and transformation. In order to do this we make a clear distinction on the different conceptions of socio-economic-institutional-spatial logics present in the region of Brabant in South Netherlands since the nineteenth century: organisational (environmental), institutional (governance and policy), and territorial space (religion and society). What renders the use of evolutionary theory attractive to study the region of Brabant is that we get a conceptual approach for general insight over historic process of spatial transformation while being empirically specific about the resultant processes. Building on the frameworks developed by this field specifically from Frenken and Boschma (2007), and Boschma and Frenken (2011), the current paper looks at urban regions as sites of complex relations that can be visualised as a confluence of various social, economic, environmental, and governance paradigms. The layering of socio-economic activities and actors, and spatial paradigms, the developmental logic of the region is studied through document and regional level analysis, literature reviews, and mapping.

In an era of economic uncertainty and strong inter- regional competition (Camagni, 2003), cities and regions are grappling with mechanisms needed to produce an amenity-rich environment that sustains quality of life for its inhabitants, while projecting a strong sense of spatial identity. By using an evolutionary approach the paper aims to bring the layering of scales of activity and space in Brabant to the forefront as a successful blending of spatial tradition and transition optimal for the rise of new economies of knowledge, creativity and experience.

The paper deals with the distribution of economic activity across the region of Brabant centring on the socio-historical processes that produced them, 'the explanation to why something exists intimately rests on how it became what it is' (Dosi, 1997, 1531). As spatial patterns emerge from processes that have taken place in the past, the paper is structured as follows, the first section of the paper focuses on the development of the region into an "urbanised landscape", breaking down the borders between the "the rural" and "the urban" in the late nineteenth century and early twentieth-century. Followed by the shift into twentieth-century urban planning paradigms that focused on industrialisation, state-controlled modernisation, and followed by a push for more top-down directives post-war. This was succeeded by the twenty-first century's economic transformations, identified by new economies of creativity, and consumption that have left a spatial legacy associated with a post-industrial and knowledge society. The paper illustrates these shifts using the South East of Brabant as an example. The idea that processes, time, and space are intrinsically linked is the central idea the paper puts forward.

The various transitions experienced in Brabant that are organisational, institutional (governance and policy), and territorial space (religion and society) have distinct spatial legacies that are expanded upon. The authors postulate that the uniqueness of the region when identified through a dynamic co-evolutionary perspective, spatial capital, new social, and economic paradigms can be fostered that strengthens the region's positioning.

Towards an industrialised region: Shifts in organisational, institutional, and territorial paradigms

A predominantly poor rural agrarian economy with small pockets of arable land in the stream valleys of the Maas, Donge, and Dommel rivers led to a spatial distribution of farmsteads, home industries (beer, butter, cogs, etc.) in small hamlets. The triad of organisational, institutional, and territorial spaces set the stage for the urbanisation of the region characterised and determined by the dependency on soil types and water systems, society, and institutions. Starting with the territorial strengthening of Catholicism in the region through the institution of the Dutch Republic in late seventeenth century. Which was followed by the introduction of direct governance from The Hague for the new province of Brabant through the Staten Generaal (Klaver, 2007), shaping the governance in the region for the next decades.

Figure 1. Province of North Brabant located in the south of the Netherlands, with the poly-nuclear urban network evident in the map.

With growing modernisation and the industrial revolution, the second half of the nineteenth century, home industry and farmsteads gave way to textile factories, surrounded by working class houses (van den Eerenbeemt, 1996). The arrival of the industrial era was experienced through the introduction and expansion of infrastructure that responded to local growing economic and cultural conditions (Bouwens et al., 1997), and mechanisation of some parts of the agricultural economy. A conversion of the landscape from sands and fens, into farmlands, villages, and small cities took root. The sandy landscapes were converted to pine tree cultivation areas, with the plains of heath, peats and moors turned into reclamation areas (*woeste gronden* in Dutch), and cultivation areas expanded through the help of natural and artificial fertilizers (TNO, 2004).

This was aided by institutional and territorial changes, seen through the implementation of canal and rail infrastructure (example, Zuid-Willemsvaart in 1823, Eindhoven canal in 1846, the railway that connected Eindhoven to Rotterdam/ Utrecht, Venlo/ the Ruhr in 1866), expanding role of the Church in healthcare and education, and an amalgamation between urban and rural settlements that took place in the late nineteenth and early twentieth century (Knuvelder, 1930, Janssen, 2002). Leading to observation from Knuvelder (1930, p. 95) on the regional shifts within Brabant, "one can idealise as much as one wants, but Brabant is no longer just the area steadfastly enclosed by woods and boscage ... whether we lament or applaud it; both regions (Brabant and Limburg) have made the acquaintance of modern industry in the harshest of ways". The introduction of industries such as lighting, automotive or machine building (Philips, Bata etc.) in Brabant also resulted in the industrialisation and rapid urbanisation of the surrounding villages and conversion of home industries (food, textile, cigars or matches) to sites of mass production.

Territorial and institutional interests shaping spatial development

The process of industrialising the former agricultural network economy, society and region of Brabant avant la letter was greatly stimulated by a conscious policy of the distributing the wealth of industrialisation and the growing importance of 'pillarization' (*verzuiling* in Dutch) that characterized nineteenth- and early twentieth-century urbanisation of Brabant. Even with rapid industrialization and urbanization of former rural regions, religious fervour remained strong, and the Catholic Church remained a very important part of the lives of laypeople (Janssen, 2015). While there is ample literature on the relationship between religion and urbanisation (McLeod, 1995; Kostof, 1995; Hervieu-Leger, 2002; Hitzer & Schlor, 2011), here we focus on the dynamic evolutionary framework that existed between ideals of religions planning in an era of looming planning rationality, and its impacts on regional urbanisation.

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Figure 2. The southern part of the Netherlands was a stronghold of Catholicism as seen in the percentage of Roman Catholics in Dutch municipalities in 1947. Source: Knippenberg, De religieuze kaart van Nederland, 181.
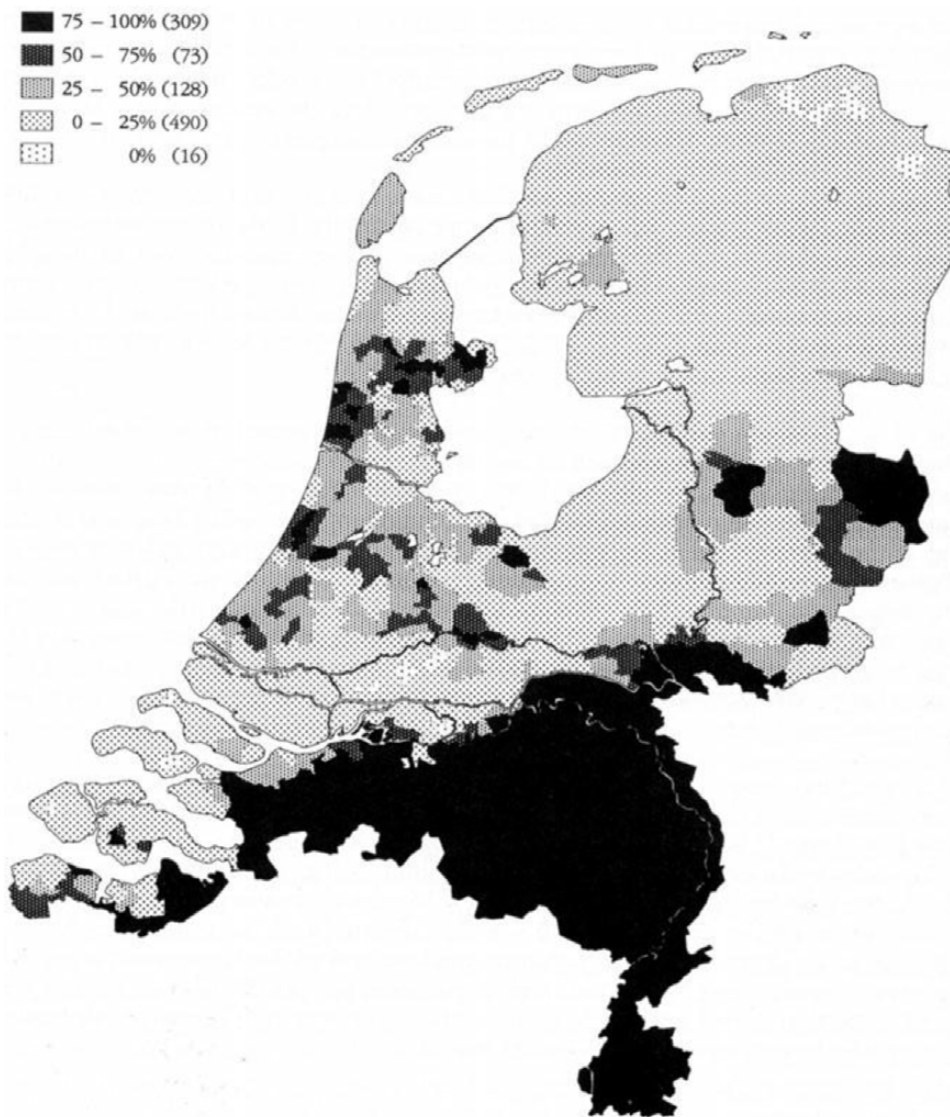
The creation of a unified 'Catholic pillar' that represented a wide variety of cultural, educational, political, and recreational organizations, and can be traced back to the reestablishment of the Catholic hierarchy in the 1850's, as seen through the work of Kersbergen and Manow (2009). The Catholic Church was instrumental in initiating a wide spread building program that ranged from convents and chapels, to schools, housing estates and neighbourhoods. Spatial planning ideals of the church governed placements of communal, and religious facilities, with an interest in retaining the centrality of church functions, social orders, and mitigate the weakening of people's faith in the Church in the climate of growing urbanisation. Decentralised communities geographically defined by parishes, rural sentiments, and central role of the church dictated planning ideals of the church in a rapidly urbanising region. In the villages of Brabant where industrialisation took root (e.g. Eindhoven, Best, Veghel, Uden etc.), the process of conversion was gradual to maintain the rural character of the villages, and the division between the rural and urban. The growth of the Catholic pillar however was within the framework of expanding state controls and emerging forms of rational urban planning in the twentieth century.

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The work of Boelens (2009) for example, and Cor Wagenaar (2011) who shows through his extensive historic analysis on the shifts of institutions that shaped urban planning in the Netherlands since the 1800, including the local, to state or provincial (1931), and national systems (1941). The increasing role of the growing secular state-led planning system that came into place during the early to mid twentieth century coincided sharply with the interests of the Catholic pillar. Based on the ideas of rational planning evolving from Germany by Gustav Langen, *Raumplanung und Raumordnung*, from the UK Raymond Unwin, Patrick Abercrombie, *Town and Country Planning*, was the growing need for planned urban developments. One such example of contrasting views shaping or not shaping urban developments in Brabant is the modern functionalist plans for Eindhoven and the region developed by De Casseres in the 1930's. Discussed in detail through the work of Boelens (2009), and Janssen (2015, 2013), the discord between the Catholic elite who idealised and even romanticised the notion of retaining the rural character under the rapidly industrialising region is highlighted. The deep divide between the religious elite and the rational planners left the region in-between the romantic notion of the countryside, rapid population growth, growing industrial jobs (Philips, Jumbo, Mars, textile mills, automotive, and pharmaceutical industries) shaped the region until mid twentieth century. In order to manage the debate between industrialization, urbanisation, and retention of character, the pragmatic aim was to have a regional vision that was embedded within local contexts and landscapes. One such example is the Welfare Plan (1947–49) initiated by Queen's Commissioner J.E. de Quay et al., where an attempt at decentralized industrialization was made.

Merging territorial and institutional interests: the Welfare Plan (1947–49)

Regional economic modernization and planning in the early post-war years introduced Keynesian policies that focused on reducing regional disparities and creating economic growth (Bosma, 1990). The increasing pace and intensity of industrialization across the province was also the result of a well-planned regional economic modernization vision through the Welvaartsplan from the twentieth century. This can identified through the clustering of textile industries around the western regions, leather making predominantly in the central areas, and metal work clustered around the eastern regions (Fig. 4).

In response to the growing need for industrial jobs after World War II, the province aimed to introduce the Welfare Plan (Welvaartsplan, 1947–1949). The central question that the plan and its committee members tired to answer was 'Should the people of Brabant live in towns and cities of 10,000 or 100,000, and what are their social and religious advantages and drawbacks?'[1]

The Welfare Plan linked the increasing urbanisation, and its associated prosperity with the Catholic agenda of mitigating impacts of urbanisation. The Welfare Plan was not only a socioeconomic plan to address the issue of rapid population growth and demand for industrial jobs, it was also a means of controlling the rising working class and the threat of dechristianization that came with modernization (Bekkers, 1947; Walravens, 1997). The dispersal of industries (decentralisation) within the province was one of the intended goals of the plans where industry would be bought to the worker rather than the other way round. Anti-urban sentiments and a glorification of rural culture played a key role in the arguments in favour of decentralization; a strategy that would resolve the paradox to keep the economy going while keeping the workers Catholic and rooted in their rural culture (Janssen, 2013). The political and administrative elite developed and implemented a spatial spreading policy of industrial, socio-religious and housing infrastructure over the villages instead of concentrating amenities in a few central big cities. The introduction of the Welfare Plan was one of the first instances where a co-evolution of territorial and institutional interests came together, though it was never fully realised.

[1]Brabant Historical Information Centre, Provincial Planning Authority files (PPD) 710, meeting to install Big City Advisory Committee, 23 Oct. 1954.

Figure 3. The North-Brabant Welfare Plan (1947–1949) indicating small-towns and villages that had to industrialize. Through a policy of intentional spreading of amenities, the Welfare Plan built on the concepts of decentralisation and borrowed size. Source: Province of North-Brabant, 's-Hertogenbosch.
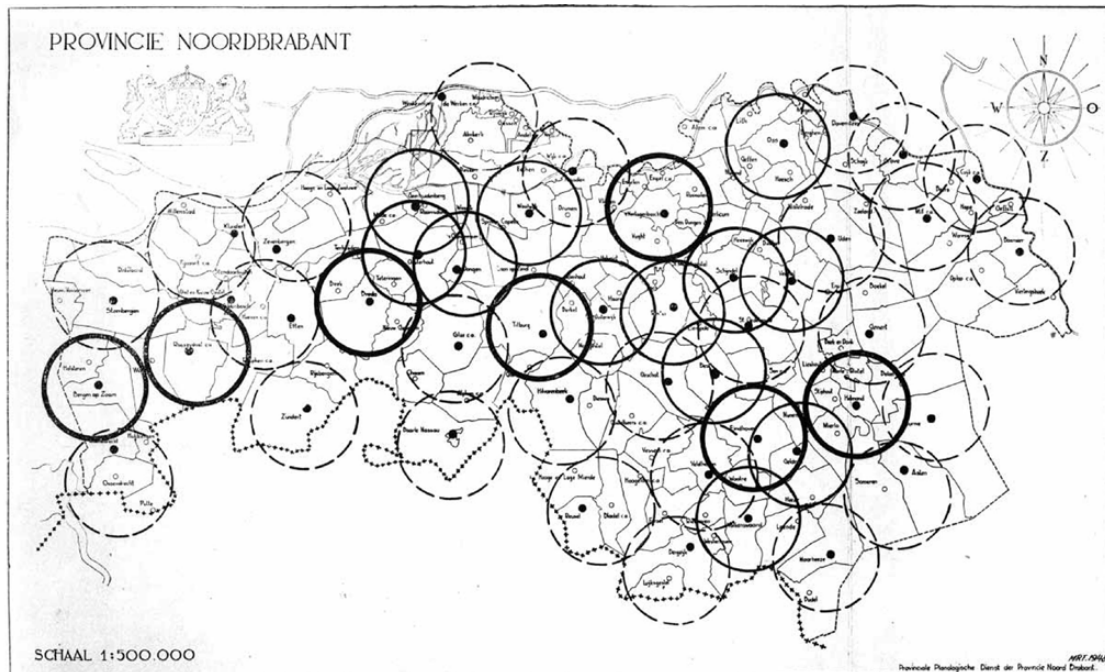
Growing powers of institutional interests shaping territorialisation

The official start of national spatial planning and the creation of an Office for the National Plan though initiated during before World War II was implemented only after the war. The ideal of a smooth, but vertical controlling triad of (inter) national, regional, and local plans arrived on the planning horizon (Boelens, 2009), and with it the need and emphasis on top-down directives. Backed by theories of regional economics, the model of the 'growth pole' developed by the French economist Francois Perroux (1955) was put in place. The importance of identifying central engines for regional economic success, along with the idea of growth poles policies, VIN EX policy, network cities, and urban networks played an important role.

Between the Brabant Catholic elite and push from the province, initiation of regional economic modernization was caught between infrastructural improvements and growth of industries, urban renewal policy for pre-war areas, new housing areas to accommodate for growing population numbers while holding on to traditional ideas of community and growth. Brabant was branded as an 'industrial-agrarian province', which entailed support for farmers and small businesses, as well as cultural policies that emphasized rural and small-town customs and traditions (Janssen, 2013).

This was achieved through planning hierarchically in terms of the neighbourhood units which was in line with the Catholic idea of community with a strong city centre The attempt to keep the parish like structure of new and old neighbourhoods, was linked to the welfare of the city and its people. By the mid twentieth century, the expanding modern welfare state, Catholic civic initiatives were being replaced with more secular models of growth and planning. The welfare state freed people from their dependence on the pillarized welfare institutions and caused a decline of the influence of the (religious) ideologies on social, cultural, and political life (Kersbergen & Manow, 2009). Between 1960 and 1980 the Dutch people developed anti-authoritarian, democratic opinions on politics, and religion (Middendrop, 1979). This was further exemplified in the growing cities where urbanisation and non-religiosity proved to be correlated process (Kippenberg, 1992).

Figure 4. The spread of industrialisation and urbanisation from the 20th and 21st century.
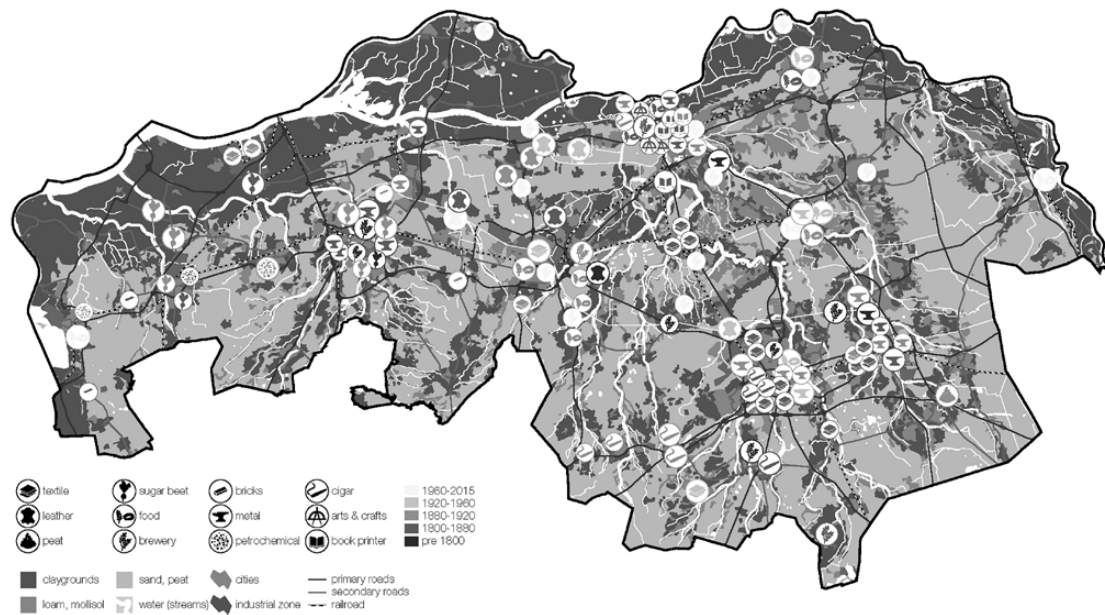
The identifying of the environs of Eindhoven as an urban and economic centre of national importance through the *Nota inzake de Ruimtelijke Ordening* in 1960 set the trajectory for rapid growth into an urban hub. Existing patterns of dispersed urbanisation from the previous decades was reinforced, and in many ways solidified with the dispersal of industries and activities across the province. The creation of universities at Eindhoven and Tilburg, expansion of Philips and Bata in Eindhoven and Best, automotive activities in Helmond and Eindhoven, commercial appropriation of the airport in Eindhoven, pharmaceutical and food industries to the East in Veghel, all lead to the creation of region that was synonymous with urban and economic growth.

The end of this period (late twentieth century) experienced the first societal shifts on which the regional economy and planning was built on. The period of intense expansion came to an end and economic restructuring was put in place. Industrial growth was coming to a halt, population growth was on the decline, in combination with a number of factors such as the saturation of markets, the decline in global trade, the first (1973) and second (1979) oil crises, outmoded production processes and concern about environmental issues (Aldcroft, 2001). With industrial plant closures and national unemployment rates at 16.6% of the workforce (www.cbs.nl), the focus of policy makers shifted towards economic regeneration and prevention of mass unemployment. Coinciding with the publication of the Spatial Planning Key Decision known as "VINEX", where the decentralisation of the state, co-operation between government and private initiatives were identified, and the region of Eindhoven identified as a major urban region where integration of spatial and environmental planning would be instituted (Galle & Modderman, 1997).

Branching of industrial dynamics and urban growth

The shift to an economy based on intellectual inputs (knowledge and consumption), and human creativity is currently shaping metropolitan areas in new and innovative ways across the world, with Brabant following suite in the last decades. Using what Frenken and Boschma (2007) postulate for theory of urban growth through explicit industrial dynamics, within Brabant, industry, government, and institutional action are converging to create new economies accommodated through geographic clusters, and networks to promote specific business sectors, and handle existing challenges.

Witnessed through the creation of polycentric Brabantse Stedenrij, the BrabantStad (partnership between the municipalities of Breda, Eindhoven, Helmond, 's-Hertogenbos-ch and Tilburg), and the Brainport Eindhoven[2], attempts for a new collection of design solutions are being developed for the human environment, while learning from the last century. This can also be seen in the methods of framing of organisational, institutional, and territorial spaces in its growth away from traditional initiatives (top-down, master-plan approach) towards more bottom-up, and co-creative approaches (Talen, 2015; Douglas, 2014; Iveson, 2013).

Urban areas are looking to build upon their unique characteristics and capabilities: ur-ban geography, architectural and cultural identity, infrastructure, economic profiles, and people (Hall & Pfeiffer, 2014; Florida, 2006). For Brabant, the 'industrial-agrarian province' image is under transition; cities such as Eindhoven, Tillburg, Breda are building on the hy-pothesis of the post-industrial and creative cities, in contrast to the rural areas rethinking their roles in opportunities for investing in green qualities of rural townscapes (villages and green, for example).

By matching local opportunities and global trends, different approaches to post-indus-trial transformations are being accommodated. Examples such as, Strijp in Eindhoven, the former industrial estate of Philips is undergoing a dynamic post-industrial conversion pro-cess, and has become a zone of creative clustering, innovative experiments and design centre for the city. Various cultural and innovative strategies including hosting the yearly Dutch Design Week, and a festival of lights called 'Glow', technology shows, the region of Eindhoven has embraced its post-industrial image. The peri-urban and rural areas of the province continuing this trend have been branding themselves as centres of craft, and food production. The food park at Vegel, hand crafted shoes from Bommel (Van Bommel) and Waalwijk, and beer breweries at Vessem (de Gouden Leeuw), Geldrop (Liefde) are shaping place-based cultural development that link cultural activities (creativity, craft and experiences) and amenities to economic, spatial and social policy goals.

While existing industrial dynamics may have initiated the wave of current clustering mechanisms (see for example, Atlas van Nederlandse gemeenten), the challenges from the last decades need and are yet to be overcome. These include, the spatial legacy of the industrial era including brown fields, vast industrial complexes, post-war housing blocks, and unused religious infrastructure. And, ecological challenges driven by expan-sion of intensive livestock farming and pollution of water sources (Schrama, 2012), and unused canal zones (IABR, 2014).

Conclusion: Coevolution harnessed as uniqueness?

Amenities in cities are not only the aesthetic properties of large cities such as historical buildings, heritage sites, and industrial landscape (e.g. Van Duijn & Rouwendal, 2013), but also the presence of a variety of specialized goods and services (e.g. Berry & Wald-fogel, 2010; Burger et al., 2013). The presence of various spatial amenities, activities, and networks in the region, is the result of the successful blending of tradition and transition, and in Brabant can possibly be used successfully in the rise of new economies of knowl-edge, and creativity. Project Atelier Brabantstad (2014) avails of the term "Mosaic Me-tropolis of Brabant" to describe the strength and challenges an inherently dispersed yet urbanised landscape in Brabant faces. However, the authors put forward the idea that a nuanced understanding of the co-evolutionary characteristics will help in identifying the

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[2]The Brainport organisation undertakes business-to-business and strategic activities to streng-then the Brainport Eindhoven Region. Brainport Eindhoven Region is a top technology breeding ground for innovation and the home base of world-class businesses, knowledge institutes and rese-arch institutions. Together they design and manufacture the technology of the future to ensure a safe, green and caring society as well as sustainable economic development in the Netherlands. Brainport, the smartest region in the world, is the hub of a network stretching out across the Southe-ast Netherlands and the Dutch borders. The five focal sectors are High Tech Systems & Materials, Food, Automotive, Lifetec and Design. For more information, http://www.brainport.nl.

region's uniqueness and challenges. For this goal, the paper looks at how organisational (environment), institutional (governance and policy), and territorial (religion and society) characteristics contributed to shaping the region.

The paper identifies that the strength of the region lies in its mosaic of urbanity, farmlands and the spread of spatial and economic activities, and its post industrial landscape. Using conceptualisations from evolutionary geography, the authors' postulate that the past and on-going transitions within the Brabant region have left behind a legacy that is embroiled in organisational, institutional, and territorial interests. The co-evolution is expressed further through the blend of the urban and rural landscape that is based on an evolutionary developmental logic, where the unimposing and the monumental, tradition, and modernity appear synchronous.

References

Boelens, L. (2009) *The Urban Connection: An Actor-relational Approach to Urban Planning* (010 Publishers).

Boschma, R. and Frenken, K. (2011) 'The emerging empirics of evolutionary economic geography', *Journal of Economic Geography* 11, 295–307.

Boschma, R. and Frenken, K. (2006) 'Why is economic geography not an evolutionary science? Towards an evolutionary economic geography', *Journal of Economic Geography* 6, 273–302.

Bosma, K. (1990) 'Town and Regional Planning in the Netherlands 1900–1945', *Planning Perspectives* 5, 125–147.

RRDR. (1966) *Tweede nota over de ruimtelijke ordening in Nederland 's-Gravenhage* (Staatsuitgeverij).

Camagni, R. (2003) 'Regional clusters, regional competencies and regional competition', *Cluster management in structural policy – International experiences and consequences for Northrhine-Westfalia* (Duisburg).

Dosi, G. (1997) 'Opportunities, incentives and the collective patterns of technological change', *The Economic Journal* 107, 1530–1547.

Duijn, M. and Rouwendal, J. (2013) 'Cultural heritage and the location choice of Dutch households in a residential sorting model', *Journal of Economic Geography* 12, 473–500.

Biddle, M. and Hill, D. (1971) 'Late Saxon planned towns', *Antiquaries Journal* 51, 70-85.

Conzen, M. R. G. (1968) 'The use of town plans in the study of urban history', in Dyos, H. J. (ed.) *The study of urban history* (Edward Arnold, London) 113-30.

English Heritage (2010) *Understanding place: an introduction* (http://www.english-heritage.org.uk/Publications) accessed 23 June 2010.

Hillier, B. (1996) *Space is the machine* (Cambridge University Press, Cambridge).

Kropf, K. S. (1993) 'An inquiry into the definition of built form in urban morphology', unpublished PhD thesis, University of Birmingham, UK.

Thompson, F. M. L. (ed.) (1982) *The rise of suburbia* (Leicester University Press, Leicester).

Dutt , A.K. and Costa F.J. (1985) *Public Planning in the Netherlands* (Oxford University Press, Oxford).

Eerenbeemt Hvd. (1996) *History of North Brabant* (Meppel, Amsterdam).

Hall, P. and Pfeiffer, U. (2014) *Urban future 21: a global agenda for twenty-first century cities* (Routledge, London).

Hervieu-Leger D. (2002) 'Space and religion: new approaches to religious spatiality in modernity', *International Journal of Urban and Regional Research* 26, 99–105.

IABR, Architecture Workroom Brussels, Floris Alkemade Architect, LOLA Landscape Architects (2014) *Reweaving the Urban Carpet* (International Architecture Biennale Rotterdam).

Iveson, K. (2013) 'Cities within the City: Do-It- Yourself Urbanism and the Right to the City', *International Journal of Urban and Regional Research* 37, 941-956.

Janssen, J. (2002) 'Nostalgic Landscape: Planning Between Conservation and Modernisation', *OASE 77*, 77-102.

Janssen, J. (2013) 'Town planning as a socio-religious issue. The 'big city' advisory

committee and the urban redevelopment of Eindhoven and its environs, 1945–1960', *Planning Perspectives* 28, 521-545.

Janssen, J. (2015) 'Religiously inspired urbanism: Catholicism and the planning of the southern Dutch provincial cities Eindhoven and Roermond, c. 1900 to 1960', *Urban History*, 1-23.

Kostof, S, Castillo, G and Tobias, R. (1995) *A History of Architecture: Settings and Rituals* (Oxford University Press).

Galle, M. and Modderman, E. (1997) 'VINEX: National Spatial Planning Policy in the Netherlands in the Nineties', *Journal of Housing and the Built Environment* 12, 9-33.

McLeod, H. (2005) *European Religion in the Age of Great Cities: 1830-1930* (Taylor & Francis).

Molema, M. (2012) 'The Urban West and the Rural Rest: Framing in Dutch Regional Planning in the 1950s', *Landscape Research* 37, 437-450.

Mommaas, H. and Janssen, J. (2008) 'Towards a synergy between 'content' and 'process' in Dutch spatial planning: the Heuvelland case', *Journal of Housing and the Built Environment* 23, 21-35.

Talen, E. (2015) 'Do-it-Yourself Urbanism: A History', *Journal of Planning History* 14, 135-148.

Wagenaar, C. (2011) *Town Planning in the Netherlands Since 1800: Responses to Enlightenment Ideas and Geopolitical Realities* (010 Publishers).

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Rurbanism/Urbanism/Meganism: toward different disciplines for different scales of human settlements and settlement fringes

Adelaida Del Puerto García
Escuela Técnica Superior de Arquitectura de Madrid, Universidad Politécnica de Madrid
Keywords: rurbanism, urbanism, meganism, urban scales

Abstract

Current conurbations are the sum of very different situations that use to be approached always with the same tools. The scale of each city fragment, its nearness or remoteness to the natural landscape, its accessibility, density and social identity should be analyzed as an organism itself.

Tools to be used, rules and future design might be completely different. Every situation has the capability to enrich the assembly keeping very different conditions compared to the surroundings. A city might be the sum of very different economic sectors. Growth in the countryside shouldn´t always result in the disappearance of the agricultural sector, but the appearance of a quality food industry that develops it. Tourism in small towns shouldn´t decrease together with the raise of residential land nor the architectural and cultural identity. On the contrary, new architecture should help along the affirmation of cultural and architectural values. Residential growths should always be the result of a local improvement, not the result of escaping from a nearby high density space. To avoid the escape from high density urban spaces, those places should be treated as the core of the civilization, the place where most of the processes that make possible a territory development occur. A place where large amounts of energy are consumed and, in compensation, large amounts of energy should be produced. The space where degradation never takes place. Solving the identity and economical base of each fringe of settlement itself means solving as a consequence other issues as traffic or family sustainability of the assembly.

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Introduction

This paper analyzes the importance of the graphic tools we use for the megacities, cities and rurban area representation. These tools will determine the way decision making happens and, consequently, the validity and appropriateness of the strategies arising from those decisions.

Citizens, who have become new actors on the scene of planning, and the development of new digital and mobile technologies are a new resource of data representation and planning decisions.

Due to the global migration movements and the drastic and frequent economic changes, we will have to develop new tools to represent issues like shrinking and growing processes. Urban morphology changes are moving the boundaries between formal and informal fringes, and between different social strata. Opposite ways of creating a city and opposite economical expectations are separated again by a river, a street or a highway. Slums and formal cities are now in close contact with each other.

We have experienced the results of highly controlled and highly designed un-slumming projects in many of our western suburbs. During the 70s, 80s and 90s the degradation, sense of not belonging, family unsustainability, economical high dependence and the lack of spaces for a social reproduction were common issues all over the continent. We can use our modern devices, our digital proximity and interconnection to collect and interpret what is really happening in the informal city in order to protect its values instead of erasing them.

Methodology

Data about historical urban and territorial strategies are being studied through sources available at the University of Castilla-La Mancha (UCLM) and Universidad Politécnica de Madrid (UPM) in Spain. Official plans have been consulted through the Municipalities' official web sites and the archives in Madrid, Toledo and Los Navalmorales, analyzing strategies and tools representing three different scales of western human settlements. Data about urban farming, participatory planning and new technologies applied to urban planning have been obtained through the web. Research articles by American and German Scholars have been the base of the shrinking and growing processes studied. In addition, experiences on slumming and unslumming described by Jane Jacobs, Sumita Sinha and the Ahmenabad workshops are the base for the research on slums.

Meganism, Urbanism and Rurbanism; decision making and graphic information

Urban planners and architects are in charge of drawing the graphic support for the political decision making processes. What we don't draw, doesn't exist. If we give importance to a specific issue in our drawing, it will become a point of discussion.

A first classification of the urban fabric is always made by the amount of people living in them and by the amount of square meters it occupies in a frozen image. But the nature of these spaces, classified by paying particular attention to their capability of hosting a certain number of inhabitants, is very different. We shouldn't use the same tools to represent them, nor the same criteria to design them.

Planners used to draw as architects and naturalists did in the early 18th century (Choay, 1992) with a 'scientific' vision on how cities or buildings are made. Planners, providing graphic information not just to politicians, but to architects and engineers as well, used to draw as tax inspectors, structures' estimators or squared meter measurers. The perceptible reality that is full of sensorial, environmental and cultural information, which should be our main data for city models, isn't sufficiently represented. That information is contained in many urban competitions and proposals from scholars, but it is significantly different from the official drawings of the urban plan. We have reached the agreement that a topographic plan resembles reality more than oil on canvas even if, objectively speaking, the reality is the opposite (Ortega y Gasset, 1940).

Figure 1. Rurban graphic support proposal; a territorial collage. Source: Ian Mc Harg, (1967) *Proyectar con la Naturaleza*, GG Editorial.

sloping landscape/architecture morphology sketch

flat landscape sketch

territorial sketch

water resources map
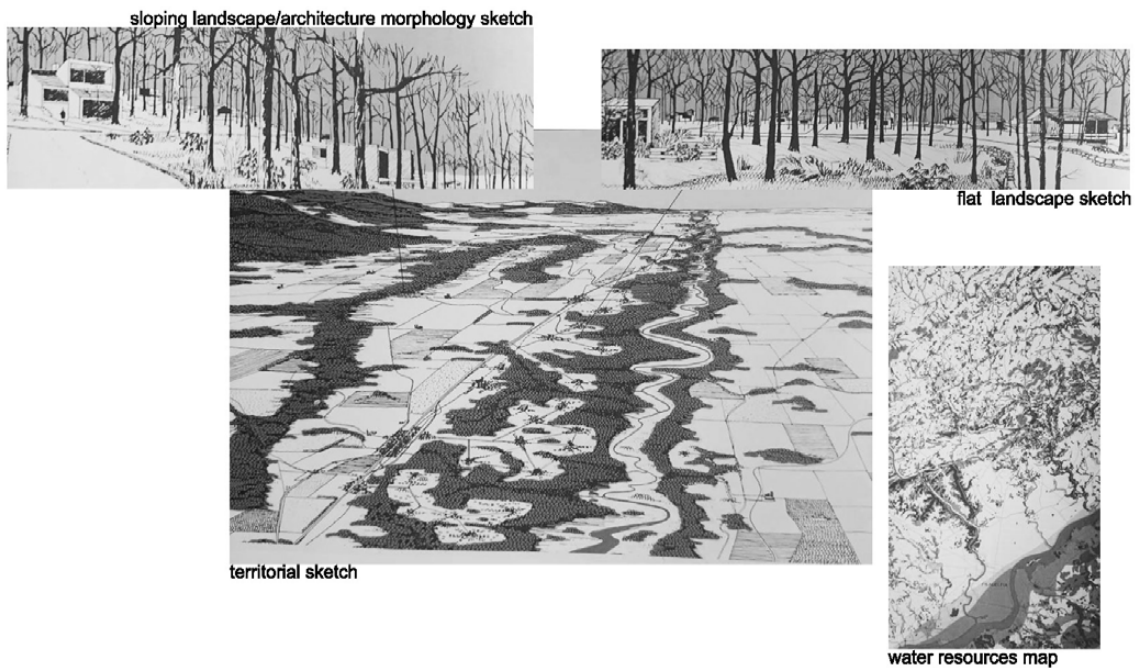
Some proposals about how to draw a complete prospective of reality were already made in the late 60s (Mc Harg, 1967). Urban and rurban landscapes were treated as tridimensional sketches, connecting and relating natural and built environments. Tools like Google-Earth images might substitute sketches, but drawing allows us to establish a scale of values depending on how we draw each element, erase the information that is not relevant, highlight the details and emphasize the subject we want to work on.

Proposals about how to treat the complex information contained in the Megacities' reality fill the architectural competitions, anticipating what should be a big change in the official style of representation. Also urban research centers and isolated young urbanists develop, with the help of new technologies, maps including citizen habits' information that translate many useful data into graphic tools.

Official drawings act as `dividers´ instead of `linkers´ between the several interactive layers of the urban fabric. Many of the internal dynamics are not described, nor the interaction with the surroundings and the nearby environment. Vital interconnections with other settlements aren´t represented unless we are drawing at the territory scale. Fringes get dissected, without keeping the memory of the interconnections.

When we draw a city at a certain spatial scale, we are forgetting the fact that, in real life, what´s important for citizens is not the distance, but the time it takes to reach one place from another. Walkability and cyclability could be really pursued if we had a continuous reference to its scarcity in our plans.

Urban Settlements: a work in process

Megacities, urban and rurban areas are the sum of fringes that undergo separate processes due to economic and social dynamics. In general, settlements that are growing along the edges are suffering a shrinking process in the inner fringe. One of the most effective strategies will be to study separately those different fringes, and to work on achieving a final balance with coordinated proposals between all the parts (Müller and Siedentop, 2004).

Figure 2. City `biodiversity´; Berlin plots analysis/Mapping walkability and cultural value through API, Twitter and Flickr data Source: Armelle Caron, Édition Lendroit, www.armellecaron.fr/Eric Fischer.
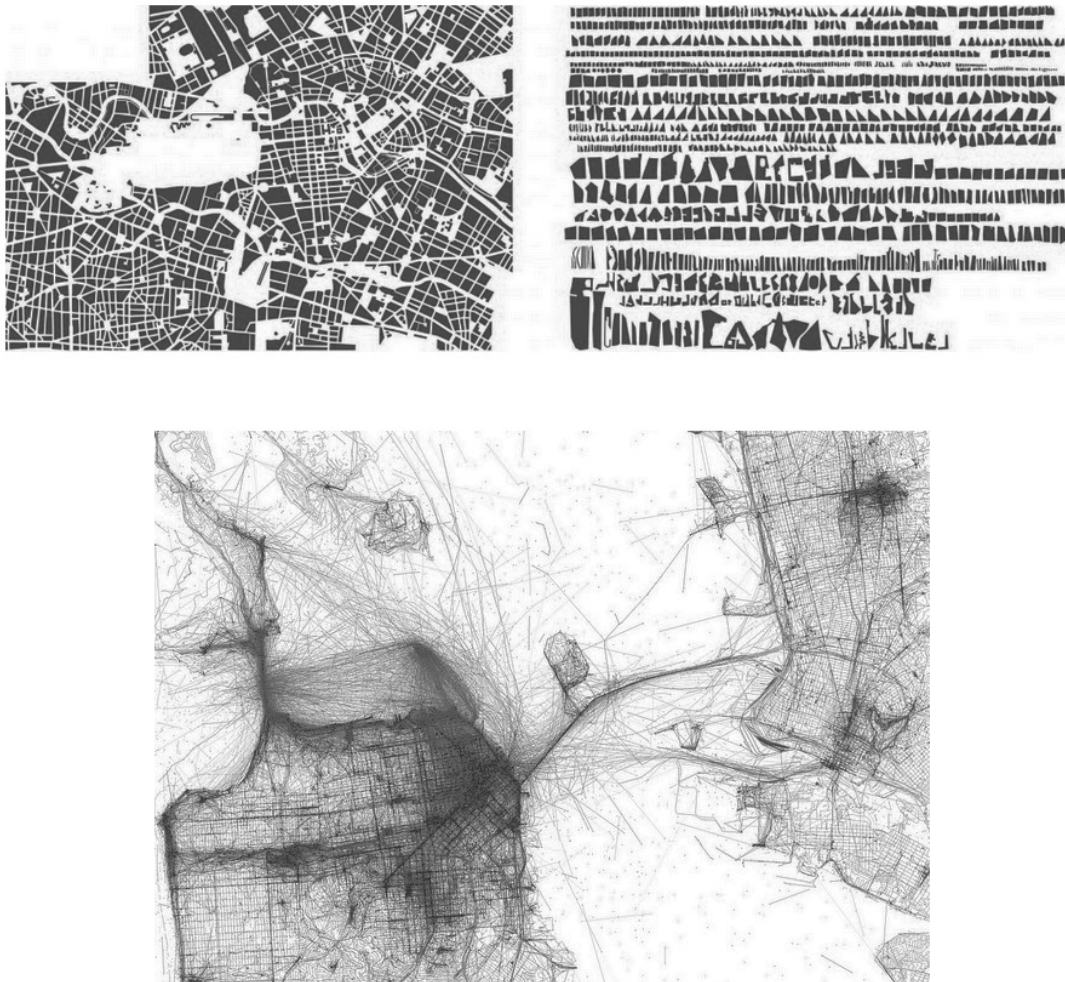
As urban planners, we are forecasting the future. Our task includes not only trying to resolve what is already happening, but also what we think is about to happen.

In a growing fringe, we will be forecasting a process of densification and enlargement, and we will have to decide how and where to grow and how to adapt the existing city to a new density and extension. Expansion should have its own tools of representation. Critical points such as carbon emissions, energy and water supply are needed in all the city representations, not just in the water and energy management plans.

Rain water harvest, urban farming, water drainage and clean energy production spaces should have as much relevance as building plots in our designs.

The choice between identity preservation, identity evolution or identity creation will be one of the most determinant points of discussion that should never be given up by planners (King, 2004). Hybrid cultural events will re-invent the core of the main megacities, as global migrations are creating 'world microcosms' in their streets and neighborhoods. (Wood and Landry, 2008)

Identity isn't just based on heritage, but on social interconnections and the habits of citizens that, sufficiently represented, will encourage the mixture of spaces dedicated to residential and business activities. It will also influence the entrepreneurial dynamics, which are at the core of the strategies to avoid future drastic shrinking processes and degradation. Internal economic resources diminish degradation and reduce displacement and carbon emissions.

In a shrinking fringe, we will be forecasting an emptying process, and we will have to pay attention to how and where it is actually shrinking. A plan of empty buildings and plots becomes the main requirement if we want to represent the contraction, and to adapt the existing fabric to a lower density (Kabish and Haase, 2005).

Special attention should also be paid to decide what to do with the actual extension and how to manage the changing city's outer edges. Safety and the guarantee of the sustainability of public services becomes one of the main issues (Ryan, 2012). Degrees of safety should have a permanent graphic echo.

As flexibility will become one of the main issues, the plots' 'biodiversity' has to be analyzed and represented. This will be helpful in understanding if the urban fabric is ready to end with the previous zoning structures, or if it is too homogeneous and rigid and needs further adjustment.

Encouraging the entrepreneurial network to reverse the economic structure from external to internal will extend the fringe life (Herr and Karl, 1989). The study of the 'biodiversity' of the polots becomes crucial, as it may permit an easy change from residential to a very different use and vice versa.

In shrinking cities, a more livable and affordable fringe is about to be born, we will have to represent its improvement potentials in order to retain its new virtues. Urban voids have infinite options. Their different boundary conditions will determine their finite possibilities.

A settlement in stagnation, instead, usually has a moderate number of inhabitants. Megacities are never stagnant for a long time (Jacobs, 1968). Their powerful inertia makes them shrink or grow alternatively as a whole. So stagnation tools will work mostly for towns and rural areas. Designing for stagnation, if it lasts in time, means having the chance to create an inventory of landscapes' perspectives, to study built environment and ethnographic identity and to embrace self-building initiatives in a positive way.

The source of growth

In growing settlements, the source of growth can be internal or external. Internal source is usually at the core of megacities, villages and slums (Jacobs, 1961). External source fuels towns and some cities.

Internal source of growth positively influences economic sustainability, family sustainability, traffic dynamics and walkability. Commutes are reduced. The choice of proximity between home, work or school, for example, is possible and services are usually available close by.

Settlements with an external source of growth become dependent and with very little room for maneuvering in economic decisions. They usually lose much of their historical value, as their growth is not the result of their own decisions, but something imposed by a higher order settlement, and at a high speed. They are rapidly enlarged when the economic situation is positive, and the first places to shrink when it becomes negative, as they are considered part of the periphery (Müller and Siedentop, 2004).

Massive commutes are the physical materialization of the dependence on other settlements or fringe economies, and they are usually done by car.

Compact or Scattered Nature

One of the characteristics that has historically defined the nature of human settlements has been the degree of compactness. It used to allow us to understand the characteristics of the territory that surrounded it: the topography, the climate and the culture (Morris, 1979).

With the beginning of Imperialism and the standardization of colonial architecture and urbanism, European models were spreading into the Asian, African and American territories. New mixtures between compact and scattered city morphologies emerged, based on architectural changes.

Modern cities, instead, are a mixture of different types of nature: they are compact in the core with extremely high densities, and scattered in the residential areas. Latest studies affirm that compactness and resilience are related. Compact cities are more adaptable to decline processes (Richardson and Woon, 2012). In a cyclical global economy,

compact cities should substitute sprawl cities in order to respond to future economic decline processes. But social dynamics are changing, new potential dwelling owners are leaning towards renting, as the global labor market forces them to move from one continent to another very often (Müller and Siedentop, 2004). The bicycle is becoming their favorite means of transportation replacing the car. They demand more walkable cities and new architectural solutions since co-working spaces and freelancing labor habits substitute conventional ones. New tools have to be created to face these changes from a half compact-half scattered city to a moderately dense city.

Historical urban strategies

The main concern for urban planners from the Middle Ages until the end of the 19th century was the binomial light/fresh air. Cities were extremely dense, and urban acupuncture was practiced with partial demolitions. The existing fabric was partially reinvented, improving the living conditions of their inhabitants. This constitutes a semi-natural un-slumming practice that may be very useful for today´s informal fringes. Only in some specific cases, a previous massive fire for example, an entirely new city or city fringe was created (Rasmussen,1934). Since the middle ages, villages and towns existed for planners just as an object of socioeconomic change. In England, the purpose for the territory transformation in the late middle ages was to reduce the community properties and the farmers rights (Sevilla, 2012). In Europe, the Church was including clear religious landmarks in the center of the rurban and urban clothes to assure a common identity (Hobson, 2004). Broadly, cities under threat were being planned from a defensive point of view. Providing fresh water to the rural population was one of the main concerns in the 18th century, as it was for Romans.

A relatively static system of borders in many European countries, made the demolition of many city walls possible, and the transformation of those voids into gardens. The main objective was to connect the historical city with the new city enlargements (Zarza, 2001). The Industrial Revolution, resulted in less livable cities, the increase of slums in the city outskirts, and the pursuit of the benefits of contact with nature. Gardens and nature were artificially and democratically included in the new city designs.

The 20th Century became the century of the binomial public space/private transportation. The debate about where to place the flow of vehicles and the parking areas became a priority. Vehicles were the main source of satisfaction for drivers, but the main source of dissatisfaction for pedestrians. Finding the right balance on how to divide public spaces between one and the other was crucial at that time, and a wide variety of solutions was given in the most collapsed and symbolic city, New York (Koolhass R.).

From the 60s, with the extreme increase in the amount of vehicles invading our public spaces, traffic saturation became the main concern.

From the end of the WWII, the migration movements and the rural exodus were critical in the developed countries. Cities had to accommodate huge amounts of new citizens with scarce resources and in record time. Cities' `emergency architecture´, made of massive and moderately distant blocks, was simultaneous to the villages' shrinking process. In the USA cities were becoming urban sprawls.

European cities were suffering a new circumstance; architectural identity was fading. Responsibility of maintaining the historical identity rested on monuments, while residential areas were becoming standard city fringes. The Heritage conservation movement strategies, which started with the French Revolution (Choay, 1992), became a non-questionable practice when the renovation of historic centers was addressed.

At the end of the 20th century, the massive concentration of world population in cities and enlargements resulted in cities that had to deal with a number of citizens that exceeded the total number of inhabitants of many countries. Green lungs and megalithic cultural structures were some of the main concerns. Green lungs became a strategy to fight traffic pollution.

At the beginning of the 21st century, with the rise of the architects´ collectives, the urban participatory dynamics and the financial crisis, special attention is being given

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to the degraded and empty spaces of the city. Citizens, passive actors in the scene of urbanism from the end of the middle ages, have become active subjects of the transformation of the city. In the decade of austerity, after the 2008 world's financial crisis that has lowered the purchasing power of cities, food security strategies and small-scale participatory cultural proposals are replacing the expensive mega-projects of previous decades in western countries.

Nowadays, the increase in the use of alternative means of transportation, like bicycles, and the pursuit of family sustainability is resulting in the transformation of the labor market. The freelancing model and the choice of shorter commutes between home and the office are increasing. The digital fabrication, which is about to change the production processes on a global scale, will avoid the great displacement of commuters and the transport of raw materials and manufactured products. The real estate disruptiveness is already changing the private investing priorities that have modelled the city outskirts and has helped the inner cities emptying processes for decades. These priority changes occur simultaneously to the mega-projects that are in process in developing countries. These strategies are changing the morphology of the cities, and are accompanied by the growth of massive informal fringes.

Morphology of developed cities is under discussion, and strategies to reach compactness will be decisive to the city sustainability (Richardson and Woon, 2012). Strategies will have to be preceded by a deep study of the new cultural and flow dynamics between human settlements on a global scale.

New dynamics 1. From urban planning to citizen involvement

Urban planners and politicians no longer act as the only subjects making decisions to improve the public space of a passive society. A third urban agent has burst onto the scene: the citizen/villager.

Urban planners were dealing with a predominantly illiterate society until the ´50s in many western countries. But with the spread of education, higher degree studies, international travelling and new data technologies, new perspectives and demands are being born amongst citizens. A similar process is already happening in the developing countries. Citizens demand their right to choose, to manage and to design their own public spaces. Together with the rise of architectural young collectives, strongly linked to the existent social networks and provided with new technologies, many spontaneous citizen actions are changing the rules of conventional planning (Peerapun, 2011). Strategies like architecture `guerrilla´, self-managed urban void initiatives, urban acupuncture interventions, collective resources management, self-built mobile devices, urban skeleton reuse, participatory urban activities (Peris and Turnes, 2015) and collective urban farming are spreading out all over the developed cities. They are transforming the social relations and the sense of belonging to the built environment.

They are also being helpful in the un-slumming processes of informal cities, resulting in more creative and positive solutions than those given by local governments decades ago. Slumming and un-slumming processes are especially representative in the case of vertical slums in countries like Venezuela or Brazil (Baan, 2013).

New dynamics 2. From urban to rural citizens in developed countries

In the first decade of the 21st century many young couples, in countries that were particularly hit by the 2008 financial crisis like Spain, initiated an urban exodus and are moving into rural areas. They were escaping from a saturated environment and from low job expectations.

They arrived to the villages looking for a place to start up their modern businesses; organic farming, art workshops, rural accommodations or freelancing design jobs. Their different conception of life, due to their education and previous urban experience, became a strong force that is starting to change the behavioral patterns, the architecture, the social relationships and the economics of some rural areas. Medieval settlements

are meeting the digital era in a few years. Somehow, the hatching of these rural fabrics is going to put their nature in common with the nature of megacities, where flexibility is a necessity and a difficulty at the same time.

New dynamics 3. From villagers to citizens in developing countries

The concept of responsive cities is being mentioned in many recent urbanism texts. But the towns surrounding a megacity, and being absorbed by it, will have to put into practice a responsive attitude in the first place. The megacity's nature doesn´t change during the growth, but the nature of all the settlements being transformed by it does.

The process of transformation from town or village into a megacity periphery starts with the improvement of the transportation infrastructures, that reduces the time to move from the village to the megacity. Later on, rustic plot conditions become more flexible and waves of contractors, family investors and real-estate agents arrive to the former village. Its rural fabric is about to experiment an incredible growth in just a few years. The village hasn´t really generated any economic improvement to justify this massive arrival of population. Its representativeness, together with representativeness of its old inhabitants, will very likely vanish. And with them, so will do the historical and landscape values.

A more gradual arrival of new inhabitants may result in a more democratic representativeness of the assembly, including the third actor: the natural environment. A gradual arrival has to do with the inner improvement and with the sustainability of the new citizens originative settlements.

New dynamics 4. Urban farming movement and new urban voids morphology

With the beginning of the financial crisis, and doubts about the food security, farming activities started spreading in the inner suburbs and the outskirts of the cities (Sinha, 2012).

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Whether in vacant plots or in community gardens, urban agriculture is seen as a strategy for business development, sustainable planning and democratic reinforcement. At the same time, a renovated attachment to the public space is emerging. Public spaces devoted to urban farming become less likely to be vandalized, and generate civil engagement and concern for other citizens.

One of the main difficulties urban agriculture has to face, in policy terms, is the barrier of zoning.

This difficulty has generated networked movements involving citizens belonging to the same fringe, creating new youth development opportunities (Golden, 2013). As public space is the materialization of the social dynamics, big changes are approaching and society becomes a deeply interrelated network. Youth development opportunities have to address a materialized reality that may transform the morphology of entire neighborhoods.

Natural un-slumming potentials

When human settlements are growing at a high speed, the existent fabric and the local government resources are not capable to properly adapt to the increase of population and the consequent enlargement of the city. A change in the scale needs some time to adjust.

Scarcity of quality plots and economic resources of the new citizens, together with the impossibility of providing public services at the right time, generates slums. Slums used to be far away from the richest areas of the cities, as spatial distance has always represented social distances (Bordieu, 1997). In the present, due to the enormous amount of villagers filling the developing cities edges, those distances do not exist anymore, contributing to a higher spatial tension but also to a greater potential of future social cohesion.

A slum is in a constant process of amelioration. The starting situation is the worst possible and the energy of the population is increasing, as waves of young people keep arriving. It is also the paradigm of sustainable businesses, as they are born directly on demand or adding new work to the existent. (Jacobs, 1961), (Temin 2013). Natural un-slumming creates better urban dynamics than artificial un-slumming. Its development

Figure 3. Participatory slum mapping process by Marta Juliana Abril; built reality and social dynamics. Source: www.arenasbasabepalacios.com Rampir no Tecra Slum Transformation Scenarios, Ahmenabad workshop 2010.
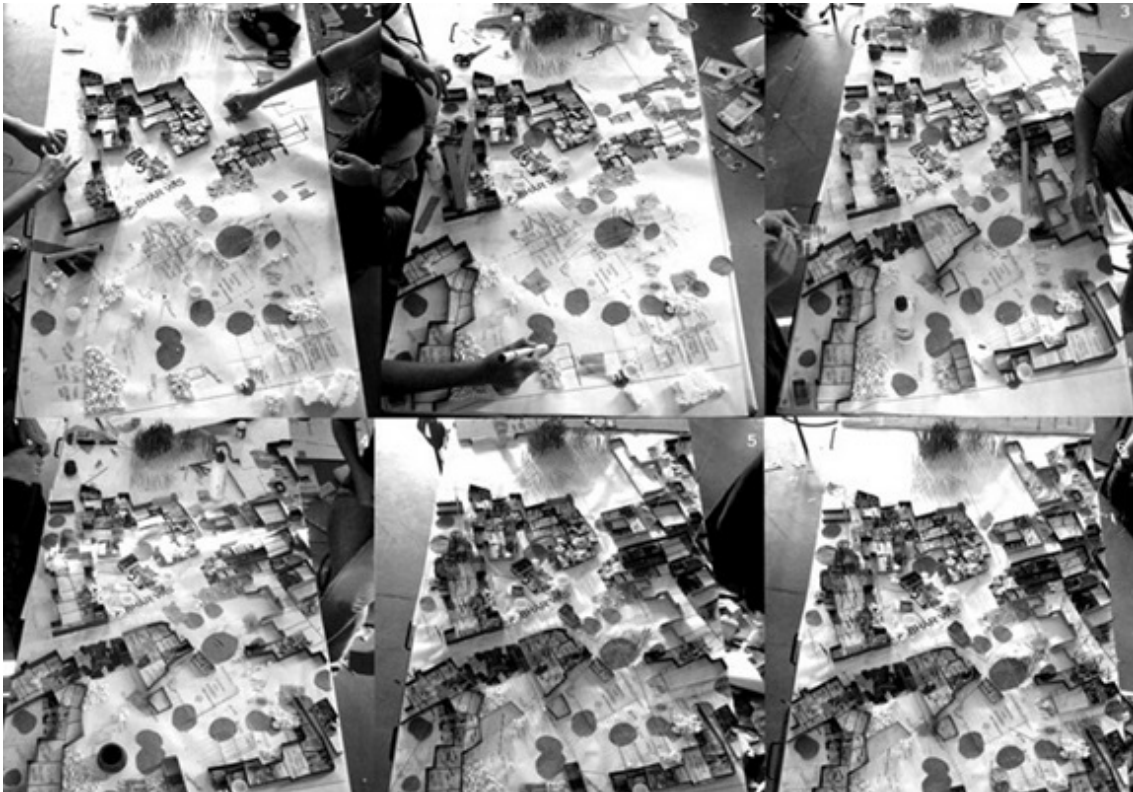
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potential will have to do with the size and shape of its plots, its topography (Montejano, 2014), and with the capability of planners and architects to engage in hands-on design and to make environmental and social responsible changes. Close negotiations with low income clients will be on demand (Oppenheimer & Hursley 2002).

A clear example of a European failure is the `*Poblados de Absorción*´ in cities like Madrid or Barcelona, created in the 50s and 60s. Local governments were demolishing slums to create new urban fabrics. They were erasing not just dwellings, but social spaces and and emerging economy, forgetting the fact that tools to connect urban parts are not objects, but events (Hara, 2004). They were creating new city strips from zero and zoning the city. Dormitory neighborhoods were pretending to substitute self-sufficient fringes, where all the economy sectors where physically represented. They also had a complex social network that had determined a precise morphology.

Conclusion

Megacities, urban and rurban areas are usually studied, dissected and drawn using the same tools and perspective. At the same time, the only accepted differences and similarities between them are related to their size, as if that were the only factor that makes them different.

Studying a human settlement requires a deep study of its scale, the growing or shrinking process that is taking place, its `biodiversity´ potential, its social dynamics and the origins of its economic resources.

In some cases, the strategies applied to a megacity and a rurban area may be very similar, as their underlying processes might also be similar. The difference lies in the way we represent the settlement. A megacity should be represented in a more abstract way,

and with the joining of many different layers, due to its complexity and its distance from natural reality. The representation of a village or town should be much closer to a tridimensional territorial reality, as the surroundings and the natural environment are a very important part of its processes and morphology.

Continuous presence of sustainable water management and energy self-sufficiency at the graphic level will be necessary if we want a growth process to last for a long time.

Social dynamics are demanding more room in our drawings, and new technologies can make their inclusion easier.

Figure 4. A first approach to the distinction of Rurbanism, Urbanism and Meganism: basic tools and strategies. Source: the author.

The graphic expression of the 'informality' is crucial in order to avoid the degradation experimented in the suburbs of cities in developed countries at the end of the last century. Un-slumming processes in megacities in developing countries should be practiced in a much more natural way, accepting that informality creates social engagement, a sustainable economy, walkability, family sustainability, and the compactness we now pursue in developed countries.

References

Bourdieu, P. (1997) *Capital cultural, escuela y espacio social* (Siglo XXI editores, Iztapalapa) 24-94.
Choay, F. (1992) *Alegoría del Patrimonio* (GG, Barcelona) 63-64.
Golden, S. (2013) *Urban Agriculture Impacts: Social, Health and Economics: A Literature Review,* (Sustainable Agriculture Research and Education Program, University of California).
Hara, H. (2004), *Discrete City-an Essay on Connectability and Separability. Vol1* (Toto,Tokyo).
Herr, H. and Karl, G. (1989) *Estimating the millennium development*, Goal 7, Target 11.
Hobson, J.M. (2004) *Los orígenes orientales de la civilización de Occidente* (Ed. Crítica, Barcelona).
Jacobs, J. (1969) *The economy of cities* (Vintage Books, New York) 96-97, 261.
Jacobs, J. (1961) *The dead and life of great american cities* (Vintage books, New York), 30, 288-290.
Koolhass, R. (1978) *Delirious Manhattan* (The Monacelli Press, Italy) 122-126.
Oppenheimer, D. and Oppenheimer, H. (2002) *Rural Studio; Samuel Mockbee and an architecture of Decency* (Princeton Architectural Press, New York).
Ortega y Gasset, J. (1940) *Ideas y creencias* (Alianza Editorial, Madrid).
Mc Harg, I.L. (1967) *Proyectar con la naturaleza* (Ed. GG, Barcelona).
Montejano, M. (2014) 'The memory of informality; the typological cycles in the selfbuilt', *Urban Morphology* journal ISUF 2014, 63-73.
Morris, A.E.J. (1979) *Historia de la forma urbana, desde sus orígenes hasta la Revolución Industrial* (GG, Barcelona) 160-170, 406, 306.
Müller, B. and Siedentop, S. (2004) *Growth and Shrinkage in Germany; Trends, perspectives and challenges for spatial planning and development,* (Deutsches Institut für Urbanistik, http://www.difu.de/publikationen).
Peerapun, W. (2011) *Participatory planning approach to urban conservationa and regeneration in Amphawa Community. Thailand* (Faculty of Architecture, Chulalongkorn University).
Rasmussen, S.E. (1934) *London, the unique city* (The MIT Press, Massachusetts).
Richardson, H. and Woon, C. (2012) *Shrinking cities; a global perspective* (Routledge, UK).
Ryan, B.D. (2012) *Design after decline: How America rebuilds shrinking cities,* (University of Pennsylvania press, Philadelphia).
Sevilla, A. (2012) *Urbanismo y reproducción social; una introducción a su historia* (Cuadernos de investigación urbanística n.80, Madrid).
Sigrun, K., Haase, A. and Haase, D. (2004) *Beyond growth-urban development in shrinking cities as a challenge for modelling approaches* (Dept. of Computational Landscape Ecology, Leipzig).
Sinha, S. (2011) *Architecture for rapid change and scarce resources* (Routledge, London) 138-144.
Temin, P. (2013) *The roman market economy history* (Princeton University Press, New Jersey).
Wood P. and Landry C. (2008) *The intercultural city; planning for diversity advantage* (Earthscan, London).
Zarza, D. (2001) 'Desbordes urbanos', *Revista Circo* (Ed. Mansilla/Rojo/Tuñón, Madrid).
(www.todopolapraxis.com) accessed on March 2015.
(http://www.ted.com/talks/iwan_baan_ingenious_homes_in_unexpected_places?language=es) accessed on May 2015.

Chair_Michael P. Conzen
University of Chicago, United States
Co-Chair_Marco Falsetti
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

Reading Contemporary Landscape

Landscapes and Territories

Urban Landscapes

Metropolitan Infrastructure

The interpretation of the territory by Saverio Muratori

Silvia Tagliazucchi
Dipartimento di Architettura e Pianificazione Territoriale, Università di Bologna,
Viale Risorgimento 2, 40136, Bologna, Italy
Keywords: Muratori, territory, organism

Abstract

Studi per una operante storia del territorio is Saverio Muratori's work, that he left unfinished at his death in 1973. It is composed of 255 drawings and 18 printed materials, which represent the territory from the field form to the world map. After the researches of Venice and Rome, these drawings testify Muratori's goal: to go beyond the concept of organism as a city and extend this at the territorial scale. To describe this work, there is only an hand-written text by Muratori, on the back of a drawing, a note that summarizes his intent: to focus the attention of the men to interpret the context in the real form, in his most natural connection with the environment, in relation to the history of the real. The extension to such a wide scale of representation and the method with which Muratori reads the territory, make these studies still extant.

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Introduction

Studi per una operante storia del territorio is Saverio Muratori's work, that he left unfinished at his death in 1973. It is composed of 255 drawings and 18 printed materials, which represent the territory from the tissue form to the world map. After the researches of Venice and Rome, these drawings testify Muratori's goal: to go beyond the concept of *organism* as a city and extend this at the territorial scale. To describe this work, there is only a hand-written text by Muratori, on the back of a drawing, a note that summarizes his intent: to focus the attention of the men to interpret the context in the real form, in his most natural connection with the environment, in relation to the history of the real. The extension to such a wide scale of representation and the method with which Muratori reads the territory, make these studies still extant.

Methodology

The corpus formed by the remaining preparatory sketches for *Studi per una operante storia del territorio* (Bollati, Bollati, Marinucci and Muratori, 1973) does not present any written text, aside from a set of notes written on the backside of a drawing where Muratori summarises the key concepts of the unfinished work, titled *Discorso d'insieme (General considerations)*.

The methodological approach to delineate the theoretical framework on which the drawings are based has been developed as follows:
- through the study of the theories outlined by Muratori in his works - from the critique of *Movimento Moderno*'s architecture up to his books
- through an in-depth analysis of Muratori as described by his scholars and assistants, in particular Giancarlo Cataldi and Alessandro Giannini, the two most prominent figures that followed the theories outlined by Muratori concerning the territory.

Giancarlo Cataldi is professor of Architectural Composition at the faculty of Architecture of the university of Florence, and he has been president of ISUF since 2013. His research has been deeply influenced by Muratori's work, in particular with regards to the *Teoria dei quadrati (Theory of the Square Form)*. Both his publications (Cataldi, 1972) and his further articles on Urban Morphology (Cataldi, 2003 -2005) have been taken into account for my research.

Alessandro Giannini also played a fundamental role for my research. He was the owner of the preparatory sketches of *Studi per una operante storia del territorio*, which he donated to the library of Modena. He published a set of seminal texts on Muratori's theories (Giannini, 1983), and he developed a definition of territory to be used for the evaluation of environmental impact (Giannini, 1984). He is also the author of *Leggendo le minute dell'Atlante del territorio di Saverio Muratori* (Giannini, 2002), a never-before-published text – now owned by the Biblioteca L. Poletti – describing the surviving material of *Studi per una operante storia del territorio*.

My analysis, based on the aforementioned materials, has highlighted how Muratori approached the study of the architecture by a continuous comparison and correlation with the context. His works clearly outline how the concepts derived from this approach are all linked, and how they are the product of an evolution of the concepts previously analysed. For this reason I addressed Muratori's theories using three different "lenses": philosophy, didactics, and the approach of his design. This method strictly resembles Muratori's choice of a constant comparison, and has allowed me to outline the cardinal points of Muratori's theories and to define the concept of territory that Muratori developed in *Studi per una operante storia del territorio*.

Forming process

The concept of territory is, for Muratori, both the final objective of his work concerning the organism, and the maximum degree of real experience. Consequently, the achievement of a clear definition of territory is what accompanies Muratori throughout his research. *Studi per una operante storia del territorio* (Muratori, 1973) represents the last

step of this path, and the final interpretation of his thought. *Studi per una operante storia del territorio* is formed by the drawings now held at the Biblioteca Poletti, donated by Alessandro Giannini in 2002. Muratori worked on his last work between 1969 and 1973, together with the help of his assistants Sergio and Renato Bollati, and Guido Marinucci.

The book is the third – and last – of a series of works concerning the *storia operante (operative history)*, the other two being Venezia and Roma. The idea of an *operative history* is to be intended as:

history of the organical processes, i.e. history of the typical organisms at the qualifying moments of their gradual transformations; this definition allows one to track point-by-point the approximate development diagram, whose laws and directional trends can ultimately direct our actions so that they are effective. If history reaches these aims, then it can be defined operative. (Cataldi, 1972, 29; translated by author)

As with all of Muratori's theories, this concept evolved through his previous works *Studi per una operante storia urbana di Venezia* (Muratori, 1959 and 1961) and *Studi per una operante storia urbana di Roma* (Bollati, Bollati, Marinucci and Muratori, 1963).

These 3 publications (*Studi per una operante storia urbana di Venezia*; *Studi per una operante storia urbana di Roma*; *Studi per una operante storia del territorio*) contain all the concepts that Muratori derived from his philosophical, didactical, and design framework. Territory, defined as the most precise interpretation possible of the reality, means that reality represents all the intersections between man and nature, between the causes and the effects that contribute to the definition of the real, of the only organism that includes all the realities.

According to Muratori the concept of reality is articulated according to how Croce, based on the philosophy of Kant, defined gradual categories, that represent the characteristics with which man's consciousness of the facts of the real gradually manifests itself – these latter called *gradi tipici di riferimento (typical degrees of reference)*. To abbreviate the definition of each category, Muratori uses the following symbols: "s" individual serial degree; "S" systemic serial degree; "o" occasional degree; "O" total occasional degree.

Everything is categorized according to the aforementioned 4 symbols, in relation to:
- Buildings planning
- Philosophical and individual concepts, such as the relation knowledge – reality
- Concepts on the historical process of reality, and its representation in the mind
- Historical cyclical process of the notion of reality, crucial to understand Muratori's concept of territory, thanks to which he achieves the categorization in symbols of the morphological characteristics of the urban settlement and the shape of the territory.

Linking back to Croce, Muratori further analyses the concept of reality through his understanding of the experiences of the real, i.e. the different types with which the real can be identified and evaluated. These types are:
- *Logics*: the distinction of the objective value, i.e. the description of the fact;
- *Economics*: the technique (the tool) that is used, i.e. its use;
- *Ethics*; the relation with the objective value, i.e. its organization;
- *Aesthetics*; the resulting empirical evaluation, i.e. the interpretation.

These types become a unique system, a unique process, that marks the gradual consciousness of the act *per se*, up to its total appropriation, through the display of the act in the interpretation.

These definitions applied to architecture are therefore to be intended as follows:
Logics as Materials;
Economics as Structure;
Ethics as Organism;
Aesthetics as Constructing Individual, i.e. the empirical manifestation in to the reality.

In order to do this the construction elements must not be anymore seen as inert matter, but as human values, as entities – inasmuch as human – tangible and real, not as variable and precarious appearance. This happens between the human sensation of

the body's experience. The human sensation does not feel the foreign materials from the body through a subjective or random opinion (the appearance), but through the real experience, namely the common body's experience. This experience is universal and is the basis for the life of human beings, through which man relates to nature, understands it, and internalizes it. He explains this fundamental experience and he appropriates himself of the meaning. He understand this according to a rule, that is communicative basis of the common language of the expression. […] the expression form the individual consciousness became part of the manifestation of the collective reality, a collective consciousness. Through this process, the individual became universal expression.

(Muratori and Marinucci (ed.),1980, 188-189; translated and adaptation by author)

Muratori groups the interactions between these elements and the declinations of the real into one system, where the interactions are the terms of the graphic exemplification called *tabellone*. This tool is used to evaluate and put into a system the elements, according to the evaluation criteria.

The aim is to highlight the differences and the analogies of the analysed elements, comparing them according to their distinctive and shared traits.

Muratori evolved the definition of this system during the years, according to the development of his theories. The *tabellone* substantially is a contingency table, where the x-axis and the y-axis represent the object and the subject respectively.

The subject corresponds to the man, he who proposed the intentions, i.e. the actions, that are connected to his aim. The object corresponds to the world (nature), the basis in which the answer to the man's actions – the results - are to be found and that coincide with the means with which they are put into action.

The relation between subject and object is one-to-one. The *tabelloni* are the representation of the result between aim and means, which constitute the situations generated by the different intersections of the various relations. Each intention of the subject corresponds to four attitudes of the object.

This tool is mainly used by Muratori for teaching purposes, and its first use dates back to 1966. During the following years he further developed it, and used it to compare the generative principles and the logics of development, in order to outline the empirical results through which the languages and the buildings are structured at different scales of architecture.

Tabelloni were also used as exercises, through which students could acquire a more critical and active role in the distinction and the interpretation of the architectural language.

It is the dynamic relation between hierarchy and sense of proportion between building and environment, that leads Muratori to link these considerations to his analysis of the city. This link allows Muratori to identify the relation between the distinctive traits of an organism and the *building type*.

This world, the urban and cultural environment of the community - where the buildings aren't lifeless but live their historical existence – constantly transforms the buildings themselves. It changes them according to time and fashion, it gives a meaning to every change, to every characteristic on the facades. The facades however remain unique, irreplaceable in the organic and formal balance of the environmental conditions.

(Muratori,1955, 15-16; translated and adapted by author)

The categorization used in the *tabellone* were first outlined during Muratori's work in Venice, as it can be seen in *Studi per una operante storia urbana di Venezia*. This research was the result of the course on "Distributional characters of buildings", held at IUAV during the early fifties. Muratori asked his students to analyze the 12 districts of Venice: from the typology of the buildings – through a series of surveys and photographical documentation – up to the historical study of the boundaries of the districts.

Through a comparative and active approach, Muratori managed to highlight the different changes and to allow his students to develop a critical approach to the topic.

The analysis proposed to his students is structured on different levels, and based on four parameters, in order to both develop a general overview of the logics of transforma-

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Figure 1. *Campionatura dei tessuti tipici territoriali (Sampling of territorial typical tissues)*, printed material, *Studi per una operante storia del territorio* (Bollati, Bollati, Marinucci and Muratori, 1973). Source: Biblioteca L. Poletti di Modena, Italy.

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Figure 2. *Tabellone* sketched by Muratori, Europe – middle ages, *Studi per una operante storia del territorio* (Muratori, 1973).
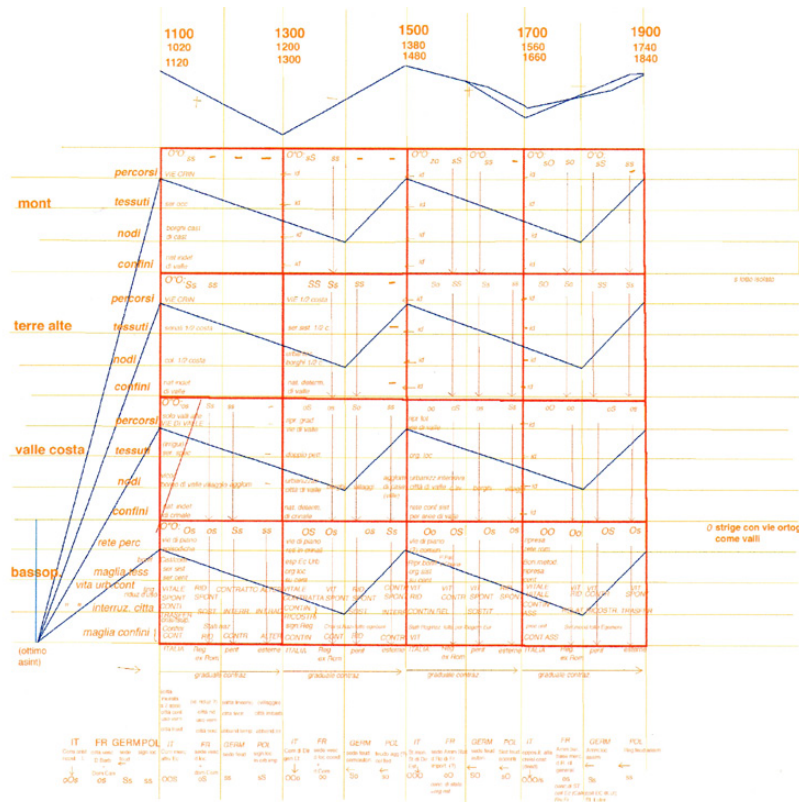
tions that have influenced the city, and to stress the importance and the interdependence of every aspect of the human life.

The four parameters adopted are:

- First parameter: research on the history of the urban structure, in order to reconstruct the different phases, identifying in the existing buildings the traces of the spread methodological developments, with the aim of linking them;

- Second parameter: research on the techno-economical structures on which the development of the urban life is based, i.e. how the economy of the city influenced both the urban and the social expressions of the city;

- Third parameter: related to the economical aspect, research on the influence of the social customs in the different historical phases;

- Fourth parameter: research on the environmental-economical, the politic-cultural dynamics, and on the stylistic characters of the buildings.

These ideas are joint together in the map of the whole city, which is at this point considered an organism.

The meaning of *building type* has then not only a value for the categorization of the distinctive traits, but in the urban organism it becomes a peculiar element of the constructive value that it communicates, i.e. of a formal sequence of the organisms typical of a society.

It then appears that broadening the view to the whole city, the elements that are crucial and that represent its constitution and changes are:

nodes / paths / tissues / organisms (in the case of the urban environment) moving then from the analysis of the tissues, to the evaluation of the relation with history, up to the outlining of an evaluation through its constitutive elements.

Broadening the scale of the view, the detail is out of sight, and it is possible to focus on the presence of the constitutive elements, crucial to the comparison of the transformations through the centuries.

The *constructive value* is understood by Muratori as index of bodily and spiritual unity, that is rooted in the most profound and original human conscience. Throughout his research Muratori identifies specific periods in time that typify the evolution of the urbanization of the territory, i.e. where the *constructive value* had its major degree of expression. These periods are:

- Roman empire - Middle Ages - Renaissance - Modern

Each one of these periods is distinguished from the rest for a characteristic – usually a prevailing tendency of attitude – so prevalent to be in itself the cause of the crisis of the period.

The Roman Empire was decisive for the organizational aspect of society, "the rational organization of the human values". This aspect brought the Roman Empire into a crisis, as it made all citizen equal. In the Middle Ages a hierarchy is re-established, but without a coherent repartition on the basis of personal merits, which will be later achieved during the Renaissance. From the loss of the ethical value by favouring the functional value, a balance is re-established through the search for a "natural religion" during the Modern period.

Each period taken into consideration is characterized by the value that identifies it, by an architectural language that defines it formally; the language is therefore a distinguishing trait of the relevant society. Each society has, in the aesthetic forms represented by the architectural language, its highest point, its maximum expression.

Between 1969 and 1973 in Rome, using the same approach, Muratori takes into consideration an even broader scale: the territory. With the preparation of the cartographic material for *Studi per una operante storia del territorio*, the analysis is taken as the broadest gradual category for the interpretation of reality.

As it can be seen in the draft for *Campionatura dei tessuti tipici territoriali (Sampling of territorial typical tissue)* (Figure 1), the same logic of comparison used in the tabellone is here applied to the comparison of different tissues, taking into account the different territorial morphologies: ridge, hill, valley floor and half-coastline. The different categories of ground analyzed by Muratori are defined according to the typical reference degree they represent, according to the respective characterization of the constitutive elements. The complex articulation of elements that composes each drawing adds a further layer of comparison and research.

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The comparison is more in-depth, and includes the parameters already taken into account for the study of the city of Venice: from the typological character outlined before Venice, to the historical character of Rome, a new conception of society is reached by summarizing the historical reasoning according to the evolution of the actions of men on the territorial scale.

The territory become the "total conservation records" of human and nature actions. Architecture therefore becomes the interpreting medium through which the traces of territorial changes are read. In this period Muratiori defines his "theory of ridges", and then proceeds on to the elaboration of theoretical models of occupational development, in relation to the Italian territory of valley and flatlands, up to the coastline. The development of this model analyses the territory in its entire history, outlining the phases in which it can be divided for a better understanding of its transformations.

This model is thoroughly applied in the cartography concerning Italy, for a total of 174 drawings.

As Muratori states in *Civiltà e territorio* (Muratori, 1967), Italy is particularly interesting because of its shape and its history, as it offers a wide range of morphological and anthropological conditions. It offers the possibility to define those parameters which are then used for systems wider than societies. Italy becomes the exemplifying territorial element; after Venice and Rome, Muratori uses as central element for his analysis Italy in its entirety: from the tissues to the entire nation, outlining the individual historical characters.

Using the same parameters, Muratori analyses three different societies: Europe, China, and India. These, according to Muratori, will evolve according to an organic-cyclical process of density, distinguished by both a typological structural meaning of space and a functional-evolutional meaning of time.

The processes through which these changes will occur can be analysed through a consideration of the object of the research on wider scales. The local process is inserted in a wider context, taking into account the whole territory. From the point of view of the whole

Figure 3. Index written by Muratori, *Studi per una operante storia del territorio* (Muratori, 1973).

tissue, the dimensional scale is smaller and is conceived as the "individual-environmental historical character". This character, independent from the cyclical phase – expansive or regressive – will remain fixed because it is intrinsic in the identity of the territory itself.

As it can be seen on the *tabelloni* sketched by Muratori (Figure 2) – and subsequently digitalised by Giannini – the same categories are used for both Italy and Europe. The index written by Muratori (Figure 3) for the cartographies further shows how they are all put into a system, both in relation with history and with the representational scale. The typical degrees and the characteristic elements that constitutes the real are involved in the analysis of the societies.

The different levels of analysis of the territory, that denote the complex system of evaluation and comparison use by Muratori through the *tabelloni* created for *Studi per una operante storia del territorio*, are based on the same parameters outlined in the last chapter of *Civiltà e territorio*. Starting from the analysis of the spatial development, the reflections on wider migratory movements of the analysed society is reached, focussing on the balance of the territory and of the civilization phases.

These latest phases emphasize the tendency of man to colonize, and to extend its knowledge to not-yet-discovered territories. The complete knowledge of the emerged lands that characterises the modern era brings a global value to the territory – therefore a finite and closed organism – in an harmonic system. The finitude of the world entails an inevitable change in the concept of evolution of societies, defined as Muratori as an accomplished balance of their constitution, i.e. *messa in orbita avvenuta (orbiting process done)*.

The only written text about Studi per una operante storia del territorio is titled Discorso d'insieme (General considerations) (Figure 4), presumably written by Muratori himself, was found on the back of one drawing draft, and was first published in this paper. In this text all the elements that summarize Muratori's theories are found. Following is a translation of the text:

Figure 4. *Discorso d'insieme (General considerations)* written text, *Studi per una operante storia del territorio* (Muratori, 1973). Source: Biblioteca L. Poletti di Modena, Italy.
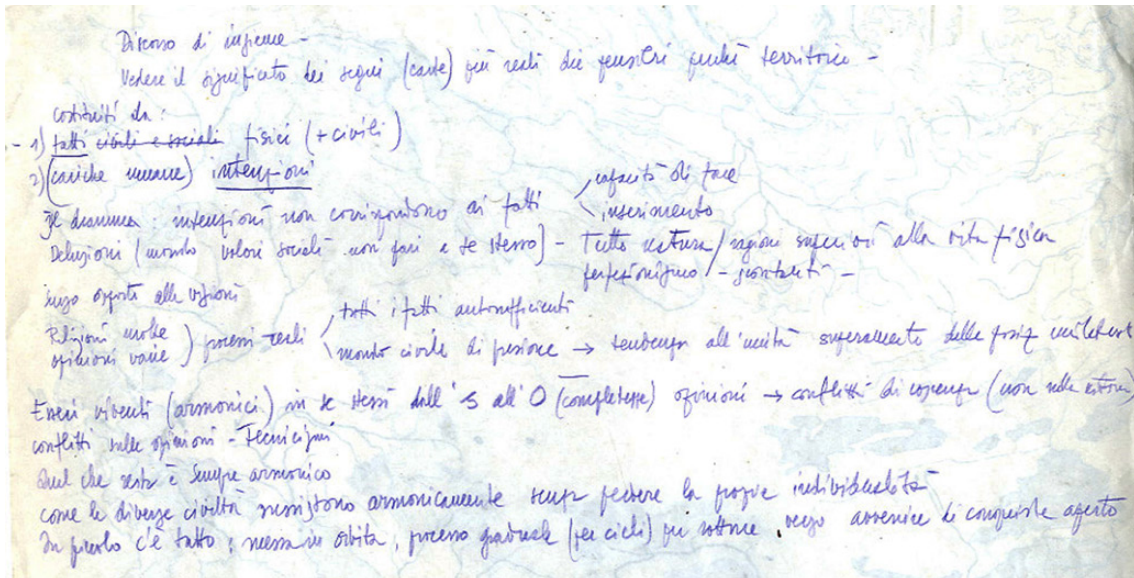
General considerations
To see the meanings of signs (drawings) in to the reality to understand the territory.
It is consistence in:
1) physical (+ civic) facts
2) (human charge) intentions
The tragedy: the human intentions don't coincide with the historical events:
- ability to actualised
- admission
Disappointments (world of social values don't be enough at itself):
world of nature is perfect / conscience higher at the physical life is dissatisfied.
The reason is opposite at the idea:

a lot of religions-   - all the facts are independent
                          -real processes
various opinions-   - the last steps of civil world -> leanings to unit, passing over
unilateral positions

The human beings are harmonious in themselves from "s" to "O" (complex) opinions
-> consciousness conflicts (not in nature)
Conflicts in the opinion - Technical rigidities
All that remains is always harmonious
As though the different civilizations coexist harmonically without losing their individuality.
In the small part there is all: orbiting process, step-by-step process (by cycles), from the break of the cycle to a open future conquest.

Conclusion

As it can be seen in the text above, Muratori compares and puts into a system the different scales of the territory to stress the importance of reading and interpreting the territory itself through a system of categories that is both progressive and open.

Studi per una operante storia del territorio is the attempt, unfortunately left unfinished, to analyse the territory from a explorative point of view, disillusioned from the historical revisionism that can derive from multiple factors such as the religious or the political ones.

It is a reading of the real past, to understand the real present, and to improve the real future. The methodological structure outlines the search for crucial degrees that are used to compare and evaluate the different periods, the different scales and the different territories that are part of the surviving material. The aim is essentially didactical and ethical, as if Muratori wanted to summarize in a more intuitive and direct way the reflections outlined in *Civiltà e territorio*. This is done in order to formulate a reading and an interpretation that can foster an interest in the territory. According to Muratori, man should rediscover the territory to acquire the awareness of his autoconscience, understood here as a civil conscience, undisputed reason of the crisis of our society.

The distinctive trait of Muratori's unfinished book represents a positive and concrete approach, that leaves space for a future vision to overcome the current crisis. The aim is to prime a reconciliation of man with its own moral, through a reunification with nature, given by the rediscovery of its own natural context.

References

Bollati, R., Bollati, S., Marinucci, G. and Muratori, S. (1963) *Studi per una operante storia urbana di Roma* (Centro Studi di Storia Urbanistica, Consiglio Nazionale delle Ricerche, Roma).

Bollati, R., Bollati, S., Marinucci, G. and Muratori, S. (1973) *Studi per una operante storia del territorio*, unpublished book, Biblioteca L.Poletti di Modena, Italy.

Cataldi, G. (1972) *Lezione sull'architettura* (Unedit, Firenze).

Cataldi, G. (1972) *Per una scienza del territorio: studi e note* (Unedit, Firenze).

Cataldi, G. (1983) *Il restauro come "storia operante": contributi e proposte per una scienza della città* (Congresso di Storia dell'Architettura, Roma).

Cataldi, G. (2003) 'From Muratori to Caniggia: the origins and development of the Italian School of design typology', *Urban Morphology* 1, 19-34.

Cataldi, G. (2005) 'Dialectical pairs in urban research: some epistemological issues' *Urban Morphology* 9/1, 46-52.

Cataldi, G. (2005) 'The study of territory and the role of history in applied research in urban morphology', *Urban Morphology* 9/2, 45-53.

Giannini, A. (1983) *La filosofia di Saverio Muratori* (Corso di Pianificazione Territoriale Urbanistica, Università di Genova).

Giannini, A. (1984) *Il progetto complementare (la valutazione di impatto ambientale)* (Corso di Pianificazione Territoriale Urbanistica, Università di Genova).

Giannini, A. (2002) *Leggendo le minute dell'Atlante del territorio di Saverio Muratori*, unpublished book, Biblioteca L.Poletti di Modena, Italy.

Muratori, S. (1955) *Conservazione e Restauri* (Congresso Nazionale di Storia dell'Architettura, Palermo) 3-7.

Muratori, S. (1959) *Studi per una operante storia urbana di Venezia I* (Istituto Poligrafico dello Stato P.V., Roma).

Muratori, S. (1961) 'Il problema critico dell'età gotica - nozione immediata e consapevolezza critica' in Maretto, P. (ed.) *L'edilizia gotica veneziana* (Istituto Poligrafico dello Stato, Roma).

Muratori, S. (1963) *Architettura e Civiltà in crisi* (Centro Studi di Storia Urbanistica, Roma).

Muratori, S. (1967) *Civiltà e territorio*, (Centro studi di storia urbanistica, Roma 1967).

Muratori, S. and Marinucci, G. (ed.) (1976) *Autocoscienza e realtà nella storia delle ecumeni civili*, lezioni 1971-1972 (Centro studi di storia urbanistica, Roma).

Muratori, S. and Marinucci, G. (ed.) (1980) *Storia e critica dell'architettura contemporanea. Disegno storico degli sviluppi architettonici attuali (1944). Saggi di critica e di metodo nello studio dell'architettura (1946)*,(Centro Studi di urbanistica, Roma).

Towards a social-ecological urban morphology: integrating urban form and landscape ecology

Lars Marcus, Meta Berghauser Pont
Chalmers University of Technology, Department of Architecture, SE- 412 96 Gothenburg, Sweden
Keywords: Urban form, landscape ecology, performativity, sustainability, social-ecological urbanism

Abstract

In recent years there has been an increasing interest in the green areas of cites. The reasons are several but generally relate to the urgent need to redirect our cities into more sustainable trajectories. Of special importance here is the shift towards greater emphasis on biodiversity and urban ecosystems rather than climate change and technological systems for energy, waste and transport. This creates new demands for a deeper understanding of the morphology of green areas in cities in their own right as ecological environments and not only by way of park typologies as often traditionally has been the case in urban morphology.

Such spatial morphology of natural landscapes is already a developed field and essential part of landscape ecology (Forman & Godron 1986). However, there is no natural overlap between the two fields of spatial morphology in landscape ecology and urban morphology why they are not naturally integrated to each other. In this paper first steps are taken towards an integrated social–ecological urban morphology based on current developments in each field. The development of such a joint morphology has the aim of informing and supporting research as well as practice in the new endeavour towards functional ecosystems in cities.

More specifically, the aim is to integrate essential concepts in landscape ecology such as patches, matrix and fragmentation (Alberti 2008) with essential variables in urban morphology such as distance, density and diversity. The aim is here also to set this within a framework of network analysis as specifically developed in space syntax (Hillier& Hanson 1984; Hillier 1996). The empirical support will be taken from the point of view of ecosystem services in cities, more particularly pollination (Marcus, Berghauser Pont, Gren 2013).

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Introduction: a shift from socio-technical to socio-ecological urban sustainability

The last decade has produced extensive and convincing proof that the world today is facing environmental threats of an unprecedented scale in human history, which, moreover, concerns environmental issues far beyond the predominant debate on climate change (E.g. Rockström et al., 2009). On top of this we can witness how current global urbanization processes, where two thirds of the world population is expected to live in cities by the year 2030, put acute stress on the ability of urban and ecological systems to support social cohesion and human wellbeing through typical urban services. Together this has moved the future development of our cities centre stage in the debate about new policy in response to these critical issues.

This put unprecedented expectations on the future governance, planning and design of cities, which increasingly – if given the right strategies for their future development – are seen as the means to the solution rather than the root of the problem. This put new demands on urban morphology as a critical knowledge base for urban design to expand its horizons and develop conceptions of urban form that include urban ecosystems, and not only human or social systems, in the understanding of the city and especially how these systems are structured and shaped by the spatial form of cities. However, this asks for deeper integration of the conceptions of spatial form in urban morphology and in urban ecology respectively, which in the latter case highlights developments in landscape ecology.

In this paper first steps are taken towards an integrated social–ecological urban morphology based on current developments in both urban morphology and landscape ecology. Ultimately, the development of such a joint spatial morphology has the aim of informing and supporting research as well as practice in the endeavour of guiding urban systems towards trajectories of greater sustainability.

Landscape ecology and urban morphology: what is mapped?

Essential for such a field, quite obviously, are means whereby one can describe the spatial Most interestingly, we can find something of an equivalent to urban morphology in ecology. In the increasingly important field of landscape ecology (e.g. Forman & Godron, 1986), that concerns the description and explanation of function and change in natural landscapes, one has developed a set of formalised concepts and geometric definitions that describe the spatial patterns of landscapes, that is, a spatial morphology. Landscape ecology is a fairly recent field to develop that materialised first in the 1970:s (McDonnell, 2011, p. 5), in close relation to the progress of urban ecology (Alberti, 2008). In recent decades the field has grown rapidly from its origins in the early 1970:s (McDonnell 2011).

Significant for this rapid growth of urban ecology was the parallel development of landscape ecology. For instance, Marina Alberti, author of one of the central text books in urban ecology, Advances in Urban Ecology (2008), states that: "Landscape ecology is, perhaps, the first consistent effort to study how human action (i.e. changing spatial patterns) influences ecological processes (e.g. fluxes of organisms and materials) in urbanizing environments" (Alberti, 2008, p. xii). This echoes the definition by the early pioneer of the field, Carl Troll, who defined landscape ecology as: "the study of physico-biological relationships that govern the different spatial units of a region" (Forman & Godron, 1986, p.7). In more visual terms Forman and Godron characterise landscape ecology in their portal work Landscape Ecology (1986) by contrasting it to ecology in general, saying that the latter has focused on the 'vertical' relationships among organisms within a relatively homogenous spatial unit, whereas landscape ecology has focused the 'horizontal' relationships between spatial units (Ibid, p. 7).

Patterns of natural landscapes, that is, a spatial morphology. The essential elements of such a morphology have remained quite fixed since Forman and Godron's important synthesis in 1986. They list the essential landscape elements as *patches*, *corridors* and *matrix* (Ibid. p. 23). We may keep in mind that fundamentally landscape ecology is a highly descriptive field with strong roots in geography, why these elements on a primary level simply are geometric descriptions of spatial patterns in the natural landscape. Naturally, such de-

scriptions are in extension intended to support different explanations of landscape dynamics, for instance, the processes that give rise to such spatial patterns, or the opposite, that is, how spatial patterns of this kind structure landscape dynamics. But on a general level, landscape ecological descriptions are mappings of spatial patterns in natural or semi-natural landscapes defined relative to the particular phenomenon under consideration.

In these general terms a 'patch' is in landscape ecology defined as: "a non-linear surface area differing in appearance from its surroundings" (Ibid., p.83); 'corridors' as: "narrow strips of land which differ from the matrix on either side" (Ibid., p.123); and the 'matrix' as: "a surrounding area that has a different species structure and composition" (Ibid., p. 83). It is easy to here identify similarities to central elements in urban morphology, as for instance the elements of the notion *town plan* developed by M.R.G. Conzen, comprising the elements *streets*, *plots* and *block plans of buildings* (Whitehand, 2001). Here 'patch' seems to fit well with the element 'parcel' and in a similar manner 'corridor' with 'street', while the idea of the 'matrix' may seem more alien. This is something noted also within urban ecology, where Alberti suggests that the horizontal structure of ecosystems: "can be represented by patches (the ecological unit) and parcels (the economic unit)" (2005, p. 258). However, while these similarities are intriguing there is need for caution before prematurely integrating the two morphologies; their elements, in many respects, are simply part of different landscape ontologies.

We need to realise that, notwithstanding the similarities in geometric description in landscape ecology and urban morphology respectively, there are important differences in what is represented in this geometry. Essential for the natural landscape, as compared to the urban, is that the natural landscape is made up of *ecosystems*, which typically are a conjunction of living (biotic) entities, that is, animals and plants, and non-living (abiotic) entities, such as water and rock. In a similar sense, we may say that urban systems are constituted, on the one hand, by what we also may call an 'abiotic' dimension, comprising physical, often very large, artefacts, such as infrastructures and buildings, and on the other hand, a 'biotic' dimension dominated by humans and their activities. It then becomes clear how landscape ecology is equally concerned with the biotic and abiotic dimension of landscapes, while urban morphology primarily deal with the 'abiotic' dimension of cities, albeit from a distinctly anthropocentric viewpoint. This primacy of the human perspective is prevalent also when urban morphology deals with green areas. Parks and other forms of urban green are in urban morphology predominantly understood as an aspect of human needs and uses and not as living entities in themselves.

Landscape ecology and urban morphology: What is the scale?

We also have to realise that ecosystems can be identified at different spatial scales; we may actually conceive of the whole biosphere as one great ecosystem at the same time as any fish tank also may constitute an ecosystem. Also, ecosystems typically interlock with each other both within and between scales, why it is impossible to perfectly isolate a particular ecosystem in a landscape. In the end we must remember that ecosystems are human constructions that we define according to particular aims and that they therefore only are possible to delimit in real landscapes under particular conditions. In a strict sense, it would prove immensely complicated to construct a landscape description from the point of view of ecosystems since these overlap and interact in a highly complex manner. Hence, any landscape ecological description must be related to a particular scale and due to the inter-scalar complexity of ecosystems we may conclude that ecosystems is not what generally is mapped in landscape ecology.

Rather we need to turn to what in ecology is called a *biotope*, often used synonymously with the term *habitat*. Ecosystems are structurally supported by such biotopes, that is, areas of uniform environmental conditions that provide places of living for particular sets of plants and animals; examples can be wetlands, salt-water marshes and deserts. Together biotopes build up particular configurations in different landscapes that most often are quite easy to distinguish even by the human eye. When we move through natural landscapes, it is biotopes that make up the typical variations in land cover, plants

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and trees we are prone to pay attention to and from air they play a decisive role in creating typical landscape patterns. Keeping in mind that also biotopes are found at multiple scales, we may conclude that we in the biotope, at least, find one central entity that is typically mapped as patches in landscape ecology.

However, we also need to consider the fact that most natural landscapes are heavily influenced by humans, most distinctly through agriculture, forestry and urbanisation. Therefore many elements in natural landscapes are not really biotopes in a 'natural' sense but highly artificial spatial units maintained by humans, for instance agricultural fields for different crops. From an ecological point of view such 'man-made' biotopes are heavily constrained and rather conceived of as human-induced disturbances similar to how other biotopes may be the effect of natural disturbances, such as fires. Still, from the point of view of landscape ecology, such artificial elements are central in many landscapes and therefore a natural part of a landscape description. By accepting such a broad conception of biotopes that include both 'natural' and humanly induced biotopes, we start to come close to a more general idea about what typically is described as 'patches' in landscape ecology. However, we need to keep in mind that the spatial morphology used in landscape ecology, comprising patches, corridors and matrixes, fundamentally is a set of generic descriptive tools that need to be defined in relation to the particular study at hand, which in extension also implies the need to define the particular scale of each such description.

Landscape ecology and urban morphology: what constitute flows?

Central for the understanding of natural landscapes, moreover, is that there is a great deal of interaction and exchange between different ecosystems in landscapes; animals, pollen, water and many other entities move between them, constituting flows that make up ecosystems on a larger scale, which naturally also are reflected in individual patches. Importantly, what constitute these flows are many different entities where no one has the same primacy for the function of the ecosystem as humans have in urban systems. Such interaction and exchange between patches is a very general phenomenon, where particular instances of such processes are studied under the name *patch dynamics*. The latter typically concerns studies of the process where particular species exploit, develop and abandon patches, creating continuous change to the landscape. Due to this multifaceted exchange between patches the landscape element 'corridors' can, furthermore, not be understood as equivalent to 'streets' in urban morphology, notwithstanding their geometric similarity. 'Corridors' do not have the distinct function of spaces for movement that streets have, even though they do have this role for a limited set of entities, primarily certain groups of animals. Rather 'corridors' are similar to 'patches' in that they primarily constitute biotopes of varying natural origin, however with an elongated geometric shape. Hence, there is a rather loose functional difference between 'corridors' and 'patches', where the difference primarily rather is formal so that we most often may interpret 'corridors' as very long and narrow 'patches'.

Finally, there is the for urban morphology rather mysterious concept of the 'matrix'; a type of element generally not considered in that field. However, for landscape ecology it is essential since in most cases 'patches' and 'corridors' are exceptions in a larger entity typically constituted by a continuous element of similar ecological composition. These exceptions could be the effect of both natural and human-induced causes, for instance, we may find both agricultural or windfall patches within a continuous forest matrix. Hence, the matrix: "plays a dominant role in the functioning of the landscape (i.e. the flows of energy, materials, and species)" (Forman and Godron 1986, p. 159). Naturally the matrix may have very many shapes and sizes and hence also dominate a landscape to different degrees; in certain cases there may not even be possible to identify one. Translating to urban landscapes we may suggest that in a landscape ecological description of a city the matrix would quite naturally be identified with its built forms and hard surfaces, which typically circumvents patches of green areas, such as parks and gardens.

Hence, on a principal level we find the primary aim of landscape ecology to simply be the mapping of spatial patterns, where the connection of such mapping to any

ecological function or theme remains secondary. Naturally, such thematic or functional descriptions is the exact aim of more specific analyses in landscape ecology, why we so far have been speaking about a morphological toolbox that naturally needs to be specified for particular studies. However, similar to what we find in urban morphology, such tools often gain methodological dominance, why we may end up using unsuitable tools for our tasks – we may compare the saying: 'to the one who has a hammer, everything looks like a nail'. We realise, for instance, that the central distinction between patch and corridor in landscape ecology, or street and square in urban morphology, may be irrelevant for many studies. The central point here is to underline that the primary elements in both landscape ecology and urban morphology have their origins in conspicuous spatial forms as such, rather than in any particular function or theme.

Space syntax: network analysis based on a cognitive geometry

Even though what we primarily are looking for here is description and analysis of spatial form or landscape pattern, whether urban or natural, in the end, given the origin of our discussion in the need for progress in sustainable urban development, we aim to relate such description to both urban and ecological systems, as a means to understand how this may help us structure and direct such systems into more sustainable trajectories. Clearly, we then also need to develop a systems understanding of spatial form. For this we turn to space syntax.

Most interestingly, Space Syntax bases its specific form of analysis of spatial form on a cognitive definition of space closely related to the theories of psychologist James Gibson (1986) and especially his concept of affordances (e.g. Hanson 2000). In an article, tellingly called: "*Studying cities to learn about minds*" (2009), Hillier turns the question in cognitive science around, so to speak, and asks: "What can we learn of the human mind by examining its products?" The product he has in mind is the city and he starts with a discussion about distance – arguably the most fundamental of spatial variables. Hillier maintains that we interact with space in cities both through our bodies and through our minds. Hence we need to think of distance in two ways: "in bodily terms the city exist for us as a system of metric distances" (Ibid.), but cognitively we primarily interact with the city through seeing, why: "the city comes to exist for us also as a more or less complex object, with more or less visual steps required to see all parts from all others, and so as a system of visual distances" (Ibid.).

The central contribution to the analysis of such cognitively defined spatial form by space syntax theory is the conception of the 'axial map'[1], which is a network representation of urban space using graph theory, constructed from the point of view of a cognitive subject, here understood as a perceiving and moving human being. The axial map is made up of the least amount of straight lines that cover all accessible open space in the area of analysis, where each straight line (here called 'axial line') in the map represents an urban space that is possible to visually overlook and physically access for a human. Thus, the axial map can be seen as a cognitively defined network representation of all accessible spaces in the area it represents, where different properties are possible to measure, for instance distances.

Distance is furthermore measured topologically as amount of axial lines, why one may argue that what is measured are *cognitive distances* in the axial map. The argument here is that if we make a straight line crooked "we do not add significantly to the energy effort required to move along it, but we do add greatly to the informational effort required" (Hillier, 2003). In other terms, the axial line comprises not only physical distance but also, as it were, cognitive distance. The strength of this approach is empirically supported by a long series of studies over the world demonstrating consistent capacity to predict pedestrian movement, which exactly seems to be due to its ability to represent the urban environment in accordance with human cognition (E.g. Koch et al., 2009; Greene et al., 2012).

[1]There are several developments of this form of representation but we will here keep to the axial map.

Cognitive network analysis of other species than humans

A lot of ground has been covered in space syntax research concerning social systems (e.g. Koch et al, 2009; Greene et al, 2012), which may prove useful also for our current aim to also integrate ecological issues in such research, ultimately integrating ecosystems, at the side of social and economic systems, into approaches to sustainable urban design. Rather than aiming for a complete understanding of the different needs for the many species we find in cities, we may rather, as a primary aim, try to identify basic movement and intelligibility demands set by other species than humans.

Expanding space syntax theory and methodology to comprise also ecosystems in cities is of course a tremendous task and in this paper we only aim at making some hints at how this could be accomplished. Addressing more specifically, the rapidly growing concept of urban ecosystems services (ESS), what we need to address is of course ecosystems in cities that produce such services, for instance, the ESS pollination, which highlights ecosystems critical for pollinators such as different species of bees and bumblebees. As we have seen, ecosystems are complex systems that incorporate all kinds of entities but what we more specifically aim for here are the spatial dimensions of such systems, which according to the argument above, primarily comes down to the distribution and connectivity between different *biotopes*, which geometrically, as we have seen, could be represented as patches. The tricky part is how to represent the connectivity between patches facilitating flows between them.

In simple but rather robust terms, what we deal with are certain sets of patches in cities, representing biotopes of natural, semi-natural and artificial origins, and their spatial connectivity. Such a description is not far from the principal understanding of urban space in general in space syntax, where we typically analyse the configuration of urban spaces as, for instance represented by the axial map, and the connectivity or relative accessibility between these spaces. More specifically, what we are talking about is how urban space in space syntax is represented as a network, using graph theoretical descriptions (Newman, 2010). To represent ecosystems, or rather the distribution of patches in cities as a network is nothing new (see Pascual-Hortal et al 2006; Zetterberg, 2011). However, most such analyses within landscape ecology and urban ecology in general are constructed specifically for ecosystems and do not account for the built form of cities in an adequate manner, whether seen from urban morphology in general or space syntax more specifically.

A critical dimension here is that such models, for instance, the MatrixGreen (Bodin and Zetterberg, 2010), do not deal with distance in a life like manner. Normally, such models represent a system of patches, constituting the vertices in the network, and the links between these as edges in the network. The edges are drawn as straight lines between the patches avoiding only major obstacles, such as large buildings and waters. Clusters of patches are then identified by setting limits to the length of edges based on the range of operation for the particular species under investigation. To this can be added different distance measures, which are calculated as weighted impedance in the network, based on conditions, such as character of terrain or different barriers. Such impedances are naturally often very difficult to estimate.

As we have seen, this problem is directly addressed for humans in space syntax models by the representative technique of axial maps. This technique represents distance in its very geometry in two ways, and has proven to do so in a quite life-like manner (Hillier, 2003). First, by defining urban space as accessible open space primarily defined by buildings (Hillier, 1996), second, by representing such accessible open space with the least amount of straight lines that cover it, where, in principle, these lines comes to represent the least amount of lines of sight and access for a human being. Whether the axial map in this sense can be defined as constituted by a cognitive geometry, as suggested above, can be discussed, but it certainly captures some basic dimensions of the conditions for human perception and as such can be argued to capture certain basic prerequisites for human cognition of urban space.

This is a large discussion that certainly needs to be readdressed in detail if an exten-

sion of space syntax modelling into ecosystems is to be imagined. However, in this paper we only aim to show how this approach, in principle, seems likely to be useful in such an extension. The challenge here is to construct an 'axial map', which we here define as a model of urban space particularly designed for the point of view of human cognition, that instead is designed from the point of view of the cognition of other species; in the case of pollination for instance bees. This needs to concern: first, what patches are to be included in the model, since we need to look for those that include necessary biotopes and together constitute viable habitats for bees; second, the definition of 'axial lines' as distance units relevant for bees, since traditional axial lines not necessarily are adequate for bees, they may not even be lines; and third, the reach of the analysis given the range of operation for particular species, for instance, bees. To this comes also a need for a deeper analysis of particular substrates of the ground that here will play a critical role in facilitating movement of different species.

While this might sound complicated, we need to remember how urban systems already are complex and that humans through history have seemed able to cope with this complexity through rather simple but sophisticated spatial solutions. As far as ecosystems goes, we might also note that these used to be a natural part of cities, often carefully maintained by humans, for instance, in urban agricultures of different kinds throughout history. Also, we do not imagine a future urban design that specifically deals with spatial forms specific for every species, but rather representative key species or species groups that can work as generic demands for design.

Conclusion: towards a joint social-ecological morphology

Above we have made some comparisons and suggestions concerning the similarities and differences between the spatial morphologies found in landscape ecology and urban morphology, including also space syntax, in the aim to prepare the ground for an integration of urban ecosystems in the practices of urban planning and design. Critical for these practices is a deep understanding of spatial form as defined by buildings and landscaping in cities, since this constitutes the central medium whereby urban process can be structured and directed by these practices. Essential here is to capture the flows in such urban social-ecological systems, since it is through interaction and exchange that these systems derive their dynamics. The physical structure and spatial form of cities here can play a critical part in directing such dynamics towards sustainable trajectories, why to further investigate and understand how to integrate ecosystems into a joint spatial morphology of cities seems an urgent challenge.

References

Alberti, M. (2008) *Advances in Urban Ecology: Integrating Humans and Ecological Processes in Urban Ecosystems* (Springer, New York).
Bodin, Ö. and Zetterberg, A. (2010) *MatrixGreen v 1.6.4 User´s Manual: Landscape Ecological Network Analysis Tool* (www.matrixgreen.org) (Stockholm Resilience Centre and KTH Royal Institute of Technology).
Forman, R. and Godron, M. (1986) *Landscape Ecology* (Wiley & Sons, New York).
Gibson, J. J. (1986), *The ecological approach to visual perception* (Psychology Press, New York, NY).
Hanson, J. (2000) 'Urban transformations: a history of design ideas', *Urban Design International*, Vol. 5, Nr. 2, 97-122.
Greene, M, Reyes, J and Castro, A (Eds.) (2012) *Proceedings of the 7th International Space Syntax Symposium*, (Pontefica Universidad Catholica de Chile).
Hillier, B. and Hanson, J. (1984) *Social Logic of Space* (Cambridge University Press, Cambridge).
Hillier, B. (1996) *Space is the Machine* (Cambridge University Press, Cambridge).
Hillier, B. (2003) 'The Architectures of seeing and going: Or, are Cities Shaped by Bodies or Minds? And is there a Syntax of Spatial Cognition?' in *Proceedings of the 4th International*

Symposium in Space Syntax (University College London, London) 1-34.

Hillier, B. (2009) 'Studying cities to learn about minds: some possible implications of space syntax for spatial cognition', *Environment and Planning B* 39, 12-32.

Koch D., Marcus L., Steen J. (Eds.) (2009) *Proceedings of the 7th International Space Syntax Symposium*, Trita-Ark-Research publication 2009:1 (KTH, Stockholm).

Marcus, L., Balfors, B. and Haas, T. (2013) 'A Sustainable Urban Fabric', in Metzger, J. and Olsson, A. (Eds.) *Sustainable Stockholm* (Routledge, London).

Marcus, L., Berghauser Pont, M. and Gren, Å. (2014) 'Can spatial form support urban ecosystem services: Developing descriptions and measures to capture the spatial demands for pollination using the framework of space syntax', *ITU A/Z*, vol. 11, nr. 2, 255-270.

McDonnell, M. (2011) 'The history of urban ecology – an ecologist's perspective', in Niemelä, J. (Ed.), *Urban Ecology: patterns, processes, and applications* (Oxford University Press, Oxford).

Newman, M. E. J. (2010) *Networks: An Introduction* (Oxford University Press, Oxford).

Pascual-Hortal, L. and Saura. S. (2006) 'Comparison and development of new graph-based landscape connectivity indices: towards the priorization of habitat patches and corridors for conservation', *Landscape Ecology* 21, 959–967.

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F.S., Lambin, E.F., Lenton, T.F., Scheffer, M., Folke, C., Schellnhuber, H.C., Nykvist, B., de Wit, C.A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P.K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R.W., Fabry, V.J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P., and Foley, J.A. (2009) 'A safe operating space for humanity', *Nature* 461, 472-475.

Whitehand, J. (2001) 'British urban morphology: the Conzenian tradition', *Urban Morphology* 5(2), 103-109.

Zetterberg, A. (2011) *Connecting the dots: Network analysis, landscape ecology, and practical application*, Trita-LWR. PhD (KTH, Stockholm).

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Socio-spatial transformations in the tourist coastal region of Ecuador: new ways of life, new urban forms

Ricardo Pozo
PhD candidate ARUS Program, Department of Geography, University of Duisburg-Essen
Schützenbahn 70, 45127 Essen, Germany.
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Abstract

The tourism industry has been one of the most profitable and growing sectors in the global market during the last 5 decades. Particularly, since the late 80s the global promotion of nature conservation and the expansion of transoceanic transportation and communication increased progressively the demand of ecotourism and the search of new 'pristine' landscapes to visit. Likewise, developing countries with high levels of biodiversity found on this demand a new market niche to globally compete for catching foreign currencies and to locally trigger economic and social development at vulnerable regions. Nevertheless, development did not arrive as originally was expected and new shapes of dichotomous and unequal landscapes emerged.

The main objective of this study is to understand the nature of the socio-spatial transformations related with international tourism along the coastal region of Ecuador. The case study is the fishing and tourist town of Puerto Lopez. By the use of GIS technology and townscape analysis, the research aims to identify and characterise the new types of urban forms that emerged in Puerto Lopez since the arrival of domestic and international tourism.

It aims to contribute to the regional and urban planning of these types of regions that are strategic for the global resilience in the 21st century. The content of this paper corresponds to the first descriptive part of the doctoral research titled 'Socio-spatial transformations in the central coast of Ecuador by the influence of the globalized tourism: the case of Puerto Lopez, 1990 -2010', which is currently developed by the author in the Institute of Geography of the Duisburg-Essen university.

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Introduction

Global tourism has been one of the most dynamic and growing economic sectors for the last 50 years[1]. With a proved capacity of resilience against economic crisis and a positive prediction of growth for the first half of the 21st century (UN-WTO, 2013), this old but healthy market has produced positive and negative impacts on territories where it has landed. Nevertheless, the nature of the social and spatial transformations of settlements in rural areas of developing countries has been less studied, even minimized.

Based on the transformationalist approach of globalisation (Murray, 2006), the study attempts to understand the nature of the socio-spatial transformations experienced for the last 20 years by tourist coastal regions with high levels of biodiversity and social vulnerability in developing countries of Latin America. It aims to contribute to the regional and urban planning of these types of regions, which are strategic as 'biodiversity hotspots' for the improvement of global resilience in the 21st century. The case of study is the fishing and tourist town of Puerto Lopez, which is localized at the central coastal region of Ecuador, South America.

By the use of GIS technology and townscape analysis, six new urban forms were identified and characterised in Puerto Lopez. They have emerged since the consolidation of tourism as one of the main economic activities. The hypothesis is that a dichotomy of development has spread within this region. The new vision of international tourism as a 'panacea' to achieve development created two new dichotomous and unequal tourism landscapes which coexist and collide at the same territory.

Methodology

The research is a quantitative-qualitative, historic-descriptive and explanatory study, which seeks to understand and discuss the nature of the socio-spatial transformations experienced by the town of Puerto Lopez during the last 20 years. The methodology is based on the 'transformationalist' approach of globalisation, which understands it as a human created phenomenon that has the capacity to transform the social and physical space of settlements, but that also can be guided by local public and private agents (Murray, 2006).

These transformations are related with the change of the regional economic geography by the influence of globalisation (in this case globalised tourism) (Swyngedouw, 2004). In rural communities of the developing world, the new urban ways of life provoke the emerging of new urban growth patterns and, consequently, new urban forms.

Townscape analysis (Kropf, 2014) was applied as a method to identify and classify the new urban forms. The objective was to observe and characterise the sustainability of the urban growth, in its most disaggregated form, in order to generate the material to fuel the scientific discussion suggested by the research question of this study.

The criterion to identify the urban forms was based on the basic townscape elements defined by M.R.G. Conzen (1968): "the town plan (within which the other two were largely constrained), the land-use unites and the built form" (Gregory, 2009, p. 764). By the use of GIS technology, changes in the land-use and built form were identified for the period of rapid urban growth 1990 – 2010. Additionally, socio-economic statistical information of the National Census (1990, 2001 and 2010) was mapped and overlapped to complement a whole characterisation.

The selected elements to describe the built form in the study were: streets, plot series/blocks, plots and buildings (Conzen, 2004). In contrast to the methodology developed by Caniggia and Maffey, other elements like 'pertinent strips, rooms, structured and materials' (Kropf, 2014, p. 46) were not included due to the lack of information. Nevertheless, features about quality of the buildings (in term of construction materials, construction systems and vulnerability) were included in the doctoral research.

[1]According to the World Tourism Organization (UN-WTO, 2013) the global tourism industry produced in 2012 alone 6 billion international tourists, 9% of the global GDP, 1.3 trillion US dollars in exports, 6% of world's trade and 6% of exports of least developed countries; one of every 11 jobs in the world is directly and indirectly related to the tourism market (UN-WTO, 2013).

RUTA DEL SPONDYLUS (Guayaquil - Manta)

Forming process

Puerto Lopez: from a pre-Hispanic settlement to an ecotourism destiny

Puerto Lopez is a fishing town localized in the Ecuadorian central coastal region and it is also one of the most important tourist destinations along the E15 or Spondylus route. With 9.854 inhabitants and approximately 384.46 hectares of urban surface (INEC, 2010) it is the capital city of the canton. Puerto Lopez has been identified as an ecotourism destiny due to the fact that around 80% of its cantonal surface is occupied by a natural reserve, the Machalilla national park (MINTUR, 2007).

In 2010, 90.14% of its urban population still lives in poverty, 32.47% of occupied houses does not have the minimal habitability conditions, only 60.42% has potable piped water, and just 15.16% of the occupied population (with the age for working 15-65) is working and covered by public or private health insurance (INEC, 2010) (Figure 1).

Despite of the fact that Puerto Lopez is not a colonial-founded settlement, there are several thousand years of history under its current location. It is settled over the ancient pre-Hispanic city of *Cercapez*, which was an important administrative, ceremonial and

Figure 2. Phases of urban growth of Puerto Lopez. Elaborated by: Ricardo Pozo, 2014.
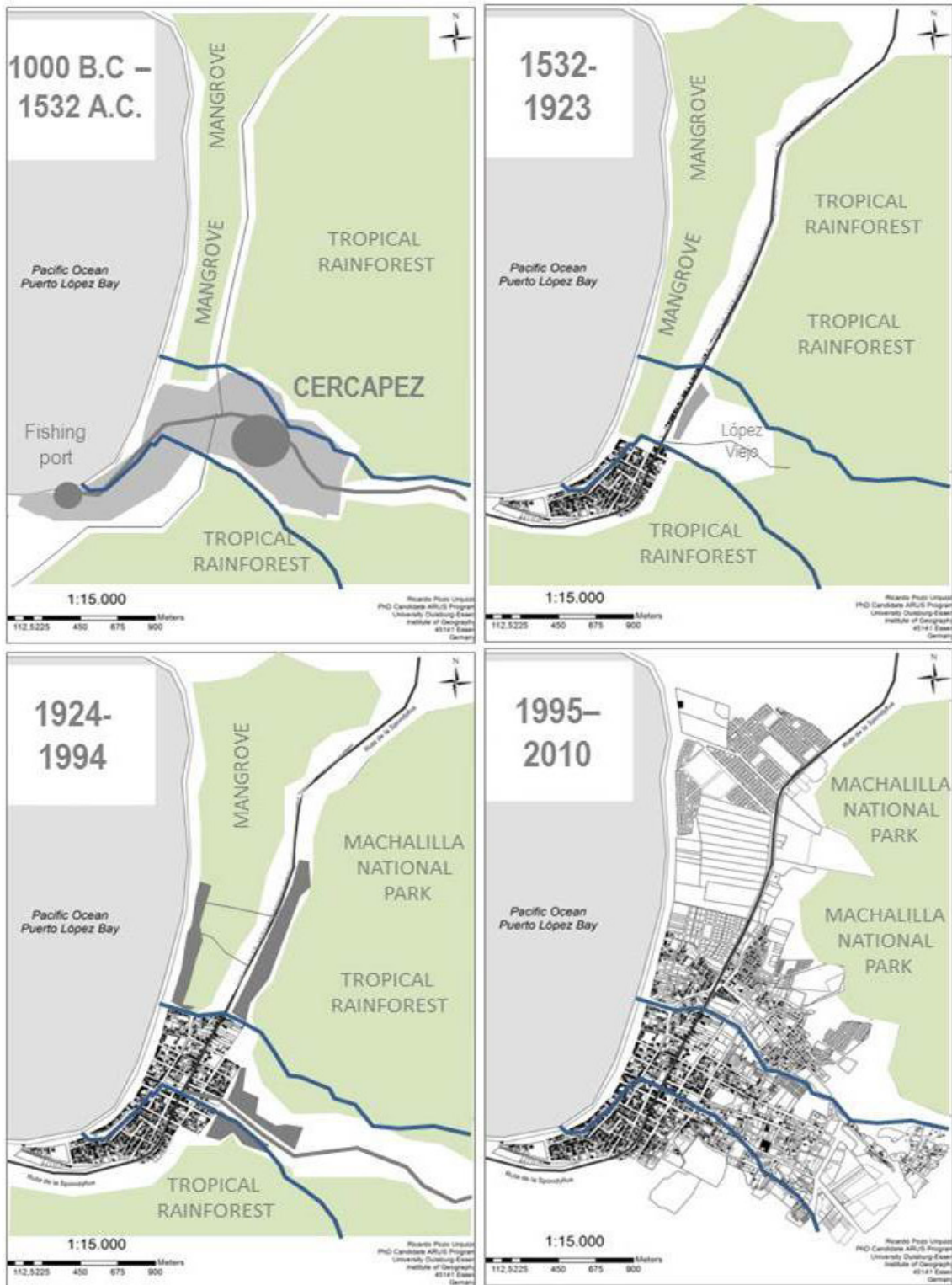
commercial urban centre from the *Manteña* and *Engoroy* cultures around three thousand years ago (Lunniss, 2014).

The identified patterns of urban growth of Puerto Lopez can be grouped on four main periods (Figure 2):

city as organism | new visions for urban life

• Pre-Hispanic port city (1000 B.C.-1532 A.C). Cercapez was an important religious and commercial port city from the pre-Hispanic cultures Manteña and Engoroy.
• Fishing village (1532 -1923). Fishing and agricultural production for local consumption. 'La Ensenada' was a small fishing village during the colonial phase and part of the republican period.
• Fishing town (1924 - 1994). Local economy was based on artisanal fishing. Puerto Lopez was a fishing town and *parroquia* of the Jipijapa canton.
• Ecotourism town (1995 - 2010). Ecotourism town and regional fishing port. Puerto Lopez was declared the capital of the canton and began the development of the local ecotourism industry.

According to the historical chronicles from the first Spaniard explorers, who arrived to the Ecuadorian central coast in the 1530s, the city of Cercapez was an important urban centre and commercial port of a well-structured settlements system from sedentary tribes. Archaeological studies developed in the 1970s, found evidence that Cercapez was an important commercial port and religious centre from the Manteña (800 – 1532 AC) and Engoroy (900 – 1000 BC) pre-Hispanic tribes (Lunniss, 2014).

For the colonial period (1532-1809), once Cercapez was abandoned by natives, a small fishing village settled at the southern part of the beach. It was named as 'La Ensenada', which in Spanish means the 'inlet of sea'. The first inhabitants of La Ensenada were fishermen and farmers who produced mainly for local consumption. The accessibility to this village was extremely difficult by overland transport, specially during the rainy season. Because of its condition as a rural settlement, the parcels were large, irregular and dispersed mainly along the beach.

The architecture and construction materials did not experience significant changes. The natural environment and the tropical climate influenced the new inhabitants to repeat the same construction methods and materials from the pre-Hispanic cultures. The use of wood and bamboo as structural materials, combined with stone-wall foundations and wood piles or 'palafitos', was reproduced along the coastal region with minimal technical variations (Sainz & Camino, 2014).

In 1923, La Ensenada changed its name to 'Daniel López' or Puerto Lopez, and was officially designated as a parish of the Jipijapa canton. This new designation meant its consideration as a town with an important quantity of population and concentration of economic activities. Due to the abundance of marine resources, artisanal fishing grew progressively during the second half of the 20th century.

By the construction of roads, terrestrial connectivity with other cities was improved. However, it was not until 1974 that the first regional bus arrived to Puerto Lopez. New commerce networks related with marine products were built and extended to the regional and national level. Fishing merchants arrived to buy fresh seafood directly at the beach in order to transport and sell it in regional wholesale markets.

In 1979 the Machalilla national park was officially created and demarcated as a national reserve (55.000 hectares). At the end of the 1990s, its name began to appear in the list of Ecuadorian tourist destinations. Afterwards, when the E15 (or Spondylus route) was improved and extended in 2008, domestic and international tourism flows began to spread along the coastline.

In 2012, Puerto Lopez was designated by the national government as the first pilot project of the ATP program (tourist protected areas), which meant direct public investment on tourist infrastructure and planning. Nowadays, Puerto Lopez is internationally promoted as one of the most important ecotourism destinations in Ecuador (MINTUR, 2007).

New ways of life, new urban forms

Over the past decade, the construction of private and public tourist infrastructure climbed exponentially along the Spondylus route (MINTUR, 2007). New tourist resorts, hotels, guesthouses, restaurants and other complementary services have been deployed in towns like Puerto Lopez. Likewise, local governments focused their urban planning visions on the development of tourism by the construction and improvement of tourist infrastructure.

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In the case of Puerto Lopez, the appreciation of land in downtown and along the beach, in addition to the demand of new affordable land for formal and informal housing, triggered the emerging of six new urban forms (Figure 3).

Parcelling and densification in downtown (1)

The first transformations began in the downtown, which usually is the most consolidated or 'urbanized' built space inside coastal villages and towns like Puerto Lopez. As it was mentioned before, Puerto Lopez was not a colonial-founded settlement. Its original, or pre-tourism urban structure, was not the consequence of an urban planning process with a strategic organization. It was a small fishing village, localized at the southern part of the beach, which began to expand spontaneously by the progressive settling of fishing and farmer families. With the passage of time, an urban core was informally developed by the concentration of the main economic, civic, religious and social activities.

Contrary to the pre-Hispanic settling practices, which probably would not consider this location as the best place for settling a permanent town or city (due to high exposure to floods, high-tides, and tsunamis), the flat area near the coastline were the first built space to increase its land value when tourism arrived. Blocks localized in the downtown and along the beach and the Spondylus route, experienced the parcelling of larger plots, the increase of mix land use (residential and retail), and the rise of population density. The appreciation of the land triggered the emerging of a new local housing market, whose dynamic was impossible to be addressed by the weak urban planning and the widespread informality.

The rise of tourist activities attracted the attention from local families and plot owners as a possibility to improve their incomes. Some of them decided to sell all or part of their parcels or plots to foreign investors. Others divided them in several pieces in order to diversify the functions and activities.

These changes, in the internal use of plots and their parcelling in several irregular shapes by old and new owners, produced an intensive process of internal spatial fragmentation and vertical growth inside blocks. The most important impacts on built and natural environment were: growth of population density, increase of low-quality self-constructed vertical growth, decrease of green areas, saturation of basic services, disorder in the land use mixture, increase of informal economic activities, boost of traffic, destruction of archaeological remains, soil pollution by latrines, and the rise of exposure to natural disasters.

Densification in the 'fringe-belt' (2 and 3)

Complementary to the densification and parcelling of the downtown, a residential 'fringe-belt' was shaped around it. The majority is composed by new built urban space, which grew rapidly formally and informally. With the course of time it was progressively legalized by the local government. Nevertheless, this urban dynamic fuelled the accelerated urban growth and expansion of other new neighbourhoods or '*cooperativas*' to the hilly eastern side of the Spondylus route.

Likewise, the use of construction materials imported from large cities shaped the urban image. Wood and bamboo was replaced by cement, brick walls, and zinc roofs. For domestic tourists, who come from coastal cities like Guayaquil or Manta, it is difficult to find physical differences between these neighbourhoods and some slums of the Ecuadorian coastal cities.

Formal social housing (4)

The rapid response of the national and local governments to informal housing was the construction of a low-income housing project at the peripheries. The oil-based budget gave again to the Ecuadorian president and local mayors the financial capacity of building formal social housing and at the same time earning votes for the next popular election.

Relocating low-income families from risky areas to decent houses meant adding popularity and rising politic power by dependency. The change from informality to formality is not easy for low-income migrant families due to the acquisition of new payment responsibilities like piped water, electricity, security and municipal taxes. In a fluctuant informal job market, where labour is not controlled and the workplaces are not guaranteed, formal housing could represent a problem more than a support.

Figure 3. New urban forms in Puerto Lopez (1990-2010). Elaborated by: Ricardo Pozo, 2014.
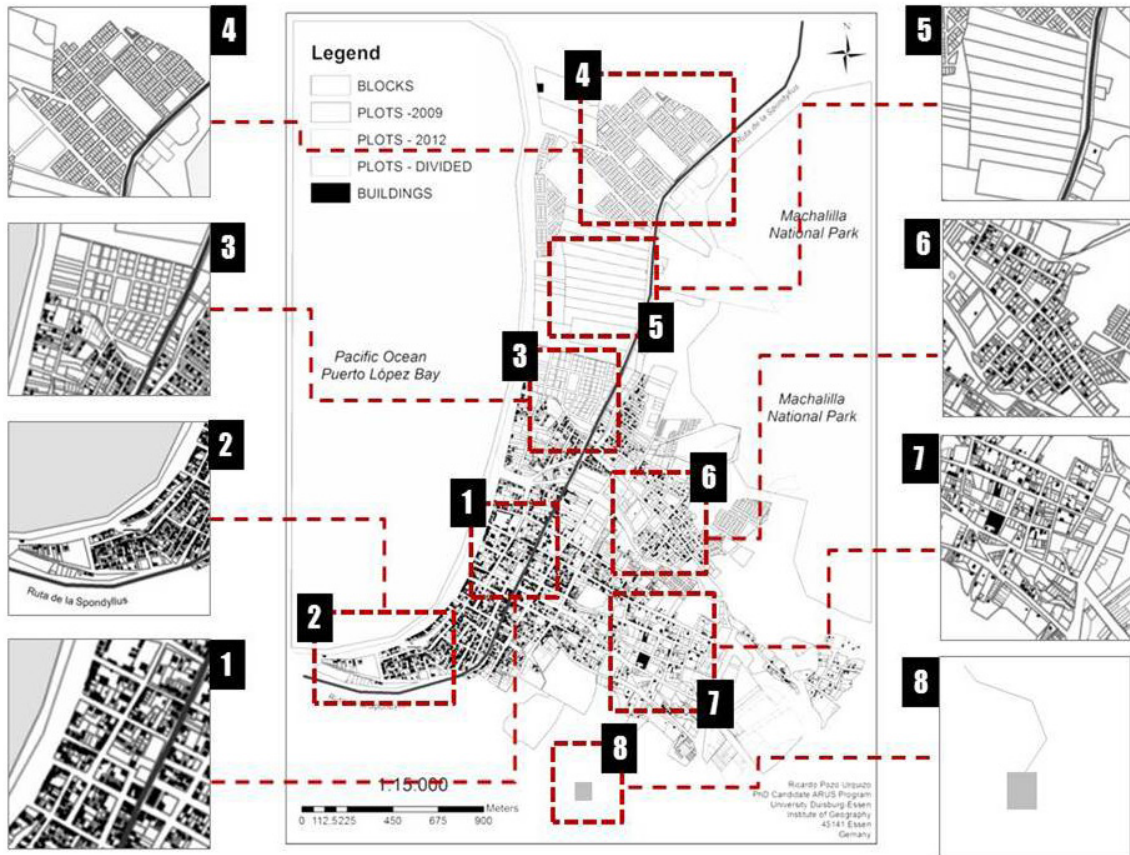
Another point to discuss is the quality of this new built environment. Despite of the decrease of the levels of exposure to natural disasters, usually the governmental social housing offer is not the best in terms of architectural design (functionality), thermal comfort, energy efficiency, and urban image. The models of houses are 'copied and pasted' from cities to rural areas without any technical consideration about the local environment, ways of life and identity.

Gated communities (outside of the urban area)
On the other hand, housing markets from Guayaquil and Quito planned and constructed second-home residential projects in association with foreign capital or financed by governmental loans. The demand of security and basic opulence in residential projects in metropolis was 'copied and pasted' on this tourist rural-urban context. New gated communities were erected in the best lands with direct accessibility to the beach and roads. In the majority of cases, they offer independency of municipal basic services, green areas, swimming pools and high standards of comfort and technology.

There was also identified an offer of gated communities for middle-income families, who have financial accessibility to housing loans or retirement funds. In this case, the investor promotes and sells the majority of the project before construction. Other housing projects just sell the plots inside the gated community and the future owners build progressively their houses. Usually, in middle-income gated communities the quantity and quality of public space and green areas are reduced in order to achieve the maximum profit of selling plots.

Finally, a new type of residential project was identified: the residential 'eco-communities' for foreign retirees. With the support of the international branding promoted by the national government and the expansion of networks between foreign and local agents,

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the Spondylus coastal region has been publicized as a natural, quiet and non-expensive paradise to retire in American and European markets.

Resort hotels, hostels and 'hosterias' (5 and 8)
Elites from Quito and Guayaquil, in association with foreign investors, found on this profitable market the opportunity to reproduce capital. New tourist entrepreneurships were constructed at the peripheries of the most visited coastal towns. Besides the amazing natural landscapes and the rustic ways of life in fishing villages, the flexibility of local governments and the low prices of land were shiny 'landing lights' which attracted flows of foreign investors.

Land disputes between natives and new owners began to be a common situation along the Spondylus route. Social and political powers were decisive arguments to impose the vision of tourism as the cornerstone for development over communal interests.

The 'ecotourism boom' (2008-2014) shaped the new private tourist infrastructure offer. Many hotels, hostels, rustic bungalows or 'hosterias' and green lodges have been erected along the Spondylus route. This offer was mainly oriented for international tourists, who have strongest spending power and high quality of requirements.

Informal low-income housing (6 and 7)
As a pattern of urban growth, the informal low-income housing has been dominating the urban expansion of Puerto Lopez for the last decade. The weak urban planning and the intensive demand of affordable land, have been contributing to the rapid and uncontrolled urban growth. The quality of built space and the quality of life inside these new neighbourhoods have been clearly unsustainable. In addition, the high levels of exposure and vulnerability experienced by low-income families have contributed significantly to the decrease of resilience in the entire town.

The largest areas of informal low-income housing in Puerto Lopez have settled at the eastern hilly lands. They have been legalized by the local government and provided with basic services and infrastructure. This mechanic of informal-formal urban growth is not new at peripheries from Ecuadorian cities. Basically, is the way how many politicians have taken advantage of the massive demand of land by poor rural families, who migrated to urban areas looking for better jobs and opportunities. In the view of politicians, these masses of low-skilled and poor people mean votes. So, they directly or indirectly do not obstruct the occupation of land and provide progressively 'drop by drop' basic services.

Conclusion

Since the arrival of domestic and international tourism, Puerto Lopez experienced accelerated and uncontrolled social and spatial transformations, which nowadays shape its urban growth. The change of the economic geography of the central coastal region influenced the ways of life from families (natives and new inhabitants) and, therefore, changed the built environment.

Particularly, for the last decade (2001-2010) the transformations were intensified due to the popularization of ecotourism as a 'panacea' for achieving social and economic development. The main outcomes of the analysis contribute to support the hypothesis which argues that globalisation has the capacity to transform territories by the generation of social and spatial fragmentation in urban areas. The main characteristics are the increase of social inequality and the emerging of new urban forms (De Mattos, 2010).

The disaggregated analysis of the urban growth experienced by Puerto Lopez, allows understanding the effects of the progressive incorporation of this town in the globalized tourism market without a strong local planning. There are two extreme dichotomous patterns of urban growth which express physically the increase of social inequality: informal housing and private tourist infrastructure. Both are consequences of the consolidation of tourism as the main economic activity, even as a monoculture. Both contribute intensively to the decrease of sustainability, the increase of inequality and dependency, and subsequently the decline of resilience of the entire urban system.
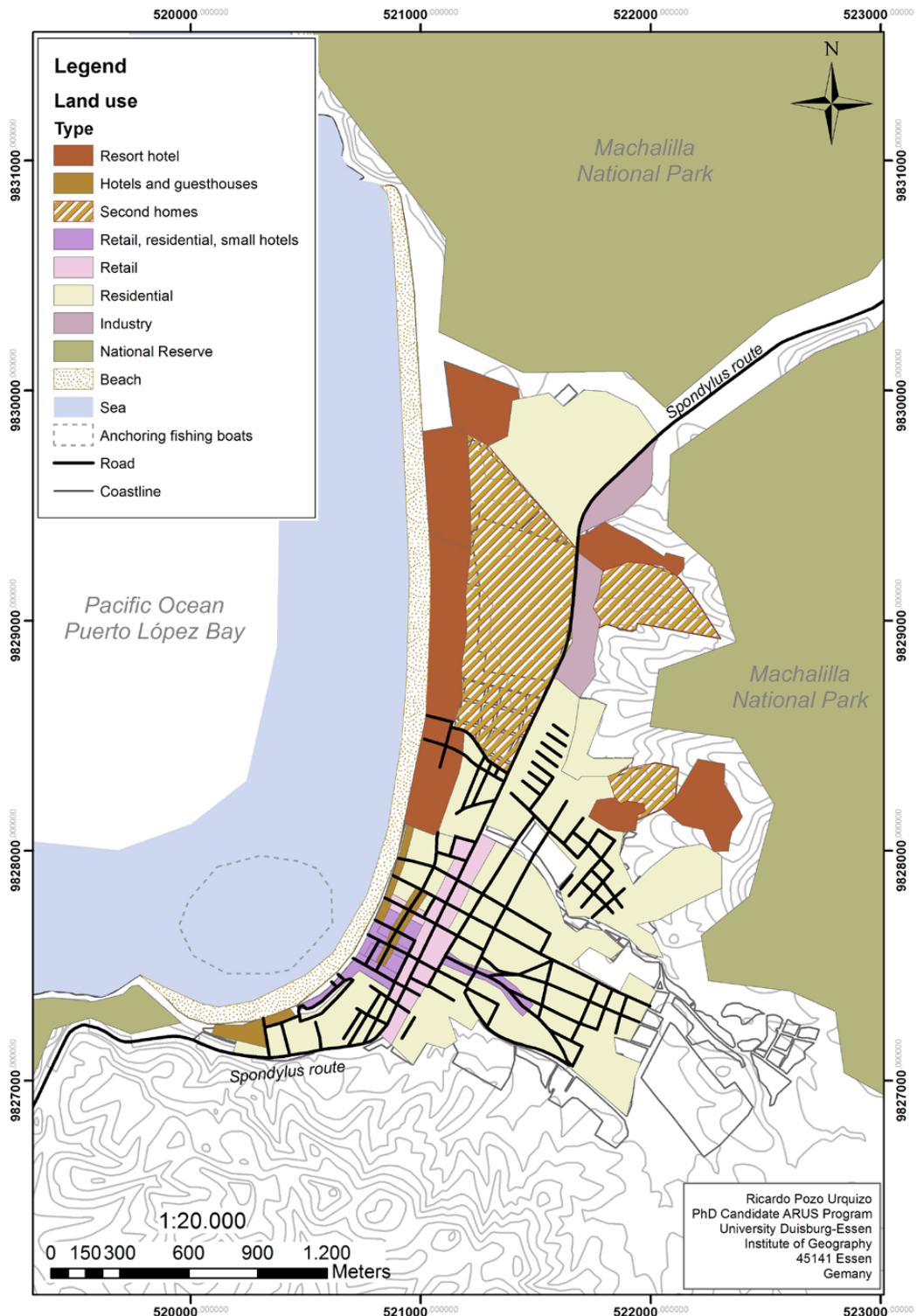
On the one hand, the overconsumption of water and energy demanded by hotels and resorts, in addition to the high levels of CO_2 emissions, impact directly to the natural and built environment. The popularized vision of ecotourism as a panacea for development in public institutions supports the relaxation of laws concerning the impacts on the natural environment, informal employment and local economy.

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On the other hand, the deficient quality of construction in low-income housing triggers the exposure to natural disasters and undermines the possibilities of a resilient urban growth. The extreme levels of poverty and vulnerability of rural coastal regions along the Spondylus route fuelled the progressive consolidation of tourism as the main economic activity in fishing towns like Puerto Lopez. The traditional informality in the rural labour market supported the expansion of several economic activities related directly and indirectly with tourism. The number of persons working formally and informally in diverse links of the tourism market chain grew rapidly. At the same time, the traditional primary economic activities like fishing and farming registered a decrease of workers.

Puerto Lopez changed, from a traditional source of rural-urban migration into a new receptor of rural-rural migration flows. Additionally, the quantity of occupied and salaried workers increased despite of the traditional tendency of high percentages of unemployed persons in rural areas. However, the percentages of families living in poverty and extreme poverty did not change significantly. Rapid urbanization brought the increase of social inequality and the rise of vulnerability. Specifically, the low-income urban growth localized at the eastern area concentrates the highest index of poverty, vulnerability and exposure to natural disasters.

References

Barton, J., Pozo, R., Román, Á. and Salazar, A. (2013) 'Reestructuración urbana de un territorio glocalizado: una caracterización del crecimiento orgánico en las ciudades de Chiloé, 1979-2008', *Revista de Geografía Norte Grande*, 121-142.
Britton, S. (1982) 'The political economy of tourism in the third world', *Annuals of tourism research* 9, 331-358.
Conzen, M. R. G. (1968) 'The use of town plans in the study of urban history', in Dyos, H. J. (ed.) *The study of urban history* (Edward Arnold, London), 113-30.
Conzen, M. R. G. and Conzen, M. P. (2004) *Thinking about urban form: papers on urban morphology 1932-1998* (Lang, Oxford).
Dicken, P. (2011) *Global Shift: Mapping the changing contours of the world economy* (The Guilford Press, New York).
De Mattos, C. (2010) *Globalización y metamorfosis urbana en América Latina* (OLACCHI, Quito).
Gregory, D. and Johnston R. J. (2009) *The dictionary of human geography* (Wiley-Blackwell, Malden).
Kay, C. (2008) 'Reflections on Latin American rural studies in the neoliberal globalisation period: a new rurality?', *Development and Change*, 915-943.
Kropf, K. (2014) 'Ambiguity in the definition of built form', *Urban Morphology. Journal of the International Seminar on Urban Form* 18/1, 41-57.
Lunniss, R. (2014) 'Los paisajes sagrados precolombinos de Manabí', *Memoria de la Jornada Académica Internacional de Turismo y Patrimonio ESPAM*, 70-75.
MINTUR (2007) *Plandetur 2020* (MINTUR, Quito).
Murray, W. (2006) *Geographies of Globalisation* (Routledge, New York).
Pozo, R., Huerta, R., Neira, F., and Valencia, D. (2014) 'Lineamientos estratégicos para el desarrollo territorial sostenible del cantón Puerto Lopez', *Revista AUC* 34, 49-74.
Sainz, J., and Camino, M. (2014) *Hábitat social digno, sostenible y seguro en Manta, Manabí, Ecuador* (AECID, Valladolid).
Swyngedouw, E. (2004) 'Globalisation or 'glocalisation'? Networks, territories and rescaling', *Cambridge Review of International Affairs*, 17, 25-48.
UN-WTO (2012) *Tourism in the Green Economy - Background Report* (UN-WTO, Madrid).
UN-WTO (2013) *Annual report 2012* (UN-WTO, Madrid).
Wheeler, S. (2008) 'The Evolution of Built Landscapes in Metropolitan Regions', *Journal of Planning Education and Research*, 400 - 416.
Williams, S. (2009) *Tourism Geography. A new synthesis* (Routledge, New York).

'La Plata' River (Buenos Aires, Argentina): traces and new territories

Viviana Colella

Academic affiliation: Instituto del Conurbano. Universidad Nacional de General Sarmiento, J. M. Gutierrez 1150. Los Polvorines. Buenos Aires. Argentina.

Keywords: urban transformations, persistences, La Plata River

Abstract

In the past two decades, streets, plots and blocks were replaced by networks of highways, large homogenous enclaves, new uses and typologies, shaping a new kind of city growth. These urban transformations produce new scenarios, new challenges to urban planners.

On the one hand, we need to recover the organicity of the traditional city but in a context of new land uses, forms and ways of inhabiting the territory. So, we propose to re-cover the persistences, the "cultural matrix", the "DNA" of the territory; those traces that give cultural and morphological continuity within the changes. (Sola-Morales i Rubio, 1997; Font, Llop and Villanova, 1999; Sabate, 2004)

On the other hand, behind a so-called fragmented territory, through the identification of land uses, socioeconomic variables and fluxes, the reading of the city as a primary source allows introducing more complexity to the processes of urban production. In this regard, we would retrieve the different disciplinary concepts and tools, that would allow debating the socio-economic logic, the uses and experiences of the city and its urban landscape.

In this context, this paper focuses on the area of the northern riverbank of Metropolitan Area of Buenos Aires, Argentina, historically characterized by a mix of land uses, typologies and plots forms that became the scene of a transformation process that has homogenized and fragmented it. We attempt to outline the morphological changes and persistences of these fringe territories and their impact on the transformation of the last two decades.

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What is at stake in the recent urban transformation processes

Over the past two decades some metropolitan areas suffered great spatial transformations because of an adaptation to new uses related to changes in production, distribution and consumption processes, on one side, and on the other, because of a growing tendency to individualism which produces a displacement of a social life to another more private.These changes of the metropolitan areas were based on transformations of the elements of urban morphology. Many studies report that streets, lots and blocks were replaced by networks of highways, large homogenous enclaves, new uses and building types, shaping a new kind of city growth. In this paper we are interested in working on these new urban forms and their production processes from three issues.

Firstly, the new urban forms are not just the result of new logic on an empty territory, but there are interrelationships among these new dynamics and the existing local particularities. It is true that in recent decades the urban form has been largely transformed by global dynamics. However, as Dematteis (2006) was suggesting, current territories are result both of vertical and horizontal dynamics, as their own existing specificities and global dynamics. The research of territorial changes emphasize on changes, however, looking at the metropolitan cities we can see that there are areas that changed while others were preserved; and also those that did change, did it in several ways and with different impacts. We wonder if some of the existing features were conditioned by the territory ability to resist changes.

Secondly, the study of territory from these two issues: changes and "persistences", can´t be limited exclusively to spatial form. The recent metropolitan changes shift from urban to territorial issues, with new regional infrastructure and new types of residential, commercial and service land uses. At the same time, the existing city changes reveal transformations not only in the private areas (plots) but also in large areas and public spaces (streets, parks, riverbanks, central areas) (Ryan, 2005) These changes in urban forms impact on social practices, on decision making processes, and influence social, economic and environmental dynamics. However, at the same time the elements and the urban form are visible results of geography, cultural, political and economic dynamics, specialist ideas, and interests of former and new stakeholders. Therefore, the process of the construction of the city involves a complex perspective to integrate those spatial, cultural, economic and social factors. Understanding the logic of construction behind a territory and the quality and character of its urban space, allows an explicit link between the urban structure, with its dynamics of land uses, flows, and socioeconomic elements, and the social meanings, imaginaries and the experiences of those who built it and inhabit it. (Feldman, 2002; Lynch, 2006)

Thirdly, many research on recent territorial transformations in Buenos Aires focus on changes in downtown fabrics or in gated communities in former rural areas. However, there has been insufficient exploration of the impact of these changes on the suburban fabrics. The traditional urban growing by continuity and contiguity shift to a growth by fragments, linked only through a transport network. But, how is it that these new ways of urban growth impact to an existing and consolidated urban fabric?

This paper focuses in the north shore of the Metropolitan Area ef Buenos Aires, Vicente Lopez, San Isidro, San Fernando and Tigre districts, at the end of Lujan river and the beggining of La Plata river.

Recent changes in the Metropolitan Region of Buenos Aires (RMBA)

The RMBA has an area of over 15,000 km2 with a population of 15,000,000[1] inhabitants. This territory grew as a sprawling urban area, where the street grid homogenized the territory. During this process, the high-income social sectors and urban facilities have settled on the north of the city.

The RMBA is part of the hydric system of *La Plata* basin (Pando and Vitalli, 2002) and consists of the basins of the *Reconquista*, *Luján* and *Matanza-Riachuelo* rivers. Those riv-

[1]According to Nacional Census, 2010.

1. Municipality of Tigre
2. Municipality of San Fernando
3. Municipality of San Isidro
4. Municipality of Vicente Lopez
5. City of Buenos Aires

ers run along a plain, so they have some particular characteristics. Lujan river carries sediments as suspended material. When it meet with the calm waters of *La Plata* river, those sediments are deposited forming a delta, with islands, and extensive wetlands and marshes on its banks. Thanks that, several coastal landfills were developed as a strategy to produce land, in a north coast characterized by having the most dynamic real estate market over the past two decades.

Since 1990's, the highways network of the RMBA has been expanded and concessioned, consolidating a process of urban sprawl following these new axes. This new type of urban growth consists of new residential, commercial, leisure and industrial gated typologies. And in the last decade this process was repeated in the inner fabric, especially in the empty areas along the rivers. (Ciccolella, 2009; Lombardo, 1999; Ciccolella and Mignaqui, 2005)

Figure 2. Three sectors.
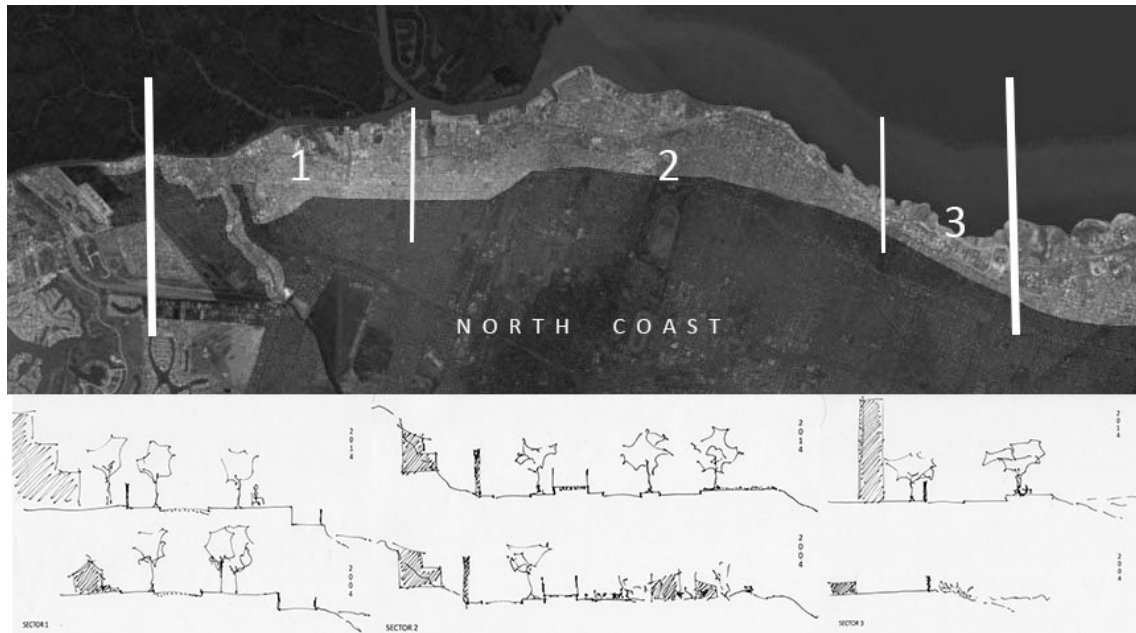
In recent decades, riverside areas, formerly places of "slums", clubs, facilities and industries, began to be environmentally and culturally valued. The northern riverbanks of *La Plata* river were revalued and became areas of opportunity for real estate. In this way, a series of gated communities and yacht clubs were settled, many of them on landfills, competing for the land with the former inhabitants, pushing them to the periphery.

"Persistences" and changes of the northern shore of the RMBA

The first roads of the northern shore were plans during the Spanish Colony and they joined the first urban settlement with the other colonial cities. Over the traces of those roads, parallel to the *Rio de La Plata*, the current avenues of *Libertador* and *Maipú* were consolidated as trade corridors with a higher density than the inland areas. On their sides, the first high-rise buildings were placed from 1970. Parallel to these corridors were planned two railroads that linked the downtown of Buenos Aires with the northern towns during the nineteenth century. The railroad "Mitre to Tigre" is located between the two mentioned major avenues. The first northern suburbs grow from its railroad stations, which are currently small neighborhood centers with commercial, residential and service activities. The railroad "Mitre to Delta" was planned between *Libertador* Avenue and the *La Plata* river, in the higher zone, as a boundary between a low-lying and flood area and the continuous regular street grid and blocks extending from Buenos Aires downtown. The railroad "Mitre to Delta" closed in 1961, and a part of its railway tracks was dismantled.

The area between this last railway and *La Plata* river grew by successive lands fillings favored by the dynamics of a river that flows slow and dragging sediments. Two regional projects were focused on this area during the twentieth century. In 1912, Benito Carrasco formulated a proposal of embellishment the north waterfront for the Office of Urban Promenades of Buenos Aires City Hall. This urban project designed an avenue parallel to the coast, a promenade, various parks, and real estate developments, across *La Plata* and *Luján* coasts, from the city of Buenos Aires to Tigre. While this project won't take place, some that ideas would in some cases be appoint by the specialists of municipal technical teams as project background.

More than six decades later, in 1977, the CEAMSE (State Society of Ecological Belt of the Metropolitan Area) was established in agreement between the City of Buenos Aires

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Figure 3. Public and private projects (1997 / 2014).
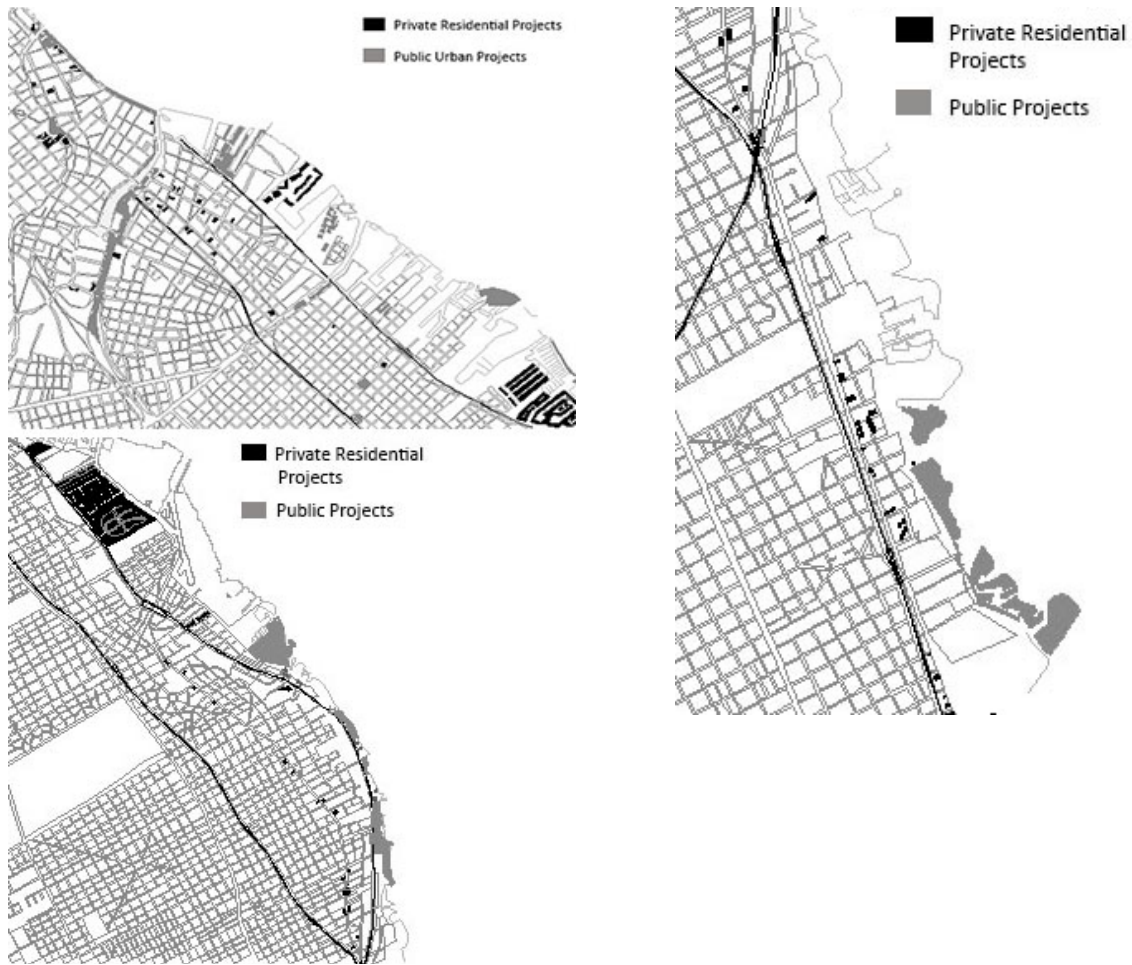
and the Province of Buenos Aires. This organization developed a project of a coastal highway, involving a 590 has land filling, intended to public parks (1/3) and real estate residential developments (2/3)[2], in this last case to financing the project. This project was abandoned five years later because financial issues and neighborhood protests.

Nineteenth century urban plans extended the regular street grid and square blocks that started from the Spanish foundation to all the City of Buenos Aires. City suburbs grew with the extension of regular grids with no plans or specific regulations until late 1970. The planning of the RMBA then, can be regarded both as a network of that regular street grid and open spaces (Gorelik, 1998), and the more or less capital gain that could offer to the real estate market. Thus, the nearshore area (in a lowland river with wetlands and flood-plains) was occupied by activities that require large lots, such as ports, industries, clubs, and homes of low-incoming sectors. Many of these large plots were occupied from the 1970s by facilities for water sports and yatch clubs, and later in the 90s, by gated comunities. However, in the last decade, the impact of environmental issues on the public and political agenda, caused different solutions along the north coast.

Residential typologies with varying degrees of land tenure informality, were settled in the interstitial areas near the ports and industrial activities, as well as in the government lands in this areas, throughout the twentieth century and, particularly, since the industrialization pe-

[2]Robutti, Marcelo; Corti, Marcelo; San Roman, Laura (2004), "4. Description of the project "Environmental and Urban Technical Report - Recovery the coast of Vicente Lopez, Zirma. Urban development and sustainable environment. p. 66.

Figure 4. Urban fabric (1997 / 2014).

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riod of the decade of 1940 due to migration. Some of these precarious housing are isolated and other are small neighborhoods. Firstly, in low-lying areas are precarious houses withought defined lots. After the changes of the past two decades, some of these families take advantage of this location, once marginal, now strategic, incorporating informal trade strategies, mostly linked to the production and sale of food during weekends. Another dispersed housing typology are settled on small lots, informally subdivided, with a central path and rows of houses on either side. This building type has been disappearing due to a lot to lot replacement process for single-family or multi-family housing for sectors with high purchasing power.

Secondly, there are areas of several informal settlements, precarious housing built, occupied with low-incoming people on a land which is not their own. In the district of San Isidro is an area of former fisherman cabins, currently occupied by low-incoming families. This neighbourhood could resist the eviction attempt by the municipality, thanks to a community organization and with the development of commercial activities, where handcraft products are sold over the weekend.

Thirdly, the larger-scale building type of informal settlements are slums that have been densified in the last two decades by urban completion of empty spaces. During this period they have been subject to different types of urban intervention.

Finally, we are interesting to note that residential uses of low-income families have only resist the displacement processes when they share the location with other families in the same conditions as well as when they have been organized. The coexistence of these sectors with others with higher incoming was mediated by development projects of public investment, that in almost all the cases reorganized the built and empty spaces, taking in these areas to the rest of the regular grid.

The study of the north coastal changes can allow us to identify three main areas characterized by different situations of morphological changes, predominant land uses, social resistance, interest at stakes, among others.

Just because I don´t have too much time, I just will talk about one of them. You can find the complete development in the paper.

1) *The coast for all*: with riverside walks, plenty of people from diferent incoming sectors every weekend, and an emergent building process of condominiums (Tigre),
2) *The coast for some*: with a sequence of gated communities and surf clubs, and in front of them, expensive villas with almost no changes (San Fernando and San Isidro),
3) *The coast for "audience"*: with towers and metropolitan parks.

The greatest transformation in this noarth coast was in *Vicente López*, the nearest area to Buenos Aires city. Formerly, there were ports, deposits, large clubs and militar facilities. During the last military dictatorship (from 1976-1983), the army made several land fillings increasing the size of their properties. These processes were imitated by the nearby clubs. In 1993 Vicente López district started a process for clubs to return to their original sizes, and thus built a metropolitan park with large cultural facilities in that area. After a negotiation process between the clubs and the local government, it was decided not to change their existing boundaries but to continue the land fillings. As this area formerly wasn´t there (it´s land gained from the river), a change in urban regulation was necessary. As a result of those changes in the regulation there was several new projects. The large plots of the clubs as well as its unconsolidated architecture, quickly gave way to large residential real estate developments. These new housing developments are high-rise buildings sited in the middle of the lot, surrounded by fences with a single entry, monitored by security cameras and private guards. The larger projects are various buildings offering apartments of different sizes, with sports and social amenities on the ground floor.

Once the larger lots were built, other developments were located in smaller lots, former middle-class or low-incoming single-family homes. Thus, there was a displacement process of recreational and industrial to residential uses, and middle or low-incomming sectors by higher incoming ones.

Traditionally the higher buildings were located on the main avenues, but in the last decade, the real estate housing developments, either tall buildings or condos, are located on calm roads, particularly dead-end ones, densifying fomerly low-lying neighbourghoods. These projects were developed and marketed by companies specialized in this northern region of RMBA, and largely with international capital. These new urban stakeholders operate in a regional scale, in the most profitable areas of the country, playing the same logic, building types and design criteria as "brands" of author.

Some final notes

The aim of this paper was to introduce some main ideas that would allow identifying a relationship between urban morphology, land uses, and political-economic and social logics. The intentional reading of the territory through transformations and "persistences", shows that the characteristics of those changes depend of that relationship.

We have seen that the size of the lot and the urban regulations have been defining the type of development to be built. But it has also been relevant the relative position of the lot to the river, to the main avenues or to the irregular street grid that allow to controlling who travel in the area.

In addition, the less consolidated uses of land for clubs or warehouses are less resistant to changes, unlike residential uses. But also, the characteristics of the resident population influence the territory´s possibility of resistance or change. The low-income sectors are the least able to resist the displacement process. However, in cases where they were located with other people in the same situation, they could organize and resist the expulsion.

We also find a coincidence between the agendas of specialists witch introduce environmental issues in the objectives of public plans and urban projects with the marketing of private developments that promote location housing front parks and green squares with river views. We understand as well, that ideas about how a city should be, its problems and its possible solutions, originate from a relationship between the diverse actors of the construction of the city.

By deepening the study of urban transformations through the differences between "persistences" and changes, we force to look at the nuances in the urbanization process and the interrelationship between the physical, geographical, cultural, social, economic

and political dynamics behind it. And by inquiring about territorial changes from the specificity of the urban elements and form, both as a cause and a product of those dynamics, it allows us to question about two issues. Firstly, about what it´s at stake in this process of urban transformation and the interests of the diverse stakeholders. Secondly, if beyond the explicit objectives of public and private urban projects, these changes reflect a broadening of the territory for the reproduction of capital or the development of a more democratic society. Thus, we can rebuild both the technical and political profile of our discipline as urban planners.

References

Bozzano, H. and Pintos, P. (1995) 'Physical environment and ecological problems', in Comisión Nacional del Área Metropolitana de Buenos Aires (CONAMBA) *The greater Buenos Aires conurbation. Inventories and analysis* (National Comission of the Greater Buenos Aires, Ministry of Internal Affairs, Buenos Aires) 20 -35.

Ciccolella, P. (2009) 'Buenos Aires: a postsocial metropoli in the context of global economy', in Pirez, P. (ed.) *Buenos Aires, the formation of the present* (OLACCH, Quitol).

Ciccolella, P. and Mignaqui, L., (2005) *Global capitalism and metropolitan transformations: Approaches and instruments to re-think the urban development* (CLASO, Buenos Aires) (http://bibliotecavirtual.clacso.org.ar/ar/libros/campus/poggiese/06cicco.pdf).

De Mattos, C. (2004) 'Networks, nodes and cities: transformations of latinametican metropolis', in Queiroz Ribeiro, L. (Comp.) *Metropolis. Between the cohesion and the fragmentation, the co-operation and the conflict* (Observatory of Metropolis / Editora Fundacao Perseu Abramo, Brasil) ISBN 85-7643-001-0.

Dematteis, G. (2006) 'At the crossroads of urban territoriality', *Bitácora Urbano Territorial Journal* 10 (National University of Colombia) 53-63. ISSN 0124-7913.

Feldman, E. (2002) 'From linear spaces to linear places: recycling rail corridors in urban areas' (Master thesis. Massachusetts Institute of Tecnology, USA).

Font, A., Llop, C. and Vilanova, J. M. (1999) *The building of the metropolitan territory. Morphogenesis of the urban region of Barcelona* (Mancomunitat de Municipis de l'Àrea Metropolitana de Barcelona, Barcelona).

Gorelik, A. (1998) *The grid and the park: Public space and urban culture in Buenos Aires, 1887-1936* (Universidad Nacional de Quilmes, Bernal).

Harvey, D. (1997) 'Globalization and urbanization', *Graphikos* 8 (Buenos Aires).

Lombardo, J.D. (1999) 'Urban planning ideas and urban development in the Metropolitan Region of Buenos Aires', unpublished research document, Instituto del Conurbano, Universidad Nacional de General Sarmiento, Buenos Aires.

Lynch, K. (2006) *The image of the city* (BInfinito, Buenos Aires).

Pando, H. and Vitali, O. (2001) 'La Plata river. Notes for its history', *Architectural journal 201: The riverbank* (Buenos Aires).

Pereyra, F. (2002) 'Geologic development of the basin', in Borthagaray, J. M. (comp.) *La Plata river as territory* (Infinito, Buenos Aires) 15-49. ISBN 950-29-0666-7.

Ryan, B. (2006) 'Morphological change through residential redevelopment: Detroit, 1951-2000', *Urban Morphology* 10(1) (International Seminar on Urban Form): 5-22. ISSN 1027-4278 (http://dspace.mit.edu/handle/1721.1/65992).

Sabaté, J. (2004) 'From the heritage preservation to the landscape planning', *Urban 7*, number 010 (University of Bio Bio, Concepción) 42 - 49.

Sola-Morales i Rubio, M. (1997) *The forms of urban growth* (Editions UPC, Barcelona).

Zirma (2004) *Environmental and urban technical report. Works and projects for the recovery of Vicente Lopez coast* (Municipality of Vicente López, Buenos Aires).

The 'Prognoz Platform' based analytical tool and its use for conservation, protection and reproduction of urban forests in the city of Perm

Svetlana Maximova, Piotr Lorens, Didier Vancutsem, Ekaterina Meltcova
Civil Engineering Faculty, Perm National Polytechnic University, Russia

Abstract

Nowadays information technology is widely used in urban planning, it allows us collecting and storing of large amounts of data about cities, their infrastructural networks, people and relationships between them. However, solving real urban problems we traditionally use unique knowledge of various experts preferring it to automated analysis of data.

This is largely due to the lack of analytical systems that can work with cartographic data and can be used to solve spatial problems. To manipulate geospatial data we have developed an analytical tool based on the Russian Business Intelligence system «PROGNOZ PLATFORM». This system is designed to solve problems by predicting, control and simulation using a wide range of modeling methods such as econometric, balancing, optimization and target methods. The BI-system allows to solve problems such as "What if ..?" And "What do I need to ..?" and supports contingency scenario modeling. It also allows to visualize and analyze operational data model and forecast processes.

We've adopted mathematical, statistical and adaptive methods of PROGNOZ PLATFORM extending it with data from the municipal database of socio-economic statistics, cartographical information from State Immovable Property Cadastre. We have already tested this analytical tool at various urban problems.

Now we would like to present a working scheme of combination of our instrument and cartographical data of the General Plan of Perm making comprehensive assessment of conservation, protection and reproduction of urban forests in our city.

We demonstrate basic algorithms for integrated assessment of urban forests: target function method, design parameters and formulas. It is shown how to use the analytical software tool to process results of the reforestation monitoring according to state forest management regulations.

The PROGNOZ PLATFORM based analytical tool is intended to increase validity of decisions in different types of city and regional planning, including priorities determination for municipal budget planning.

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Introduction

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Urban forests conservation, protection and reproduction problems in Russia, objectives and tasks

The city of Perm is located in the central part of the country near Ural Mountains. Perm is the 13th city in Russia in terms of population and the 3rd one in terms of area. Urban forests and other in-city greenery occupy about a half of the territory - 382,8 square kilometers.

Natural type of plantations – urban forests dominates the structure of the green areas occupying over 99% of the area about 379 square kilometers. This is primarily due to the natural surroundings of the city. Perm is located in the forest zone of Southern Taiga. Also, because of the nature of the urban landscape: the city is crossed by more than 100 valleys of small rivers and streams. These territories are not in use or being used passively. Artificial – public green spaces: parks, squares, streets and other common areas occupy up to 3.8 square kilometers.

Russia's traditional policy of quantitative evaluation of administrative work hides the problems with the quality of greenery from the regional and municipal authorities and residents (Golovin, 2013).
- Individual trees receive little attention, the data is collected disorderly and is not accumulated on a single platform;
- state assessment, including the evaluation of plantation health, is conducted on unreasonably enlarged areas;
- average values are being used for the analysis of green territories.

The lack of proper instruments allowing to resolve the data collection challenges effectively at the level of each tree is one of the main problems of green areas management. Urban landscape quality assessment tool for monitoring, analyzing and forecasting of green plantations, on the level of the whole city or its individual districts is needed.

General characteristics of tasks solved by the Information-analytical system

Perm National Research Polytechnic University together with ZAO «PROGNOZ» is developing the model of Information-analytical system (IAS) for three years with the financial support of the Perm Region Government. This system combines socio-economic sta-

Figure 1. Scheme of ratio of urban territories to natural landscape in Perm.
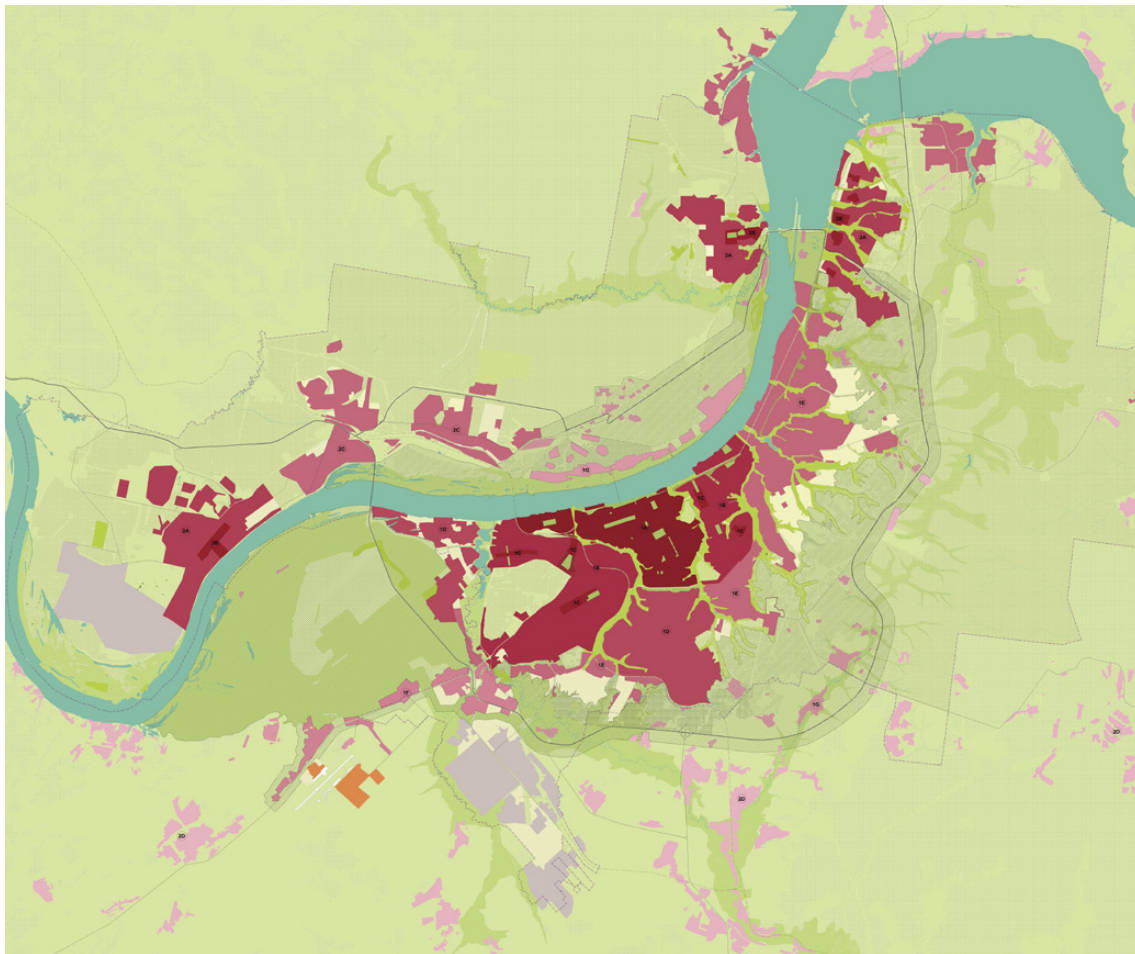
tistics, real estate state cadastre data, mathematical, statistical and adaptive methods library integrated with GIS under the single platform.

IAS is based on the Prognoz Platform (PP) which is the next-generation BI platform for building high-tech business applications on a turnkey basis. PP is designed to solve problems of prediction, control and simulation by a wide class of modeling methods, including econometric, balance, optimization, target. BI-system allows solving problems such as "What if ..?" And "What do I need to ..?" and supports contingency scenario modeling. PP also allows to visualize and analyze operational data model and forecast processes. It has its own data warehouse designer which helps to build full-featured industrial BI systems based on the Prognoz Platform. Its integration with the state information system for urban planning allows consideration of established local and federal law requirements for urban environment quality, the prevailing land use and capabilities of municipal budgets.

We have already tested this prototype at various urban problems:
- Optimization of social facilities, taking into account federal regulations and budgetary constraints: selection of the site for the construction of a new school in the city (Zavialov, Maksimova, 2013);
- Justification of the energy infrastructure development scenario by combining mining settlements of Kizelovskoe and Gremyachinskoe municipal districts of Perm Region (Zavialov, Maksimova, 2013);
- Land Use Plan development for new residential area in New Lyady, Perm (Vancutsem, Lyubimov, 2013).

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Figure 2. Information-analytical system design.
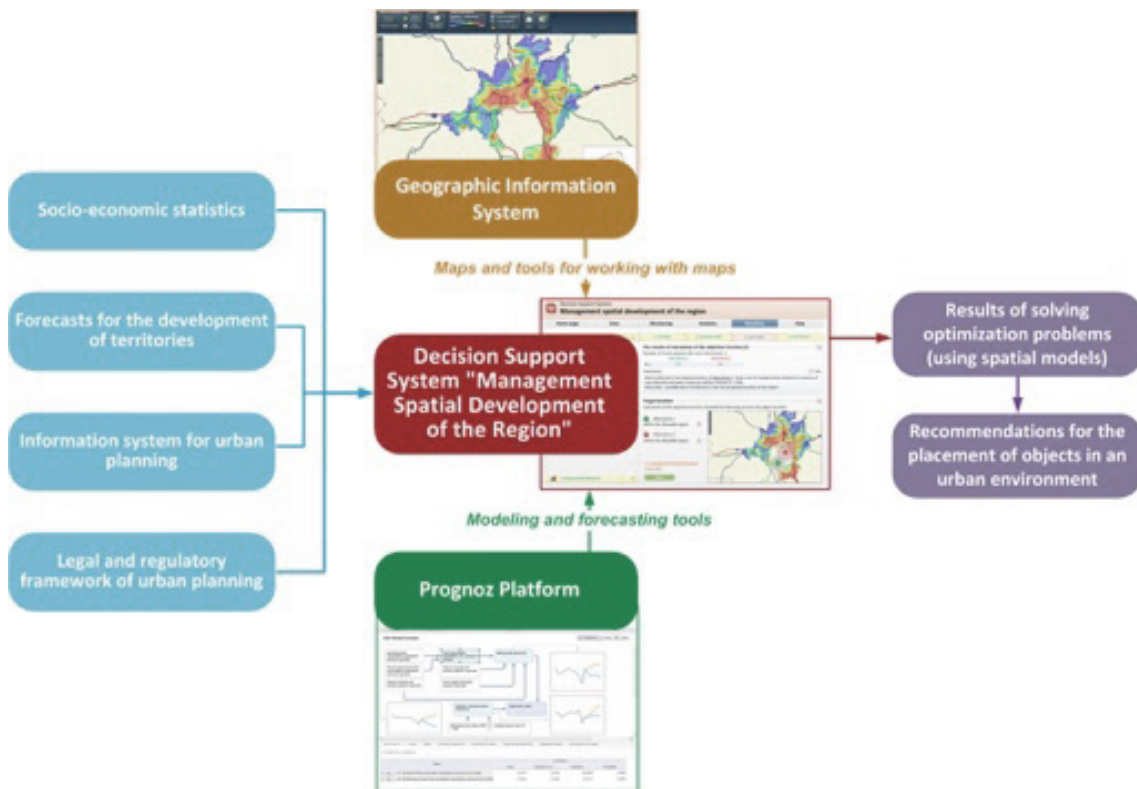
Key parameters and target functions of the Information-analytical system

The next step of the analysis targets the specific green infrastructure development challenges arising at the regional government level, for the solution of which it is possible to use the created model due to its ability to work with geo-referenced data.

IAS can solve a full range of problems starting from processing of primary data, storing this geo-data in the knowledge base, until preparing final reports. Collection of primary data about plantations requires adding an additional module to the IAS. This module would allow data importing from systems that are used in the inventory of plantations. As another option it might be an additional software tool allowing us to generate a database on plantations remotely analysing satellite imagery. In our opinion both areas of work are promising. In this paper we are going dwell on the second option: the remote database creation.

To this end, i-Tree is successfully used worldwide. This is a modern software tool approved by experts. It was developed by the Forest Department of the United States Department of Agriculture (USDA Forest Service). Its possibility to measure value and results of forest/urban plantations (benefits assessment) is also very interesting for us. i-Tree is released in Public Domain.

The integration of the analytical tool i-Tree Eco into our workflow is one of the most promising possibilities for us. This tool provides a broad forest picture (Song, Porter, Foster, 2014). i-Tree Eco is designed to work with complete or individual sites field data inventories, with hourly local observations of air pollution and meteorological data, and generate the qualitative assessment of urban forests natural effects and value to society.

Using such tools in the body of IAS or integrating results obtained outside of IAS would create a high-quality database of the city green areas. From the author's point of view, it is necessary to continue research in this area. However, the protection and conservation of urban forests are matters that are needed to be responded and managed now using data that is already available.

Figure 3. Screenshot of IAS window showing the map of the functional areas in Perm.
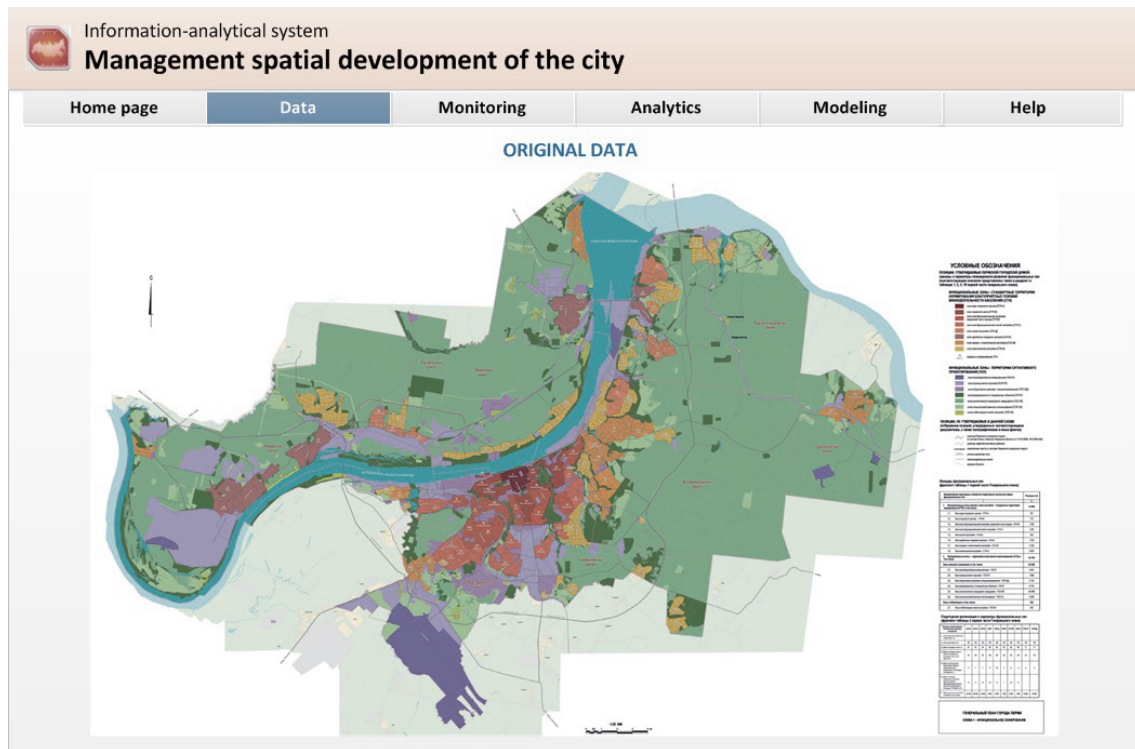
The main purpose of IAS today is forming of a system for urban forests condition monitoring rather than supporting decision making process.

In this way, we are faced with the objective difficulties associated with the formation of the data warehouse.

The Russian state environmental statistic database formulates the specific requirements for attributes of information. The composition and quality of attributes are regulated by the only normative document used to assess the status of green space in the city – the Program of socio-economic development of Perm region during 2012-2016 [adopted by the Legislative Assembly of Perm region on the 6th of December 2012].

The Program recorded a number of indicators to assess the effectiveness of measures aimed at conservation, protection and reproduction of urban forests:
   - area of city's natural framework;
   - area of specially protected natural areas in the city.

The area of city's natural framework is an aggregate of three different type of objects:
   - S1 – area of city's artificial plantations (parks, gardens, alleys and other);
   - S2 – area of urban forests;
   - S3 – area of water objects.

The area of city's specially protected natural areas is an uncalculated indicator.

All this information has to be collected annually by the 1st of February.

The assessment is made by comparison of numbers of a reporting year with the year before. The results are evaluated from the perspective of preserving of the area occupied by urban forests. They estimate direct reduction / increase of the area in absolute terms.

It is not hard to guess that the state environmental statistics, which can be accessed for research and testing of IAS, is conducted only on indicators described above.

Based on the available raw data, we have formulated the objectives for testing the prototype of IAS and the calculation algorithm.

Figure 4. Screenshot of IAS window showing the map of the urban greenery and forests areas in the central part of Perm.
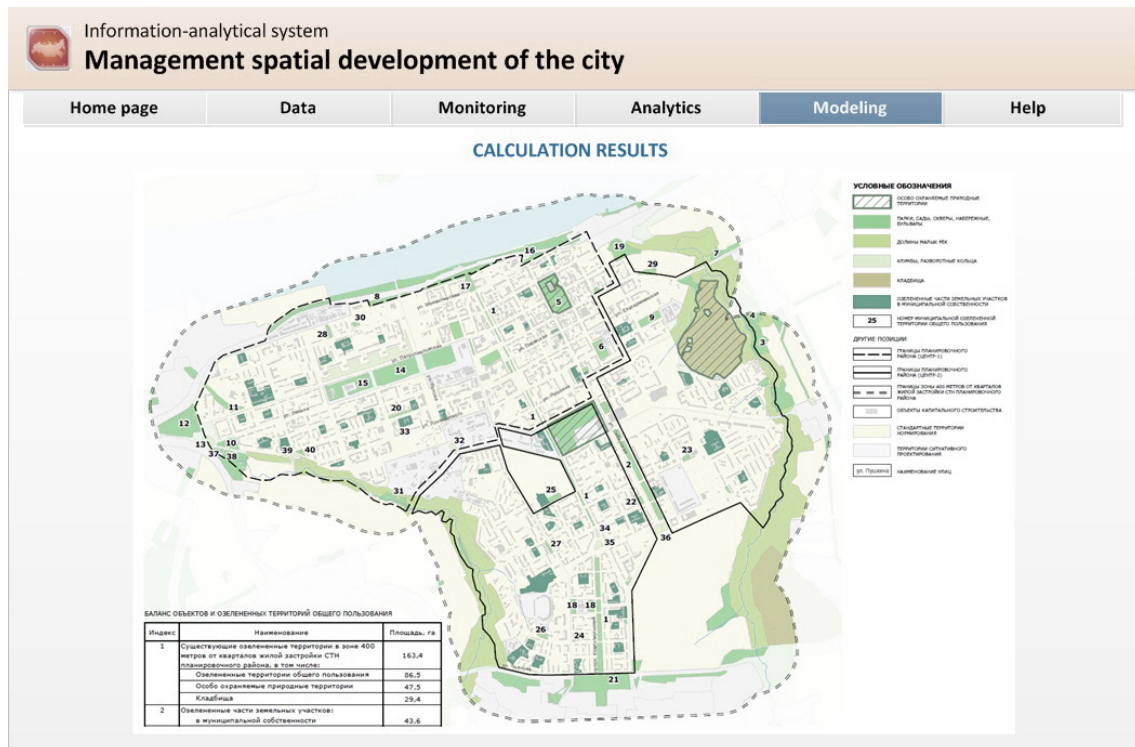
Algorithm and prototype of information-analytical system

The main components of the model as the basis of information-analytical support system of strategic decision-making in the field of spatial planning are three major subsystems: 1) data storage, 2) tools for working with maps and 3) modeling and forecasting tool.

Data repository must contain:
- Socio-economic statistics,
- Forecasts for the development of territories,
- Information system for urban planning,
- Legal and regulatory framework of urban planning,
- Other sources of data used in the practice of urban planning.

Prognoz Platform is used as a tool for modeling and forecasting. It is a next-generation BI platform for building high-tech business applications on a turnkey basis. Prognoz Platform is used to build software solutions for desktop, web, and mobile devices. PP can be used for visualization and online analytical processing (or OLAP), reporting, and modeling and forecasting of business processes.

The logic of the system and its use to solve practical problems is presented in Figure 2.

Test problem

The objectives:
1. Automation of forest land status monitoring for maintaining current forest resources of the city of Perm and replenishing it by restoring the artificial, natural and combined way (changes in the area of urban forests land during the reporting period);
2. Determination of the proportion of plantations in a satisfactory condition including the trees that have been planted or cut down during a certain period of time (the reporting period).

The raw data has been used to generate the data store:
1. Map of Perm with two functional areas (zones):
- zone of ecological natural landscape - ТСП-ЭП;
- zone of recreational area and special facilities - ТСП-Р.
2. Terms of improvement and maintenance of the city of Perm [adopted by the City Duma of city of Perm on the 21st of January 2008];
3. Sanitary and hygienic standards (operating in the Russian Federation);
4. Official statistics:
- a list of plots for gardening (targets in the map view). Source: Resolution of the Administration of the city on the planned land plots for gardening;
- a list of objects of gardening. Source: Resolution of the Administration of the city on the planned land plots for gardening;
- a list of landscape objects with description of their area. Source: Resolution of the Administration of the city on the planned land plots for gardening;
- information about cutting down trees. Source: a consolidated list of municipal acts for the demolition of trees during the reporting period, specifying addresses of works and amounts of trees / shrubs felled;
- information about new planting trees. Source: the action plan for the calendar year. In the form of a map or a chart indicating trees and bushes planting sites and their amount;
- information about the amount of environmental investments. Source: public environmental reports.
5. Additional information from direct measurement. This information is not updated every year. These documents are not normative.
- number of trees surveyed;
- characteristics of trees sanitary condition. The estimate of trees sanitary condition was done using the Method of plantations inventory, which was developed by Perm State National Research University in 2007. They implemented so-called integrated or comprehensive indicator of tree health. It can be measured on a scale from 1 to 3: good, satisfactory, unsatisfactory (Kulakova, 2012).

All previously named information sources have been formed into two groups of variables:
- variables taken from databases (including maps and schemes);
- calculated variables.
Variables taken from databases (including maps and schemes):
1. Number of trees, thousands units (Tree_population);
2. Share of trees in satisfactory sanitary condition, % (normal_trees);
3. Number of felled trees, thousands units (felled_trees);
4. Number of felled trees in poor condition, thousands units (felled_bad_trees);
5. Number of planted trees, thousands units (new_trees);
6. Area of city's artificial plantations (parks, gardens, alleys and other), ha (S1);
7. Urban forests area, ha (S2);
8. Area of water objects, ha (S3);
9. Area of forest land at the time of approval of "Forestry regulations of the Perm ur ban forest", ha (PF);
10. Change in the area of forest land during the reporting period by planting landscape crops and natural regeneration, ha (PC).
Calculated variables:
1. Number of trees in poor sanitary condition (bad_trees) – the share of trees in the unsatisfactory sanitary condition: bad_trees = tree_population - normal_trees * tree_population;
2. Share of trees in satisfactory sanitary condition during the reporting period (new_tree_population);
3. Share of demolished trees, % of trees in poor condition;
4. Share of planted trees, % of felled trees.
Target function – conditions of conservation and replenishment of current forest wealth of the city:

1. PSi> = PS(i-1);
2. PFi> = PF(i-1);
3. normal_trees > = felled_trees;
4. felled_trees = felled_bad_trees;
where:
i - function value (index) for the current year;
(i-1) - function value (index) for the previous year.
The calculating algorithm includes:
1. Determination of the total number of trees in a predetermined area: new_tree_population = normal_trees * tree_population - (felled_trees - felled_bad_trees) + new_trees - (felled_trees - felled_bad_trees);
2. Determining the proportion of trees that are in good sanitary condition to the total number of trees: new_normal_trees = (new_tree_population - (felled_trees - felled_bad_trees)) / new_tree_population;
3. Determination of the total area of the city's specially protected natural areas (objects of gardening, urban forests, water bodies) PS = S1 + S2 + S3
4. Determination of the forest land area (including cultural landscape) PL = PF + PC,
5. Verification of the specified objective functions.
The result is given in form of a map showing calculation results in a table.

Conclusion

IAS allows to store data efficiently and promptly make analysis of changes of indicators used in the greenery assessment. The tool allows their users (city or region authority) to predict indicators values before the end of the reporting period allowing to moderate the outcome.

The automated information processing will significantly simplify the management of green spaces in the city. However, further work is required to make it possible to collect and update information for every individual tree.

Prognoz Platform is affordable, easy to install and its interface is good. Using IAS will allow municipalities to move from assessment of green space only by area to assessment using more informative indicators of quality. This is a new, technological and economic way of management of green areas for the city of Perm.

References

Alekseev, Y.V. and Somov, G.Y. (2003) *Urban planning of settlements. The evolution of planning* (ASV Publishers, Moscow).
Maguire, D.J. (ed.), Goodchild, M. F. (ed.) and Batty, M. (ed.) (2005) *GIS, Spatial Analysis, and Modeling* (ESRI Press, New York).
Montrone, S. and Perchinunno, P. (2012) *Statistical Methods for Spatial Planning and Monitoring (Contributions to Statistics)* (Springer, New York).
Golovin, A.V. (2013) 'Modeling for decision-making in urban planning at the example of the network of municipal educational institutions', *Bulletin of the Perm national research polytechnic university 'Urbanity'* 2 (10), 6-31.
Zavialov, A., Maksimova, S., Shultz, D., Mikushin, P. and Lorenz, P. (2013) 'Integrated model of development as basis for the urban planning', *Bulletin of the Perm national research polytechnic university 'Urbanity'* 4 (12), 10-20.
Vancutsem, D. L., Lyubimov, A., Maksimova, S. and Meltcova E. (2013) 'Summury of spatial development concept for settlement of Novye Lyady based on industrial cluster 'Technopollis 'Novyi Zvezdnyi', *Bulletin of the Perm national research polytechnic university 'Urbanity'* 4 (12), 21-30.
Kulakova, S. (2012) 'Assessment of the city greenery planting', *Bulletin of the Perm State National Research University "Geographic Vestnik - Ecology and Nature Management"* 4 (23), 59-67.

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Song, C., Porter, A. and Foster, J.S. (2014) 'iTree: Efficiently Discovering High-Coverage Configurations Using Interaction Trees', *Software Engineering, IEEE* 40-3, 251-265.

PROGNOZ PLATFORM official web-site (http://www.prognoz.ru/platform/modeling) accessed 15 February 2015.

iTree software official web-site (http://www.itreetools.org/resources/) accessed 15 February 2015.

Program of socio-economic development of Perm region during 2012-2016 (2012) (Legislative Assembly of Perm region, Perm).

Strategic master plan of city of Perm (2008) (Zebra Press, Perm).

General plan of city of Perm (2010) (The City Duma of city of Perm, Perm).

Terms of improvement and maintenance of the city of Perm (2008) (The City Duma of city of Perm, Perm).

Chair_Pierre Gauthier
Département de géographie, urbanisme et environnement, Concordia University, Montréal, Canada
Co-Chair_Pia Marziano
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy

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Typological processes, urban landscape character and development control: the case of Auckland, New Zealand

Xi Zheng
Architecture & Planning School, University of Auckland, Private Bag 92019, Auckland, New Zealand

Abstract

The idea of typological processes is a key tool used by researchers of the Muratorian school to understand the course of urban form change. Central to this idea is the notion that the city and its architecture are products of cultural consensus based on collective memory. The dominant types in a new period of urban development are conceived from the dominant types of an earlier period. The fact that the forms created in one period are different from those created in another, and that similar types are grouped over time, thereby generating distinct urban tissues, is fundamental to both characterising and planning the urban landscape. Despite the increasing interest in the idea of typological processes, it has been slow to receive clear empirical support and its application in planning remains limited. Major cities in New Zealand are under great pressure for change. This paper illustrates the analytical techniques for an investigation of the typological processes of the spatial structure of urban areas at difference scales in Auckland. The research findings suggest alternative zoning strategies which are place-based and more responsive to local and regional character.

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Background

The Muratorian school of architectural typological thinking which was mainly developed in the 1960s is built on an evolutionary concept of change (Caniggia and Maffei 2001, Kropf 2001, p. 30). The architectural typologists postulated that the dominant types in a new period of urban development are conceived from the dominant types of an earlier period (Marzot 1998, p. 54). Based on Muratori's pioneer work in the 1950s (Cataldi et al. 2002), Gianfranco Caniggia and others first introduced, in the 1960s and 1970s, the concept of typological processes to describe the morphological transformation of building types in relation to the processes of urban development cycles (Cataldi 2003, p. 5; Gauthier 2005, p. 88; Maretto 2012, p. 122). The typological process is concerned with the evolution of the forms that buildings and urban tissues take (Kropf 1998, p. 45). It is the sequence of developments whereby a new building or urban-tissue type supersedes an existing one; adaptations of the existing type provide the basis of a new type (Marzot 2005, p. 49).

The idea of typological processes is a fundamental tool for understanding how urban areas change over time. In particular, the built forms created in one period are different from those created in another; and the similar types which are grouped over time can thereby give rise to distinct urban tissues (tessuto urbano) (Caniggia and Maffei 2001). Urban tissue is an organic whole whose form can be described at distinct levels of resolution (Kropf 1996, p. 724). The levels correspond to the different elements identified in spatial analysis, the elements are: streets and blocks (or plot series); plots; buildings; rooms or spaces; structures, such as walls or roofs (encompassing details of construction) and materials (Kropf 1996, p. 724). Articulating and characterising urban tissue according to its formative processes is fundamental to both describing and prescribing changing urban landscapes.

Despite the increasing interest in theory and practice of the typological process, it has been slow to receive clear empirical support. The sheer complexity of the processes underlying changing built forms makes this unsurprising, particularly as that complexity has tended to increase since the beginning of the industrial era (Gu et al. 2008, Whitehand et al. 2014). The practical significance of typological research has been related to development control that regulates and guides urban form so that it fits coherently into existing urban structures (Kropf 1996, p. 724). However, examples of clearly formulated typological methodology and effective planning implementation are still limited. It is to the remedying of these deficiencies that this article is devoted.

Auckland, with a population of 1.51 million in 2013, is the largest city in New Zealand. It is one of the fastest growing cities in Australasia. The metropolitan area of Auckland mainly occupies an isthmus between the Manukau and Waitemata harbours. Most of the isthmus had been surveyed by the 1860s and was utilized to some degree by various forms of economic activity by that time (Bloomfield 1967, p. 7). It was largely built up by the 1960s (Bloomfield 1967, p. 20). The inner suburbs surrounding Auckland's CBD contain varied land uses and built forms. Being the oldest suburb in Auckland, Parnell has about 170 years of European history (Di Stewart and Associates 1993, Wild 2011). Stimulated by urban intensification, economic restructuring and the growth of tourism, its central area has been subject to strong pressures for change in the past two to three decades, creating challenges for current planning management.

Literature, paintings and photographs about Auckland have been published since the 1840s expressing the lifestyle, landscape and architecture from early colonial days to the present (Brand 2002, Byrnes 1995; Johnston 1969). There are numerous plans and maps of Auckland beginning with surveys made at the time of initial settlement in the early 1840s (Auckland City Libraries 2014). They are of major importance in reconstructing the historical development of urban form. A plot-by-plot survey of the urban landscape in conjunction with the historical maps and plans has provided a basis for the typological analyses of Auckland's isthmus and the central area of Parnell.

Based on a critical review of recent research on typological processes and urban development control, this article illustrates the use of typological mapping and analytical techniques in articulating and characterizing the complex urban landscape. The iden-

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tification of urban tissues is based on both systematic field-based cartographic survey and the understanding of the processes of urban growth and change. The current zoning regulations, developed from the assessment of existing building form, is intended for effect-based control of land-use changes and building details. However, the absence of an evolutionary approach has undermined the maintenance and positive development of the coherence of historical urban environments. This article suggests a form-based zoning alternative based on typological analysis of the spatial structure of urban form.

The typological process: research and practice

The origin of the typological thinking could stretch back to the 18th century when the French Enlightenment was to counter the break in the historical continuity and the separation in the building process between the designer and the client (Kropf 1996, p. 722; Petrucciolio 1998, p. 10). The emergence of typological theory which was concerned with systematic methods and techniques for maintaining the historicity of cities whilst not inhibiting their constructive and positive development may be traced back at least to the 1950s (Muratori 1950, 1959). That followed a period of modernist development when the urban landscape had undergone great pressures for change. Based on the identification of the crisis in modern architecture as a crisis of civilization, Saverio Muratori argued that it was necessary to refresh people's memories - typological leitmotivs (Cataldi 2003, p. 20). The typological leitmotivs should be carried forward within new buildings which, however, must no longer be conceived as isolated monuments but as adapted parts of a historically and linguistically consolidated whole (Cataldi 2003, p. 20).

Saverio Muratori indicated that the city is a dynamic organism and collective work of art, which supported the idea of planning new buildings in continuity with the building culture of the place (Cataldi et al. 2002, p. 4; Maretto 2012, p. 122). Gianfranco Caniggia and Paolo Maretto are perhaps the first Italian architects who used the terms that are related to the development of the idea of typological processes (Cataldi et al. 2002, p. 5-6). In "Lettura delle preesistenze antiche nei tessuti urbani medievali", presented at the "Convegno internazionale sui metodi di studio della città antica" (CESDIR), Milano in 1973, Caniggia discussed the "typological process reconstruction" ("*ricostruzione del processo tipologico*"). A similar term – "typological history" ("*storia tipologica*") was used earlier in 1960 by Paolo Maretto in *L'edilizia gotica veneziana* (p.3 and p.5) (personal communication with Giancarlo Cataldi 2013, Cataldi et al. 2002, p. 5).

At the core of typological thinking is the way in which physical structures, notably buildings and urban tissues, are altered over time, for example by certain recurrent types of adaptation and addition. Such changes to existing built forms eventually become the basis for a new generation of built forms, a new "type" which contains, from its inception, features that in earlier buildings had been adaptations (Whitehand and Morton 2006). The significance of this typological process is its dialectical understanding of the nature of the continuity and change of urban areas. The seemingly new characteristics of forms – architecture and urban tissue are frequently *inherited* from previous generations of forms (Whitehand et al. 2014). The practical significance of the typological process has been related to architectural and urban design and development control.

Typological research, especially that part concerning "operative history" (Cataldi et al. 2002, p. 2; Maretto 2012) has always been closely linked with architectural and urban design. Muratori's architectural and urban projects demonstrate his appreciation of their formative logic (Cataldi et al. 2002). Growth and maturation are reflected in his work, arguably culminating in his Benetian projects for the Barene di San Giuliano in 1959 (Cataldi et al. 2002, p. 3). An awareness of a kind of cultural progression and the significance of crises in ideas and phenomena has led to his discovery of built forms (Cataldi et al. 2002). The use of typology in design practice also has demonstrated in projects of Aldo Rossi, Giorgio Grassi and Rafael Moneo (Grassi and Moschini 1984; Moneo et al. 2010; Muratori and Cataldi 1984, 1991; Rossi and Regan 1983).

Ivor Samuels (1998, 2008), Karl Kropf (1996, 2011) and Brenda Sheer (1998, 2001, 2011) are among researchers who have made an important contribution to the application

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Figure 1. Ground plans and building types representing the morphological periods. Source: Based on author's field survey and Auckland GIS data, 2013.

of typological thinking in urban coding and planning. In particular, Kropf highlighted the importance of the idea of urban tissue in development control (Kropf 1996). Urban tissue is an area of urban form that has a consistent physical structure of streets, plots and buildings and is distinct from surrounding areas (Kropf 1996). Urban tissue derives its character mainly from their cultural contexts and historical processes which are those of economic, social and technological development (Kropf 1996). In relation to planning, the key point is the way in which urban tissue embodies local historical development – the intentions, values and ideas of the people who created it (Kropf 1996). Identifying urban tissue can be used as a basis for prescriptions in which future changes are incorporated harmoniously into the existing landscape.

There are intriguing links between urban tissue and the geographical-morphological idea of plan units which was mainly developed by M. R. G. Conzen (1960). The concept of plan units is integral part of town-plan analysis. The town plan can be subdivided for analytical purposes into streets, and their arrangement in a street system, plots and their aggregation in street-blocks, and buildings, or more precisely their block-plans (Cozen 1969). A plan unit represents an individualized combination of streets, plots and buildings distinct from its neighbours (Cozen 1969, p. 128). Plan units are essentially morphogenetic plan type areas and vary in character. Exploring the links between the typological and geographical-morphological thinking has been attracting increasing research attention (Whitehand et al. 2014). The term "typo-morphology" has been more frequently used in research publications after the 1980s (Chen and Thwaites 2013; Kropf 1998, 2009; Samuels 1998, 2008).

The adaptations and redevelopments of historical urban landscapes are taking place at an unprecedented pace practically worldwide in the past two to three decades. The practical significance of typological research has been related to urban coding that regulates urban form so that it fits coherently into existing urban structures (Carmona et al. 2006, p. 219-221; Hall 1997; Kropf 1996, 2001; Samuels and Clark 2008; Samuels and Pattacini 1997; Scheer 2001; Scheer and Scheer 1998). The typological approach to urban coding is form-based management of landscape forms (Kropf 2011, p. 172). By using evolutionary analysis of the spatial structure of the urban landscape as the basis for development coordination and control, typological coding is place-based and more responsive to local and regional character.

Despite the recent advances in typological theory and practice, the idea of the typological process has been slow to receive clear empirical support. The techniques and processes of identifying urban tissue at different scales need to be clarified. There are also problems of ineffectiveness in planning implementation. Typological research has been mostly used to understand urban landscape transformation in cities with a long history. It has been much less applied hitherto to cities in Australasia. By investigating the city of Auckland, this article aims to explain the typological processes at different urban scales and its significance for development control.

The typological process of built forms in Auckland's isthmus

Most cities in New Zealand only have about 170 years European urban history. In evolutionary research on cities with a short history, the application of typological techniques generally allows precise reconstructions of the historical development of the urban landscape. The expansion of the isthmus area of Auckland consists of four morphological periods: pioneer development (1840s-1880s), late-Victorian and Edwardian (1890s-1900s), inter-war (1920s-1930s) and early post-war (1950s-1960s). Each period has been characterized by distinctive design and planning ideologies that have left observable material residues. Dominant building types and urban tissues characteristic of each period are shown in Figure 1.

Auckland experienced rapid growth during most of the pioneer period of some 40 years following its foundation in 1840 (Armstrong 1959; Barr 1985, p. 35). The major streets in Auckland's CBD are in a geometrical pattern. Winding streets mainly follow the coastline or reflect other topographical features (Gu 2010a) (Figure 1). Cottages which usually have a central passage and rooms on both sides were timber-framed structures with a

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gable roof and planned as a square house for a small family (Cameron 1992). Late-Victorian and Edwardian growth was characterised by the construction of streets meeting at right angles. A back-to-back plot pattern and a relatively high-density built environment characterise the ground plan. Single-storey detached villas in an eclectic architectural style that mainly combines Gothic and Italianate decorations (Salmond 1986, p. 177-182) are the basic building types of this period (Figure 1). A grid street pattern was also the major plan type in the inter-war period, but green open spaces began to be incorporated in the plan, reflecting the influence of garden-suburb ideas. A mature bungalows was usually built in wood with a low-pitched corrugated iron roof. To eliminate the housing shortage during the late 1930s (Elkink and Pringle, 2011), state houses developed from late bungalows of mixed American and English origins. The brick-and-tile hipped roof aesthetic predominated and became a solid base for government and private housing for at least two decades (Brookes 2000). All the houses were generally rectangular in plan and contained between two and five bedrooms. In the post-war period, loop roads, crescents, culs-de-sac and irregular shapes came to dominate urban layouts (Bloomfield 1967; Emami 2002, p. 224; Miller 2004) (Figure 1). The style of the early 1960s house was more akin to those of the 1950s, but there was more variation in plan forms such as L, T and shallow V shapes (Elkink and Pringle 2011).

In addition to house-building fluctuations, the adoption of new transport modes has played an important role in the formation of the urban-tissue type areas in Auckland's isthmus. Though the first trams, which were horse-drawn, commenced running in 1884, Auckland was still essentially a pedestrian city in the early 1880s (Bloomfield 1972). The development of electric tramways from 1902 coincided with the late-Victorian and Edwardian period of rapid economic and population growth (Dahms 1980), which had resulted in the creation of tramway suburbs. The further development of electric trams and the emergence of motor buses during the inter-war period stimulated expansion of suburbs. In association with the wide adoption of private motor cars and the emergence of urban sprawl, the residential accretions of the post-war period began to emerge. As result of this process, the physical structure of Auckland's isthmus comprises three types of landscape areas: a historical nucleus, belts of residential accretion, alternating with more open-grained and mixed-land use zones of inner, middle and outer fringe belts accommodating land users' spatial needs on peripheral locations (Gu 2010b) (Figure 2).

Development from the cottage to villa to bungalow is interpretable as a progression. In general, each stage in the sequence corresponded broadly to a morphological period, most obviously in the case of the villa (1890s–1900s) and bungalow (1920s–1930s). It is evident that the new building type is developed from the existing building type; and the introduced new features tend to accommodate new social and technological conditions and combined with the existing features. In particular, the layout of central corridor with four main rooms and the feature of hip roof and front veranda of a villa were inherited and developed from a cottage. The plan of bungalow remains similar to a villa but the exterior was changed, mainly the roof style and the window. Geometric street blocks and back-to-back plot pattern, with gradual decrease of density, characterise the urban-tissue type areas until the 1940s. The advent of modernism on a large scale after the Second World War, characterizing a further morphological period, is less obviously conceptualized as a progression grounded in earlier types. Modern houses and urban tissue are a pronounced departure from previous house types and urban tissues.

In relation to the identification of morphological periods, the reconstruction of the process of urban outward growth has allowed a spatial analysis of the typological process of Auckland's isthmus. Differences between buildings constructed at different times can be recognized. A recognizable developmental sequence from one morphological period to the next is evident in the study areas. The succession of the forms of dominant types of residential buildings and corresponding plan-type areas (streets and plots) have formed the urban-tissue divisions which are the basis for the understanding of the spatial configuration and regional character of Auckland's isthmus.

The study of typology relies on the identification and analysis of structural elements or a combination of structural elements of the urban landscape. Analytical techniques used

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Figure 2. Development of residential accretions and urban-tissue type areas on Auckland's isthmus. Source: Based on Gu, 2010b, p. 49-50.

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for the analysis of typological processes are not only place-specific, but also influenced by availability of requisite typological and morphological data. In an investigation of a large urban area, a study of a series of its historical ground plans (showing streets, plots and building block-plans) and local architectural and planning history normally form the basis for the understanding of both building and urban typological processes. To carry out a typological study of a division of a city – an urban precinct of neighbourhood, the concept of micromorphology, which is concerned with changes at the scale of the individual plot (Whitehand 2001, p. 106), is particularly important. This is demonstrated in the following exploration of the typological process of the central area of Parnell.

The typological structure of the central area of Parnell

The historical suburb of Parnell is adjacent to Auckland's CBD. The pioneer development of the built–up area of Parnell has been strongly influenced by its underlying topography. The main streets in central Parnell, especially Manukau Road and St Georges Bay Road, followed the high ridges. The original plots which were of various essentially

Figure 3. Streets and plots in central Parnell in the early 1840s, 1910s, 1948 and 2012.
Source: Based on Gu, 2014, p.163.

rectilinear shapes [Figure 3a] were created in the early 1840s (Di Stewart and Associates 1993, p. 12). Owing to its proximity to the city centre and the open harbour, Parnell soon became a residential area favoured by officials, churchmen, army officers and missionary families. This has resulted in subsequent land subdivisions and transactions (Gu 2014).

The built environment of Parnell underwent a period of rapid repletion and consolidation in the late 19th and early 20th centuries. Intensive plot subdivision took place in the area adjacent to Manukau Road. New streets, similar to those developed in the central area of Auckland in the same period were constructed (Gu 2010a). A back-to-back plot pattern and relatively high density of built environment characterized the ground plan (Figure 3b). Beginning in the 1870s, Mechanics Bay and St Georges Bay were reclaimed for industry, railway and port development. Electric tramways extended to Manukau Road in the early 1900s, stimulating more commercial, residential and other development.

Inter-war growth mainly took place in the areas formerly occupied by Mechanics Bay and St Georges Bay where, in addition to the expansion of the railway station yard, more industries and warehouses were located (Di Stewart and Associates 1993, p. 19) (Figures 3b and 3c). During the early post-war period, many factories and warehouses pushed out from the city centre, encroaching into residential areas (Auckland City Council 1971, 1972). The development of residential and office buildings up to six-storeys high began to change the skyline. Associated with these new developments, plot amalgamation and building replacement occurred widely (Figure 3c).

The building types in central Parnell vary greatly in age. Only two buildings – Windsor Castle Hotel and Hulme Court – built in the period of the pioneer development are extant. The classical revival style, which was widely adopted between 1860 and 1910, mainly exists in the areas adjacent to Parnell Road and Cheshire Street. Many buildings initially in residential use were single- or multi-storey detached villas. Buildings created between the 1910s and 1949, still exist widely and have a variety of architectural forms, including Arts and Crafts, Queen Anne, Spanish Mission and Californian bungalow style. Buildings constructed during the early post-war years are generally utilitarian in appearance (Gu 2014).

It is evident that the street system in central Parnell, which was almost fully developed by the 1880s (Figure 3a), remains largely unchanged today. Systematic examination of change to plot patterns and building block plans, especially plot subdivision and amalgamation, has been an important basis for the identification of seven urban-tissue type

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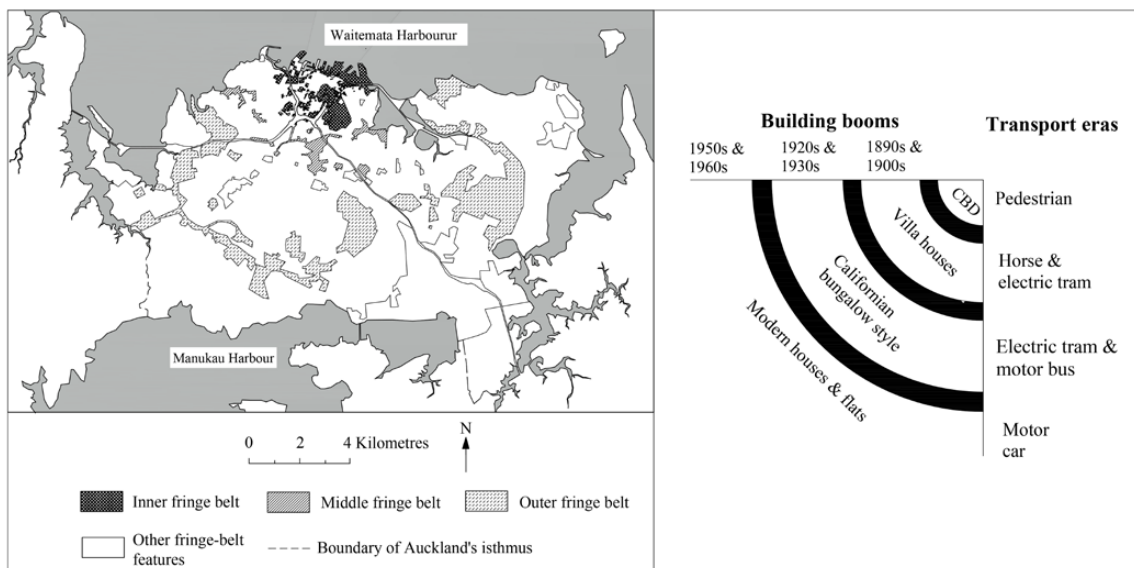
Figure 4. Urban-tissue type area in central Parnell. (1) St Georges Bay unit, (2) Parnell Road unit, (3) Denby Street unit, (4) Cheshire Street unit, (5) New housing unit, (6) Waipapa Valley unit, (7) Holy Trinity Cathedral unit. Source: Based on Figure 3 and Gu, 2014, p.165.

areas in central Parnell (Table 1 and Figure 4). Plot amalgamation and the building of modernist structures during the period from the 1950s to the 1970s mainly took place in the St Georges Bay and Denby Street units. Despite widespread building replacement, the Cheshire Street unit has largely kept its twentieth-century plot pattern. The boundaries of the urban-tissues type areas (Figure 4) conform to those of the plan units. The building type areas that were well-established by 1950 are highlighted in grey.

The succession of forms from 1840 onwards, in terms of urban tissues (ground plans and building types), reflects the development of society from its early colonial days. Identification and interpretation of urban-tissues type areas through an understanding of how places have developed over time, can not only serve as an important basis for characterising, but also managing the change to the historic urban landscapes.

Conclusion

Muratori postulates that the built environment, seen by him as an imprint of human culture, evolves similarly in successive phases, from a sequence characterized by periods of dynamic stability alternating with periods of crisis in collective codification (Gauthier 2005, p. 84).

Different tissues are the product of different stages in the development of the city. Tissues are in effect historical units, their characteristics attributable to the constraints and conditions as well as principles of design applying at the time. In general towns grow by the addition of tissues and change by the transformation of existing tissue, in part or whole (Kropf 1996, p. 726).

The logical and analytical interest of the concept of typological processes is widely recognised by researchers of the Muratorian school. However, it has been slow in receiving systematic empirical substantiation and its full potential for planning is still to be unveiled. By providing empirical evidence from Auckland, New Zealand, this paper illustrates that the typological approach is capable of explaining the changing urban form and suggesting possible directions for future adaptation and change.

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The delimitation of urban-tissue type areas is largely derived from the reconstruction of the process of urban growth and change. In the investigation of Auckland's isthmus, identification the plan-type areas and basic building types provide a basis for the analysis of the typological process. In the case of central Parnell, where the street system was almost fully developed by the 1880s and remains largely unchanged today, plot metamorphosis and building block-plan changes are important objects of the typological investigation. The concept of micromorphology, which is concerned with changes at the scale of the individual plot (Whitehand 2001, p. 106), is particularly important for the identification of urban tissues. Cartographic methods of identifying urban form divisions that recognize a spatial mixture of different period types and styles as a result of the dynamics of historical-geographical development, are essential for typological analysis.

The built environment can be seen as an accumulation of past experimental results and the refinement of practical solutions (Kropf 2011). Current urban development control, mainly concerned with land uses and building details, tend to be reactive and ineffective in guiding positive management of change to the historical urban landscape. And planning policy has not addressed some of the most defining and persistent landscape elements of the city (Gu 2014). Rooted in an understanding of the built environment as a dynamic rather than a static entity, typological analysis provides a framework for articulating the planning objectives and corresponding management.

The links between the typological and geographical-morphological thinking which are both concerned with the structure of urban form require more research. In particular, the idea of urban morphological regions is used by urban morphologists for distinguishing and characterizing urban landscape divisions and their hierarchical relations between them. Based on the differential persistence of form complexes in the historical landscape, the idea of urban morphological regions emphasises the principle of morphogenetic priority which is less articulated in typological thinking. To develop a more integrated approach to creating and managing the urban landscape, a comparative study of the ideas of urban tissues and urban morphological regions merits research attention.

References

Ashford, J. (1994) *The Bungalow in New Zealand* (Auckland, NZ, Viking).

Auckland City Council (1972) *Parnell Planning Proposals: A Report Subsequent to the Parnell Preliminary Report – 1971* (Auckland, Auckland City Council).

Auckland City Council (1999) *The District Plan – Isthmus Section* (Auckland, Auckland City Council).

Auckland City Libraries (2014) *Maps online* (http://www.aucklandcitylibraries.com/teachyourselfskills/eresourceguides/mapsonline.htm) accessed June 8.

Barr, J. (1985) *The City of Auckland, New Zealand, 1840-1920* (Whitcombe and Tombs, Auckland).

Bloomdield, G. T. (1967) 'The growth of Auckland 1840-1966.' in J. S. Whitelaw (ed.) Auckland, *Ferment*, a special publication of New Zealand Geographical Society, miscellaneous Series No. 6, Auckland, New Zealand, *New Zealand Geographical Society*,1-21.

Caniggia, G., and G. L. Maffei. (1979) *Composizione architettonica e tipologia edilizia I: Lettura dell'edililizia* (Marsilio, Venezia); Caniggia, G. 1984 'La didattica e il pensiero di Saverio Muratori' In Montuori, M. (ed.) *L'insegnamento di Saverio Muratori* (Istituto Universitario di Architecttura di Venezia, Venezia) 11.

Caniggia, G., and G. L. Maffei. (2001) *Architectural Composition and Building Typology: Interpreting Basic Building* (Firenze: Alinea).

Cataldi, G., G. L. Maffei, and P. Vaccaro. (2002) 'Saverio Muratori and the Italian School of Planning Typology', *International Seminar on Urban Form* 6 (1): 3-12.

Cameron, S. (1992) *A History of Villa Renovation in Auckland*, Thesis (BArch), University of Auckland.

Conzen, M. R. G. (1960) *Alnwick, Northumberland: a Study in Town-plan Analysis*, Institute of British Geographers Publication no. 27 (London, George Philip).

Conzen, M. R. G. (1969) *Alnwick, Northumberland: A Study in Town-plan Analysis*, 2nd edn., Institute of British Geographers Publication no. 27 London: Institute of British Geographers.

Elkink, A., and T. Pringle. (2011) *Renovate: 1940-1960s* (Porirua, N.Z., BRANZ).

Gu, K., Y. Tian, J. W. R. Whitehand, S. Whitehand. (2008) 'Residential building types as an evolutionary process: the Guangzhou area, China', *Urban Morphology* 12(2): 97-115.

Gu, K. (2010a) 'Urban morphological regions and urban landscape management: the case of central Auckland, New Zealand', *Urban Design International* 15(3): 148-164.

Gu, K. (2010b) 'Exploring the fringe-belt concept in Auckland: an urban morphological idea and planning practice', *New Zealand Geographer* 66(1): 44-60.

Gu, K. (2014) 'From urban landscape units to morphological coding: Exploring an alternative approach to zoning in Auckland, New Zealand', *Urban Design International* 19 (2): 159-174.

Kropf, K. S. (1996) 'An alternative approach to zoning in France: Typology, historical character and development control', *European Planning Studies* 4(6): 717-737.

Kropf, K. S. (2001) 'Conceptions of change in the built environment', *Urban Morphology* 5(1): 29-42.

Kropf, K. S. (2011) 'Coding in the French planning system: from building line to morphological zoning', in S. Marshall (ed.) *Urban Coding and Planning* (London, Routledge) 158-249.

Maretto, M. (2012) 'The early contribution of Saverio Muratorxi: between modernism and classicism', *International Seminar on Urban Form* 16(2): 121-132.

Muratori, S. (1950) 'Vita e storia delle città', In *Rassegna critica d'architettura*, 11-12: 3-52.

Muratori, S. (1959) 'Studi per una operante storia urbana di Venezia. I', Palladio: 3-4 (2nd end, 1960, Istituto Poligrafico dello Stato, Roma); Maretto, P. 1960. 'Studi per una operante storia urbana di Venezia. II. L'edilizia gotica veneziana', *Palladio* 3-4: 123-201 (2nd edn, 1961, Istituto Poligrafico dello Stato, Roma); (3rd end, 1978, Filippi, Venezia).

Muratori, S., and Cataldi G. (1984) *Saverio Muratori, Architetto (1910-1973): il pensiero e l'opera = The Thought and the Work* (Firenze: Alinea).

Muratori, S., and Cataldi G.. (1991) *Saverio Muratori, Architetto, (Modena, 1910-Roma, 1973): il pensiero e l'opera: the thought and the work: mostra itinerante* (Rístampa

ampliata. ed.)(Firenze, Alinea).

Rossi, A., and J. Regan. (1983) *Aldo Rossi: Selected Writings and Projects* (London, Architectural).

Salmond, J., and J. Hansen. (2009) *Villa: From Heritage to Contemporary* (Auckland, N.Z., Godwit).

Samuels, I. (2008) 'Typomorphology and urban design practise', *Urban Morphology* 12(1): 58-62.

Samuels, I., and L. Pattacini (1997) 'From description to prescription: reflections on the use of a morphological approach in design guidance', *Urban Design International* 2(2): 81-91.

Stewart, D. (2002) *The New Zealand Villa: Past and Present* (Auckland, N.Z., Viking Pacific).

Whitehand, J. W. R., K. Gu, M. P. Conzen, and S. M. Whiteahnd. (2014) 'The typological process and the morphological period: a cross-cultural assessment', *Environment and Planning B: Planning and Design* 41(3): 512-533.

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A 'socio-building' reading of the Valle d'Itria's landscape

Nicola Scardigno
DICAR, Department of Civil Engineering and Architecture, Polytechnic of Bari, Italy
Department of Architecture, University of Roma 3, Rome
Keywords: landscape, *Valle d'Itria*, socio-building analysis, scalar components

Abstract

This essay focuses on the Valle d'Itria landscape, a sub-region of central Apulia. Here a long and arduous process of civilization occurred over the years has culminated in the emergence of an agricultural society which has shaped this landscape in such a way that the urban and the rural environment are synthesized. Within this essay I will investigate this synthesis by analysing the Valle d'Itria landscape according to different levels of complexity: elements (architectural organisms), structures (urban aggregates, urban organisms, rural aggregates and rural settlements), systems (settlements, routes and productive activities), and organism (the landscape itself). Such an analysis will be introduced by reflecting on a theoretical-logical method that tends to attribute a temporal-structural dimension to the territory and consequently to the landscape. In fact by referring to studies developed since the 1960s by the Italian architects Saverio Muratori and Gianfranco Caniggia, I will attempt to provide an idea of the territory as a living organism whose structure is determined by the anthropic process that has occurred throughout history. Aware that contents will emerge from this research could be interpreted in several ways, and that each of the levels of complexity of the Valle d'Itria landscape would require a more in depth analysis, this study has mainly the purpose to demonstrate how the aesthetic data of this landscape is the result of anthropic interventions which, conceived on different scales interconnected each other, bind living and working places with the countryside.

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Introduction

This essay must be considered as an attempt to finalize the initial step of an in progress research concerning the study of the *Valle d'Itria* landscape (Apulia region, south Itlay). Through the tool of a socio-building reading of the *Valle d'Itria* landscape's scalar components, such writing invites to reflect on an analysis method finalized towards an organic knowledge of a peculiar landscape reality. The *Valle d'Itria* in fact expresses a microlithic culture, where the dense agrarian fabric is characterized by the presence of terraces, *parieti* (fencing walls), *a trullo* and *a pignon* constructions, haystacks, *jazzi* (fenced areas for animals), water tanks and *masserie* (farm). All forms of architectures that beyond expressing the Mediterranean agro-pastoral civilization, demonstrating the skill of the Apulia farmer/builder who, as member of the local civil society, represented the real "maker" of this landscape.

Definition of a method based on a historical and structural vision of the landscape

"In our mind the landscape is something stationary and suspended, with motionless forms and crystallized images, i.e. a collection of shapes captured and fixed in a perpetual moment. This is because our idea of landscape is linked to the concept of the painting which sets out a moment of the landscape's life, in the same way that photography does. But the landscape interpreted in this way is a given landscape, a landscape which has reached its time, one of its infinite moments, the result of many previous moments, and so of all its past life: an infinitesimal moment in which all the earlier moments are sedimented, and in that sense each landscape is essentially a concretion of events, a set of footprints, of memories". (Turri, 1974)

Essentially what the Italian geographer Eugenio Turri reveals in the above quote is the need for a dynamic interpretation of the landscape. This interpretation goes beyond emotional approaches which consider the landscape as a single frame and rather tends to attribute to the landscape a fourth dimension: the temporal dimension. The landscape then need to be considered as the result of anthropic dynamics developed over the *longue durée* (Braudel, 1958), i.e a reality anything but static comparable to a sort of civil palimpsest upon which man, as a protagonist of his culture, has recorded his phases of civilization. Not one of these single phases of the landscape can be neglected since each phase tends to metabolize in each following phase technologies, typologies and shapes belonging to the previous phase.

In addition to associate to the landscape the idea of "design", it is fundamental to be able to recognize and critically interpreting historical phases recorded in the landscape, especially if the "design act" is aimed to give continuity to the transformation process occurred over the years, rather than appears as a purely empirical act. Furthermore in order to correctly interpreting the binomial between landscape and design, it is important to consider the landscape as a "formal structure of history" - *struttura formale della storia* (Petruccioli, 2009) - i.e. as a space logically structured on the base of a dialectic relationship - historically determined - between soil morphology, routes, settlement systems and productive activities. Once established the need to analyze the landscape according to its historical and temporal dimension, this essay essentially focuses on the socio-building study of the *Valle d'Itria* landscape, that is the analysis of those scalar components (precisely buildings and respective social forms) which are indicative of different levels of complexity of the landscape itself: elements (architectural organisms), structures (urban and rural aggregates and rural settlement), systems (settlements + routes = agrarian morphology), and organism (the landscape itself). These scalar components are investigated using an intellectual tool: the concept of "type". It is a concept which expresses the sum of physical characters common within a geographical context and inherited in the form of process. Being also expression of a dynamic concept, it synthesizes the characteristics of previous types and represents the forerunner for all subsequent types. Specifically within this essay the concept of type is extended to the *Valle d'Itria* landscape. Such a typological approach leads to perceive the entire landscape in the form of a sci-

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Figure 1. Double entry chart showing the method of socio-building reading of the Valle d'Itria landscape's scalar components.

SCALAR COMPONENTS	"BUILT ENVIRONMENT" DEGREES OF COMPLEXITY		CIVIL SOCIETY DEGREES OF COMPLEXITY	
ELEMENTS	urban / rural environment — architectural organism "a *trullo*" construction & "a *pignon*" construction		urban / rural environment — farmer and his family	
STRUCTURES	**urban** environment — aggregates with a *trullo* typology & with "row house" typology — Urban Organism	**rural** environment — aggregates casale - contrada & settlement *masseria*	**urban** environment — neighborhood units/community — urban community	**rural** environment — productive community
SYSTEMS	urban / rural environment — settlement systems (urban and rural environment) — routes system = system of the agrarian morphology — terracings, inter-crofting paths marked by dry stone walls, rural habitat typologies - trulli, aggregates (casale and *contrada*), settlement (*masseria*)		urban / rural environment — rural / urban community	
ORGANISM	urban / rural environment — landscape as complex form of architecture (type of landscape)		urban / rural environment — local civil society	

entific and rational data, questioning any purely aesthetic perception of the landscape itself. The double entry chart (Figure 1) shows on the ordinate axis the scalar components of the *Valle d'Itria* landscape - elements, structures, systems and organism, with this latter corresponding to the entire landscape itself. Instead different degrees of complexity of the entire built environment and local civil society are indicated on the abscissa axis.

The method of the "gradual" reading represents a systematic means to analyze a landscape reality through the acquisition of "scalar facts" which are interdependent each to other (Cataldi, 1977). Therefore starting from single "building type" within the landscape, the aim is to understand interconnections between different levels of complexity of anthropic acts contained within the landscape itself.

The reading of the *Valle d'Itria* landscape's scalar component has been essentially developed through the re-elaboration of the graphical material contained within Luigi Mongiello and Giorgio Simoncini books, and on the base of the I.G.M. chartography.

Reading of the four "scalar components" of the Valle d'Itria landscape

1st scalar component: Elements

A *trullo* and a *pignon* buildings represent the first scalar component of the *Valle d'Itria* landscape. These buildings types, which originally were built using the dry construction technique, are representative of housing and productive activities, both in the urban and in the rural context.

The analysis of the first level of complexity of the *Valle d'Itria* landscape starts by analyzing the typological process of the *a trullo* architecture, from the "base type" up to the preliminary multi-cellular assemblies which mainly maintain a residential function (Figure 2) – previous to the *masseria* type. Regarding technological and bioclimatic issues, although strongly related to the definition of the building type, it is possible to refer to the already abundant literature on this subject.

1st phase – Formation of the base type as "polar" building

The base type consists of a mono-cell building with a circular plan (a) having a diameter between 2-4 meters. It initially developed in the rural environment and is locally called *casedda*. This elementary matrix from which more complex building types derived, responds to the farmer's need for a shelter in which to rest during the day, to store work tools, to lay the harvest, and possibly to stay during periods of intense work. The base type with square plan (b) must be assumed as the first variant of the base type with circular plan. Such a variant demonstrated the first critical choice towards a more mature geometry which would allow the farmer to experiment with the thickness of the wall.

2nd phase – Beginning of the base type mutation

When the base type starts to be used properly as a residence, the interior space of the cell is vertically divided by means of a timber loft used for storage, and is dilated through niches and alcoves into which basic furnishing elements or fireplaces are inserted (c, c1). Such mutations, even when expressed in a more sophisticated manner, as shown by the two symmetrical alcoves in the example (c2), do not yet affect the outer envelope of the building.

3rd phase - Configuration of the cell as an "axial nodality"

The evolution of alcoves - which become more articulated in the plan and are covered with a barrel vault - led to an alteration of the internal space homogeneity and of the construction external envelope, both at the base and at the covering level. In the examples (d) it can be seen how the cell plays the role of axial nodality because it is placed where the two axes - which go from alcove to alcove and from entrance to alcove - intersect each other. Essentially, this phase where alcoves are almost configured as autonomous entities within the overall layout, expresses the family's practical need to specialize spaces and functions within the house. In this way a hierarchical system rooted in the binomial between nodal spaces and services spaces is defined. This binomial represents the reading key for interpreting the following multi-cellular assemblies.

Multi-cellular *a trullo* typology developed on the territory of the *Valle d'Itria* in parallel with the phenomena of ruralization. Such phenomena, which was encouraged by the local practice of long-term leasing, gave to the farmer the opportunity to become, with just a minimal annual fee, the owner of a piece of land. In fact the transition from laborer to landowner led the farmer and his family to gradually inhabit the countryside and, through the whole family's sacrifice and hard work, to transform the original rocky piece of land into very intensely cultivated land (Simoncini, 1960). The need to reside permanently on the field led the farmer to experiment with more comfortable living/working architectural solutions based on the assembly of more *trulli*: two, three, four and more cells, up to pre-figure the typology of the *masseria* - a farm which will be analyzed in the next scalar component.

4th phase - Typology with double cell (residential function)

The *a trullo* double cell typology basis on a hierarchical relationship between the main cell with the entrance and a functionally and morphologically subordinate service cell. In the case of the doubling of the circular plan cell, both the units seem to be juxtaposed and communicating with each other. Both the cells can be individually perceived (e), or in the attempting to define a more organic solution, these can be incorporated within a unique base from which two conical roofs emerge (e1). Even in the case of cells with a square plan, the doubling basically occurs in two ways: either by adding another cell behind the main cell (e2) - in this way strengthening the main entrance's axe which is indicative of a way of using the internal space - or through lateral doubling of the main cell (e3). In both cases, the cell on the back or the one on the side, are both subordinate to the main cell.

5th phase - Typology with three cells
The assembly of three cells leads towards two different uses of the interior spaces:
linear and consecutive: main cell - 1st service cell - 2nd service cell (f,f1); or centralized: where from the main cell direct access to each of two services cells is guaranteed (f2,f3). These latter examples which emphasize the nodal role of the entrance cell, introduce the typology of the so called *Villino Fasanese*, which was mainly used by the farmer as a seasonal rural residence especially during the harvest period. It generally consists of three circular cells linearly distributed along the transverse axis in relation to the entrance (f4). Sometimes within this typology it is possible to find a further unit, a sort of alcove, placed on the entrance's main axis and directly communicating with the central cell (f5). The presence of a roundish perimeter containing all cells, singularly identifiable from outside only by the conical covering, increases the organicity of such typology.

6th phase – Assembly of four and more cells and expansion of the nodal cell
This phase sees the initial separation between residential and working functions. Two are basically the consequence of this distinction: cells are equipped with an independent entrance, and the nodal space of the entire cells aggregation increases its dimension with respect to the other cells.

These two aspects can be noticed by analyzing some plans and elevations:
- a linear development of the cells, where the main cell is about 1.5 times bigger than the other cells and occupies an anti-nodal position, that is a peripheral location with respect to the nodal cell (g);
- an extension of the previous layout by introducing cells having productive functions and then independent entrances: (g1), the addition of an independent cell to the corner of a linear layout, where the main cell occupies a nodal position within the plan; (g2), potential external overturn of cells, with the main cell which occupies an anti-nodal position within the entire layout;
- an increase in the dimensional hierarchy between the nodal cell and the lateral row made of three service cells, each of them approximately ¼ of the main cell size: two of them have an entrance that directly opens onto the nodal space, while the third one has an independent entrance from outside (g3).

The example (g3) seems to introduce the multi-cellular typology with tripartite plan. This typology is essentially developed in two solutions: with a serial assembly of six cells equal in form and dimension – two of them aligned along the entrance's axe (g4); and with a central bay that plays the role of a large nodal space which directly leads to four lateral cells ¼ smaller then the nodal space size (g5).

A further degree of complexity for this typology can be seen in example (g6): here both the central nodal space and some lateral cells have niches, and also there is a further important entrance along one of the two shorter sides. From outside it can be noticed how all units are contained within a parallelepiped base from which only conical roofs emerge. It manifests the achievement of a high degree of organicity of the *a trullo* residential type.

About the *a pignon* typology, considering its rectangular plan and the absence of an internal dogmatic division, it is an architecture that meets different functions: in fact in a primordial stage, it was used both as a residence and support for agricultural activity. By analyzing the typological evolution of the *a pignon* construction, four main phases can be identified (Figure 2):

1st phase - Formation of the base type (about 4x12 metres)
A longitudinal plan with a truss timber covering. Here all four walls have a load-bearing function (h).

2nd phase - Mutation of the covering system
Replacing of the truss timber covering with the barrel vault - use of mortar. Consequently the hierarchy of the wall's static system changes: longitudinal walls have a load-bearing function, while transversal walls have a curtain wall function (h1).

The location of the *a pignon* cell in the rural environment led to the first mutation of the base type which increases longitudinally in order to adapt to cattle breeding (h2).

3rd phase - Spatial articulations of the interior space (proportioning of the cell's height and width)

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Figure 2. Scheme which synthesize the typological process of the architecture within the Valle d'Itria landscape.
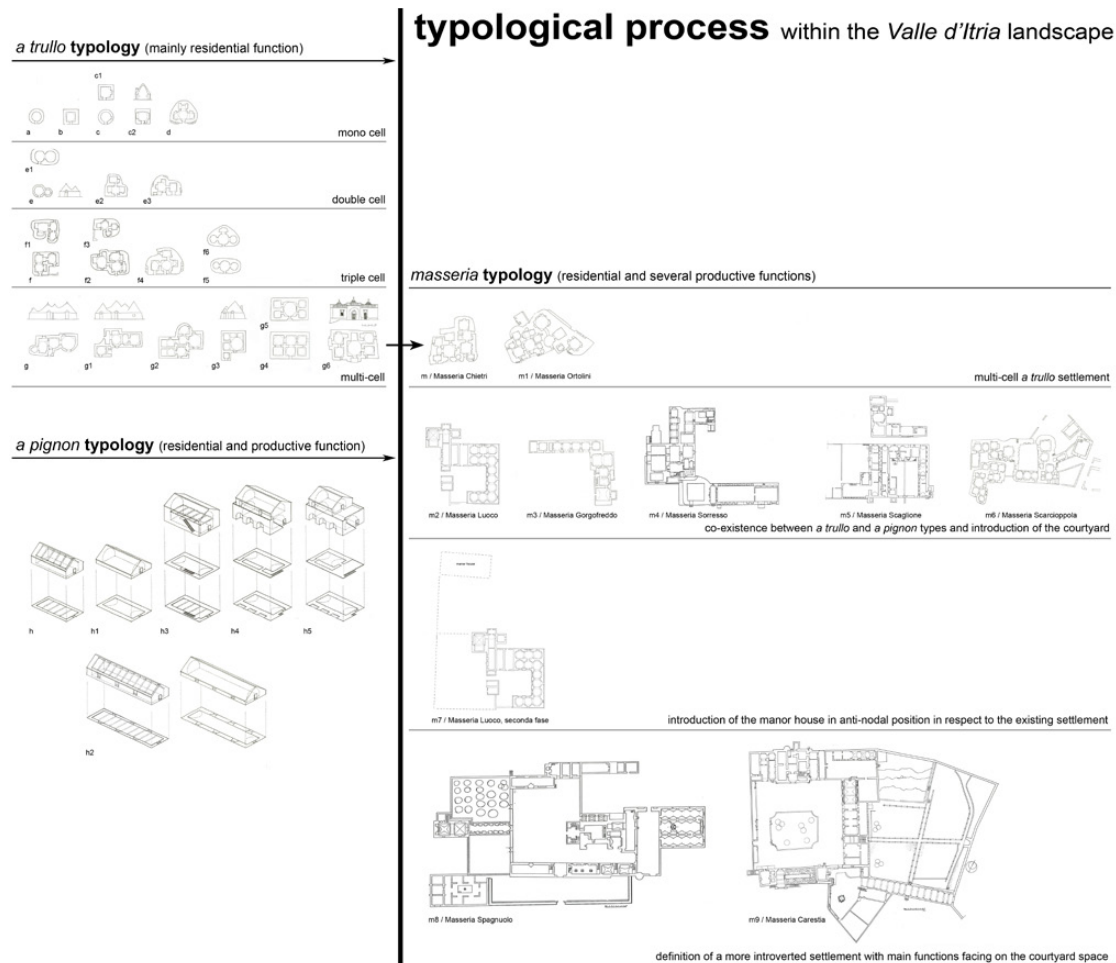
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The change of the covering system leads to experimenting with the vertical division of the interior space by means the introduction of a timber loft and a staircase. This staircase can be external or inserted inside the longitudinal walls' thickness (h3).

4th phase - Vertical doubling of the base cell

Having experimented with the possibility of using the vertical interior space of the elementary cell, the entire cell is now vertically doubled. Basically two different compositional solutions derive from that cell doubling: by means of the juxtaposition of an arched portico along the longitudinal wall of the ground floor cell, a long and narrow balcony is formed in order to provides an access to the above cell (h4); while by setting back the above cell's transversal wall, a small lodge along the short side of the building is obtained (h5).

2nd scalar component: Structures

The second scalar component of the *Valle d'Itria* landscape concerns aggregates i.e. those structures of elements both developed in the urban and rural environment.

The analysis of the aggregate in urban environment focuses on the Alberobello city, and specifically on *Rione Monti* and *Aja Piccola*, two districts which develop on the sides of an orographic depression of the town. Here the *a trullo* typology - both as the "leading type" or in the form of its "synchronic variants" (Caniggia, Maffei, 2001) - represents the architectural expression of a social class which thought in unison. Both these districts are the formal expression of needs deriving from housing and working activities mainly related to the processing of agricultural products.

city as organism | new visions for urban life

Figure 3. *Rione Monti* and *Aja Piccola* in Alberobello / Assembly of *a trullo* house.

a

b

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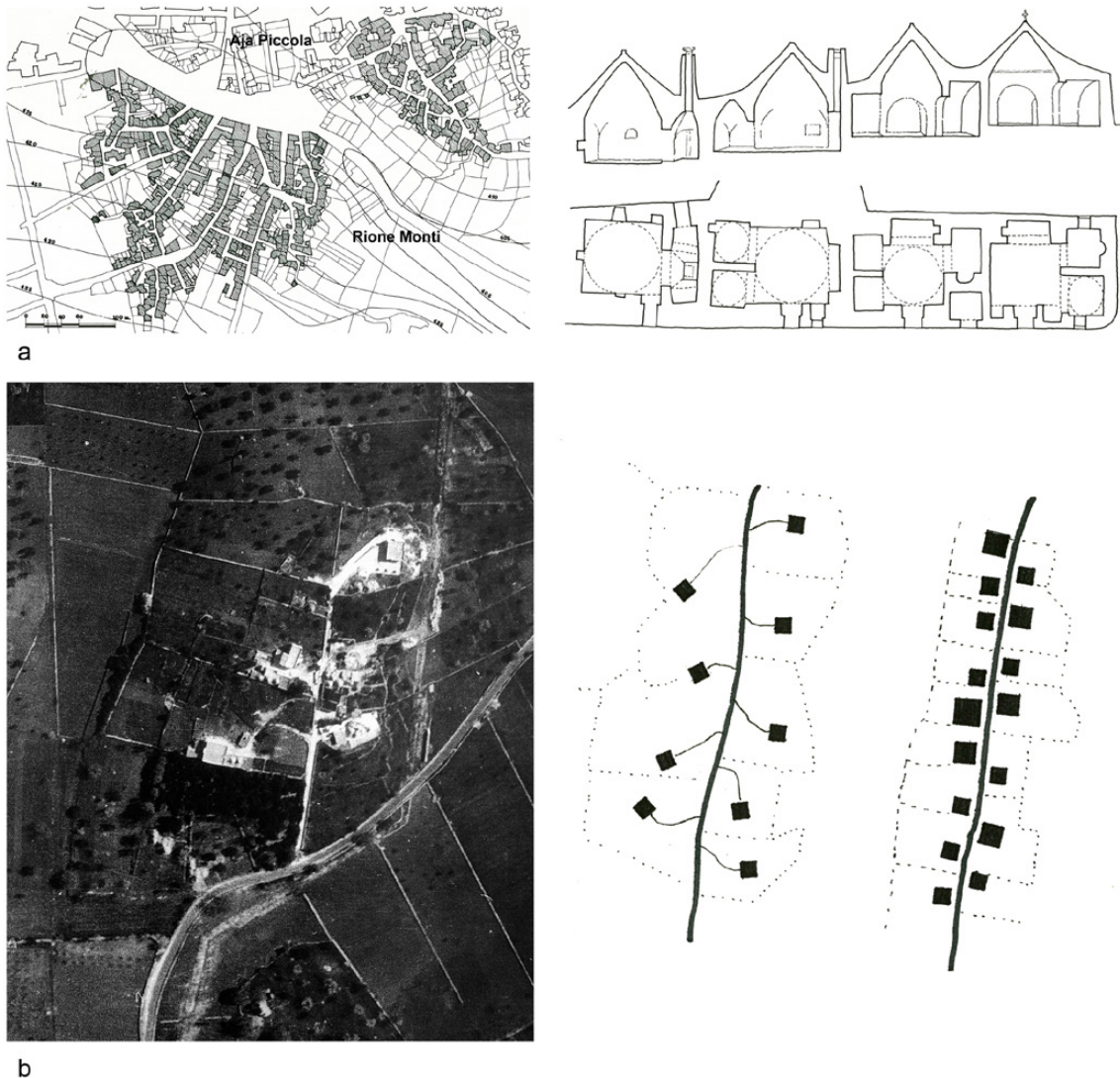
Here in fact, the farmer's family represents the "sociological type" (Maretto P., 1980) which is reflected in the *a trullo* type, that is the concept of house historically stated within Alberobello's local community in the form of a collective shared project. Basically, in both districts the assembly of *a trullo* houses occurs linearly along the public space of urban routes - running north-south and perpendicular to the contour lines, in such a way that allows rain water to be channeled towards the natural depression. The houses also communicate with the semi-public space of a common courtyard internal to the urban block. This courtyard - locally called *aia* - was the place where farmers processed agricultural products. (Figure 3a)

Despite the presence of blocks with large internal courtyards, both districts have very dense fabrics which are characterized by a sense of socio-building homogeneity: a characteristic synthetized by the concept of "neighbourhood unit". This is a concept which basis on the binomial between the farmer's family (representative of a social homogeneity) and the *a trullo* house (expression of a building type homogeneity), and that informs the aggregate representative of a domestic urban dimension which mediates between the *a trullo* house and Alberobello's urban organism.

Both the *casale* that the *masseria* represent forms of aggregates which have bridged the social need to live and work in the rural environment. Compared to some elemen-

tary rural settlements developed during the Norman period, the medieval *casale* must be conceived as an urbanized outpost generally consisting of 50-100 houses - with some minimal collective services - and based on a mixed economy: agricultural, pastoral, craft and commercial. By living in these kind of proto-urban aggregates, the farmer increased his operational capability by reducing time for reaching his workplace - the field - since they were very close to the residential aggregate (Licinio, 1981). Between fifteenth and eighteenth centuries, some *casali* evolved into urban centres, while others reborn in the form of hamlets, locally called *contrade*. These are residential aggregates conceived according to the neighbourhood dimension, and structured by a built-up route configured as a "matrix route" of each aggregate. (Figure 3b)

Unlike the residential character expressed by the *contrada* type, the rural settlement of the masseria has always been representative of a productive community - agricultural and breeding.

Within the *Valle d'Itria* landscape, the *masseria* typology expresses a settlement concept characterized both for different building types adopted (mainly *a trullo* and *a pignon*), and for its different compositional principles. Despite these distinctions, there are some typical functions that are common within Apulian *masserie*: dwelling spaces, spaces for general services, spaces for supplies and manures, spaces for animals, spaces for working and processing agricultural products, spaces for the storage of agricultural products, space for the storage of livestock products (Mongiello, 2002). The *masseria* evolution occurs from the fifteenth to the nineteenth century and the *a trullo* multi-cellular typology - above described - represents the beginning of this evolutionary process (Figure 2). Essentially the *a trullo* multi-cellular typology developed when the farmer started to settle permanently within the countryside and it is characterized by the fact that residential and productive functions begin to coexist within the same organism. Both *Masseria Chietri* (m) and *Masseria Ortolini* (m1) must be read in continuity with this typology, in fact here a further degree of functions specialization - accompanied by the increase of independent entrances - it can be noticed.

The transition from the *masseria* as a multi-cellular organism to a real form of rural settlement starts both with the integration of the *a trullo* and *a pignon* types within the same layout, and with the introduction of the courtyard space. This latter is conceived to pro-

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Figure 4. Example of the *contrada* view from the top / Two examples of the *contrada* aggregate.

vide accommodation for animals and to allow the processing of agricultural products. From a compositional perspective, the courtyard plays the important role of nodal space within the settlement, because of its capability to distribute functions around itself.

By preserving the rural architectural language, until the eighteenth century the *masseria* settlement developed with greater or lesser organicity degrees, depending on how different functions - and thus architectural elements - were mutually arranged. For example, the original U-shaped layout of the *Masseria Luoco* (m2) with an *a trullo* square cell and an *a pignon* longitudinal cell arranged around the courtyard space, shows a lesser organicity degree than the *Masseria Scarcioppola* (m6). In fact in this latter, the arrangement of the *a trullo* buildings is such to configure a more hierarchical settlement both in terms of forms and functions. Between these two extreme layouts lies the *Masseria Scaglione* (m5) with *a pignon* cells interpreted and assembled to form a U-shaped layout around the courtyard space, and *masserie Gorgofreddo* (m3) and *Sorresso* (m4), whose *a trullo* and *a pignon* constructions - specialized in terms of function and dimension according to their position within the whole settlement - form an L-shaped layout.

At the beginning of the eighteenth century, landowners in the form of entrepreneurs moved their permanent residences to the country in order to oversee their lands. In this stage the manor house was integrated into already existing settlements whose internal hierarchies were altered due to two main reasons: firstly because the manor house, despite the location in the rural context, conserved the typical architectural language of the urban palace; secondly because the manor house occupied an independent position in relation to the working nuclei. These nuclei, whose rural character was preserved by the presence of *a trullo* and *a pignon* types accommodated the farmer's house. Such stage of integration between the manor house and existing settlement can be seen both in the *Masseria Luoco* (m7) and the *Masseria Tagliente*. Only those *masserie* that Mongiello compares to real "urban embryos" demonstrate an ultimate level of organicity and a homogenized architectural language (2002). *Masserie Spagnulo* (m8), and *Carestia* (m9), for example, are certainly configured as settlements where working and residential functions - including the manor house - face completely inwards on a single large central courtyard which represent at the same time, the core of the whole composition and a piece of landscape within the entire settlement.

3rd scalar component: Systems

By analysing historical and recent chartography, it can be noticed how the overall routes system of the *Valle d'Itria* has progressively developed up to configure a polycentric radial system from which secondary and tertiary orders of routes branch out. This hierarchical system of routes essentially represents the framework of the agrarian morphology, whose built character derives from the presence of cultivated fields in the form of terraces, inter-crofting paths marked by dry stone walls, and rural building typologies such as *a trullo* and *a pignon* architecture, and typologies of aggregate such as *contrade* and *masserie*. (Figure 4)

The strongly anthropic character of such agrarian morphology invites to think about the functional role played by the single architectural element within the *Valle d'Itria* landscape: it is not conceived in the form of a monument as a benchmark, but rather as a dynamic entity capable of performing and enhancing functions for which it was conceived. Therefore, it is an architecture which represents both rural and urban community in a synthetic form, because it encodes construction techniques, compositional forms and an architectural language.

Conclusion: recognizing of the 4th scalar component. The *Valle d'Itria* landscape as Organism

The analysis of elements, structures of elements and systems of structures of *Valle d'Itria* landscape has basically allowed to recognize how the work of a local civil society has been able to define a "cultural area" (Caniggia, Maffei, 2001) and consequently a form of "local landscape" (Guidoni, 1980). That is a landscape which is configured as a sort of

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strongly anthropized "microcosm" or, as Cesare Brandi says, as a "countryside planned as a city" (1979), where the agricultural activity has been, and probably still would be, the only economic activity able to guarantee the sustainability, and then the real meaning, of that landscape.

Now, on the base of recent consideration and regional plan concerning the conservation of this landscape - see directives of Apulia's PPTR - there is a question that should be answered, if the real aim is that to actively protecting this landscape: by recognizing to social and economic values the capability to transform, for better or for worse, a landscape reality, is it today possible to re-evaluate benefits of the agricultural activity within *Valle d'Itria* landscape by experimenting with new form of housing and agricultural production?

References

Bertaux, E. (1899) 'Etude d'un type d'habitation primitive : trulli, caselle e specchie des Pouilles', *Annales de géographie*. t. VIII, n. 39, 207-230.
Brandi, C. (1979) *Pellegrino di Puglia* (La terza, Bari).
Braudel, F. (1958) 'Histoire et Sciences sociales: La longue durée', *Annales. Économies, Sociétés, Civilisations*, 13e année, n. 4, p. 731.
Caniggia, G., Maffei, G.L. (2001) *Architectural composition and building typology. Interpreting basic building* (Alinea, Firenze).
Cataldi, G. (1977) *Per una scienza del territorio* (Alinea, Firenze).
Guidoni, E. (1980) 'Il paesaggio locale. Nota di dimensione storico-antropologica dell'ambiente', *Rassegna di Architettura ed Urbanistica*, n.47/48, 96-97.
Licinio, R. (1981) L'organizzazione del Territorio fra XIII e XIV secolo, *C.D. Fonseca. La Puglia tra Medioevo ed età moderna. Città e campagna*, p. 247.
Mongiello, L. (1992) *Trulli e costruzioni a pignon* (Adda, Bari).
Mongiello, L. (1999) *Nuclei urbani di Puglia* (Adda, Bari).
Mongiello, L. (2002) *Masserie di Puglia* (Adda, Bari).
Petruccioli, A. (2007) *After Amnesia. Learning from the Islamic Mediterranean Urban fabric* (Tipo-litografia Grafica&Stampa, Altamura).
Petruccioli, A., Spada, A. (2009) *Struttura del paesaggio murgiano. Puglia e Corfu': comparazioni tipologiche e morfologiche per la conoscenza e valorizzazione dei beni culturali e paesaggistici della regione mediterranea basso adriatica*, 29-44.
Turri, E. (1974) *Antropologia del Paesaggio* (Marsilio Editore, Venezia).

New forms of the urban space in relation to nature. A didactic experience for the city of Monopoli

Anna Bruna Menghini
Dipartimento di Scienze dell'Ingegneria Civile e dell'Architettura (DICAR)
Politecnico di Bari, Via Orabona 4, 70125 Bari, Italy
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Abstract

The loss of the boundary between city and countryside and the presence of large voids and fragments of nature in the city, if reinterpreted with type-morphological grammars, could constitute the basis to gain a renewed organic feature of the contemporary city and redefine an alternative form for the compact city.

A recent teaching experience carried out at the Design Laboratories of the Architecture Faculty in Bari has chosen the city of Monopoli as a paradigmatic case study to test new models of urban space in relation to nature. Monopoli has a very clear forma urbis, which it developed during the time in relation to the natural morphology of the coastline, but that went into crisis in the contemporaneity. In the historical town it is possible to find some characteristics conditions of coastal centers of Puglia, typical ways of interpreting the relationship between the natural forms of the coast and the settlement forms. In the Laboratories these spatial models have been assumed as the key issues for the design: the coast that stretches over the sea with a promontory, interpreted through the themes of the podium, the belvedere, the muraglia, the bastion; the coast that houses the sea with a bay, becoming a water square on which the compact city overlooks; the coast linearly in front of the sea, interpreted through the themes of the palazzata and the riviera; the reinterpretation of the peri-urban and rural textures and the lama-cala systems.

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Introduction

The link between the forms of human settlements, geographic features and morphologies of the land, is constantly present in the history of civilizations. This relationship has always characterized territories and has guided their transformations. Every civilization has elected typical places to settle, corresponding to housing forms just as typical that have interpreted and exalted their original features: the Greek, Etruscan or Roman landscape and the Italian Renaissance landscape are paradigmatic examples of this good alliance between nature and architecture. Every culture has constructed and represented his landscape attributing an architectural value to the forms of the earth through the primary acts of crossing, delimiting, resting, digging, plowing, protecting, measuring, sighting, triangulating.

The attention to the morphology of the physical substrate for the construction of urban and architectural forms has consistently given an organic balance of the territory, as the human activities practiced on it in accordance with its natural shape were the most logical, economical and sustainable, opposing less resistance to its original structure. But the relationship between land and settlement forms has deeply fallen into crisis in the contemporary world. New settlements are generally based on indifferent logics to the physical forms of the substrate which receives them and, therefore, of the logic of settlement that would be typical of those places. This caused the loss of form and legibility of the contemporary city, evident in the chaos of the suburbs expansion. The incongruous positioning of buildings on a basis interpreted as a neutral plan, a "tabula rasa" easily reshaping for a bigger exploitation, has caused the crisis of forma urbis and the loss of characterization of urban space.

Because of the crisis of the compact and closed city model in favor of open and spaced out systems, the theories and urban projects of the twentieth century attempted to interpret the phenomenon of the loss of the limit between city and countryside and the presence of large voids and fragments of nature in the city, looking for a new urban aesthetic. But the attempt did not give satisfactory results, perhaps because it was considered enough solving the phenomenon of urban sprawl only in terms of aesthetic perception or functional efficiency and not by the structural-morphological aspects.

The abandoned spaces in the city or on its edges, the cultivated land and the uncultivated nature between the disorderly urbanized areas, the phenomena of informality today defined "third landscape", if interpreted in terms of urban space and if traced to a type-morphological grammar, could form the basis through which gaining a renewed organic nature of the contemporary city and redefining an alternative form to the compact city. These spaces can acquire a new meaning if they are brought back to the typical shapes of the empty of nature in relation to the forms of the earth.

In fact, the contemporary urban sprawl, with its reversal of the ratio empty/full and open/closed spaces, can find the re-founding and generative grammars only in relation to nature, looking for their roots in the formal structures of the earth. It may draw its settlement principles from the coexistence of enclosed urban places and natural open and dilated spaces. The recognition of the physical structure of the residual voids can be both the basis for the regeneration of the existing situations, starting from the assignment of their shape and size without necessarily fill and "consume" the soil, and the foundational principle for new settlements.

The UrbanFormGrammars (UFG) Research Group (Beccu *et al.*, 2014), operating in the Dipartimento di Scienze dell'Ingegneria Civile e dell'Architettura (DICAR) of the Politecnico di Bari, adopts this line of research, placing itself in continuity with that part of theoretical and practical Italian tradition which has taken the geographical scale as a specific dimension of the contemporary city (Costantino Dardi, Vittorio Gregotti), which has worked on the idea of city-territory elaborating the concept of "territorial room" (Franco Purini), which has founded the urban project on the permanence of the territorial settlement forms (Saverio Muratori, Aldo Rossi), which defines the forms of architecture in relation to the primigenial shapes of the earth (Francesco Venezia). In particular, the theoretical, methodological and applicative research of Saverio Muratori has distinguished itself

by the study of the structural logics that regulate the relationship between land shapes and forms of city and architecture. It has founded a school of thought today fruitfully hybridized with other theoretical contributions. The UFG Research Group takes as reference the consolidated experience of urban analysis that has characterized the Architectural Italian School in the twentieth century: from the Muratori's typological and "processual" school, to the Rossi's and Grassi's type-morphological school, to the Purini's structuralist school, looking to the contributions of Colin Rowe, Ungers and the phenomenological approach, with the aim of making a renewed synthesis. The urban analysis is interpreted as an operating phase that can understand the founding principles that characterize the urban phenomena, the relations between natural and artificial territorial structures, the grammars of the urban morphology and the building types, to identify the transformation rules of the contemporary city and the necessary tools for his government.

Teaching experience: "land cities" and "water cities" of Puglia

The didactic activity carried out at the Laboratories of Architectural Design Studio, 4th year, at the Politecnico di Bari during the a.y. 2010-14 has chosen as field of investigation the relationship between city and nature, between settlement patterns and morphologies of the natural landscape.

During the years, the design exercises went through two typical realities of Puglia: the "land cities" in the Ionic hinterland characterized by natural systems of the *gravine*, and the "water cities", distributed as strongholds in the landscape of the south coast of Bari. In particular, the areas of the intervention are located in the towns of Gravina di Puglia, Mola di Bari, Polignano a Mare and Monopoli. The Laboratories investigated the conditions of the edge of town, the limit of the countryside and the sea and the direct relationship with the landscape rather than with the building fabric. They studied the topics of the topography of the land and the large size of the horizon of the sea and the countryside. The problem was giving shape and size to these voids without necessarily "sew up" and filling the fragmented building fabrics, trying to reproduce the measured condition of "inner space" of the historic city.

The projects are based on an interpretation of the uniqueness of this area highlighting the potentiality of the space and establishing meaningful relationships through architecture. An oriented reading of the forms and the existing natural and anthropic structures has guided the choice of the settlement principles and the type-morphological relations, combined with the recognition of typical forms of appropriation of the ground and supported by the study of paradigmatic conditions deduced from history.

The idea of "*natura naturata*" has united the different design strategies, narrated through the architectural description of the topography and the natural elements (slopes, inclines, fractures, blades, highlands, lowlands, coastline, courses of water), together with anthropogenic signs (walls, infrastructure, tracks, roads, structures and agricultural divisions, quarries) and the architectures located in the area (towers, "*masserie*", abbeys, castles); a description rewritten in the project through the architectural analogies or the metaphors such as "inhabited soil". In addition to the "tectonic" relationship with the natural substrate and the "analog" approach with the original forms of settlement, the Laboratories have faced the role of architecture in the interpretation of the context in terms of "perception". So the projects have faced how the architecture stands in the nature to measure and comment the landscape through its artificiality, how integrates herself into the landscape revealing the characters, how can accommodate inside herself the landscape and can visually and physically introject parts of nature.

The project topics, corresponding to the primary acts of appropriation of the physical places, were: the "roots" to the ground through the "*podium*" or "digging"; the "demarcation" of the vacuum through the "enclosure" or "clear"; the "measurement" of the void through the "emergent buildings" or "regulator track".

The substantial diversity of the areas has allowed to experiment two different conditions of the *continuum* (fill the *vacuum*) and *discontinuum* (measure the *vacuum*).

Urban forms and natural morphologies of the coastline of Monopoli: settlement principles and character of the space

In particular, in the academic year 2013-14 the Laboratory of Architectural Design Studio has chosen the coastal town of Monopoli as a paradigmatic case study to test new models of urban space in relation to nature (Menghini and Montemurro, 2014).

The city of Monopoli belongs to the landscape of "coast embattled" in the south of Bari. This territory appears as a continuous system of recesses and protrusions formed by a rocky coastline interspersed by sandy coves that mark the head of the "*lame*", tiny alluvial engravings perpendicular to the coastline that originate on the reliefs of the first rung of the Murgia. This part of land has a clear formal principle given by the superposition of two orders: the indented coastline with the natural system of the "*lama-cala*" and the artificial structure of the roads layout, agricultural frames, infrastructures and urban centers, arranged in the recesses or promontories of the coast. There is a clear relationship between the natural forms, topography and topographic mapping of the Apulian coast and the architectural and urban settlement historically consolidated.

The city of Monopoli has a very clear *forma urbis* that it has developed over time in relation to the morphology of the rugged coastline. The walled city was built on a part of coastline bordered by two "*lame*", and it is jutting out between Cala Portavecchia and the Porto Vecchio. With the successive enlargements Cala Porto Vecchio was incorporated in the walled city, becoming a sort of "square of water". The nineteenth-century expansion took place in the hinterland, according to the logic of checkerboard blocks. The north coastline out off the urban walls, including Cala Batteria, Cala Fontanella and Cala Curatori, was occupied by the port and some industrial plants. But this urban form, recognizable in its different parts until the nineteenth-century expansion, has fallen into crisis in the contemporary world.

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The Laboratory has studied the urban strip facing the sea, the boundary between city and nature, identifying some critical areas, without shape and size, connoted by the presence of abandoned buildings and empty unresolved spaces. The projects have faced two challenges: on the one hand, the presence of large voids without architectural and urban quality, that make difficult the relationship between the consolidated city and the sea, and on the other the presence of large abandoned areas and fragmented spaces in peripheral coastal areas. So the Laboratory has investigated the possibility of giving shape and size to the inform voids in the compact historic city, to the space contained in the modern urban sprawl, to the country fragments embedded in the contemporary suburb and to the rural areas near to the coast. The projects did not confront themselves with a dimensional scale of the compact building fabric, but they related with the great extent of the coastline, the open space of the countryside and the topography of land.

In the old town of Monopoli it is possible to identify some characteristic conditions of the coastal towns of Puglia, some typical ways of interpreting the relationship between city and sea: the coast with a promontory jutting out into the sea, interpreted through the themes of the *podium* and the "*belvedere*" or enhanced through architectural emergencies (tower, lighthouse, castle); the coastline protected and bounded by walls, enclosures, bastions; the coast that embrace the sea in a bay, that becomes a "square of water" on which the compact city overlooks. These spatial models have been assumed as the founding topics for the contemporary project, along with the theme of "*palazzata*", typical of the waterfronts of the nineteenth-twentieth century cities, along with the reinterpretation of the architectural frames of peri-urban and rural areas and along with the inner space that characterizes the "*lama-cala*" systems.

Project topics

Therefore the projects have faced different spatial conditions that characterize the coastline and the several characters of the urban places overlooking it. So the Laboratory has set different strategies for the interpretation of these different parts of the city and the coast, checking more project ideas on each area.

Figure 1. Masterplan: framework of the projects.

A. "Inhabited agrarian textures"

The first project area, located on the northern edge of the city, corresponds to a long stretch of rocky shoreline, bordered upstream by the parallel road to the coast (Viale Aldo Moro, continuation of SS16). The area is delimited in the north by a "*lama*" and in the south by an old abandoned quarry. The form of the coast is mostly characterized by a dense sequence of "*cale*".

A parallel trail to the sea divides the area into two lengthwise strips, one in the inland, occupied by industrial buildings and another one overlooking the sea divided into long and narrow agrarian lots perpendicular to the coast.

The area is characterized by the presence of the old tuff quarry, now used for crops. The empty space of the quarry separates the residential urban fabric from the production areas. The natural slope of the terrain decreases towards the coast, with a height difference of about 7 meters. The artificial walls of rock and the natural cliffs allow to see the thickness of the coast.

The projects interpret, through the architecture, the shape of the embattled coast, the horizontal plane of the countryside with its agrarian textures, the slope and the thickness of the soil, the relationship with the horizontal line of the sea.

Some projects enhance the presence of vegetable gardens on the sea and measure the coastline through the rhythm of the agrarian traces and the green textures, or enhance the presence of the stone walls that become "inhabited walls"; other, taking advantage of the difference in level, shape the soil through basements, podium, terraces, excavations, fills; others located near the hollow of the quarry interpret the condition of the "inner space" and the condition of overlooking the board.

B. "Palazzata" to the sea

In the second project area, heading to the port of Monopoli, the coast is divided into three major headlands interspersed with deep coves. One of these peninsulas is currently occupied by an old tank of fuel. The old coastal road separates the shore from the city. The waterfront is interpreted through the architectural theme of the "*palazzata*" and the "*riviera*", and is defined with a continuous rhythmic and variously articulated fronts between the sea and the city, allowing the comparison of the small-scale of the city with the large-scale of the sea.

C. "Water squares" and "urban walls"

The third project area is the one of the port. It includes the former cement plant, which overlooks the port between Cala Curatori, Via Nazario Sauro and Via Vecchio Macello. The area currently degraded, has a great potential for the particular feature of the rug-

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Figure 2. "Inhabited agrarian textures".
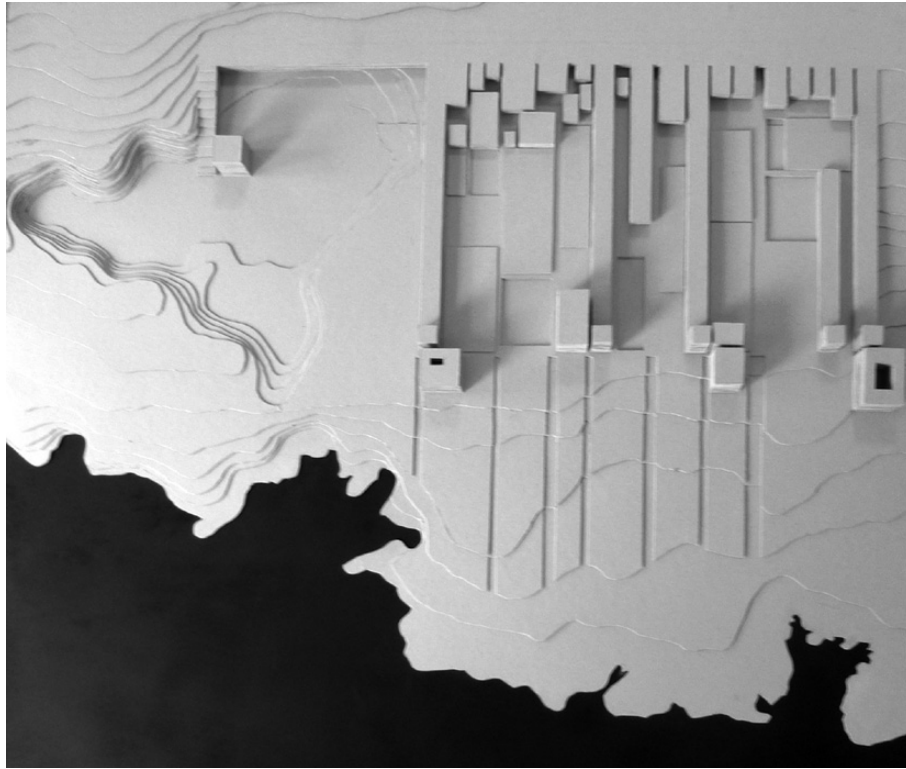
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ged coastline that includes the sea in some deep creeks. The projects have focused on the issues of the "*muraglia*" and bastions next to the sea and of the space of the relationship between buildings and sea, or in other words, a "water square".

D. "Podium" on the water

In the fourth project area, in the south of the walled city over Cala Portavecchia, the coast juts out into the sea with a headland, occupied by two school buildings partially disused. The headland, a privileged point of view towards the old city and the sea, is interpreted as a *podium* or garden on the sea, through an "inhabited ground" variously articulated.

E. "Green open courts"

The fifth project area confronts itself more directly with the contemporary city. The coast continues to articulate itself with indentations and protrusions. Via Procaccia marks the separation between the coast and the city. The empty areas, the interstitial spaces between the built, can be seen as fragments of nature that are wedged in the city. In particular a large empty enclave in front of Cala Paradiso was chosen as a strategic focus. The projects have transformed this great space in a big more or less regular green court that houses a piece of countryside.

Conclusion

The general strategies adopted for granting a measure and a form to the coastal strip, by choosing the natural or artificial order, have been the following: the interpretation of the concave/convex shape of the coastline through large open courtyards towards the sea or slabs and footings stretch out on the coast; the interventions on the coast with the texture of agrarian plots, engravings and prints on the rock surface; the dotting of the coast through small villages-farms or through important buildings distributed as iterable elements in the landscape; or even the architectural characterization of the road system

Figure 3. "Water squares" and "urban walls".
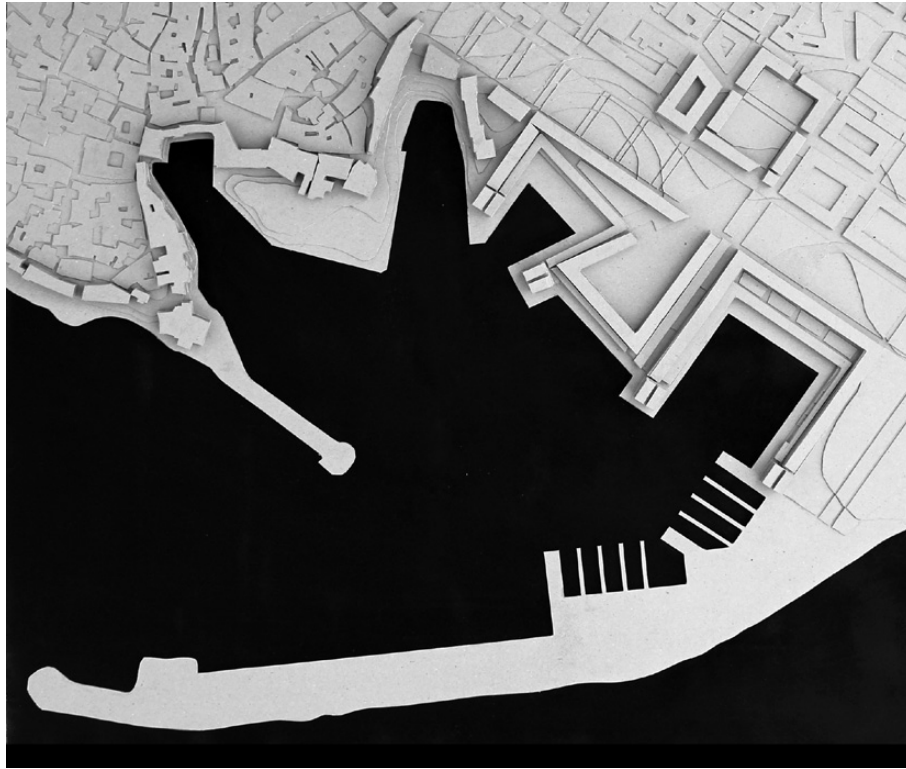
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perpendicular to the coast through inhabited walls with raised pathways.

The projects have introduced filters, enclosures and urban doors to mark the boundaries between city and countryside and between city and sea.

The main topics, corresponding to the primary acts of appropriation of the physical locations, were: the "rootedness" to the ground through "*podium*" or "digs"; the "demarcation" of the *vacuum* through "enclosures" or "glades"; the "measurement" of the empty space through "tracings"; the occupation of the emptiness with "prominent buildings".

In addition with the natural forms and the shapes of the earth, the projects have sought the congruence with the anthropic and historical features of the territory. In fact the projects have investigated the problem of identity of the places and the permanence of their typical forms in relation to the contemporary condition.

Beside the interpretation of potential of the physical morphology of the coast of Puglia, the Laboratory has also raised the question of the analogy with the forms, spaces, housing types of the seafaring cities and with the maritime structures, viewed also these as primary interpretations of the natural forms: squares of water, *podiums*, gardens, walls and bastions on the sea, water protection structures, outstanding buildings.

The projects are related to the complexity of traditional housing and to the historic patterns of aggregation (for example the path on the basement in Cala Batteria).

The architectural elements of the tradition were used after a size increase (eg. the *loggia* of the Abbey of San Vito near Polignano a Mare, which confronts themselves with the large-scale of the sea).

The language of construction has interpreted the typical aspect of the Apulian towns: the hierarchical duplicity of stone and plaster (basic building / specialist buildings, basement floor / upper floors), looking for a continuity of the matter and of the space between soil and buildings.

The character of the stereotomic city of stone overlooking the water is expressed through the continuity and the closure of its spaces and the massiveness of its form. The buildings are characterized by a uniform monolithic material and great thickness of the

Figure 4. "Open green courts".
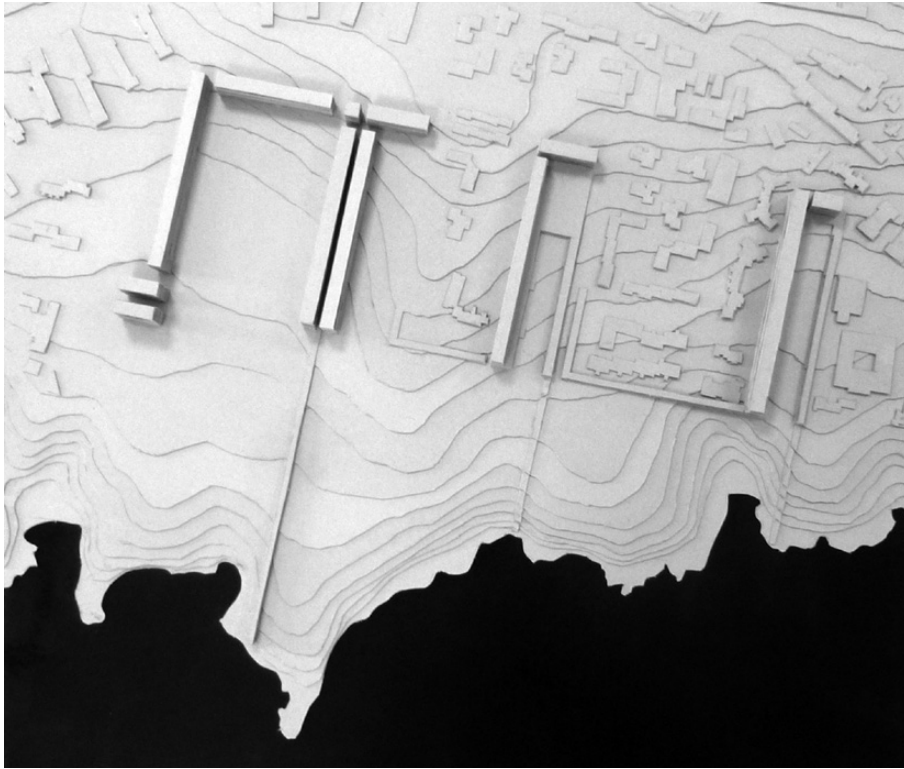
structures. At the same time these are based on an analytical compositional syntax, evident in the distinction of the parts and in the construction through separate boxes or through fragments of open walls. Therefore the projects have investigated two interpretations of the architecture walls: on the one hand the compositional and constructive principle of the dug mass and on the other the enveloping wall adopted in open systems.

The research of the inside-outside relationships took place in two different ways: through the excavation of a solid space or trough the enclosure of an empty space.

This way of dealing with the landscape can help to overcome the ideologically conservative attitude and the common opposition to the architectural interventions in natural environments. In fact the history teaches that the presence of the man and his actions in order to inhabit the land can valorize the natural environment, and can transform these sites in "places" culturally and architecturally significant.

References

Beccu, M., Defilippis, F., Ficarelli, L., Ieva, M., Menghini, A. B., Moccia, C., Montemurro, M. and Riondino, A. V. (2014) 'Grammatiche della forma per la città del nostro tempo' in *1st Workshop on the State of the Art and Challenges of Research Efforts at Poliba*. Politecnico di Bari, Bari, 3-5 Dicembre 2014. Groups Research on KETS and SCS. vol. B (Gangemi Editore, Roma) 113-17.

Menghini, A. B. and Montemurro, M., (2014) 'La ricostruzione della forma urbana. Monopoli: spazi di natura e luoghi pubblici lungo la costa orientale' in Conte, A., *La città scavata. Paesaggio di Patrimoni tra tradizione e innovazione* (Gangemi Editore, Roma).

Signage regulation: an overview behind the production of chaotic commercial landscapes in Brazil

Vanessa Casarin, Alina Gonçalves Santiago
Departamento de Expressão Gráfica, Universidade Federal de Santa Catarina,
Campus Universitário Reitor João David Ferreira Lima, Trindade, CEP: 88040-970,
Florianópolis, Santa Catarina, Brasil.
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Abstract

As second skin to buildings (Ashihara, 1983), commercial signs have great impact in the perceived urban landscape (Nasar, 1988; 1997); technology permits increase in size and diversity and the challenge is how to deal with chaos and order in such landscapes. In this sense, the aim of this paper is to discuss the production of commercial landscapes with visual overload in Brazil, bringing the view of those who produce and the role of signage regulation. As commercial landscapes, we consider its visual features which involve not only signs (ads, billboards), but also buildings, urban furniture, vegetation and everything that takes part of these particular settings visually perceived. Such elements, together with its maintenance and cleanness have a huge impact in landscape quality. To talk about these chaotic settings, we take the city of São Paulo, in Brazil, as a case study to discuss what is behind its production. This paper is based on qualitative study, in which, in-deep interviews were applied, to specialists and users involved in different areas of commercial landscape production, and perception. When commercial intentions are behind activities in urban space every square meter in landscape is valuable and disputed. It was observed that, not only the absence of law create conditions to chaotic landscapes, but also inconsistent ones are instruments to create these settings. These chaotic landscapes can certainly be intentionally created by law; however, when it is not desired, the presence of state in inspection and punishment is important to keep its coherence and legibility.

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Introduction

As a second skin to buildings (Ashihara, 1983), commercial signs have great impact in the perceived urban landscape (Nasar, 1988; 1997). In this sense, the central aim of this paper is to discuss the production of commercial landscapes in Brazil, mainly those with conditions of overload (Passini, 1984), presenting the view of those who produce this settings and analyzing the role of signage regulation. For conditions of overload we understand, as Passini (1984, p. 93), "conditions of stimulation exciding processing capacities", considering that "capacity to process information naturally has a limit that may vary according to the individual, to his disposition at a particular time, and to the perceptual channels involved".

For this analysis, we consider the visual features of commercial landscapes, which involve not only signage, but also buildings, urban furniture, vegetation and everything that takes part of these particular settings visually perceived. Such elements, together with its maintenance and cleanliness have a huge impact in landscape quality (Nasar, 1988, 1997). To talk about these chaotic settings, we take the city of São Paulo, in Brazil, as a case study to discuss what is behind its production.

São Paulo has implemented in 2007 the law "Cidade Limpa (Clean City) – Law 14.223/06", responsible for removing billboards from the street and regulate fairly narrowly indicative or identification signage. The withdrawal of advertising and reduction in size and amount of identification ads that caused visual overload, produced a significant change in the image of the city; a transformation that took a while until all the retailers were able to readjust themselves to the new rules and replace their ads. This transformation was positive evaluated by most of the local population that think the image of the city had improved. About 63% of the population approved the implementation of the law (Opinião Pública, 2007).

In this study, in which the intention was to listen to opposed views and fundamentally retailers within a qualitative approach, it was possible to capture nuances that lie behind the creation of these chaotic commercial settings and that, however, confirm the importance of establishing regulations that control excesses and ensure the legibility of the landscape, in order to prevent disordered interventions and do not compromise the *wayfinding* processes in urban space and the visual quality of the landscape.

In this sense it is worth emphasizing the importance of *likability* for urban space (NASAR; 1988, 1997), which enables not only an improved quality of life, but promotes other opportunities for cities, such as the exploitation of its tourist potential.

Methodology

This research is based on a qualitative study carried in a period of two years which involved (i) theoretical and (ii) documental survey and analysis; (iii) in deep interviews applied to specialists and users involved in different areas of commercial landscape production, and perception such as planers, representatives of professional associations, retailers and consumers.

The responses of a group of seven experts (planners and representatives of professional associations involved in the implementation of the Law) and sixty users (mostly retailers) are the corpus of this research. Users were interviewed on-site, in three commercial settings of similar scale and configuration: Teodoro Sampaio Street, Oscar Freire Street and Vinte e Cinco de Março Street.

It is important to highlight that studies which involve the cultural variable, according Nasar (1998), require application in different cultures, so results can be generalized. In this sense it is important also to point out that studies dealing with the evaluative image of a city, in a given culture, will be useful as much as they are applied considering different situations to complement the construction of knowledge.

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Chaotic commercial landscapes: signage in the context of urban complexity and coherence and the evaluative image of the city

The first part of this research was dedicated to build its theoretical framework to understand commercial urban landscapes and the elements that take part on it. This led the researcher to the concepts of complexity and coherence (Venturi et al, 1998; Salingaros, 2000; 2006), and how complex landscapes are perceived (Rapoport, 1978; 1990) and evaluated (Kaplan; Kaplan, 1978; 1989; Nasar, 1988; 1997), especially commercial ones, in order to explain when they are considered as chaotic.

For Rapoport (1978), cities or parts of them have an ambience, a sensory quality or character that one can easily realize. Environmental aspects that often escape the viewer's consciousness shape their evaluation, feelings, inferences and behavior. The visual quality, according to Nasar (1998), can have significant effects on the experience of an individual and how he appreciates his surroundings.

To Nasar (1997), as well as to Lynch (1999) form and reform of a city should be guided by a visual plan of recommendations and control, concerned with the visual form in the urban scale; and to define such plans it is needed to know how people evaluate the landscapes of the city and which meaning they see in them; this is what Nasar (1998) considers the evaluative image of the city. In these evaluations, preferences can be inferred. In an evolutionary context, Kaplan and Kaplan (1978) point out that usually preferred places are those in which the individual can be successful through their skills, rather than being harmed by them.

So likeability is a concept extensively explored in researches concerned with the visual quality of a city; and is defined by Nasar (1998) as the probability that an environment has to evoke a strong and favorable response among groups or people who experience it. "Inhabitants of a city with a good evaluative image find pleasure in the appearance of their memorable and visible parts" (Nasar, 1997 p.3). It must be emphasized that the evaluative image of the city is not the only aspect of a good city, but it has a fundamental value (Lynch, 1999; Nasar, 1997).

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The elements that people value as pleasant in appearance of landscapes are, according to Nasar (1997, p.62), the presence of natural elements such as vegetation, water or mountains; areas with good maintenance and cleanliness; open spaces to the view, historical significance and aspects of order (the degree of organization realized by users in a given environment). So landscapes evaluated as unpleasant by individuals, are the opposite (obstructed areas, with traces of human uses such as garbage, degraded, with little historical importance and disorganized) (Nasar 1988, 1997; Kaplan; Kaplan 1989; Rapoport, 1978).

The disorder in the form of physical incivilities such as vandalism, graffiti, trash and buildings in a state of abandonment, "evokes a sense of anxiety and fear suggesting a threat to survival", according to Nasar (1997, p.3). The author also states that people dislike built landscapes with high-contrast, as trade routes, industrial centers, transmission networks and signaling. In one of his researches, Nasar (1997) found that commercial landscapes were evaluated as the less preferred ones. However, we found in this research (Casarin, 2012) that organized, clean and well maintained commercial landscapes, with less obstructed views and with the presence of vegetation and urban furniture are positive evaluated by users considering their visual quality. An example of that is Oscar Freire Street, in São Paulo.

Some of these elements of urban likability can be easily regulated in a Landscape Master Plan, such as cleaning aspects, and ads and its characteristics as size, position and further features related to order.

According to Nasar (1997), researches have consistently found preferences associated with order and related variables (organization, coherence, congruity, legibility) as Kaplan and Kaplan (1989), Ulrich (1986), Zube et al. (1982).

These features can be associated to the psychological studies from Gestalt of how individuals visually perceive the environment, which is reflected in recognized studies of urban space, as Lynch (1999) studies, with emphasis to legibility as fundamental in the perception of a city and therefore able to contribute with visual quality. These features are also addressed to the urban landscape by Cullen (2002) and emphasized by Kohlsdorf (1993) in the Brazilian academic context. These Gestalt principles arise when we analyze the visual information which intend to guide people and the way this information is arranged in the landscape.

Good environments must present a degree of involvement that Kaplan and Kaplan (1978) and Kaplan, Kaplan and Ryan (1998), define as complexity or diversity; and they need to make sense, which means, be coherent.

For Jacobs (1961), one essential quality shared by living cities is the high level of organization of its complexity; to achieve coherence in a recognizable urban morphology.

The complexity, which for Nasar (1997, p.75) "involves a variability of noticeable elements and distinctiveness between them", is, to Rapoport (1978), an intermediate level between the monotony (very low level of stimulation) and chaos (very high level of stimulation). Those are subjectively identical, since very low or extremely high stimulus levels lead to disinterest; so complexity and perceptual stimuli in the landscape should be moderate. Over-stimulation can inhibit the processing of information (Passini, pg.93), damaging the stimulus-response relationship. It happens because the individual attention becomes, in these cases, selective.

Studies from Kaplan and Kaplan (1978), Nasar (1988, 1997), Rapoport (1978) and Salingaros (2006), corroborate that individuals prefer a certain degree of complexity in the environment, suggesting that the "complexity and its related variables" such as visual richness, ornamentation, level of information, diversity and variety, "have consistently appeared as prominent features" on the user's responses to their environment (Nasar, 1997, p.74).

Interest and preference (affection/likeability) follow the increasing complexity until some extent, when preference tends to fall with increasing complexity. Evaluative studies related to the image of the city corroborate this assertion (Kaplan, Kaplan, 1978; Nasar, 1988, 1998, Nasar; Hong, 1999; Rapoport, 1978), and address the visual preference to a moderate degree of complexity in the environment.

Among studies on commercial signage Nasar (1988) found that preference increases with coherence in commercial signs.

The order, according to Arnheim (1978), is possible at any level of complexity. An ordered composition is governed by a general principle, which does not happen in the disordered one. The more complex the structure, the greater the need for order. More complex settings are susceptible to incompatibility or disorder, since a complex model combines elements of different sizes and shapes, different directions, color and texture in the same structure. In a set with multiple - more or less dependent – parts (eg. a living organism as a city), they can easily become incompatible or disorderly.

Figure 1. Rua Barão de Itapetininga, República, São Paulo, SP, BR, in 2001 and 2007 respectively. Folhapress, Digital. Credits: Jorge Araújo and Rodrigo Paiva respectively

Coherence, according to Kaplan and Kaplan (1978), is what makes possible the organization of a field, and its division into units with appropriate representations. Complexity and diversity promote a sufficient number of representations that fill the mind and ensure that the focus is not shared with other content.

According to Rapoport (1978), there is no contradiction between complexity and legibility (Lynch, 1999), they are, therefore, complementary concepts. As well as legibility is irreplaceable on large scales, complexity is in the small ones. So at the same time individuals wish to be oriented in space, they wish moderate complexity.

Making relationship between information and complexity in the building scale, Salingaros (2006) states that a white wall does not offer any information to the observer, while complex compositions, ordered or chaotic, offer a lot of information differently organized.

Salingaros (2000) proposes some principles for understanding the urban coherence, from the smallest objects (sculptures, etc.) to the buildings. They are rules for geometric coherence that involve a variety of elements (complexity), the connections between them and interdependent relationship established between them, how they are perceived (by the silhouette) and how they are organized (hierarchy and balance).

Orderly complex compositions, according to Salingaros (2006), have a large amount of information minimally organized, therefore coherent. On the other hand, the chaotic compositions have a lot of internal uncoordinated information and thus overcome the mind's ability to process information.

The random information is inconsistent and can fail in providing correlations, then could not be decoded (Passini, 1984; Salingaros, 2006).

The organization depends on the geometric coherence and interrelationship of different scales (also coherence in a complex system is the result of the connection between these scales). Hierarchically, the largest scales depend on the good performance of smaller scales (Salingaros, 2006). Following this argument, we can understand smaller scales characterized by ads and their content set in a building (larger scale), giving it greater complexity, and therefore providing greater complexity to the urban setting. Depending on the way ads and information are organized (orderly or disorderly) in the setting where they are placed, it can be perceived as coherent or not. So in a living organism as a city, with little control provided by guidance plans, it is not difficult to find this chaotic composition, special in commercial areas.

In a survey published by Nasar (1988), the evaluative image of commercial signage in a given area was especially addressed. In that research, complexity and coherence of signage were manipulated in a model of a commercial route. The results showed a preference for moderate complexity and high coherence regarding commercial signage, both among potential consumers surveyed and among retailers. The results also showed that the sense of excitement grew as complexity increased and coherence decreased.

From this theoretical framework it was possible to say that there had been a reduction in the complexity of São Paulo landscape by reducing the variability and amount of its elements. It is also possible to say that coherence has increased, since it is possible to perceive principles of order, for example, figure-ground relationship between ads and buildings are now clear, showing a certain hierarchical degree, illustrated by the following images. So these changes in complexity and coherence could be the cause of the improved appearance perceive by users, which was also supported by the interviews.

Therefore, the general guidelines proposed by Nasar (1997) for greater pleasantness in the landscapes of cities - use of natural elements (water and vegetation), moderate complexity, high coherence, legibility and compatibility of the parties, panoramic views and open spaces, cleaning aspects and preservation of historic features -, if incorporated into urban commercial settings, could possibly increase its visual quality. However, the great impact of signs in urban landscape should not be ignored in landscape plans, which should strictly regulate it.

Chaotic commercial landscapes in Brazil: what is behind its production and why signage regulation is important

Understanding the impact of signs in urban landscape two questions emerge: what is the engine for the production of chaotic commercial settings in Brazilian context and in which way signage regulation is important?

It was found in this research that, when commercial intentions are behind activities in urban space, such as signage, every square meter in landscape is valuable and disputed. If all the elements of urban space contribute to its complexity (buildings, street furniture, vegetation, vehicles and even pedestrians themselves), they also contribute to retailers to see them as threats to the visibility of their business, and this creates a kind of competition for visibility, involving commercial signs of major proportions, as big as the legislation and the available area in the urban space permit.

So every part of building facades visible from public space is considered, by retailers, valuable to transmit messages to passersby, possible consumers.

In this sense, retailers considered every area which makes visual contact with consumers through the logic of competition for their attention, as previously highlighted by Vargas and Mendes (2001) and corroborated by this research (Casarin, 2012). Following this thought, those with higher available area in their facades have the advantage of good visibility, which smaller neighbors try to overcome. So when this space is regulated, usually, all permitted areas are filled with ads and similar; retailers sometimes block the traffic routes with exhibitors to call attention for their products.

If this is the logic behind the ads, then the laws that control them are able to create more complex or less complex landscapes. It was observed in this research that, not only the absence of law creates conditions to chaotic landscapes, but also inconsistent ones are instruments to create these settings. These chaotic landscapes can certainly be intentionally created by law, as in Times Square and surroundings in New York City; however, when it is not desired, the presence of state in strict regulations, inspection and punishment is important to keep landscape coherence and legibility.

It is important to mention that these regulations should be context-sensitive (Carr, 1973; Durksen; Goeble, 1999; Morris et al, 2001).

Little importance has being given to the landscape character in Brazilian legislative context, mainly the aesthetic character, in which the control of advertisements is included. In a context where there is no concern about the quality of public urban spaces (even sidewalks that are of particular responsibility have bad quality), complex laws allow misconduct and supervision and punishment are not sufficient; standardization and simplification help the inspection (which can be promoted by retailer themselves), as happened in São Paulo. Standardization also inhibits competition, which was mentioned in the interviews. However, in a context where violations and impunity are common, respect for the rules means also the prevision of high fines payment, as applied in São Paulo.

The experience of São Paulo worked out due to accurate technical solutions adopted supported by political will that made easily possible inspection and punishment. It resulted in higher visual quality to the landscape.

When subjects were asked if they felt injured in any way, and if the adoption of the law led to decrease on sales, the responses of retailers were all positive to the intervention as follows: (i) loss on sales happened only when building renovation was under construction, with no relationship to size and position of identification sign (ii) expenses were only for the adequacy of the new visual communication and facade reformulation according to the new law. No other damage was reported. There was no drop in sales by changing the visual communication of the facades and the majority of respondents mentioned that the city landscape became more beautiful. Thus, smaller and fewer ads contribute to the visual quality of the cities and do not damage to the operation of commercial activity. Smaller and fewer means sufficient size and amount to be read in distance (Carr, 1973) and to provide essential information, respectively.

The example of São Paulo was followed by a sort of cities in Brazil, but the problem is that most of these cities followed not only the example of applying the law, but also ap-

plied the same standards for identification signs (which are most numerous in landscape) without thinking, for example, in they hierarchical importance and other significant features from ads, and also in landscape itself. These regulations should be context-sensitive, as point out Morris et al (2001).

It should be noted that not always the punishment is needed for a legislation to be implemented. In the case of Florianopolis, Santa Catarina, Brazil (Casarin; 2012), whose pilot project preventing visual pollution was implemented in 1998 (covering an area of only a few blocks) the punishment by fine was not necessary, however the imposition existed in any way: since the visual communication had not been changed by the retailer at the stablished deadline, the city town hall was incumbent to pull it off. The entire perimeter of the historic city center had its landscape changed, and although there are no studies showing the relationship between smaller ads with sales in this case, the trade continues to exist with great vitality in this intervention area of the project. On the other hand, a recent signage regulation was approved in Florianopolis, however it has not been implemented yet. This new regulation applies to whole areas of the city (including downtown and outskirts, with exception to heritage sites which has its proper standards) the same standards (considering identification signs) proposed to the city of São Paulo, as the example of several other cities in Brazil.

Conclusion

Although commercial signs have great impact in urban landscape, to the point of being considered as a second skin for buildings (Ashihara, 1983), until the application of the Law (Cidade Limpa) in Sao Paulo, little was discussed and little importance was given to the subject in the Brazilian context. Greater attention was restricted to historical landscapes. In general, little importance is given to the landscape character in Brazilian legislative context, mainly the aesthetic character, where the control of advertisements are included. After the law has been implemented, in São Paulo, many Brazilian cities followed the example, which makes clear the need for signage regulation in urban landscape to face competition in the use of public spaces. Competition, together with the absence of strict laws (which can define the visual character of a landscape), are considered the engine to create chaotic commercial landscapes. Regulations must be linked to general plans that address the landscape character, especially the aesthetic, in which elements of urban likeability, to which Nasar (1988, 1997) calls attention, should be consider. In New York City, standards of ads are linked to the map of land use and occupation, defining, for example, that the advertisements at Times Square are welcome, whereas in residential areas its use is quite limited.

The dimensions, quantity, type, shape and position of the ads should therefore fit the context to best meet its needs. Setting a single standard for the entire city, with little variability, facilitates surveillance. It, somehow, has to do with the context. However, it does not mean same standards should be replicated without thinking about each context. Reproducing the same pattern for other municipalities whose contexts are different does not seem to be an agreed solution. Considering ads in the context of urban complexity and coherence, it is possible to say that in a complex setting where a variety of elements take part, smaller ads, which respect the figure-ground relationship and other principles of visual perception is more likely to be successful in performing their function, without harming commercial activity and contributing to urban likability.

References

Arnheim, R. (1978) *La forma visual de la arquitectura* (Gustavo Gilli, Barcelona).
Ashihara, Y. (1983) *The Aesthetic Townscape* (Mit Press, Cambridge).
Casarin, V. (2012) 'O ordenamento da mídia exterior e a transformação das paisagens de caráter comercial: o caso de São Paulo', unpublished PhD thesis, Universidade Federal de Santa Catarina, BR.
Carr, S. (1973) *City, Signs And Lights* (Mit Press, Cambridge).

Cullen, G. (2002) *Paisagem urbana* (Edições 70, Lisboa).

Duerksen, C. J. and Goeble, R. M. (1999) *Aesthetic, Comunity Character And The Law* (American Planning Association, Chicago).

Folhapress Digital (2001) Banco de Imagens (http://www.folhapress.folha.com.br/foto/595894) accessed 14 June 2015.

Folhapress Digital (2007) Banco de Imagens (http://www.folhapress.folha.com.br/foto/709186) accessed 14 June 2015.

Jacobs, J. (1961) *Death and Life of great American cities* (Random House , New York).

Kaplan, S.; Kaplan, R. (1978) *Humanscape: environments for people* (Duxbury, Belmont, CA).

Kaplan, R.; Kaplan, S. (1989) *The experience of nature: A psychological perspective* (Cambridge University Press).

Kaplan, R.; Kaplan, S.; Ryan, R.. L. (1998) *With people in mind: Design and management of everyday nature* (Island Press, Washington, DC).

Kohlsdorf, M. E. (1996) *A apreensão da forma da cidade* (Ed. UnB, Brasília).

Lynch, K. (1999) *A imagem da cidade* (Ed. Martins Fontes, São Paulo).

Mendes, C. F. (2006) *Paisagem Urbana: Uma Mídia Redescoberta* (Ed. Senac, São Paulo).

Morris, M; Hinshaw, M. L.; Mace, D; Weinstein, A. (2001) *Context-Sensitive Signage Design* (American Planning Association, Planning Advisory Service).

Nasar, J. (1988) *Environmental Aesthetics* (Cambridge University Press, New York).

Nasar, J. (1997) *The Evaluative Image Of The City* (Ed. Sage Publications, Inc, Thousand Oaks, California).

Nasar, J.; Hong, X. (1999) 'Visual Preferences in urban signscapes', *Environment & Behavior* 31, 5, 671-691.

Opinião Pública (2007) *63% são a favor do Projeto Cidade Limpa* (Instituto Datafolha, São Paulo).

Passini, R. (1984) *Wayfinding in Architecture* (Van Nostrand Reinhold Company Inc., New York, USA).

Rapoport, A. (1978) *Aspectos humanos de la forma urbana. Hacia uma confrontación de las Ciencias Sociales com el diseño de la forma urbana* (Gustavo Gili, Barcelona).

Rapoport, A. (1990) *The meaning of the built environment: a nonverbal communication approach* (The University of Arizona Press).

Salingaros, N. (2000) 'Complexidade e coerência urbana', *Journal of Urban Design*, 5, 291-316.

Salingaros, N. (2006) *A theory of architecture* (UMBAU-VERLAG Harald Püschel, Solingen).

Ulrich, R. S. (1986) 'Human responses to vegetation and landscapes', *Landscape and Urban Planning*, 13, 29-44.

Vargas, H. C.; Mendes, C. F. (2002) *Poluição visual e paisagem urbana: quem lucra com o caos?* (http://www.vitruvius.com.br/arquitextos/arq000/esp116.asp) accessed 16 November 2004.

Venturi, R.; Izenour, S.; Brown, D. S. (1998) *Apriendendo de Las Vegas* (Ed. Gustavo Gilli, Barcelona).

Zube, E; Sell, J.; Taylor, J. (1982) 'Landscape perception: Research, application and theory', *Landscape Planning*, 9, 1-33.

Zube, E. (1992) *Environmental Evaluation: perception and public policy* (Cambridge University Press, New York).

The fading of morphological conformity caused by street upgrading in arterial ribbon. Case study of Beijing Nanluo Guxiang in China

Leilei Song, Feng Song
College of Urban and Environmental Sciences, Peking University, 100871, Beijing, P.R.CHINA

Abstract

In the analysis of Alnwick's town plan, the concept 'Ribbon development' is proposed by M.R.G. Conzen, referring to the extension of urban development along an existing arterial road. Meanwhile, 'Morphological conformity' is utilized to depict the manner in which a plan unit corresponds with the existing plan outline or morphological frame. It is not difficult to figure out there exists 'Morphological conformity' in double ribbon, that the plots pattern and plot series exhibit some extend of conformity. In the subsequent development, the arterial road may upgrade to a higher level, especially of commercial significance, resulting in an infusion of population and economic activities in each side of plots along the road. Then it follows repletion and repletive absorption, causing changes firstly in the burgage tail and eventually in plot series and plot pattern. The former double ribbons belonging to the same plan unit evolve into two distinct plan unit. Such a conformity fading can be discovered in the case of urban form development along the Bondgate street close to the Hotspur street.

The above evolution can be found in city of Beijing, China, that the celebrated traditional morphological form Hutong, Nanluo Guxiang, changed its morphological conformity in its double ribbon, due to the road level promotion of social state among show-folks.Though the former ribbons belong to two plan units, the frontage of each ribbon sustain conformity. The road grading caused morphological conformity fading can be used to give further insight into the relationship between the road and plan-unit.

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Introduction

In the analysis of Alnwick's town plan, the concept 'Ribbon development' is proposed by M.R.G. Conzen, referring to the extension of urban development along an existing arterial road. Meanwhile, 'Morphological conformity' is utilized to depict the manner in which a plan unit corresponds with the existing plan outline or morphological frame. It is not difficult to figure out there exists 'Morphological conformity' in double ribbon, that the plots pattern and plot series exhibit some extend of conformity. In the subsequent development, the arterial road may upgrade to a higher level, especially of commercial significance, resulting in an infusion of population and economic activities in each side of plots along the road. Then it follows repletion and repletive absorption, causing changes firstly in the burgage tail and eventually in plot series and plot pattern. The former double ribbons belonging to the same plan unit evolve into two distinct plan unit. Such a conformity fading can be discovered in the case of urban form development along the Bondgate street close to the Hotspur street.

The above evolution can be found in city of Beijing, China, that the celebrated traditional morphological form Hutong, Qianmen-Freshfish Street, changed its morphological conformity in its ribbon, due to the road level promotion of social state among showfolks. Though the former ribbons belong to two plan units, the frontage of each ribbon sustain conformity. The road grading caused morphological conformity fading can be used to give further insight into the relationship between the road and plan-unit.

Methodology

According to Conzen school, townscape has three key elements, plan, street and plot. Seen from spatiality, the difference lies in the two elements is the function of publicity or privacy. More use intensity is exerted on the space, then the space transforms from private to public. The plot is a space of private, while the street is public. The grade of street is obtained through the degree of publicity, which seems that the more utilization intensity and more user, the higher street grade.

At the initial stage, 'Ribbon development', proposed by M.R.G. Conzen, referring to the extension of urban development along an existing arterial road, can be obvious especially in the fringe belt. It is not difficult to figure out there exists 'Morphological conformity' in double ribbon, that the plots pattern and plot series exhibit some extend of conformity.

In the subsequent development, the arterial street upgrades to a higher level in term of publicity, resulting in an infusion of population and economic activities in each side of plots along the road. Then the ribbons initiate repletion and repletive absorption, causing changes firstly in the burgage tail and eventually in plot series and plot pattern. The former double ribbons belonging to the same plan unit evolve into two distinct plan unit. Such a conformity fading can be discovered in the case of urban form development along the Bondgate street close to the Hotspur street. Nevertheless, the sequent repletion and repletive absorption may also be affected by the other factors as planning policies. And the consequent plot series and plot pattern in turn have impact on the street.

Forming process

The origin of ribbon development in Yuan Dynasty

The development of the Qianmen district dated back to Yuan Dynasty, which developed near Lizheng Gate, one of the connections of the inner and the outer of capital wall. Since Kublai, the fifth king of Yuan Dynasty, established Beijing capital, amount of goods and materials were transported to the capital by canal. To insure the freighters from the south directly arrive at the city, Tonghui River was excavated, and the merchants with the freighter gathered near Lizheng Gate, forming a market. The market laid the foundation of sequent plot patterns, and its unique location deciphered the market's emergence there, not other places. As the business and residence were forbidden in inner city, which was stipulated only for executives and loyalty, then much of the business

Figure 1. The Site Transitions of Beijing and the Restoration Map of the Yuan capital city.
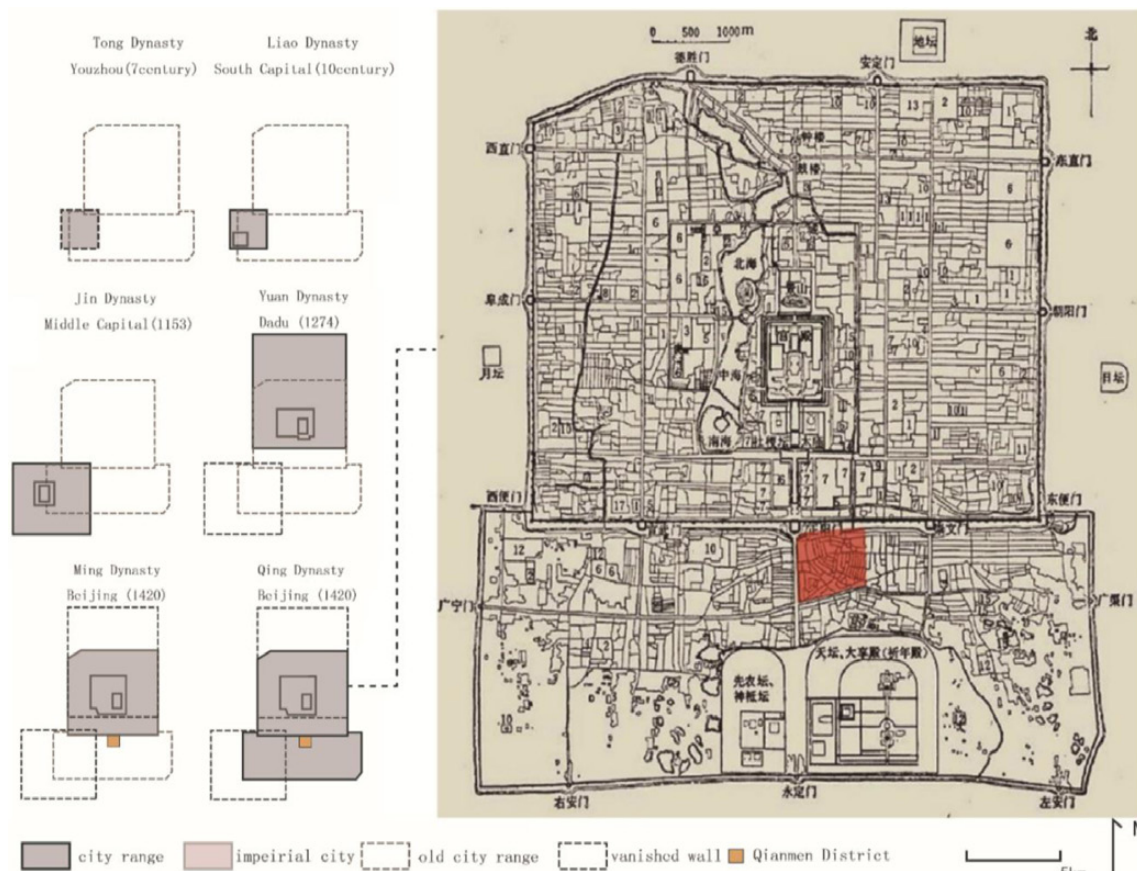
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and residence distributed outside the city wall. And the Lizheng Gate was connection note of inner and outer city as well as the end of axis of the whole city, its unique location attracted the bulk of merchants and business activities. But sadly, the accurate map of the plan does not exist, so the plot series and patterns cannot be explored.

The formal formation of Qianmen-Freshfish District traced back to Ming Dynasty, as the street pattern seldom changed since then. Ming Dynasty first established Nanjing instead of Beijing as its capital. Later, when the Second King of the Dynasty altered the capital to Beijing, the capital wall extended south in accordance with the planning thought of Chinese ancient ritual that the different administrative levels of cities with different size, so the Lizheng Gate and former plot series mostly include in new inner city. And a new gate Zhangyang Gate, also called Qianmen, was opened, functioning the same as the Lizheng Gate. The axis of capital also extended further south on the former basis and became the Qianmen Street.

To be the King the son of the first King started battle, the population and commerce and handicraft in Qianmen District fell sharply. Since the reestablishment of Beijing as capital, migration of population was initiated by government and laid a solid foundation for the development of Qianmen District. Four LangFangs, same as blocks, were planned to construct, forming the ribbon development of the Qianmen District. The Langfang were mainly untilized for business and residence. Business existed only along the road, so the plot frontage open for street. The planed plot series exhibited the ribbon development just like the Bondage Street. Langfang No.1 sequently specialized into lamp shops, Langfang No.2 a jade and antique street, Langfang No. 3 some small business street and Langfang No.4 was the most famous business street, which business had affected to change the former ribbon development by forming new road.

Since the establish of Qing Dynasty, residental and commercial activities were banned in the inner city, which can be defined by old city wall, the ring road today. The Qian-

Figure 2. Road System and Plot Layout Evolution Mode of Freshifish Area from 1948 to 1967.

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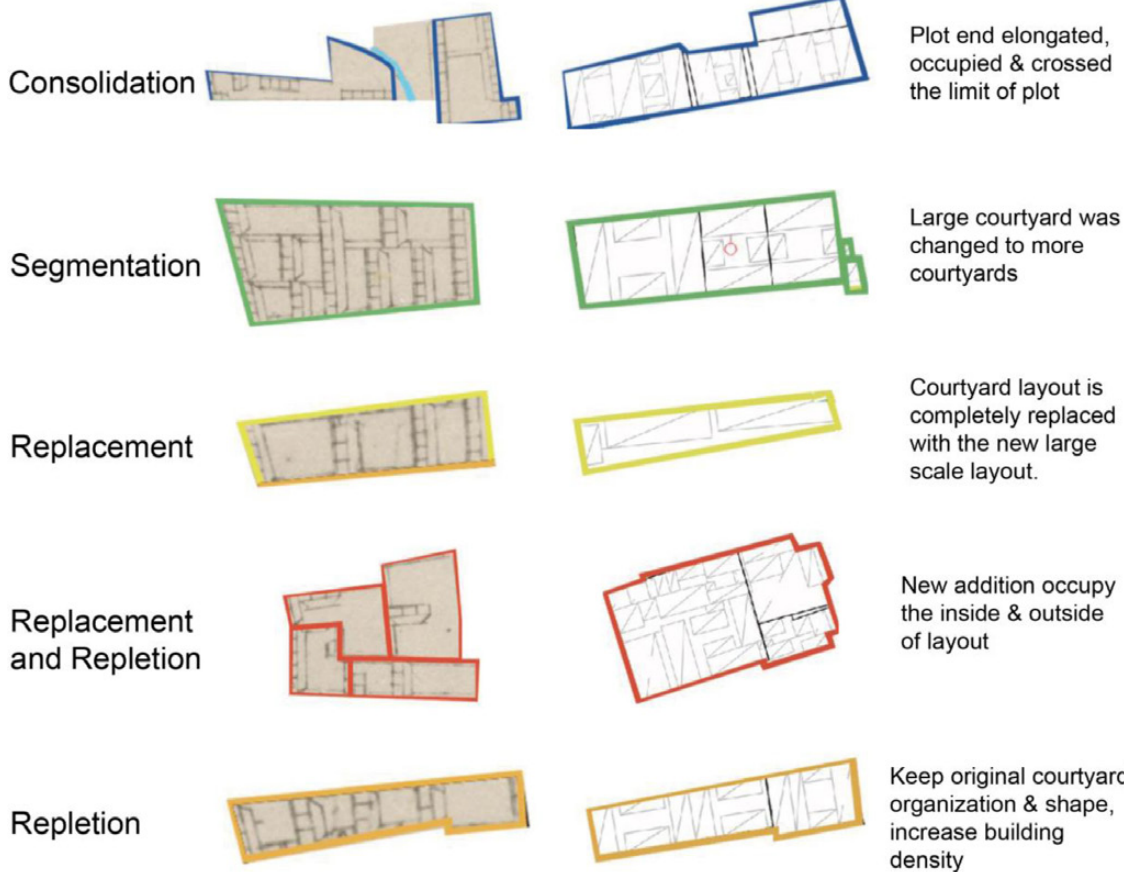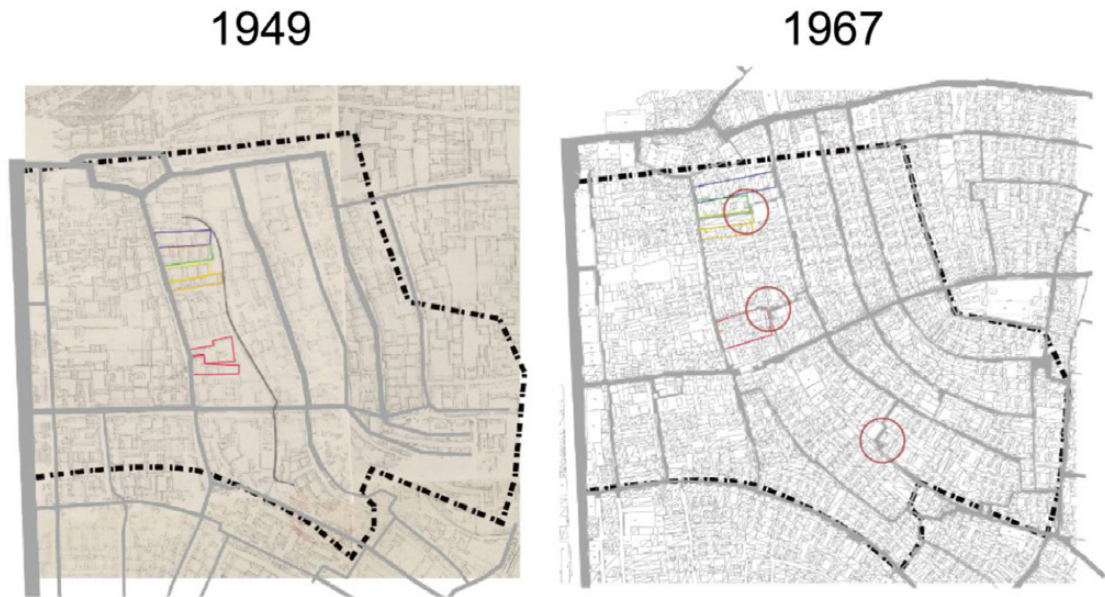
men was the neareast gate to inner city, cause huge population gathered there, which is called Gate Effect, as is the case of Hotspur Street. So with former foundation of commmercial, numerous commercial shop and handicraft migrated to Qianmen-Freshfish District. Additionally, regional officials, business man coming to Beijing and students to attend Imperial Examination call gathered there, thus a special sort of hotel was construct-

Figure 3. Road System and Plot Layout Evolution Mode of Freshfish District from in 1966 and 2000.
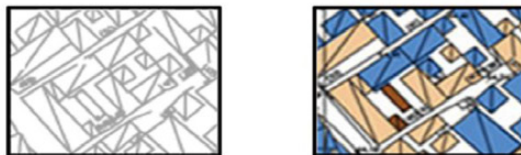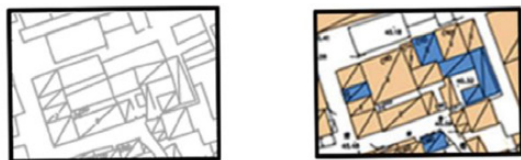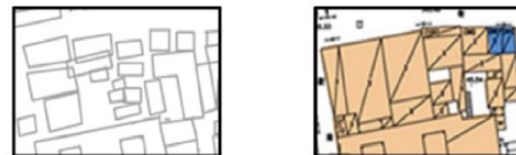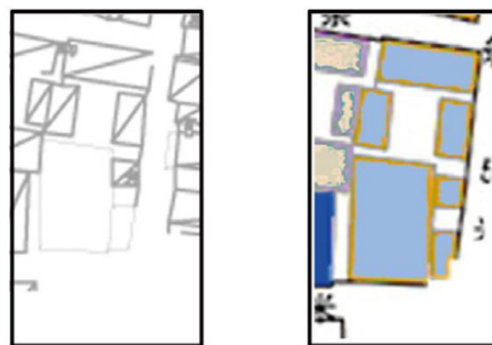
ed and owned by fellow mainly serving fellows from the same place other than Beijing. Thus complex business activities intensed the commercial importance and morpholigical repeltion and repletive absorption.and Plot front were occupied by commercial.Tail were residential courtyards.

Figure 4. Road System and Plot Layout Evolution Mode from 2000 to 2013.
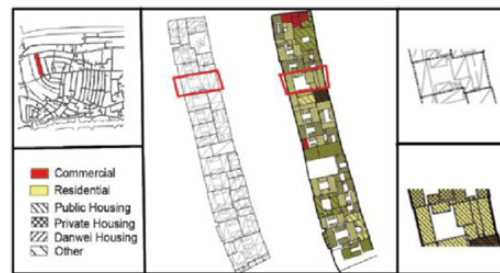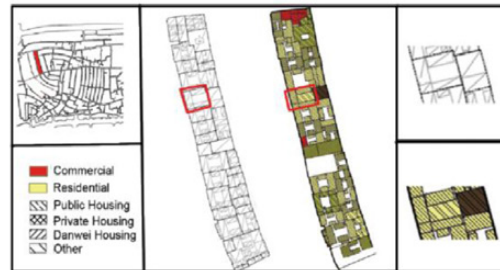
The Morphlogical Evolution of Freshshif Street before 1949

After the ribbon development resulted from Langfang's construction, together with the migration policy of the population from inner city in Qing Dynasty, the street and the ribbon plots besides underwent intense repletion and repletive absorption. The repletive absorption emerged mainly along the Qianmen-Freshfish Street, the main arterial road, by the forms of temporary stalls. The stalls in Ming dynasty gradually converted into formal house legacy in Qing Dynasty, formed on both sides of frontage plots of Qianmen Street. Thus one street has evolved into three street, influenced by repletive absorption.

Because the old map only shows the relative relationship and the literature of the original ownership can hardly be found. So the shape of courtyard layout is used to distinguish ownership. Commercial plot is suggested to have lined courtyard layout. Residential plot

located in the east district, has a relatively complete traditional courtyard layout. Hotel especially for local officials and theater are occupied with enclosed buildings.

Commercial plots distributed along Freshfish Street. And they were arranged in north-south direction, indicating that business function was much more dominant than residential function. Mostly, the plot front was narrow but with a long depth, which helps save land, resulting in greater business profits in a limited area.

The Morphlogical Evolution of Freshshif Street in 1949 to 1966

After the founding of the People's Republic of China, the Freshfish Street remained an important commercial district. Many century-old shops clustered and new commercial activities like opera, drama, hotels, chemical stores, clothing shops, department stores, bike shops, photo studio also gathered there.

Though train traffic flow was still dense, but gradually was replaced and turned into the Railway Museum. And the former in-out city ban was broken, many commercial gradually migrated to the inner city. So the commercial importance of Freshfish Street declined.

At the beginning of new China, as social employment, security and health conditions were improved significantly, a population peak emerged in 1949—1960 in Beijing. Housing property ownership was a mess, therefore, the government began land reform. Unauthorized houses belonged to Government, of which partly given to institutions of government called Danwei. In 1958-1966, it was regulated a house more than ten or more separate rooms should be handed to government.

The original position of Sanli Rive was filled with repletion of residences. In order to maintain the prevailing demand of traffic, 3 cross alleys appeared.

As a significant commercial street and also connecting two large business circles nearby, the Freshifish Street was a commercial passby. The plot heads along street were occupied by commercial and plot tails were residential. And the plot head usually was narrow but with a large depth, and the roof of plot connected to one another.

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Government owned plots were occupied or rented by employees and many formal layouts were transformed to meet demand for space. Because exact property ownship map was unaviable, brief plot layout evolution modes are presented here.

The Morphlogical Evolution of Freshshif Street in 1966 to 1979 and 1979 to 2000

In August 1966, reform of communism continued and business reform also initiated. Old stores, some goods and services were forbidden and discontinued, which caused dissolution of the individual economy and expansion of collective economy. Residential plots all became public ownership and it was state that operated and maintained all the houses.

It was not until 1979 reform and opening up that small amount of original private housings were given back to old owners, but many houses have been government or institutional property.

During the two periods, Business began to slow down, housing privatization has become the main driving force of repletion and repletive absorption. Width and direction of Freshfish District main roads remained unchanged, decrease the alley width less than 4m more. Although the intensity of commercial activities decreased, the number of alleys which were less than 4 meters wide, increased, allowing more population flow to enter. Compared to the number of functional blocks to reduce residential alley, it may have been occupied by foreign invasion effect plots.

Though some houses were given back to original owners, within most of the old courtyard lived many families. The former one family one courtyard living mode was broken, resulting in many additions and constructions appeared to meet the demand for space of different families, like kitchens and storage room, destroying the layout of traditional courtyard.

The real estate communism, in fact, was land split. Public operators need to convert land usage or leased to multiple users, individuals and institutions included. The natural population growth of rental and private homes, which was given back after 1979, caused repletion.

The Morphlogical Evolution of Freshshif Street in 2000 to 2015

After 2000, government conducted historical preservation planning, aiming at protecting Freshfish Street and improving the commercial viability and dwelling condition. Planning transformed the original street frame and even plot series. Freshfish's commercial importance rised again, bringing big morphological changes.

Since 2006, the government as the operator involved commercial land and residential land morphological change. Commercial land as well as roads in the west were all demolished and reconstructed. Freshfish Street east end were broaden, thus the buildings and layouts along it were tored down and shorted to set aside space. While, on the residential land, several road deriving from traffic demand emerged spontaneously.

The morphological changes mainly were conducted by government and individual. Government conducted morphological changes can be complete demolition, addition demolition and residential plot reconstruction. Complete demolition emerged mainly in the new commercial plot series, and whole or part of courtyard layout was dismantled.

Government operated addition demolition aimed at removing the intrinsic generate additional buildings and structures.

Residential plot reconstruction conducted by government mainly appeared on the residential plots, breaking the plot boundary, causing some sections' demolition, and rearranged the building sequence within plot layout.

Repletion of private property was caused by population growth and need for private space of modern life.

Conclusion

Road upgraded as being the axis of capital and also connecting the inner and outer of capital wall, attracting flow of the good and population. This attraction of flow can be illustrated by the special location of the street as well as the location of Qianmen Gate. The location superiority increased the importance of the road, sequentially, the commercial and residential plot series within the double ribbon evolved, but mainly in terms of repletion.

With the repletion intensity increase, the former plot layout gradually changed. Meanwhile, the location also changed. On one hand the location function modified to meet the new need or policy regulation. On the other hand, location situation had changed, as the case in Freshfish Street that the inner and out city ban was cancelled, altering the former location superiority. And all the factors from repletion, location and location situation, accumulated in morphological changes. Gradually the initial morphological conformity of ribbon was disrupted and even the former constraining street also changed.

References

Conzen, M. R. G. (1969) *Alnwick, Northumberland: a study in town-plan analysis* (2nd edition), institute of British Geographers Publication 27 (George Philip, London).
Conzen M R G. (2004) *Thinking about Urban Form: Papers on Urban Morphology*, 1932-1998, edited by Michael P. Conzen, (Peter Lang Pub Inc).
Albert, L. (1999) 'Urban morphology and the problem of the modern urban fabric: some questions for research', *Urban Morphology* 3(2), 79-85.
Conzen, M. R. G. (1968) 'The use of town plans in the study of urban history', in Dyos, H. J. (ed.) *The study of urban history* (Edward Arnold, London) 113-30.

Narrating Helsinkis Kalasatama. Narrative Plotting, Genre and Metaphor in Planning New Urban Morphologies

Lieven Ameel
Department of Finnish, Finno-Ugrian and Scandinavian Studies, University of Helsinki,
P.O. Box 3, 00014 University of Helsinki, Finland
Keywords: Helsinki, narrative planning, harbor redevelopment

Abstract

In urban planning, narrative is increasingly used as an instrument to give coherence to the often contradictory functioning of cities and their partly uncontrolled development. The "story turn" (Sandercock 2010) in urban planning has led to new planning methods and practices, but also to an increasing complexity in research methodology. The fields of literary and narrative studies could make two important contributions to the examination of changing urban morphologies: first, to actively engage in a process of narrative mapping (cf. Childs 2008) by supplementing existing qualitative data with more experiential knowledge. And second, to bring long-standing expertise on narrative structures to bear on the burgeoning narrative practices within planning.

In my paper, I will look at how cultural narratives of the Helsinki shorelines are actively sought for and implemented by planners in order to engage in place-making, and to communicate with local inhabitants. The most conspicuous use of cultural narratives is the recent move of the Helsinki City to hire 8 artists to help the Planning Department develop the city, as well as the highly mediatized use of landscape art to help create spatial identities, and the commissioning of a literary novel in one waterfront development. I will examine one case in particular: the former container harbour Kalasatama, in Helsinki, which is currently under construction.

I argue that adapting concepts from literary theory – Bakhtin's concept of narrative polyphony (1984), and the study of genre, plot and metaphor, in particular – could help researchers to come to terms with ongoing narrative remodelling of urban form, and might offer both planners and citizens new tools to enter into a more inclusive and democratic dialogue about how various narratives and voices are (or ought to be) petrified into the morphology of the built city.

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In urban planning, narrative is increasingly used as an instrument to give coherence to the often contradictory functioning of cities and their partly uncontrolled development. The "story turn" (Sandercock, 2010) in urban planning has led to a complexity of planning methods and practices, but also to an increasing complexity in research methodology. The fields of literary and narrative studies could make two important contributions to the examination of urban morphology: first, to actively engage in a process of narrative mapping (cf. Childs, 2008), supplementing experiential knowledge to existing qualitative data. And second, to bring long-standing expertise on narrative structures to bear on the analysis of burgeoning narrative practices within planning.

In my paper, I will look at how cultural narratives of the Helsinki shorelines are actively sought for and implemented by planners to redevelop the long waterfront of the Finnish capital, in order to engage in place-making, and to communicate with local inhabitants. The most conspicuous use of cultural narratives is the recent move of the Helsinki City to hire 8 artists to help the Planning Department to develop the city, the mediatized use of landscape art to help create spatial identities, and the commissioning of a literary novel in one waterfront development. I will examine one area currently under developing in Helsinki, in particular: the former container harbour Kalasatama, which is planned to be finished in the 2030s. The source material for my paper consists of official internet pages, urban planning documents, as well as official social media profiles and media accounts. Literary sources relevant to narratives of the use of the Helsinki waterfront will be used as complimentary sources.

As Ruth Finnegan has accurately observed in her seminal study of narratives in Milton Keynes, "recent years have … seen an explosion of interest in the concept of narrative. The scope has extended from the original literary context into studies right across the social and human sciences, even more widely." (Finnegan 1998, p. 4) In urban planning theory, the interest in narrative, visible since the early 1990s onwards, tends to be associated with a Foucaultian interest in discourse, storylines and argumentation (Boyer, 1983; Fischer & Forester, 1993; Hajer, 1993, 2006) and the post-Habermasian attentiveness to the way language shapes human interaction, including planning and policy. The study of rhetoric devices is one possible way of examining how such stories are used and adapted in the context of urban planning (see Throgmorton, 1993, 1996; see also Myerson and Rudin, 1996). In planning theory, argumentation, discourse and storyline are some of the concepts that have been applied to examine how planners shape a vision of a specific locality as part of a political and cultural dialogue with other actors. Bringing in an awareness of narrative into planning theory and practice may have the possibility to facilitate the dialogue between various actors in planning that has been sought in recent research on consensus building (Innes and Booher, 2010), collaborative (Healey, 1998) planning, and the idea of the planner as deliberative practitioner (Forester, 1999). Patsy Healey has pointed out that the work of contemporary planners can be described in terms of story-writing:

In many parts of the world, governance elites are trying to write new stories for their cities, to inscribe these stories in the identities of the key players upon whose actions the core relations of a city depend and to incorporate them into the practices of an urban governance which stretches beyond the town hall to a wide range of people involved in governance in one way or another. *The challenge for planners is to reconstruct their own ways of thinking and acting to provide creative resources for critiquing and facilitating this work of city story-writing*. (Healey, 2000, pp. 527-528; my emphasis)

The schooling and conceptual apparatus available to urban planners, however, seems to have left this profession somewhat ill-equipped to embark upon the kind of work of 'city story writing' envisioned by Healey. Similarly to Healey, Knieling and Othengrafen (2009) describe the work of planners as a constant negotiation between potentially conflicting stories, but they point out that the shift to a postmodernist paradigm, which has introduced culture into planning practices, has failed to bring into existence a 'general and systematic framework to integrate culture as an organizing principle into planning' (p. 39-64). What is needed, then, is a more rigorous effort to develop a theoretical and

conceptual framework with which to address and analyze the more discursive urban planning practices that have been evolving during the past decades

So far, questions of narratives as narrative within planning discourse, based on narrative or literary studies, have had limited impact on the study of narratives in planning. Very little systematic research has been carried out to analyse the kinds of narratives used, the various ways in which these are applied within the planning and development process, or the extent to which they feed into the everyday lives of urban dwellers. As Isserman & Markusen (2013) and others have emphatically argued, narratives do matter in urban planning. But there is not, as yet, a clear set of conceptual or methodological tools with which to examine the proliferating narratives in contemporary planning in terms, specifically, of their narrative qualities. One of the reasons of this conceptual deficit may reside in the fact that few scholars working on narrative urban theories have let themselves be inspired by narrative theory. This is the more striking given the notable expansion of studies of narrative in the humanities and in the social sciences.

During the last decades have increasingly, theorists within literary studies and the social sciences have developed models with which to adapt narratological concepts (often drawing on literary studies) to narratives other than literary texts, such as biographies, media narratives, patient diaries, to name but a few examples (see e.g. Bruner, 1991; Fludernik, 1996; Hyvärinen, 2010; Nünning & Nünning, 2010; Nünning, 2010). A more concerted effort to map and analyse the use and structures of narratives in planning could benefit from recent advances in comparative literary studies, narratology, as well as recent research in sociology and self-narratives. Concepts from narrative theory could bring new insights into the field of urban planning theory, which has arguably been struggling to develop conceptual frameworks with which to coherently incorporate discursive practices and paradigms, and in particular, to replace totalizing master narratives with a subtle treatment of "small", local narratives (cf. Knieling and Othengrafen, 2009; Sandercock, 2010).

I argue that adapting concepts from literary theory – Bakhtin's concept of polyphony (1984), and the study of genre and metaphor, in particular – could enable researchers to come to terms with ongoing narrative remodelling of urban form, and to offer both planners and citizens new tools to enter into a more inclusive and democratic dialogue about how various narratives and voices are petrified into the morphology of the built city.

In narrative theory, one particularly useful conceptual framework is provided by (literary) genre typology. In literary studies, there is a long tradition of genre studies that has shown how literary genres act as "frameworks of expectation" (Seitel, 2003, p. 277): "storehouses of cultural knowledge and possibility … that support the creation of works and guide the way an audience envisions and interprets them" (Seitel, 2003, p. 279). Some of the most revealing narrative analyses of urban planning have shown the considerable extent to which narrative documents draw on generic structures that have a long history in literature. Mireile Walter, for example, in her recent study of Karlskrona's masterplan, has shown that Karlskrona strategic narrative of a future sustainable city reads as a comedy of the sustainable city, since it "contains many elements that, according to Frye (1957), belong to the classic formula for a comic plot" (Walter, 2012, p. 167).

Genre comes close to the concept of policy frame, which has been studied quite extensively in planning and policy theory (Hajer and Wagenaar, 2003, p. 29). Similarly, drawing on the work of Rein and Schön, Fischer and Forrester argue that at the basis of policy frames are "the stories, or narratives, participants are disposed to tell about policy situations. Frequently constructed around "generative metaphors," problem-setting stories "link casual accounts of policy problems to particular proposals for action" and so link accounts of "is" and "ought."" (Fischer and Forester, 1993, p. 11). Metaphor is a second concept that has been studied extensively in literary and narrative studies, before it became applied in the studies of planning argumentation and rhetoric, that can lead to new insights into how narratives in planning are shaped. Drawing on Ricoeur, Kaplan has argued that metaphors "have the ability to bring together what at first seem 'distant' into something" (Kaplan, 1993, p.172). I will argue that in contemporary urban planning visions of Kalasatama (and other examples from the long Helsinki waterfront), metaphor is what bridges the gap between the past and the future, what concretizes in language the changes envisioned in the planning.

Polyphony, the many-voicedness of the city, is a potentially crucial conceptualization of how narrative can bring new perspectives to planning. Indeed, the importance of narrative in theory has often been seen to reside in its potential to allow for more democratic and inclusive planning. The past decades have seen the appearance of the relatively widespread assumption that drawing local voices and local narratives into the planning process may offer the key to more positive experiences of place, a more close-knit sense of community, and a more genuine sense of identity and belonging (see e.g. Bianchini, 2006, p. 26). An awareness of the local stories in a community is explicitly seen as beneficial for the planning process (see Filep et al., 2014, p. 305; Depriest-Hricko and Prytherch, 2013). Esnard (2012) emphasizes the importance of "local knowledge derived from social narratives" (317), and in the words of Bloomfield (2006), cities "should draw on the diversity of social perspectives through research on citizens' narratives to forge a more democratic, pluralist and inclusive urban imaginary" (p. 45). Several theorists have similarly emphasized the potential impact of local narratives for a more inclusive, democratic and sustainable city (Eckstein & Throgmorton, 2003; Bartholomew and Locher, 2011, p. 94–97; Hajer et al., 2010, p. 24–26; Li and Hamin, 2012, p.188–190).

In literary studies, the concept of polyphony is connected first and foremost with the figure of Mikhail Bakhtin (1963), by whom it was developed in an influential study of the work of Dostoevsky. Polyphony is not a new concept within urban theory, although its roots are not always clearly traced to Bakhtin's. In the way it is most commonly understood in urban studies, polyphony has its roots in 'new' ethnology, and in particular, in considerations about how researchers speak of the people they study (from people in the 'Middle East' being orientalised by Western researchers, to inhabitants of Medieval France in historiography) (see e.g. Crang, 1992). Polyphony as a method, then, endeavours to replace the monolithic voice of the authoritative researcher with a discourse that includes the voices of those under scrutiny, for example by including original narratives recounted by indigenous people in scientific texts discussing these.

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In geography and urban theory, if used at all, polyphony has for the most part seen as a research approach. Several planning researchers refer to what they call 'polyvocal' narratives as part of their analysis, drawing the link with ethnographic research; the relation to Bakhtin's work is often much more implicit (see Dormans, 2008; Hubbard, 2006, p. 122; Llewellyn, 2004; Sandercock & Attili, 2010), although there are notable exceptions (see Holloway & Kneale, 2000). In his article on planning as persuasive storytelling, James Throgmorton (1993), drawing on the philosopher Arran Gare, does mention Bakthin's concept of 'polyphonical, dialogical narrative', seeing similarities between his own views on planning and Gare's reading of Bakhtin, but this literally does not amount to more than a footnote.

While genre and metaphor (applied from the framework provided in literary and narrative theory) can offer insights into the structure of planning narratives, the concept of polyphony may offer new methods in the kinds of planning processes that lead up to legally binding policy plans. Polyphony as a concept and as a method (or, as Bakthin put it, as a principle of human relationship), may carry the potential of not only of a more ethically grounded planning theory, but also of more ethically informed narrative planning.

When applied to the waterfront development in Kalasatama, approaching urban planning documents and practices of this area in terms of their narrative genre and the metaphors brings to light a number of contradictory narrative characteristics of this future area. The focus in planning documents to be on the 'comic' genre of inclusion and resolution, and resembles in a number of aspects the genre of the *Bildungsroman*, with its promise of mutually beneficial integration. The metaphors used put an emphasis on the natural and indeed bodily characteristics of the city and this area under construction. Both of these narrative features are far from self-evident, especially when considered against the background of the urban morphology of this part of the city. While building height, building block structure, and public transport would seem to favour solutions similar as those used in the city centre, thus underlining the idea of a natural development of the inner city, other features of the planned urban morphology run counter to this storyline. These features include the projected construction of several unusually large skyscrapers, as well as the concentration of commercial and other services in an excessively large shopping centre.

When the planning documents of this area are read against the backdrop of a Bakhtinian ideal of polyphony, the claim that Kalasatama is 'a story told in cooperation', as the official website claims, leaves much to wish for. Regardless of the planning's many narrative characteristics (in the sense of narratives used explicitly to promote the area, and official actors' invitation to the public to engage in storytelling about the area), it has been argued that the planning of Kalasatama is defined by a relatively low degree of communicative action and deliberation. When it comes to planning for resilience, it has even been argued that the degree of communication with participants involved has been low: in a comparative examination in relation to the resilience to flooding, Heleen L.P. Mees found that in the case of Kalasatama (and the planned floating district in Kalasatama, in particular), there was "hardly any participation; participation was restricted to information meetings and legally compulsory participatory evenings". As a consequence, Mees argued, decision-making had a low degree of legitimacy (Mees, 2013, p. 263). This is no trivial matter, given the fact that the risks of flooding are more than ever an issue that should have involved inhabitants: Mees notes that from 2014 onward, the national government would no longer compensate damage due to flooding, but that there was as yet no risk communication towards citizens (Mees, 2013, p. 261).

Several of the activities associated with the development of Kalasatama would seem to fall in the category of polyphonic practices, in particular the project of hiring artists to act as in-betweens between city and citizens, and the various artistic projects these artists have enacted together with locals. However, these activities do little to become part of the key narrative features of the area's development, as these are laid out in the planning documents. Rather than being part of the narratives *in* planning, they constitute elements that are part of the more peripheral narratives *of* planning – narrative elements that act as a commentary to, rather than as integral to, the chore narrative elements of a planning project (see Ameel, 2014).

In the way they function within planning narratives, genre and metaphor are more than the seemingly superficial rhetorical tropes they are sometimes made to be. Rather, they are tropes that guide not only the imagination of a particular area, but that also have their influence on the way in which the urban morphology of the area in question will unfold, including such things as size, form and situation of building blocks, distribution of services, and solutions related to transport. In order to move towards a narrative strategy in planning that is able to incorporate more varied local narratives, polyphony, as outlined by Mikhail Bakhtin, could provide a crucial concept with which to measure to what extent various narratives could be accommodated and included in the chore storylines of a particular planning project.

References

Ameel, L. (2014) 'Kohti kerronnallista käännettä yhdyskuntasuunnittelussa', Yhdyskuntasuunnittelu 52, 2, 62-67.

Bakhtin, M. (1984) *Problems of Dostoevsky's poetics* (University of Minnesota Press, Minneapolis).

Bianchini, F. (2006) 'Introduction. European Urban Mindscapes: Concepts, Cultural Representations and Policy Applications', in Weiss-Sussex, G. and Bianchini, F. (ed.) *Urban Mindscapes of Europe* (Rodopi, Amsterdam) 13-34.

Bloomfield, J. (2006) 'Researching the Urban Imaginary: Resisting the Erasures of Places', in Weiss-Sussex, G. and Bianchini, F. (ed.) *Urban Mindscapes of Europe* (Rodopi, Amsterdam) 45-61.

Bruner, J. (1991) 'The Narrative Construction of Reality', *Critical inquiry* 18, 1, 1-21.

Childs, M. C. (2008) 'Storytelling and Urban Design', *Journal of Urbanism* 1, 2, 173-86.

Crang, P. (1992) 'The politics of polyphony: reconfigurations in geographical authority', *Environment and Planning D: Society and Space* 10, 5, 527 – 549.

Depriest-Hricko, L. R, and Prytherch D. L. (2013) 'Planning and Sense of Place in a 'Dying'downtown: Articulating Memories and Visions in Middletown, Ohio', *Journal of Urban Design* 18, 1, 145-65.

Dormans, S.E.M. (2008) *Narrating the City. Urban Tales from Tilburg and Almere Enschede*

(Printpartners, Ipskamp).

Eckstein, B. J, and Throgmorton J. A. (2003) *Story and Sustainability: Planning, Practice, and Possibility for American Cities* (MIT Press, Cambridge, MA).

Esnard, A. (2012) 'Visualizing Information', in Rachel, W. and Crane, R. (ed.), *The Oxford Handbook of Urban Planning* (Oxford University Press, Oxford) 306-322.

Filep, C. V., Thompson-Fawcett, M., and Rae M. (2014) 'Built Narratives', *Journal of Urban Design* 19, 3, 298-316.

Finnegan, R. (1998) *Tales of the city: a study of narrative and urban life* (Cambridge University Press, Cambridge).

Fludernik, M. (1996) *Towards a 'Natural' Narratology* (Routledge, London).

Hajer, M. (1993) 'Discourse Coalitions and the Institutionalization of Practice: The Case of Acid Rain in Great Britain', in Fischer, F. and Forester J. (ed.) *The Argumentative Turn in Policy Analysis and Planning* (Duke University Press, London) 43-76.

Hajer, M. (2006) 'Doing Discourse Analysis: Coalitions, Practices, Meaning', in van den Brink, M. and Metze T. (ed.) *Words Matter in Policy and Planning. Discourse Theory and Method in the Social Sciences* (Netherlands Geographical Studies, Utrecht) 65-76.

Hajer, M.; Grijzen, J., and van 't Klooster, S. (2010) *Sterke Verhalen. Hoe Nederland De Planologie Opnieuw Uitvindt* (010, Rotterdam).

Healey, P. (1993) 'Planning through Debate: The Communicative Turn in Planning Theory', in Fischer, F. and Forester, J. (ed.) *The Argumentative Turn in Policy Analysis and Planning* (UCL Press, London) 233-53.

Healey, P. (1998) 'Building Institutional Capacity through Collaborative Approaches to Urban Planning', *Environment and Planning* a 30, 9, 1531-46.

Healey P. (2000) 'Planning in Relational Space and Time: Responding to New Urban Realities', in Bridge, G. and Watson, S. (ed.) *A Companion to the City* (Blackwell, Oxford) 517-30.

Holloway, J. and Kneale, J. (2000) 'Mikhail Bakhtin. Dialogics of Space', in Crang, M. and Thrift, N. (ed.) *Thinking Space* (Routledge, London) 71-88.

Hubbard, P. (2006) *City* (Routledge, Oxon).

Hyvärinen, M. (2010) 'Eletty Kertomus Ja Luonnollinen Narratologia', in Hatavara M., Lehtimäki M. and Tammi P. (ed.) *Luonnolliset Ja Luonnottomat Kertomukset: Jälkiklassisen Narratologian Suuntia* (Gaudeamus, Helsinki) 131-57.

Innes, J.E, and Booher, D.E: (2010) *Planning with Complexity: An Introduction to Collaborative Rationality for Public Policy* (Routledge, London).

Isserman, N. and Markusen, A. (2013) 'Shaping the Future through Narrative: The Third Sector, Arts and Culture', *International Regional Science Review* 36, 1, 115-136.

Kaplan, T.J. (1993) 'Reading Policy Narratives: Beginnings, Middles, and Ends,' in Fischer, F. and Forester, J. (ed.) *The Argumentative Turn in Policy Analysis and Planning* (UCL Press, London) 167-185.

Knieling, J. and Othengrafen F. (2009) 'En Route to a Theoretical Model for Comparative Research on Planning Cultures', in Knieling J. and Othengrafen F. (ed.) *Planning Cultures in Europe: Decoding Cultural Phenomena in Urban and Regional Planning* (Ashgate, Farnhan) 39-64.

Li, N., and Hamin E. M. (2012) 'Preservation', in Weber, R. and Crane, R. (ed.) *The Oxford Handbook of Urban Planning* (Oxford University Press, Oxford) 197-217.

Llewellyn, M. (2004) ''Urban Village' or 'White House': Envisioned Spaces, Experienced Places, and Everyday Life at Kensal House, London in the 1930s', *Environment and Planning D* 22, 2, 229-50.

Mees, H.L.P. (2013) 'Legitimiteit in meerlaagse waterveiligheid' in *Rooilijn* 46, 4, 258-264.

Myerson, G. and Rydin, Y. (1996) *The Language of Environment. A New Rhetoric* (Routledge, Oxon).

Nunning, V. (2010) 'The Making of Fictional Worlds: Processes, Features, and Functions', in Nünning V. Nünning A. and Neumann B. (ed.) *Cultural Ways of Worldmaking: Media and Narratives* (De Gruyter, Berlin) 215-45.

Nünning, A. and Nünning V. (2010) 'Ways of Worldmaking as a Model for the Study of Culture: Theoretical Frameworks, Epistemological Underpinnings, New Horizons', in in Nünning V. Nünning A. and Neumann B. (ed.) *Cultural Ways of Worldmaking: Media and Narratives* (De

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Gruyter, Berlin) 1-28.

Sandercock, L. (2010) 'From the Campfire to the Computer: An Epistemology of Multiplicity and the Story Turn in Planning', in Sandercock, L. and Attilli, G. (ed.) *Multimedia Explorations in Urban Policy and Planning: Beyond the Flatlands* (Springer, Heidelberg) 17-37.

Sandercock, L., and Attili G. (2010),'Digital Ethnography as Planning Praxis: An Experiment with Film as Social Research, Community Engagement and Policy Dialogue', *Planning Theory & Practice* 11, no. 1, 23-45.

Seitel, P. (2003) 'Theorizing Genres-Interpreting Works', *New Literary History* 34, 2, 275-97.

Throgmorton, J (1993) 'Survey Research as Rhetorical Trope: Electric Power Planning Arguments in Chicago', in Fischer, F. and Forester, J. (ed.) *The Argumentative Turn in Policy Analysis and Planning* (UCL Press, London) 117-44.

Throgmorton, J. (1996) *Planning as Persuasive Storytelling: The Rhetorical Construction of Chicago's Electric Future* (University of Chicago Press, Chicago).

Walter, M. (2013) 'Making Plans-Telling Stories: Planning in Karlskrona/Sweden 1980-2010.' Blekinge Institute of Technology.

Chair_Alessandra Capuano
DiAP Department of Architecture and design, "Sapienza" University of Rome,
53A, via Gramsci, 00197, Rome, Italy
Co-Chair_Angela Fiorelli
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

Reading Contemporary Landscape

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city as organism | new visions for urban life

Atlanta Beltline: Peripheral Interstitial Urbanism

Michael James Carroll
Kennesaw State University Department of Architecture, Marietta, Georgia, United States 30060

Abstract

As pointed out by Rem Koolhaas in S,M,L,XL, Atlanta is a new kind of city, a collage city, a multi-centric city, a generic city, a city of extensive infrastructures embedded in an undulating vegetal carpet of green. The city's formless configuration is best described by its highway system, a stretched 'X' surrounded by a peripheral 'O'. In his analysis of Atlanta, Koolhaas did miss a vital component of the city's makeup that in recent years has become a key ingredient in its urban revitalization, namely, the Atlanta BeltLine, a pear-shaped perimeter railway that was completed in 1902 and serviced a constellation of warehouses along its industrial corridor. It is probably not surprising that Koolhaas missed the Atlanta Beltline, by the mid-1990s it was basically abandoned and literally enveloped in a sea of kudzu – it was essentially a no-man's land that reinforced the boundaries between Atlanta's inner city neighborhoods and contributed to its urban fragmentation and, more importantly, its racial, political and economic segregation. Similar to other abandoned industrial infrastructures, such as the New York City Highline, the Atlanta Beltline in recent years has been transformed into a new urban vision – a twenty-two mile promenade for pedestrians and cyclists that eventually will also be the site for a light rail transit system. Not slated for completion until 2030, the first three-mile section of the Atlanta Beltline was opened in August 2014, with other sections of the path currently in development. Within the context of a car-centric city, the project has provided an alternative, post-car infrastructure that has been a catalyst for the densification of its inner-city perimeter. As a project aligned with the tenets of ecological urbanism, the Atlanta Beltline features an urban arboretum and a linear park of native grasses, bioswales and permeable surfaces. Ironically, the Atlanta Beltline, once defined as the periphery of the city, has become the central focus of its urban re-invention – an interstitial zone of urban intensification that provides a new connective tissue that fosters vital organic networks between the heterogeneous patchworks of Atlanta's inner-city neighborhoods.

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Peripheral City

"If there is to be a "new urbanism" it will not be based on twin fantasies of order and omnipotence…but about expanding notions, denying boundaries, not about separating and identifying entities, but about discovering unnamable hybrids; it will be no longer be obsessed with the city but with the manipulation of infrastructure for endless intensifications and diversifications, shortcuts and redistributions…"[1]

The city is not dead, but exists in another state of being, not the European pre-car city, with cohesive urban fabrics and discernible local cultures, but another entity – a city of the 21st century, born of the car-centric 20th century. This city is expansive, it exists without a dominant center, and it thrives, as a suburbanized metropolis comprised multiple nodes, clusters of intensities connected but also divided by multiple infrastructures – both present and past. Although the city might have a central downtown, it is really defined by its periphery – a city without a center, a city of circumference(s).

This city is also one that must be re-invented, a city of the 21st century in which the post-industrial city must be tempered, as a new post-fossil fuel, post-car future becomes the dominant reality. Embedded and rusted industrial infrastructures, of train tracks, inner-city railway yards and other brownfield sites will become points of departure for the reconstruction and consolidation of future cities. Of course, this switch has already begun in the late 20th century in many post-industrial cities – but will become increasingly a reality as the American culture confronts issues of sustainability with an emphasis on energy generation and use. This maybe a leisure-centric culture of the information age, but it is invested in a future with less reliance on the car, an emphasis on health and well-being, and a focus on community building – both local and global. But where is this city of the 21st century?

Atlanta: A Contemporary City

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"The contemporary city ... ought to yield a sort of manifesto, a premature homage to a form of modernity, which when compared to cities of the past might seem devoid of qualities, but in which we will one day recognize as many gains as losses. Leave Paris and Amsterdam - go look at Atlanta, quickly and without preconceptions."[2]

Rem Koolhaas is infatuated with Atlanta. He devoted a whole chapter to the sun-belt city in his treatise, *S,M,L,XL*. The chapter is a collection of Koolhaas' observations, written between 1987-1994, when the city was undergoing an expansive building boom. Listed under the 'Extra Large' category, Atlanta is included in the company of other cities: Las Vegas, Singapore and the ubiquitous metropolis of nowhere – The Generic City.

"…the city liberated from the captivity of the center, from the straitjacket of identity… It is a city without history. It is big enough for everybody…if it gets to small it just expands."[3]

Unlike the Grand Tour of the In the 17th and 18th centuries of gentlemen architects and artists, this Koolhaas' survey does not include the treasures of Venice, Florence, Rome, Naples or the ruins of Pompeii. Definitely not, the future of cities, if there is one, is seen through the lens of the brash and beautiful American city – a source of both intoxicating dreams and sobering realities. Koolhaas, the sublime pragmatist infatuated with the banal, begins to untangle through his keen observations, lessons from Atlanta and other generic sprawl cities.

Atlanta: Boom (and Bust) City

In 2007, CNN reported that Atlanta was one of the fastest growing metropolitan areas in the United States since 2000, with a gain of nearly 900,000 residents increasingly its overall population to 5.1 million. In 2015 that number has increased to over 5.4 million. As one drives around Atlanta and its environs it begins to look like everything was constructed

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[1]Koolhaas, Rem and Mau, Bruce. S.M.L.XL (New York: The Monacelli Press, 1995) pg. 969
[2]Koolhaas, Rem. "Toward the Contemporary City." Design Book Review no. 17. (Winter 1989) pgs.15 - 16
[3]Koolhaas, Rem and Mau, Bruce. S.M.L.XL (New York: The Monacelli Press, 1995) pgs.1249 -1250

Figure 1. Map of the Atlanta BeltLine in Context with the Perimeter Highway (I-285).

in the last decade – everything is new and ready for business, despite the recent recession. Unlike most American cities like, New York, Chicago or Los Angeles, Atlanta is not a grid city. Any resemblance of the grid, evident in the old downtown, quickly disintegrates as the undulating topography, the historic patterns of railways, and the tangle of super highways, create a web of streets and that encircle swaths of development that expand outward to the city's perimeter and beyond.

"Atlanta's basic form...its basic formlessness, is generated by a highway system, a stretched X surrounded by an O...The X brings people in and out; the O – like a turntable – takes them anywhere."[4]

Although an astute observation, Rem Koolhaas did miss a subtlety in the basic make-up of Atlanta, half buried in the ground, completely overshadowed by the tangle of highways, is Atlanta's inner O – a pear-shaped perimeter railway track built by the Atlanta Belt Railway Company that was completed in 1902. This circle rail line was built in order that freight car transfers could occur on the outskirts of Fulton County rather than downtown Atlanta (Figure #1).

BeltLine City

The Belt Railway connected a whole constellations of industrial areas of the city, from the cotton warehouses on the southern border of the Atlanta's Old Fourth Ward neighborhood, to the White Provisions District and other industrial complexes west of Howell Mill Road to the large Sears Roebuck Warehouse (now Ponce City Market) and Ford Assembly Plant (now residential lofts), just south of Ponce de Leon Avenue; the historic

[4]Koolhaas, Rem and Mau, Bruce. S.M.L.XL (New York: The Monacelli Press, 1995) pg.836

dividing line between the white and black population of the city. As trucking became increasingly popular, The Belt Railway was gradually put out of business. By the 1980s it was largely abandoned – a forgotten, yet vital component of Atlanta's development – a twenty-two mile loop of infrastructure that would literally dissolve into the landscape of city, overtaken by shrubs and the ubiquitous ivy plant of the south, kudzu.

However, in 1999, a thesis completed at Georgia Institute of Technology College of Architecture by Ryan Gravel for his Master of Architecture and Master of City Planning, would mark the beginning of a new chapter in the history of the Belt Railway in Atlanta. Gravel's work entitled: *BeltLine - Atlanta: Design of Infrastructure as a Reflection of Public Policy*, theorizes the redevelopment of the Belt Railway as a light rail transit and a pedestrian/cyclist right-of-way that would reconnect the city and provide alternative transportation. The idea of the Atlanta BeltLine, as a repurposed infrastructure, that would be instrumental in the future of the city, was born. Gravel's thesis addressed the difficult issue evident in many North American cities in asking the question: how can a sprawl city become denser. How can the disparate neighborhoods isolated by abandoned tracks of rails and highways form a cohesive urban identity?

In his thesis document, Gravel states his vision for the BeltLine:

"At the seam of the City's goals to protect and revive historic neighborhoods, accommodate an influx of new residents, redevelop available land and provide alternative means of transportation, we find the historic belt lines and their associated territories ripe for redevelopment and ready for mass transit."[5]

Gravel continues to describe how essential the BeltLine project will be in reshaping Atlanta's future – a city historically founded as a terminus of the Western and Atlanta Railroad:

"The BeltLine, used as infrastructure, can revive the inner city and protect our natural ecology and agricultural resources by providing access to urban redevelopment areas for Atlanta's growing population as an alternative to suburban sprawl."[6] "… as one small part of that new understanding, the BeltLine light rail transit line can restructure urban brownfield redevelopment sites associated with underutilized historic freight lines."[7]

From graduate student with a vision, Gravel is now part of an effort to make the BeltLine project (Figure #2) a reality as a senior urban designer at Perkins + Will, a national architectural firm with a regional office in Atlanta. A press release in February 2011 announced the next chapter of the BeltLine saga:

"BeltLine official announced today that James Corner will join with the Atlanta office of Perkins+Will, which happens to employ BeltLine visionary Ryan Gravel, as the winning team for the $9.5 million design contract."[8]

Fresh off Manhattan's High Line linear park on an abandoned elevated railroad, New York's James Corner of Field Operations stated the following concerning Atlanta's BeltLine:

"Forward-looking cities and towns all over the world are investing in parks, open space and green infrastructure. The BeltLine is one of the most original and exciting—a large-scale greenbelt that will recast the identity of Atlanta, reconnect its neighborhoods, and enrich the public life for all of Atlanta's citizens. As with New York's High Line, the BeltLine will bring new life and vitality to the old, derelict infrastructure of industry and railroads, retooling these infrastructures for new social and environmental purposes."[9]

Although James Corner's participation in the Atlanta BeltLine project ceased a year later the project did continue and the Eastside Trail, the first finished section of the Atlanta BeltLine trail in the old rail corridor, was constructed and officially opened to the public in ribbon cutting ceremony in August 2014. The Eastside Trail of the BeltLine (Figure #3)

[5]Gravel, Ryan. Belt line - Atlanta: Design of Infrastructure as a Reflection of Public Policy (Thesis: Georgia Institute of Technology College of Architecture, 1999) pg. 25

[6]Gravel, Ryan. Belt line - Atlanta: Design of Infrastructure as a Reflection of Public Policy (Thesis: Georgia Institute of Technology College of Architecture, 1999) pg. 33

[7]Gravel, Ryan. Belt line - Atlanta: Design of Infrastructure as a Reflection of Public Policy (Thesis: Georgia Institute of Technology College of Architecture, 1999) pg. 32

[8]Press Release, Atlanta BeltLine, Inc., February 2010, see: http://www.beltline.org/Portals/26/Media

[9]Press Release, Atlanta BeltLine, Inc., February 2010, see: http://www.beltline.org/Portals/26/Media

Figure 2. Map Illustrating the Configuration of the Atlanta BeltLine.
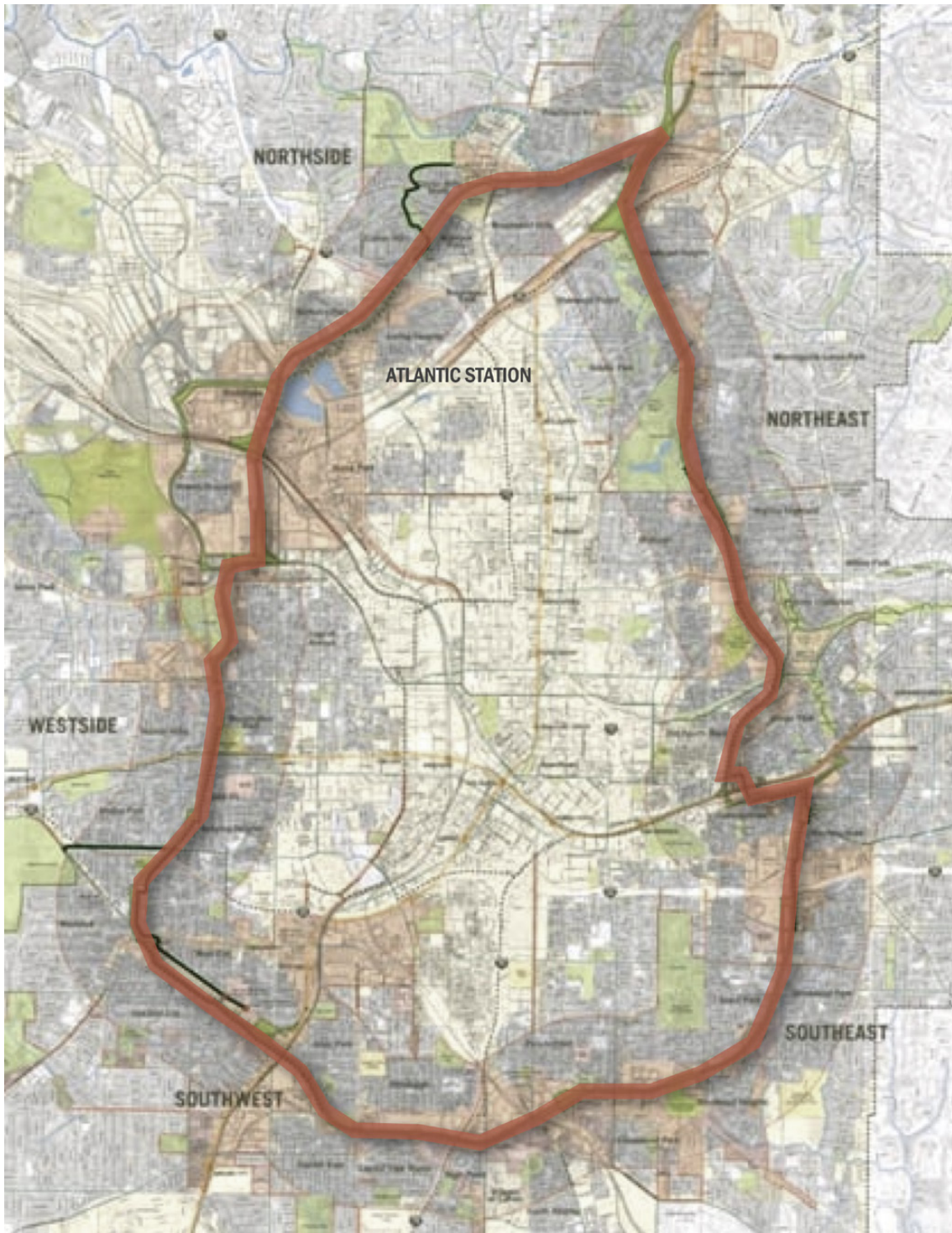
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stretches from Midtown Atlanta's intersection of 10ᵗʰ Street and Monroe Drive and extends southward to the Old Fourth Ward's Irwin Street. It is two and one-quarter miles in length and links Inman Park, Atlanta's first suburb to Piedmont Park.

As a piece of infrastructure that cuts through three of Atlanta's inner city neighborhoods, the significance of the BeltLine effect is already apparent, however it's potential must be teased from the seemingly banal mix of elements that the BeltLine has been

Figure 3. Map Illustrating the Eastside Trail of the Atlanta BeltLine. http://beltline.org/trails/eastside-trail/

LEGEND
● Access Points
— Eastside Trail
-- Interim Hiking Trail

Montgomery Ferry Dr.
ANSLEY MALL
Westminster Dr.
Piedmont Ave.
PIEDMONT PARK
Evelyn St.
Park Dr.
Cresthill Ave.
10th St.
Virginia Ave.
Monroe Dr.
Greenwood Ave.
Ponce De Leon Ave.
Angier Springs
North Ave.
HISTORIC FOURTH WARD PARK [HFWP]
CARTER CENTER
Ralph McGill
HFW SKATE PARK
N. Highland Ave.
Freedom Pkwy.
Lake Ave.
Boulevard
Irwin St.
Edgewood Ave.
Dekalb Ave.
Inman Park/ Reynoldstown MARTA Station
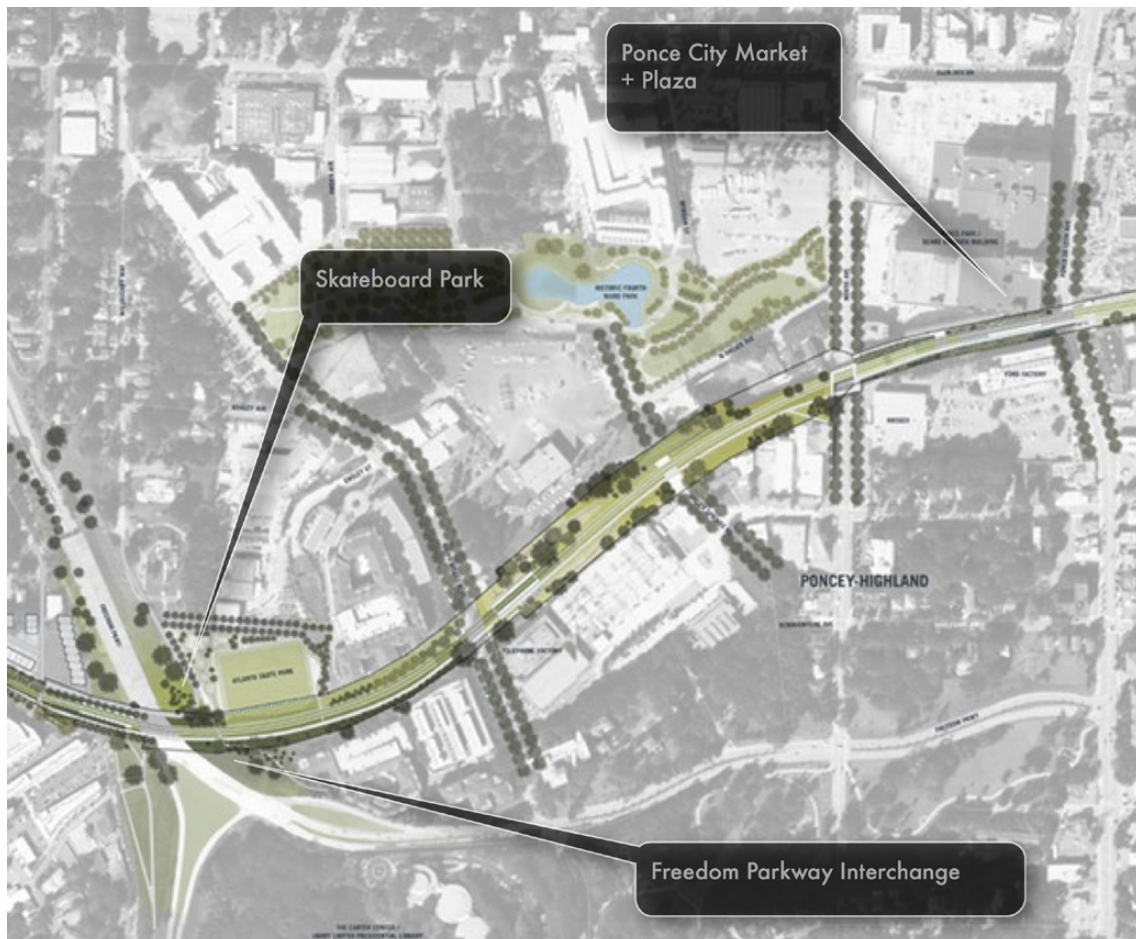
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successful in exposing. In order for Atlanta to realize this potential, it must adopt a Koolhaasian sensibility of the accomplished nihilist in which the seemingly absurd mix of elements create moments of intensity that give way to new kinds of spaces for the American city of the 21st century.

Images of the traditional European city, with its arcades, squares and consistent urban fabric must be replaced by the dirty realism of the urban frontier. In this regard, the Atlanta BeltLine as a piece of newly minted pedestrian-centric infrastructure born from the ashes of an industrial rail corridor, is a prime location for experimentation in which the generic and ordinary are seen as starting points in the creation of authentic spaces that create a renewed sense of community within the interstices of a sprawling metropolis.

BeltLine Promenade

Atlanta is a city of cars – a fragmented city in which it various neighborhoods are distinct pockets separated by shifts in topography, railway yards and a matrix of highways. In some cases, adjacent neighborhoods are only connected by a circuitous route of streets and sidewalks. The irony of infrastructure is it can both connect and divide.

Beyond the tree-lined paved paths of Piedmont Park, Atlanta needs more urban promenades, places that link its fragmented neighborhoods, places outside the confines of the corporate shopping mall in which one can appear in public, face-to-face with fellow citizens. In an increasingly privatized world nested in the anonymity of the Internet

and the banalities of Facebook, an urban promenade is a necessary antidote. In order for a promenade to work, it needs not only a generously proportioned path, it also needs focal points, and it needs anchors. In this regard, the Eastside Trail of the Atlanta BeltLine (Figure #4) seems to have some potential. Its fourteen-foot wide concrete walkway has a generous proportion as it weaves for two and a quarter miles through some of the city's more interesting neighborhoods. As an added bonus the BeltLine as a railway bed is relatively flat, in contrast to Atlanta's undulating topography. No only is this a benefit for a more leisurely walk but it also makes the pedestrian more aware of the sectional quality of the city's topography and provides dramatic views of the downtown and mid-town distant skylines.

The Eastside Trail has a variety of focal points along its length – an important fact for the success on any urban promenade. At its most southern tip it has Studioplex, a sprawling development of over 130 live/work studios as well as a series of restaurants and galleries. Located along the BeltLine, Studioplex before its renovation in 2000 was listed as the oldest brick and concrete building in the city – a fireproofed warehouse built in 1906 in which cotton was bagged before it was loaded onto the railcars. The adjacent water tower that originally was part of the building fire suppression system today is a focal point of the Fourth Ward neighborhood that is visible from the BeltLine. Adjacent to the Studioplex is Krog Street Market, an under-utilized set of industrial buildings that was redeveloped into an urban market complete with several new restaurants. It opened to the public in November 2014 and has further spurred residential developments in the surrounding neighborhood.

At the northern end of the Eastside Trail as it bridges over North Avenue and Ponce de Leon, lies another testament to the BeltLine 's legacy, a 2.1 million square-foot concrete warehouse that served from 1926 to 1987 as the main warehouse, flagship store and Southeast headquarters for Sears, Roebuck and Company. The complex was sold to a private developer and is currently being redeveloped to house a large urban market, boutiques, offices and two hundred and sixty rental loft units. When it is fully completed in 2015, the new complex named Ponce City Market, developed by Jamestown Properties, will rival its other developments such as Pike Place in Seattle or Chelsea Market in New York. As a major development within Atlanta, part of the attraction for the Ponce City Market is its adjacency to the BeltLine. The project's urban market will be directly accessible by foot and bicycle from the BeltLine and will be an important attraction for the pedestrians and cyclists enroute to Piedmont Park to the north or Inman Park to the south.

As part of the Ponce City Market, an existing elongated shed building that fronts onto the BeltLine is being renovated as an open air market that will feature cafés and shaded terraces. Adjacent to this area is a new urban plaza a collaborative effort between Jamestown and the Atlanta BeltLine, Inc. publically funded by the U.S. Department of Transportation through a Transportation, Community, and System Preservation Grant. The developer will construct a stair and an elevator that will link the plaza to North Avenue, a street that is thirty-five feet below the finished grade of the BeltLine area. A native grass meadow will provide a buffer between the plaza and the BeltLine trail.

Although there has been a boom of new construction of apartments and condominiums since the BeltLine's construction, it has also been the catalyst for the recycling of many of Atlanta's industrial buildings, such as the aforementioned StudioPlex and Ponce City Market, that in many cases were derelict. As stated in Mohsen Mostafavi's *Ecological Urbanism*, this recycling of industrial artifacts from infrastructures to buildings is important in building and enriching the urban context:

 "…urban recycling of the remnants of the industrial city benefits from the unexpected and given context of the site that needs to be remade, a context far from a tabula rasa. In these examples, the site acts as a mnemonic device for the making of the new. The result is a type of relational approach between the terrain, the built, and the viewer's participatory experiences."[10]

[10]Mostafavi, Mohsen and Doherty, Gareth. Ecological Urbanism, (Zürich: Lars Müller, 2010), pg. 28

BeltLine: Graffiti + Art

Given the expanse of concrete retaining walls and highway underpasses, the city of Atlanta has become a graffiti paradise. This is especially true of the BeltLine corridor, that until recently has been a prime territory of the city's many graffiti artists. The extent of the graffiti is now becoming apparent as the corridor is being opened to the general public and the backs and undersides of industrial warehouses and highway infrastructures are now visible. This graffiti phenomenon is especially true as one meanders along the Belt-Line and under the Freedom Parkway Interchange that hovers approximately thirty feet overhead. The substantial concrete columns, girders and inclined retaining walls form an extensive surface area for both text and image based graffiti. The artworks are so extensive that they form a visual field of color and texture that begins to define the volume as a civic space with the potential of becoming a new urban plaza. Standing in the space, one can image this graffiti-lined concrete volume as a covered plaza that can accommodate a range of activities from an outdoor market to an open-air concert.

In the spirit of seeking urban potential within the paradigm of landscape urbanism, the Freedom Parkway overpass is one of three elements that make this section of the Atlanta BeltLine a key point for urban intensity. The second element is the recently opened Historic Fourth Ward Skate Park, the city's first public skate spot – a 15,000 square-foot facility that offers bowls, curbs, smooth-rolling concrete mounds to the city's burgeoning population of skateboarders. Just beyond the skate park, is the next element within this urban trilogy, the 1,000-foot tall WSB-TV Tower. When it was completed in 1957, it was the tallest freestanding lattice tower in the United States. It still stands a major urban landmark on the Atlanta skyline.

Besides the graffiti and large-scale murals, sculpture and performance art are important aspects of BeltLine culture. Since 2010, the organization Art on the Atlanta BeltLine has been exhibiting unique works of visual and performance art. In 2011 it featured sixty-six works, in 2014 that had increased to over one hundred. The curated exhibition, which encompasses a diversity of local artists runs from September through November. Most of the works are temporary and removed to make way for subsequent art pieces. The exhibition is launched each year at the beginning of September with a Lantern Parade – an event that attracts hundreds of people of from various communities and enhances the public life of the city.

BeltLine _ Vegetal Infrastructure

As one walks the BeltLine, the observations of Atlanta by Rem Koolhaas seem to have particular significance:

"Atlanta does not have the classical symptoms of a city; it is not dense; it is a sparse, thin carpet of inhabitation, a kinds of suprematist composition of little fields. Its strongest contextual givens are vegetal and infrastructural: forest and roads. Atlanta is not a city; it is a landscape."[11]

In terms of greenspace, one of the objectives of the Atlanta BeltLine as a piece of infrastructure is to consolidate a vast array of vegetal 'fields' in order to create a linear park that connects forty of Atlanta's parks, including more than 1,200 acres of new greenspace and improvements to approximately 700 acres of existing green space. In terms of this endeavor, the non-profit organization, Trees Atlanta, has been a major player. Founded in 1985, Trees Atlanta's threefold objective is to address Atlanta's tree loss, protect its forests and create new green space within the metro Atlanta area. As an organization they not only educate the public, they also conserve existing trees as well as plant new trees that are native to the metro area. The planting of non-invasive trees and plants improves the success rate with what is planted and reduces long-term maintenance costs for the city. Trees Atlanta major contribution is Atlanta BeltLine Arboretum, which will be planted along the full length of the 22-mile corridor. The first stage of the Arboretum was

[11]Koolhaas, Rem and Bruce Mau. S.M.L.XL (New York: The Monacelli Press, 1995) pg. 835

completed on the Eastside Trial in which over six hundred and fifty trees were planted. Trees Atlanta was also responsible for the design and planting of meadows that feature native grasses and flowers that are also part of passive water management system of bioswales, retention and detention ponds.

The reincarnation of the BeltLine as a linear park is somewhat ironic given that Beltline in the 70s and 80s was polluted stretch of abandoned rail engulfed by kudzu, an invasive species of ivy originally from Asia. Once the Atlanta Beltline Corporation had cleared 100 acres of kudzu and overgrowth, the next task was the remediation of the soil, not an easy task given that fact that the Beltline has been used for one hundred years as an industrial corridor. The initial remediation of the soil was completed in April 2011, with an estimated 1,700 tons of diesel and lead-impacted soils removed. To date, more than 40 acres of brownfields have been remediated. It is estimated that up to 1,100 acres of brownfields exist within the confines of the 6,500-acre Atlanta BeltLine District. After the soil had been remediated, the new infrastructure installed included drainage systems, utility duct banks, stretches of retaining walls and a fourteen-foot wide concrete walkway.

Atlanta BeltLine: Racial Politics

Beyond the physical aspects of the BeltLine, it is also mirrors, to a certain extent, the city's racial politics. Historically, Atlanta has been the center of the advancement for civil rights for African-American citizens. Before the 1960's Atlanta, like many American cities was racially divided particularly in terms of education, public transportation and job opportunities. It was not until 1954, that the United States Supreme Court deemed racially segregated schools unconstitutional. This ruling met resistance in Georgia until 1959 when a federal court directed that Atlanta's public schools be integrated. Martin Luther King (1929-1968), who lived and preached in Atlanta was a key player in the fight for civil rights for African-Americans leading to the Voting Rights Act of 1965 that prohibited racial discrimination in voting.

Despite the huge advances for the African-American community, who form the majority demographic of the metro population, Atlanta in certain ways remains a racially divided city, with the wealthy white neighborhoods, such as Buckhead to the north and poorer black neighborhoods to the south and west. Situated just east of downtown, the Old Fourth Ward neighborhood is the historic African-American neighborhood and was the center of black-owned businesses on Auburn Avenue.

The BeltLine marks the eastern boundary of the Old Fourth Ward and provides an interface with traditionally 'whiter' neighborhoods such as Inman Park (Atlanta's first suburb and traditionally home of many Coca-Cola executives), Poncey-Highlands and Virginia Highlands. The Eastside Trail is in high contrast to the Belt Line's railway track that was a real point of division in Atlanta just years previous. In fact, the abandoned railway corridor had become an informal overgrown pedestrian path – a no-man's land that separated adjacent neighborhoods, inhabited by the homeless and a known destination for drug addicts and dealers. Although it is unfortunate that the homeless population has been displaced to other areas of the city, the BeltLine has become a real and vital connection for the constellation of neighborhoods that intersect it. In doing so, one of the most important outcomes of the project might be an unexpected one - to ease and possibly erase the traditional racial and class boundaries of a once segregated American city.

Streetcar Named Desire

In its ultimate stage the Atlanta BeltLine will feature a light rail train that will encircle the city and intersect with MARTA (Metropolitan Atlanta Rapid Transit Authority), Atlanta's current transit system. Although MARTA does provide an essential link between Atlanta's Hartsfield-Jackson International Airport 9 (one of the world's busiest), downtown and Buckhead to the north and Decatur to the east, it does not provide a comprehensive transportation system that serves Atlanta's many residential (and disadvantaged) neighborhoods.

Although the car dominates Atlanta today, the city featured a complex network of streetcars until they were phased out in 1949 and the city shifted to the development of

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highway systems. It was not until 2003, that a non-profit agency, Atlanta Streetcar Incorporated was formed to reintroduce the streetcar to downtown Atlanta. The result of this venture was a 2.7 mile streetcar loop, opened in December 2014, that links downtown Atlanta to the Old Fourth Ward neighborhood. The city is currently planning to extend this streetcar loop to the east by 1.6 miles and link it to Irwin Street and in turn the BeltLine. Atlanta's streetcar expansion strategy will provide an important east-west connection for its citizens. Given the BeltLine's light rail transit system may not be realized for decades, the streetcar will provide a vital link for both cyclists and pedestrians who want to intersect with other transportation networks in the city and avoid using the car.

It is an interesting fact that the streetcar and transit systems in Atlanta was also a point of racial division – and it seems that political undercurrent is fueling the funding politics of the BeltLine today. The more affluent traditionally 'whiter' suburbs to the north of Atlanta, in particular, Marietta, have been resistant to the expansion of public transportation systems such as MARTA and have continued to resist its northern expansion. This has resulted in a metropolitan area that is too dependent on the automobile with the ever-constant threat of car gridlock realized usually during weather extremes, such as the snowstorms of Winter 2014. The completion of the Atlanta BeltLine is an expensive venture. It is estimated that its development that includes trails, transit, infrastructure, etc. would be in the range of $4.8 billion dollars (2013 estimate). To generate revenues a metro-wide sales tax entitled the Transportation Special Purpose Local Operations Sales Tax (T-SPLOST) was proposed. This tax was subject to vote by the citizens of Metro-Atlanta in 2012. Although generally supported by inner city residents, the suburban population resisted the tax increase and the venture was defeated. It is the now the case that the "…BeltLine transit, streetcar service from the BeltLine, and passenger transfer station between the BeltLine and MARTA remain dependent on federal funding and other sources."[12] The defeat of T-SPLOST means the Atlanta BeltLine probably will not be completed until 2030. However, the demographics of the city are changing and perhaps a future vote maybe received more positively.

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BeltLine: Slowness

Atlanta is not an easy city to understand. It does not have one but at least three city centers: Downtown, Midtown and Buckhead. It is a 'town' with a core population of under 500,000 within a large 'metropolitan area' of over 5.4 million inhabitants. It exists as a kind of anomaly, a sprawl city of infrastructure embedded in a carpet of lush vegetation. It is an inland city that does not have a river that flows through it. It is a city of topography without a mountain (or a hill) as a focal point. Both the Cattahootchee River and Stone Mountain are situated miles west and east of the city center respectively. It is a city without a central natural attraction that can define it. In this regards, maybe the Atlanta BeltLine, situated on what was the city's perimeter that now forms the peripheral edge of the inner city can become a 'constructed' central attraction. In a twist of fate, perhaps the Atlanta BeltLine, a project that reconfigures a lost piece of infrastructure aligned with the tenets of ecological urbanism is the missing piece of a puzzle that begins to give real definition to Atlanta, an element that defines it – an element that gives it a soul. Ironically, as a 21st Century city, it is not the car, the train or the plane that will redefine Atlanta, but its citizens categorized as pedestrians, cyclists or skateboarders who makes their way around the twenty-two mile BeltLine circuit. Given Atlanta's physical, political and racial fragmentation, the Atlanta BeltLine provides a needed post-carcentric infrastructure that connects and stiches together it desperate parts, its patchwork of neighborhoods and provides a new way of understanding the city's diversity. Instead of seeing fellow citizens through a car windshield – the BeltLine allows Atlantans and travellers to meet face to face not only with friends but perfect strangers – becoming more conscious citizens by slowing down and thus accelerating Atlanta's urban transformation as a culturally, economically and ecologically more sustainable city.

[12]Garvin, Alexander. 'Emerald Necklace Southern Style' in Planning, The American Planning Association, 2014, pg. 24.

References

Koolhaas, Rem and Mau, Bruce (1995) *S,M,L,XL* (The Monacelli Press, New York).
Gravel, Ryan (1999) Belt line - Atlanta: Design of Infrastructure as a Reflection of Public Policy (Thesis: Georgia Institute of Technology College of Architecture).
Atlanta BeltLine Inc. (2010) Press Release (http://www.beltline.org/Portals/26/Media), accessed, 1 June 2015.
Trees Atlanta (2015) Who We Are (http://treesatlanta.org) accessed, 1 June 2015.
Mostafavi, Mohsen and Doherty, Gareth (2010) *Ecological Urbanism* (Lars Müller, Zürich).
Garvin, Alexander (2014) 'Emerald Necklace Southern Style', Planning, The American Planning Association, pg. 24.

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The Construction of Mountain-river Skeleton Based on Oriental Culture in Bengbu City

Junyan Yang[1], Ying Tan[2], Linlin Wang[3]
School of Architecture, Southeast University; Key Laboratory of Urban and Architectural Heritage Conservation (Southeast University), Ministry of Education, China
Keywords: Oriental charm, mountain-river skeleton, construction, Bengbu, multi-scale

Abstract

Mountain-river skeleton is the basis of spatial structure in an oriental mountain-river city and each skeleton is unique. It is also a three-dimensional space structure based on the natural topography and physiognomy of the city. Its impact on urban space will be seen in the urban space layout, building height and building density, and it has a supporting role in urban morphology.

The construction of mountain-river skeleton is put forward in Chinese traditional view of nature as well as the reflection on the practice of contemporary urban construction. Moreover, it has become an important approach to shape the urban space features and get rid of landscape convergence. To create unrepeatable urban landscape through the protection of the city's mountain-river pattern and reasonable utilization of natural heritage.

Bengbu city with abundant natural resources was selected as the research object in this paper. Firstly, though the multi-scale analysis, landscape morphology structure analysis, three-dimensional space modeling analysis and mountain-river topographical advantages analysis, and based on the principle of protect the mountain-river resources, as well as comply with the nature. Then according to the city's mountain-river resources of its own, this research not only put forward the construction method of operational and local mountain-river skeleton, but also explored the urban structure of being in harmony with the nature. Finally, to create "the integrity of human being and nature" urban landscape, while to derived from the unique oriental charm of the urban characteristics.

First of all, analyze the characteristics of urban mountain-river morphology in regional scale. Under the background of the natural landscape of Bengbu, to judge and refine of regional mountain-river morphology and pattern characteristics, and explores the relationship between the natural mountain-river resources and urban layout.

Secondly, analyze the characteristics of Bengbu Mountain-river skeleton on an urban scale. On this basis, to combine the characteristics of urban mountain-river morphology with the history and culture of the city masterly, and carry out space conception and image design.

Third, perfect the Bengbu's Mountain-river skeleton. The perfection measures which are strengthen and improved the space images by increasing the rivers and green space and other means, promoting mountain-river city's space art. Furthermore, on this basis to determine the layout suitability, development intensity and development capacity of the city.

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Introduction

China has many well-known mountains and rivers, not only including magnificent and beautiful natural landscape, but also covering deposited historical culture. As the classical Chinese poetry goes, "The wise man likes water and benevolent man likes mountain" (from "The Analects of Confucius Yong"), these verses have fully demonstrated the mountain-river's use for lifting the spirit and nourishing the soul. Under the leavening influence of Chinese traditional mountain-river esthetics thought and ancient philosophical idea of "Man is an integrated part of nature", Chinese city often pay attention to the city's mountain-river environment in construction site selection, and Chinese also seek a living environment with the feature of integrating the nature with human beings.

The construction of mountain-river skeleton is a pattern design for urban form which is put forward in Chinese traditional view of nature. By analyzing of "mountain-river-city" patterns of many cities, such as Guilin, Sanya and Wuxi, Mr. Liangyong Wu explored some ways on the protection and development of the traditional mountain-river pattern since 1980s. Furthermore, since 1990, Mr. Xuesen Qian studied on "Mountain-river city" actively, and he proposed an idea that Mountain-river city should be the model of the city construction of socialist China in the 21st century. In recent years, a series of work were also carried out by related research fields that researchers discussed initiatively how to combine mountain-river environment with the developing and changing pattern of the city. For example, Yulin Chen explored a construction approach of the "art skeleton" with historical and cultural landscape at the core, and relying on the natural mountain-river landscape. Moreover, Xin Chen and Bin Zhang studied on topological analysis of urban spatial morphology evolution under the mountain-river pattern; not last but least, both Hongyu Zhang, Bo Zhou, Bo Wang and Rulin Zhang, Zhongyu Xing studied on city identity based on mountain-river elements or mountain-river pattern. On the other hand, at the working conference of the Central Urbanization in December 2013, it is announced that we should rely on the existing mountain-river skeleton and other unique natural scenery, and get a city into the nature, so that could see the mountains and water, and remember the homesickness; In addition, the meeting also proposed that we should strive to pass the green hills and clear water on to the residents, emphasizing the harmony between human and nature, and to express the trends and conceptions of future urban development.

Mountain-river skeleton is a structure of three-dimensional urban space which is based on natural topography and landforms of city, and it has character of uniqueness. In the urban construction, through protecting the pattern of mountain-river city and using mountain-river skeleton of a city itself, the unique city appearance was constructed. Then, pursuing a realm of the form and meaning surrounded by water and mountains, and the human inhabitation environment, a combination of man-made environment and nature environment, which represent the city was established (Liangyong Wu). As mentioned above, these are the most significant ways of creating the characteristics of the urban space and running out of the convergence of landscape, and also comprise deep ecological philosophy (Shixing Bao).

Under this background, based on Bengbu city of rich mountain-river resources, this thesis studies mountain-river skeleton of oriental cities, then discusses how a city mountain-river skeleton can be constructed scientifically and artistically during master landscape planning stage, and improving the unique appearance of mountain-river city.

Research scope and approaches of Bengbu city

Bengbu is in the north of Anhui province, and it has abundant natural mountain-river resources and distinct seasons. Meanwhile, based on the relative historical documents, Bengbu, with a long history and a splendid civilization, was a place where pearls were gathered by people, thus it is known as the "Pearl City". The layout of nature resources in Bengbu, with the mountains or green spaces scattered like the pieces on a chessboard and the crisscrossed rivers, also includes the city groups within Bengbu surrounded by these mountain-river resources. Thus this such excellent natural background establish-

es the foundation for mountain-river skeleton of Bengbu. In this paper, we put forward the construction approach of mountain-river skeleton with the enhancement of urban mountain-river structure, with making a connection with southern area and northern area within the city, and with shaping the harmonious coexistence between mountain-river and city, and have developed multi-level and multi-channel conservation and development strategies for mountain-river skeleton by analyzing the multi-level and natural pattern of mountain-river.
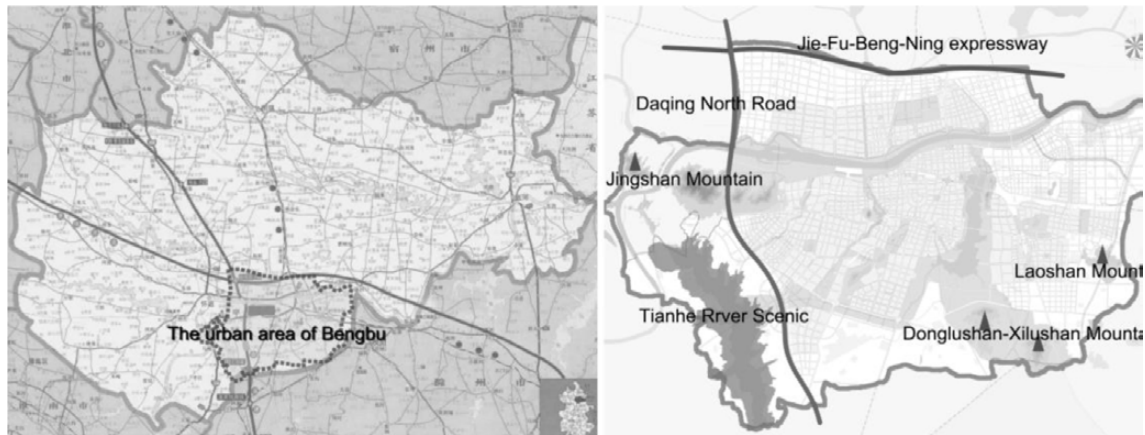
Research scope

This spatial scope of regional research, combining the scope controlled and guided by the general planning of Bengbu (2012-2030) with the specific conditions about central city of Bengbu, is designated as central city and suburbs, from Jie-Fu-Beng-Ning expressway in the north, Donglushan and Xilushan Mountain in the south, and is bounded to the east by the Laoshan Mountain, to the west by Daqing North Road, Tianhe River Scenic and Jingshan Mountain (Figure 1), and with an area of 189.23 square miles.

This article mainly focuses on the the analysis of the favorable lie of mountain-river pattern and the construction of mountain-river skeleton in scope of theoretical research. Firstly, through the study of landscape resources in Bengbu City, a comparatively complete mountain-river skeleton of city is constructed by using existing natural mountain-river resources in line with local conditions on the basis of protection. Then, we must coordinate the relation between urban culture and mountain-river culture, at the same time, combine with the relevant theories such as mountain-river city and mountain-river pattern, and finally summarize a series of theories and techniques of construction of mountain-river skeleton.

Research approaches

The construction of mountain-river skeleton in Bengbu should start with the investigation and analysis of regional geographic and mountain-river pattern, and determining and refining its regional mountain-river pattern and the characteristics of mountain-river city pattern by analyzing the mountain-river elements in different spatial levels and scales. Secondly, we should fully respect background of mountain-river nature, with the principle of protecting mountain-river resources and following the nature, strengthen and improve a pattern of mountain-river city by taking measures such as increasing rivers and green spaces on the theory of urban ecology, and mountain-river skeleton of Bengbu is constructed, which is beautiful and harmonious and has a distinct characteristic to meet a goal of optimizing the relationship between "mountain-river, woods and city" (Figure 2).

According to research need, this study mainly adopts two methods of analyzing the pattern of landscape form and analysis of three-dimensional modeling.

Figure 2-3. the Research Framework of Mountain-river Skeleton in Bengbu. Data Sources: Self-plotted. The Analysis Chart of Region Mountain-river Form. Data Sources: Self-plotted. a) The regional distribution; b) The extraction of regional form; c) The abstract graph of regional form.
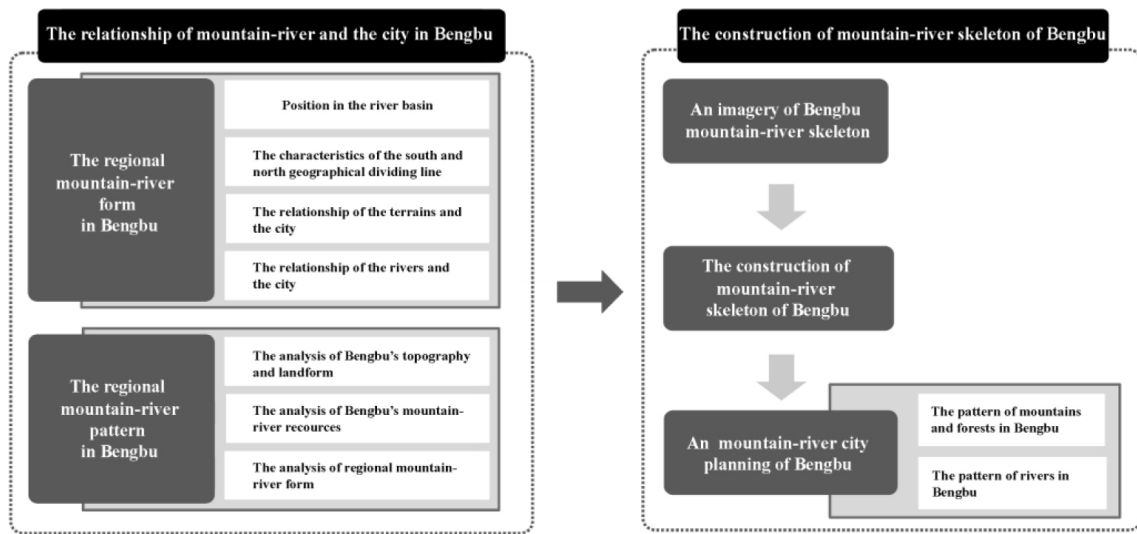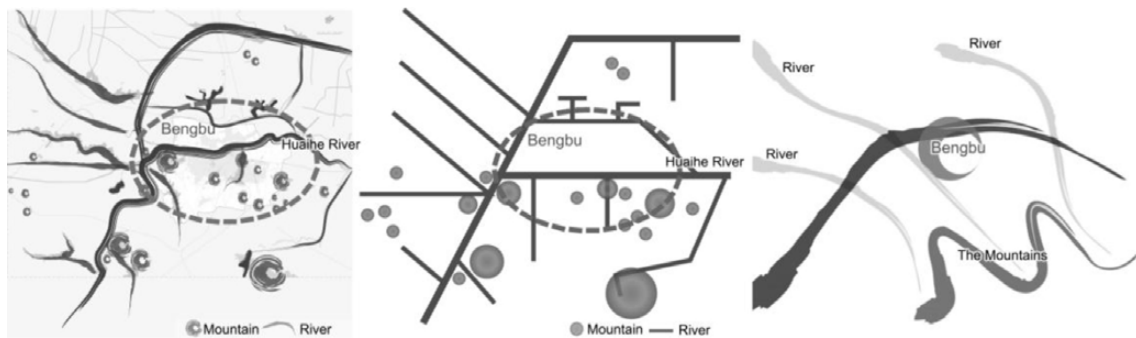
1) *The analysis of pattern of landscape form*

The data sources include not only the planning materials such as general planning of Bengbu (2012-2030), urban control planning, growth plan about hundreds and thousands of mu of forest in Bengbu, investigation report of the wetland resources in Bengbu, Planning of blue line in Bengbu, Sketches of Tianhe Hu wellhead protection area delineation, from Bengbu Planning Bureau, Bureau of Parks, Water Conservancy Bureau and Environmental Protection Bureau, but also related materials on books and pictures, such as the Bengbu municipal record, related books about urban development of Bengbu, related treatises in aspects of the history and geography, and related papers, as well as the related maps like Topographic Map of Bengbu, Topographic Map of Anhui Province and The Map of Huaihe River. And finally, the characteristics of Mountain-river resources in different scales in Bengbu are analyzed by drawing the plan of mountain-river pattern and refining intention figure of mountain-river pattern.

2) *The analysis of three-dimensional modeling*

Based on the image materials and data of the city, we classify mountains of Bengbu into four levels according to the elevation, the first level is above 300 meters in elevation, the second is about 200-300 meters, the third is about 100-200 meters and the last is below 100 meters. Consequently, three-dimensional mountain-river space of Bengbu is obtained. Then we can do the research on space analysis by using the computer model.

Relationship analysis of urban mountain-river in Bengbu

Regional mountain-river form: Bengbu is crossing the southern and northern of it, and Huaihe River is running through east and west.

Regional mountain-river form is spatial scale that includes the scope of regional development in Bengbu, and based on natural background. This paper analyzes the natural mountain-river background of Bengbu and explores the relationship between the natural mountain-river and the layout of the city, followed and developed the ecological environment of the city.

1) The mountain-river geographical characteristics of Huaihe River valley

Bengbu, an important hub city of Anhui province, is located in Huaihe River valley and has always been the material distribution center and land-and-water transportation center in Huaihe River valley. Meanwhile, Bengbu port being the biggest port in Huaihe River, which is open to navigation all year round in Jiangsu, Shanghai, Zhejiang, Jiangxi and other provinces and cities, while it also have been opened to overseas through the ports. There are four geographical characteristics of Bengbu in Huaihe as follows:

Firstly, Bengbu is located in the middle reaches of Huaihe River. Huaihe River, with in the four major river system, the Huanghai Sea to the east, is surrounded by Funiushan Mountain, Tongbaishan Mountain, Dabieshan Mountain and Yimengshan Mountain in west, south and north-east respectively. Thus, there is a broad plain between the mountains and the sea, lying in the north-west and south-east of low elevation. Bengbu is an important city in the middle reaches of Huaihe River, where from Honghe River mouth to the outlet of Honzehu Lake named "Zhongdu".

Secondly, Bengbu is the largest city in the upper reaches of Huaihe River. The river area is vast, but its cities are rare. There are only four cites like Bengbu, Huainan, Huaian and Xinyang in the river. However, Bengbu is the second largest city in the middle reaches of Huaihe River.

Thirdly, Bengbu is an important city on dividing line of South and North in China. The meanings of this line include the traditional boundary in China, the planting boundary of rice and wheat, the boundary of subtropical zone and the warm temperate zone, and the boundary of temperate deciduous forest and subtropical evergreen forest. Bengbu is the first clear boundary city in China. It established the demarcation of sculpture in 2006.

In the end, Bengbu is embraced by a bend in the river. The Huaihe River has eleven big bends, and Bengbu is at the ninth corner of the river that is reflects a situation of surrounding Bengbu with a bend of Huaihe River. On the other hand, Bengbu is also located in the second tributary named Wohe River.

2) The mountain-river geographical characteristics of the junction of hills and plains

There are two topographic types within Bengbu, such as Huaibei Plain and Jianghuai Hilly Area. The special junction of hills and plains create geographical characteristics of Bengbu.

First of all, Bengbu is the northern city in Jianghuai Hilly Area. The terrain in region shows that high in the east and low in the west along the Eastern of Dabieshan Mountain, with rolling hills and tattered landform.

Secondly, Bengbu is located in the southern of the Huaibei Plain. Huaibei Plain, covering the area from the north of Huaihe River to the south of Shayinghe River, is mainly formed by the flooding of Yellow River and the alluvium of Huaihe River. Then, as the surface relief is flat, with the terrain tipped slightly towards the southeast, the plain has lots of rivers and advanced agriculture. In addition, owing to the major area of Bengbu in the southern of the Huaibei Plain, it mainly to the plain and has abundant rivers.

3) The analysis of regional mountain-river form

Under the mountain-river background of large-scale, on the one hand, Bengbu has many hills with its north dominated by plain and south by mountains and hills. These hills include Zhuizishan Mountain on the east side of the city, Caoshan Mountain on the east bank of the Longzihu Lake, Xuehuashan Mountain on the west bank of the lake, Yanshan Mountain, Mengshan Mountain, Taoshan Mountain and Tiger Mountain on the east side of the city and stretching into the city from south to north, Xiaohuangshan Mountain on the west side of the city, and a mountain chain stretches more than 30 kilometers

from Zhanjiadashan Mountain, Damoshan Mountain and Guangtoushan Mountain in the south of Huaiyuan to Shuangjianshan Mountain, Dawushan Mountain, Shuangtoushan Mountain and Laoqingshan Mountain in Fengyang. On the other hand, there are many rivers and lakes in Bengbu, such as Sifanghu Lake, Sanchahe River, Diaoyutai Lake, Nihe River, Tianhe River and Longzihu River. Based on the mountain-river pattern analysis of Bengbu in macroscopic view, the regional mountain-river form is characterized by the features of "Bengbu is the city which is on dividing line of South and North in China and Huaihe River is running through east and west. While Bengbu, with mountains in the south and rivers in the north, is surrounded by its mountains and hills and arranged from south to north for branches" (Figure 3).

"Bengbu is the city which is on dividing line of South and North in China and Huaihe River is running through east and west."

The most important geographical characteristic of Bengbu is that Huaihe River across the city from west to east. Thus Bengbu is located in the geographical dividing line of China's southern and northern area, and it has important geographic values. Moreover, it has also been a land-and-water transportation center and Jianghuai hub in Anhui Province which plays an important role in the development linking of north and south within province, and it has an important transportation and economic significance.

"Bengbu, with mountains in the south and rivers in the north, is surrounded by its mountains and hills and arranged from south to north for branches."

Bengbu divided into north and south areas of the totally different natural geographical environments by Huaihe River. Areas to the north of Huaihe River are flat, with more rivers including two major river systems of Huaihe River and Huaihong New River, have the vast waters; However, areas to the south of Huaihe River with sparse rivers, dominated by mountains and hills, thus forms a terrain where river systems alternating with mountains and hills.

The pattern of mountain-river city: The River embracing with the city, and the terrain forming a pattern with both mountain and water.

Bengbu, a typical mountain-river city, is mainly plain, and lying in the north-west and south-east of low elevation.

1) Topography and landform characteristics of the city

Landforms of Bengbu are divided into two types: plains and hills. The main plain is the Yellow River Floodplain, along with some other plains like the plain of interfluvial lowlands, the lower river terrace with hills and river-beach land along river. The hills are mainly distributed in the suburbs of Huaihe River to the south, and the hills are outcrop of basement rocks which have been weathered away and denudated, with poor developed.

2) Mountain-river resource characteristics of the city

There are 13 mountains or hills and 7 river systems within our investigation conditions. Bengbu is a really mountain-river garden city with its green mountains and rivers.

For the mountain resources in Bengbu, there are Xuehuashan Mountain, Caoshan Mountain, Zhuizishan Mountain, Laoshan Mountain to the east of the city, south of the Laohushan Mountain, Taoshan Mountain and Yanshan Mountain, west of the Heihushan Mountain, southwest of the Xiaohuangshan Mountain, and Xiaonanshan Mountain and Zhanggongshan Mountain in the middle of the city. Besides, there are Jishan Mountain and Tushan Mountain (Figure 4) outside the city. Also some of them are sites of historic interest and talented people, such as Xiyan Temple site at Zhuizishan Mountain, Tanghe`s tomb at Caoshan Mountain, which are rare tourism resources of cultural relics and historic sites and forest tourism resources.

For the water resources, Bengbu is located in the middle reaches of the Huaihe River, it has some little river systems include the North Feihe River to the north, and to the southwest of Tianhe River, to the east of Longzihu River and Baojiagou River. All of them is a type of ombination of lakes and rivers, with little flowed, which are short and often broken during dry years except North Feihe River. By the way, small rivers generally fall into the Huaihe River. In addition, many of the rivers and lakes in the north of the city mainly include Sifanghu Wetland listed as a national key construction project of the wetland, National Sanchahe Wetland Park and Diaoyutaihu Lake to the east of the city (Figure 5).

3) The analysis of urban mountain-river pattern

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Figure 4-5-6. Distribution of Mountain Resources in Bengbu. Distribution of Water Resources in Bengbu. Data Sources: Self-plotted. The Analysis Chart of Mountain-river Pattern in Bengbu. Data Sources: Self-plotted.
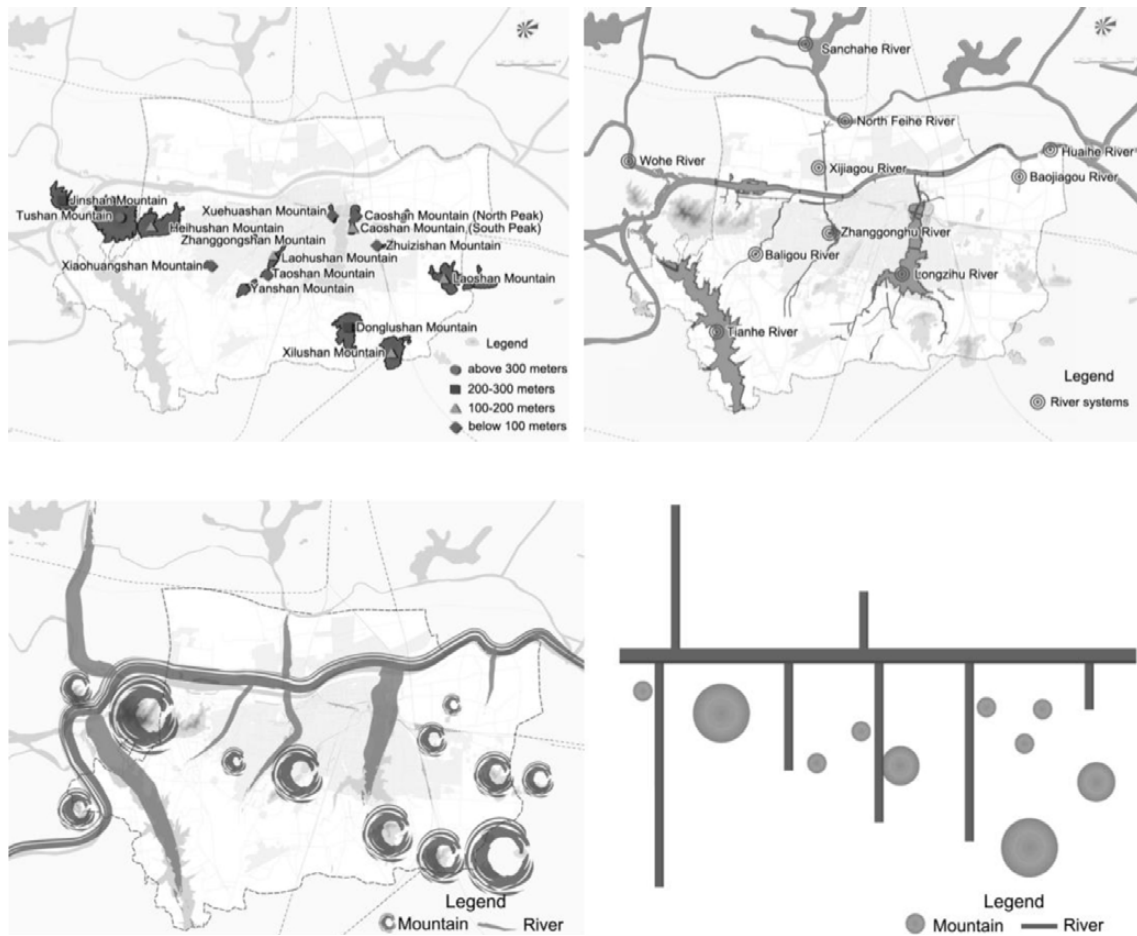
Under the background of regional mountain-river form, the urban mountain-river pattern can be refined and abstracted into a graph by a graphic analyze method (Figure 6), it is observed that the Huaihe River crosses the Jingshan Mountain and Tushan Mountain, then turns south, forming an area surrounded by river. From the picture, we can see that Bengbu is just located in the area, and it seems like the river is embracing the city.

The characteristics of mountain-river resources with rich resources on the south bank but poor on the north bank of the river is more prominent, therefore, mountains mainly distributed in the south of Huaihe River, besides Xijiagou River is crossing in north and south sides of the river, other rivers are mostly distributed in the south of river. Furthermore, in the southern region of Huaihe River, the small rivers are flowing into Huaihe River, which showed an arrangement characteristic of south and north, especially formed a terrain where river systems alternating with mountains and hills, showing the city's spatial rhythm.

The construction of mountain-river skeleton of Bengbu

An imagery of Bengbu mountain-river skeleton: A mussel forced by pregnancy after suffering a dazzling crystal pearl, while the clear rivers distributing in an area of north and south of the Huaihe River like the inlaid jade belts floating in the city.

There are a large number of scenic spots in the outskirts, country parks, forest parks, nature reserves, wetlands and scenic woodlands around Bengbu. On the south side there are Tianhe River reserve, East and West Lushan Mountains, rivers and a large num-

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Figure 7-8-9-10-11-12. The Chart of Mountain-river Skeleton in Bengbu. Data Sources: Self-plotted. "Main Vein". "Dual Semi-ring". "Eight Ribbons". "Eight Pearls". Data Sources: Self-plotted. The Planning of Mountain-river Pattern. DATA SOURCES: Self-plotted.
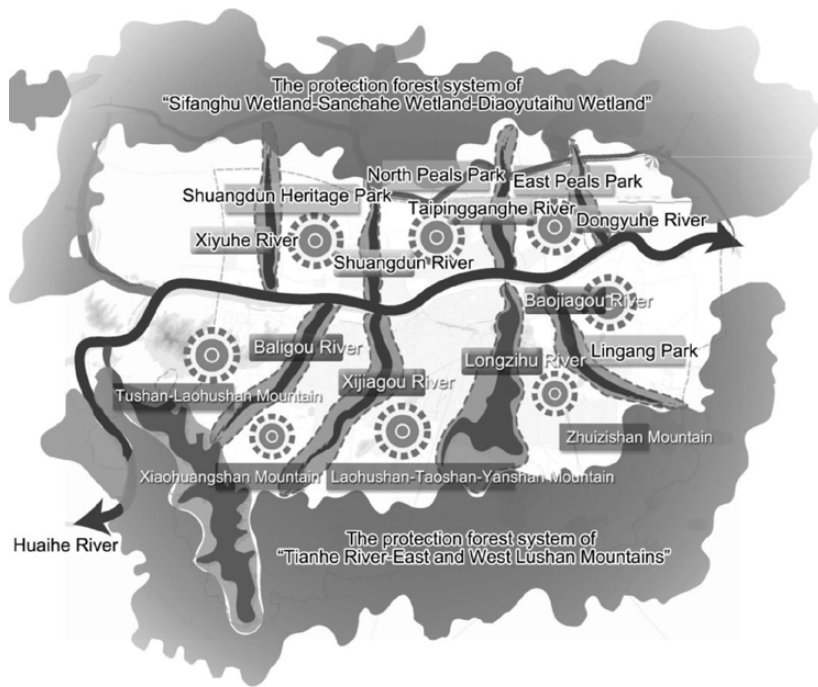
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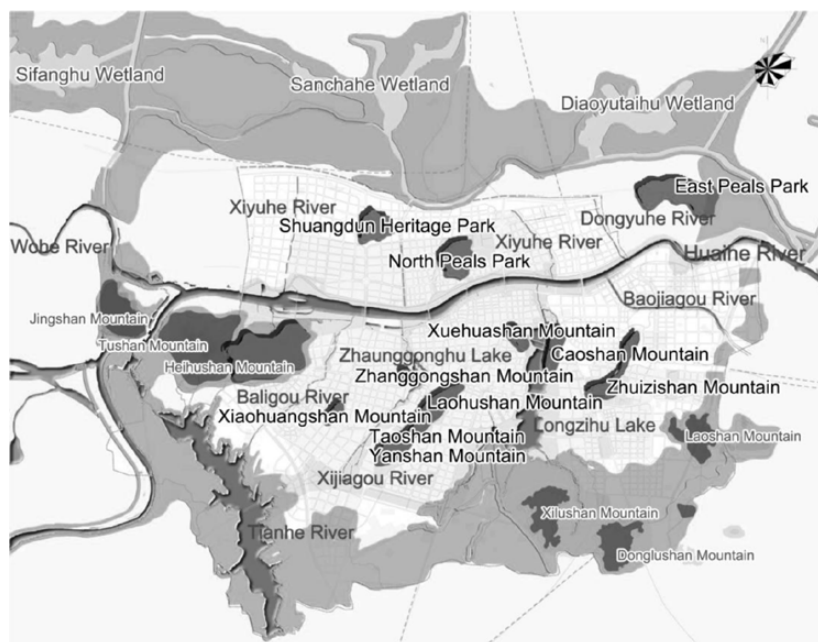
ber of agricultural lands; and there are Sifanghu Wetland, Sanchahe Wetland, Diaoyutaihu Wetland and some branches of Huaihe River to the opposite direction. Therefore, Bengbu is wrapped in the vast stretches of green spaces. As is based on this situation, reminds us of the place where pearls were gathered in history and the beautiful name of "Pearl City". Thus, resulting in an ingenious conjunction between the characteristics of mountain-river form and history and culture of the city, the space conception of "an ancient mussel with pearls" is developed, and further developed an imagery of Bengbu mountain-river skeleton of "A inspirational mussel forced by pregnancy after suffering a dazzling crystal pearl, while the clear rivers distributing in an area of north and south of the Huaihe River like the inlaid jade belts floating in the beautiful city."

"An inspirational mussel forced by pregnancy after suffering a dazzling crystal pearl":

It means that the city is wrapped in the vast stretches of green spaces like a huge mussel, and the mountains and parks is scattered in every corner of the city like the pigmentation of shining pearls by a mussel. Owing to the mountain-river resources with rich resources on the south bank but poor on the north bank and the interphase distribution of rivers and mountains, we should combine the city function zoning with the existing terrain, by increasing the woodland hills and parks in the flat area on the north shore of Huaihe River, to bring the "peals" on the north shore and on the opposite shore into balance, also greatly enhance good planning control of the city green spaces.

"The clear rivers distributing in an area of north and south of the Huaihe River like the inlaid jade belts floating in the beautiful city":

It has been found in the urban mountain-river pattern that its water resources are unevenly distributed, with the number of rivers in south is more than north. Meanwhile, in the southern region of Huaihe River, it has been formed a terrain where river systems alternating with mountains and hills, and has a beautiful city's spatial rhythm. Thus, we should expand the original channels or excavate new channels combined with the terrain on the north shore of Huaihe River, to form a responding mountain-river relationship between the north and south sides of the river.

The construction of mountain-river skeleton of Bengbu: "the main vein crosses the dual semi-ring, while it appears a distribution feature alternate with eight rribbons and eight pearls"

Relying on the existing mountain-river pattern of Bengbu, with the ecological landscape structure of "a main vein, two horizontal lines and three vertical lines" in overall planning for reference, and on the basis of an imagery of Bengbu mountain-river skeleton, we could construct a mountain-river skeleton of Bengbu with "the main vein cross the dual semi-ring, while it appears a distribution feature alternate with eight ribbons and eight pearls" (Figure 7).

"Main Vein": Huaihe River, as the space main vein, is passing through the city from west to East.

"Dual Semi-ring": It means that all kinds of green spaces in southern and northern areas of city outskirts, include protection forest system of "Sifanghu Wetland-Sanchahe Wetland-Diaoyutaihu Wetland" and "Tianhe River-East and West Lushan Mountains" (Figure 8), and Bengbu is wrapped in the vast stretches of green spaces.

"Eight Ribbons": There are four existing rivers include Baligo River, Xijiagou River, Longzihu River and Baojiagou River. By expand the original channels or excavate new channels combined with the terrain on the north shore of Huaihe River, it has been formed new four rivers, named Xiyuhe River, Shuangdunhe River and Dongyuhe River. It has been formed eight ribbons, with eight rivers and riverside green spaces, they are arranged like a fishbone and fall into the space main vein that is Huaihe River (Figure 10).

"Eight Pearls": The "eight pearls", based on the hills, green spaces and places of culture and history, are distributed in the city. On the north shore of Huaihe River, the pearls are Jinshan Mountain, Tushan-Laohushan Mountain, Xiaohuangshan-Zhanggongshan Mountain, Laohushan-Taoshan-Yanshan Mountain, Zhuizishan Mountain, and Lingang Park. On the south shore, the pearls are Shuangdun Heritage Park, North Peals Park and East Peals Park (Figure 11).

Bengbu mountain-river pattern planning guided by mountain-river skeleton of the city

1) The pattern of mountains and forests in Bengbu: There are the mountains in the south and forests in the north, while the hills and rivers are facing each other across the river.

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In the outskirts of the city, based on the mountains, forests, wetlands, farmlands, protection forests and forest belts and other existing ecological spaces, to build regional green ecological defenses continuously and to strengthen the diversity of natural landscape, and ultimately form the spatial pattern of "The city is surrounded by mountains in the south of the city, the woodlands to the north, and the low hills are scattered here and there in the middle of the city".

2) The pattern of rivers in Bengbu: Huaihe River is located in the center of Bengbu, and there are eight rivers flowing into it.

Huaihe River that is running through the center of city, after master urban planning, there will be four rivers flowing into it respectively on the both north and south shore. Among them, the new planning rivers are based on the original channels with the method of expanding, which are Xiyuhe River, Shuangdunhe River and Dongyuhe River (Figure 12).

Conclusion and discussion

The natural mountain-river landscape has important significance for shaping the unique appearance of the city. It's a crucial topic that how to protect the urban mountain-river pattern and use the natural heritage reasonably in Chinese urban landscape planning. Based on the analysis of the intension characteristics of urban mountain-river skeleton, with the rich mountain-river resources of Bengbu as a case, the paper puts forward the construction method of urban mountain-river skeleton through the method of multiple scales, I hope this article can make a first trial in constructing a mountain-river city with the traditional oriental style. Looking to the future, the Chinese traditional towns, with "a city is half the hills and half the rivers", may really not far away from us.

References

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Bengbu Chorography Compiling Committee (1995) *Bengbu Chorography* (FangZhi Press, Beijing).

Chuofeng Zhu (2008) *Mountain-river Situation of City Landscape and its Succession and Development - Example from Nanjing* (School of Architecture in Southeast University. Nanjing).

Jonathan H. and Adrian N. (2003) *The restoration of woodland landscapes* (The Forestry Commission, Edinburgh).

Liangyong Wu. (1996) 'On Mountain-river City', *Proceedings of Liangyong Wu's urban study. (1986-1995): With the coming of the new century* (China Building Industry Press, Beijing) 337-342.

Meijuan Jin and Zhibin Zhang. (2006) 'A Review on the Study of Urban Spatial Structure Home and Abroad', T*ropical Geography*, 26(2).

Shixing Bao and Mengchao Gu. (1994) *Distinguished scientist Xuesen Qian's theory, Urbanology and mountain-river city* (China Building Industry Press, Beijing).

Sustainable Design and Urban Regeneration

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Chair_Wowo Ding I Carlo Cecere
School of Architecture & Urban Planning, Nanjing University, Jiangsu, P.R.China
Facoltà di Ingegneria Civile e Industriale, Sapienza Università di Roma, Rome, Italy
Co-Chair_Maesoomeh Arabi I Deborah Chiara Lefosse
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy

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Sustainable Design and Technologies

Practices after a Disaster: Geographical Narratives vs Territorial Dispersion

Lina Maria Calandra
Dipartimento di Scienze umane, Università degli Studi dell'Aquila, Viale Nizza, 14, 67100, L'Aquila, Italy
Keywords: Participatory Geography, Geographical Narrative, Disaster, Earthquake, L'Aquila

Abstract

After the earthquake on 6 April 2009, L'Aquila becomes more fragmented and dispersed physically, socially, and culturally. This transformation is closely bound up with some emergency solutions as the realization of segmented and separated residential zones that determine internal inequalities. L'Aquila knows a growing sense of fear, mistrust, uneasiness and a decreasing sense of cohesion towards a social polarization typical of larger cities. What most damages the community capacity to retain its potential for communication, participation, exchange, sociability is the sudden or accelerated replacement of open and public spaces with separated and private areas.

In the context of the urban transformation after the disaster that changed daily life of people and communities within the Municipality of L'Aquila, participation can represent a practice of regeneration to face urban fragmentation and territorial dispersion (Calandra, 2012). Some researchers of the Department of Human Studies, University of L'Aquila (Italy), have developed and are applying, according to the "trial-and-error" strategy, a methodology of communication and participation in research practices. It will be explained the geographical narrative issued from the participatory/participating research that involved citizens, students and scientists together (Cahill, 2007; Fuller, Kitchin, 2004; Pain, 2014) and that emphasizes the importance of places in the everyday life of people for their psycho-physical health and for the welfare of the entire community.

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Introduction

The earthquake that hit the city of L'Aquila on 6th April 2009 resulted in a profound transformation of the urban fabric, with significant consequences for the behaviour and habits of its inhabitants[1]. Suddenly the whole territory became more fragmented, as well as physically, socially and culturally dispersed. Such a process was closely related to the adoption of some emergency solutions and the development of new residential zones that were in themselves separated and segmented, resulting in spatial inequalities. These zones, named C.A.S.E. (*Complessi antisismici sostenibili ed ecocompatibili*: earthquake-proof sustainable and eco-friendly housing complexes), consist of 19 residential complexes that are scattered throughout the territory, including 186 buildings (4,500 dwellings) (figure 1). The design of the new 'temporary territory' also included M.A.P. (*Moduli abitativi provvisori*: temporary housing units) and M.U.S.P. (*Moduli ad uso scolastico provvisori*: temporary school units).

The sudden or accelerated replacement of open and public spaces with separate and private areas is resulting in an adverse impact on the city's ability to regain its potential for communication, participation and sociability amongst politicians and communities.

In this context, some researchers from the Department of human studies (DHS), University of L'Aquila, have developed and applied (with the contribution of students and private citizens) a research methodology based on communication and participation. According to the trial-and-error strategy, the research takes the shape of a regeneration practice to face urban fragmentation and territorial dispersion.

Practices after the earthquake: the participatory/participating research action

The Participatory-Participating Research Action (PPRA) was conceived in the *tendone* (big tent) of Piazza Duomo, where, since February 2010, a number of associations and citizens have been promoting activities to stimulate the public debate and participation within the city, including several events of national prominence. Specifically, a group of citizens involved in the *Tavolo comunicazione* (communication group), established within the "Assembly of Piazza Duomo"[2], defined and promoted the C.As.A. Initiative (Comunicazione per l'ascolto attivo: communication for active listening). A number of researchers, PhD students and students from the University DHS Cartolab laboratory also joined in the project.

Following S. Kemmis and R. McTaggart, "Participatory action research aims to help people recover, and release themselves from, the constraints of irrational, unproductive, unjust, and unsatisfying social structures that limit their self-development and self-determination. It is a process in which people explore the ways in which their practices are shaped and constrained by wider social (cultural, economic, and political) structures and consider whether they can intervene to release themselves from these constraints - or, if they cannot, how best to work within and around them to minimize the extent to which they contribute to irrationality, lack of productivity (inefficiency), injustice, and dissatisfactions (alienation) as people whose work and lives contribute to the structuring of a shared social life" (Kemmis, McTaggart, 2005; Blake, 2007).

[1]The Municipality of L'Aquila covers an area of 467 square kilometres, including much of the Gran Sasso Massif, the highest peak in the Apennines. As of January 2009, the residents were 72,800; in 2013 just over 68,000. The Municipality consists of about fifty historical villages (from 3-4,000 inhabitants to a few hundred, for a total of 235 hectares) surrounding L'Aquila (13th century). The latter, with a prestigious historical centre enclosed by walls, covering an area of 168 hectares, is the capital city of Abruzzo and home to a University. Approximately 10,000 people (and over 5-6,000 university students) lived in the city centre of L'Aquila before the earthquake. The heart of the town was filled with public services, professional offices, businesses and cultural activities. Finally, a number of neighbourhoods, in a nearly continuous network, were developed outside of the city walls (Comune dell'Aquila, 2012).

[2]Please refer to: *L'Aquila Anno1: Spazi Aperti per un'agenda aquilana*, Instant report (21 March 2010) and Mid-term report (18 April 2010); *Opuscolo informativo - Spazi Aperti* (available for download at http://territoriaq.com/2012/11/26/266/).

Figure 1. The territory of L'Aquila after the earthquake of 6h April 2009.

L'Aquila 10 September 2011
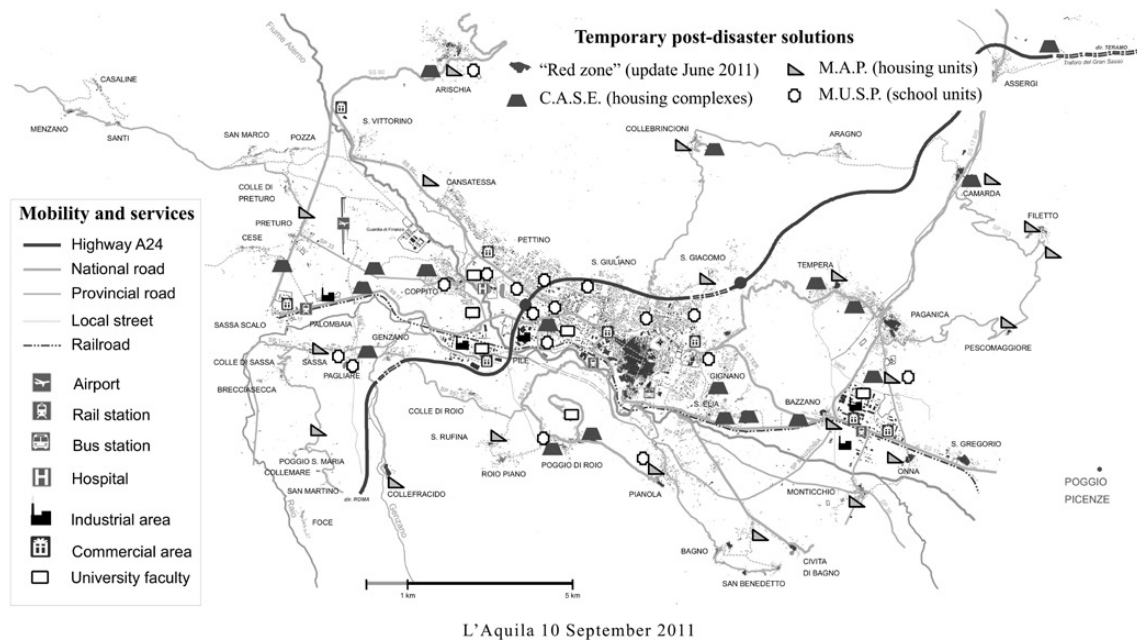
The primary focus of the C.As.A. Initiative was to look at the territorial configuration before and after the earthquake, in order to give insight into the changes that affected the individual and collective behaviour.

The activity took place from June to September 2010 in 9 C.A.S.E. sites (figure 2). For each site, it involved several days of brainstorming, in-depth interviews and data collection through a questionnaire. Over 300 households took part in the survey, with a total of about 1000 citizens.

The result consisted of a broad investigation of the social and territorial unease after the earthquake, as an aftermath of the new territorialisation of L'Aquila. The most important result, however, was the "geographical narrative" of the earthquake elaborated in such a way as to illustrate ongoing social phenomena, relating them to the daily actions of each person (Boudon, Bourricaud, 1982). Combining multiple instruments (questionnaires, interviews, territorial and thematic meetings, etc.) and approaches (horizontal, vertical, integrated), and integrating qualitative and quantitative methods, the PPRA allowed to draw the "new social geography of L'Aquila after the earthquake", starting from the places of everyday life (Pain, 2004).

The results were presented on 10th September 2011, during a public meeting. This event, a *world café*, was attended by associations, academics, administrators, politicians, teachers, students and private citizens[3]. The results of the PPRA were presented in the form of a "visual story" through an exhibition including 40 posters divided into different sections[4]. The main goal of visual communication was to 'stage' people's lives before and after the earthquake. And it could not have been any different since the PPRA was conceived, organised and carried out by the same stakeholders that were involved in the decision-making processes (van Asselt Marjolein, Rijkens-Klomp 2002). The research-

[3]In parallel with the *world café*, taking place in a tent set up in the park nearby the Spanish Fort, in the old town centre of L'Aquila, a team of students and professors from the DHS pedagogical area set up a gazebo and organised a number of workshops involving children and teens (*LC Junior*). Results were presented at the end of the *world café*.

[4]The itinerary included the following thematic sections: 1) The boundaries of pain - Housing solutions; 2) Citizens want to hear; 3) A desire to participate; 4) Daily life after the earthquake; 5) Future perspectives; 6) Words and thoughts (Calandra, 2012).

Figure 2. The C.As.A. Initiative: C.A.S.E. complexes covered by the survey.
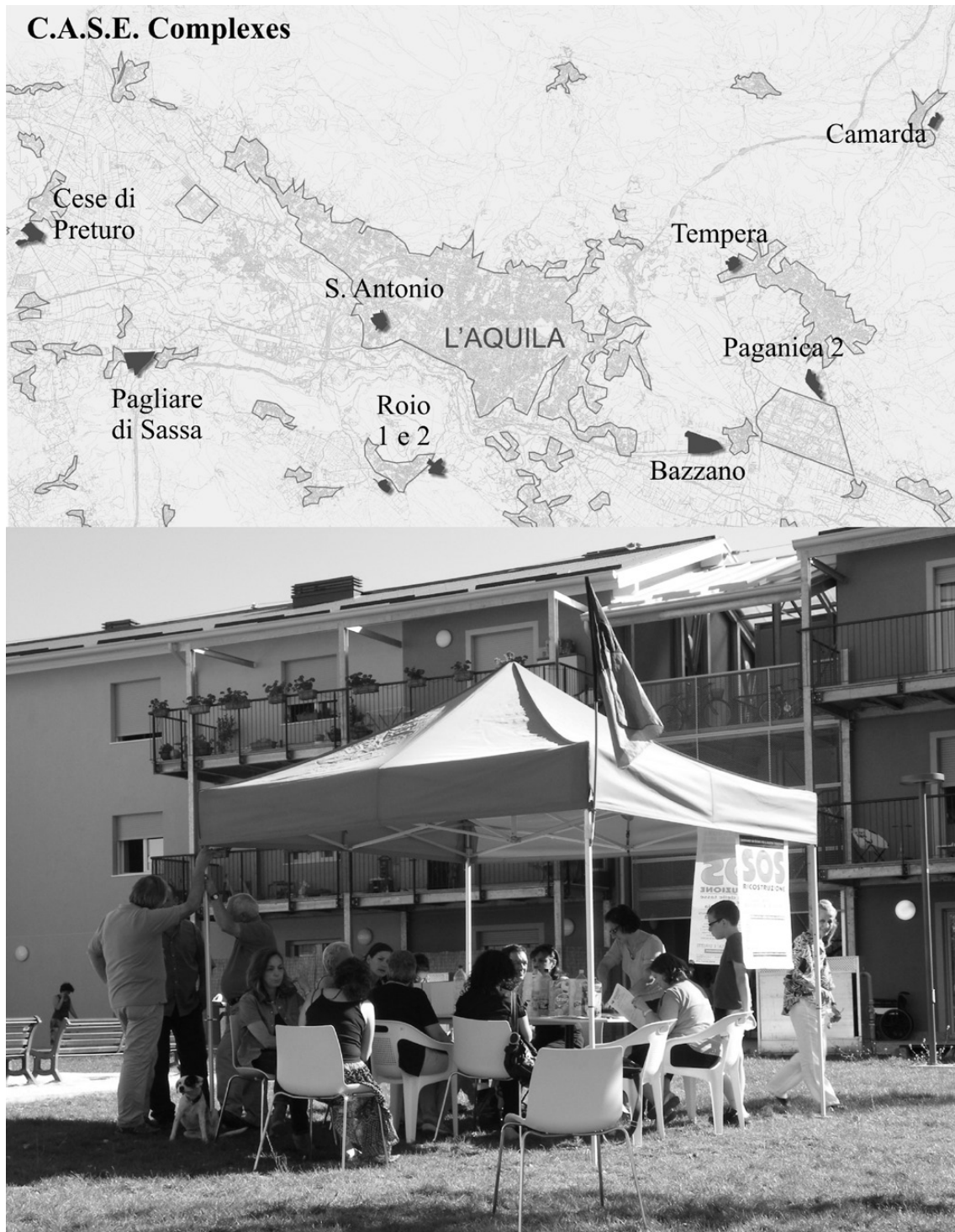
ers involved were themselves stakeholders, or better *terremotati* (earthquake survivals), living in the territories covered by the survey: they were not external experts totally unrelated to the research topic and relevant political choices (Elias, 2006). For this reason, the research was not only participatory, but also participating, in a broader sense.

This visual story, where cartographic representation plays an important role, represents the core element of the proposed communication and participation model that was

presented during the meeting: the *Laboratorio città* model (LC). It is a flexible, open, inclusive and always in progress "laboratory of democracy" that aims to identify and create a number of occasions to publicly discuss topics and issues starting from spatial analysis and territorial studies (Habermas, 1996; Reason, Bradbury, 2001). In the research, the visual processing of the results and the geographical narrative has a central role. It is designed so as to trigger social and political dynamics (Cahill, 2007; Elwood, 2006) to drive the empowerment of the local community, as well as the democratisation of knowledge and of the decision-making processes.

In other words, LC aimed to provide a methodology, both scientific and political, following the assumption of A. Giddens that the most effective forms of connection between social research and policy-making are those carried out through an extensive process of communication between researchers, decision-makers and those involved into any of the investigated matters (Giddens, 1987). Consequently, even the idea of participation at the base of his model is twofold.

Firstly, participation is understood as a methodology of inquiry used, prior to the cognitive process, by the experts (those who have the methodological, theoretical and technical knowledge) to obtain the systematic involvement of those who daily live in the territory, not as "study objects", but rather as "subjects of knowledge" (Lather, 1986); a methodology to elaborate a legitimate framework for the interpretation of reality incorporating "the vocabulary of those who live the territory" (Martinez Alier, 2009). The purpose is to democratise knowledge and power through the research process (Fuller, Kitchin, 2004).

Secondly, participation is understood as a praxeological device, namely a communication platform and a space for ethical reflection where the intellectual and existential dimensions closely interact (Matthey, 2005). The idea is that participation acts as a catalyst for political dynamics and social actions towards an actual change; and, in the framework of a shared knowledge, as an "arena" to draw a number of moral, ethical and political considerations (Cutchin, 2002).

The institutional, political and social implications of the research

In line with the commitments made at the end of the *world café* meeting, a closer collaboration with the municipal authorities was established. In the first stage (October 2011 – June 2012), it took place in an informal and voluntary way and was implemented through public itineraries that were structured in three cycles of territorial meetings:

1) six meetings for a collaborative consulting to elaborate the Municipality "Participatory regulation";
2) five meetings for the presentation of the "Plan for the reconstruction of the old town of L'Aquila and its villages" for the opening of a public inquiry;
3) four meetings for the collaborative writing of the "Mandate Program 2012-2017" of the Mayor Massimo Cialente, starting out on the election program (also prepared in a participatory way during the election campaign)[5].

As a result, this partnership was formalized and, in October 2012, the DHS and the Municipality of L'Aquila undersigned a Memorandum of Understanding. Researchers and students from the Cartolab laboratory, as well as private citizens, volunteered offering their support for coordinating the Municipal Office for Participation, as well as for the preparation, organisation and implementation of new pathways to participation. In this new framework, three PPRA different stages were again proposed within the territory, consistently with the LC model.

The first stage was related to the *Preliminary survey for the participatory budgeting (PB)_2013* of the Municipality. The survey aimed to define a general framework summarising the main requests made by the citizens – sorted by geographical area – to be included into the municipal budget, in accordance with the various regulatory and financial constraints[6].

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[5]The Participatory Regulation and the Mandate Program are available on the web site of the Municipality of L'Aquila (http://www.comune.laquila.gov.it).

[6]The survey revealed a majority of requests concerned with interventions in the field of public works. Therefore the Municipal Council allocated just under 3 million Euros for the *Participatory*

The research was carried out through a public *Question time* (December 2012 - February 2013), a cycle of ten meetings held all over the municipal territory, with the mayor and the councillors. In short, the collection of data and information took place during the meetings, more precisely during the *proposal time*, which was dedicated to the discussion, in working groups, and the completion of a questionnaire. Data were also collected in some of the local high schools, within the European project "Youth Participatory Budgeting", with the Municipality as leading partner.

Overall, this stage of the PPRA involved nearly 850 people, of which 436 completed the questionnaire. The latter included a set of questions for the assessment of their territorial context and living conditions, as well as the formulation of proposals and practical requests[7].

As in LC, the results were presented in the form of a posters exhibition, which were organised in order to provide a comparative perspective on the different stories of adults and youngsters. The presentation of the geographical narrative resulting from the research took place during ten deliberative meetings dedicated to the Participatory budgeting (March-April 2013).

The second stage of the PPRA, aimed to evaluate the sense of insecurity perceived by citizens, was held during a cycle of meetings, known as *Percorso sicurezza* (May-June 2013). During the meetings, the participants were asked to complete a questionnaire, which was delivered over the following months, also through face-to-face interviews. Overall, 324 questionnaires were collected[8].

Finally, the third stage of the PPRA consisted of the work of fourteen young members (aged between 16 and 30) of the unofficial *Move your city* group, which joined the European project "Youth participatory budgeting". The research about mobility in the area of L'Aquila was conducted between November 2013 and February 2014. The team included 1,240 students from high schools and universities, and set out to prepare a report on urban mobility in relation to the habits of students, in terms of leisure and places of socialisation (Castellani, 2014). Once again, the results were returned in a visual form: eight posters presented to high school students through participatory meetings (May 2014).

As can be seen, the participatory paths are essentially conceived as a set of occasions to make permanent the cognitive process of interpretation and representation of reality. The purpose is to provide a foundational shared knowledge to support informed decision-making.

Research results: geographical narratives of the territorial dispersion and social fragmentation

The geographical narrative, drawn from the outcomes of the PPRA, articulates around the many places of people's everyday life. As mentioned, it focuses on the visual channel, using graphic and cartographic materials that will not be reported in this paper due to length restrictions[9]. However, we will try to account, in a discourse form, for specific moments of this geographical narrative of L'Aquila after the earthquake.

The places of the emergency (2009-2010)
At the beginning of the story, we can find the places of birth and some personal information about the 308 casualty of the earthquake: beside the citizens of L'Aquila, many of the victims came from other municipalities of Abruzzo, from other Italian regions and from other European, Latin American and Mediterranean countries. They are mostly young

Budgeting 2013, in particular to the Multi-annual Plan of Public Works.
[7]All documentation relating to *Question time* and *Participatory Budgeting* can be downloaded from the "Participation" section of the Municipality of L'Aquila's web site.
[8]Following the replacement of the governmental police commissioner, the results were only presented after one year, during a conference, but not at local meetings with stakeholders.
[9]The graphic and cartographic materials of the research were published in Calandra (2012) and can be downloaded from the "Poster" section of the web site http://www.laboratoriocittalaquila.it.

Figure 3. Geographical narrative of earthquake: the places of death.

Deaths by municipality

272	L'AQUILA
17	VILLA SANT'ANGELO
5	POGGIO PICENZE
5	CASTELNUOVO
4	FOSSA
3	SAN DEMETRIO NEI VESTINI
1	LUCOLI
1	TORNIMPARTE
308	

Villages of the Municipality
of L'Aquila with quake deaths
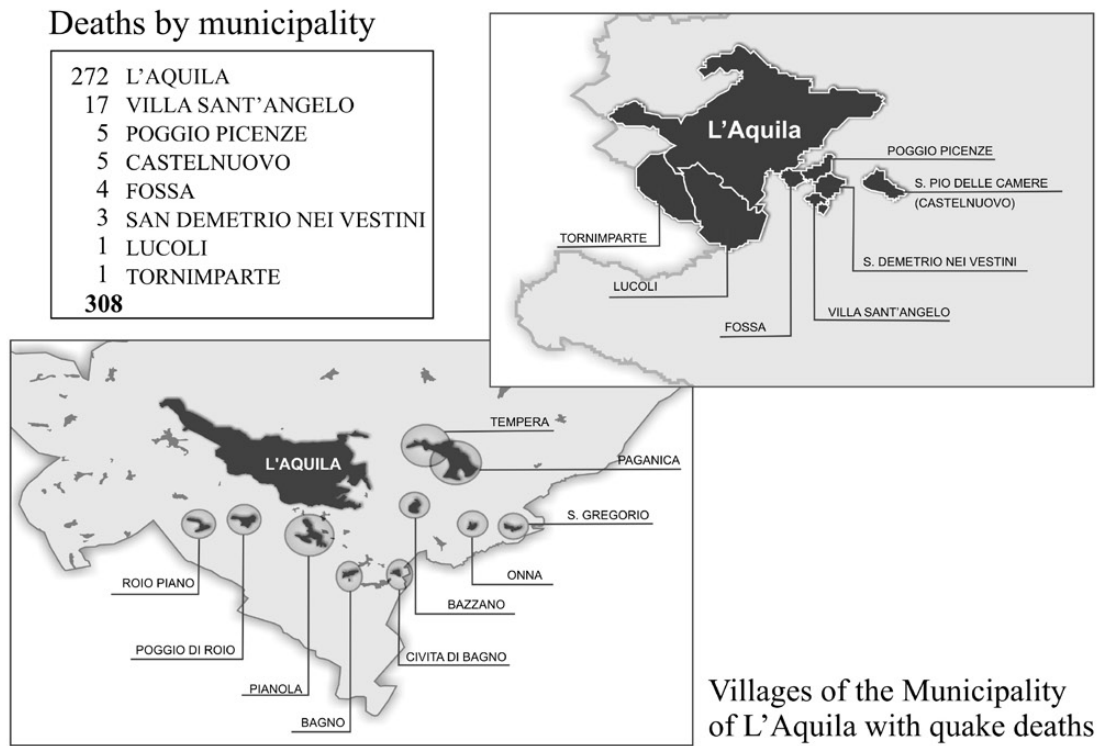
Localization of the deaths in the historic center of L'Aquila

The perception of territorial quality in the present

- according to adults
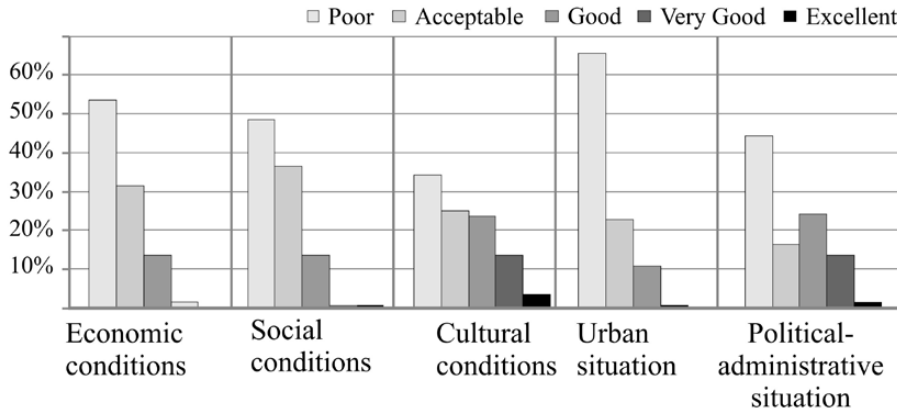
- according to young people
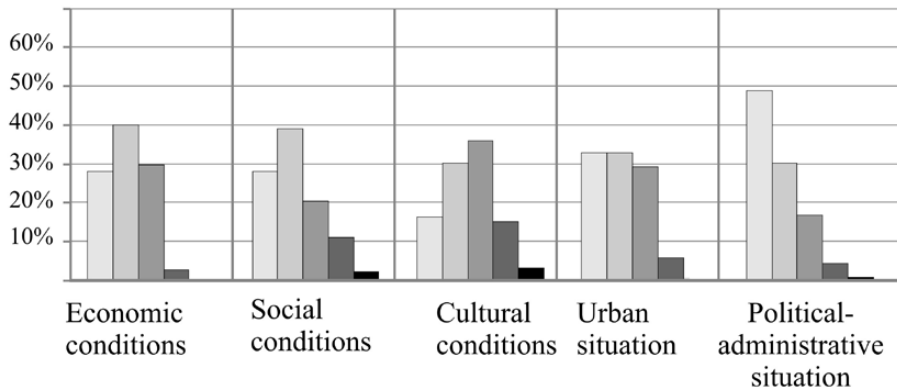
The perception of territorial quality for the future (in twenty years)

492
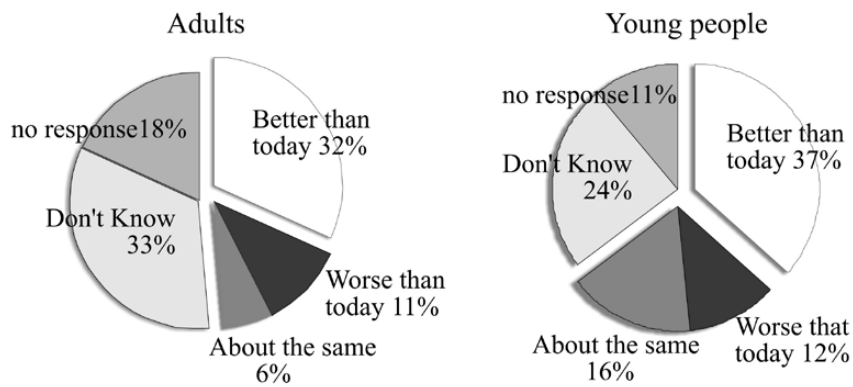
people (students) aged between 18 and 29 (about 23%), and elderly people aged over 65 (about 19%); women account for 58% of the total number. Even though the recollection of life antedating death leaves us speechless, the display of death places somehow prevents fatalism from creeping into people's mind and soul. It clearly appears that most of the victims lived in the Municipality of L'Aquila (272) and 50% of these concentrated in the southwest part of the old town (figure 3). Such a concentration of deaths in one single area is not a mere chance: it is the result of repeated acts of negligence towards the territory, from the early 1900s onwards, especially after another earthquake that struck Avezzano in 1915 (Stockel, 1981).

In the same way, the visualisation of the areas affected by material destruction reveals how some of them suffered more than others from the ongoing attitude of carelessness, shallowness and speculation towards the territory. Beyond the severe damages that affected the historic buildings of the city centre and the surrounding villages, it is striking to see the extent of damage that affected strategic public buildings, such as the regional hospital, the courthouse, the police headquarters, the land registry and newly urbanised districts (from the 1980s onwards) such as Pettino, the largest and most populated neighbourhood of L'Aquila with approximately 15,000 inhabitants. In Pettino, 38% of the buildings were affected by major structural damage (Calandra, 2012).

Finally, there are the places of the 67,000 evacuees: the *tendopoli* (tent cities) that accommodated approximately 20,000 people immediately after the earthquake, and the touristic facilities (hotels), especially along the Adriatic coast of Abruzzo. Most of the other affected people found their own alternative accommodations.

The places and practices of fragmentation and dispersion (2010-2011)

After the initial phase of emergency, the story shifts to the places of fragmentation and dispersion, highlighting the changes that affected the behaviour and the habits of the citizens of L'Aquila.

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Many places were affected by sudden changes in terms of nature and functions. First of all, the old town centres of L'Aquila and the surrounding villages were declared 'red zone', off-limits and militarised. Similarly, whole neighbourhoods and areas of the city outside the walls emptied out, because the buildings were unusable. For months, the houses 'with the lights on' were only a few dozen. Only after the 'light' reconstruction (end of 2012 – early 2013), that is the reconstruction of 6,400 homes with fewer and no structural damages, here and there in the city could again be seen lights at the windows and flowers on the balconies. Meanwhile, in order to respond to the housing emergency of the displaced people, the Italian Government built a number of accommodations known as C.A.S.E. (figure 1): 14,000 people were accommodated in nineteen different sites, mainly located on national roads, especially in remote rural and suburban areas far off from the, prior to the earthquake, roughly continuous urban fabric. They are mostly sites deprived of any emotional and symbolic reference points, as well as material and organisational, where services are absent or inefficient. Depending on the site, from 200 to 2,000 people were accommodated in these houses. As a result the city stretches out 'like a chewing gum', from east to west, for about 35 km (Palma, 2012). At the same time, many services and activities were relocated without adequate coordination. As for instance:
  - The municipal offices were scattered in more than a dozen different locations;
  - Several university faculties were relocated in disused industrial buildings in the areas of Pile and Bazzano – these sites are only 10 km apart, yet, during certain hours, it may take up to 40 minutes to travel from one place to the other;
  - In October 2009, only a few schools resumed their activities in their previous headquarters, whereas the majority of them were relocated in temporary units known as M.U.S.P., mainly situated within the old urban setting (where, at the time, hardly anybody used to reside anymore) (figure 1). Until now no school has been rebuilt.
  - Several ambulant vendors that used to operate in the daily market of Piazza Duomo randomly relocated on streets, squares, parking lots, and so on.

As a consequence, post offices, shops, professional offices, etc. shut down or relocated, resulting in the disruption of relationships and proximity-oriented practices. For

instance, before the earthquake, 60% of the population used to reach for the nearest post office or medical facility, whilst, after the earthquake, 25% were forced to look for a different family physician or did not even know where their previous one relocated to.

As a result, thousands of people started perceiving as a problem simple activities that were previously quite natural and taken for granted: grocery shopping, pension's withdrawal, mail delivery, medical appointments, commuting to work, taking children to school and so on. People's habits in terms of shopping behaviour and shopping places were deeply affected: before the earthquake, people used to go shopping in local supermarkets (44%) and at the daily market of Piazza Duomo (21%), whereas, after the earthquake, 25% of citizens go shopping "wherever they can", 13% buy from "street stalls" and the percentage of those who go to shopping centres increased by eleven points (from 14% to 25%). In this regard, it should be noted that, within eighteen months after the earthquake, the number of shopping centres in the Municipality of L'Aquila had more than doubled. Similarly, even with respect to leisure time, there were important changes in terms of behaviour: the percentage of people going to the old town significantly decreased (before the earthquake, 35% of people used to go to the city centre for shopping, too), as well as cinema and theatre attendance. It is striking, on the other hand, the significant increase of people that tend to spend their time "at home", which reveals the tendency of individuals to take refuge in themselves and their own families. It took a few years (2013-2014) for the old town centre to regain its popularity, especially among teens every Saturday evening and young people (not just university students) every Thursday and Friday night.

Mobility resulted in a major issue, and still is today. There are many critical factors: on the one hand, the inefficiency of public services, which fails to adequately cover the new increased distances; on the other hand, the impact on mobility, due to the increased use of cars, the alteration of routes after the chaotic relocation of offices, services, functions, etc., and the increased flows in certain areas due to the concentration of 1,000-2,000 people in areas that were only equipped to accommodate few hundred (for instance the C.A.S.E. complex of Cese di Preturo). Moreover, from most of the C.A.S.E. sites, it is virtually impossible to reach work places, schools or supermarkets on foot, or simply to go for a walk. This results in the congestion of the major road transport arteries, which are now blocked by construction sites, leading to an increase (twice, trice or even quadruple as much) of the journey times during certain hours.

The places of everyday life: objectivity versus perception (2012-2013)

People's behaviour after the earthquake was not conducive to the maintenance or reconstruction of relatedness, communicability, proximity and solidarity networks. This had an impact on the way people perceive the places of everyday life, life contexts, and security.

After five years from the earthquake, from the adult population's point of view, the relationship with the territory is troublesome in its present and future projections (figure 4): overall, they provide poor quality evaluations about the present and cannot figure out some kind of vision for the future. Therefore, the fact that, in spite of this, most adults (72%) declared that they were not willing to move to another city reveals a tendency to feel like 'prisoners' of one's own territory: this implies that the sense of constraint prevails on that of belonging. Instead, from the point of view of young people, even though the spatial projection into the present appears more objective and pondered over real data (after all, "not everything sucks"), the projection into the future turns out even more pessimistic then the adults': it is not surprising, therefore, that 46% of young people want to move to another city.

This perception of the life context counterpoints the desire for care, decency and cleanliness, which translates into practical and precise needs: improvement of road conditions, enhanced usability and accessibility of public spaces, maintenance or creation of equipped green areas, pedestrian traffic control, road cleaning and maintenance, and so on.

The desire for care is connected with a strong sense of insecurity amongst the citizens of L'Aquila. Looking at the places and situations in which people feel it more, it is significant, but not surprising after all, that 52% of people declared they feel more insecure

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when they "go out at night": this figure, while higher, is more or less in line with similar data at a national level. Moreover, it relates to the direct rating of the places of everyday life – for example, some roads are dirty, in bad conditions and poorly lit – and certain places where alcohol abuse and vandalism are quite frequent. Instead, it is quite surprising that 48% of people declared that the place where they feel more insecure is "at home". Very significantly, the percentage rises to 57% among those who live in the C.A.S.E.; whereas 55% feel "little or not protected" when they go out at night. It is also quite worrying that 12% declared that they "do not go out" at all, and to the question "How safe do you feel when you are alone at home and it is dark?", 38% replied "little" and 17% "not at all". This is not due to an high crime rate, but rather to the relationship that connects the territory and its inhabitants after the earthquake; a relationship that seems to evolve from a physiological to a pathological functioning (Allevi, 2013).

Conclusion

As we have seen, L'Aquila is currently experiencing a growing sense of fear for the future, mistrust and uneasiness, as well as a decreasing sense of cohesion towards a social polarisation that is typical of larger cities. The reconfiguration of the territory after the earthquake resulted in an acceleration and accentuation of the sense of fragmentation and dispersion, which, although already present before the earthquake, was not so widespread amongst inhabitants. In this context, we believe that the PPRA may represent a response to the inconsistency of urban fragmentation, as well as a practice for regenerating paths for the valorisation of relationships, social cohesion and territorial inclusiveness. Definitely, the PPRA may represent a form of resistance and resilience, but also an ethical choice focused on knowledge, awareness and responsible action (Smith, 1997; Soja, 1993). In the same way, the geographical narrative of social and spatial dynamics, drawn from the research, plays a key role as a potential medium between politics, communities and science in post-disaster contexts, also as a means to preserve the identity of places and, above all, to preserve a possibility for people to be happy and feel good in their own territory.

References

Allevi, M. (2013) 'Cultura e luoghi: quando l'abitare diventa atopico. Esempi da L'Aquila post sisma', in Pedrana, M. (ed.), *Multiculturalità e territorializzazione. Casi di studio* (IF Press, Roma) 33-54.
Blake, M. K. (2007), 'Formality and friendship: research ethics review and participatory action research', *ACME: An International E-Journal for Critical Geographies* 6, 411-421.
Boudon, R. and Bourricaud, F. (1982) Dictionnaire critique de la sociologie (PUF, Paris).
Cahill, C. (2007) 'Repositioning ethical commitments: participatory action research as a relational praxis of social change', *ACME: An International E-Journal for Critical Geographies* 6, 360-373.
Calandra, L. M. (ed.) (2012) *Territorio e democrazia. Un laboratorio di geografia sociale nel dopo sisma aquilano* (L'Una, L'Aquila).
Castellani, S. (2014) 'Participation as a possible strategy of post-disaster resilience: young people and mobility in L'Aquila (Italy)', in Calandra, L. M., Forino, G. and Porru, A. (eds.), *Multiple geographical perspectives on hazards and disasters*, (Valmar, Roma) 105-117.
Comune dell'Aquila (2012) *Piano strategico dell'Aquila* (http://www.comune.laquila.gov.it/pagina487_il-piano-del-2012.html) accessed 4 June 2015.
Cutchin, M. P. (2002) 'Ethics and geography: continuity and emerging syntheses', *Progress in human geography* 26, 656-664.
Elias, M. (2006) '«Practicing» geography: reflections on an uncommon encounter between research an practice', *Research and Practice in Social Sciences* 1, 156-167.
Elwood, S. (2006), 'Negotiating knowledge production: the everyday inclusions, exclusions, and contradictions of participatory GIS research', *The Professional Geographer* 58, 197-208.
Fuller, D. and Kitchin, R. (2004) 'Radical theory, critical praxis: making a difference beyond

the academy', in Id. (eds.), *Radical theory, critical praxis: making a difference beyond the academy* (Praxis (e)Press, Vernon and Victoria) 1-20.

Giddens, A. (1987) *Social theory and modern sociology* (Stanford University Press, Stanford).

Habermas, J. (1996) *Between facts and norms: contributions to a discourse theory of law and democracy* (MIT Press, Cambridge-Massachusetts).

Kemmis, S. and McTaggart, R. (2005), 'Participatory action research: communicative action and the public sphere', in Denzin, N. K. and Lincoln Y. (eds.), *Handbook of qualitative research* (Sage Publications, Thousand Oaks) 559-603.

Lather, P. (1986), 'Issues of validity in openly ideological research: between a rock and soft place', *Interchange* 17, 63-84.

Martinez Alier, J. (2009) *Ecologia dei poveri* (Jaca Book, Milano).

Matthey, L. (2005), 'Éthique, politique et esthétique du terrain: cinq figures de l'entretien compréhensif', *Cybergeo* (http://cybergeo.revues.org/3426) accessed 4 June 2015.

Pain, R. (2004) 'Social geography: participatory research', *Human Geography* 28, 652-663.

Palma, F. (2012) 'Dimensioni dell'abitare dopo il sisma. L'Aquila tra territorialità, emergenza e C.A.S.E.' in Calandra, L. M. (ed.), *Territorio e democrazia. Un laboratorio di geografia sociale nel dopo sisma aquilano* (L'Una, L'Aquila) 109-124.

Reason, P. and Bradbury, H. (eds.) (2001) *Handbook of action research: participative inquiry and practice* (Sage, London).

Smith, D. M. (1997), 'Geography and ethics: a moral turn?', *Progress in human geography* 21, 583-590.

Soja, E. (1993), 'Postmodern geographies and the critique of historicism', in Jones, J., Natter, W. and Schatzki, T. (eds.) *Postmodern Contentions* (Guilford, New York).

Stockel, G. (1981) *La città dell'Aquila. Il centro storico tra il 1860 e il 1960* (Edizioni del Gallo Cedrone, L'Aquila).

van Asselt, M. B. A. and Rijkens-Klomp, N. (2002) 'A look in the mirror: reflection on participation in integrated assessment from a methodological perspective', *Global Environmental Change* 12, 167-184.

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Seismic vulnerability and urban morphology, tools for urban and building integration

Edoardo Currà, Alessandro D'Amico, Malte Michael Nettekoven
Facoltà di Ingegneria Civile e Industriale, "Sapienza" Università di Roma, Italy
Keywords: urban resilience, built heritage, urban design, urban vulnerability, historical city

Abstract

In historical towns, the morphology is intrinsically linked to the seismic vulnerability of the urban organism. The seismic history of the Italian peninsula has influenced its towns highlighting the close correlation among the evolution of masonry constructive technique, typologies and morphologies (Fiandaca, Lione, 2009).

Through the reading of the urban fabric from a seismic vulnerability point of view, and the investigation of the property of structural resilience in the built heritage, it's possible to identify compromised, incongruous and improper components of both building and urban organisms.

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The purpose of the research is to provide effective tools to investigate and analyse the heritage in order to define an organic approach on the aforementioned components for building, architectural and urban intervention.

Among these tools, the survey of the building and typological units, considered in their mutual aggregation and relationship, or the map of the age of the built heritage (MABH) show the components in the urban fabric where to operate to implement the 4Rs of Resilience (Rapidity, Robustness, Redundancy, and Resourcefulness) (Cimellaro et al., 2010, D'Amico, Currà, 2014).

For example the MABH should be read in parallel and compared with the actual configuration, structural and morphological, of the urban organism analysed. The visualisation of the stratification of the building types and construction systems leads to determine quantitative and qualitative "degrees of freedom" in building and architectural renovation and integration projects.

The study was conducted on a significant selection of cities in central Italy, from small to medium size, with a significant built heritage percentage. Each case study will be described through the sequence of the experimented tools.

Introduction

Italy, next to Greece and Turkey, is one of the most earthquake-prone countries in Europe[1]. The close correlation between the seismic history of our country and the evolution of the masonry construction technique, such as the typological and morphological manifestations of buildings in historic towns, can be considered a potential starting point in the analysis and the definition of the urban resilience, in especially regarding the role of the built environment.

The processes of growth, according to typological criteria that have characterized the historical urban fabrics, are particularly compatible with the planning and the urban design that implement the properties of resilience. They are also related to specific reading instruments of the built environment. The evaluation of the problem of resilience implementation in urban contexts passes through various components – social ones, economic ones and technical / structural ones – as regards in particular the role of the built environment in the definition of the urban resilience (ICOMOS, 2013).

Among the performances of the built environment there are the ones referred to the resistance. The corruption of these features, such as the loss of strategic buildings or infrastructure, it may increase the vulnerability of a community (Haigh, R., Amaratunga, D., 2010).

Vulnerability, morphology and resilience

The research presented is based on a holistic approach to the historic town, and it aimed to define the relationships between the morpho-typological properties of the masonry city and the building interventions on the historical built heritage. The identification of interventions and their verifying modelling are part of a program aimed to the selection and validation of criteria currently in use in more expeditious analysis of urban and building vulnerability (primarily relating to the system of open spaces and building aggregates) and still belong to a phase of running research.

This investigations lies in an organic and structuralist conception of the morphology of the historical town, which highlights the role of the seismic prevention. If the urban morphology is accepted as the study of the shape of the city, as the visible aspect of its structure (Strappa, 2014), consequently it is possible to identify a formative process, that is recognizable and rationally investigated as a design tool. Some significant morphological evolutions become visible by analyzing the long processes of growth of our old towns. These discoveries reinforce the belief that the "form of architecture, that we perceive, is consequently only a temporary moment of balance within this continuous stream of transformations" (Strappa, 2015w).

It is above all this concept of process and balance, that makes appear fertile the considered development of methods and tools for the intervention evaluation. Those methods could take advantage of the concept of resilience, beside the more structural and defined concept of vulnerability (D'Amico and Currà, 2014a).

However to achieve this you need to collocate these methods in a shared definition of resilience. The current concept, introduced mainly by Holling (1973), has been developed following independent paths in the various disciplines (mostly ecology, psychology, economics and physics). Of that work definitions and classifications resulted that was reduced to the single discipline scope to the detriment of the real holistic sense of the approach (Francis and Bekera, 2014)[2].

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[1]The latest updated map has been provided by the European project ShareE (Seismic Hazard Harmonization in Europe - Seventh Framework Programme), represented for Italy by the working group INGV, coordinated by Gianluca Valensise. In particular INGV was responsible for the creation of the active faults database of the European catalog of earthquakes and the map of the distribution of the maximum expected magnitude.

[2]Concerning urban resilience engineering definitions, Timmerman (1981) first already set a germinal lemma of Engineering Resilience. He defined it as a measure of a system's capacity to absorb and recover from the occurrence of a hazardous event.

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Since its introduction for ecosystems, the concept of resilience permits to understand and analyze the iterations shown in complex systems. It has been shifted to urban structures in order to approach their own nature in evolution as much in a single temporary configuration. Today the word resilience is widely associated to the disaster risk reduction (DRR), hence the UN International Strategy for Disaster Reduction (UNISDR) Hyogo Framework for Action 2005-2015. The UNISDR (2005) defines resilience as "the ability of a system, community or society potentially exposed to hazards to adapt, by resisting or modifying itself, to achieve and maintain an acceptable level of functioning and structure." An important outcome is represented by the interpretation of Wilbanks (2007), referred in CARRI[3] reports: "the ability of a community or a territory of 'prepare for', 'respond' and 'recover from' a significant multi-risk threat, with minimal damage to the public health and safety, the economy and national security". This definition seems the more inclusive for the concept of urban resilience.

Several international networks operate in this context (ANDROID, World Bank, UN-HABITAT, UNISDR, i-Rec, etc.) but they have paid more attention to some aspects of resilience (psychological, organizational, economic and purely infrastructural), leaving large open areas for research in the field, perhaps more complex, of the resilience of built environment. Recently, it has been highlighted the opportunity and effectiveness of this approach in the context of the crisis caused by seismic events, with a particular reference to the old towns and the historical fabrics of the Italian peninsula (D'Amico and Currà, 2014a, 2014b).

Prevention and modification processes

Examining historical urban fabric according to morphological point of view – related not only to its seismic vulnerability but also to its recuperation capability after a crisis – permits a critical review of methods applied for prevention. This recalls the path indicated by Antonino Giuffrè: "The seismic restoration of historical townships however must combine the two leanings of security and heritage conservation. These two concepts are included in one single verb, the simple 'to restore', that fulfils its meaning only by ensuring and conserving at the same time" (Giuffrè, 1993). Giuffrè was also aware of the modification, that every consolidation process comprises, and suggested vehemently a method based on deep knowledge of objects, aggregates and workmanlike. His aim was to prevent generalised solutions, which have frequently proved their inadequacy in solving problems concerning both conservation and safety.

Thus, during the later twenty years, scholars and technicians investigated parameters and functions describing seismic vulnerability of constructions and, recently, of urban fabrics. Primarily the variables originated from post-damage surveys, analysis and interpretations of the principal earthquakes of the Italian peninsula: 1976 Friuli[4], 1980 Irpinia, 1984 Eugubino, 1997-1998 Umbria-Marche, 2002 Molise-San Giuliano[5], 2009 Abruzzo[6], 2012 Pianura Padana Emiliana-Emilia Romagna[7].

Particularly, starting from the earthquake that struck Umbria and Marche regions in 1997-1998, a series of researches was carried out with a significant impact on the fields of prevention and urban planning. In those circumstances planners and administrations acquired, cooperating with the sector of seismic engineering, the awareness that territory performs as a system and that interactions between the different scales of urban organism and territory exist. This way of thinking has allowed the definition of the vulnerability grade of a defined area. The concept of vulnerability of an urban system comes from the assumption that the response of a city to a disaster derives, not only from the sum of the vulnerability of the individual building elements, but rather is the result of a systemic

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[3]Community and Regional Research Initiative on Resilient Communities.
[4]CNR established the PFG (Progetto Finalizzato Geodinamica).
[5]Extension of seismic zoning to the whole national territory, ord. P.C. 3274.
[6]During the Abruzzo reconstruction were first applied the new NTC 2008.
[7]New NTC 2014.

behaviour of the city. This type of behaviour is related to the influence that the existing relations between the individual components of the urban structure have on urban vulnerability (Gargiulo and Papa, 1993; Fistola and La Rocca, 2009).

From this point starts an examination of the historical towns beyond the single building level that opened up new vistas for prevention and improvement: on the one hand, the system of open spaces in relation to architectural e structural outstanding buildings and, on the other, the management of intervention in urban fabric, in order to reduce vulnerability and to increase resilience.

In this context, it is worth noting the norm of the region Umbria concerning the so-called Minimal Urban Structure (SUM), adopted with the regional law no. 11/2005. The text consolidates studies and researches, that has been conducted for ten years in the Umbrian territory and defines the SUM as a system of pathways, spaces, urban functions and strategic buildings for urban response to the earthquake during the emergence phase, and for the maintenance and resumption of ordinary urban, economic and social activities, in later phases following the earthquake (Fabietti, 2012). The structure includes the minimum required components, none of which can be subtracted without compromising the overall functioning. In other words, the SUM is identified by answering the question "what should resist" in case of an earthquake. They include: The system of mobility and accessibility; The system of open safe spaces; The system of strategic buildings and structures; The system of major technological networks (Regione Umbria-DPTU Sapienza, 2010).

Also cultural heritage, places of sociality, the system of economic and productive activities and main urban functions could be additional parts of the SUM, due to the specific strategic value given them by Administration and local communities.

Concerning the management of urban fabric, the main cases unfortunately are almost exclusively represented by reconstruction plans. Actually reconstruction plans were made and experimented solely following seismic events of great intensity. These plans make use of knowledge criteria of urban fabric and building aggregate to manage the transformation (among other please note: Nocera Umbra (1998/2001 and following years) and Fossa (L'Aquila) 2012).

In those plans we notice the proposition of instruments for a rapid evaluation of seismic vulnerability in order to determinate a classification, for the different building aggregates, and to define the priority of interventions. These urbanistic instruments are applied under post-crisis conditions. In fact building owners accept more willingly a seismic vulnerability evaluation post-disaster, while it is more difficult to propose them a diffuse buildings seismic classification finalized to a prevention planning. So how to combine morphology,

Figure 1. Map of the built heritage: the case studies of San Gemini and Rieti represented at the same ratio.

vulnerability, resilience and prevention not only inside management instructions for the disaster but inside urbanistic instruments of ordinary historic township management? It is important to collect handling instruction established by the 'Guidelines for the evaluation and reduction of seismic vulnerability of cultural heritage' concerning the necessity "of providing analytical instruments for different levels of deepening, applicable to two different scales: the vulnerability evaluation of cultural heritage on territorial scale and the security evaluation and planning of intervention for the single building" (LL. GG. 2010,3).

The different levels consider the form, the morphology, as an expression of the comprehensive structure. Indeed the examination of the common urban fabric and its intrinsic vulnerability characteristics steers the research to a process-related definition of the design project. By starting from existing building and urban components, design indications could be added to architectural project of anti-seismic improvement.

Urban fabric of the historical town and morphological elements of vulnerability

Instead of presenting results of different analyzes in tabular form, an agile screening could be based on cartographic tools, for instance, a GIS system, which provides to overlay several layers of the investigated data. In this way it is also possible to simplify the recognition and the differentiation between the two conditions, that qualify the process of construction of the old township form: On the one hand realizations for public and private holders, represented by architectural objects in the urban space, on the other hand the use of recurring forms in coordinating the widespread building units (building and construction typologies).

The research activity has devised a sequence of analysis and reading tools based on the following maps at the urban level:
- Map of the age of the built heritage (MABH);
- Charting of building types.
And on the following drawings of analysis at the level of detail:
- Planimetric representation of the building fabric;
- Constructive characters of built heritage.
All of these tools have their own role in setting up a map of the urban and fabric vulnerability.

Map of the age of built heritage (MABH) and charting of building types

An useful tool for the analysis of urban fabric is the map of the age of built heritage (MABH), that is taken in consideration by different elements of urban planning. The map is based on some fundamental assumptions: In historic townships – while examining a determined building typology in a determined topographic area – it's statistically possible to associate the age of built heritage with a limited group of building techniques. Further one can notice sequences of different types of modification interventions, that are connected to the evolution of structural building consolidation norms. The first awareness that is intended to instil into technicians is the one of the non-homogeneity of the historic township. The numerous crises, its habitation over a long periods of time and the many legislative and normative measures led to a continuous modification of constructive fittings even though the old age of façades and form of public spaces were preserved[8].

The analysis of urban fabric and building composition are conducted starting from the oldest cadastral and technical representation. According to the regressive method, it is possible to obtain preliminary indications concerning the recent phases of the occupation and modification of the single building units (Guidoni, 1979[9], – Consiglio Superiore

[8]Unfortunately in practice predominates the attitude of non considering the whole building an organism: Interventions in façade are conducted in a conservative way, meanwhile the inner building often gets modified heavily without knowing precisely its structural behaviour and its mechanical properties.
[9]In the fundamental double edition (12/13) of "Storia della città" with the topic "Cartography

Figure 2. Investigation of the urban morphology, the case of Rieti. Planimetric representation of the urban fabric in the center of the town, above, and the reconstruction of the historical phases of a monument, belove.

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dei Lavori Pubblici, 2012). Then the reading is integrated by on-site visits. These permit to confirm or refute the presumed dating. This process is aimed to identify the historical constitution phases of current urban heritage, of original building cells and of saturation/occlusion episodes in the open spaces. Therefore by an awareness of age and constructive characteristic of the urban fabric it becomes possible to deduce the existing precariousness and consequently the prospective presence of selective vulnerability due to modification occurred over the course of time.

The critical interpretation of the different phases configuration, provides data, which can offer crucial highlights on certain kinds of vulnerability otherwise not detectable (e.g. interruptions in the continuity of masonry cells in ground plan o elevation, the interlocking of masonry panels, the linear disposition of inner openings in the case of merging of two structural cells, extensions or addition of a further storey).

This process also highlights if the configuration reached by a given phase caused a deterioration or an improvement comparing with the previous one. The final summarising document is the MABH, which shows the dating of the built heritage highlighting homogenous nuclei of urban fabric, to whom is associated a corresponding map of urban vulnerability[10].

Both the MABH of the two case studies of San Gemini[11] and Rieti are illustrated in figure. One can identify immediately the locations of occlusions and advancements of the building's forefront in comparison to the original town complex. These interventions represent the most common ways of modification inasmuch they led to a global alteration of the building aggregates. Thus following deeper analysis can be concentrated to these kinds of building aggregates.

In the MABH the chronological development of the two towns is graphically represented by a chromatic sequence. In San Gemini the most part of the present buildings preserves the original disposition (before 1819), meanwhile in the case of Rieti one can observe a greater presence of units transformed over the years. Sometimes ancient building aggregates were entirely substituted, meanwhile other aggregates were completely o partially transformed.

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The second analysis instrument is the charting of building types, necessary to distinguish the way in which the masonry cells combine over the time, inside the urban fabric of the historic townships. As it is well known this instrument was deeply established in the studies of Canniggia. The charting of building types could be consulted parallel to the MABH so that the identification of synchronic and diachronic variants (these last of major interest in our investigation) represents a groundwork, on which associate the data concerning the investigation of constructive types. These synchronic reading permits, in a speed screening, to detect   vulnerability data of local construction techniques.

The planimetric representation of the building fabric, through the assembly of land register maps and the constructive characters of built heritage

Once defined the first two instruments, that manage analytical data at the urban level, it's possible to enlarge resulution and evaluate the maps that investigate the characters of fabric and building units - i.e. planimetric analysis by knowing every unit that composes the urban fabric. This analysis will supported through the assembling of the cadastral plans and the identification and mapping of constructive typologies.

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and History" Enrico Guidoni wrote: "The cartographical component, beyond old 'vedutistic' schemes, represents by now an indispensable instrument for modern urban historiography (the present journal contributed to point out that): it is enough to think of the schedules about 'minor' townships, the representation of process sequences, the analysis of property, the studies about the settlement development, the most subtle restitution of the design process and the symbolic intention".

[10]In order to protect the privacy of the inhabitants of the townships selected as case studies it was not possible to publish the prepared "map of urban vulnerability".

[11]The case study of San Gemini was conducted thanks to the research agreement between the Department of Architecture and Design of the Sapienza University of Rome and the municipality of San Gemini from 2014, scientific advisor Fabrizio Toppetti, scientific coordinator Cecilia Battistini. The agreement arose in the context of the activities of the post-graduate master programme PARES and the research centre CRITEVAT.

The planimetric analysis of the building fabric is the first instrument in the scale of detail, as well as the key component for the survey of the urban built heritage.

This tool is processed in the first instance by the assembly of the cadastral plans of historic fabric. Then it has to be verified by subsequent site inspections carried out to clarify doubtful or incongruous situations compared to the cadastral data.

In this kind of study the difficulties, in obtaining the planimetric material for issues of interpretation of the privacy rights of the property are well known. This represents a substantial barrier to a better understanding of the urban fabric and for the scientific sharing of the most relevant data.

As it is well known, the planimetric analysis of the building fabric does not have in its goals the only geometrical knowledge of the state of the current configuration. It has been used for years to reach the analytically identification of the urban processes, that underlie the current morphologic evidence aimed to the design outputs made possible by the acquisition of awareness of such processes (Strappa, 2014). For the purposes of the present work it also allows to develop the initial considerations on systems and on constructive typologies and to study in deep the processes of building formation and transformation. It also constitute a proper basis in the documentation of the damage and decay.

Already Cremonini (2004) highlights the importance of this type of survey, in the experimentations carried out in the Region of Emilia-Romagna, referring to a simultaneous relief of geometrical, structural and stratigraphic aspects at aggregate level. The possibility of extending this concept to the whole urban fabric of the historical town allows to have a broader overview while reading and analyzing marks of transformation, that affected, usually, more or less spread portions of urban organism and not only a single aggregate.

There are some features of particular interest, immediately readable and verifiable in the planimetric analysis of the building fabric. There are e.g. "the geometric relationships of the walls (B / L and B / H) highlighting any horizontal and vertical slenderness, also in relation to the types of constraints to the orthogonal walls and to the horizontal elements. These can facilitate collapsing mechanisms of macro-elements, such as the tilting of the entire wall or parts of it in connection with the creation of rotation hinges, whose location – if the quality masonry is sufficiently good – is fairly predictable. Another significant element is the presence of accretions and strong variations of the wall thickness, both vertically and horizontally, e.g. for incorporation of existing masonry structures (eg. the city walls, the walls of hydraulic protection) in residential buildings. Equally important are the elements of discontinuity between the buildings because the existence of structural discontinuities in the blocks allows to limit the examination of the holistic seismic behavior to smaller portions of the block. Meanwhile the lack of discontinuities reports the possibility of structural interferences between different building units and hammering phenomena, such as the existence of the building walls being in direct contact with another one or the existence of a joint between them (Cremonini 2004).

Finally, among the evaluations aimed at reducing the seismic vulnerability, significant importance assumes the mapping of construction typologies, developed from an analysis of data provided in the Aedes Form[12]. By defining the masonry types, associated with the types of floors and roofs, it's possible to identify the prevalent construction typologies in the historical fabric. In the opposite to the Aedes form in our survey the caption of any data concerning damage or practicability loses relevance. Thus because we are not considering a post-crisis stage, but formulating integrated devices between design and prevention. This led to the assumption, that it is necessary elaborate a more detailed definition of construction typologies. This further tool identifies homogeneous nuclei under a constructive point of view as well as building units with substantially similar structural features. This method allows deepening the knowledge of the built heritage techniques

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[12]The AeDES (Agibilità e Danno nell'Emergenza Sismica) is a Rapid Post-Earthquake Damage Evaluation form, from GDNT (Italian national seismic protection group). The AeDES Form has been adopted by civil protection technical staff since June 1998 to survey damages in the after-shock. The form allows a quick survey and a first identification of the building stock, with the collection of metrical and typological data of the buildings.

Figure 3. Constructive characters of built heritage.

tipologie costruttive
- SG.01
- SG.02
- SG.03
- SG.04
- altro

0

5.000

505
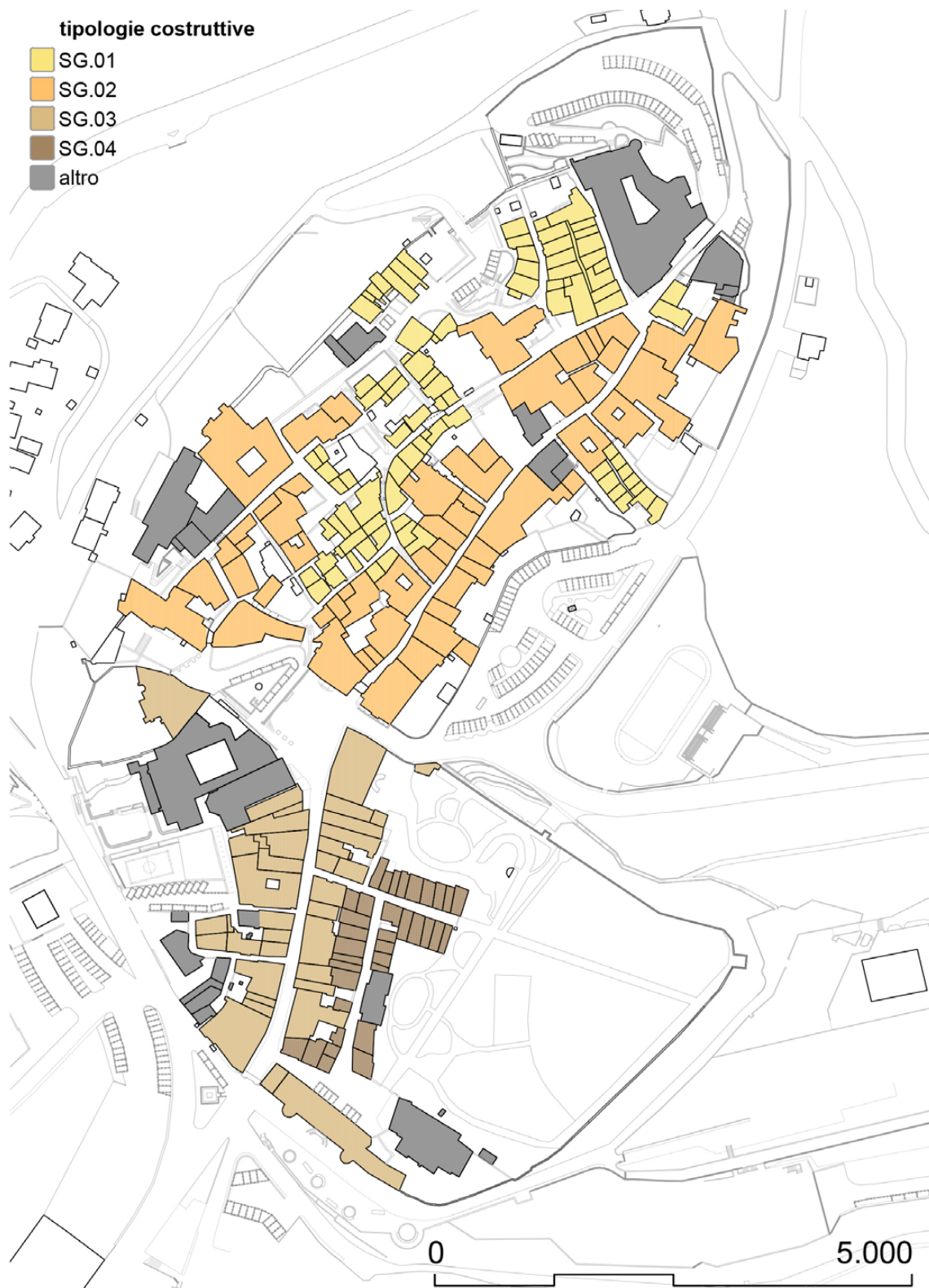
Figure 4. Synoptic view of different elaborations. From right to left: age of built heritage, aggregates definition, with vulnerability levels, urban vulnerability.

by searching connections between the two disciplines of urban planning and seismic engineering. In the case studies, e.g. in San Gemini, it can be noted, that the constructive charting permits to identify further steps of modification of built heritage and areal subdivisions, beside the ones identified in both MABH and detailed town ground plan. The constructive analysis constitutes the instrument that continues supplying information, where the data available by mean of the registers stops. Thus the mapping of constructive typologies provides useful information also concerning the built heritage of the most remote phases, with an approach, that analyses the physical substance of buildings with archaeological probative force. In a second step results have to be validated by examining the corresponding documentary sources. In San Gemini, the majority of the buildings, whose main layout is already present in Gregorian cadastral map from 1819, is characterized by four well distinguishable construction typologies. At the same time, it is possible to verify the results of the MABH, e.g. the use of different subsequent techniques in the realization of the occlusions of paths or annexation of public areas. The map also highlighted the cases of other construction typologies, which are not prevalent types in the tissue, sometimes even an unicum in urban construction, as the case of interventions in reinforced concrete in the dwellings or specialistic building types.

Prospects

Within the present contribute the authors decided to present a first complete part of a research work meanwhile the second experimental activity is currently in its implementation phase.

This phase is characterised by verifying design studies, that aim at the raise of urban resilience. The studies elaborate interventions in those areas and building units, which the synoptic examination of the presented documents defines and identifies as the most vulnerable. A map showing characteristic of the urban vulnerability constitutes a basis for this work, but for privacy reason the authors preferred not to publish it.

The most worthy evidences, that deserve to be mentioned in conclusion, are the management of spot vulnerability issues and the recognition of gaps in the built environment, by way of example they are the main subjects for further experimentation. This last perspective gives the opportunity of a most resilience-aware contemporary design.

Concerning the spot vulnerability, as for instance building and construction typologies with intrinsically insufficient properties, Antonino Giuffrè noticed: "Once you notice that a building typology is intrinsically unsatisfactory, it becomes clear that it should not be preserved anymore. However, in some occasion, it is possible to choose interventions in a wider logic of masonry construction, than the examined building presents, inducing consistent improvements, that are coherent with the original architectural language"

Table 1. Relations between aggregates properties: homogeneity of age of built heritage, construction and comparative vulnerability. When the aggregates show high values of homogeneity, in age and in construction, predominate low values of vulnerability (green). Instead a low rate of homogeneity, even in a single factor (age or construction), confirms higher values of vulnerability (blue).

(Giuffrè 1993). Operating on the existing vulnerable built heritage with an awareness of masonry construction logic is one of the most important purposes of this research.

While the design for specific urban lacks has been widely studied and we are now able to evaluate, both on a quantity and quality level, the consequent vulnerability, this research showed a less evident typology of urban lacks by mean of an investigation that considers those building organisms, that, – although being kept under protection of heritage preservation laws and being by all appearances an historical object – underwent so many irreversible transformation concerning their typological and constructive constitution so that frequently their vulnerability has been increased. These cases are more frequent in the outstanding architectural buildings rather than in the urban fabric, and the need for lowering the vulnerability can go through a more effective and conscious design of the historic architectural and urban organism.

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References

Camiz, A. (2012) 'Venzone, una città ricostruita (quasi) - dov'era, com'era', *Paesaggio Urbano*, 18-25.
Cimellaro, G.P., Reinhorn, A.M. and Bruneau, M. (2010) 'Framework for analytical quantification of disaster resilience', *Engineering Structures* 32, 3639-3649.
Consiglio Superiore dei Lavori Pubblici (2012) *Studio propedeutico all'elaborazione di strumenti d'indirizzo per l'applicazione della normativa sismica agli insediamenti storici*.
Cremonini, I. (ed.)(2004) Manuale per la compilazione della scheda d'analisi della vulnerabilità di sistemi urbani (Regione Emilia Romagna, Bologna).

D'Amico, A. and Currà, E. (2014a) 'Urban Resilience and Urban Structure. Vulnerability assessment of historical Italian towns' in Salford University (ed.) *Proceedings of ANDROID Residential Doctoral School 2014* (Salford University, Salford).

D'Amico, A. and Currà, E. (2014b) 'The Role of Urban Built Heritage in Qualify and Quantify Resilience: Specific Issues in Mediterranean City', *Procedia Economics and Finance* 18, 181-189.

Fabietti, V. (2012) 'La struttura urbana minima come strumento di mitigazione del rischio', in Branciaroli, P. and De Angelis, G. (eds.) *Rischio e progetto urbano* (Libra, Melfi Potenza).

Fiandaca, O. and Lione, R. (eds.)(2009) *Il sisma: ricordare, prevenire, progettare* (Alinea, Firenze) 616.

Gargiulo, C. and Papa, R. (1993) 'Caos e caos: la città come fenomeno complesso'. in Università degli Studi di Napoli Federico II (ed.) *Per il XXI secolo: una enciclopedia e un progetto* (Università degli Studi di Napoli Federico II, Naples) 297-306.

Giuffrè A. (1991) *Letture sulla meccanica delle murature storiche* (Edizioni Kappa, Rome).

Giuffrè A. (1993) *Sicurezza e conservazione dei centri storici, il caso Ortigia* (Editori Laterza, Bari).

Haigh, R. and Amaratunga, D. (2010) 'An integrative review of the built environment discipline's role in the development of society's resilience to disasters', *International Journal of Disaster Resilience in the Built Environment* 1, 11–24.

Holling, C. (1973) 'Resilience and stability of ecological systems', *Annual Review of Ecology and Systematics* 4, 1-23.

ICOMOS/ICORP (2013) 'Heritage and Resilience Book for GP2013 Disaster Management' in ICOMOS (ed.) *Heritage and Resilience: Issues and Opportunities for Reducing Disaster Risks* (ICOMOS, Geneva).

Ministero per i Beni e le Attività Culturali (2010) *Linee guida per la valutazione e riduzione del rischio sismico del patrimonio culturale* (Gangemi Editore, Roma).

Regione Umbria - DPTU University of Rome - Sapienza (eds.) (2010) *Linee guida per la definizione della struttura urbana minima (SUM) nel PRG, ai fini della riduzione della vulnerabilità sismica urbana*.

Strappa, G. (2014) *L'architettura come processo* (Franco Angeli, Milan).

Strappa, G. (2015w) http://www.giuseppestrappa.it/?p=6245 – visited 04/21/2015.

Exploring collaboration between the Conzenian and configurational approaches to urban morphology

Ye Zhang
Department of Architecture, National University of Singapore,
4 Architecture Drive, Singapore 117 566.

Abstract

One of the key challenges urban morphology faces today is to share disciplinary boundaries and enable productive coordination and combination between different morphological traditions (Whitehand, 2012). This paper examines in which ways the Conzenian and Configurational approaches can be used in conjunction with each other and how joint use of them can better inform research on and practice of urban conservation. It argues that the lack of sensitivity to place-specific historical processes of urban form in the Configurational approach can be addressed by the Conzenian tradition, and in return the ignorance of the role that generic generative rules of spaces play in the transformation of urban form in the Conzenian approach can be remedied by the Configurational one. On this basis, a complementary approach is proposed. First, it can produce an enhanced understanding of the historical development of urban form with an insight into the conditioned functioning of generative rules of space and an explanation of the spatial organisation of morphological regions. Second, it can provide an analytical method for conservation planning and design, with which urban areas that are socially and economically viable or at risk of declining can be identified and their connections to a broader urban fabric can be investigated. This will then inform the development and evaluation of more responsive conservation plans.

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Introduction

One of the key challenges urban morphology has to face is to share disciplinary boundaries, so as to enable productive communication between different morphological traditions and develop integrated approaches (Whitehand, 2012). Despite that significant efforts have been made to resolve this problem in the past few years, e.g. Gauthier and Gilliland (2006), Kropf (2009), Kropf (2014), Marshall (2014) and Oliveira et al. (2015), the gaps still remains largely unbridged.

In search for a common reference point to co-ordinate different morphological traditions, Kropf (2009) undertook a critical analysis of publications and summarised four major schools of thought in urban morphology. That is, spatial analytical, configurational (Space Syntax), process typological and historico-geographical. While collaboration and synthesis of process typological and historico-geographical approaches have been reasonably well explored, such as Whitehand (2001) and Maffei and Whitehand (2001), studies that combine and co-ordinate other approaches are generally rare.

This research aims to make a contribution to the bridge building between the Conzenian (historico-geographical) and configurational traditions. Specifically, it is not limited to conceptualising the ways in which these two approaches can be combined and co-ordinated. Rather, a particular emphasise is given to how these two methods can complement each other to better inform the practise of urban conservation.

It is necessary to clarify that the configurational approach in this study not only refers to Space Syntax but also a group of newly emergent methods that share a similar theoretical and methodological foundation with Space Syntax. In general, those methods, including Place Syntax (Ståhle et al., 2005), Multiple Centrality Assessment tool (Porta et al., 2006) and Urban Network Analysis tool (Sevtsuk and Mekonnen, 2012), investigate from a strategic perspective the inter-connection between spaces and places and hence the structural properties of urban network.

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A shared theoretical ground

According to the ridge path theory (Kropf, 1993) the first groups of human beings, in their search for food, tended to follow watersheds. These paths offer walkers numerous advantages: they do not sink in the mud, they do not require bridges and they enable bearings to be obtained from high up and coastal heights to be reached by branching out.

In reviewing the study of urban form in Britain, Larkham (2006) pointed out the existence of a great opportunity for exploring the potential complementarity between the Conzenian tradition and Space Syntax. However, provided that the two perspectives are fundamentally different, particularly in their contrasting qualitative and quantitative nature, one of the key difficulties in using the Conzenian and configurational approaches in conjunction with each other perhaps is to find a shared theoretical ground. Therefore, to achieve a more sound and productive co-ordination and integration of the two traditions, we shall firstly look into their theoretical foundations.

First, both the Conzenian and configurational perspectives share the similar epistemic statue that urban form is a relatively independent system rather than purely a passive product of various external determinants (Gauthier and Gilliland, 2006). Both approaches take the same view that urban grain itself constitutes the object of analysis in examining and interpreting the relation between the form of the city and different human activities that take place within it. Despite the identical epistemological foundation, however, it is noticeable that most studies drawing on the Conzenian tradition in fact also adopt an externalist perspective and concerned with the impact of social, economic and other factors upon the evolution of urban form (Gauthier and Gilliland, 2006). In this sense, it perhaps more accurate to understand the configurational approach as a genuine internalist perspective, in which space is seen having its own formal logic. And the autonomous potential of space to form patterns is the means through which it gives expression to social meanings (Hillier and Vaughan, 2007). Rather, the Conzenian tradition is a mixed approach, in which space is seen in combination with external factors influencing the

Strategic level

Explain relations between spatial organisation of morphological regions and structural properties of urban fabric

Inform formulation of conservation plans and test, analyse and evaluate different proposals

Conzenian: historical and geographical order of urban form
Configurational: sspatial integration-separation pattern of urban fabric

History ←→ Future

Explain interaction of spatial generative rules and place-specific complexity in morphological processes

Identify advantagous/disadvantagous areas for conservation and develop more appropriate conservation plans.

Conzenian: morphological regions that better encapsulate past societal experience
Configurational: lively local centres that are socially and economically viable

Local level

subsequent organisation and transformation of urban form (Conzen and Conzen, 2004). Second, both the Conzenian and configurational perspectives take the emergent structure of urban spaces, rather than the specific geometry of particular physical object or groups of objects, as the spatial basis to explain its fundamental social nature (Griffiths et al., 2010). In other words, the city is seen as an ensemble of interrelated forms. However, it is noteworthy that the two approaches take fundamentally different ways to conceptualise the specific forms and the ways in which they relate to one another.

In the Conzenian approach, built form (urban landscape) is conceived as a compositional hierarchy of morphological regions, where the relatively small-scale homogeneous regions, defined by distinct combination of streets, plots and building blocks, nestle within larger regions of more heterogeneous but coherent general character (Conzen and Conzen, 2004). The regionalisation of urban form clearly identifies geographical areas of different periods of origin and different formative processes and hence depicts the socio-historical processes of the city.

In contrast, the configurational approach conceives built form as a systematic arrangement of spaces, where streets are not seen as constituent parts of any areas but instead principally a contiguous network that connects and organises buildings and plots. In this view, the relative importance of a spatial location (a street segment, a plot or a building block) is determined by its specific position within the structure of the configuration as a whole. The configurational processes by which different built form elements aggregate is argued as the generic process that generate spatial and activity patterns of the city.

Third, both the Conzenian and configurational perspectives share similar heuristic purpose. Principally, they were developed with the aim to produce explanatory framework (Gauthier and Gilliland, 2006), but in practise both have also been used for prescriptive purpose. The Conzenian approach is essentially developed from a historical perspective and mainly focuses on explaining the evolution of urban form. Although prescription of future urban form is not the original heuristic purpose of the perspective per se, it has been advocated as a useful method for urban landscape management (Whitehand and Gu, 2010). Slightly different, the configurational approach is developed to uncover the generic rules and regularities of space itself. And in terms of application, it has been widely used to explain evolutionary process as well as prescribe the future state of urban form.

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In general, the common theoretical ground shared by the two morphological traditions provides a solid basis for complementary use of them. Specifically, the ways in which the two approaches can complement each other and the ways in which the combined approach may enhance relevant researches instead arise from their different focuses of investigation. To summarise the above discussions, the Conzenian perspective examines how different built form elements, i.e. building blocks, plots and streets, related to each other and belong together historically, taking into account a variety of social, cultural and economic factors. It uncovers the place-specific containment structure of urban form consisted of character areas (morphological regions) of different hierarchies. In contrast, the configurational perspective investigates how a particular type of built form elements, e.g. building blocks or street segments, relate to other elements of the same or different type, considering spaces alone. It reveals the generic structural properties of urban fabric that characterise spatial locations in terms of their positions within a system. In what follows, we will discuss in details how the two morphological traditions may complement each other to enhance research and practise.

A complementary approach

Complementary use of the Conzenian and configurational approaches may firstly enable an enhanced understanding of the historical development of urban form and secondly provide an analytical method for urban conservation practise.

Historical development of urban form
As discussed above, urban form is seen epistemologically both as a relatively independent system having its own logic and regularities and the end product of processes driven by economic, social, political and other forces (Gauthier and Gilliland, 2006). With respect to the historical development of urban form, this means that while the physical fabric of the city of a certain historical period is in general characterised by the specific socio-cultural conditions, it is also affected to some extent by the spatial circumstances inherited from the previous period. Therefore, to obtain a comprehensive and accurate understanding of the formation and transformation of a city or an urban area requires both the more specific non-spatial forces and the more generic spatial rules to be systematically examined. This is exactly where collaboration of the Conzenian and configurational traditions can contribute.

What can be achieved by this collaboration is an enhanced account of the historical development of urban form. As Illustrated in Figure 1, at more local level, knowledge of the specific historical and geographical processes of urban form provided by the Conzenian perspective can be complemented by an insight into the role that generic generative rules of space play in this process. In return, thorough understanding of place-specific interrelationship between urban form and society can help to better explain the ways in which the particular relationships condition the functioning of generic generative rules of space at specific locations.

At strategic level, an understanding of the structural properties of urban network provided by the configurational perspective can enable a new insight into how morphological regions of different periods of origin organise themselves in the historical process and how inherited spatial circumstances conditioned the morphological development of the city. Detailed knowledge about the morphological processes of the city as well as the underlying forces allows for a better explanation to how changes to the urban fabric sustain or destruct the original network structure of the city and what are the consequences.

In fact, the above opportunities for collaboration between the Conzenian and configurational perspectives have been suggested by previous studies. Taking Space Syntax for instance, Hillier (2002) pointed out that while configurational factors play an imperative role in generating the generic structure of the whole settlements, socio-cultural factors produce the differences between local construction of settlement. Other studies also showed that there exist a correlation between morphological periods and characteristic configuration of urban form. Pinho and Oliveira (2009) in their study of the transformation of urban form of Porto from

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1813 to 2005 discovered that built form of different morphological periods exhibits distinctive configurational features. And Griffiths et al. (2010) also showed that spatial configurational analysis can help to distinguish different phases of a suburban area's historical development.

A further implication of these studies is that, more than solely providing a useful way to identify morphological regions, configuration of street network itself is an intrinsic and valuable property of urban form. A number of historical studies in Space Syntax researches repeatedly proved that urban configuration carries layers of historical information and hence is the "spatial spirit" (Karimi, 1999) of a city. Its continuity and consistency across different periods in the history is critical to the survival and development of historical regions (Azimzadeh, 2003, Azimzadeh and Bjur, 2005).

Urban conservation

One of the pressing problems in present urban conservation worldwide is that all too often awareness of the historical value of urban form remains at the level at which individual buildings or areas or both are treated as disconnected patches, rather than mosaics of interrelated forms (Whitehand and Gu, 2010). As a result, areas for conservation are usually delineated with limited consideration of their relations to surrounding built environment. The Conzenian and configurational approaches capture respectively different aspects of the relationship between built form elements. And complementary use of the two research traditions can provide an analytical method, addressing this issue.

From the Conzenian perspective, planning area is approached from the formulation of a hierarchy of morphological regions. This is based on systematic analysis of the historico-geographical process of urban form. Underpinning this approach is the proposition that urban landscape as a precious asset encapsulates in those morphological regions previous societies' aspirations, efforts and experiences, and the historical expressiveness or historicity of urban form shall be the first priority in conservation. The purpose of regionalisation is to allow the built form elements that historically belong together to be conserved as a complete entity, hence making the past to be better experienced by people at present. The significance of this approach, as presented in many researches (Conzen and Conzen, 2004, Whitehand and Gu, 2010, Whitehand and Gu, 2007, Whitehand et al., 2011), is in enhancing identity of the built environment and reinforcing inhabitants' sense of place.

Nevertheless, as discussed before, the Conzenian approach is essentially an intellectual enterprise that aims to develop an explanatory framework to improve the understanding of historical development of urban form. Despite that it has been advocated in many studies as a useful tool for urban landscape management, what the Conzenian perspective could provide is in fact a structural framework for the future of present urban form, i.e. historical and geographical order. Practically, it allows for controlling which part of exiting built form can be changed and what kind of new form can be incorporated. However, what is absent but critical to urban conservation is an anticipation of possible changes to urban form with respect to social and economic conditions. The potential risk is the ignorance of urban decline that may confront certain regions of significant historical value and ultimately result in rapid deterioration of the physical environment and loss of historicity in those areas. In this situation, conservation can become meaningless.

From the configurational perspective, in general analysis performed at local and global level can uncover respectively a patchwork pattern of urban fabric and a strategic network that connects all the patches into a whole. For instance, Hillier et al. (2009) showed that a network of semi-discrete patches of urban spaces could be identified by using metric universal distance measures at different metric radii, and the strategic structure could be revealed by applying the topo-geometric measures to the entire network. It has also been evidenced that the "patches" are not solely spatial features of urban fabric but instead correspond to functional differentiation in the city. In the same study, Hillier et al. (2009) demonstrated in the case study of central London that the patches in fact correspond with lively urban quarters, such as Seven Dials, South Bank Centre, Goodge streets and etc. Similar research, such as Yang and Hillier (2007), also showed that in both historical centre of London and Beijing the "patches" well correspond to perceived neighbourhoods or named areas.

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This dual spatial structure enables an estimate of the likely conditions for urban conservation practise. One the one hand, those lively urban quarters or perceived neighbourhoods are usually where a diversity of activities concentrate and thus likely to continue to thrive at least in the near future, if there is no fundamental changes to the city. Such circumstances undoubtedly mean great advantages and supports for urban conservation. On the other hand, the possible social and economic changes to individual areas (patches) can be estimated based on their interconnections and their position within the structure of the urban network. It is therefore meaningful to take the patchwork pattern as well as the related structural network as references when deciding planning areas.

However, the focus of the configurational perspective on generic properties of urban network suggests it can lack sensitivity to the place-specific historical and geographical processes of the change of urban form. Despite that configuration of urban network in itself arguably carries layers of historical information and that the position of either individual buildings or areas of historical significance within the structure of configuration is critical to their conservation, lack of detailed understanding of how building blocks, plot patterns and street plan come into existence and transform in specific social and cultural contexts may result in unawareness of valuable built form features that can enhance people's historical awareness and sense of continuity of the past through bodily experience.

It is clear in the above discussion that combination of the Conzenian and configurational perspectives can provide a more systematic and balanced analysis and understanding of the relationship between the network structure of urban form in which distinct areas are embedded and the fine grain patterning of streets, plots and building blocks that defines distinct areas. As shown in Figure1, the combined approach can inform urban conservation practise at both strategic and local levels.

The configurational approach can complement the Conzenian one by providing an estimate of social and economic conditions for urban conservation, so that the aforementioned potential risk of urban decline can be made aware and addressed at an early stage. At the local level, the patchwork pattern allows for identification of morphological regions or parts of morphological regions that fall either within or out of lively local centres. It helps to clarify whether additional treatments are needed for certain morphological regions to ensure successful preservation of valuable built form elements. This is particular important for those heritages of great historical value but confronted with spatial and social segregation.

At the strategic level, the generic network structure firstly allows for an insight into the impact of changes to urban network of a broader area on local centres under consideration. Secondly, as a precious property of historical urban form, it can effectively inform formulation and development of planning and design proposals and at a later stage to test, analyse and evaluate different options. It is not unusual that improvement of local socio and economic conditions is achieved more effectively by interventions made at strategic level. For instance, an insightful understanding of the configurational structure of urban network can help to develop interventions that maximally strengthen connection of weakly linked morphological regions to surrounding areas and well maintain the traditional structure of urban network.

In return, the Conzenian tradition can complement the configurational one to further assess planning and design proposals. Thorough understanding of fine-grained relationship between building blocks, plot patterns and street plans and their historical processes can help to evaluate whether and, if so, to what extent changes to urban form suggested by the results of configurational analysis of urban network may jeopardise the completeness or historical expressiveness of morphological regions at local level and the historical and geographical order of the city at strategic level.

Discussions

We discussed above that the patchwork pattern identified by applying configurational analysis could help to estimate social and economic conditions for urban conservation, so that the traditional built form can be better preserved. However, the value of

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historical built form is multifaceted and its social and economic dimensions are equally important. It should not be ignored that the characteristic morphological regions identified by the Conzenian approach could also serve as a useful reference for dealing with social, environmental and many other issues in different areas and targeting interventions in a more precise way. This is because the intra homogeneity and inter heterogeneity of morphological regions suggests that their social, economic and environmental performances tend to be different from one another. In a recent survey of applications of urban morphology in urban design practise, Kropf (2011) highlighted that urban tissue, which shares great similarity with the concept of morphological region, as "a key, coordinating point of reference, can provide an essential foundation for understanding the structure and complexity of the built environment as well as for creating, transforming and managing it."

It is also necessary to call attention again to the distinctiveness of the area structure described by the two morphological traditions. While morphological regions identified in the Conzenian approach are a hierarchical composition of contiguous geographical units with clear cut boundaries and distinct historical processes, areas (patches) identified by the configurational approach are in fact the patchwork properties of the network, that is, a series of discrete or semi-discrete non-hierarchical patches with fuzzy boundaries (Yang and Hillier, 2007). What is also noteworthy is that the range of patches varies dramatically across different thresholds used for analysis.

Therefore, great cautions are needed when using the two types of area structure to decide the appropriate areas for planning and design interventions. Although urban network of a city may arguably has a natural spatial regionalisation at all scales, not every patchwork pattern generated using different thresholds are meaningful and corresponds to functional differentiation. Special attentions need to be paid to questions such as why a particular threshold is selected to perform analysis, how to interpret the generated patchwork pattern and etc.

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Conclusion

So far, urban morphological researches that look into coordination and collaboration between the Conzenian and configurational approaches are rather limited. And whether the two research traditions are substantively complementary and, if so, how they may benefit research and practise has not been fully investigated. The aim of the proposed framework as illustrated in Figure 1 is to map and clarify the potential. The mapping shows that in general the explanatory nature of the Conzenian perspective and the prescriptive power of the configurational approach means that one can significantly extend the research scope and enrich the knowledge provided by the other. In particular, the lack of sensitivity to place-specific historical processes of urban form in the configurational approach may be addressed by the Conzenian tradition, whereas in return the absence of the role of generic generative rules of spaces in the evolutionary process of urban form in the Conzenian approach can be remedied by the configurational one. And combing the two perspectives can enable an enhanced analytical understanding of the transformation of urban form both in the past and future. Nevertheless, as an initial attempt, the proposed ways of collaboration and combination of the Conzenian and configurational approaches are largely based on theoretical deductions. Evidences from real case studies are needed to test their validity. Further investigations into the potential means of collaboration between the two morphological traditions are certainly crucial, in order to produce a more robust framework to guide future researches and practise.

References

Azimzadeh, M. (2003) *Survival of bazaars: Global spatial impact and local self-organising processes*. Paper presented at the 4th International Space Syntax Symposium (University College London, London UK).
Azimzadeh, M., & Bjur, H. (2005) *Transforming Cities. The role of the configuration of the*

network of public spaces in urban life. Paper presented at the 5th International Space Syntax Symposium, Faculty of Architecture, TU Delft, Delft, The Netherlands

Conzen, M. R., & Conzen, M. P. (2004) *Thinking about urban form: papers on urban morphology, 1932-1998*. (Oxford, Bern, Berlin and New York, Peter Lang.)

Gauthier, P., & Gilliland, J. (2006) 'Mapping urban morphology: a classification scheme for interpreting contributions to the study of urban form', *Urban Morphology*, 10(1), 41-50.

Griffiths, S., Jones, C. E., Vaughan, L., & Haklay, M. (2010) 'The persistence of suburban centres in Greater London: combining Conzenian and space syntax approaches', *Urban Morphology*, 14(2), 85-99.

Hillier, B. (2002) 'A theory of the city as object: or, how spatial laws mediate the social construction of urban space', *Urban Design International*, 7(3), 153-179.

Hillier, B., Turner, A., Yang, T., & Park, H. T. (2010) 'Metric and topo-geometric properties of urban street networks: some convergences, divergences and new results', *The Journal of Space Syntax*, 1(2), 258-279.

Hillier, B., & Vaughan, L. (2007) 'The city as one thing', *Progress in Planning*, 67(3), 205-230.

Karimi, K. (2000) 'Urban conservation and spatial transformation: preserving the fragments or maintaining the 'spatial spirit'', *Urban Design International*, 5(3-4), 221-231.

Kropf, K. (2009) 'Aspects of urban form', *Urban Morphology*, 13(2), 105-120.

Kropf, K. (2011) 'Morphological investigations: Cutting into the substance of urban form', *Built Environment*, 37(4), 393-408.

Kropf, K. (2014) 'Ambiguity in the definition of built form', *Urban Morphology*, 18(1), 41-57.

Larkham, P. J. (2006) 'The study of urban form in Great Britain', *Urban Morphology*, 10(2), 117-141.

Maffei, G., & Whitehand, J. (2001) 'Diffusing Caniggian ideas', *Urban Morphology*, 5(1), 47-48.

Marshall, S. (2014) 'A symbolic articulation of morphological structure', *Urban Morphology*, 18(1), 73-75.

Oliveira, V., Monteiro, C., & Partanen, J. (2015) 'A comparative study of urban form', *Urban Morphology*, 19(1), 73-92.

Pinho, P., & Oliveira, V. (2009) 'Different approaches in the study of urban form', *Journal of Urbanism*, 2(2), 103-125.

Porta, S., Crucitti, P., & Latora, V. (2006) 'The network analysis of urban streets: a primal approach', *Environment and Planning B: Planning and Design*, 33(5), 705-725.

Sevtsuk, A., & Mekonnen, M. (2012) 'Urban network analysis', *Revue internationale de géomatique* (2), 287-305.

Ståhle, A., Marcus, L., & Karlström, A. (2005) *Place Syntax: Geographic accessibility with axial lines in GIS*. Paper presented at the 5th international space syntax symposium, Faculty of Architecture, TU Delft, Delft, The Netherlands.

Whitehand, J. (2012) 'Issues in urban morphology', *Urban Morphology*, 16(1), 55-65.

Whitehand, J., & Gu, K. (2010) 'Conserving urban landscape heritage: A geographical approach', *Procedia-Social and Behavioral Sciences*, 2(5), 6948-6953.

Whitehand, J. W. (2001) 'British urban morphology: the Conzenion tradition', *Urban Morphology*, 5(2), 103-109.

Whitehand, J. W. R., & Gu, K. (2007) 'Urban conservation in China: historical development, current practice and morphological approach', *Town planning review*, 78(5), 643-670.

Whitehand, J. W. R., Gu, K., Whitehand, S. M., & Zhang, J. (2011) 'Urban morphology and conservation in China', *Cities*, 28(2), 171-185.

Yang, T., & Hillier, B. (2007) *The fuzzy boundary: the spatial definition of urban areas*. Paper presented at the 6th International Space Syntax Symposium, Istanbul Technical University: Istanbul, Turkey.

Dramatic Changes in Urban Morphology: Urban Regeneration in Istanbul-Gaziosmanpasa

Yasemin Erkan Yazici, Zeynep Ayse Goksin, Evrim Tore
Faculty of Architecture, Istanbul Kültür University, Istanbul, E-5 Karayolu üzeri, 34156, Bakırköy,Istanbul
Keywords: urban regeneration, urban morphology, gated community, Istanbul, Gaziosmanpaşa

Abstract

In Turkey, urban planning is being replaced by piecemeal and property-led urban regeneration projects. Those urban regeneration projects affect cities in Turkey in two fundamental ways. The first impact is on the morphology and the second impact is on the social structure of the city. In this paper, their impact on the morphology of the city is analyzed through a case study of Istanbul's Gaziosmanpasa District. There are squatter houses from 1950s and apartment blocks redeveloped from squatter houses in the urban regeneration area designated by central and local governments. Today, these buildings have become the subject of regeneration. The paper is based on the preliminary findings of a TUBITAK-funded (The Scientific and Technological Research Council of Turkey) project being developed by the authors. As well as literature review, the research is shaped by face-to-face interviews with related agency representatives, on-site observations, analysis of plans, projects and documents prepared by related agencies and articles in the media on the subject. The main findings of the research established that the existing urban morphology of the area, formed by low-rise, single houses in an organic and unplanned setting, was changing. This existing urban fabric is being replaced by high-rise apartment blocks which can be described as gated communities. As far as Istanbul is concerned, its existing organic, unplanned structure leaves its place to a, mostly grid-shaped, planned structure and thus a spatial structure which takes no notice of local features such as climate, topography and orientation, and its immediate surroundings emerges.

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Introduction

This paper seeks to identify how urban regeneration processes affect the morphology of the city of Istanbul. The analysis is based on the preliminary findings of a research project funded by TUBITAK (The Scientific and Technological Research Council of Turkey -Pr. no.114K626) being developed by the authors and focused on the regeneration of residential areas. The Gaziosmanpasa District of Istanbul is selected as the case study area.

First, the paper briefly explains Turkish urbanization processes in the second half of the 20th century and its impact on Istanbul's morphology. Then it summarises urban regeneration processes in the past decade and the ways in which they are changing the city's morphology. The change is then illustrated in detail based on the preliminary findings of a field work in Gaziosmanpasa Sarigol Urban Regeneration Area. The concluding section outlines a series of recommendations.

Morphological change is easy to observe in the city. It can strengthen city's unique characteristics and ultimately its character, but also can cause destruction in urban context and morphological continuity. These changes can be on individual plots or in building blocks. Change in morphology has significance since it affects the socio-economical and cultural structure of the city. In case of Istanbul, it is destructing the neighbourhoods physically and socially, changing the social structure of the residents in neighbourhood regeneration areas. Change in housing over time creates differences in the spatial order of the housing itself, as well as causing change in the built environment functionally, spatially, visually and morphologically (Ünlü, 2006a). Ünlü (2006b) defines building height, plot size, building density, building order, street network and building block form as morphological elements of the urban built environment.

During urbanization process, housing is affected socially, culturally, economically and spatially and in terms of location, form and area. While residential areas in cities are the dominant development form which make up the largest urban areas, change in housing areas at the scale of either individual plots or larger areas influence the physical change in cities.

A 'property-led approach' to urban regeneration is currently dominant in Turkish cities. It is operated through a centralised 'top down' process of demolition and re-building of mainly private property. There is an extreme 'centralization' trend in Turkish government processes which are dominated by central government departments and agencies, equipped with almost unlimited powers, working with local authorities, which have a subordinate role. Besides creating excessive profits for landowners and construction companies and causing forced displacement, particularly of poor owners and tenants, this 'top-down' process is changing the urban morphology of cities.

The morphological outcomes of the urban regeneration process in Istanbul can be grouped mainly under three categories. The most visible outcome is the property-led, large scale and mixed use 'prestige projects', implemented without any consideration of the impact on adjacent low income neighbourhoods. These are usually implemented in central areas of the city. Renewal projects in old neighbourhoods of conservation areas are form the second category. These projects damage the traditional urban patterns and usually create gentrification. The last category is the urban regeneration projects in gecekondu or former gecekondu areas. They are mainly residential projects with some amount of social and commercial uses.

Methodology

As mentioned above, the paper is based on the preliminary findings of a TUBITAK-funded (The Scientific and Technological Research Council of Turkey, Pr.no.114K626) project being developed by the authors. As well as literature review, the research is shaped by face-to-face interviews with related agency representatives, on-site observations, analysis of plans, projects and documents prepared by related agencies and articles in the media on the subject.

Post war urbanization and urban morphology in Turkey-Istanbul

This section explains the elements in the existing morphology and the post war urbanization process which produced it. The need for urban and neighbourhood regeneration stems from the nature of Turkish urbanisation and the consequences of the rapid grow th of Istanbul from 1 million people in 1950 to 5 million in 1980 and 14 million in 2014, through mainly illegal development on earthquake vulnerable land.

Beginning in the 1950s and continuing through the 60s and 70s until the early 1980s, the state-led industrialization process in Turkey encouraged massive migration from Anatolia to the big western cities mainly Istanbul, Ankara and Izmir. The migrants could not afford legally constructed houses and since there was not a social housing system, the state could not respond to their housing problem by supplying affordable houses. Therefore, they generated their unique solution to the problem: gecekondu (literally 'built overnight'). Gecekondus are squatter houses of very poor quality built by the migrants themselves, on under-used land usually owned by the state. This illegal way of settlement continued in places where resistence was minimum. Thus the subsequent settlement pattern had become one of the least dense and sparce settlement patterns of the World (Keyder, 2000). The state responded to the problem of gecekondu developments by a series of Amnesty Laws which supported and protected gecekondu residents who illegally settled on public land in exchange for their votes (Keles, 1997).

Additionally in this era, urban land outside municipal boundaries could be divided by title deeds offices upon applications by land brokers without requiring any subdivision regulation. This enabled a huge number of small plots to be formed and gecekondu development was encouraged on these newly formed plots (Tekeli, 1994, İstanbul Ansiklopedisi). In 1970s, since urban land in gecekondu areas were included within municipal boundaries, land brokers could not easily get plots divided or merged through title deed offices. So, they started to sell the agricultural land in the peripheries via shared land deeds.

This type of development also occurred in relatively small plots in the city where there was a modest single-family house and in plots where there were larger Ottoman-era mansions, in the city or in the summer resorts. In the summer resorts, it usually involved the sub-division of a large property into smaller pieces, on each of which an apartment building was built (Enlil, 2011).

Both types of development were made possible via a process called the share of construction (also known as build-sell). In this process, small developers negotiate with the owners of empty lots, single storey gecekondu dwellings, single-family houses or large Ottoman-era mansions, to redevelop their land for multi-storey apartment blocks. On completion of construction the new dwellings are shared between the owners and the developers. In 1965, the state enacted the Flat Ownership Law which enabled the ownership of a single flat in an apartment block which provided the legal framework for the share of construction system. This system dominated the housing provision in Turkey, in both gecekondu and planned areas until the end of the 1970s (Tekeli, 1994).

The traditional urban fabric in inner-city neighbourhoods, with many wooden houses and mansions, was mostly replaced with reinforced concrete apartment buildings in much denser neighbourhoods. Development sprawled in peripheral areas at the expense of forests, water basins and farmland.

During the 1980s, four more Amnesty Laws were enacted. These laws ultimately legalized gecekondu areas by giving them title deeds (or pre-title deeds) through Improvement Plans and opened these areas to development by giving them 4-storey development rights. However, implementation on the ground produced 7-8 storey buildings. In most of the areas, these buildings covered almost all of the plot area, leaving no space between the neighbouring buildings at the back (Tufan, 2014).

The gecekondu neighbourhoods in the 1990s had a grid network while first generation gecekondus had a more spontaneous, organic self-help, low density housing environment in harmony with the landscape, with large front and back gardens, built to the needs of the inhabitants (Pınarcıoğlu ve Işık, 2008, Altınok, 2006).

Mass Housing Administration (TOKI) was established in 1984 with the aim of building

social mass housing and encouraging their construction by giving loans to cooperations. Between 1984 and 1999 over 100,000 units were constructed in Istanbul by TOKI in mass housing areas (Keyder & Oncu, 1993). These were generally high-rise, almost identical apartment blocks on large areas of lands, particularly along the main highways. They were often organized as housing cooperatives (Bilgin, 1998; quoted in Enlil, 2011).

Their overall impact on urban morphology has been dramatic. They also had an impact on the social geography of Istanbul's neighbourhoods. Mass housing projects formed high-rise, high-density suburbs in the periphery and created more socially homogeneous housing areas (Enlil, 2011).

Urban regeneration processes in 2000s and their impact on morphology of the city

At the end of the 1990s, much of the gecekondu development was on earthquake vulnerable land. The 17,500 deaths, 50,000 hospitalised citizens, and 300,000 buildings destroyed or seriously damaged in the 1999 Marmara Earthquake tragically demonstrated the need to upgrade the city's urban fabric. Thus a new legal and administrative framework for urban regeneration has been established since 1999. This consists of a series of new laws, together with the administrative restructuring of key public agencies.

The most influential laws included 2005 Municipal Law no. 5393 (Article 73), 2005 Renewal Areas Law no. 5366, and the recent 2012 Urban Regeneration Law no. 6306.

Under Article 73 of Municipal Law no. 5393 municipalities now have powers to designate Urban Regeneration Areas (URAs) of 5-500 hectares in size, implement regeneration projects to redevelop or restore old neighbourhoods, change their function to commercial and industrial purposes, create new residential neighbourhoods and/or minimize earthquake risk. They also have powers to specify densities and building heights in these areas. In urban regeneration areas projecs are usually implemented in partnership between TOKI and the municipality, to use the 'demolish/rebuild' method to redevelop the existing housing (Kuyucu & Unsal, 2010).

Law no. 5366 provides powers for local municipalities to designate Renewal Areas (RA) in designated Conservation Areas, identify urban infrastructure requirements and specify construction standards to meet earthquake safety requirements, prepare a phased programme of projects to be approved by a government appointed Regional Conservation Board and then implemented in the area, establish project organization and management arrangements, and take measures to ensure local residents' participation in this process (Gibson & Goksin, 2009).

In parallel the government passed a series of legal reforms between 2002-2008 which restructured TOKI to become the sole agency for regulating the zoning and sale of all state-owned urban land, except military land. TOKI now has powers to build 'for-profit' housing on state land either by its own subsidiary firms or through public–private partnerships to raise funding for subsidised housing construction in Urban Regeneration Areas. TOKI was also given powers to revise statutory plans and expropriate property in gecekondu areas (Kuyucu & Unsal, 2010).

Moreover, in June 2011, Ministry of Environment and Urbanism (MEU) replaced the Ministry of Redevelopment and Settlement. In a major centralisation process, the new Ministry was given powers which originally rested with local authorities, including making and approving statutory development plans, approving projects, giving building and occupancy permits, and confiscating property (SPO, 2011).

The 2012 Urban Regeneration Law no. 6306, official title 'Law About Transformation of Areas with Disaster Risk', is intended to give priority to improvement, clearance and renewal of disaster (mainly earthquake) vulnerable areas and buildings. MEU now has powers to designate URAs in response to applications by metropolitan or district municipalities and subject to the approval of Council of Ministers. It also has powers to designate areas for replacement housing. After designation, formal development and implementation plans and urban design projects should be prepared. An important element after designation is the community engagement process but this is reduced to developers negotiating with owners. Although all powers for URAs rest with the Ministry, they can

be delegated to metropolitan or district municipalities.

There are mainly two types of urban environments that the implementation of these laws in gecekondu areas produce. The first one is the housing estates built by private contractors after the area is cleared from gecekondus and the gecekondu dwellers are re-located elsewhere. These tend to be prestigious dwellings with high quality services.

The second is the residential areas built by TOKI for the local residents of regeneration areas. They are usually high-rise blocks built on-site or elsewhere in the city. The housing estates in the peripheries are usually built on greenfields, away from the city centre. Replacement housing are also built outside the regeneration area but within district boundaries. Sometimes, the replacement housing on-site includes houses for both local residents and outsiders.

These two type of urban environments are typically a product of a process outside formal planning processes. These regeneration plans and projects do not comply with the formal planning decisions for those areas. They generally increase the plot ratio identified in the formal plans which means more construction area and building density. This also leads to an increase in building heights. The maximum height limits of the plans are either ignored or altered and usually high rise housing blocks are built. The projects usually merge plots and building blocks, sometimes including streets within development. This alters the street network which can reduce the permeability of the environment.

The morphological change is the manifestation of change in the socio-economic structure of the city. Gecekondu regeneration areas have distinct socio-spatial qualities. They usually still have a sense of neighbourhood. The spatial order of these neighbourhoods enable and encourage an environment of communication and sharing. The front areas and the entrance porches of the houses nurture neighbour relations. The lack of spaces such as those in the new projects weakens neighbour relations and social ties on which the communities rely very much on for solidarity. The loss of such possibilities can force families to leave their new accommodation as well as economic circumstances.

Ultimately urban regeneration projects dramatically change the morphology of the urban environment which can subsequently lead to destruction of neighbourhoods in many ways. Considering that 40 urban regeneration areas have already been designated by the MEU based on the 2012 Urban Regeneration Law, the potential morphological outcome of the urban regeneration process will be substantial.

Case study: Gaziosmanpasa Sarigol-Yenidogan Urban Regeneration Area

The development of Gaziosmanpasa began in 1950s when houses for Balkan refugees from Bulgaria and Yugoslavia were built by the Menderes government in the area. As industry began to expand in nearby Eyup and Rami, the industrial workforce, mostly comprising rural migrants, started to illegally settle in Gaziosmanpasa and built their gecekondu on government owned land. By 1962, there were some 18,000 gecekondu houses which accommodated 90,000 people. Gaziosmanpasa was separated from Eyup and became a district in 1963 (http://www.gaziosmanpasa.bel.tr/).

By 2007, Gaziosmanpasa's population was over 1 million and in 2009 it was divided into three districts and its population decreased to 460.000. In 1992, an Improvement Plan was prepared which gave gecekondu buildings title deeds and pre-title deeds. The plan also made e improvements in infrastructure including laying power, water and land lines.

Today, Gaziosmanpasa is an aspiring sub-centre. Throughout the district, increasing private investment in commercial projects is accompanied by public investment in physical and social infrastructure, together with plans and projects for regeneration of gecekondu areas.

In 2005, Gaziosmanpasa Municipality started to designate Urban Regeneration Areas and prepare plans and projects. More recently 13 Urban Regeneration Areas were designated based on 2012 Urban Regeneration Law no. 6306 (Figure 1).

Sarigol-Yenidogan URA is one of the gecekondu areas in the district which covers parts of both Sarigol and Yenidogan Neighbourhoods. The 23 hectare-area is located on the south of the district (Figure 1 – numbered 12) on a slopped land, close to the district

Figure 1. Gaziosmanpasa URAs. Source: adapted from www.keym.com.tr
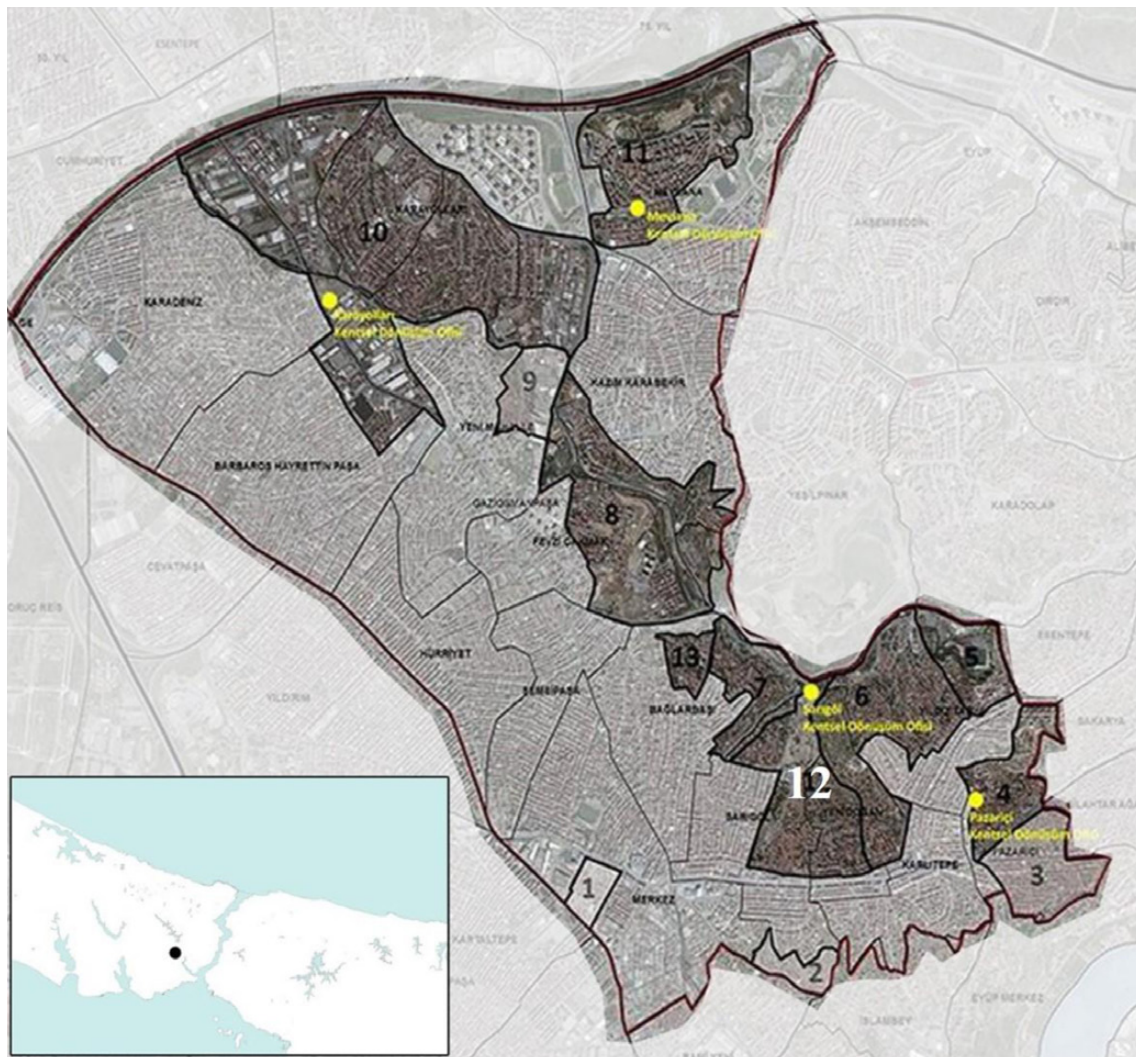
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centre. There are 1488 buildings and 1996 dwellings within the area. Mostly low-rise gece-kondu with gardens and some old multi-storey apartments form the building stock. It has an organic and dense urban pattern (Figure 2). However, there are problems with urban services, community facilities and infrastructure. The area is also associated with illegal activities such as drug dealing. Unemployment is another key problem.

There are three main social groups living in the area, namely immigrants from Bulgaria and Yugoslavia, migrants from the Black Sea Region and the Roma community which includes families who came from Sulukule (U. Basin, personal communication). Gathered from interviews with residents, it has been established that there are strong social ties and neighbour relations in the area. Residents come together regularly in home town associations. In the site visits, it has been observed that the residents used the street as a social space, women and children in particular, for various uses such as sitting out, getting together, and playing. In some gardens, they have hen houses and they look after stray animals.

Urban regeneration in Sarigol can be analysed in three stages. The first stage began in 2005 when Gaziosmanpasa Municipality designated 5 neighbourhoods including Sarigol, based on the Municipality Law no. 5393. The Mayor said that they were not going to force residents to demolish their houses as long as they have title deeds. A few gecekondu houses were demolished. But the designation was cancelled in 2007 (Akkoyunlu, 2013).

Figure 2. Sarigol-Yenidogan URA.
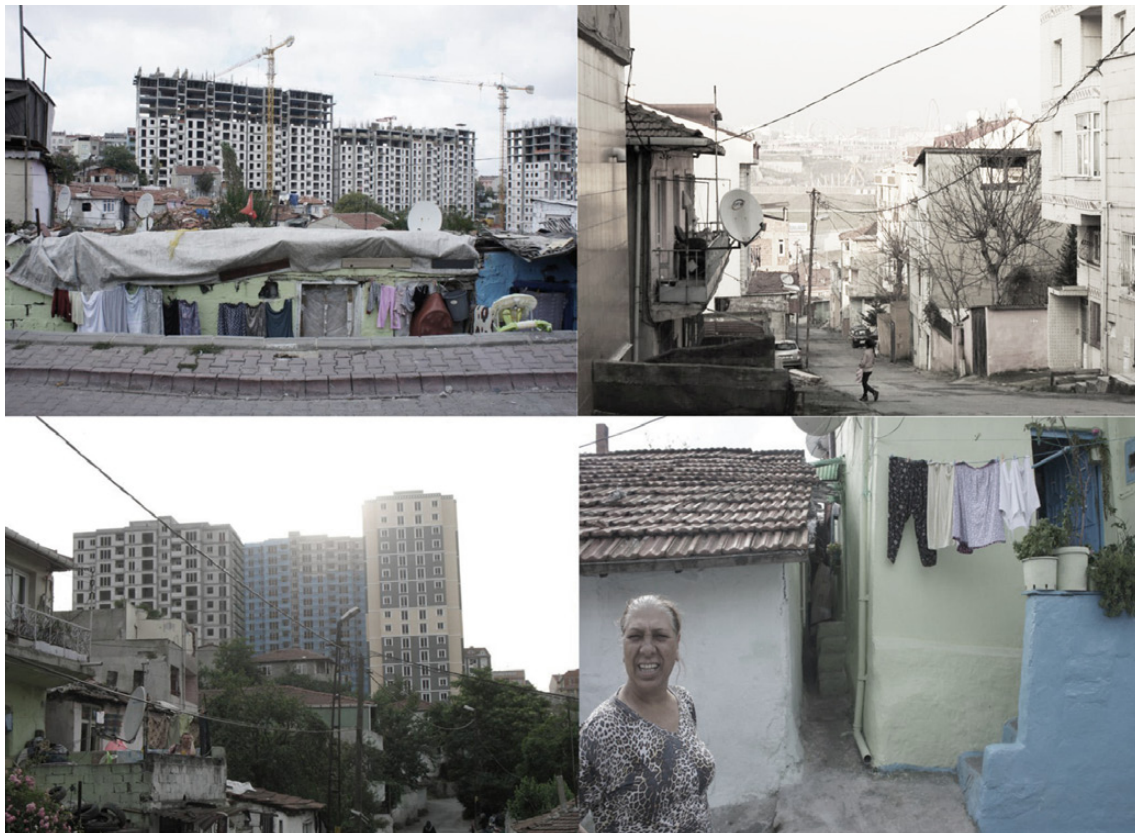
The second stage began in 2010 when 285 ha. in Sarigol was designated as a Gece-kondu Redevelopment Area again by the local municipality, based on Gecekondu Law no. 775. Initially, the Municipality worked in partnership with initially TOKI, and then a private construction company. The Municipality revised the existing district plan, increased the plot ratio and cancelled the height limit. The outcome was a proposal for 725 replacement houses in nine 16 storey-blocks, located around two swimming pools. The Chamber of Urban Planners (SPO) raised their concerns about the lack of provision of transportation infrastructure and community facilities and took the plan revision to court in 2011. The court case is still going on (SPO, 2011).

Most of the residents had only pre-title deeds and thus were not accepted as 'rightful owners'. They were forced to sell their houses to the municipality for very low prices and leave neighbourhood out of fear of expropriation. The tenants were automatically displaced since they had no rights to housing. Some 600 houses have been evacuated and demolished.

In the beginning, it was announced by the Municipality that the replacement housing would be sold to Gaziosmanpasa residents only. But it was announced in November 2013 that sales would be open to the public. Apparently, owners could not afford and/or did not want to buy the replacement housing since it does not suit local residents' ways of living (S. Cati, personal communication).

The rest of the Sarigol-Yenidogan Area was designated as a URA by the MEU in December 2013, using the new powers. This was the beginning of the third and the current stage. After designation, all powers were delegated to the district Municipality. GOPAS, an arm-length company of the Municipality, is running the regeneration process. KEYM, a private company, is commissioned by GOPAS to deal with negotiations as well as the urban planning and design phase (A. Bolukbasi, personal communication). KEYM stated work in June, 2012. KEYM employees provide information about the project to the residents in the local nmnicipality office.

Figure 3. Existing and proposed morphology. Source: adapted from www.keym.com.tr

The project is being developed and will be implemented in 5 phases. The plan and the urban design project for the whole area were prepared by KEYM planners and architects and approved by the Ministry in July 2014. Architectural design is being prepared by private architectural companies behind closed doors and has not been made public yet.

The urban design project for the whole area consists of a combination of high-rise blocks of 6-13 storeys (Figure 3). It has swimming pools and gates with security. Based on the data gathered from official plans and projects and interviews with key actors and residents, it can be stated that the new design will be a particular form of 'gated community'.

Demolitions in Phase 1 and 2 have been completed. Residents with pre-title deeds are offered the half the compensation given to residents with title deeds and tenants are given a one-off rent support of 500TL (H. Kaya, personal communication).

Individual meetings are carried out with owners and there are concerns raised by the residents about the varying contents of individual deals. At the meetings, residents are shown urban design projects only. Only a vague description about the location of the new houses are provided; such as one street up or one street down from where they live. (C. Bozkurt, personal communication). Residents state that they would prefer to live in houses with gardens. They do not want to live in the new high-rise blocks but they also do not want to leave their neighbourhood.

In parallel, residents established a neighbourhood association in February 2014. The Association took the designation to court. The court ruled in their favour and cancelled the designation in December 2014. The next stage is remains to be seen.

Conclusion

Urban regeneration processes in Turkey-Istanbul are dramatically changing the morphology of the city. The morphological outcome of the process is usually high rise blocks in particular type of 'gated communities'. These housing developments often constitute 'modifications' in formal plans i.e. they are superimposed on the formal statutory land use plans. They drastically change the scale of the urban patterns. Organic, low to medium density urban environments are replaced by high density settlements without regarding the topographic circumstances of the sites.

The morphological change also affect the socio-economical structure of the neighbourhoods. As illustrated in Gaziosmanpasa Sarigol-Yenidogan Urban Regeneration Area, the replacement housing is neither affordable nor suitable for mainly low-income residents of the regeneration areas. Even if they are given houses in the new schemes, they have to sell and move to a more suitable environment which is likely to be another low-income neighbourhood in a poor quality urban environment.

At present there two parallel planning processes - the statutory land use plans and the designation of urban regeneration areas. These processes should be integrated as this will a higher degree of morphological continuity and harmony across the metropolitan area.

Although regeneration projects provide earthquake proof housing, they make limited contribution to the quality of life. In some cases, they provide poor living environments in the stereotypical high rise blocks with very limited community facilities. The problems that these blocks built with no respect to geographical and social conditions are going to generate in the future should be considered beforehand.

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Taking into account the morphological and social structure of the area, together with interviews with local residents, low-rise social housing would be more suitable in the case study area and in areas with similar characteristics. Good quality low-rise design can deliver high density. Moreover, building heights can be increased at some focal points to create landmarks, balance building density and avoid monotony.

Especially large scale urban regeneration projects should be designed respectful to the topography, climate and aspect of the sites, taking account of the infrastructure, community facilities and relationship with the surrounding areas. They should be accessible by public transport and automobiles as well as on foot. They should have green infrastructures and establish a balance between the built environment and the green areas. They should be in harmony with the surrounding morphology. They should appreciate aesthetic values and variety in design.

Most of all, the design should regard the socio-economic characteristics of the local communities, their needs and their ways of living. This can be achieved via a participatory design process. The needs and wishes of local residents should inform the design. This would involve architects and urban designers to work with the communities in the design process. Participatory methods including neighbourhood profiling, Planning for Real and design charrettes can be used to create morphologically more suitable housing environments for local residents in regeneration areas.

References

Akkoyunlu, N. (2013) 'Şen Mahalle'de açılımlı dönüşüm ve kentsel yalanlar', in Koca, A., Çalışkan, Ç. O.,
Kaya, E. and Akgün, G. (Eds.) *Kentleri Savunmak* (Notabene Publishing, Istanbul).
Altınok, E. (2006) 'Yasadışı yapılaşan alanlarda dönüştürme kapasitelerinin tükenişi ve kentsel yoksulluk Çeliktepe örneği', unpublished master thesis, Yıldız Technical University, Turkey.
Enlil, Z. M. (2011) 'The neoliberal agenda and the changing urban form of Istanbul',

International Planning Studies 16, 5-25.

Gibson M. and Goksin, Z. A. (2009) 'Neighbourhood regeneration challenges, progress and prospects in Istanbul: a neighbourhood capital perspective', Paper presented at the *1st International Neighbourhood Renewal Conference* (London, UK, November, 19-20, 2009).

Keleş, R. (1997) *Kentleşme Politikası-4. Baski* (Imge Kitabevi, Istanbul).

Keyder, Ç. (2000) 'Enformel konut piyasasından küresel konut piyasasına', in Keyder, Ç. (Ed), *İstanbul-Küresel ile Yerel Arasında içinde* (Metis Yayınları, İstanbul) 171-191.

Keyder, Ç. and Öncü, A. (1993) 'Istanbul Yol Ayrımında', *Istanbul Dergisi 7*, 28–35.

Kuyucu, T. and Unsal, O. (2010) ''Urban transformation' as state-led property transfer: an analysis of two cases of urban renewal in Istanbul', *Urban Studies 47*, 1479-1499.

Pınarcıoğlu, M. and Işık, O. (2008) 'Not only helpless but also hopeless: changing dynamics of urban poverty in Turkey, the case of Sultanbeyli, Istanbul', *European Planning Studies* 16, 1353-1370.

SPO (2011), *648 sayılı kanun hükmünde kararname değerlendirmesi* (http://www.spo.org.tr/genel/bizden_detay.php?kod=3260&tipi=4&sube=0#.VUszEY7tmko) accessed 27 May 2015.

Tekeli, İ. (1994) *The Development of the Istanbul Metropolitan Area: Urban Administration and Planning* (Kent Publishing, Istanbul).

Tufan, M. (2014) *Bugünün Türkiye'sini 2981 sayılı İmar Islah Yasası yarattı – Hüseyin Kaptan ile söyleşi* (http://www.yapi.com.tr/haberler/bugunun-turkiyesini-2981-sayili-imar-islah-yasasi-yaratti_116417.html) accessed 27 May 2015.

Ünlü, T. (2006a) 'Mersin'de değisen kentsel mekan; Çamlıbel'de morfolojik değisim', *Megaron Dergisi 4*, 178-200.

Ünlü, T. (2006b) 'Kentsel mekanda değisimin yönetilmesi', *ODTÜ Mimarlık Fakültesi Dergisi* 23, 63-92.

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The Lost and Gains in Chibi City's Transition. The Reinterpretation of the Deconstruction of Historic Morphology of Chibi Historic City

Yanfei Jia, Yi He
School of Architecture and Urban Planning, Huazhong University of Science and Technology, Wuhan, China
Keywords: morphology, deconstruction, reinterpretation, transition, Chibi

Abstract

The stunning space transformation during Chinese unprecedented urbanization has brought about severe space dilemma thoroughly, especially to historic built areas, causing great misinterpreted aberration in inheriting, conservation and rehabilitation. After studying of various urban morphology constitutions and their evolution, this paper pays more attention on deep factors analysis of the change and its operating mechanism, the co-performance of various factors, such as local social organization, political decision, economical status and existing built environment. The reinterpretation of space evolution and its instinct factors could give hint to city planners to solve complex problems in a comprehensive perspective on the basis of understanding the instinct logic society.

As a typical representation of Chinese medium-small cities' space change, Chibi historic city could deepen our knowledge about the heterization of urban morphology and its constitution. In view of representation of Chibi's space evolution, firstly the evolution of transition of its morphology reviews space elements and their change in historic center (walled area). Based on the reinterpretation of the morphology change and space transformation of the entity and some key sites, we can know how all the referred factors play in Chinese traditional cities' mechanism. This paper is to outline the destruction of its constitutions, to criticize the performance of urban social-economic mechanism.

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The historic city's morphology and its constitutions

The study of forming logics of space is the conclusion, carding, analysis and reinterpretation of both local chronicles and urban construction history. Through the description of the evolution and the form of various constitutions, to know the motive forces and to know the spatial constitution, feature and its evolution laws, which can provide reference to the future urban construction. Mainly depending on the local chronicle of Ming and Qing dynasty and later construction records, plus the field survey, the historic city's morphology and its constitutions is to be studied.

The whole morphology of Chibi shows the typical property of local city construction philosophy - Shanshui natural City (mountain and water landscape city). Chibi reflects comparatively integral city construction theory of that the city is a part of the whole nature. Initially, the organic idea leads to that the certain scale urban area is affiliated to its surrounding nature. Established in AD633, following Guanzi (Guanzhong, BC 476)'s saying that a city should choose the foot of mountain, or the bank of river as the site, Chibi locates at the plain sounded northern-western-southern mountains as the barrier, while the Lushui river runs from the south-west to the east and then turns to the north-west, finally to the Yangzi River. The plain provides enough construction and agriculture lands, while it is near to the water resource, providing goods shipping channel. Then the hills up and down is involved as a part of the cityscape by towers building (see figure 1). The city wall, in a oval pattern, firstly, built in Ming Dynasty in 1575 by clay. Though as the seat of a county authority, the city wall was not vertical to adapt to the river and mountain. Then the latter governor substituted the wall with stones, and erected 6 gates in 1670. In the Qing dynasty, the wall was rebuilt and the perimeter was about 3500 meters long, with the height is 5.7 meters and width is 5.3 meters. Every gate was always accompanied with some temples, such as Yangong Temple was out of the South Gate, while Wuking Temple was near to the West Gate, Tianfei Temple is east of the north gate across the river and etc. Mainly the institutional buildings, like county yamun and the drill ground (1), Confucian temple (2), military temple (3), storehouse (4) and honorific arches (5) locate in the east part. Furthermore, two lakes were involved into the west walled area, especially the Ximen Lake were divided into two parts. It is very unique that the wall built on the lake (6) but for providing the drilling place to the water army. As the main threat comes from the north, hence the temple of War God (7) and barracks (8) were located in the north. Civic buildings, patron god temple (9) and other temples locate in the west. The other parts mainly are the residential area- Lifang (see figure 2). In terms of communication, there were ports out of the gate, as the gateway of goods exchange. The tea from various farms, like the Yangloudong Town was gathered into the city, moved from here by boat to Hankou Town's factories through the Yangzi River and then to Mongolia, Russia and West Europe overland, forming the famous *Ten Thousands Miles Tea Route*.

In the light of the link between opposite gates, these streets form arterial communication lines. They are bent for adapt to the topography (see figure 3). Then lanes between courtyards affiliated to the prior one. There were about 24 lanes, most of which were paved by clay, except the road link south gate and north gate was paved by slab-stone. Furthermore, dozens of memorial arches were placed on roads, especially at main crossing and around public buildings, Lined with storefronts, shops, temples and restaurants, MiaoQian street and the central Renmin Street formed the main axis and commercial center.

The living unit, Lifang as a rectangular residential area and a unit to govern, is homogeneous vernacular cluster wards. Lifang was narrow and endocentric, lack of public space and connection. In Tang Dynasty's Chang'an, the length of the Lifang was from 250 to 450 meter, while the length is about from 300 to 500 meter. According to the common dimension of the walled area, there were about 8 Lifang. In every Lifang, most residential houses are typical two-story courtyard houses, with one small patio for lighting. The first floor of common civic houses is built by clay while the upper one is made by pine blanks with pitched grey tiled roof. The houses belong to officers, landlords or temple were built by blue bricks and hipped roof, with ambulatory decorated by carved beams and painted.

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Figure 1. The site of the city, cited in Chibi County Annals.
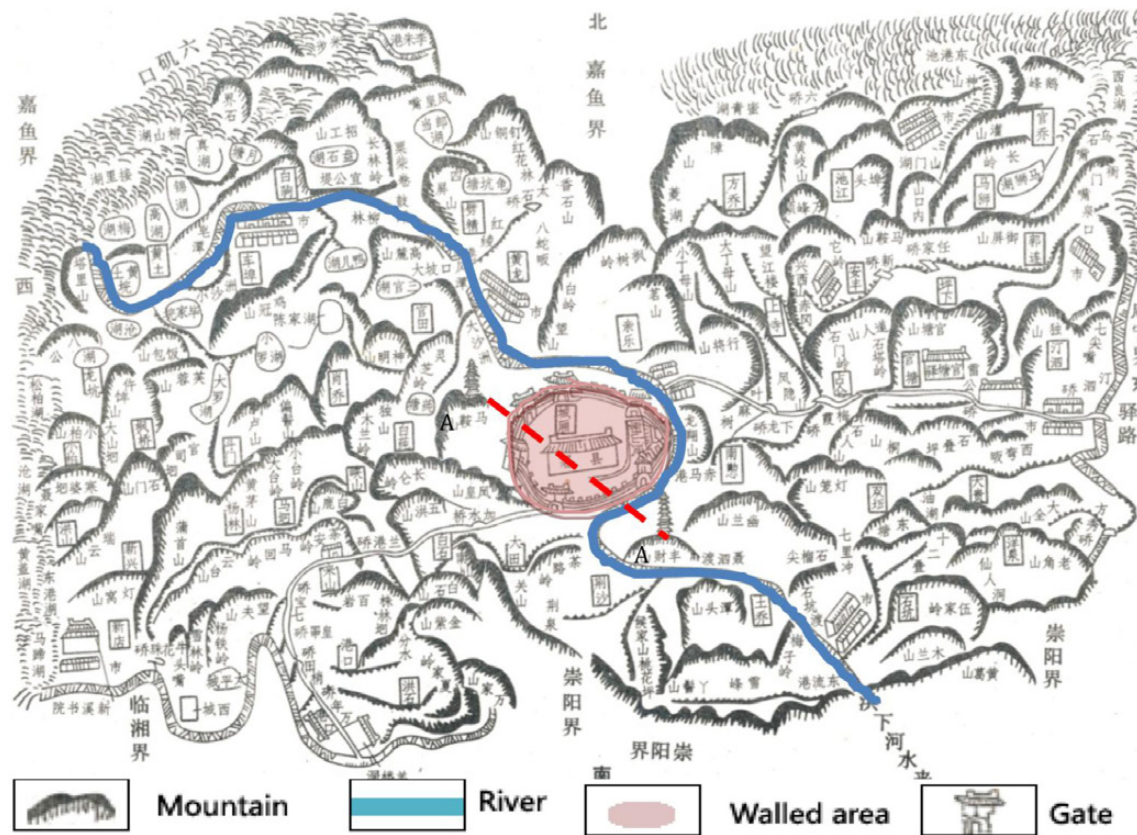
According to S. Kostof, the pattern attaches the city instinct meaning (Kostof, 1993), and furthermore Liang Sicheng pointed out that the planed-whole city as a symbol of ancestors' intention of the affiliation to the Heaven (Liang, 1963). In other words, walled area in a kind of shape to accommodate the people has to follow the intention of the God, is just a part of the nature. Hence, city just as a kind of secondary part of its surrounding, makes good use of its natural endowment (Jia, 2014). Mountford pointed out city as the platform of the special activities, influenced by the cultural power and capital (Mountford, 1961). Those power acts on the morphology and brings out certain pattern (Christaller, 1961). The principles of construction consciousness are nature-oriented and harmonious in local cities (Wu, 1990), play the key role. In the first place, integrated idea makes that the walled area, mountain, river and its surrounding environment in as a holistic part. Then, great attention were casted on every constitution, mountain forms the background, river as the moat provides natural communication channel, the ventilation is well considered in the direction of the walled area, buildings and streets, wall provides the basic shape and the flexible roads laid spatial structure, then residential area were laid organically. Mainly the site choice is rational depending on the requirement of the daily need. In one word, the city construction follows the principles of that man is a holistic part of nature, through organic flexible way.

Chibi's historic morphology was the witness of Chinese urban construction disciplines of both Lizhi and the idea of adaption to topology. On one hand, Lizhi, as a kind of the ritual system and social institution performed by official buildings in certain site, scale, material, color, types, roof style, order, direction and etc. On the other, suffered by the local economic condition and construction techniques, most of the time, the idea of adaption to topology triggers flexible distribution and pattern, like the wall shape, the road line, the Lifang pattern were not vertical. Furthermore, the lower level government does not need to follow the Lizhi strictly, which provides enough freedom for the civic buildings to choose

Figure 2. The walled area of Chibi in Ming Dynasty, cited in Chibi County Annals.

Gate ▮▮▮ Wall 🏯 Public offices 𝄸𝄸 Water ⊞⊞ Roa[d]
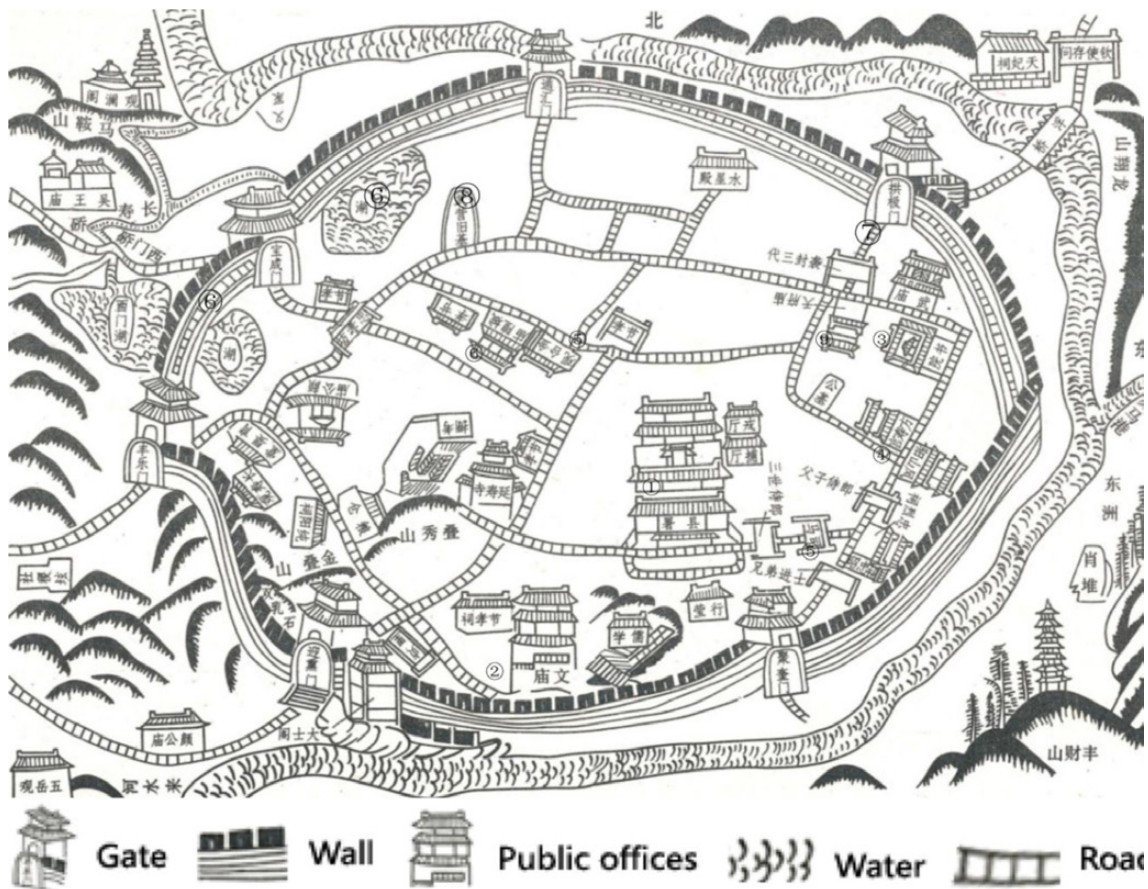
the site, scale and form. It is a pity and common dilemma to the Chinese professionals that few documents referred to the cadaster of plots and buildings in local towns and counties. From the universality of the types of civic buildings in the surrounding villages and towns, the basic space factor is the local courtyard. The typical plot is about 8-12 meters long façade and 15-30 meters deep. It gains great feature form Chinese "nine squares system of land ownership". So we can know the space was compound homogenous.

The deconstruction process and the alien constitutions

This historic morphology last until to the beginning of 20th century, even suffered serious feudal peasant uprising wars. Though, accompanied with the deconstruction of agricultural economic, at the end of Qing Dynasty and the beginning of Public of China (1911-1949), plus the transaction became standstill due to the World War II, the whole city ran to deterioration. Until 1936, there were only 2000 persons, with less than 400 shops. The Japanese invasion exacerbated this situation, and damaged most part of the original factors of the morphology. Luckily, the city wall still kept integrated until 1968, most of the construction was limited into the walled area. Then after the erection of the People's Republic of China in 1949, the whole city experienced two stages due to various motives. At the outset, the replacement of the old constitution in small scale due to primary communist economic development and political intention. And then after the Reform and Open in 1980s, large scale regeneration has substituted the whole constitution in a rude way triggered by the market power and new political strength.

Figure 3. Main roads of walled area, drew by the author.

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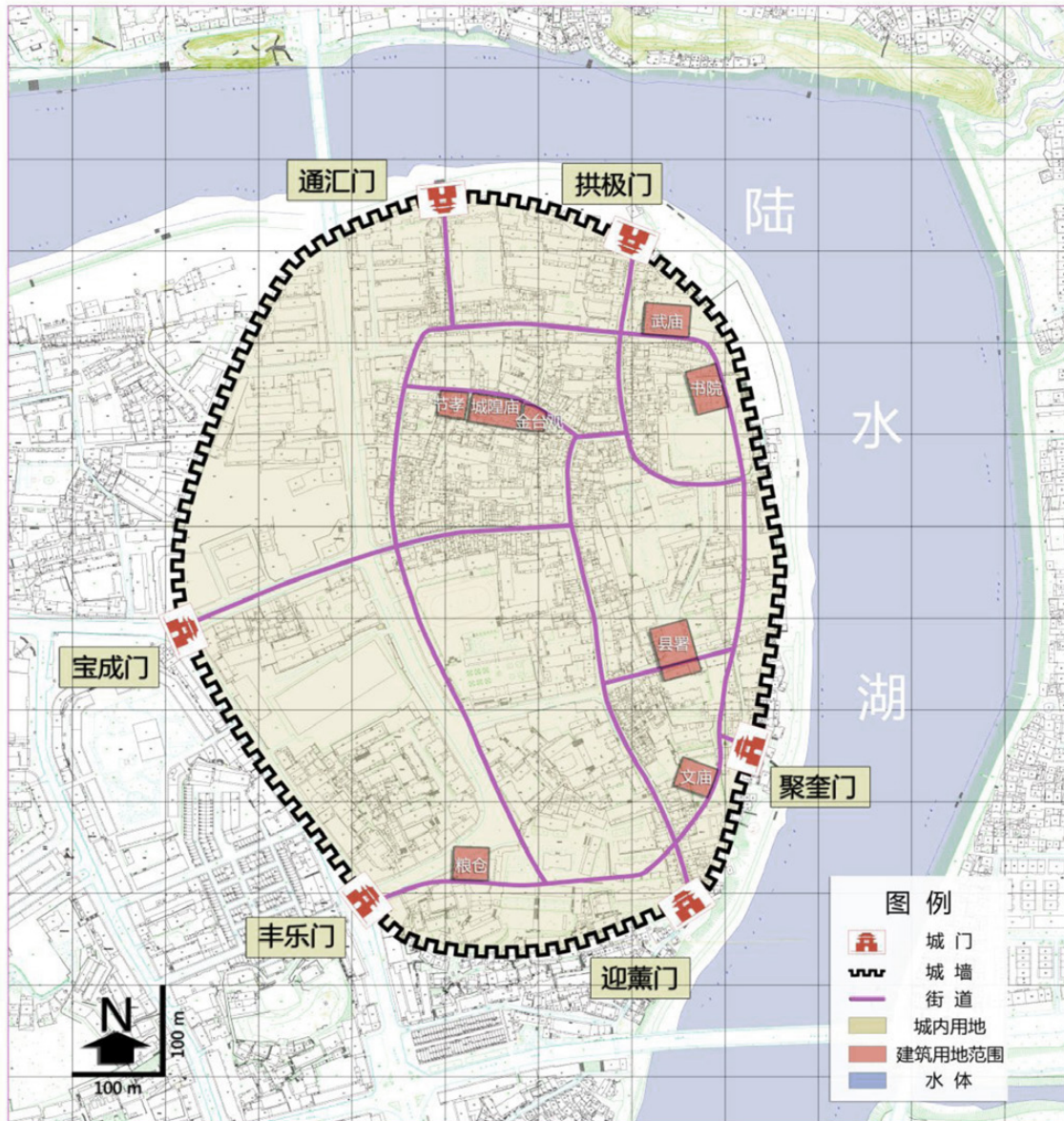
Small scale substitution of factors

Since 1950s, the new communist country's primary exploit brought out great change to the existing construction environment. Against the background of all the land is expropriated by the country, it was ridiculous that the private civic houses expanded in an astonished speed. Any people who could apply the construction permission and paid for the tax, could build house freely. Thousands of people, most were the surrounding farmers flooded into the walled area, a great many of wild houses were built, mainly around the northern Chenghuang Temple, and beyond the south gate. Mainly the plot were reorganized in this way, mess and disorder plots were used for one floor brick buildings. Up to 90 000 square meters house, though with lower quality limited by the bad economic invaded into the existing fabric, causing great alienation, though in small scale but large amount way. Furthermore, new public building, such as the hospital, park, bureau office and others were accommodated into the prior nobles' courtyards or substituted some existing plots, such as the most important Yingbing hotel were located in the back of the

Figure 4. 1982, 1986, 1994 urban morphology.
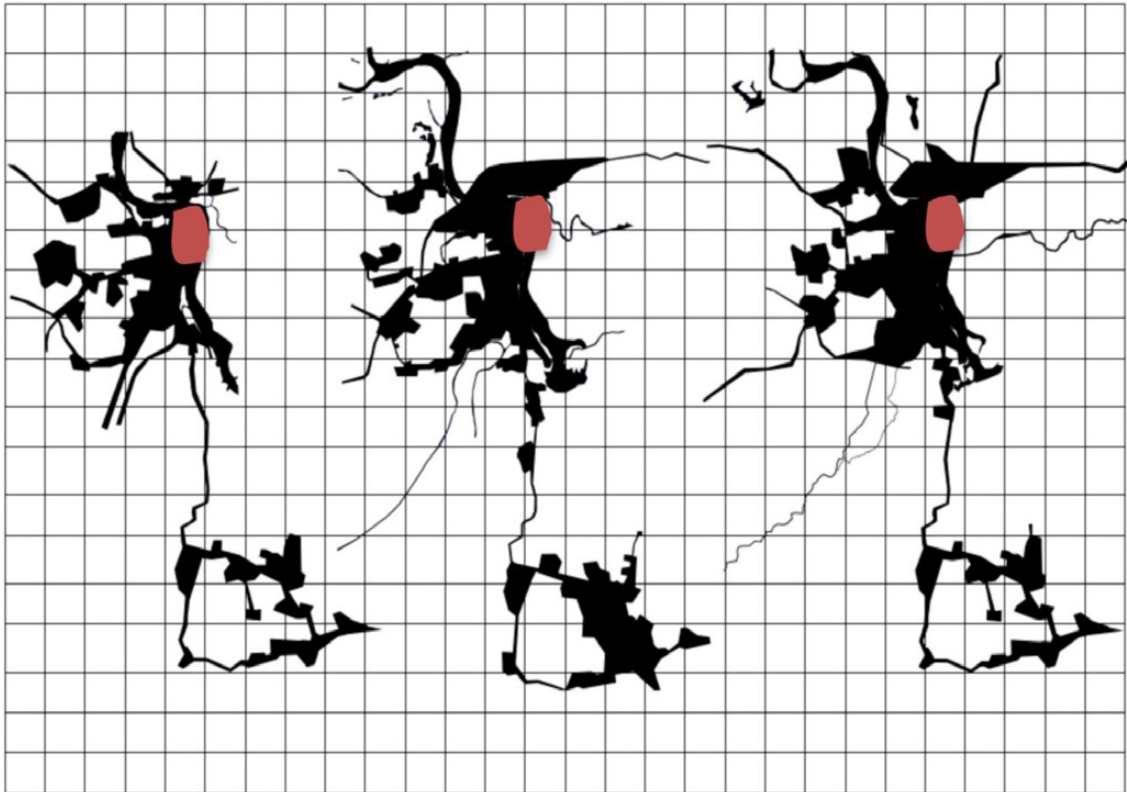
prior county's office. And most of the temples were demolished because the communist party forbidden the religious activities at that time. Deepening by the central government's command of locating the industry into the southeast inland, several factories, such as brick factory (1966), the monolith Spinning and Weaving Factory (1967), chemical plant (1968), paper mill (1969), Lushui Dam (1969), carbon-product factory (1972) and etc., mainly were located in the west and south beyond the walled area. But they brought out two concomitant phenomenon, firstly, all the roads were expanded for the communication, leading to demolish all the buildings along the prior road; then, a great deal of workers' dormitory and houses were built into the city. Hence, demolition and alienation led to great change of the existing construction environment. The morphology were reshaped by the private houses and public function buildings. Finally, the city decided to expanded towards to west and south to locate industrial parts, in this way the west half was demolished. In term of flood protection, the east half, about 1800 meter long and four gates are kept.

Large scale regeneration and elements

Guided by the Master Planning 1982, the whole city expanded to the southern industrial area, hence the city expanded greatly. Most of the new construction happens in the south and east of the whole city, while the historic walled area has been experiencing great regeneration. As the commercial center and connection node in the whole urban area, all the roads were expanded and were straightened. The excellent site of the houses along the road regenerated much fast, all of which mainly became 2-stroys buildings. These buildings are in simple modern style, with 7 meters width and 10 meter depth. Then some key sites were wholly regenerated. Like the West Lake area, all the lake were buried for the houses, and then transformed into market area in 1990s. Most of the government site were removed to the new district, the prior site were sold to the prompters to the real estate exploit, most of which were built into 7-storeys houses or high rise houses. Further-

more, the private houses built in the prior period became serious dilapidated and compound dense with bad public goods, are being regenerated by multi-story houses by the owners. The government's finance depends greatly on the land selling, so there area several large scale gated community were built in the prior walled area, mainly in the west and south east. And in the east, the prior fabrics were regenerated into schools and houses. All these new elements mainly are multi-levels buildings in mechanical arrays, and the buildings along the road changes into higher ones. Taking the prior government hall as an example. Until now, all the historic fabrics were almost regenerated twice, with few original elements remains. We have to underlined that even all the elements were replaced and the city expanded, the historic walled area's pattern still keeps comparative clear, even the key important elements missing but the boundary and structure (road) remain (see figure 4). It shows that the morphology of Chinese historic city's wall and road play great role in the morphology, no matter small scale change or large scale regeneration. Once the wall and the road part lost, all the morphology become unclear, see the west part and the east part of Chibi's historic area.

Conclusion

As a typical representation of Chinese medium-small cities' space change, Chibi historic city could deepen our knowledge about the heterization of urban morphology and its constitution. In view of representation of Chibi's space evolution, firstly the evolution of transition of its morphology reviews space elements and their change in historic center (walled area). After studying of various urban morphology constitutions and their evolution, the change is the result of the co-performance of various factors, such as local social organization, political decision, economical status and existing built environment. The reinterpretation of space evolution and its instinct factors could give hint to city planners to solve complex problems in a comprehensive perspective on the basis of understanding the instinct logic society. Based on the reinterpretation of the morphology change and space transformation of the entity and some key sites, we can know how all the referred factors play in Chinese traditional cities' mechanism.

The hidden factors of morphology
Authoritarian power, refers to the authoritarian power is the most important power to shape, deconstruct and regenerate a city area. Key constitutions are embraced this factor directly, like the wall's dimension and height, the shape of the buildings. Then, Topology provides the carrier of the city, all the historic construction was limited by its natural condition and cultivate the local feature. When the economic develops, market motive became the first important shape power to reorganize and reshape. Last but not least, civic autonomy of the citizens provides the un-planed but full of feature parts.

The key factor of morphology
There are three important types of historic constitution, once they keep stable, even suffered great regenerate, the morphology keeps stable. Once they were damaged, the morphology became vague. They are the boundary, which usually is the wall and moat, and second factor is the structure, which created by the roads. The other is the center of axis.
The stunning space transformation during Chinese unprecedented urbanization has brought about severe space dilemma thoroughly, especially to historic built areas, causing great misinterpreted aberration in inheriting, conservation and rehabilitation. This paper is to outline the destruction of its constitutions, to criticize the performance of urban social-economic mechanism and identify the morphology's key factor and outer power. It can help the inheriting and conservation.

References

Conzen, M. R. G. (1968) 'The use of town plans in the study of urban history', in Dyos, H. J. (ed.) *The study of urban history* (Edward Arnold, London) 113-30.

Conzen, M. R. G. (2004) 'Comparing Japanese and European medieval urban history: geographical reflections on the environmental context', in Conzen, M. p. (ed.) *Thinking about urban form* (Peter Lang AG, Bern) 186-196.

Hillier, B. (2007) *Space is the machine* (Cambridge University Press, Cambridge).

Jia, Y (2014) 'The comparative study of Historic Center conservation mechanism between Italy and China' unpublished PhD thesis, Politecnico di Torino, Italy.

Kostof, S. (1993) *The City Shaped: Urban Patterns and Meaning Through Hisotry* (Bulfinch).

Kropf, K. S. (1993) 'An inquiry into the definition of built form in urban morphology', unpublished PhD thesis, University of Birmingham, UK.

Mumford, L. (1961) *The City in History: Its Origins, Its Transformation, and Its Prospects* (Harcourt, Brace and World, Inc. New York).

Slater, T. R. (1989) 'Medieval and Renaissance urban morphogenesis in eastern polish', J*ournal of Historical Geography*,15(3), 239-259.

Thompson, F. M. L. (ed.) (1982) *The rise of suburbia* (Leicester University Press, Leicester).

Wu, J. (1990) *Chinese urban morphology: structure, feature and its evolution* (Jiangsu Science and Technology Press) P8.

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Amor vacui/Amor pleni

Carlo Moccia

Dipartimento di Scienze dell'Ingegneria Civile e dell'Architettura, Politecnico di Bari, Via Edoardo Orabona, 4, 70125 Bari, Italy

Abstract

The urban void areas situated in the sprawled outskirts or the "dismissed areas" inside the dense-city, are those parts of the city in which the presence of the nature ("well preserved" or to be restored), allows us to experiment renewed ideas of city that assume the nature as the context of the city's construction. Establishing renewed relationships among delimited spaces evocative of the urban "internality" and wide and free spaces, that let us recognize the forms of the land's "physical geography".

For this reason it is necessary to renew the principles of the city's construction opposing to the disordered dispersion of the contemporary junkspace a new "order". A new order that cannot be based on the repetition of the same principles that informed the construction of the nineteenth-century city. It is necessary to replace the extraordinary paradigmatic value that the street and the plaza had in the construction of the city in the past period with new paradigms that may assume the void space as a syntactic value in the relationship among the built parts of a city, and no more a "reserve" of space to be occupied by buildings.

New paradigms that contemplate the "internality" and the "externality" as characters of the spaces of a city-nature that may be coexisting and interrelated. Paradigms that summarize the discontinuity and the delimitation of several different urban parts and void spaces of nature among them.

The definition of the elementary part of the city is one of the steps that founded this research. With a metaphor this elementary part of the city-nature has been called "architectural island".

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Introduction

The urban void areas situated in the sprawled outskirts or the "dismissed areas" inside the dense-city, are those parts of the city in which the presence of the nature ("well preserved" or to be restored), allows us to experiment renewed ideas of city that assume the nature as the context of the city's construction. Establishing renewed relationships among delimited spaces evocative of the urban "internality" and wide and free spaces, that let us recognize the forms of the land's "physical geography".

For this reason it is necessary to renew the principles of the city's construction opposing to the "disordered" dispersion of the contemporary a new "order". A new order that cannot be based on the repetition of the same principles that informed the construction of the nineteenth-century city. It is necessary to replace the extraordinary paradigmatic value that the street and the plaza had in the construction of the city in the past period with new paradigms that may assume the void space as a syntactic value in the relationship among the built parts of a city, and no more a "reserve" of space to be occupied by buildings. New paradigms that contemplate the "internality" and the "externality" as characters, of the spaces of a city-nature, that may be coexisting and interrelated. Paradigms that summarize the discontinuity and the finiteness of several different urban parts, and void spaces of nature among them. We have to imagine the nature of urban spaces inside the "city-nature" and to the define the elements of its construction.

Kind of spaces

The ancient Greeks used different words to define space "inside things" and space "between things". The space "inside things" is the static space of internality.

In architecture it is the space of the room as defined by its boundaries: the walls as well as the ceiling. But it is also the space of the courtyard, an opencast room where the atmospheric outdoor becomes an "interior" due to the mere delimitation of a place: a parcel of land, enclosed by walls and connected to the "depth" of the sky.

In ancient cities, the space of "internality" was the space of the forum, a large collective enclosure that was roofless but bordered by a porch that led to the interior and "sheltered" spaces of the public buildings behind. Giambattista Nolli, the author of the map of eighteenth century Rome, had that spatial paradigm in mind when he used the same code to represent the space of squares and the interiors of churches and public buildings.

The idea of urban space as the space of internality has a long tradition in Western culture that was originated in Roman cities and lasted as late as the nineteenth century, when the "dimensional scale" of squares and streets changed, unlike the nature of urban space still intended as "internal space". The space "between things" is the space of relations. If the space of "internality" is defined by its boundary and its shape can be viewed as the "positive" of delimitation, the space "between things" is a field defined by the "tension" between volumetric shapes. The former might be said to correspond to the space of concave forms, the latter is the space of the relation between convex forms.

In the ancient cities the space of "tension" was the space of the acropolis. Overall it is an "open" space that invites relations of proximity between various elements (in Athens, the Parthenon is connected to the Erechteion and the Propylaea) and, at the same time, can get "to resonate" the other elements farther away in the landscape (in Athens, the slopes of the Penthelic Mountains).

Constantinos Doxiadis has explored the grammar of this space as ruled by the layout of architectural volumes and articulated by a "sequence of frames" (Auguste Choisy's description of the Acropolis, also repeated by le Corbusier, is too well known to quote it here)[1].

The space "between things" is also the space of the Field of Miracles in Pisa. In this amazing "square" a tension is created in the composition of architectural characters by the poles of the Tower, the Cathedral and the Baptistery in the open space of the field

[1]Doxiadis, Constantinos Apostolou. (1972). *Architectural space in Ancient Greece*. MIT Press, Cambridge.

defined by the Cemetery's wall.

The paradigm of the "open" and "continuous" space between things has deeply influenced the Modern Movement's investigation of urban forms. In their book "Collage City" Colin Rowe and Fred Koetter compare the urban plan of Parma to that of Saint Dié, designed by Le Corbusier to highlight the epistemological shift of the Modern Movement's "idea of city" and the topological inversion" it introduces. The plan of Parma expresses the condition of urban spaces defined by the continuous built fabric that is typical of the historical city, while Saint Dié exemplifies the open condition of the urban/natural space that the Modern Movement conceives as the continuum of buildings[2].

Before Rowe and Koetter, Siegfried Giedion had written an essay about the "three concepts of space"[3]. Having described the composition by discrete elements (group design) that was typical of Greek architecture, and the space of "internality" typical of Roman architecture, Giedion explained that contemporary urban space had to find a new identity resulting from the coexistence of two kinds of space (the space of the Forum and the space of the Acropolis).

The space of "internality"(the space of urban "rooms" – the courtyard and the square) can shape the feeling of "living" by identifying it with a defined and demarcated place, the space of "openness" where renewed connections can be established between architectural forms and natural "voids" in the contemporary city. In the city that Giuseppe Samonà called "city in extension".

No clear boundary separates urban and rural space, and free spaces of nature are often in the city rather than outside it; therefore the "city in extension" requires an interpretation of its formal potential. The relationship between the forms of physical geography and built forms, as well as between the "compacted" spaces of the dense city and the free expanded spaces of nature, the syntactic role of natural "voids" in the structure of the "city in extension", are some of the issues we have addressed in our meditation. We have not yet a grammar for the urban spaces able to recognize the value of the "voids".

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Grammars of the form for city-nature

The "fragmentation" and the "discontinuity" of the building "diffused" in the territory, the absence of every limit to the extension of the city inside the country, is certainly a demonstrations of crisis of the urban form.

We must turn this condition of crisis of the contemporary city into an opportunity for its form, attributing meaning to the empty areas of nature englobed in the city, or to the "fragments" of city put in outskirts contexts. To think the urban form in the condition of the "city in extension" or in the great urban voids determined by the dismissed areas, we need to define a new idea of city: an idea of *city-nature* in conformity with our ability to recognize the beauty of the nature; an idea of city-nature in conformity with, at the same time, our wish to reaffirm the civil value of the city[4].

For this reasons it is necessary to base new principles of urban construction, opposing to the amorphous condition of the "sprawl city" a new order. An order capable to define a relationship among built and void spaces to make coexist the discontinuity of the built parts of the city together with the finiteness of those parts. A new order able to use the "voids" as a syntactic value in the relationship among the built parts: necessary to the identification of the parts and not as "reserve" of space to be occupied.

The city-nature is constituted by "parts of city", formally defined, separated and, at the same time, unified by the "intervals" of nature[5]. With a metaphor called "archipelagos city" this idea of city, and the elementary unity by which it is composed has been

[2]Rowe, Colin. Koetter, Fred. (1978). *Collage City*. MIT Press, Cambridge.

[3]Giedieon, Siegfried. (2001). *Lo spazio in architettura*. Dario Flaccovio Editore. Palermo.

[4]Moccia, Carlo. (2014). *Citynature*. In: 1st Workshop on the State of the Art and Challenges of Research Efforts at POLIBA. Research Contributions. vol. C1, p. 407-411, Gangemi Editore, Roma.

[5]Purini, Franco. (2011). *Tra parte e frammento*. In: "Ricerche in Architettura, la zolla nella dispersione delle aree metropolitane", p. 316-320, Edizioni Scientifiche Italiane, Napoli.

Figure 1. Projects for Catania_Pescara_Parma and Scalo Farini_Milan.
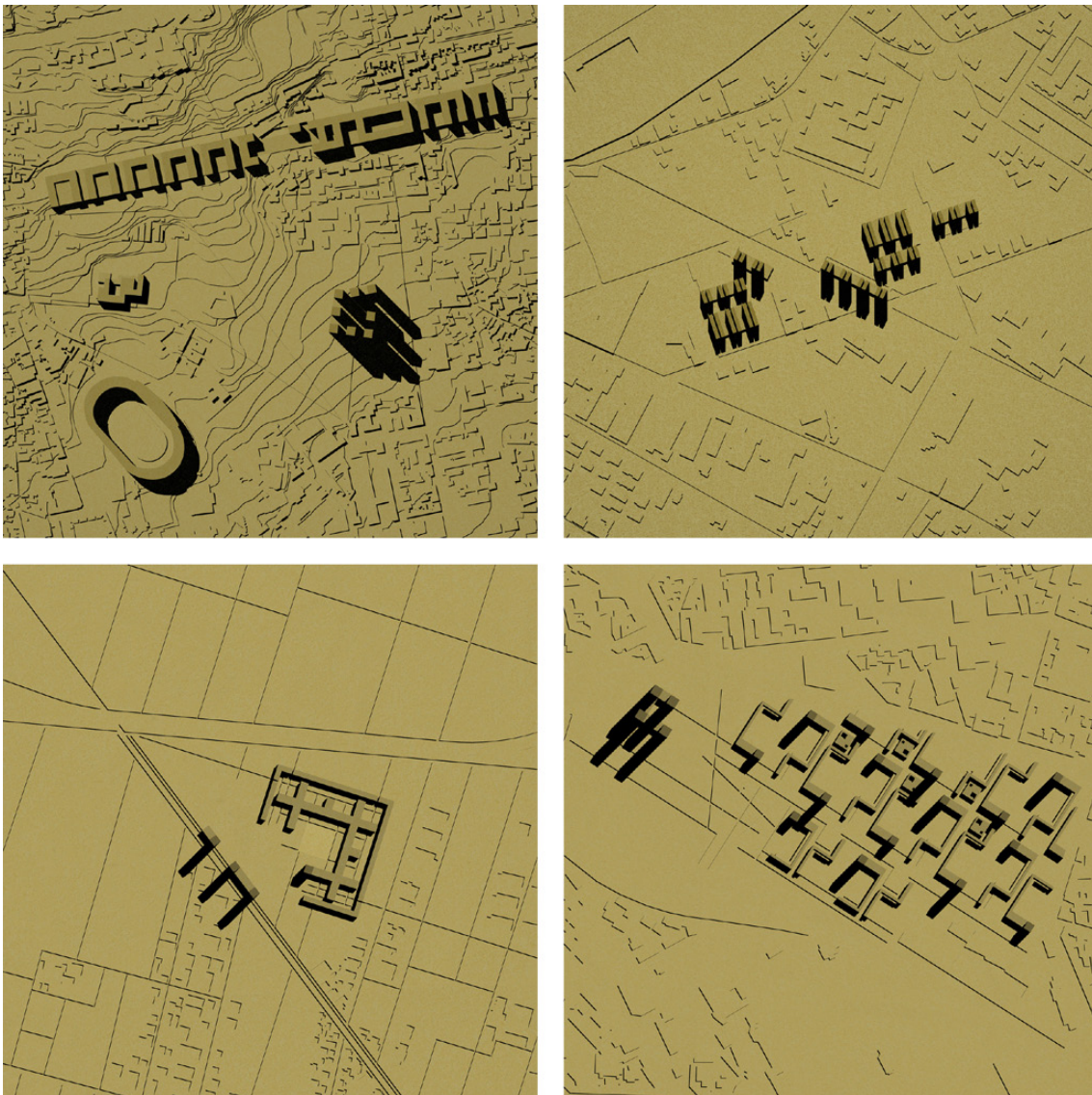
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defined "architectural island"[6].

Considering the condition of "architectural island" as a construction principle of the "archipelagos city" poses two orders of problems. Indeed, there is an order of problems that deals with the composition of architectural types and the conformation of spaces inside the "architectural island", while another order of problems refers to the settlement of "architectural island" inside the void space of nature.

The settlement principle of "archipelagos city" implies a morphological individualization of the "architectural island" as a "basic unity" of urban construction.

The choice of adopting some "open forms" or "closed forms", some linear or compact forms, as well as some continuous or discrete forms (which may be serial or linked) depends on the relation we would establish with the natural forms (first of all, the orographic form), and on the character we would give to the urban spaces in each unity. In any case, the condition of finiteness of the parts is necessary to identify the "island".

A sort of "estrangement" of the forms, that look as "fragments" of the city settled inside the nature, seems to confer to those forms a greater capability to evoke their very civic value.

[6]Monestiroli, Antonio. (1997). *Temi urbani*, Edizioni Unicopli, Milano.

Figure 2. Projects for Italcementi's area in Monopoli.

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The disposition of the unity-island in the natural void represents another fundamental step in the project of the city-nature. Actually, the void space should not be a residual space, but should acquire the value of place, so it is necessary that the islands are settled by establishing a sort of reciprocal tension, according to a system of relations, which would be interpretative of different characters of the natural form of places.

Referring to the projects that I have carried out, I think that we can identify some constant factors for the grammar of the urban forms. The coexistence of "mixed types" (towers, courtyard buildings and linear buildings), "elements" composing the form of the island, evoking the urban complexity; the unity and finiteness of the composition that let you recognize the urban part or the "architectural island"; the positioning of the "architectural islands" in the conspicuous points of the orography, along territorial axis or geometrical divisions of the fields; the "spatial tension" among different architectural islands, established through planimetric and volumetric proportioning of their masses settled in the nature; the "externality" of natural space (that is no more circumscribed by buildings but it is set as the place of relations between the architectures); the presence inside the architectural islands of different internal spaces, facing the external void of the nature.

Design experiences

I will try to explain the value of these "principles" through the description of five projects[7]. The first one is the project that we have done for the area of Milo in Catania with Uwe Schröder and Marco Mannino. The second is a project for the area "New Salaria" in Pescara, the third is the project that I have done for the west outskirts in Parma. The quarter is a project for the dismissed area of the "Farini Station" in Milan. The last one is a project for the area of the dismissed disposed concrete factory in Monopoli. In this project we assumed as remarkable the value and the characters of the natural orography, marked by the convergence of the erosive furrows of the blades and from the particular articulation of the line of coast.

In Catania the occasion was offered by the designing of the new railway station in the area of Milo. We have tried to interpret the condition of this area recognizing, together with the weakness of its urban structure, the extraordinary potentialities constituted by its position in the landscape.

A landscape characterized by the form of the volcanic ground and the presence of wide "pieces" of country survived to the encirclement of the city. We have looked for, through the forms of the project, an "order" in the urban structure assuming the value of the "natural" void.

The project makes to coincide the position of a great "comb building" that connects two different places through an urban sequence of courts and plazas, along the layout of the disposed railway.

A wide plinth for the whole length of the building connects among them the residential courts. These courts are similar in dimension, proportion and form, to the spaces of the historical city.

The settlement and the position of the plinth retrace those of the natural "step" that characterizes, with a sudden jump, the orography of the area. The courts of the "comb building" are open to the view of the harbor and of the distant landscape of the coast. On the free areas of the disposed military station, the project puts a great and "solitary" volume constituted by the aggregation of eight towers.

The towers stay on a plaza-platform that, holding them together, it individualizes the "architectural unity" situated in the free space of the park.

The "unity" constituted from the eight towers builds a sort of vertical counterpoint to the horizontality of the "comb building" and they establish with the existing stadium, a triad of "great architectures" that measure the wide space of the new urban park of Milo.

In Pescara the project faces the theme of the construction of the urban form in a "piece" of country, englobed among different tissue characterized by the "variety" of the architectural types and from their casual positions. Every hypothesis of "re-connect" the tissue has appeared improper in comparison to the conformation of the area. Rather could be affirmed a new order recognizing the geometries of the agrarian division of the fields (the drain channels directed orthogonally to the main course of the river) and the territorial axis (Tiburtina road and Salaria road) that cross the area.

We put the building destined to the offices along the Salaria road and the residences "blocks" directed according to the division of the fields.

The project proposes to maintain free the great part of this area (preserving it as cultivated and productive country) preparing the office/ towers along the Salaria road and the isolated residential "blocks" settled in the "void of the country" and directed according to the division of the fields. The succession of towers build the perspective of the Salaria road and individualizes the residential block unities in the "sprawled city" that develops between Pescara and Chieti.

The "series" of open courtyard buildings, unified by the plinths destined to the produc-

[7]Moccia, Carlo. (2011). *Amor vacui, Places for the city of our own times*. In: "European City Architecture, Project/Structure/Immage", (a cura di) Amistadi Lamberto, Prandi E., p. 120-123, Festival dell'Architettura Edizioni, Parma. Moccia, Carlo. (2011). *Vuoti urbani*. In: Aion n.19 Civitas, p. 132-15, Firenze.

Figure 3. Projects for Italcementi's area in Monopoli. Perspective.
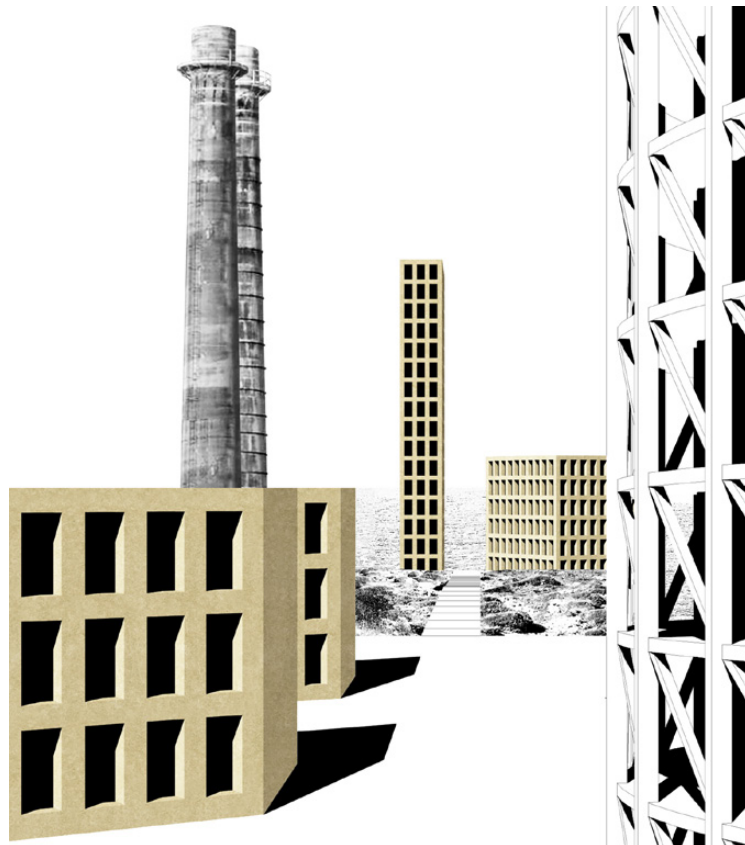
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tive activities, as an "island block", are settled between the "external" countryside and the "internal" urban plaza.

The project for Parma faces the matter of the urban form in the west outskirts of the city. As well as many Italian cities, the outskirts in Parma, deprived of civil places, is extended in the territory repeating the type of the one family house/block surrounded by a garden. However if we look at the forms of the countryside near Parma we could still recognized the permanence of long lasting formal structures. The isotropic grid of the division of the fields defined by the ancient Romans, the territorial axis that overlap to the cultivated field geometry another plot structured in reference to urban polarities, those can be assumed as elements of the construction of the new city-nature. The project proposes the construction of a "part" of city settled inside the countryside, the part is composed by two "architectural islands" separated by a void space.

The first "island" is made by a succession of towers, unified from a plinth. The second is a "grid" of courtyards that re-proposes, as the monastic complexes or the great rural farmhouses, the hierarchy and the complexity of a "fragment" of city in the free space of the country. Each one of the "architectural islands" directs according to the territorial elements to which it refers.

The towers assume the territorial axe that goes from Parma to Cremona. The tallest towers, visible from far, individualize in the flat territory this "fragment" of city. The grid assumes the geometry of the fields. The smaller towers, that raise along the external enclosure of the "grid" of courtyards, individualize the "part".

The disposed area of the Scalo Farini Station in Milan constitutes an extraordinary opportunity for the experimentation of a new idea of city appropriate to the inhabit culture of our time[8]. An idea of city in which the free spaces of nature are placed not only outside, but also inside the consolidated city, constituting the renewed context of the urban construction. The project departs from a masterplan by A. Monestiroli. The park situated nearby the railway layout reunifies the two parts of the city; the *rambla* as the "central backbone" of this new part of city; the system of the crossing gardens "inside" the urban blocks.

A "castle / building", marked by the presence of four high towers, placed in the park, in the "conspicuous" point determined by the convergence of two important urban axis. The "castle" is an architecture "autonomous" whose proportion is thought in relationship to the wide dimensions of the park. It is able to put in "tension" the free space of nature. A system of *redent* builds the places of the residence.

The *redent* mirrored along the crossing axle of the block, they determine a succession of delimited gardens, but at the same time continuous and linked each other. On these courtyards the loggias of the houses lean out establishing, through the relationship with the delimited place, the sense of the living.

The presence of some towers, destined to the temporary houses and the offices, underline the points of passage between the courtyards and their intersection with the roads. The choice of the *redent* allows a contextual articulation of the external space: the space of the roads and the broadens, that are, at times, occupied by the halls of collective buildings. The "compressed" spaces of the roads and passages, the delimited but at the same time open spaces of the courtyards, the "continuous" space of the park they coexist in this "fragment" of city-nature.

542 The area of the project in Monopoli were the site of the old concrete fabric built on the widest of the three peninsulas that articulates the coast inside the harbour basin[9]. It deals with a degraded area but of great value for the whole city both for its position and proximity to central places. The demolition of the fabric will offer the occasion to recover a direct relationship with the sea and to consider the sense of the whole harbor basin. Our work started from the recognition of the "original" characters of the coastal landscape and from understanding of the relationship established by the historical city with the physical form of the line coast. Monopoli rises along a rocky and jagged coast, characterized by the alternation of peninsulas and inlets that define a succession of "externality" and "internality", of convexity and concavity, in direct relationship with the water. Also the harbor basin is articulated in three spatial fields (that correspond to the "mouths" of three rivers lama), it exalts the characters of the conformation of the coast and interprets it through the forms of the ancient city and that Murat quarter.

Paradigmatic it is the way through which the ancient city interprets this topological condition. On the point of the peninsula is prepared the "convex" the architecture of the Castle, that assumes the value of datum, while the inlet of the ancient port is defined as an inner place of the city: one "water's plaza" delimited by the architectures that lean out on it. In the Nine hundred the construction of the main dock of the harbor has determined a changing of "scale" for the space of the harbor basin. The place of the water dilates itself and the basin become more complex and articulated. Above all it becomes wealthy because of the variety of the urban characters that are represented, as on a stage, on the basin of the harbor. The "theatricality" of this space of water becomes even more evident on the occasion of the popular feasts day on August.

The founding choice of the project has been to bring inside the basin the natural form of the coast. The peninsula occupied by the fabric will be re-naturalized. It will become

[8]Moccia, Carlo. (2014). *Le forme del vuoto*. In: "La parte elementare della città", (a cura di Neri, Raffaella.), p. 30-37, LetteraVentidue, Siracusa.
[9]www.rebuildurbanform.com

Figure 4. Projects for Italcementi's area in Monopoli. Perspective 2.

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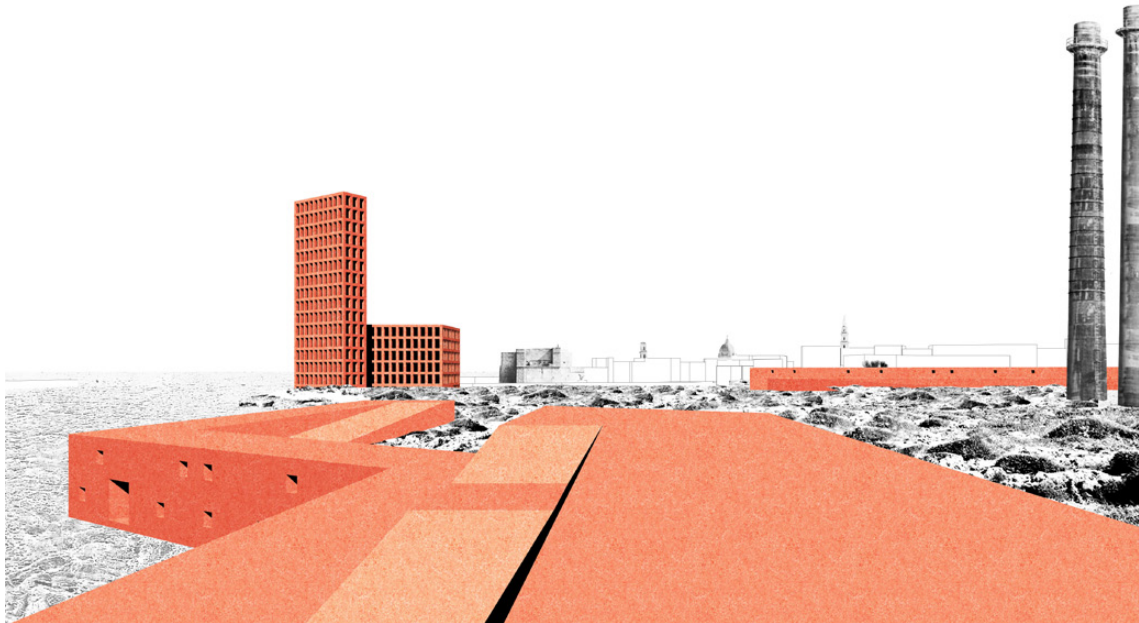
the place, "inside" the city, in which we will find again the characters of the natural coastal landscape.

The open space of the park will serve as counterpoint to the mass of the compact ancient city.

A new civic place: a space, at the same time, urban and natural in direct relationship with the sea. It will be defined by the mutual relationships that will be established between the architectures in the natural void.

The project proposes the construction of two architectures able, in reason for their position, to measure the extension of the park giving "tension" to the space. These architectures will mark the most advanced point of the peninsula and the rotation point of the grid of the modern and contemporary city. On the advanced point of the peninsula we imagine a building constituted by a "tower" and a "block". The tower will be a resort hotel, the block will be a museum. Each of these buildings will direct themselves interpreting the topology of the site: the tower, with rectangular plant, will assume the position of the modern city, the block it will turn itself toward the castle on the other side of the harbor.

The point of the rotation of the urban grids among Street Fiume and Street Sforza, will be marked by the construction of a circular tower that will be realized in metallic carpentry, with the same constructive forms that characterized the hangars of the shipyards.

Along the coast road, assuming the position of it, will be built a "fragment" of urban tissue of courtyard blocks.

The project proposes, finally, to complete the urban sequence of "inlets" and peninsula, through the realization of two new plazas of water. This space will be delimited by a building/platform that, developing itself around the inlet, will join the city with the place of the park. The building/platform will entertain commercial and loisir activities, and the nautical sports. The building/platform define two ways to be in the natural space, that correspond to the low quota of the water and of the coverage. Inside the plaza of water we are in a "static" place, delimited but open to the port basin. On the roof of the platform we are in an open space, marked by the presence of the towers.

References

Doxiadis, C. A. (1972) *Architectural space in Ancient Greece* (MIT Press, Cambridge).
Rowe, C. Koetter, F. (1978) *Collage City* (MIT Press, Cambridge).
Giedieon, Siegfried. (2001) *Lo spazio in architettura* (Dario Flaccovio Editore, Palermo).
Moccia, C. (2014) 'Citynature', In *1st Workshop on the State of the Art and Challenges of Research Efforts at POLIBA*. Research Contributions. vol. C1, p. 407-411 (Gangemi Editore, Roma).
Purini, F. (2011) 'Tra parte e frammento', In *Ricerche in Architettura, la zolla nella dispersione delle aree metropolitane*, p. 316-320 (Edizioni Scientifiche Italiane, Napoli).
Monestiroli, A. (1997) *Temi urbani* (Edizioni Unicopli, Milano).
Moccia, C. (2011) 'Amor vacui, Places for the city of our own times', In *European City Architecture, Project/Structure/Immage* (a cura di) Amistadi L., Prandi E., p. 120-123, (Festival dell'Architettura Edizioni, Parma).
Moccia, C. (2011) 'Vuoti urbani', In *Aion* n.19 Civitas, p. 132-15, (Firenze).
Moccia, C. (2014) 'Le forme del vuoto', In *La parte elementare della città*, (a cura di Neri, R.), p. 30-37 (LetteraVentidue, Siracusa).
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Exploring Design Approaches for Urban Regeneration of Brown Fields: a Case of Hazaribagh Tannery Area

N. M. Esa Abrar Khan, Nabanita Islam, MD. Symum Hasan, Ifat Sultana, MD. Lutfor Rahman
University of Asia Pacific

Abstract

In the context of south Asian cities, particularly those with higher rate of urbanization, increasing population density and land scarcity, Brown Field development can be considered as a potential solution for urban regeneration and inner city expansion in order to achieve better livability and sustainability. This study aims to explore contextual design approaches for urban regeneration and redevelopment of brownfields in the case of Dhaka, one of the densest cities of south Asia. Covering an area of 25 ha, Hazaribagh in the heart of Dhaka city is the centre of the entire leather industry of Bangladesh. But mindless discharge and dump of toxic effluent and wastes has turned the area into a formidable obstacle and catastrophic place within the city. Considering the highly toxic and polluting nature of its leather industries, Government of Bangladesh has decided to shift the tanneries from Hazaribagh to Savar. According to the established definitions, this area has been marked as a Brownfield and has created a good opportunity for sustainable urban regeneration. While Governments internationally are recognizing the benefits of innovative Brownfield redevelopment strategies for addressing environmental and public health protection while contributing to economic development and community revitalization, the urban development authorities of Dhaka are also responding to these growing needs at mostly broader policy level, leaving gaps in terms of specific development and design strategies to address the unique socio-economic and cultural variables, land use and ownership pattern. This paper is an attempt to address those gaps through exploring relevant policy and design approach in one of the segments of Hazaribagh while briefly depicting the associated agencies, their action plans and the broader policies and how the broader policies formed the basis of a new way of looking into the regeneration process in this situation. The study involved an archival research, field survey and design exercise as a part of an extensive urban design studio project.

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Introduction

The term "Brownfield" has remained as an aspiring term since its first use in 1992 at a U.S. congressional field hearing hosted by the Northeast Midwest Congressional Coalition. The US Environmental Protection Agency (EPA) defines the term as "*real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.*" The conversion of Brownfield sites into other viable land uses has evolved from an initial concern for public health protection, gradually transforming into urban planning strategy which promotes economic and social development as well as environmental improvement (Smith,2008).Example of such development are mostly applied and evolved in countries such as the United States, the European Union, and Australia. However, evidence is emerging that Brownfield policy is being developed and applied in cities of Asia, Africa and in other global locations. Those applications include both the public health protection and strategic urban consolidation components of Brownfield activity which have been evident in the West. But as Wu & Chen, 2012 put it forward; it is clear that each city has a unique path which consists with the pattern of its physical (form) and social (institutions) structures. This unique contextual system affects the adaptation of technology and the governing practices for Brownfield regeneration. This provides a strong motif for this paper to look into the current practice of Brownfield development in the context of Dhaka, one of the emerging mega cities of Asia, where there is a lack of precedents exemplifying how the Brownfield development needs to be addressed in a city with acute land scarcity and high population density; where the local context varies to a great extent in terms of socio-economic and cultural complexities; and land use administration from the western precedents. In this regard, the case of Hazaribagh Tannery area, one of the prime industrial chunks at the densest heart of the city, has been investigated. Considering the highly toxic and polluting nature of its leather industries, Government of Bangladesh has decided to shift the tanneries from Hazaribagh to Savar. According to the established definitions, this area has been marked as a Brownfield and has created aspiring possibilities for sustainable urban regeneration of the area. This paper, thus, takes this opportunity to explore the possible policy and design approaches for intervening the detail design phase of the regeneration process based on the broader planning policies framed by different agencies and how the those policies formed the basis of a new way of looking into the regeneration process in this situation.

Methodology

This study has been a part of an urban design studio project of Architecture students of fourth year. A broader policy framework and master plan of Hazaribagh has been derived following an extensive field survey and based on the assumption that the leather industries have been shifted and the land is subject to regeneration. Later, each of the four segments of the study area has been approached through micro level design and policy decisions in terms of local community, land use and configuration, street network, landscaping and urban spaces. One of these four segments has been selected as a case for this paper. The unique features of this particular segment lie in its diverse mosaic of different land use and community; and its unique natural features such as an existing canal that has been derogated due to unplanned development. The research has been a combination of archival research, field survey and speculative design process.

Case study: Hazaribagh Tannery area

Location and History

Covering an area of 25 ha, Hazaribagh in the heart of Dhaka city is the centre of the entire leather industry of Bangladesh [Fig-1(a)].Hazaribagh tannery area falls under DPZ-8, Western Suburb-south; consisting of Ward no. 47, 48, 52 and 58. This area harbors one of the most poisonous and obnoxious (tannery) industry amid residential quarters in

Figure 1. a) Existing Landuse pattern of study area. b) The study area.

Fig-1 a)

Fig-1 b)
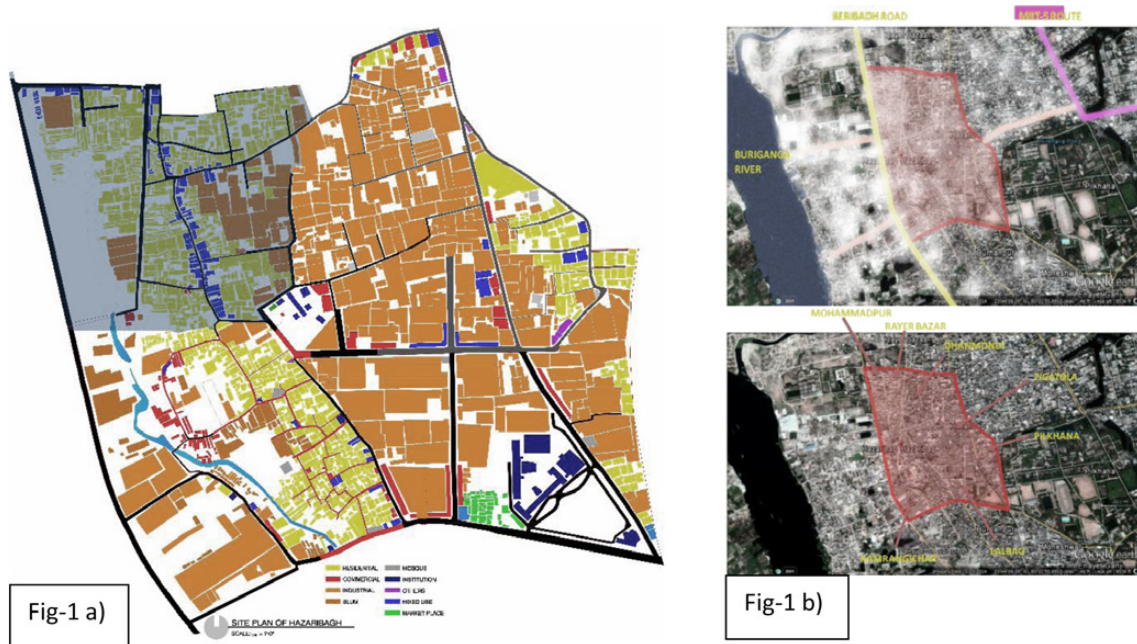
the south towards Nilambar Shaha Road. Nearly 149 tanneries of the 200 producers of leather and leather products are located in the Hazaribagh area (Haque et al. 1997). Tanneries in Hazaribagh were started in 1960 by Punjabi traders from what was then Pakistan. The industries grew and, after the independence of Bangladesh in 1971, became a 'cash cow' to earn foreign currencies (Khatun and Haque 1994; Haque et al. 1997). The urbanization pattern in Hazaribagh is organically evolved rather than imposed if we compare its growth with the adjacent planned areas.

[Fig-1(b)] shows the initial study area comprised of Hazaribagh tannery and its adjacent residential areas in a total of 3.94 sq.km. This parcel is connected to the other parts of Dhaka city through some major arterial roads. Hazaribagh lies to the west of Dhaka city which is surrounded by residential neighborhoods, except to the west where it is bounded by an embankment built in the late 1980s for flood protection. The tannery campus is surrounded by residences, except the southwestern part. More than 0.2 million people live adjacent to the tannery campus and 20,000 people are directly exposed to the hazards within the tannery complex (Asaduzzaman et al. 2002).

Land use and ownership pattern

The land use pattern of Hazaribagh is a clear evidence of how this area has choronologically evolved [Fig-1 (a)]. The development of the area is an accumulation of mostly residential and industrial areas along with some transitional uses like mixed use and commercial. The residential areas of Hazaribagh dominated by old and organic settlement, most of which are predominantly medium-rise buildings with narrow setback spaces in between used for pedestrian movement. The road network is full of narrow winding streets. There is a substantial number of residential plots under 2katha (1440 sft) that according to the Building Construction Act 2008, avails very little benefit in terms of buildable volume. The industrial area has large chunk of plots where majority of buildings are temporary structures with very few permanent ones. Within mixed used and commercial development schools, mosques, small and medium trades like fruit shops, barber and tailoring shops, tea stalls on the side of the streets, kacha bazaars are prominent.

The ownership pattern in this area shows an interesting amalgamation of freehold, leasehold and Government (khas) lands. The informal interview with some of the tannery owners revealed an interesting ambiguity regarding the ownership of the tannery lands.

city as organism|new visions for urban life

According to the owners, those lands are freehold whereas history of this areas settlement depicts these lands as leasehold. The residential lands are mostly freehold along with a belt of Government khas lands beside the west embankment road.

Open space and environment

Hazaribagh area has scarcity of green and open spaces. Most of the open spaces are covered with industry products or being used as a waste disposal ground; so most of the open and green spaces actually go under remediation when the evacuation of Hazaribagh Tannery will start.

The condition of water bodies (lagoons, ponds, and lakes) in Hazaribagh is deeply under peril and this condition is degrading on a daily basis. According to the Department of Environment, the tanneries discharge 22,000 cubic meters of untreated liquid toxic waste daily into the rivers, gutters and canals that run alongside in the roads of Hazaribagh. The north–south canal, which runs parallel to the flood control embankment (Fig. 3), is connected to the tannery runoff for ultimate discharge into the Buriganga River (Bhuiyan et al, 2010).

Socio-economic and cultural context

Old Dhaka is one of the densest settlement of Dhaka City and also it is the original part of present Dhaka metropolitan city. The southern part is entirely dominated by low-income settlements and slums interspersed with middle income groups; attached with tannery industry, thereby very much poorly serviced in terms of utility services. Excessive density (1028 ppa in 2001 and projected 1340 in 2007) in residential parts has given rise to congested building construction, unhealthy congested living pattern coupled with social crime and delinquency (projected total density of DPZ-8 is 310 ppa in 2007 which will rise 420 ppa in 2015). However, in spite of having tannery and polluted environment, Hazaribagh has a warm community bondage which is actually an inherited flavor from Old Dhaka and still in existence. Narrow, pedestrian dominated streets bounded by adjacent buildings in Hazaribagh gives a feeling of intimate social spaces. The street width at Hazaribagh varies from 3ft to 5ft to sometimes 12 to 15 ft, creating a good sense of enclosure and the quality of intimate urban space. These intimate spaces encourage and enhance the community and cultural activities at outdoor urban environment, which is also

sustainable for community spirit. The spaces in between and in front of the buildings are vibrant and provide many enclosed and short vistas, which make the streets, allies and other public space comfortable, satisfying and secure for assorted activities and to walk through (Mowla, 2002). In many part of the road, the original character of the neighborhood has changed due to new construction of tall buildings and obviously for tannery industries which are giving a completely contrast character to the spatial relationship of the area. Due to rapid urbanization, haphazard development is occurring within this indigenous pattern. The uncontrolled and fast changing character of the urban pattern is thus disruptive to the community structure.

The overall spatial pattern of Hazaribagh gives us the following observations -
• The actual socialization revealed through neighborliness and theoretically, neighborhoods are characterized by social homogeneity and tightly knit pattern of primary relationship (Nilufar, 1997). Thus, the linear mahalla represents strong sense of neighborly relation due to the same occupation, ethnicity and caste and creates social cohesiveness within the members.
• Mixed land-use pattern as working place along with living spaces also increases the belongingness among the inhabitants of the area which also enhances the social interaction.
• The narrow road pattern overcrowding with vehicles creates a chaos within the area that interrupts the age old street based socialization process.

Broader policy framework and responses

Study by UNIDO (2006) stated that the land left by relocating Hazaribagh tanneries will be in high demand for commercial office and residential development due to its location and ease of communication. This part is a summary of the broader policy frameworks extracted from the Details Area Plan, (DAP) for Dhaka (Fig.10) and the rest from the analysis of the above discussion. It also indicates the related responses derived through a workshop at the early stages of the studio that forms the basis of the later design interventions.

1) DAP proposed to keep this site vacant for 15 years for remediation.
Response: more precise legislation and regulations should be formulated to specify the suitable remediation techniques in the context of Dhaka. Moreover, there should be a clear guideline for phase wise development and clearly defined scope of work for different phases.
2) According to DAP, this DPZ shall undergo a "Land Readjustment Scheme" with 50% family's relocation process. With this sort of scheme the area might experience an Urban renewal which will enhance the land value and physical quality of the area. Middle income families from old Dhaka-east orDPZ-7 can be shifted or encouraged to settle down. Upgrading the existing land for house owners to settle down in planned residential neighborhoods has also been proposed.
Response: as it is assumed to be difficult to relocate the existing residential settlers during the remediation phase, this paper suggests retrofitting of existing physical condition (drainage, security) and afterwards land development through "land consolidation" approach, where owners of the plots below 1440 sft might be encouraged to develop collectively based on the strong kinship among them and take the advantage of existing F.A.R and improved road condition.
3) Among the urban planning guidelines, DAP proposes a number of new roads and widening of existing roads that will greatly facilitate internal circulation and access to main arterial routes like Sat-Masjid road and the road over western embankment.
Response: in spite of the proposed roads, conserving the socio-cultural and economic trends and essence of existing community is of utmost importance for a sustainable urban regeneration solution. Some of the unique features of Hazaribagh that needs to be preserved, irrespective of the proposed movement network, are the morphology of social spaces (pedestrian dominated movement network, social spaces within the narrow allies), the existing trade and commerce and an inclusive society with a variety income range.

4) DAP proposes to improve the existing haphazardly developed area (industrial or residential) through land pooling system which includes better serviced plots, utility, roads and other social infrastructure.

Response: a systematic inventory of the vacant industry building needs to be prepared to figure out the industrial heritage potential and the issue of liability. This paper strongly believes that the decision of whether the vacant industry buildings should be preserved or not should be guided by sustainability issues.

5) DAP proposes the Khals to be identified and recovered for proper change.

Response: the canal needs to be treated in the remediation phase along with landscape proposals. In the later phase, the canal might be revived through turning it into an economic belt of the earlier small and medium entrepreneurs, combined with affordable housing options for lower-middle income people in shop-house model.

Design and policy approach for a sample segment

Based on the broader policy decision in the workshop, the next step of the investigation was to achieve an in depth understanding of how to the micro issues of the settlement at Hazaribagh can be addressed through specific policy and design interventions. For limiting the scope of work, a particular segment (Highlighted portion in [Fig.1(a)] has been chosen to be worked out aiming to address socio-economic dynamics of local community, land ownership pattern, unique configuration of urban spaces and sustainable development approach.

This particular segment within the study area consists of an amalgamation of organically grown residential and industrial settlements and government khas lands, currently occupied with slums and squatters. Commercial development along the major streets is a commonly observed phenomenon in this part which is again a predominant character of old Dhaka. In a city where the development initiative is dominated by private developers, the residential plots have never been a lucrative option for either real estate companies or the plot owners themselves due to lack of accessible road network, poor infrastructure and unhealthy living condition induced by the toxic tannery industries. The resultant impact can be observed in the small household units with low rent, affordable for a vast array of people from lower to lower middle income people, forced to sacrifice the livability issues in daily life. However, the informal survey revealed that these people who are mostly engaged in the tannery industries are not eager to leave this place in spite of the fact that the tanneries will be shifted elsewhere. Thus the challenges that the authors needed to resolve are:

1) A socially sustainable design approach that will not evict the existing communities whose preference of location is based on its connectivity to the mass transit corridors; rather encourage a balanced mixture of different socio-economic groups.

2) Explore a realistic framework for land development and regeneration of social spaces within the community, keeping the social interaction pattern unharmed.

The concept in this regard has been, "A Communal Neighborhood within a Neighborhood Boundary" adopted from Christopher Alexander's "Pattern Language". A human group, with a specific life style, needs a boundary around it to protect its individualities from encroachments by surrounding ways of life. A boundary or cell wall of a community is just not a surface that divides inside from outside, but to preserve the functional integrity of its own. Also it provides a mass of transactions between the interior of the neighborhoods and surroundings.

Once the boundary zone is remark there can form a kind of public meeting ground, where neighborhoods come together. This boundary will control all of the land between neighborhoods the boundary lands because this boundary land is just to function commonly to all where people must find space. As a result, this boundary not only protects individual neighborhoods but also unite them in their larger developments (Ref).

With reference to the first broader policy in the previous section, the initial decision was to divide the total development in two phases. The first fifteen years dedicated for "Remediation & Retrofitting" and the later fifteen years for "Land Development and Place making".

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First Phase: Remediation & Retrofitting
    The decisions for the first fifteen years has been based on the assumptions that-
    - The production activities of the tannery industries will be entirely shifted to Savar and the land will be subjected to remediation.
    - The evacuated tannery buildings will be demolished or preserved based on their recycling value.
    - The proposed roads according to DAP guideline will take approximately15 years to be completed and to increase the development potential of the residential plots. Based on the above assumptions, following policy and design decisions have been drawn for this phase.

    Remediation
    - The mitigation of toxicity will be conducted through phytoremediation process, with close association with scientific experts. Phytoremediation is the use of special types of plants that are able to absorb or metabolize harmful chemicals from soil, sludge, sediment, groundwater, surface water, and waste water. Some of the local species that have been short listed for this process are sunflower and mustard. These plants also hold aesthetic potential to be used as a landscape element. This vegetation will be used in all of the tannery lands, canal and the strip of land between the embankment road and the canal.
    - The canal will be revived, treated and preserved through this phase.
    - The proposed 15m green belt of trees along the embankment road will be carried on with proper selection of species helpful for noise reduction, air filtration and visual aesthetic.

    Retrofitting
    - The toxic land subjected to remediation will be converted into eco-landscape by creating elevated walkway above the treated lands and small bridges above the canal which terminates into the 15m green belt, so that it adds a recreational value to urban life of the residential communities and becomes a easy movement network for bicycle riders and pedestrians.
    - Improving the living condition within the residential settlement by widening and improving the safety, security, comfort and vibrancy of the narrow pedestrian alleys mentioned in the previous discussions. One of the strategies to achieve these is to transform a portion of building ground floors into various types of shops to enhance people activity.
    - Designing an incremental land development scheme based on the existing Building Construction regulations and the pattern of social kinship.

Second Phase: Land Development & Place making
    While formulating the design and policy propositions at this stage, the aurhors were confronted with multiple challenges. Firstly, the freehold residential plots, difficult for Government to acquire through land pooling system; the natural urge of the plot owners to develop their lands into highrise apartment buildings after the infrastructure gets better, a fact that might prove harmful in way of preserving the age old spatial and social elements of the settlement; the strategies to create affordable housing opportunity for the lower and lower middle income people along with their informal trade and commerce; and finally the strategies to bind the newly developed land parcels, i.e. the canal strip and the evacuated industrial land with the existing residential settlement.

Land Development
    - The design approach here has been based on the concept of land consolidation. First of all, the residential plots of 2 katha and below (the plots that will not be benefited according to existing laws of F.A.R) have been identified and grouped into some hypothetical clusters by adjoining smaller plots. The condition that have been applied here is that each of the clusters must have one side adjoining a major vehicu-

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EXISTING PLOT OUTLINE   CLUSTERING PLOT OUTLINE   CLUSTER & NEIGHBORHOOD SPACE

In-between space   Pocket activity for   Individual sharing   Common sharing space
                     Dead end   space

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lar road.

- After consolidation, neighborhood spaces have been generated according to the concept extracted from "Pattern Language". The volume of the built form has been derived based on F.A.R calculation and on the conditions that-

A. Each building should get its own sharing space.

B. Two buildings share an in-between space.

C. Pocket activity is provided in dead zones.

D. A large common sharing space for several buildings (Fig.3).

Place making

- Ground floor of residential building will be converted into commercial spaces to promote public activities and surveillance at street level.

- A large chunk is marked for developing commercial facilities since a kacha bazaar named "bou bazaar" already exists here [Fig-4 (a)] .

- The revived and treated canal has been proposed with shop house style mixed use development on both sides of the canal consisting of trade hubs of small and medium enterpreneurs on ground level and affordable housing for low and lower middle income communities at upper levels. The flexible land development policy in case of Government khas lands on canal side has been utilised in this case.

- The canal has been conceptualised as a vibrant public hub with variety of shops and public promenade that will preserve and enhance the existing pattern of trades, strengthen the local economy; as well as, act as a vibrant recreational and cultural corridor for the local community [Fig.4 (b)].

Figure 4. a) Connectivity within alleys to alleys through ground floor and its proposed shopping vibrancy, b) Sectional analysis, c) analysis of 3dimensional space allocation.

Fig-4 (a)

Embankment   Community space for   Shops   Residence   Cannel   Cannel side activity
              housing dwellers

Fig-4 (b)

Embankment   Housing for   Mass Housing   Commercial   Park   Health
road   Lower income group   Educational &
                                                                       Cultural block

Fig-4 (c)
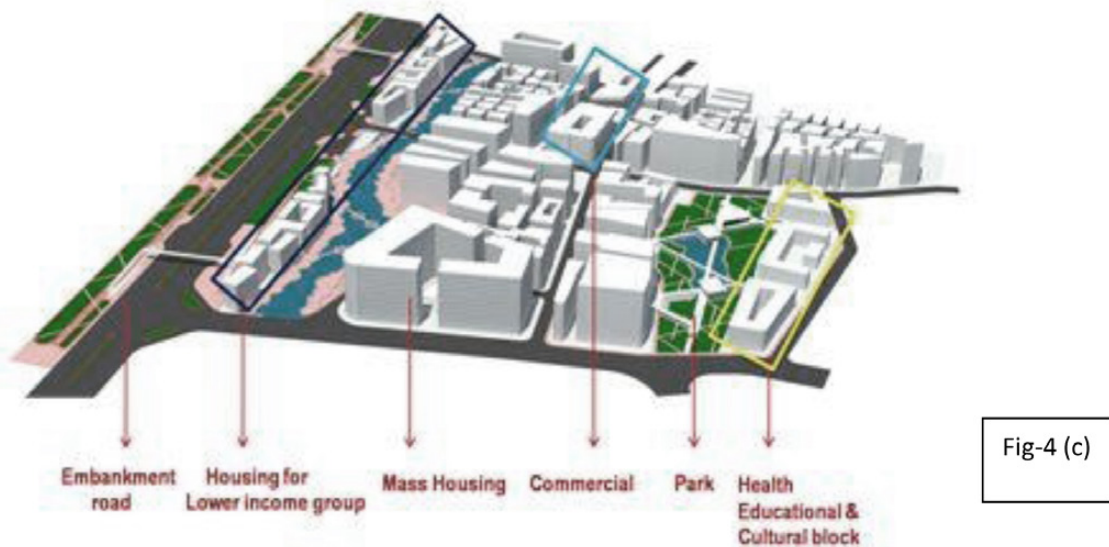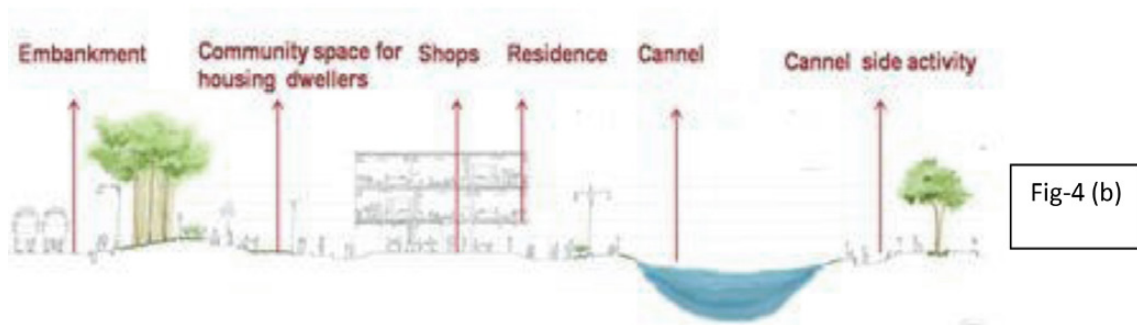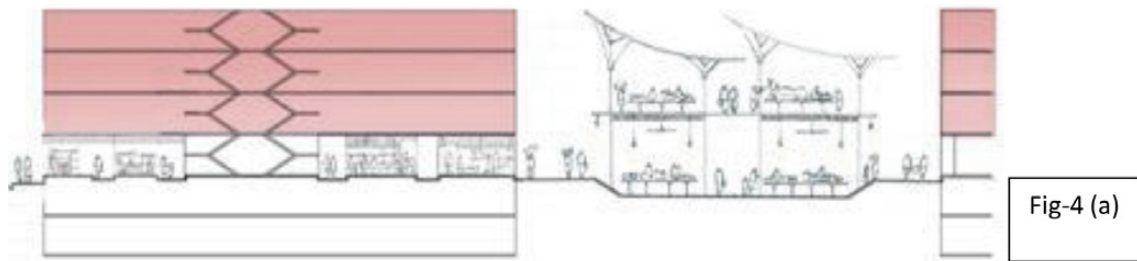
- The vacant tannery land will be converted as Community Park after remediation as the amount of open spaces in this area was negligible compared to the existing and the projected population density.

Conclusion

As a brownfield, Hazaribagh holds immense potential in terms of its strategically well connected location, geographical context and a diversified socio-economic and cultural context. The western precedents might pave the path to approach the regeneration process of this unique site at macro level, but the micro level decisions have to be evolved through sensitive understanding of place and people. This paper expects that the projected policies and design interventions will encourage urban practitioners to understand and approach the unique dynamics of Brownfield development and urban regeneration through different perspectives.

References

Alker, S., Sandra, J. (2000) 'The Definition of Brownfield', *Journal of Environmental Planning and Management*, Volume 43, Number 1, pp. 49-69(21).

Armstrong, C.S., (2007) The Social Construction of Brownfields, PhD Degree, University of Southern California.

Bashar, M.A., Hasan, M.N., Rahman, M.S., Hosen, M.F. (2002) 'Effects of addition of tilapia on the abundance of periphyton in freshwater prawn culture ponds with periphyton substrates', *Journal of Bangladesh Agricultural University*, ISSN 1810-3030, Volume 10, Issue 2, pp. 313–324.

Bhuiyan, M.A.H, Suruvi, N.I., Dampare, S.B., Islam, M.A., Quraishi, S.B., Ganvaglo, S., Suzuki, S., (2011) 'Investigation of the possible sources of heavy metal contamination in lagoon and canal water in the tannery industrial area in Dhaka, Bangladesh', *Environmental Monitoring and Assessment*, Volume 175, Issue 1-4, pp 633-649.

IEDC, (2008) *International Brownfields Redevelopment, Washington D.C., International Economic Development Council* (http://www.iedconline.org/?p=Brownfields_ Publications) accessed 28.6.08.

Mowla, Q. A. (2002) 'Emergence of Civic Space in Dhaka', *Plan Plus*, Volume 1, Issue 1, pp. 98-116.

Rosly,D., Rashid, A.A. (2013) 'Revitalizing Urban Development in Malaysia through the Implementation of Urban Regeneration Programme', *43rdAnnual Conference of the Urban Affairs Association 2013, San Francisco*, California, United States of America.

Smith,G., (2008) 'Contributions of Brownfield Development to Urban Internal Expansion and Urban Renewal in PracticeBrownfields Development', *44th ISOCARP Congress*.

Smith,G., (2010) 'Brownfield Planning: A tool for economically and socially effective sustainable urban development', Brownfield Development, *46th ISOCARP Congress 2010*, Nairobi, Kenya.

UNIDO, (2006) 'Director-General's Bulletin', *Evaluation Policy*, UNIDO/DGB(M).98.

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The great dimension housing complexes as a place for urban regeneration

Lorenzo Diana, Edoardo Currà, Carlo Cecere
Dicea, Critevat, SOSUrbanLab, Sapienza Università di Roma, Italy
Keywords: regeneration, density, social housing

Abstract

The large-dimension housing complexes in Rome have grown since the late '60s as a result of the 1st PEEP planning of 1964. The plan tried to face the large housing emergency caused by the rising urbanization (Albano, 2001). The peripheral areas of the city started to be filled with several neighborhoods in sharp break with the close urban fabric: high-density neighborhoods that for conformation and urban characteristics were placed in contrast to the existing compact city. This discontinuity is highlighted by urban scale designing approach, described by wide spaces for gardens and high speed roads, separating isolated great-size buildings.

Approaching the city as an organism in constant evolution in space and time (Piccinato, 1941) and composed of continuous additions and modifications (Rossi, 1966), these neighborhoods resulted immediately as amorphous objects, autonomous from the continuity of the existing city and isolated from the network infrastructure. Nowadays, after about forty years, they still live in strong isolation conditions, becoming the focus to look at for urban regeneration interventions.

The proposal article suggests a comparison between the great-size neighborhoods and the conventional compact ones by the analysis of different density data (floor area ratio, population density, cubic meter built on the covered area, green area ratio) in order to stress the morphological differences for the possibilities of transformation.

The transformability of some case of studies (CastelGiubileo, VigneNuove, Pineto, PrimaPorta, Torevecchia) are analyzed up to the building scale, through modeling correlating structural and technology performances with the morphological characters.

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Introduction

The housing emergency in metropolises, as Rome, raised up at the beginning of '60s as a consequence of the urbanization process. This key problem forced the public Authorities to play out some important urban decisions. The main objective was to realize a significant number of dwellings in order to move inhabitants from subaltern situations of slums that were arising in the peripheral areas.

In Rome, in 1994 the Administration proposed the 1st plan for social housing (P.E.E.P.): a plan for more than 700 thousands inhabitants.

As the plan was activated, several neighbourhoods, characterized by great size housing complexes characterized by conformations and urban characteristics in sharp break with the urban fabric of the existing compact city, gradually arose in the peripheral areas.

Approaching the city as organisms in constant evolution in space and time (Piccinato, 1941) and composed of continuous additions and modifications (Rossi, 1966), these neighbourhoods resulted immediately as amorphous objects, autonomous from the continuity of the existing city and isolated from the network infrastructure. This discontinuity with the traditional urban fabric is highlighted by urban scale designing approach, characterized by wide spaces for gardens and high speed roads that separate isolated great-size buildings.

By the comparison between these great-size neighbourhoods and the conventional compact ones emerge very clearly their morphological differences. The differences are stressed by the analysed density data, such as the floor area ratio, the population density, the coverage and the green area ratio. The results showed for great-size neighbourhoods low values for each density but significant values in terms of building concentration. This concentration and bigness often suggest low values of covered area and high values of green area ratio.

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The general urban conformation has important influences also at the building scale. The great size urban interventions influenced in fact the designing choices in terms of typology and construction. Some interventions, such as mega-structures, propose solutions in line with the international propositions of that time (the international movement of megastructures of the beginnings of '60s). In other cases, the great size of buildings are only a continuous repetition of typological standard solutions.

Nowadays, after about forty years, the 1st PEEP neighbourhoods still live in strong isolation conditions. The spaces intended for public gardens and parks are now untreated and abandoned. The buildings live situations of material decay and general social issues such as unemployment and precariousness enhanced by the global crisis. This widespread situation of emergency makes these districts a priority of the urban regeneration policies.

This necessity of regeneration is supported by the general morphological conformation of the urban design of these great size interventions. The great empty spaces available, often exceeding in terms of streets and parking, implies good chances for future transformations, such as little and conscious densifications intended for the reconnection with the nearby district, or intervention on the general environmental qualities by actions on the gardens and parks.

In some cases, also the conformation of buildings and their construction give the chance for potential transformations, in terms of densification of ground floors and change of use of the roof floors.

For the global revitalizing of contemporary suburbs, the great size housing districts result the ideal place where to activate urban regeneration projects.

1st PEEP urban analysis

The aerial view of the city of Rome shows an uneven distribution of the built environment among the various zones. It results impossible to identify just two different entities such as a compact centre and a scattered suburb. Most of the neighbourhoods follow each other, each one with its own urban features and its own characteristics in terms of shape and density.

What it is possible to notice very clearly is the sharp discontinuity, in many peripheral situations, between conventional compact neighbourhoods, made of well-defined fabric, with a match between buildings and the road network, and neighbourhoods that are above these dynamics. In these areas, buildings and roads are particularly disengaged from each other, with isolated constructions in large-green areas, connected by high-speed roads.

These districts are, more or less, the 1st PEEP districts (plan for economic and affordable housing).

The plan proposed the growth of the city by additional parts, crowding the central and the semi-peripheral districts, with an uneven fabric in relation with the compact ones. The 1st PEEP districts were characterized by a different scale design, where the architectural project moved toward a larger scale and become urban planning generating what are called "urban architecture".

The Plan of 1964, spurred by a strong demand for housing due to the processes of urbanization, envisaged more than 700 000 rooms on an area of 50 square km. The first interventions began in the late '60s. Following removals and variants, the Plan was reduced to 400 000 rooms. Despite the reduced realization in comparison with its original planning, it still represents an important part of the public housing of Rome (Albano, 2001). With 400 000 and more inhabitants settled on, the 1st PEEP ideally would stand at 7th place in terms of population among the Italian cities, in front of important regional capitals such as Bologna, Florence and Bari. It reaches a total of about 32 million cubic meters of residential housing. Adding the mc for services and trade, the total is just over 36 million cubic meters[1]. Computing variants and integrations, the plan arrives at 442 810 inhabitants. Several are the districts with more than 25 000 inhabitants, among these are cited: Tiburtino South, North, Casal dei Pazzi, Tor Bella Monaca, Laurentino, Spinaceto, Grottaperfetta[2].

An attempt to urban structure is denoted in some neighbourhoods, in the logic of creating an integrated system of infrastructures through the construction of public city, facilities and housing. An example of this is the system of the quarter north-east and south-east, where the city is really structured around the public districts. On the contrary in other cases, the interventions, even of large size, are dispersed and isolated both from each other and from the rest of the close districts.

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Nowadays, 50 years after its approval, the Plan has greatly reduced its importance, mostly in terms of council housing. Owing to the process of alienation of public propriety in fact, the number of dwellings administrated by the ATER (the public agency for housing) in 1st PEEP districts, passed from 41 394 to 23 672, with a reduction of 57%. However, the 23 672 accommodation still represent an important value. The regeneration of these 23 672 dwellings means trying to regenerate the whole city.

Density data and transformation

The isolation and the discontinuity with the close neighbourhoods were not unexpected consequences of designing choices, but clear planning wills. The new neighbourhoods were designed in fact with the intention of being isolated and autonomous entities, conceived as finished parts, as a complete portion of the city. In addition, the PEEPs' districts became the occasion to give an order to the development of the shapeless suburbs both regular and irregular, by the addition of formally concluded and functionally self-sufficient neighbourhoods with large number of accommodation, but also facilities and shops.

This difference between conventional and uneven neighbourhoods can be read by comparing the values of different densities, which also allows us to make considerations about their essential characteristics.

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[1]The cubic meters are calculated, as what has been done by Albano, multiplying the number of inhabitants per 80 cubic meters / inhabitants and the volume relatively non-residential attributing a share of 15% of the residential.

[2]All the date are taken from (Bossalino, Cotti, 2000).

Figure 1. 1st PEEP in Rome, population density and FAR.

N.	Piano di Zona	REALIZZAZIONI			DENSITA' ABITATIVA	FAR
		stanze (abitanti)	mc totali	superficie totale	ab/ha	SUL/St
1	Castel Giubileo	8,046	724,500	462,000	174	0.52
2	Fidene I	3,445	317,400	246,700	140	0.43
3	Fidene II	1,075	89,010	142,060	76	0.21
4	Serpentara I	8,690	803,300	445,750	195	0.60
5	Serpentara II	10,919	958,518	396,200	276	0.81
6	Valmelaina	15,800	1,308,240	1,214,250	130	0.36
7	Vigne Nuove	8,333	492,730	549,000	152	0.30
9	Prima Porta	4,551	440,000	725,000	63	0.20
10	Casal dei Pazzi	21,143	1,880,555	1,525,400	139	0.41
12	Rebibbia	9,663	864,956	728,600	133	0.40
13	Pietralata	11,380	407,000	850,450	134	0.16
14	Tiburtino Nord	11,048	758,037	1,112,070	99	0.23
15	Tiburtino Sud	37,000	3,309,893	1,875,100	197	0.59
16	La Rustica 1	1,132	104,550	77,800	146	0.45
16a	La Rustica 2	1,548	124,050	127,000	122	0.33
18	Arco di Travertino	2,074	154,386	366,350	57	0.14
19	Tor Sapienza	4,650	446,500	492,780	94	0.30
20	Ponte di Nona	6,651	532,730	666,000	100	0.27
22	Tor Bella Monaca	28,000	2,178,650	1,880,000	149	0.39
23	Casilino	10,903	999,480	403,200	270	0.83
25	Fontana Candida	3,523	324,110	392,000	90	0.28
27	Giardinetti	4,320	297,660	323,000	134	0.31
28	Torre Maura	4,000	367,792	362,000	110	0.34
29	Torre Spaccata Est	4,120	378,927	225,800	182	0.56
30	Torre Spaccata Ovest	2,112	259,000	83,000	254	1.04
31	Osteria del Curato 1	2,070	118,208	192,100	108	0.21
33	Quarto Miglio	1,107	104,038	29,800	371	1.16
34	Cinecittà	1,702	156,638	118,000	144	0.44
35	Cecafumo	930	85,600	20,900	445	1.37
35/a	Roma Vecchia	1,010	92,920	14,500	697	2.14
37	Ferratella	11,019	947,700	536,400	205	0.59
38	Laurentino	30,984	2,722,880	1,645,083	188	0.55
39	Grottaperfetta	28,791	2,630,497	1,315,560	219	0.67
40	Vigna Murata	16,860	1,548,874	842,250	200	0.61
46	Spinaceto	26,612	2,407,500	1,873,250	142	0.43
47	Tor de' Cenci Nord	9,670	875,303	688,400	140	0.42
53	Palocco	1,913	158,544	157,837	121	0.33
55	Ostia Lido Nord	6,987	621,825	644,000	108	0.32
57	Isola Sacra	970	72,824	82,300	118	0.29
59	Colli Portuensi Sud	6,978	567,616	250,000	279	0.76
60	Colli Portuensi Nord	3,392	312,103	339,243	100	0.31
61	Corviale	8,512	760,150	605,300	141	0.42
65	Pineto	4,375	400,000	179,440	244	0.74
67	Acqua Traversa Sud	672	53,760	161,200	42	0.11
68	Primavalle Ovest	8,945	262,799	731,410	122	0.12
70	Cortina d'Ampezzo	545	44,800	152,500	36	0.10
71	S.Maria della Pietà	1,238	102,440	213,500	58	0.16
72	Ottavia Nord	2,137	160,168	204,500	104	0.26
	TOTALE	**401,545**	33,729,161	26,668,983	**151**	**0.42**

N.	Piano di Zona	REALIZZAZIONI			DENSITA' TERRITORIALE	FAR
		stanze (abitanti)	mc totali	superficie totale	ab/ha	SUL/St
	VARIANTI SINGOLE					
15bis	Tiburtino III	4,073	376,248	322,200	126	0.39
74	Torrevecchia 1	3,652	320,000	244,624	149	0.44
79	Casette Pater 1	130	11,360	8,153	159	0.46
81	Quarticciolo	718	62,385	57,680	124	0.36
83	La Lucchina	4,541	327,410	440,000	103	0.25
	TOTALE	**13,114**	1,097,403	1,072,657	**122**	**0.34**
	VARIANTI INTEGRATIVE					
1V	Cinquina	2,290	158,865	327,250	70	0.16
2V	San Basilio	2,500	202,000	255,000	98	0.26
3V	Settecamini	1,740	142,400	116,000	150	0.41
4V	Casale Caletto	2,960	243,150	316,000	94	0.26
10V	Acilia 2	8,532	711,380	627,618	136	0.38
11V	Dragoncello	1,900	143,250	271,400	70	0.18
12V	Acqua Acetosa	2,126	160,120	339,000	63	0.16
13V	Quartaccio 1	2,433	199,050	303,460	80	0.22
14V	Portuense	1,900	157,320	322,800	59	0.16
15V	La Pisana	1,770	146,556	177,000	100	0.28
	TOTALE	**28,151**	2,264,091	3,055,528	**92**	**0.25**

N.	Piano di Zona	REALIZZAZIONI			DENSITA' TERRITORIALE	FAR
		stanze (abitanti)	mc totali	superficie totale	ab/ha	SUL/St
	TOTALE complessivo	**442,810**	37,090,655	30,797,168	**144**	**0.40**

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Figure 2. FAR values for same important neighbourhoods in Rome.

QUARTIERE	FAR
Batteria Nomentana	2.91
Piazza Bologna	2.91
Don Bosco	2.73
Prati	2.71
Balduina	2.56
Re di Roma	2.38
Campo Marzio	2.18
Esquilino	2.13
Centocelle	2.02
Garbatella	1.92
Cassia	1.23
Labaro	1.17
Montesacro	1.15
Pigneto	0.99

Some studies on density (Reale, 2008) show the FAR values of some different areas of Rome. The Floor Area Ratio (FAR) provides the value of the ratio between the sum of the gross floor area of the different stages of an intervention and the surface on which this gross floor area rests on.

Table 1 and Table 2 show the values of FAR for the interventions of 1st PEEP and for the traditional neighbourhoods of the compact city.

An usual error is to mix up the concept of density and concentration. This distinction becomes very important in analysing the model of town proposed by the 1st PEEP districts. The 1st PEEP interventions in fact present low values of density but a high concentration of few great size buildings in which are condensed all the planned cubic content.

In conclusion, both in terms of FAR and population density, the 1st PEEP city does not turn out to be the high density city as often is defined. The only data that results to be high is the value of land density: the ratio between gross floor area of different stages and the land area of the different built lots. This data does not provide information on the total of the neighbourhood but exclusively on the nature of the different buildings that, as said before, in the 1st PEEP interventions are of great dimension (tall or long to be).

The compact neighbourhoods, from the centre to the suburbs, show values of FAR higher than the 1st PEEP ones. It is possible to identify (table 2) very high density areas such as: Batteria Nomentana (2.91), Piazza Bologna (2.91), Don Bosco (2.73), Prati (2.71). Then there are the high density areas: Balduina (2.56), Re di Roma (2.38), Campo Marzio (2.18) and Esquilino (2.13). The medium-high density neighbourhoods are: Centocello (2.02), Garbatella (1.92), Cassia (1.23), Labaro (1.17), Montesacro (1.15). The last area of the table is Pigneto with a medium value of 0.99 FAR[3].

On the contrary, the different 1st PEEP interventions reach lower values of FAR, with medium-low and low density. Almost all the districts show values between 0.10 FAR (Cortina d'Ampezzo) and 0.83 (Casilino 23). Overall, 47 districts are low-density districts, with FAR less than 0.50. Among these cases it is possible identify particularly populated cases such as: Valmelaina (FAR 0.36 - Population 15,800), Casal dei Pazzi (FAR 0.41 - Population 21,143), Tor Bella Monaca (FAR 0.39 - Population 28,000), Spinaceto (FAR 0.43 - Population 26,612).

Such a clear difference lies in the own characteristics of the model proposed by the discontinuous city. In fact, the settlement model proposed by 1st PEEP provides big surface interventions in which all the cubic content is condensed in few big buildings with a high amount of free land for traffic infrastructure and public green areas. Buildings,

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[3]The different "density groups" might be collected: < 0.5 low density, 0.5/1 medium density; 1-3 high density; > very high desinty.

Figure 3. Coverage in 1st PEEP.
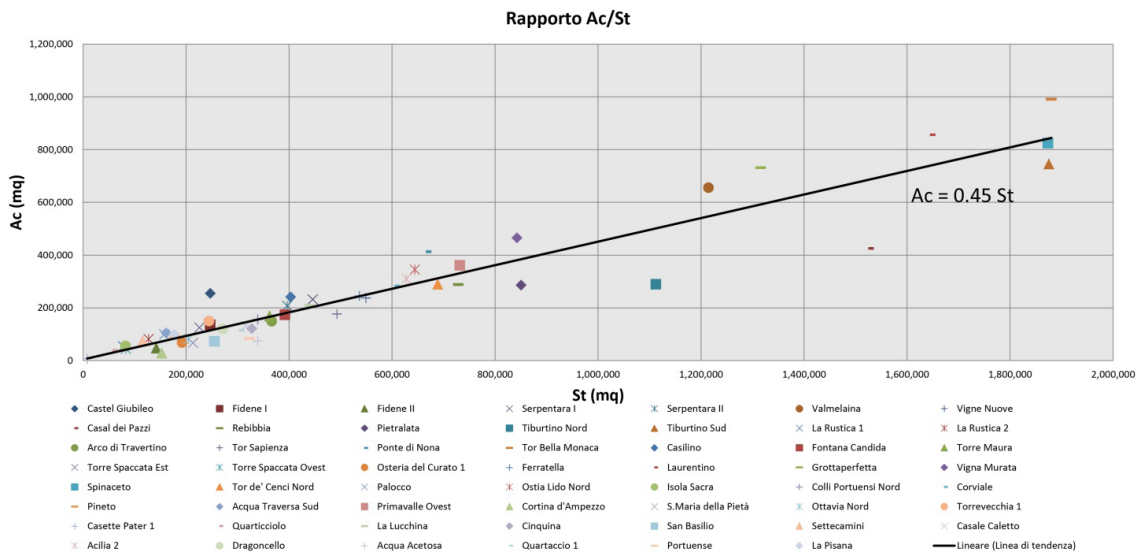
observing the precepts of modern architecture, result isolated entities among trees and meadows, with free access to natural resources such as wind and sun.

However, low density values do not directly guarantee availability of spaces for green or streets. On the contrary, low density values are synonymous with widespread interventions of small dimensions (such as single family houses or low height housing) according to the logic of sprawl, that means little spaces for public areas. Therefore, it is necessary to cross the density data with the values of the covered area in order to understand the urban morphological features and the availability of free space of the neighbourhoods analysed.

Graph 1 shows the coverage values. The coverage is the relationship between the ground floor area of enclosed buildings and the area of the interventions. In 1st PEEP district, the average value for coverage is 45%. It means that little less than half area is built, while 55% of the total surface is free. The cases of Casal dei Pazzi and Tiburtino Nord have the lowest values, 28% and 26% respectively.

The low value of coverage means that there is a lot of free space. Generally, this space is largely dedicated to public green areas rather than to streets and parking. The average value of green areas on the total free area in fact is 64%, meaning that more than half of the free area is dedicated to public green (graph 2). The case of Casal dei Pazzi, already cited for the low coverage, also has a green area value of 86%. Other important cases are: Spinaceto (green/free area 71%); Tor de Cenci (green/free area 74%); Corviale (green/free area 80%).

In conclusion, it can be stressed that the approach to the new city carried out by planners and designers of the 1st PEEP was radically opposite to that of the conventional city. Basically, there was the desire to create finished and independent parts of the city having high quantities of green and network of expressway in order to isolate the buildings as monuments in the urban landscape.

Nowadays, the economic difficulties of the administration reduce the chance of standard maintenance and conservation of green spaces and buildings, generating a widespread state of neglect and decay.

However, the presence of such extensive green areas is an important natural potential resource, especially in prevision of possible environmental regeneration programmes. The green areas in fact could be environmental high quality elements, taking shape as lungs to contrast the phenomenon of urban heat island.

Figure 4. Green area ratio in 1st PEEP.

Rapporto Verde/Area libera

Verde = 0.65 Area libera

Area libera (St - Ac)

◆ Castel Giubileo	■ Fidene I	▲ Fidene II	✕ Serpentara I	✳ Serpentara II	● Valmelaina	+ Vigne Nuove
━ Casal dei Pazzi	━ Rebibbia	◆ Pietralata	■ Tiburtino Nord	▲ Tiburtino Sud	✕ La Rustica 1	✕ La Rustica 2
● Arco di Travertino	+ Tor Sapienza	━ Ponte di Nona	━ Tor Bella Monaca	● Casilino	■ Fontana Candida	▲ Torre Maura
✕ Torre Spaccata Est	✕ Torre Spaccata Ovest	● Osteria del Curato 1	+ Ferratella	━ Laurentino	━ Grottaperfetta	◆ Vigna Murata
■ Spinaceto	▲ Tor de' Cenci Nord	✕ Palocco	✕ Ostia Lido Nord	● Isola Sacra	+ Colli Portuensi Nord	━ Corviale
━ Pineto	◆ Primavalle Ovest	■ Cortina d'Ampezzo	✕ S.Maria della Pietà	✕ Ottavia Nord	✕ Torrevecchia	✕ Casette Pater 1
+ Quarticciolo	━ La Lucchina	━ Cinquina	◆ San Basilio	■ Settecamini	▲ Casale Caletto	✕ Acilia 2
✕ Dragoncello	● Acqua Acetosa	+ Quartaccio 1	━ Portuense	━ La Pisana	━ Lineare (Linea di tendenza)	

In a logic of global regeneration of the suburbs, PEEP neighbourhoods assume an important role because of their morphological conformation, with the concentration of the cubic content in few isolated buildings: the free areas, compared to the covered areas, account for more than half of the total area, guaranteeing the possibility of operating interventions of regeneration with a greater degree of freedom.

It does not mean that the regeneration interventions should necessarily provide the realization of further buildings and the mineralization of the green. Certainly, the large availability of space guarantees both the freedom to operate relocation in temporary buildings located into the empty areas and the freedom of movement for the proper functioning of the construction site. The densification interventions through the construction of new residential units should be planned according to the actual housing demand and the standards availability. These interventions would not just guarantee an housing offer but would act as elements of reconnection with the neighbouring district.

Typology and transformation

In particular, in a logic of regeneration that takes into account environmental aspects and the soil depletion, the possibility of densification should look at interventions on existing buildings, which for the own morpho-typological features are willing to undergo successful transformations.

The susceptibility to transformation of the 1st PEEP building stock depends on the typical features of great dimension housing. The great size housing represents the main mode of development of the 1st PEEP interventions. In the vast majority of cases, few buildings, particularly high or long, collect all the cubic content of the whole neighbourhood. The average building of all the 1st PEEP intervention is 17,000 cubic meters, a higher value than conventional peripheral buildings such as apartment houses or tower blocks. The highest value is the one of Corviale with 33,000 cubic meter per building.

Such a model became an efficient solution for the reduction of construction, management and urban services costs and for the chance to realize a significant number of dwellings aimed to face the huge housing emergency of that time. In an unconditional way all the interventions were oriented to the great dimension. The Public Authorities tried to introduce prefabricated components in the construction process, assuming to be able to control the quality of constructions and the relative costs and progress. This hap-

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pened only in a smaller part than expected, generating several malfunctions, leading to delays and cost rises and to poor realization from a construction point of view.

From a typology point of view, the great dimension housing turned out to be an interesting chance for the involved designers to realize interesting experimental solutions, proposing even megastructures projects. The 1st PEEP in fact became a notable period for the Italian architecture, an important typological laboratory. A residential megastructure is a building at high density characterized by: a functional mix (residential, commercial or services spaces); a separation of vehicular and pedestrian flows; open and closed common areas; a modularity and articulated repetition of the housing system; a typological integration between different modules; a structural monumental trestle in which the accommodation fit in a smaller scale; a relationship of collision with the site topography; a self-referentiality of the sign that exclusively identify them (Banham, 1973).

The large size housing gave/inspired designers the urge/impulse to undermine the concept of standard typological aggregation between the different housing units. Often, the aggregation in plan and elevation of the various dwellings were planned in a totally/completely alternative way to the conventional solutions. In the whole building entity, designers tried to go beyond the standard designing approach based on schematic repetition of standard models. Some interventions in particular tried to propose a varied supply of dwellings, with different surfaces and forms, added up without repetitiveness.

Another experimental element in some cases is the morphological and functional organization of the spaces on the ground floors and roof tops which are characterized by the presence of articulated paths and common areas, well identifiable in the global system. Furthermore, the inclusion of residential services was a major step forward the integration between the housing and urban context, that tried to relate the private space of the house with the public of the city.

In the end, within the complex of great size 1st PEEP interventions, there are two different sets of buildings: the mega-structures and the standard big buildings. Overall in megastructures a greater predisposition to transformation is found compared to cases of standard type, becoming the preferred complexes on which to focus the interventions of urban regeneration at the building scale.

In Pineto and Vigne Nuove cases, two of the roman megastructures together with Corviale and Laurentino, the incidence of space on the ground floors and roofs, originally destined for common functions and today used improperly or abandoned, stand respectively for the 30% and 21% of the whole residential surface. These spaces are ideal for the temporary relocation of tenants in the organization of the intervention of retrofitting. It must be stressed that these values are higher in relation to the other standard cases analyzed, such as Prima Porta and Torrevecchia[4], that arrives at 9% and 8%. Two other indexes fundamental for transformation evaluation are the possibility of installing solar panels on the roof floors, and the average height of common spaces. Both indexes in megastructural cases are higher. In Pineto and Vigne Nuove, the index of free space for solar panel at the roof tops is 62% and 46% of the total roof surface. In the conventional cases such as Castel Giubileo, Prima Porta and Torrevecchia this value does not reach 40%. The average height of common spaces, in Pineto and Vigne Nuove is 4.01 m and 2.87 m. The index provides information on the chance of intervening with change of use or technological implementation of the slabs. The non-megastructural cases does not reach 2.80 m.

At the current state of material decay of buildings, the operations at the building scale are necessary. In most of the cases, the interventions date back to '70s and '80s, period when prefabricated techniques and rationalization of construction processes started to be experimented. Nowadays, these prefabricated construction elements are no longer able to guarantee acceptable comfort level due to the general material decay. For instance, the general energy consumption results very high specially because of the poor performances of the casing materials.

[4]These cases of study are analysed in "CRI_TRA: an integrated approach to the evaluation of critical issues and potential transformation of public social housing", Lorenzo Diana PhD thesis. Further information on CRI_TRA method in (Diana , 2015b).

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Building deficiencies are not limited to the energy and environmental performances. Important critical issues are also connected to structural problem, above all related to the seismic risk. Overall, it is the global supply to be poor, unable to meet the contemporary demand, not the least those of typological nature and size of dwellings. The size of the public accommodations, specially 1st PEEP ones, is referred to a model of 40 years ago family unit which is extinguished by now, in favour of single-parent families or young couples. Also with regard to the internal distribution, existing dwellings shows a straight separation between different zone of the accommodation, with an important weight of the connection elements with respect to more open models that guarantee better flexibility in use.

In the end, great size public housing regeneration should be a muti-scalar process, starting from a global urban level arriving at the building scale. Thanks to their extension and diffusion, the regeneration of great size neighborhoods, , could stimulate the general regeneration of suburbs.

Conclusion

The cross-reading of different data density as well as the knowledge of the features of buildings which are part of the great size public social housing asset and the mapping of their critical issues may help Public Authorities which are interested in urban regeneration to identify the ideal place where intervene.

In conclusion, several reasons encourage us to look at the large size city as the place to address the interest of the urban regeneration. Some reasons are referred to the category of the "need", those connected to the raised critical issues, and other fall into the category of "possibility", those related to the predisposition of urban fabric and buildings to undergo interventions of regeneration.

The main critical issues stood in the general state of abandon of the buildings and public spaces, characterized by material and performance decay of constructive elements and widespread state of neglect of green public areas and squares. In addition to this, the complex supply of this type of neighbourhoods fails to intercept the instances of the contemporary demand, especially in terms of type, shape and number of dwellings.

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From the transformation point of view, the main features are those concerning the form and nature of the urban fabric and, at a more detailed level, relating to the typological nature of the residential complexes. The concentration in compact and big buildings of the total cubic content settled leaves ample free spaces on which it is possible to intervene both through minimum densification and volume zero. These last would aim to enhance the green areas, by the realization of urban parks and the protection of green lawns and gardens, in a global logic of reduction of the heat island phenomenon.

Regarding the typological aspects, the conformation of the complexes of large size provides good chance for effective regeneration interventions, especially in megastructural cases, where in the ground floors and roofs the presence of extra-residential function spaces ensure possibility of transformation, change of use and densification with minimum land consumption.

As a whole, for its extensiveness and spread, the great size city is the ideal place to look at for sustainable suburbs regeneration that could stimulate virtuous processes also for the nearby neighbourhoods.

References

Albano, A. (2001) *Roma il piano e i piani. Residenza pubblica e integrazione urbana* (Gangemi Editore, Roma).
Astengo, G. (ed.) (1988), Piccinato, L. (1941) *La progettazione urbanistica. La città come organismo* (Marsilio Editore, Venezia).
Banham, M. (1980) *Le tentazioni dell'architettura: megastrutture* (Laterza Edizioni, Roma)
Bossalino, F. and Cotti, A. (2000) *Roma anni novanta* (Sapere 2000, Roma).
Diana, L. (2015a) 'CRI_TRA: an integrated approach to the evaluation of critical issues and potential transformation of public social housing', unpublished PhD thesis, Sapienza

University of Rome, IT.
Diana, L. (2015b) 'Metodo CRI_TRA un metodo di valutazione comparativa delle criticità e della trasformabilità edilizia del patrimonio residenziale pubblico in Italia', in Fattinnanzi, E. and Mondini, G. (eds) *L'Analisi Multicriteri tra valutazione e decisione* (DEI Editore, in press).
Piroddi, E. (1966) 'La 167 e i problemi del town-design', *Rassegna dell'Istituto di architettura e urbanistica*, A.II, N.6 (Università degli Studi di Roma, Facoltà di Ingegneria, Istituto di architettura e urbanistica).
Reale, L. (2008) *Densità, città, residenza. Tecniche di densificazione e strategie anti-sprawl* (Gangemi Editore, Roma).
Rossi, A. (1966) *L'architettura della città* (Marsilio Editore, Padova).
Tentori, F. (1991) 'L'architettura urbana in Italia', *Rassegna di architettura e urbanistica*, A.XXV, N.73/74/75 (Edizioni Kappa, Roma).

Harmonious or Monotonous: Urban Regeneration and the Form of Contemporary Urban Landscape

Mohamed M. Fageir Hussein
Department of Architecture and Built Environment, University of Nottingham, University Park, Sustainable Research Building, NG7 2RD, Nottingham, UK
Keywords: Liverpool, urban regeneration, urban landscape, heritage, urban design

Abstract

The regeneration of urban environment is one of the key urban planning and design issues nowadays. Urban regeneration has become a widely accepted tool for restoring a city's economic, social and physical fabric (Sykes and Roberts, 2000). However, the stories of success of many regeneration schemes around the world have led many cities to underestimate the enormous challenges and complexities of urban regeneration. One of the key areas of debate amongst academics and professionals alike is the impact of urban regeneration on the form of city and whether this impact will result in harmonious or monotonous urban landscape. This paper aims to enrich this debate by studying two of the key regeneration schemes in the city of Liverpool. The two schemes are the Paradise Street Development Area PSDA (now branded Liverpool One), and the recently proposed 5.5bn skyscraper waterfront scheme 'Liverpool Waters'. Although the two regeneration schemes do have a lot of similarities, in fact, they undertook completely different approaches of regeneration and consequently different urban forms. However, by studying and comparing these two cases, this paper provides a better understanding of the complexity of the issues that undermine the form of the contemporary urban landscape and how best to approach urban regeneration. It is argued also that there are no specific models or approaches that can create a harmonious urban landscape; nonetheless, what is important is ensuring the complexity and the inclusiveness of the process of regeneration which will result in a more distinctive, imaginative and genuine contemporary urban landscape.

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Introduction: The Complexities of Urban Regeneration

Urban regeneration has become in the past few decades a major concern for academics and critics (Atkinson and Moon, 1994, Blackman, 2013, Colquhoun, 1995, Evans, 1997, Sykes and Roberts, 2000, Tallon, 2013, Tarn, 1985). Urban regeneration can better be understood as tool for better management of urban transformation. Roberts (2000, p. 17) defined urban regeneration as "*a comprehensive and integrated vision and action which leads to the resolution of urban problems which seeks to bring about lasting improvement in the economic, physical, social and environmental condition of an area that has been subject to change*". From this definition, comparing urban regeneration with other urban policies such as urban renewal or redevelopment, it is very clear that urban regeneration goes beyond their aims and aspirations. Urban regeneration focuses on achieving long-term, more strategic and sustainable outcomes. Urban regeneration is also inherently complex process as urban problems and opportunities are unique and thus approaches to urban regeneration are unique to their context and time. There are also no two cities are expected to have exactly the same approach of regeneration. However, studying the urban regeneration is key to learning about this process.

A fundamental matter that influences the practice of urban regeneration nowadays is the issues of globalisation and urban competitiveness. Understanding globalisation is essential to address the issues of urban regeneration. Urban areas are now viewed as economic assets rather than liabilities which reflected in the huge investment in urban areas and the growing attraction of urban life (Tallon, 2013). Bognár (1997) pointed out that with the new conditions of globalisation, cities seeks to acquire more competitive advantages over their regional, national and global counterparts while they are connected with each other and working as a unified network of urban settlements. In this environment, the main task of urban regulators is to create urban conditions that is adequately attractive to lure potential corporations, to attract investment and to improve and safeguard the city's economic prospects (Beriatos and Gospodini, 2004). These new conditions of globalisation has completely change the way cities is working, Gospodini (2002, p. 60) stated that "*in the era of globalization, the relationship between urban economy and urban design, as established throughout the history of urban forms , seem to be being reversed. While for centuries the quality of the urban environment has been an outcome of economic growth of cities, nowadays the quality of urban space has become prerequisite for economic development of cities; urban design has undertaken an enhanced new role as a mean of economic development*". However, the impact of globalisation on the form of the emerging urban landscape is very contentious. Madanipour (2006) indicated that while the improving competitiveness of cities is the way to economic prosperity, it has resulted in monotonous places, dislodging local identities and blurring the individuality of place. Similarly, Beriatos and Gospodini (2004) argued that in the context of moving towards supra-nationality within the European Union, however, this has resulted in blurring national identities and place identity has become an issue with significant importance for all societies. On the other hand, Dredge and Jenkins (2003) pointed to the role played by economic globalisation in enhancing the identity of place with the aim of promoting the place, attracting investment and increasing the market share.

In this context, the issues of globalisation has manifested in urban regeneration in the tension between heritage conservation and development. Within a city, historic quarters are more likely to receive regeneration more than other less historic areas. The greater the authentic character and sense of place means more possibility there will be efforts to conserve and regenerate. However, Tiesdell et al. (1996) noted that the motives of those who aim to regenerate historic quarters are expectedly to be different from those initial conservationists who bring these quarters into public awareness. Thus, a conflict can arise between anxieties of conservationists who seek to limit change, and regeneration which seeks to accommodate necessary economic and social change. This paper aims to enrich this debate by studying the process of two of the key regeneration schemes in Liverpool. By studying and comparing these two cases, this paper intends to provide a better understanding of the complexity of the issues that undermine the form of the con-

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temporary urban landscape and how best to approach urban regeneration in order to obtain a harmonious outcomes. The following section will briefly introduce the city of Liverpool and the two regeneration schemes. This will be followed by more comprehensive account for the process of regeneration of the two schemes. The final section extracts key lessons and conclusions.

The City of Liverpool:

Liverpool, the core city of the Merseyside in the North West region of England, is known historically as the second city of the British Empire for its significant contribution as a port city to the world trade. The city has experiences extremes of growth and decline. The prosperity of the city was apparent in a number of architectural masterpieces such as the Three Graces of Liverpool, the development and the innovation of the city's docklands, and other pioneering infrastructure such as public parks and railways. Recently, large portions of the city waterfront and downtown have been inscribed by UNESCO as a World Heritage Site WHS for its 'Outstanding Universal Value'. Unfortunately, the growth of the city did not continue. The city had declined sharply during the first half of the twentieth century. However, the regeneration of Liverpool has become a top priority for the national government in the 1980 when the national government established the Merseyside Development Corporation. As yet, the regeneration of the city is continuing with significant regeneration projects on the city's downtown and waterfront. This study focuses on two of the key regeneration schemes, namely, the Paradise Street Development Area PSDA and Liverpool Waters. The first is a regeneration scheme that aimed to bring the city centre of Liverpool into effective use and the second is a skyscraper scheme on the northern waterfront of the city with the aim of attracting transnational capital into the city (Figure 1). Each of the two projects, in fact, has emerged from a slightly different context and undergone different regeneration approach which consequently resulted on the production of completely different urban forms. The two schemes will be studied in the following two sections. The discussion will focus on the evolution of the projects and their impact of the urban landscape from stakeholders' point of views. Table 1 summarises the key features of these regeneration schemes.

The Paradise Street Development Area PSDA

Figure 1 shows the vital location of the PSDA in Liverpool. Historically, this area has been bombed totally in the 1941 and became redundant creating a big vacuum dividing the city and its historic waterfront. An inner city ring 'The Strand', a bus station, a hotel and office building with ground floor parking had been developed after the war by the powerful local authority guided by post-war urban design thinking. In the 1990s, the Paradise Street area was a disconsolate zone that linked the regenerated area of the Albert Dock, the business district, the Ropewalks and the shopping streets.

The regeneration of the PSDA coincided with the national government inclination towards reinforcing the role of cities and adjusting peoples' perception of urban life which was manifested in adopting the Urban Renaissance agenda[1]. Biddulph (2011) pointed out that two elements have derived the regeneration of the Paradise Street area, the first, the availability of the European Objective One fund to the city as a result of its status as one of the weakest performing regions in Europe; the second, the changes in urban governance from traditional managerial to entrepreneurial as a respond to the issues of globalisation and interurban competition. The PSDA prolonged from 1999 until its completion in 2008, the year that Liverpool was celebrating the European Capital of Culture ECoC.

[1]In 1998 the national government set up the Urban Task Force led by (Lord) Richard Rogers to establish a vision for urban life that will bring people back into cities. The year after, the outcome was published in the 313 pages report, Towards an Urban Renaissance which established a vision for regeneration based on the principles of design excellence, social well-being, environmental responsibility and a viable economic and legislative framework.

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Figure 1. The locations of the two regeneration schemes and their surroundings. Source: Flashe-arth maps modified by the author.

1 Paradise Street Development Area PSDA
2 Liverpool Waters
3 Pier Head Waterfront
4 Albert Dock
5 Ropewalk
6 Liverpool Business District

city as organism | new visions for urban life

Table 1. A summary of the PDSA project and Liverpool Waters Project. Source: the author.

The Scheme	Developer	Size and cost	Status	Key Stakeholders	Description
PSDA	Grosvenor + Liverpool City Council	42 acres, £1 billion	Completed	Grosvenor, Liverpool City Council, Liverpool Vision, CABE, English Heritage, UNESCO, local civic societies	A mixed-use development predominantly retail
Liverpool Waters	Peel Holding	148 acres, £5.5 billion	Started, 30 years project	Liverpool City Council, CABE, Liverpool Vision, English Heritage, UNESCO, local civic societies	A mixed-use development predominantly offices and business

The rescue and the regeneration of the PSDA were vital for two reasons. First, to re- join back the different zones of the city and, second, to expand the city retail quarter and bring the city back to its status as the UK top five shopping destinations in 1970s. Furthermore, Liverpool City Council commissioned a private consultant to study the city centre retail provision; its retail offer, function and future offer. The study concluded that the city is in short of 100,000 m^2 of a new major retail development to protect the city vitality and viability in the long-term. The study also suggested that the area around the Paradise Street will be most suitable for this new retail quarter (Parker and Garnell, 2006). Another key element that has considerably influenced the design of the scheme was the general national and local inclination towards the idea of place making and urban design. The city specifically conducted an urban design study in 1999 for the PSDA which has established the guidelines for the new development.

In 2000, a proposal by the architect Philip Johnson for a large shopping mall hidden inside futuristic membrane of roof superstructure was proposed. The mall contained a bus station and links the shopping area with the Albert Dock. The City Council despite the significance of the design in terms of form, it did not see it adding to the wider regeneration of the area and rejected the proposal. Biddulph (2011) argued in theory it is iconic building with a star architect in which the city in theory should be delighted to accept, yet, the city reacted differently by rejecting the design because it did not carry wider benefits for the city. This shows that the city was very much driven to embrace the urban design agenda. It also shows that the city did not want simply a mall which self-contained, inward facing which would sit distinctively in superb isolation rather than a development that would be an integral part of the city and links the different parcels of the city all together (Interview with Michael Parkinson, planner and academic, 2013).

Around the same time, the city started to make its vision into reality by announcing the city interest to appoint a developer for the PSDA. A total of 47 developers expressed their interest; they were all encouraged by the changes in the local politics and the city strong determination to go ahead with a radical transformation. Later, Grosvenor was selected from six shortlisted developers after a tough and hard competition that was attended not just by the city but by other agencies such as Liverpool Vision, Mersey Travel and English Heritage. The selection of Grosvenor was very much praised by stakeholders as the company shared the same vision of the city, their ability to deliver a high quality development, and their long-term investment.

Grosvenor appointed the BDP Masterplanners and other consultancy firms to turn the aspiration of the brief into a detailed masterplan. The main aim of the masterplan was that the scheme should help to reconnect the city with its waterfront, besides acting as a hub for pedestrian to the adjacent areas of the Ropewalk and Business District. The massive scale of the project was the largest challenge for the developers. The masterplan tries to modulate the scale and the grain of the development, building up from the

smaller, more intimate streetscape of the Ropewalk to something of the magnificence of the Pier Head. This has resulted in dividing the project into different distinctive urban district. As the masterplan developed, the distinctive districts within the PSDA were named: Paradise Street, Hanover Street, Peter's Lane, South John Street, and The Pool and Park. Hence, the masterplan rather than creating one large monolithic development, it has succeeded in creating series of new places, generating variety not uniformity, and also providing a wide space for contemporary architecture that is varied (Figure 2). This has led Grosvenor eventually to recruit 26 architects to design each building of the scheme. However, to balance the variety not to look too heterogeneous, Grosvenor and BDP developed a set of guidelines for each development and gave each architect a certain amount of design freedom that not to limit the architects creativity rather than to ensure the essence of the masterplan was maintained (Littlefield, 2009). The PSDA masterplan has also succeeded quite considerably in respecting the historic buildings and key views by ensuring that landmark historic buildings like the Three Graces and the Albert Dock were framed by the new buildings. What is remarkable in this project was the success of urban designers in arguing for open street development. Biddulph (2011) argued this has created the impression of public streets from which many people would use throughout day and night, the only difference is how it is been managed.

In general, the PSDA 'Liverpool One' is now a vibrant attractive place; it has succeeded in achieving mixed-uses of activities that enhance the vitality of the city and creating a place for living, working, and entertaining. In short, this project shows the critical role that urban design can play in the process of urban regeneration. However, without a strong commitment to urban design agenda, by all stakeholders, such a result might not be achieved. As such, it can be argued having a shared vision based on urban design agenda coupled with strong adherence by all stakeholders to those agenda are the key for attaining a harmonious urban landscape.

Liverpool Waters Scheme

Liverpool Waters is a major regeneration and development scheme proposed for the derelict north docks of Liverpool at an estimating cost of around £5.5bn. The developer of the project is the giant of the North-West Peel Group. The company has previously developed large significant projects in Manchester and Liverpool such as Trafford Centre, Media City in Salford, and it is a major investor in Liverpool John Lennon Airport.

The project is completely located within the WHS and its buffer zone. 42% of the project land is within the World Heritage Site, and makes up about 22% of the whole inscribed site. Peel (2012) claimed that the project intends to draw on the distinctive identity of the site and the city to define character areas, delivering a high density and easy accessible waterfront that is both economically and environmentally sustainable, and which will significantly reinforce Liverpool's strong identity. However, the project since it has been announced has raised a lot of concerns about its effect on the historical area of the WHS. However, Peel (2012) maintained that the aspects of the outstanding universal value of the site that are embodied in the site will be protected, enhanced and presented to the public on agreed criteria in conjunction with Liverpool City Council.

Liverpool Waters scheme brings forward proposals for 9,152 residential units, 69,735 m^2 of hotel and conference space, 305,499 m^2 of Business space, and in addition to, retail, leisure and community facilities. The master-plan includes a series of public spaces and a cruise ship terminal. The scheme is a high density development that incorporates two clusters of tall buildings, with towers up to 195 metres in height, the majority of the scheme is a medium rise blocks along the Mersey River front.

English Heritage, despite its general support for the principle of regeneration of the Northern docks, it has commented on the Liverpool Waters Scheme saying that "the information of the planning application does not allow the effect of the development on historic buildings to be assessed accurately" (Liverpool Daily Post, 2011). Similarly, CABE (2011) 'Commission of Architecture and Built Environment' criticised the proposal for its lack of information and ambiguity, it has stated that "the current Liverpool Waters plan-

Figure 2. The PSDA, the project worked very well in connecting and joining the different parts of the city centre. Source: the author.
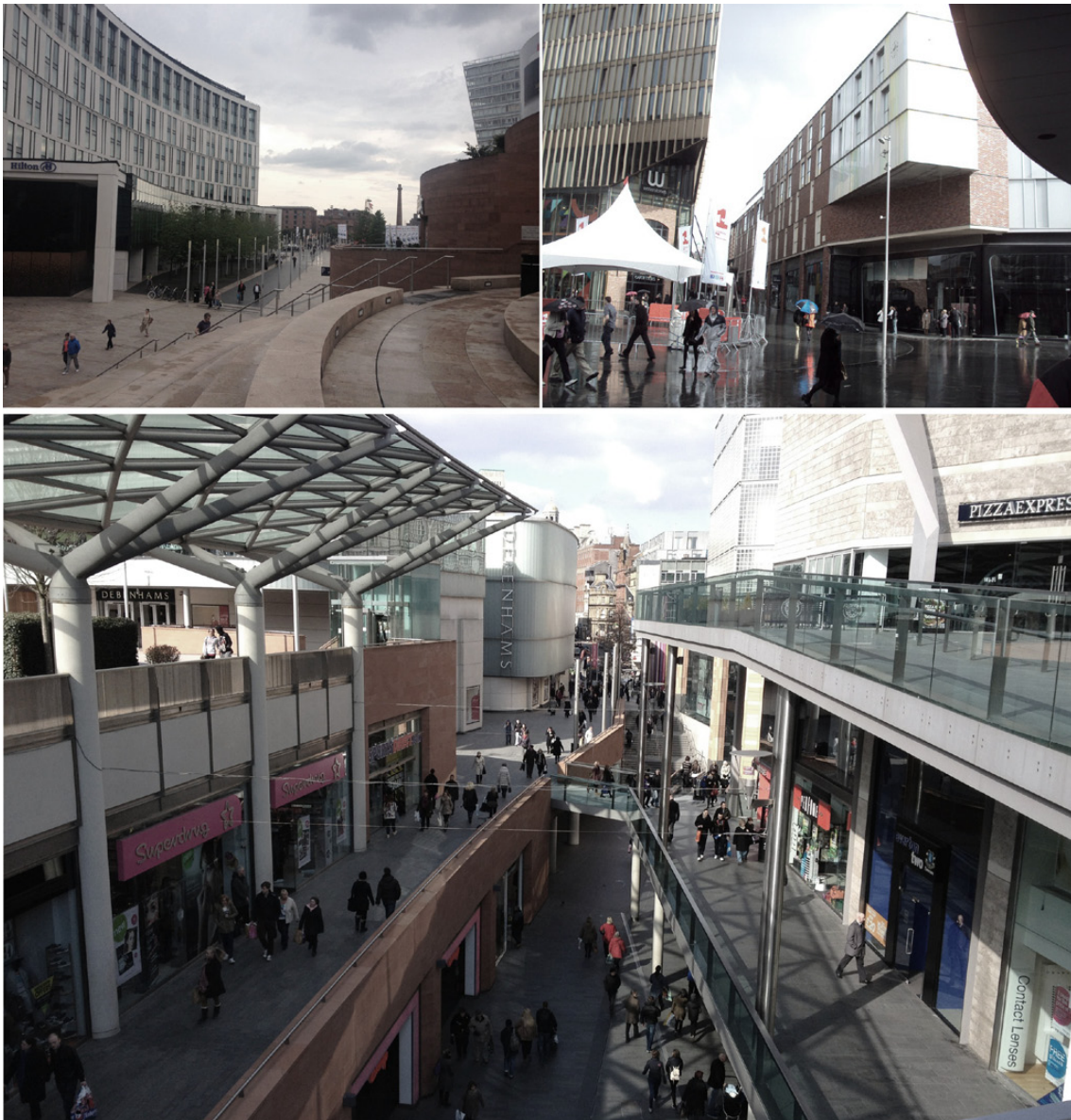
ning application does not fully articulate the nature of what is being applied for in the material submitted and, in its current form, does not provide the confidence that a high quality scheme will emerge". However, after a long discussion between Peel and English Heriateg, English Heritage issued an official objection to Liverpool Waters scheme. English Heritage in its official objection said that the plans will cause a substantial harm to the outstanding universal value of the WHS; it also opposed the secondary cluster of tall building around the Clarence Dock, saying it would overwhelm the historic horizontal character of the docklands. Furthermore, English Heritage also argued that the project would "detract from the historic primacy of the Three Graces and will harm the setting of the Stanley Dock warehouses by obscuring key views" reported by Bartlett (2012) in Liverpool Daily Post.

In 2011, UNESCO was also very concerned about the impact of Liverpool Waters on the WHS. It has warned the city that it could strip off the WHS status if the proposal is granted planning permission. UNESCO was very critical about the changes that the proposed

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project will result in the city's skyline. It argued that the two clusters of tall buildings will shift the profile of the city to the north by introducing a cluster of tall building three times higher than the Three Graces, which will relegate the Three Graces to play second violin and therefore, losing a significant visual and historical reference to the city's glorious past. Furthermore, the UNESCO criticised the way the project was designed as it will fragment and isolate different dock areas, instead of integrating them, besides it would alter the relationship of the different areas of the World Heritage property, thus seriously affecting its integrity. Liverpool Waters, however, was granted planning permission in February 2012 which meant a major implications for the future of the city's WHS status. Few months later, the UNESCO World Heritage Committee decided to place Liverpool Maritime Mercantile City on the *List of World Heritage in Danger*, with the possibilty of deletion of the property from the World Heritage List if the current project be implemented (UNESCO, 2012). However, despite the project has been granted planning permission and all legal issues have been sorted out, nothing on the ground started to take place. This is partly due to the recession period and the weak market conditions.

The regeneration of the northern waterfront of Liverpool throughout Liverpool Waters raises many concerns and controversy amongst critics and stakeholders alike. Although the principle of the regenerating the north historic docklands of Liverpool is accepted, however, Liverpool Waters is considerably criticised even from the supporters of the project for generally two key issues; the lack of its urban design and architectural quality and its insensitivity to its historic ambience (Interview with Rob Burn, urban design and heritage manager at LCC, 2013). On the other hand, Liverpool Waters is also is seen as a key project to secure the future growth of the city particularly with the current global recession and the massive competition with other cities. Dominic Wilkinson (Interview, 2013) 'chair of Liverpool Architectural Society' believes that "... given the time scale of the project 20-40 years, the project will match the scale of growth of the city, and it is a good opportunity for the city that there is a developer want to develop with this long term view".

In general, Liverpool Waters, unlike the previous PSDA project, has retained less emphasis on the importance of design excellence, heritage and urban design, while a major focus is placed on increasing the city's market share and economic growth. This can be attributed to the significant intensification of the intercity competition which has forced cities in general to be more flexible in accepting market conditions. This might indicates that the form of the urban landscape will be largely driven by the interests of private sectors and will become less public matter. The trajectory of such imbalanced approach to urban regeneration is that the urban landscape can be formed more by the imprint of each opportunity rather than a coherent scheme.

Conclusion; Harmonious or Monotonous

The regeneration of Liverpool PSDA and Liverpool Waters reflect the complexities and the enormous challenges of urban regeneration. The impact of globalisation and urban competitiveness on shaping the emergent urban landscape cannot also be underestimated. The regeneration in Liverpool clearly demonstrates that although the city was able to certain degree to control its urban form through urban governance and the adoption of a number of key strategies and policies and the involvement of design and heritage bodies, however, the regeneration is largely driven by global and national economic trends and policies that were often beyond the city's ability to control. According to Marshall (2001), he pointed out that that the city has become less the result of design and more expression of economic and social trends. In general, the complexity of urban regeneration issues in Liverpool shows that no single authority can control the form of the emergent urban landscape whereas what defines it is a mixture of bureaucracy and market forces.

Although there are a lot of similarities between the PSDA and Liverpool Waters, however, the two schemes represents a completely two different approaches to urban regeneration. The PSDA is a public private led regeneration based on shared long-term vision where the principles of urban design were used consistently to assess interventions in the urban landscape. Issues such as heritage and existing urban fabric were considered as opportunities rather than an obstacle for regeneration. On the other hand, Liverpool Waters reflects a new approach that is primarily led by private sector where the physical qualities of the place gain less significance in comparison with economic issues such as job and wealth creation. Such approach aims chiefly to satisfy the conditions of transnational capitalist class even though if it was on the qualities of the existing urban landscape. This research argues that the first approach can result in harmonious, imaginative and genuine urban form that represents the complexities of our contemporary urban life while the second regeneration approach would produce monotonous, dull and isolated developments that set itself apart from the existing urban landscape.

This research stresses that a key to attain a harmonious urban landscape is ensuring the complexity and the inclusiveness the process of regeneration itself. According to Bruttomesso (2001), he specified that complexity is a quality that distinguishes the more complete, articulated urban organisms. This research does not call for certain models of urban regeneration to be followed, rather, it strongly argues to ensure an inclusive and

a complex process of urban regeneration based on urban design agenda and public-private partnerships. The complexity and the inclusiveness of the process of regeneration are essential to gain positive outcomes and harmonious urban landscape.

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References

Atkinson, R., & Moon, G. (1994) *Urban Policy in Britain: The City, the State and the Market* (Palgrave Macmillan, London).

Bartlett, D. (2012, 6 May) 'English Heritage object to Liverpool Waters but does not call for public inquiry', *Liverpool Daily Post*.

Beriatos, E., & Gospodini, A. (2004) '"Glocalising" urban landscapes: Athens and the 2004 olympics', *Cities* 21(3), 187-202.

Biddulph, M. (2011) 'Urban design, regeneration and the entrepreneurial city', *Progress in Planning,* 76(2), 63-103.

Blackman, T. (2013) *Urban Policy in Practice* (Taylor & Francis, London).

Bognár, B. (1997) *Tokyo* (Academy Editions).

Bruttomesso, R. (2001) 'Complexity on the urban waterfront', *Waterfronts in post-industrial cities*, 39-46.

CABE (2011) *Liverpool Waters* (http://www.cabe.org.uk/transfer/liverpool-waters.pdf) accessed 01/06/2012

Colquhoun, I. (1995) *Urban Regeneration: An International Perspective* (B.T. Batsford Limited).

Dredge, D., & Jenkins, J. (2003) 'Destination place identity and regional tourism policy', *Tourism Geographies* 5(4), 383-407.

Evans, R. (1997) *Regenerating Town Centres* (Manchester University Press).

Gospodini, A. (2002) 'European Cities in Competition and the New 'Uses' of Urban Design', *Journal of Urban Design* 7(1), 59-73.

Littlefield, D. (2009) *Liverpool One: Remaking a City Centre* (Wiley).

Madanipour, A. (2006) 'Roles and Challenges of Urban Design', *Journal of Urban Design* 11(2), 173-193.

Marshall, R. (Ed.) (2001) *Waterfronts in post-industrial cities* (Spon Press, London).

Parker, C., & Garnell, C. (2006) 'Regeneration and retail in Liverpool: A new approach', *Journal of Retail and Leisure Property* 5(4), 292-304.

Peel. (2012) *Liverpool Waters* (http://www.liverpoolwaters.co.uk/content/home.php) Accessed 08/05/2012.

Post, L. D. (2011) 'English Heritage won't support Peel's Liverpool Waters plans', *Liverpool Daily Post*.

Roberts, P. (2000) 'The Evolution, Definition and Purpose of Urban Regeneration', in P. Roberts & H. Sykes (Eds.) *Urban Regeneration: A Handbook* (SAGE, London).

Sykes, H., & Roberts, P. (2000) *Urban Regeneration: A Handbook* (SAGE Publications, London).

Tallon, A. (2013) *Urban Regeneration in the UK* (Taylor & Francis, London).

Tarn, J. N. (1985) 'Urban regeneration: the conservation dimension', *Town Planning Review*, 56(2), 245.

Tiesdell, S., Oc, T., & Heath, T. (1996) *Revitalizing Historic Urban Quarters* (Architectural Press).

UNESCO (2012) *Decisions Adopted by the World Heritage Committee at its 36th Session (Saint-Petersburg, 2012) Saint Petersburg*, Russian Federation World Heritage, UNESCO.

Reading Warsaw's complicated urban fabric

Aleksander Lupienko
Institute of History, Polish Academy of Sciences, Warsaw (Poland)
Keywords: urban history, 19-20th centuries, urban layers, urban tissue destruction, urban planning

Abstract

Looking at the Warsaw building blocks may be a confusing experience. Layers from different historical periods are scattered around the city, making up only parts of urban blocks. They often dovetail with each other, but are stylistically incongruous.

One of the reasons was the unclear building regulations, due to the political situation (the city was under Russian rule), and virtually no urban policy during the formative for the urban fabric years. From 1918 the situation changed, but the mass of building blocks was too huge to deal with by the authorities of an independent, yet poor state. WW2 caused mass destruction of Warsaw urban tissue, which gave the opportunity for big-scale interventions, in favor of communication and representation. Many historical urban blocks were according to the CIAM rules dismantled. Finally, from the 1970s the policy changed again and new buildings were supposed to fill in the gaps in the street fronts, rather than to blow up urban blocks.

In my paper I will provide an analysis of some building blocks history and try to evaluate the final outcome of city fabrics twisted growth. The result is a chaos in buildings heights and styles, but it also plays an informative role. One has to keep in mind, that the irregularity of urban blocks fabric was always one of Warsaws hallmarks. It may be also presumed that the uniformity of street fronts (as in case of, say, Paris or Vienna) is not the only possible pattern of urban growth.

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Introduction and methodology

The subject of Warsaw urban fabric is broad and I don't intend to describe its development in a detailed way. This paper provides only a brief outline with some remarks of a historian and an analysis of a group of Warsaw's urban blocks. The main points to which I will adhere include the question of main axes of Warsaw urban development, the problem of urban interventions, and that of urban tissue's 'reduction'. I will argue that the urban fabric of Warsaw's centre is multi-layered with layers stemming from different periods, when different rules of political, economic and technical development prevailed. These rules marked the forms of the plot, as well as the urban fabric and can be traced as 'historical urban layers'. What is more, because of the urban fabric 'reductions', each historical layer is still very visible in the city image. These layers don't always conflict with each other: they can be seen as parts of one mosaic. Such parts are sometimes quite different in their size, colour and material, but the image they create can be perceived as coherent.

I will examine the urban fabric development in the centre of Warsaw, the rules of outlining the streets and the way the plots were being built up. Crucial to that is the political change which altered these rules throughout the last centuries. We can trace such changes by examining the written sources (related to urban regulations, as well as state and municipal interventions), and examining the sequence of detailed city plans. Warsaw's sources were terribly damaged during the war of 1939–1945, but it is still possible to delve into the urban planning rules. There are also good city plans from 1867, 1897 (the so called Lindley Plan, made for the purposes of a new sewer system), 1930 and from the post-war times. The results of the Warsaw's urban fabric development can therefore be seen today and interpreted.

Forming process

First I will examine the question of the axes of growth. Warsaw, the capital of the 'Republic of the nobles' (it obtained this status in late 16th century) evolved from two late medieval cities along the main communication route in the North-South direction, connecting Warsaw with Cracow, the former capital. The so called 'Royal Route' leading southwards, alongside the Vistula river, was the most developed urban part outside the walls in the 18th century. Many of city's great nobles' manors, which were characteristic for Warsaw, many churches with their *parvis*, as well as two royal residences with their *avant-courts* were all strung on this main axis. Although the roads leading west were numerous, they were narrower and less important.

It was only in the nineteenth century when a process of gaining in importance of East-West routes gained momentum. A clear case in point was the carrier of an old *Senatorska* street, which began to link three newly created or reorganised squares: the one in front of the Royal Castle, the one between new Warsaw Town Hall and Theatre, and a square neighbouring new edifices housing economical institutions. Other roads followed, including a new (1824) major thoroughfare of *Aleje Jerozolimskie*, to the south from the centre. The process of sprawling of the urban tissue towards West and South was conditioned also by location of the main railroad station (1845), and the building of a Citadel at the northern edge of the city after the 1830-31 uprising (the Citadel blocked the urban development in the northern direction). After a century of street development, a new situation became idiosyncratic for Warsaw: the underdevelopment of North-South routes. Beside the Royal Route there was the important *Marszałkowska* street, marked out in the 18th century, and few others, but none of them enabled a continuous passage through the city. Each of them bent or was closed by building blocks or parks. It was improved only after the city destruction in 1939–1945.

The second question is the problem of urban interventions and I will describe them in a more detailed way. The whole situation of the cities in the early modern Republic was catastrophic, because city dwellers were deprived of fundamental rights (in favour of the nobles), which characterised this group in the Western Europe. The biggest city was Warsaw, but it couldn't boast a coordinated urban policy until 1791, because it consisted of only a small medieval municipality and a ring of private towns around, which were owned by the nobles and church institutions. Each was governed and its space was planned,

on a local scale. The Parliament started to impose some regulations by means of special 'Boni Ordinis' committees. They were obliged, though, only to maintain the existing street web in order and look after the fire safety and living conditions of the inhabitants. The only interventions in Warsaw were of private sort. It is worth stressing here the outlining, by the king, of new streets at the southern edge of the city (south from the *Piękna* street), consisting of three round squares connected by a system of diagonal alleys lined with trees. This system bore clear traces of the contemporary French garden designs.

After the Napoleonic wars Warsaw experienced an unprecedented development in terms of spatial order. The new Polish Kingdom in union with Russia, its hegemon, was a centralistic state, in contrast to the Republic of the nobles. Warsaw gained almost all the functions of a modern capital of that times (except for the function of the royal court seat). The need for new administrative buildings and edifices housing new institutions led to numerous public orders. Some old nobles' manors were adapted to the needs of ministerial councils and municipal authorities. There were also state interventions into the urban fabric. As mentioned above, a set of new squares was created along the *Senatorska* street, leading west from the medieval towns. New bank facilities and a large theatre were built there (Łupienko, 2012).

The spatial order was regulated by new laws concerning the appearance of new buildings, which were controlled by a special Building Board (1817). One of many factors taken into account was the appropriateness of a building in the particular urban context. Another aim of the authorities was to prepare comprehensive regulations of the streets, beginning in 1820 and continued until 1860s. It was important because there has been virtually no such attempts before and boundaries of many plots projected into the street space. The streets were meant to be straightened and sometimes widened. A special law facilitating the expropriation for the purposes of street regulation was imposed. What is more, state and municipal funds providing cheap loans were created, to speed up the building of front houses and to promote solid bricks-and-mortar constructions with more than one floor along the main streets (Cegielski, 1971; Łupienko, 2012, p. 85). These efforts were strengthened by establishing a special Committee whose task was to draw up Warsaw's regulative plan. Works began in 1856. Many new building lines were laid down, and some streets were widened (the most important was the widening of the northern part of the old Royal Route in 1864).

The period of 1860s till 1914, in the aftermath of Polish national uprising of 1863–1864, was the most tough. All the mentioned institutions were cancelled. Warsaw, lacking municipal autonomy already from 1831, lost its chance for it until 1918. New dwellings were built according to Russian laws (partly according to the former Polish Building Code of 1820), but these rules began to be challenged after the revolution of 1905 (Roguska, 1980). In the period of 1905–1914 Warsaw saw many new tenement houses of 6 and more floors to be introduced into the old street frontages, bringing chaos into them (Zachwatowicz, 1971, p. 276). Generally speaking no major urban fabric interventions took place in the city, as the political situation (hostile attitude of the authorities towards Warsaw and 'Congress' Kingdom) and municipal finances didn't allow for any ambitious attempts. The regulative work done at that time was limited to - except for the creation of a new district on the southern outskirts of the centre - outlining only some minor streets to support local communication, but also to help capitalistic *laissez-faire* divisions of bigger plots and speculative building of new tenements.

First World War was a chance for Warsaw. The Russians were gone and new German conquerors agreed on so called 'Great Incorporation' of Warsaw suburbs in 1916. There was a big need for that as the city was tightly built and the suburbs were extensively urbanised, chaotic and needed badly space regulations (it was the consequence of building and maintaining a ring of fortresses around the centre from the 1880s).

After 1918, when new Polish authorities finally gained full sovereignty in Warsaw, a new policy towards city growth began to be worked out. Architects and urban planners had at last an opportunity to draft a regulative plan, the first comprehensible study of city needs and its development prospects, with real possibility of enacting it. There is no place to study all the plans for Warsaw, I will present instead the main guidelines for the centre. Three new thoroughfares leading from North to South were proposed, by cutting through urban blocks, linking parts of existing streets, cutting part of the Saxon Garden, big 18th century

Figure 1. New streets marked out in 1856–1870 and 1871–1914 (black colour), after: Zachwa-towicz, 1952, p. 227.

greenery just in the urban core, and by building overpasses above some streets going down the river slope. The plan also stressed the diagonal street pattern as the most appro-priate for the city and the need for green wedges linking the outskirts with the centre. The political change let also the planners to propose new municipal land divisions, expropriat-ing the military authorities of their numerous barracks, military fields and hospitals (it was a legacy of the Russian rulers) in favour of dwelling needs. A new body governing the spatial urban growth was created after a half-century break: City Regulation and Building Bureau (Szwankowski, 1952, p. 279; Różański 1968, p. 323–325; Kotaszewicz, 2004, p. 18).

In 1928 a new Building Code was enacted. It regulated also the policy towards the parcel division and urban building process, giving the power finally into the hands of the municipality (Kotaszewicz, 2004, p. 22).

The only full regulative plan for Warsaw from the interwar period was enacted in the early 30s. The centre was crossed by two major transport routes, N-S (as previously) and E-W (with a tunnel under the Saxon Garden and a new bridge). The centre was meant to be

Figure 2. The selected part of the Warsaw centre according to the Lindley plan from 1897. One can see laissez-faire urban fabric (1.) consisting of many small privately owned built-up plots. The central part is still occupied by a huge 18th-century hospital. The main Royal Route is also visible (2.).

modernised, marked with new public institutions' edifices (which were insufficient in number during the Russian rule) alongside the historical Royal Route and near the new boulevards to be built by the river coast. Only the minor industry and artisan workshops were to be allowed in the city core. What is more, a modern type of zoning was introduced for the first time, with zones allowing for building heights from 9 to 22 m and the plot ratio of 50% to 70%, which was quite high, and enabled further increases in density. No attempts were made to restructure the urban core, though there were proposals made by architects (Różański, 1968, p. 329–330; Szwankowski, 1952, p. 281-282; Zachwatowicz, 1971, p. 286).

There was no acts facilitating expropriation though, what made big interventions very costly. By the same token there was no possibility of changing the heights of some extraordinary tall buildings along the historical streets, by buying them and restructuring. There was also not enough money to purchase parcels to allow new greenery in the centre. What is more, each private owner of a parcel near a newly regulated street could appeal against the general urban plan. A better situation concerning municipal land ownership appeared after 1935, when numerous urban plots have been gathered by the new Warsaw administration (Szwankowski, 1970, p. 50, 59). But restructuring of the centre remained unfeasible, and the authorities abandoned any ambitious attempts to change it.

The only serious discussions and designs were related to outlining a new monumental district alongside a greenery, which had previously military functions, stretching at the southern edge of the 19th century city (*Pole Mokotowskie*). That district could perform new functions, needed in the city. It was conceived of before 1935, but the works gained momentum after the death of the main Polish interwar leader, Józef Piłsudski and named after him. A big national sanctuary, a monument to Piłsudski and representative buildings (administrative and cultural) would be placed there. Also some sport facilities, dwellings (planned as detached buildings in contrast to the tenements in the centre), green-

ery and wide roads were designed there. The district would have modern, avant-garde character with strong monumental and symbolic elements (Trybuś, 2012, p. 260).

The reality was much more modest. Counting the executed works, one must mention the marking out of some elements of the N-S route, the southern part of it, called the Alley of Independence (*Aleja Niepodległości*) (Szwankowski, 1963, p. 138–139). The other big and costly intervention was cutting through of a route from the vicinity of the old towns northwards, leading to the new dwelling district (*Bonifraterska street*). 10 plots were bought and 36 buildings erased (Szwankowski, 1952, p. 286–287). In the centre, though, only small interventions and corrections (made by the Warsaw Development Committee) took place at that time (Szwankowski, 1952, p. 277). It was due to the very high price of land and not sufficient amount of it in possession of the municipality (Kotaszewicz, 2004, p. 32). This tiny municipal possession of land was another legacy of the Russian period, when only 4-5% of plots belonged to the city.

More important new dwelling units were built alongside the river slope, as far as the centre is concerned. The major restructuring took place in the former suburbs, a ring of new districts, where enough publicly owned lands were located and which were ill-equipped with infrastructure. These suburbs were meant to become self-contained unities performing similar functions as the city centre. The most important newly executed dwelling complexes were built in the acquired land near the former Citadel (*Żoliborz*), former meadows (*Saska Kępa*), or around older suburbs like *Mokotów*. These dwelling complexes had an ambitious social aims and program (Olszewski, 1968, p. 302).

This huge capitalistic city was ruined during the war. Some demolitions took place after the aerial bombardments of 1939, but it was after the Warsaw Uprising of 1944, when a planned demolition of the left-bank Warsaw took place, conducted by the Germans. The city was conquered by the Red Army in January 1945 and the decision to rebuild it was taken soon afterwards. Already in May 1945 the Capital's Rebuilding Bureau was created.

The first plans for rebuilding Warsaw stressed the functional division between districts, treating the broadly conceived centre (*Śródmieście*) as an exceptional one of them, with much less dwelling functions than before. The urban fabric was destroyed, burnt or partly ruined in more than 80% in the whole left-bank city. This destruction was seen by the planners as an unimaginable chance. Not only the urban fabric was ruined, but the new government announced in October 1945 that all the land in Warsaw changes the owner, and from now on it remains in the hands of the municipality. After many decades of weak municipal stake in the urban territory, now all the state, institutional and private owners were expropriated. The Capital's Rebuilding Bureau had the most powerful possibilities as urban planner ever, though they were limited by a large scale of damage done to the industry. In the first comprehensive plan of 1946 the rebuilding of the previous urban fabric was abandoned (with the exceptions as below) in favour of creating a new socialistic kind of city.

This city was meant to consist of hierarchically conceived parts, from neighbourhood communities, through dwelling complexes to districts. Each had its own set of public utilities. This first plan was made by experienced planners with an explicit inspiration drew from the ideas of CIAM. The main dwelling unit of urban development was a detached block (Zarzycki, 1973, p. 71–76; Mieszkowski and Siemiński, 2002, p. 73–74). The idea of a 'social' dwelling complex lay behind the newly created neighbour communities. It was socialistic in its origin, with roots reaching the interwar period and the activity of Polish avant-garde movements like "Block" and "Praesens". Egalitarian society of such dwellings should - according to the principles - meet its basic needs for good and healthy home. The same architects designed after war new complexes at the outskirts of the centre (Syrkus, 1973; Górski, 1981, p. 197–216).

In 1948 new drafts for the centre stressed the importance of public gatherings space, their monumental urban frame, as well as wide, orthogonally planned routes. New buildings, dwelling complexes and public edifices had the priority over the ruined fabric, guiding the demolition scheme. Main political decisions were most crucial, and even urban planners had to stick to them. That was the time of emerging socialistic realism style in architecture. It prevailed from 1949, stressing the folk-style decorations and spatial coherence of the complexes. It affected also the urban fabric structure, as only the frontage development around inner yards was preferred, though the proposal to adapt older

Figure 3. The same part of the Warsaw centre in 1945 with the plot scheme from the interwar period (the hospital already demolished and the land parcelled). Marked in red and brown is the ruined or demolished urban fabric, in blue the extant fabric, new broader streets are also marked. Scheme after Sigalin 1986.

back buildings that survived into such complexes was categorically rejected. New dwellings were planned by a new (1948) Workers' Dwellings Institute (ZOR).

Many discussions were invoked by the question of rebuilding the monuments from the past: what should be rebuilt and how exactly (preserving the state from 1939 or omitting subsequent changes, especially from the late 19th century)? The solution was a compromise. The rebuilding comprised both medieval cities and the axis of the Royal Route, with monuments from the 17th till the beginning of 19th century, thus restoring the regular classicist appearance of the axis (Ostrowski, 1980, p. 132–135; Zarzycki, 1968, p. 92–94).

A model urban intervention of that time was the building of *Marszałkowska* Dwelling District (MDM) around new Constitution Square (1950–1952). Dwellings were located in the urban blocks of the southern diagonal street system, building up their edges. The walls of the Square bore marks of a screen-like structure (or a camouflage: Baraniewski, 2010, p. 62), separating new public space from the existing remains of the capitalistic city. It was the first attempt to build space for folk ceremonies in Warsaw, conducted by the new socialistic authorities, a sort of an experimental plot for social engineering.

Such dwelling complexes were built also on the site of former Ghetto in the northern district and e.g. near the Royal Route (*Osiedle Kubusia Puchatka* from the 1950s), what is seen in the detailed plan below (from 1993). The most important feature of that architecture was first of all the monumentality. It can be best seen in the biggest urban investment: the Palace of Culture and Science (1952-1955), an extraordinary huge skyscraper in a form of a Moscow-style tower, inserted at the core of Warsaw. A huge parade square,

Figure 4. The same part of the city in 1993 (fragment of a contemporary map). 1. the remnants of the 19th-century urban fabric; 2. the main Royal Route; 3. urban fabric from the 1950s (with street frontage); 4. the Osiedle Kubusia Puchatka dwelling complex, mentioned in the text; 5. the Palace of Culture with its huge Parade Square; 6. the 'East Wall' complex; 7. detached housing complexes from the late 1950s until 1970s (among others the Grzybów complex mentioned in the text).
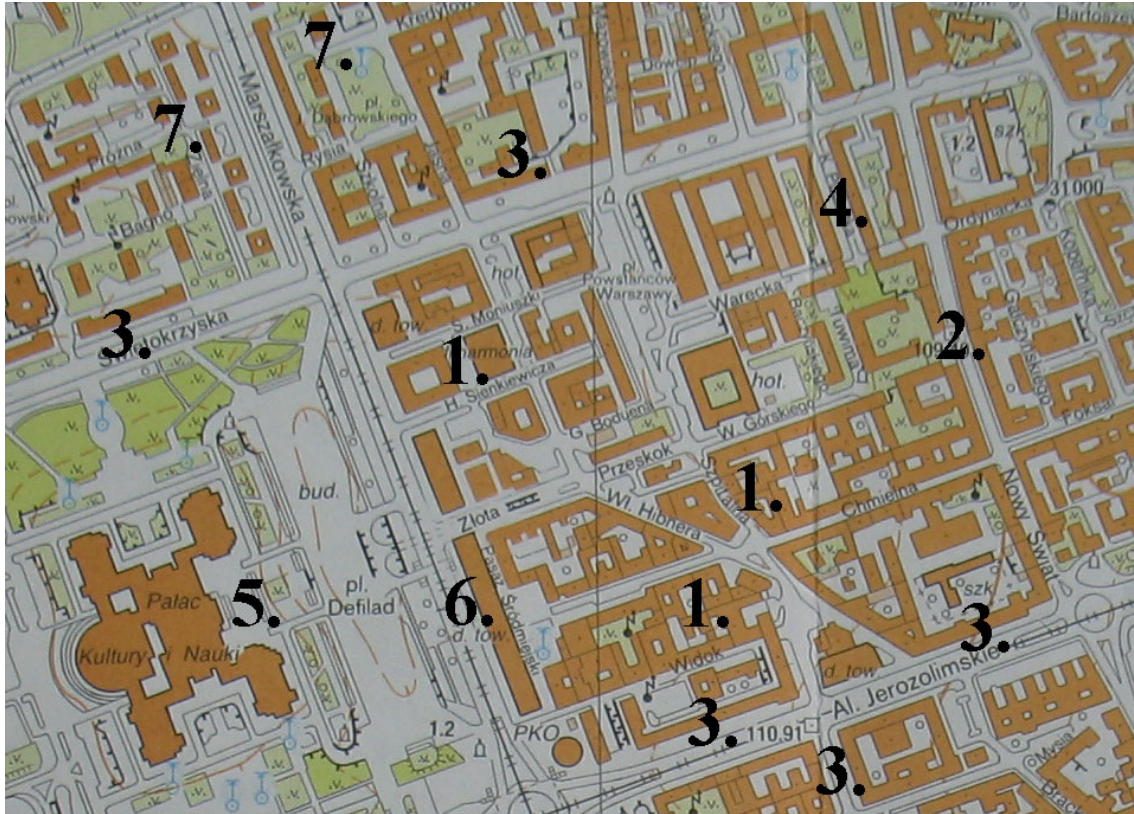
probably the largest in Europe, was created around it and named after Joseph Stalin.

Also the scale of executed central routes was unprecedented. 1947 saw the creation of a E-W route through the centre, leading partially in a tunnel under the historical Royal Route, facilitating for the first time the communication throughout the city. Also the route N-S was created in three lines: Marszałkowska street was lengthened through the Saxon Garden and further north; a partially brand new thoroughfare was created lengthening the existing line of the Independence Alley. Later a third route by the river was built. The extant pre-war parts of the routes were also widened.

After 1956 the socialist-realistic phase of urban planning was over. Frontage development was criticised by the theoreticians (Chmielewski, 2002, p. 108). New period was dominated by central economic planning (which had the priority before the spatial one), in the pace of new 5-year economic plans. The intention of reducing the dwelling function of the centre was forgotten, what could be seen in the general plan of 1956 (Mieszkowski and Siemiński, 2002, p. 104). There was also no urban regulations in the strict sense. Only the functions of urban blocks were regulated, not the building heights (Chmielewski, 2002, p. 128). Architects were preparing their designs according to strict standards, which made their architecture uniform, that is, less dealing with the urban context. The empty space around big detached blocks was perceived as anonymous and was being devastated by the inhabitants (Basista, 2001).

According to the plan of 1956, new dwellings were introduced in the centre with the aim of urban densification and deployment of existing urban infrastructure. This way new complexes of medium height or high detached blocks were built in the northern centre (which will be seen below): *Mirów* - started before, *Grzybów*, *Mariańska*, *Emilia*, and *Złota*,

Srebrna, Miedziana to the west (these complexes began to be visible in the mid-60s[1]). The complex *Plac Teatralny* was located near the rebuilt historical edifices near the Theatre Square. There were also many smaller insertions in the 'holes' of existing street frontages. All this was due to the growing population of Warsaw, which was becoming worrying for the authorities (Chmielewski, 2002, p. 110–112). Districts were still seen as self-contained unities with all the social and commercial utilities. The main new dwelling complexes were located still in the old centre and the height of some high-rise buildings surpassed already 10 floors.

The complex which was seen as important for that period was the so called 'East Wall', i.e. the eastern side of the Parade Square (former Stalin Square). First dwelling blocks in a form of skyscrapers were designed here, as well as large department stores.

In the later years the economy, which was based on full employment and extensive industrial development, created even greater need for new flats. To meet these needs dwelling complexes and blocks made with the help of prefabricated elements were introduced, mainly on the outskirts of cities (Słodczyk, 2012, p. 419). High-rise, detached dwelling units became the norm, ruining the traditional appearance of cities, as in case of central part of Warsaw, where a dwelling complex of 19 long buildings, 16-floor high, with 300-400 flats in each, was inserted in the vicinity of the old Saxon Garden. The complex *Za Żelazną Bramą* was started in 1965 and finished in 1972. Some other new complexes were built in the 1970s near the centre. The last decade of communism (1980s) saw building of the last big complexes in smaller Polish cities.

The centre of Warsaw was now built-up. With the change of government after 1989 a new capitalistic period began. New office and commercial buildings, as well as modern apartment units were now inserted into the empty spaces, surrounding communistic dwelling complexes. The high price of plots, the selling out of the land, which returned to some of the pre-war owners' families, as well as the urge to recreate frontage development, where it was possible, led to the birth of the newest urban layer.

Conclusion

The development of Warsaw urban fabric was more or less chaotic throughout the history. Warsaw virtually lacked regulations allowing broader state or municipal interventions regarding city spatial development until 1820s. What is more, the mature capitalistic period from 1860s to 1920s was also marked by insufficient (in terms of direct interventions into the street web) urban policy, due to the hostile attitude of the Russian authorities. One must admit that also the interwar period was too short, and the state of the Polish economy too weak to allow for bigger urban interventions. Capitalistic Warsaw's urban tissue was a set of different elements stemming from various times. It included 1) the medieval cities, 2) main early modern Royal Route with residence complexes tied to it, 3) few old diagonal streets leading to the city, 4) remains of urban layouts of former private towns, 5) a dense row of East-West streets, spanning throughout the western part of the city, making up a kind of a rectangular grid, and 6) a system of diagonal streets in the south. Such a city saw a long period of *laissez-faire* capitalistic development with only partially executed big thoroughfares.

The only chance to create a new coherent city appeared after 1945. The capitalistic city was not totally demolished and many fragments of it are still clearly visible. The ideas of the first years of people's rule (a coherent city with frontage development) were also later abandoned. The weakness of the ruined country, and - later - cardinal economical shortcomings of the soviet-like regime led to the development of great reinforced concrete blocks, which had little to do with the urban context.

This historical urban process can be illustrated by a sequence of city plans. I chose a fragment of the centre, to the west of the Royal Route. The legacy of this process are the historical layers, which evolved here throughout the centuries. They 'stamped' Warsaw's appearance in each new period, while the previous political regime and 'its' layer began fading away. The centre of little manors and wooden tenements was partially replaced by a brick-and-mortar capitalistic city. This capitalistic city was mostly destroyed during the

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[1] 'Zmierzch »dzikiego zachodu«', Stolica, 1964, no. 40, p. 8.

last war and the remains of it were filled in by new socialist realistic fabric and - later - great concrete dwelling units. Such units are now built around by newest capitalistic fabric.

References

Baraniewski, W. (2010) 'Architektura Warszawy w czasach stalinowskich. Marszałkowska Cegielski, J. (1971) *Polityka budowlano-mieszkaniowa w Warszawie w latach 1815-1864*, in: *Warszawa XIX w.*, vol. 2 (PWN, Warszawa).

Dzielnica Mieszkaniowa: historyczny kamuflaż', *Kwartalnik Architektury i Urbanistyki 55*, vol. 3, 49–64.

Basista, A. (2001) *Betonowe dziedzictwo. Architektura w Polsce czasów komunizmu* (Wydawnictwo Naukowe PWN, Warszawa).

Chmielewski, J.M. (2002) *Okres planistyczny 1956–1965*, in: *Atlas historyczny Warszawy. Plany zagospodarowania przestrzennego z lat 1916–2002* (Stowarzyszenie przyjaciół APW, Warszawa), 108–129.

Górski, J. (1981) *Warszawa prawie współczesna. Szkice* (PIW, Warszawa).

Herbst, S. (1978) *Ulica Marszałkowska* (Książka i wiedza, Warszawa).

Kotarbiński, A. (1967) *Rozwój urbanistyki i architektury polskiej w latach 1944–1964. Próba charakterystyki krytycznej* (PWN, Warszawa).

Kotaszewicz, T. (2004) *Międzywojenny okres planistyczny, in: Atlas historyczny Warszawy. Plany zagospodarowania przestrzennego z lat 1916–2002* (Stowarzyszenie przyjaciół APW, Warszawa), 12–61.

Krawczak, C. (1975) *Prawo budowlane na ziemiach polskich od połowy XVIII wieku do 1939 roku* (Wydawnictwo naukowe UAM, Poznań).

Mieszkowski, W. and Siemiński, W. (2002) *Okres planistyczny 1945–1956, in: Atlas historyczny Warszawy. Plany zagospodarowania przestrzennego z lat 1916–2002* (Stowarzyszenie przyjaciół APW, Warszawa), 65–105.

Nietyksza, M. and Pruss, W. (1973) *Zmiany w układzie przestrzennym Warszawy, in: Wielkomiejski rozwój Warszawy* (Książka i wiedza, Warszawa) 21–47.

Olszewski, A.K. (1968) *Architektura Warszawy (1919–1939)*, in: *Warszawa II Rzeczpospolitej 1918–1939*, vol. 1 (PWN, Warszawa) 287-320.

Ostrowski, W. (1980) *Zespoły zabytkowe a urbanistyka* (Arkady, Warszawa).

Roguska, J. (1980) 'Wpływ przepisów na kształtowanie zabudowy Warszawy w drugiej połowie XIX wieku i na początku XX wieku', *Kwartalnik Architektury i Urbanistyki* 25, vol. 3-4, 275-298.

Różański, S. (1968) *Planowanie przestrzenne Warszawy*, in: *Warszawa II Rzeczpospolitej 1918–1939*, vol. 1 (PWN, Warszawa) 321–346.

Sigalin, J. (1986) *Warszawa 1944–1980. Z archiwum architekta* (PIW, Warszawa).

Słodczyk, J. (2012) *Historia planowania i budowy miast* (Uniwersytet Opolski, Opole).

Syrkus, H. (1973) *Losy koncepcji osiedla społecznego w Warszawie współczesnej na przykładzie osiedla WSM na Kole*, in: *Warszawa stolica Polski ludowej*, vol. 3 (PWN, Warszawa) 113–154.

Szczypiorski, A. (1966) *Warszawa. Jej gospodarka i ludność w latach 1832–1862* (Zakład Narodowy im. Ossolińskich et al., Wrocław et al.).

Szwankowski, E. (1952) *Warszawa. Rozwój architektoniczny i urbanistyczny* (Państwowe Wydawnictwo Techniczne, Warszawa).

Szwankowski, E. (1963) *Ulice i place Warszawy* (PWN, Warszawa).

Szwankowski, E. (1970) *O realizacjach urbanistycznych Warszawy 1919–1939*, in: *Warszawa II Rzeczpospolitej 1918–1939*, vol. 2 (PWN, Warszawa) 49–65.

Trybuś, J. (2012) *Warszawa niezaistniała. Niezrealizowane projekty urbanistyczne i architektoniczne Warszawy dwudziestolecia międzywojennego* (Muzeum Powstania Warszawskiego et al., Warszawa).

Zachwatowicz, J. (1971) *Rozwój przestrzenny, urbanistyczny i architektoniczny Warszawy międzywojennej* (PWN, Warszawa) 275–289.

Zarzycki, J. (1973) *Ewolucja planu urbanistycznego Warszawy w latach 1945–1949*, in: *Warszawa stolica Polski ludowej*, vol. 3 (PWN, Warszawa) 69–112.

From nature to the city and back: the case of Piazzale Clodio, Rome

Rosalba Belibani, Deborah Chiara Lefosse, Eride Caramia
DiAP Department of Architecture and design, "Sapienza" University of Rome, 53 A, via Gramsci, 00197, Rome, Italy
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy
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Abstract

On the basis of complex urban realities that time dissolves into fragments, now punctual into the consolidated fabrics, now confined to the broken margins without coherence or dialectic with the sourroundings, it is difficult to image the city as an unified organism, alive, able to adapt to changing needs of society as nature. The task becomes more difficult in the analysis of development of a city like Rome and in specific reading of the area named Quartiere delle Vittorie, so much rooted in the collective imagination cause its history and unique morphology, recognizable due to the typical starry path signed by a controversial planning and to its relations with Quartiere Prati and Trionfale. A part of modern city, still incomplete. The urban fabric is adapting to a geometric matrix of linear paths, no orthogonal, converging towards the highest hill of the city: Monte Mario. They stop in front of orography, not comparing with the territory. There is not a pole to mark a fitting end to a design planned, but only an undefined area, degraded in the use and in the physical state, as the landscape around Piazzale Clodio.

In a more general urban regeneration project it appears not only to architecture as a social art, able to reconnect communities, places and nature, but also as a process, in the reverse direction, which completes the anthropical realty from natural context, defining a unique landscape, that like every other living organism challenges its own limits, becoming into a continuous evolution.

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Introduction. The topic

Piazzale Clodio is one of the unfinished edges of the city: on one side, it physically touches but does not integrate with the slopes of Monte Mario, whilst on the other side lies the built and consolidated city.

The city as planned in 1909 stops at the edge of Circonvallazione Clodia, which it draws as its border; failing to advance due to the interruption from the chaotic front of Monte Mario.

Today it looks like a slot of asphalt (an asphalt buttonhole) welcoming a confused flow of buses and cars: judges, lawyers and defendants cross it daily.

It is a rather undefined space, a sliver of land that glides downstream to meet up along the asphalt of Circonvallazione Clodia. Only several planted trees and huge advertising billboards conceal the unfinished nature of an empty square, which over time became a bus terminal, parking, junction and roundabout.

The Panoramic road, known as Via Falcone e Borsellino, continues in the direction of Viale Mazzini, climbing into the Park of Monte Mario.

On the right side the square extends in an uncertain fashion along Via Teulada, marked only by the R.A.I. building (Italian Radio and Television) whose antenna symbolizes the sixties. On the left side the city continues to Piazzale degli Eroi, before settling on the Court.

In this special context a part of the urban fabric, confined between the Panoramic road, Via Teulada and Monte Mario, shows itself as ground parking and circus events, an undefined place full of potential where the city can reconnect to the landscape.

Historical analysis. Piazzale Clodio: formation and evolution

To understand the transforming mechanisms of the city of Rome, from the historical capital of Italy to the modern European metropolis, it is useful to study the evolution of a specific part of the city, in this case Piazzale Clodio. Whether such a particular area evolved similarly to other parts of the city, or went against the grain, such study aids in understanding the complex image of the urban organism which hosts it, namely the city of Rome.

During the last 150 years Rome has undergone profound morphological changes: from a relatively compact city to an urban sprawl in the roman countryside, without adequate governance or planning, and from a concentrated focus on its historical center to a polycentric urban model. Historical analysis of the urban district, the main theme of these few pages, is very useful when comparing with the first stages of the Roman capital city as a whole: the foundation of Piazzale Clodio and of neighborhood Delle Vittorie coincides with the initial expansion of the city, outside the Aurelian Walls beginning from the northeastern quadrant.

In 1871, when Rome was proclaimed capital and symbol of the Italian unification, it still reflected dated standards both in economy and urban planning, where it consisted mostly of fields, villas and monasteries. To transform Rome into a modern European capital, its landscape becomes quickly a large outdoor yard, where more residential-intensive planning would be introduced amongst the old monuments.

Along the left bank of the Tevere, between Monte Mario and Castel Sant'Angelo, there was a vast agricultural area, also used for a long time as a training area for the military. Two new developments arose in this picturesque and bucolic area: first the neighborhood Prati, followed by the neighborhood Delle Vittorie, and hence the city began to move toward the North. The first city plannings were not complex models like the contemporary proposals by Haussmann, Cerdà and Wagner, since they considered only works of expansion and rehabilitation in the historic center based on a growing population. The early stages of urban development affecting the neighborhoods of Flaminio and Prati di Castello, were both planned on an orthogonal pattern, where the road layout would prevail over the building typology. Thus the closed block was born; as a negative of a thick and regular mesh that is repeated from Via Flaminia to Via Porta di Castello, still ending today on the axis of the Military Barracks. At this point however, the blocks become larger and modulate the surrounding geometry with a slower pulse.

The neoclassical Rome conforms itself to the umbertino model, which imports compact fabrics as blocks that constitute it. The image of a compact city, made of chessboards, fixed paths and continuous facades, would be re-proposed later and for more than fifty years in different areas of the city: we can find the same urban composition again in several district like Viminale, Testaccio, Porta Pia, San Lorenzo, Esquilino and Gianicolo. The classic typology for this urban model is the 'house for rent' as defined by Insolera, rented buildings of 4-5 floors, later replaced with the roman Palazzina (Insolera 1985).

The real authors of the Quartiere delle Vittorie and its structure, as it appears today, are the mayor Nathan and Sanjust di Teulada, designer of the new plan (1909) and expert engineer, an outsider to the building speculations that threatened urban growth in those last years. Their plan involves expanding on several fronts of the city with distinct characteristics and layouts, large green areas, urban equipment and infrastructure networks, and well defined building types. The plan shows the new neighborhood Milvio, renamed Delle Vittorie to celebrate the Great War. As the clear cut of the Military Barracks confirms, the new fabric is morphologically contrasted to the matrix of Prati because of stellar and diagonal geometries. Confined between Via Carso and Viale Angelico, the fabric radiates in concentric shape from Piazza Mazzini, with the tree-lined boulevard of Viale Mazzini interrupting the orthogonal matrix. The squares are obtained by the intersection of the main paths, but because of the interplay between built areas and surrounding voids, they lose their typical identity of public places, instead being realised as the courtyards of building blocks. The stellar shape, as found in the Appio-Tuscolano district, reflects urban planning of the past, such as those commissioned by Pope Sixtus V and spread around Rome. The outward features of the blocks are derived from the three residential types planned by Sanjust: high-density buildings (24 meter- high blocks with an open courtyard, marked in the façade by a stone base and neoclassical decorations); smaller buildings with 3 floors and surrounding garden, and villas within public parks. However, the plan did not consider the Universal Exhibition held in 1911, which changed the urban face of Rome in just two years as it became the city celebrating Italy's 50th Anniversary. The Exhibtion was split into two sections on either side of the Tevere: the then unrealized Quartiere delle Vittorie was dedicated to Ethnographic and Regional Exhibition, whilst Valle Giulia focused on Art. From this extraordinary event the district inherited the primary urbanization networks; the fundamental axes which went on to mark the future design (the main axis of the Exhibition corresponds to the current Viale Mazzini) and a series of small villas, reinterpreted in Renaissance and Baroque style, is still visible on the riverside (Lucchini 1988).

In subsequent years, the debate on the final structure of the Quartiere delle Vittorie became long and controversial, with many proposed variants (fig.1). The joint proposal by Piacentini and Giovannoni, which prevailed over the others, proposed curving Viale Mazzini up towards Piazzale Clodio, connecting it to the new urban expansion. Their plan also introduced the palazzina as a new building type (with a commercial ground floor and 4 upper levels) which together with the intensive buildings went on to become one of the most common building forms in the city.

The neighborhood was completed in the next two decades, but being a publicly owned area it was never subjected to uncontrolled speculations and anisotropic expansions, even if subsequent plans proposed to shift the focus from the center to the suburbs. The necessary urban growth started with the official and spontaneous districts and with the new neighborhoods built for special occasions (such as E42); Rome transformed itself from a compact city to a Metropolitan Area. In the same years (1942) Giacomo Balla from the window of his study painted 'the beautiful district' (fig.2), as it has always been known to all those who have inhabited it since the '30s: now it is the image of a complete city, beyond some houses demolished later. Today the district still boasts the same architectural and urban quality in its morphology such as in the compact blocks merging into the intimate spaces of the courtyards.

While the district is included in the consolidated city, extending slightly toward the natural landscape and beyond the limits of the main paths, the historical events affecting Rome since the postwar period until today.

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Figure 1. Planning variants (1909 Sanjust; 1911 Stubben; 1911 Sanjust; 1913 Giovannoni; 1914 Piacentini; 1915 Piacentini-Giovannoni, final design).

greatly influenced the evolution of the city. Territorial expansion is designed to ensure the home as a primary asset to the constantly increasing lower middle class. According to I.N.A. CASA and P.E.E.P works, the capital city grows and renews itself with landmarks at large scale, neither with an orthogonal fabric as in Prati, nor a stellar configuration as in the district Delle Vittorie. They instead conform to abstract geometries composed of broken lines and circular arcs, merging together as isolated galaxies of linear buildings and high density towers, but they are mostly so-called 'dormitory neighborhoods' according to the zoning of the latest planning. The aim is to renew the face of the city with new forms in the new modern style. However, what we see today is an image of degraded suburbs, general lack of services, with low architectural and urban quality.

In the last decades the urban planning of Rome has changed, both to overcome the planning crisis, and to ensure a higher quality of life. This represents a shift from urban sprawl to rehabilitation of the city itself. The goal is to recover the existing city: with its history and nature, consolidated fabrics and decaying suburbs, villas, parks, illegally exploited and unused areas. Metropolitan size is configured as a network of multifunctional centralities linked together, radiating from the center. Multiple points lie along the main axes or in privileged positions, small cities within the city, similar in their morphological features and functions but not in their order.

Whether real or as depicted by artists, the district remains unchanged today. It is part of the consolidated city to be rehabilitated due to the presence of unfinished areas such as the examined one: a strategic limbo between natural and urban landscape, which need a strong regenerative action to rebuild its identity as a physical and public space, included with uniform and harmonious growth of Rome.

Forming process. The role of the Park of Monte Mario.

Established as a Park in 1989, the Reserve of Monte Mario represents to the city of Rome a rich heritage of biodiversity, spanning an area of 150 hectares. It was a place of study and a "Grand Tour" destination for poets, artists, and writers, whose descriptions and portrayals of the area are now important sources for historical reconstructions of the site.

The Reserve's natural features and strategic location make it one of the most un-

Figure 2. Balla, G. (1942). "La fila per l'agnello". Balla paints the Quartiere delle Vittorie, from the window of his studio in Via Oslavia 39/b.

spoiled areas within the Roman territory. In fact, it accommodates the area of the "Zodiaco" astronomical observatory, whose enviable location keeps it away from the bright lights of the metropolis below.

It is precisely in this confrontation between nature and city; the two great realities inhabited by man, where a curious third landscape of urban culture along the periphery hides.

Historic late-fifteenth century houses owned by the Strozzi family, a late-nineteenth century fort and old brick factories exist together with the R.A.I. headquarters, along with large parking facilities and an area originally meant to accommodate travelling circuses. Today some of these places, such as the circus area, have lost their primary functions, leaving a physical and functional void, thus creating a new border without any connection to the surrounding territory.

To understand the meaning of this place, one must consider its genesis and transformations. One quickly realizes how Piazzale Clodio remains a drawing left at the margins:

the modern system of the early-nineteenth century did not provide for collective-use spaces, except for imposing squares placed between the crossroads of various roads. The Piazzale, which stops at the foot of the mountain, remains the last ever completed work of the urban plans which helped shape the city.

What remains missing is a relationship with the environment, since what follows is simply a clear separation deprived of any dialogue between architecture and landscape. On one hand is the city, with its speed, while on the other lies nature with its imposing elegance. Both are isolated in their generative mechanisms, which recede as they approach the marginal area of Piazzale Clodio.

The lack of identity of this place makes it even more of a front line, an "in-between" demarcating the boundaries of the Monte Mario Reserve, which lie higher than the city of Rome, and the fabric of the Quartiere delle Vittorie, the relegating the square to a solely connective function, serving its particular area of the city.

The importance of involving the theme of architecture with that of landscape appears crucial, and an essential generative process, since it is the interaction between these two elements which constitutes one of the possibilities of transforming the area.

As one knows, architecture can never be isolated from its context. One element interacts with the other, integrating and influencing modifications in a reciprocal manner, in a continuous evolution that enables endless opportunities in configuring a new space.

The term "new", however, should not distract from the process that lurks beneath the reconfiguration and the continuous transformation of a space composed of layers linked to the passage of time. Thus, one does not imply a completely new space, but rather an open system allowing change and transformation (Gattinara 2005).

Every time a new temporal layer is introduced into the life of the place, a modification which remains unchanged in time brings about sedimentation of a particular form, thus defining a temporary plan. These actions, when repeated and accumulated over the years leading to the current configuration of the place, may be retraced, revealing thought and identifying the different layers.

Therefore, the possibilities of a new space can be infinite and never devoid of objective data, since they arise from relationships with the surrounding environment, whether built or natural (De Carlo 2013).

And it is indeed the strong presence of nature in Piazzale Clodio that can generate the difference, by proposing a new design direction composed of relationships and experiential spaces rather than pure forms and geometry, as happened in the latter part of the last century.

Here, it is the nature of the place to plead for a space in relation to the surrounding environment; no longer a boundary between architecture and landscape, but a strategy able to incorporate the different ways of transforming places (fig. 3), recovering areas, and situations capable of fulfilling one of mankind's fundamental needs: inhabiting and living within a space.

Perhaps the open system of the morphological approach, refusing static conformity whilst preferring dynamic relationships to definite formalizations, could be the answer to the crisis of the great systems and the very idea of progress.

New pattern for an urban design between nature and history

On the basis of previous considerations, resolving Piazzale Clodio is an important matter due to its urban, environmental, and landscape value, together with its unsettled relationship with the continually eroding slopes of the Park of Monte Mario.

The necessity of an intervention led to a planning study, which established the following pre-requisites: the introduction to the problems of the urban project, with definitions and meanings in literature and in practice; the acquisition of the necessary knowledge for carrying out the urban project with respect to the strategies, relationships of scale, representation; the completion of the preparation in the field of architectural design in its relationships with the urban design with particular attention to issues of environmental sustainability, complexity, interdisciplinary relations (Belibani, Bossalino, Gadola 2010).

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Figure 3. The urban void on the slopes of Monte Mario is not connected with surrounding fabric. The new reconversion/project deletes the boundaries to recover the urban networks.
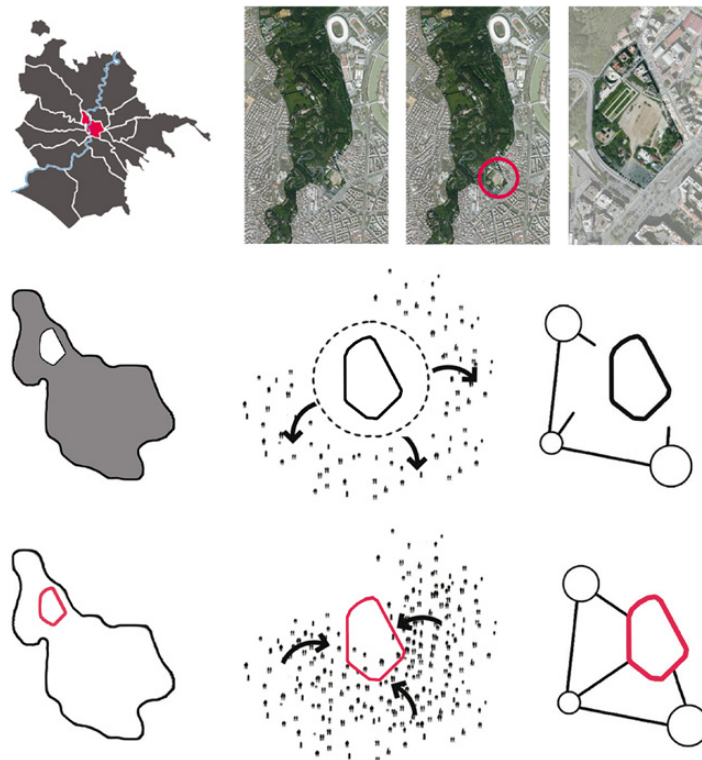
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To this end, we have proposed as a theme within a Design Studio IV, the design of the square and its relationship with the park. The design research, experimented for two years, tried to remedy the permanent degradation of the square, reviewing the internal mobility roads, remodeling the free north boundaries with Monte Mario and locating services, lacking in the neighborhood.

For this reason, we wanted the project to value the presence of the Park and satisfy the following objectives:

- Reconnect the natural slope of the Park with Piazzale Clodio, restoring its natural appearance;
- Restore the park's interaction with the square, making it directly visible from the square and reconstructing its green slopes in a physical and visual continuity;
- Remodel the hanging landscape of the Park, composed of the visually suspended but inaccessible park;
- Maximize the value of the park's presence by placing on its slopes services which are lacking in the district;
- Rebuild an urban setting where the fabric stops through the 'door' of the Park and new services;
- Rationalize the mobility system and the exchange facilities between public and private transport;
- Convert the daily parking areas to regenerated urban spaces;
- Redefine the borders of piazza on the left side, from the parking area to the chaotic access at the Courts;
- Reconsider the presence of the pedestrian subway beneath the Panoramic road (known as Via Falcone e Borsellino).

We suggested a project strategy oriented to safeguard and value the residual open spaces, whilst reorganizing the boundaries of the piazza and providing new specialized services through the landscape design.

Figure 4. Some design solutions that show the reconnection of the park district, the ecobuildings and the new arrangement of the Piazzale Clodio.
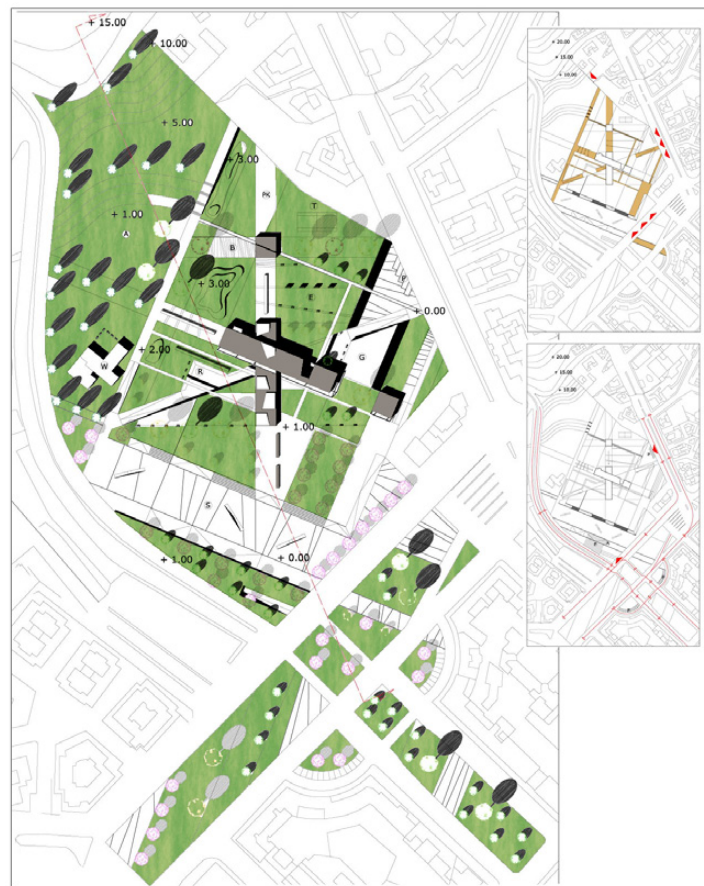
The ideal axis of Viale Mazzini takes you through the infrastructural system, which necessitates different strategies when planning any intervention, depending on whether it is within a residential fabric (as Quartiere delle Vittorie), in an infrastructural knot (as Piazzale Clodio) or in the open space of the Park (as a continuation of Via Falcone e Borsellino).

Taking this into consideration, we delineated several pertinent themes of architectural and urban planning, concerning:
- The landscape with its own natural and architectural features;
- The mobility system and infrastructure (driveways, cycling and pedestrian);
- New residential, tertiary and productive buildings.
These themes are intended to satisfy diverse general objectives:
- Extend and increase the value of the landscape, especially the area of the Park;
- Plan the intersections of local streets with regards to sustainability and environmental improvement;
- Increase the mobility network, favoring public transport;
- Solve the problem of parking areas;
- Complete the residential fabric with new local services and public spaces.

The main objective of the project is the arrangement of the piazza, with a new system of public and private mobility. An important issue is the location of the new buildings, which can be designed either to create a new independent fabric, or in accordance to the current ones: placing them in order to continue the existing orthogonal fabric or as an isolated landmark into the park (fig. 4). Another important matter concerns the new buildings, their position, typology and height, in comparison with the image of the consolidated city.

The project considers one or more buildings with a complex functional program; these would include a small library, a cafeteria or a restaurant, classrooms and workspaces, an exhibition space, administrative offices, temporary residences, a multi-purpose and conference room, a cinema or multimedia theater. In addition, the park would offer several different functions: theater, outdoor auditorium, sporting area, children's play area, wi-fi area. The project is also concerned with the integration of the existing trees with the planned new ones; it provides for the identification and planning of new green areas, possible breaking areas, parking levels, water ways, ways inside the park and paved areas.

The proposed projects offer appropriate solutions to the problems, solving every pertinent theme in a different way: the entrance of Viale Mazzini into the square and its continuation towards the hill, the internal mobility networks, the relocation of existing terminal and parking areas, the connection to the park, the choice and position of services. Among the possible proposals, the most interesting include: moving the bus terminal to the center of the piazza, in front of the Court; an underground parking, which would provide for a clear view towards the Park, allow access to Monte Mario, whilst being perfectly visible from Viale Mazzini.

The entrance to the Park introduces, from a morphological perspective, a remarkable difference in height, where the gap, providing for great visibility, is resolved with a stairway marking the access. The traffic circle would be located underground, with the lane in an east-west direction along the Park and the perpendicular crossing to Viale Mazzini on ground level, leaving a dedicated pedestrian and green space. This new urban scenario is designed in such a way that the piazza appears as an open space, with a more regular internal distribution.

All proposed solutions appear as the last stage of a transformation, the readable synthesis of interpretation of the actual fabric of the city. The outcomes of the entire process, representing the evolution and the vocation of the area, offer almost always the reconnection of parts of the city aliened from its milieu.

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The synthesis, finally, are able to reconstruct a single organism, but always manifest in the intervention or in the reinterpretation of mending its temporal stratification, the intervention scar in the body overall.

References

AA.VV. (2007) *Roma città mediterranea: continuità e discontinuità nella storia* (Gangemi, Roma).

Belibani, R., Bossalino, F., Gadola, A. (2009) http://www.diarambiente.it/

Boemi , C. M. (2006) *Roma dall'Alto* (CROMA Press, Roma).

Cocchioni, C. and De Grassi, M. (1984) *La Casa Popolare a Roma. Trent'anni di attività dell'I.C.P.* (Kappa Press, Roma).

De Carlo, G. (2013) *L'architettura della partecipazione* (Quodlibet Abitare).

Fattorosi Barnaba, N. (2010) *Prati e Della Vittoria: un quartiere e un rione da amare* (Palombi, Roma).

Gattinara, E.C. (2005) *Aprire Vivere Abitare, in Il pensiero delle forme tra architettura e scienza della vita* (MG Sistemi editoriali, Roma).

Insolera, I. (1962) *Roma moderna. Un secolo di storia urbanistica* (Einaudi).

Insolera, I. (2001) *Roma moderna: un secolo di storia urbanistica, 1870-1970* (Einaudi, Torino).

Insolera, I. (1996) *La Città nella Storia d'Italia. Roma* (Laterza Press, Bari).

Lucchini, F. (1988) *L'area Flaminia. L'auditorium, le ville i musei* (Officina Press, Roma).

Rossi, P. O. (2000) *Roma Guida all'architettura Moderna 1909-2000* (Laterza Press, Bari).

Secchi R., a cura di (2005) *Il pensiero delle forme tra architettura e scienza della vita*, (MG Sistemi editoriali, Roma).

Spagnoli, L. (2012) *Storia dell'urbanistica moderna. Dall'età della borghesia alla globalizzazione (1815-2010)* (Zanichelli, Bologna).

Vittorini, A. (2004) *Dalle Armi alle Arti* (Gangemi Press, Roma).

Zambetti, B. A. (1962) *Il Quartiere della Vittoria* (Palombi, Roma).

Chair_Nadia Charalambous
Department of Architecture, University of Cyprus
Co-Chair_Ario Nasserian
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

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Urban form and social segregation: the case of Mazatlán

Vicente Colomer Sendra, Ana Portalés Mañanós, David Urios Mondejar, Juan Colomer Alcácer
Departament of Urban, ETS. Architeture, Universitat Politècnica of València
Camino de Vera, s/n 46022 Valencia
Keywords: integration, segregation, transitions, joints

Abstract

Its truth that urban form determines the degree of social segregation of the city, but is also true that the adoption for the city of urban forms balanced and well articulated is not a guarantee for the social integration of its inhabitants.

The Mexican city of Mazatlan is an interesting urban organism that has positive values in its urban fabric and its historic buildings, surrounded by a generous nature of the Pacific mexican coast.

The historic urban transitions in Mazatlan taken into account the joint geometric conditions that have allowed urban expansions without traumatic ruptures and radical specialization of urban uses.

However, contemporary extension was performed with a specialization in tourism services and radical changes in the predeterminated urban form.

The result is a very negative segregative expansion for local residential urban habitat.

Given this situation, we will compare forms integrators cases more balanced results, as is the case of urban transformations of the Barcelona Olympic Games, as well as other more specific scale urban projects of the architect Álvaro Siza.

Of special interest, we will refer to the book New Urban Spaces by Jan Gehl, by the reflection that makes us interesting case selection of contemporary urban reforms, since it avoids falling into easy, such visions as the "paradigm of the European city or designing richest spaces for rich people, and presents a more complex and interesting vision, where the scale of success is more on the intelligent lecture and proposals able to apply techniques to improve the city, in any circumstance.

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Mazatlán, an urban introducción

The Historic Center of Mazatlan (HCM) is surrounded by water. On the west side, the Pacific Ocean. On the eastern side, the Port. The resort town has grown along the coast to the north, between the "marisma" and the coast, while residential growth has spread to northeast direction.

Except for the coastal hills, Mazatlan is a plain near the sea, at an average height of 2.50 m., Which has a slight tilt toward the Estero Chad and to the Pacific. His abundant groundwater is unfortunately salty. This site, due to the ease of port infrastructure, does not enjoy the best features of health and climatic comfort, but the beauty of its beaches and the attractiveness of its HCM They have enabled the transition from an agricultural economy, fishing and hunting, to one based on services to tourism, with some economical success.

The coastline, the marshes, the mountains and the port settings characterize the city and its different tissues are based on the orthogonal grid, formed streets and blocks of generous dimensions on which buildings whose characteristics and quality levels depend settle of its urban position.

The presence of hills in that part of the coast near the port, has conditioned the development of HCM, which covers the areas of market and symbolic places. Today also receive tourist pressure in some of its most prominent landmarks, but it is losing population for permanent residence and presents some enclaves of urban decay.

Until recent years, the urban sprawl to the north, between the coast and the Marisma and even to more indoors, developed by orthogonal system tissue. Streets and public spaces agglutinated urban relationships and staying apples residential plots of equipment and services.

The emergence of mass tourism, hotel facilities brought midsize, who were occupying the first coastal strip, without detracting from the original tissue already described. However, recent tourism developments have completely changed the situation and support larger performances without geometric regulation, which continuously privatize the north coast of the city.

At the same time, the inner residential urban sprawl has grown unchecked in large performances. The detached social housing massively produced has led to large tracts of land, urbanized precariously without corresponding measures of equipment, services and employment generating facilities.

This whole phenomenon has led to mass production of urban land with great functional specialization. In the case of new residential areas with very low densities. The low density and functional specialization, produces high mobility generated excessive costs for the inhabitants of the periphery of Mazatlan and public administration in charge of providing urban services and equipment to the resident population. In addition, all derivatives entails environmental problems of mobility and make this form of unsustainable growth.

To establish a morphological division of the city of Mazatlan, one must begin with its extraordinary and diverse phisical support, marked by the presence of the coastline over the Pacific, the hills, its counterpart in the nearby islands of the coast and the estuaries and waterways, very present in the geography of the city.

It is also important to incorporate the morphological analysis of the city, the infrastructure works that have conditioned its historical development. The most important are the proper fill containment and the port area, the railway line and construction of the Malecon, with its 7 km. set length, although much improved that way, the coastline itself.

rom these conditions, Mazatlan is structured by an orthogonal system of streets and blocks that contain subdivisions and construction of low density. Uses, in the most central-places are residential or commercial, structured by areas and urban axes.

The central area, conditioned by the presence of hills and the port and establishes two distinct areas: the Historic Center and the development of South Beach, which is derived from the expansion and filling of this port area.

HCM, exists because of its central urban setting is not as recent as that of other Mexican cities, and in their urban and architectural fundamentals come substantially from the nineteenth century. This brings to these central places symbolic values that are very
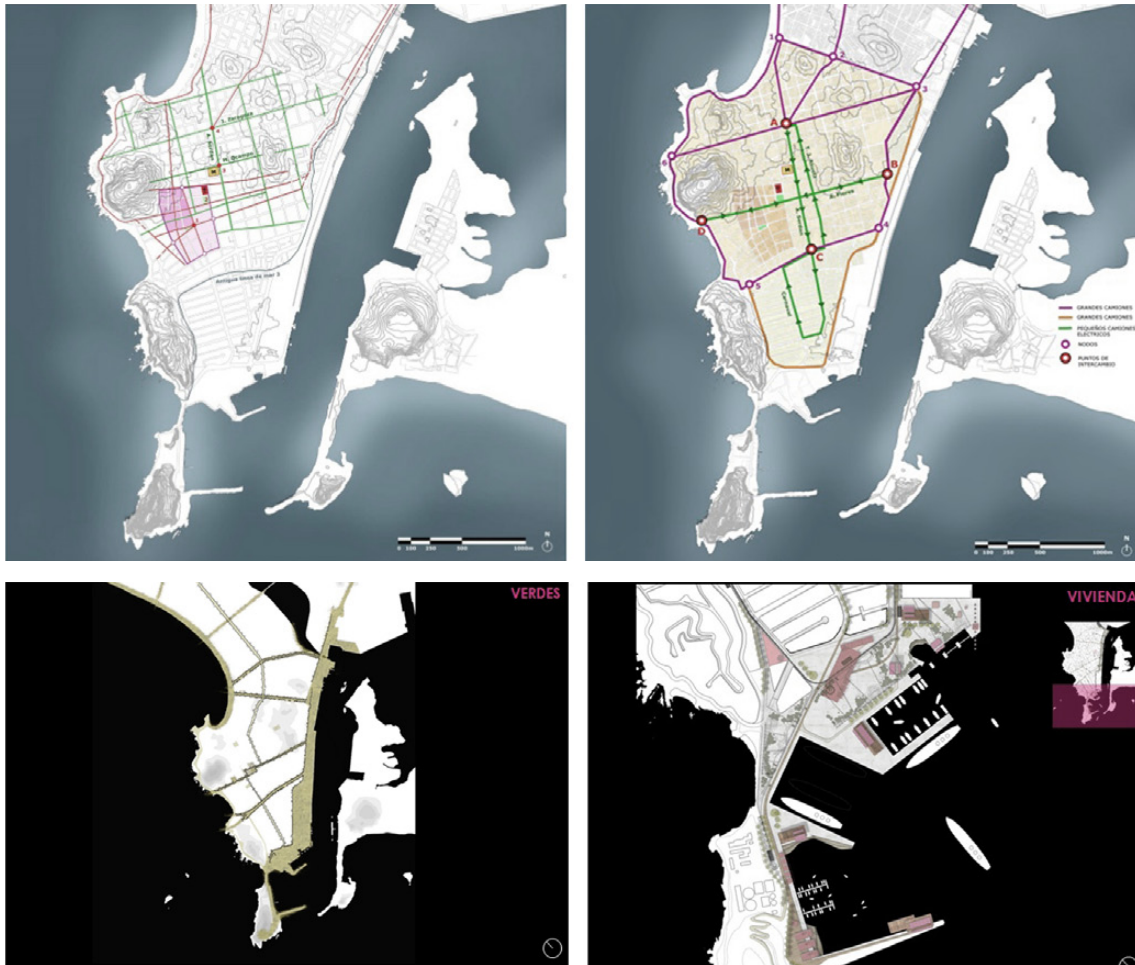
important for the settlement of tourism, as a floating population that active economic mechanisms of urban revitalization, although this revitalization has a sectoral or specialized nature.

As this occurs, the indigenous people of HCM has been established in other parts of the city more peripheral and citizens who inhabit it belong more and more layers of marginal population with low incomes and occupy degraded areas such as the east slopes of Cerro de la Nevería.

HCM contains the most important religious centers in the city: the Basilica of the Immaculada Concepcion (1856-1875), Temple of San José, at the foot of Cerro de la Nevería (1835-1842) and the Church of Cristo Rey, together the street Manuel Gutiérrez Nájera. Also institutions and public administration has its headquarters in HCM: The City, several major government buildings of Sinaloa State and Federal Government building.

Trade and municipal markets are well represented in the HCM: Next to City Hall and the Basilica, Fábricas de Francia shopping center, the Municipal Market of Manuel Gutierrez Najera and Pino Suarez Market.

The industry, which stands in front of Gabriel Leyva Street and other places of the city: Pacific Brewery, cafeteria Marino, 18 Freezing facilities, 5 Shipyards, 3 bottling, packing of foodstuffs 5 and e1 mill.

The capacity for absorption of vehicular traffic on the HCM, harbor tilts, road collector Manuel Leiva, which includes the transverse vehicle transits of Miguel Aleman and Manuel Gutiérrez Nájera being fundamental.

Figure 2. a) Alonso De Armiño. Hotel block location; b) Hotel ground floor; c) Hotel type plant; d) Hotel section.
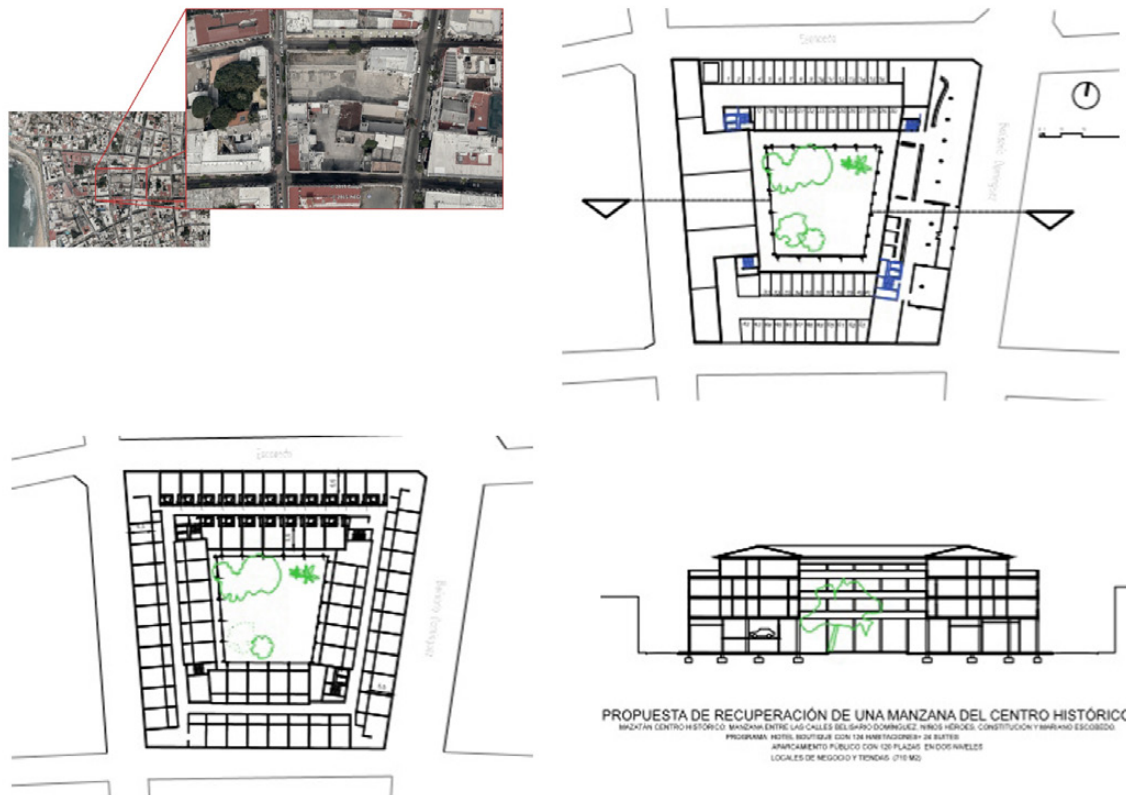
HCM is 412 hectares. And it consists of 458 blocks, therefore, the average area of the block is approximately 1 Ha.

The resident population is 25,000 inhabitants according to the 2005 census, we will take as a base, although in the last nine years has been down more due to the process of depopulation already alluded. These figures result in a density of 60 inhabitants/Ha would correspond to 20 homes/Ha.

The revitalization of the central places of Mazatlan, pass through an increase in housing density. The aim would be to reach 100 homes/Ha. And thus 300 inhabitants/ha.

Apples are of approximately square and its footprint built on them can approach 90%.

As already described, the HCM it is a place equipped and symbolic. His lack of open spaces in the form of gardens and parks is compensated by the presence of the Port and the beaches, an effect that would be greatly strengthened if these next space became more accesible.

bounded by Miguel Aleman street to the north, the port area is closely linked to a complex system consisting coast Cerro del Vigia west, Cerro del Creston south and the Port of Mazatlan itself.

The HCM has grown to the south, as a new harbor districte The main streets form a ring with Miguel Aleman north, Street Emilio Barragan east, Hilario Rodriguez Malpica south. Westward, the presence of the Cerro del Vigia is surrounded by Venustiano Carranza street and Paseo del Centenario, the latter already in the waterfront and both with a complex layout.

Apples are elongated in the direction SW-NE, with approximate dimensions of 50x250 m., Which gives an average of 1.25 blocks/Ha and contain a different "fraccionamientos", although a constant 10 m appears. as head of plot and 20 m. deep, with a footprint of the building very high (around 90%). In the building, dominated by 2 floors and its condition it is adequat overall.

The growth of Mazatlan has occurred north of HCM. This huge stretch, it begins in the east on the Malecon, where the urban fabric has more regularly, and welcomes in their first shoreline apples, 90x200 m (1.8 has), a large proportion of medium-sized hotels, built in the last quarter of the twentieth century, for the tourism industry.

From the marsh, the geometric reference track is the railway, though, begins a geometric disorder that is accentuated as the urban stretches, as in a mosaic, in which each operation reparcelación (divisions) makes its own geometric guidelines.

To the extent that the city expands towards the hinterland, the tissue is manifesting in ever increasing way the inconsistency of low-density suburban developments, disregarding the waterways for use as open space, demonstrating the impossibility of providing appropriate to the new urban areas endowments, services and near the place of resience job form.

In the tourist extensión on the coast, developments acquire two ways: The first, enhance the activity of fishing and recreational boating, have low densities and extend tourism in depth with respect to the waterfront. The second, colonize the coast without structure nor public spaces, enhance sun and beach facilities.

As tourism facilities are separated from the central locations of the city, as well as low-density residential suburbs, functional separation in areas increases, which increases the frequency and distance of displacement, both from home home to work as tourist. The provision of increasingly distant places urban services are also expensive.

The industrial sector, which traditionally has been associated largely to the fisheries sector, both directly linked to fishing, such as the preparation and marketing of fishery products. Industry, disorderly, will occupy the road between Mazatlan and Villa Union, within municipality located south of the city, near the airport and railway station.

As we see, all of Mazatlan, with its 400,000 inhabitants, without reaching the size of large cities in Mexico, and presents a disturbing picture of unsustainable urban area, excessive extension and at this point, you should perform a specific reflection on Mazatlan tourism issues, as their urban and regional crises is associated with the problematic past and future development of this activity and its social and environmental consequences.

Mazatlan is one of the most popular tourist urban enclaves of Mexico on the Pacific coast. 60's development is driven by the famous Acapulco and experience under the first Tourism Law in 1949. So also with the creation of the Guarantee Fund and Development of Tourism (FOGATUR) in 1956 credits for tourism stimulation provided. The political implication of the legislation on tourism and the creation of specific agencies to this end, established a framework to institutionalize this type of action, which together with the growth of tourism demand in the second half of the twentieth century led the launch of this sector in Mexico (Francia, 2.012).

Along with other Pacific coastal cities such as Puerto Vallarta, Veracruz and with the leadership of Acapulco, Mazatlan, it was configured as one of the "mass destinations" coastal tourists. This claim prompted the construction of medium-sized hotels and visitor attractions. From that time to Mazatlan tourism coupled with the fishing industry, it began to contribute to the generation of more jobs yal population increase.

The new engine of tourism in the city of Mazatlan, continues to drive a developmental growth fueled by the interest of consolidating and expanding the tourism regardless of the construction of a fragmented urban model, without geometric regulation and neglecting the richness of the natural environment and Cultural Landscape.

This tourism development based on unlimited growth, has involved a process of territorial transformation that promotes urban speculative and harassment regardless of reversibility or not the environmental cost. The depopulation of the HCM, extensive uncontrolled occupation of the urban fabric with the particular occupation of the coastal strip for the hospitality industry, has generated social, economic and environmental implications. We can point out first social segregation favored by the differential and incompatible uses of the urban fabric, and the privatization of the coastal strip.

As discussed (Gómez, 2005) "*In the tourist resort space is privatized, curtains buildings (hotels and apartments) stand are built marinas and golf courses, in territorial transformation processes where problems facing the local space increasing with renewed forms of residential segregation that strengthen social exclusion and fragmentation of space.*"

Figure 3. a) Densification 2 environmental; b) Densification 3 environmental; c) Densification 2 Urban Voids; d) Densification 2 Urban Planning; e) Densification 3 Urban Planning; f) Densification 3 Morphological Units.
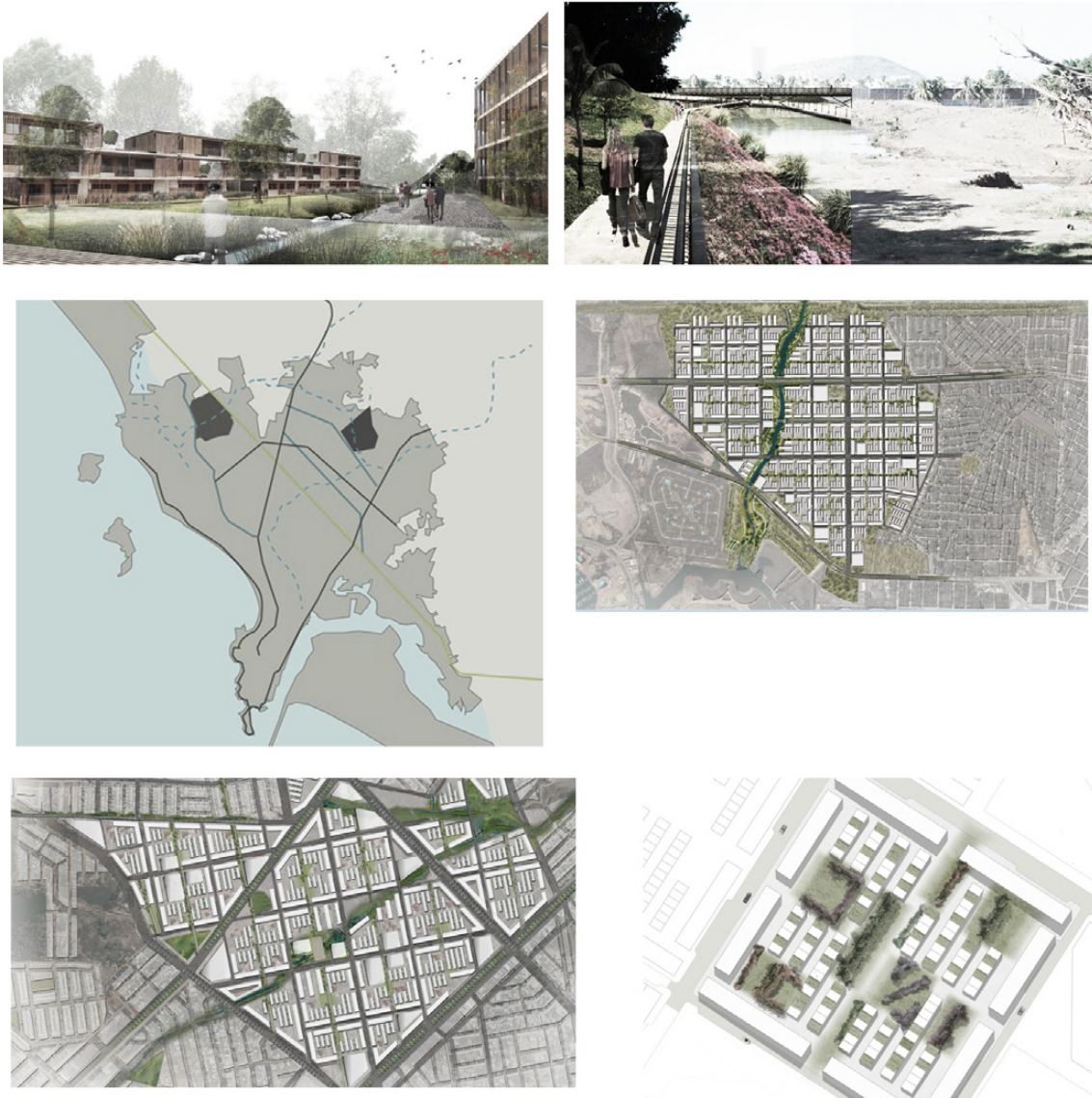
Well as economic and environmental problems emerge, for vehicular transportation needs arising from extensive model city, and by the invasion of the footprint of the building in the coastal landscape. In addition, one might add that the obsolescence of these tourist tissues, 50 years after its construction, it is manifest. Today, these places have, in many cases signs of exhaustion and maturity, being considered as tourist destinations expired, poor quality and, ultimately, a drag on the development of sustainable tourism (Lobeira, 2012). Whose proposals have been made in the form of comprehensive restructuring plans, usually considered the low quality of the building and the image of public space as an indicator for revaluation intervention studies. But it is also necessary to propose strategic actions of urban regeneration, densification of residential fabric and environmental protection.

I can not fail to extend this section based on the urban and territorial problems derived from tourism, without referring to an aspect as rooted in Spain since the 50s of the twentieth century, as the genesis of tourism coast in Mexico it approaches the Spanish phenomenon chronologicaly.

Intensive construction in most of the Spanish coast transformed the urban, demographic and social landscape under the 1st Land Act of 1956[1], which made possible the exploitation of the territory and allowed the tourist profitability of the coast. Thus, in the late fifties and the sixties, there was the important tourism development spread to all social classes as a result of the introduction of the welfare state.

The tourism favored the so-called "Spanish tourist boom", *a model that identified with the Mediterranean climate and attractive search of sun and sand. It is considered as a mature destination, who is undergoing a period of stagnation, requires adapting to an increasingly informed and that demand, developing new modes of consumption and spending, more and better attractions, diversification of supply of services and better use of space; abandoning the old "paradigm" of unlimited growth*. (Virgen, 2009)

Strategy of intervention in the historical center of Mazatlán (HCM)

The HCM, is undergoing a process of depopulation, which shows the comparison between the censuses of 1995 (32.000 inhabitants) and the 2005 (25.000 inhabitants). This poor indicator of population carries the aging population, the decline in the average income of residents, the physical deterioration of some areas and the outsourcing of others.

This phenomenon of depopulation, followed by specialization in the services sector linked to tourism, is always detrimental to a balanced functioning of the central and symbolic places of the city, since functional specialization, absent residential activity, has a correlation very negative that is urban segregation. As a first consequence of the foregoing, we conclude that it is necessary to activate an urban policy incentives to residential use for the HCM.

The work of Professor Giancarlo Cataldi[2] (Figure 1.A)[3] has unveiled the evolutionary keys of the CHM in its different phases, so that has allowed a better assessment of the overall strategy for selecting intervention sites, improvement and urban revitalization.

Mobility in HPM, is to find a new equilibrium based on two fundamental and complementary aspects: public transport priority and implement a system of greenways. (Figure 1.C)[4]. The first issue could be resolved using conventional public transport, an outer ring with hinge points for electric minibuses that could make internal routes without CO2 emissions. (Figure 1.B)[5]. To make the second aspect, greenways should be designed as a cross-network between the Malecón up to the hills and the port, both renewed through a process of requalification of public spaces, recycling of obsolete buildings, new residential and service. (9), (Figure 1.D).

Inside the HCM, apples have a large number of vacant parcels of regular size, with the peculiarity that in almost all cases, the ancient walls of façade remains. These large plots could be reconstructed with new multi-family residential building, with new hotels

[1]According to Fernando de Teran in Reflections on the planning crisis (Page 21) "we can deduce that the Land Law appears to us as a remarkable attempt to reconcile a rigorously coherent planning in their wishful aspirations physical configuration of urban development, with a system private land ownership and free market it". Thus, this feature of the law would be exploited by investors who together with the landowners become the right to develop a very profitable business.

[2]This work is based on previous publications of Giancarlo: CATALDI, Giancarlo. FORMICHI, Fausto. Pienza forma urbis. Aion Ed.2007. Firenze p.55-81 CATALDI, Giancarlo. Saverio Muratori, architetto, Modena 1910, Roma, 1973 a cento anni della nascita. Aion Ed. 2013. P.10-15.

[3]Figure 1.A summarizes the work of Professor Cataldi during the Workshop of Architecture and Urbanism (TAU) Mazatlan, developing a hypothesis of the origin and development of the historic center of the city that was the basis for some of the design decisions taken by groups of teachers, architects and students who participated in the workshop.

[4]MAYTORENA, Fernando. SALVADOR, Nuria. SÁNCHEZ, Natalia. SOSA, Samuel. TAU Mazatlán. February 2015. In the Workshop of Architecture and Urbanism of Mazatlan, this team of architects and students of architecture is the author of a project of urban regeneration of the harbor.

[5]MANJARREZ, Mariana. MENDIVIL, Mª. De los Ángeles. ROMERO, Adolfo. MONTEMAGNI, Jacopo. TAU Mazatlán. February 2015. In the Workshop of Architecture and Urbanism of Mazatlan, this team of architects and students of architecture is the author of a project of urban regeneration HCM.

Figure 4. a) Vicente Colomer. Densification 4 Gandía comb Ground floor; b) Densification 4 Gandía comb; c) Densification 4 Gandía comb; d) Densification 4 Mazatlán comb; e) Densification 4 Mazatlán comb Morphological Units; f) Densification 4 Mazatlán comb.

(Figures 2.A, 2.B, 2.C and 2.D)[6] and commercial premises suitable to the needs of the new population resident . All this would lead to a balanced urban revitalization.

Of the various forms of intervention in historic centers, it seems relevant to the case, remember how to intervene Alvaro Siza in the Chiado after the fire turned to ashes much of this neighborhood of Lisbon. Especially since this reconstruction, since it is still standing largely the facades that constituted the public stage of this enclave, forced to maintain and even reproduce the scenario, without this being an impediment to proceed with an update of architecture, building its evocative capacity. (Testa,1993).

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[6]ALONSO DE ARMIÑO, Luis. TAU Mazatlan. February 2015. During the Workshop, Professor   Luis Alonso de Armiño, made a Draft Hotel on one of the blocks in HCM..

Residential Densification Strategy in the periphery of Mazatlán

Suburban low-density residential growth raises economic, social and environmental problems that must be corrected. In medium-sized Mexican cities such as Mazatlan, the phenomenon is not of gravity which have large cities, as in the case of Mexico City and Guadalajara, Mazatlan but note that their occupying large tracts lots of interior floor (permanentresidential housing) and coast (tourist village) is becoming increasingly important and is aimed at situations of unsustainability.

It is necessary to establish densification strategies, morphological and typological proposing solutions to the three objectives: to adapt the new models to its urban and regional environment, curbing urban sprawl and improve the design and use of public spaces.

In order to establish references to Mazatlan, we have taken some historical relations between the production of dense urban space in European cities, and particularly in the urban phenomenon of the northern cities of the Mediterranean basin.

Large areas of these cities, bring together orthogonal layout systems with apples dense mixed-use building: multifamily residence, administrative, commercial and dotational. We refer specifically to the long tradition of "Ensanches" produced in European cities, in the Mediterranean along the nineteenth and twentieth centuries. Widening the paths have been very flexible in adapting to the morphological and typological demands of the modern movement, reaching the XXI century with topical, as is the case in Barcelona. In particular, I want to emphasize here the case of the Olympic Village as an example of adaptation of the location of the Eixample Cerda to new urban conditions in the city late S XX.

Continuing with the reflection on the adaptation to the environment, I also refer to two projects of Alvaro Siza: the Barrio del Pendino, in the port of Naples and the Shilderswijk West in The Hague (Testa,1993) examples of contiguity paths and ancient volumes and new, with extraordinary subtlety of the master.

To make a factual assessment of high-density residential models, we have selected some urban spaces on the outskirts of Mazatlan and we have implemented a building of 100 homes/ HA. A first check has been to their adaptability to the environment of the subdivisions and the use of existing water courses, added to the project as components of the existing landscape, with the result that express the attached images. (Figures 3A, 3B, 3C, 3D, 3E and 3F)[7].

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Mazatlan selected for the project have chosen models of laminar residential low-rise multi-family, tailored to two basic conditions for the block: the reduction in the areas of housing, reducing the common elements and adapting to the local climate spaces Mazatlan. (Figures 4A, 4B, 4C, 4D, 4E and 4F)[8]

References

Baños, J. A., (2012) 'Ocupación del territorio litoral en ciudades turísticas de México', *Bitácora*, vol. 1, 41-52.
Cataldi, G., Formichi, F. (2007) *Pienza Forma Urbis* (Aion edizioni, Firenze) 56-81.
Cataldi, G., Saverio M., (2013) *Saverio Muratori Architetto, Modena 1910, Roma 1973 a cento anni della nascita*, (Aion edizioni, Firenze) 0-15.
Cataldi, G. (2015) *Genealogy of the Historic Center Mazatlán*, elaborated in TAU Mazatlán (México).

[7]COLE Ana Sofía. VEIGA, Diogo. GAXIOLA, Eloisa. CINCO, Jesús. OYDEGARD, Àse. TAU Mazatlán. February 2015. In the Workshop of Architecture and Urbanism of Mazatlan, this team of architects and students of architecture is the author of a project of urban residential densification. YBARRA, Ana. MONTOTO Eric. VALENCIA, Sergio. BERUMEN, Beatríz. GUTIERREZ, Cynthia. TAU Mazatlán. February2015. In the Workshop of Architecture and Urbanism of Mazatlan, this team of architects and students of architecture is the author of a project of urban residential densification.

[8]COLOMER, Vicente, author of Peine Gandia project, addressed the group of students: BENITEZ, Keyri. SARABIA Jesus. LIZÁRRAGA, Marta. TAU Mazatlan. February 2015.In adapting this system to one of the urban spaces of Mazatlan, as an exercise of urban residential densification.

Frampton, K. (1999) *Álvaro Siza obra completa* (Gustavo Gili) 243-252 and 293.

Gómez, S. (2005) *El desarrollo turístico imaginado. Ensayos sobre un destino mexicano de litoral* (Universidad de Guadalajara, México).

Gómez, S., (2012) 'La planificación de los destinos turísticos mexicanos: una receta mil veces vanagloriada', *Investigaciones Turísticas*, 4, 77-98.

Lobeira, M. Á. (2012) *Regeneración de destinos turísticos. Tres casos de estudio en España* (Doctoral dissertation, Universidad Internacional de Andalucía).

Testa, P., Frampton, K. (1993) *Álvaro Siza, Obras y Proyectos 1954-1992.* José Paulo dos Santos (ed.) (Gustavo Gili) 226-233.

Virgen, C. R. (2009) 'El ciclo de vida de un destino turístico: Puerto Vallarta, Jalisco, México', *CULTUR*, año 03, 1,8.

Territories of Social (Dis)Order: criminal landscape and spatial dynamics of St. Petersburg 'neighborhoods'

Marianna Muravyeva, Alexander Lukoyanov
Higher School of Economics, Department of Sociology, ul. Soyuza Pechatnikov 15, St. Petersburg, Russia
Keywords: Crime, urban safety, safe neighbourhoods, St. Petersburg

Abstract

Problems of social order, improvement of territories and social organization have been always acute all over the world. Scholars have provided enough evidence to talk about significant correlation between cues of social disorder and deviance and crime contextualized within certain historical and spatial environments. In this paper we will focus on the transformations of social (dis)order in connection with crime and landscape over time using St. Petersburg as a case-study.

Using empirical data from police reports and various characteristics of municipal territorial units of St. Petersburg we would like to verify the main hypothesis of the theory of social disorganization theory, that is, that the environment, in which the individual lives, has a significant impact on their behavior contextualized within normative models of social order. The paper analyses the spatial distribution of crime by GIS and environmental determinants of deviations in various areas by OLS.

The paper consists of two parts. The first part deals with historical landscapes of crime and social (dis)order in St. Petersburg (1703-1990) to highlight historically inherent models of spatial dynamics of crime characteristic of St. Petersburg as a "regular" city and a capital of the empire descended into a provincial town after 1924. The second part of the paper explains how these historical models (dis)continued in the 1990s and 2000s due to changing environments and advances in urban planning.

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Introduction

Contemporary cities have been struggling with a variety of environmental challenges for centuries, crime being one of the leading issues on the agenda. Environmental criminology has developed a set of theories to influence policy makers to introduce intelligent urban design to prevent crime (CPTED), which includes territorial reinforcement, natural surveillance, building and interior design as well as cite design, lightning and social interaction spaces (Brantingham and Brantigham 1991; Crowe 2000). Landscaping and building design can be remodelled to create safe and crime free spaces. In addition, landscapes are on the political agenda as of lately. The main reason is the general observation that the changes in landscapes become extremely devastating, because many new elements and structures are superimposed upon the traditional landscapes that become highly fragmented and lose their identity. New landscapes are created and they are characterised by a functional homogeneity (Antrop 2004). Therefore, there is an inevitable conflict between traditional landscapes and requirements of CPTED, especially in the situations of urban innovations and remodelling of old neighbourhoods that are considered non-safe.

Studies in urban crime and spatial dynamics have been dominated by social disorganization theory that posits that adverse community characteristics such as poverty undermine levels of informal social control, which, in turn, fosters crime in urban setting (Sampson and Groves, 1989). In addition to study economics and noneconomic institutional effects on crime scholars have recently started to use institutional anomie theory as developed by Messner and Rosenfeld (1994). This theory claims that community-based economic institutions elevate normlessness that produces higher rates of criminal activity; however, noneconomic institutions hold the capacity to buffer anomic-fuelled economic effects of crime. Both theories work well when placed in the context of the systemic network thesis, which argues that broad range of community and institutional characteristics affect crime indirectly through their effect on informal social control (Bursik and Gramick 1993; Kornhauser 1978; Wilson 1987).

Criminological, urban design and landscape preservation literature have not paid much attention to the historical aspect of crime and landscapes, that is, why and how old neighbourhoods and historical urban landscapes structure and absorb crime versus new neighbourhood and functionally homogenous landscapes. In this presentation, we would like to examine how historic landscapes through their design influence the distribution and rates of crime, that is, if in old (historic) neighbourhoods crime rates are higher due to old-fashioned urban design and urban landscape and their historical reproduction patterns than in new functional neighbourhoods and how economic and non-economic institutions influence crime distribution.

St. Petersburg is a good test case study as it has both historic and new neighbourhoods. It is also a new case-study that can shed light on crime and urban landscapes in the 'planned' cities as St. Petersburg was built as a functional space based on advanced design technologies of the eighteenth century and was perceived as a progressive and modern compared to old European cities which had developed and emerged without conscious planning.

Methods: Setting and Sample

St. Petersburg was founded in 1703 as a capital for the new Empire according to the progressive urban design plans of the era. It was built using the principles of functionality and good governance as well as following the ideas of regularity, unity, esthetics and grandeur. St. Petersburg was supposed to symbolize the victory of reason and regularity over chaos and impulsiveness (Braunfels 1988). It developed quickly to become the largest city in Russia by the 1750s. When St. Petersburg lost its capital status in 1918, it remained economic, industrial and cultural centre of the country. Today, St. Petersburg is the second largest city in Russia with a population of 5,191,690 (Petrostat.gsk.ru as of 1 January 2015) for the area of 1,439 sq.km. St. Petersburg was built in the delta of the Neva River and was situated on twenty-five islands (increased to 101 in the nineteenth century

due to urban design changes). Today St. Petersburg includes 33 islands that add to its design specificity. St. Petersburg landscape includes 40 percent of parks and other green areas (65 sq.m. per person), however, the majority of parks and gardens are situated in the suburbs such as Pushkin, Pavlovsk and others or St. Petersburg historic centre. There is a lack of green areas in the new districts. St. Petersburg belongs to the conservation type of urban design; the main issue is how to preserve historical landmarks. Therefore, its new districts have been built around the historic centre (UNESCO World Heritage Site) and the population migrated (often forcefully) from the historical districts to the new ones, often advertised as more comfortable and better-infrastructured (Yarwood 2014).

The setting is a geographically defined area of St. Petersburg municipal districts. It includes 111 municipal districts (MD) of different historical origin, area size, population density, social, economic and cultural status, urban design. We have chosen the MD as a unit of analysis because it is statistically possible to describe and being an official administrative urban division it gives us an insight if any 'neighbourhood' theories work in application to official construct of local identities. Besides, any analysis of specified spaces such as streets and other localities is possible using an MD level only due to collection and reportage of crime incidents.

Several independent data sources were culled to construct the data file: (1) Incident Log of St. Petersburg Branch of the Ministry of Internal Affairs (https://78.mvd.ru/news/vnim); (2) Social and Economics development indicators of St. Petersburg municipal districts (http://omsu.spb.ru/); (3) Federal Statistics Agency for St. Petersburg – PETROSTAT (http://www.gks.ru/dbscripts/munst/munst40/); (4) Cadastral Registry of St. Petersburg (https://rosreestr.ru/site/activity/kadastrovaya-otsenka/); (5) Google.maps; (6) St. Petersburg Restaurant association – RESTOCLUB (http://www.restoclub.ru/).

The first source of data – Incident Log of St. Petersburg Branch of the Ministry of Internal Affairs – was used to carry out the mapping of crime incidents in relation to their street address and to provide criminological analysis of criminal situation in the municipal districts in respect to spatial characteristics of incidents for years 2012-2014. The second and third sources of data – Social and Economics development indicators of St. Petersburg municipal districts and Federal Statistics Agency for St. Petersburg – provided demographic, social and economic indicators for each municipal district to construct a model of socioeconomic dependencies. It also provided data for such indicators as a number of cultural and religious landmarks, educational institutions, sport facilities, shops and markets useful for the infrastructural analysis of each district. The fourth and fifth sources of data – Cadastral Registry of St. Petersburg and Google.maps – provided data on urban design, building ageing aggression, landscape and property prices in the area. The sixth source of data - St. Petersburg Restaurant association – provided data on entertainment sites and spaces, including alcohol-serving outlets.

All data was geocoded to their respective MDs, producing an analysis file of 102 MDs. Population sizes for the MDs ranged from 1,378 to 138,979, with a mean population of approximately 48,728. Instead of looking at the general statistical patters, we have selected to use the case-study method as the most relevant in this study due to the fact that we conduct a historical analysis together with an in-depth description of the contrast MDs that shall allow to see which indicators and predictors of crime and their combination work in the context of historical and new neighbourhoods in St. Petersburg. In our file, historic MDs happen to have generally higher crime rates per capita than new MDs. To highlight the differences in crime rates and historic districts, we have selected 6 MDs based on high, medium and low monthly crime rates per capita and their historical status: low crime rates – MD 'Posadsky' (historic) and MD # 15 (Vyborgsky district, new) 0.37 and 0.78; for medium crime rates – MD 'Chkalovskoe' (historic) and MD 'Ivanovsky' (post WWII, relatively new) 4.64 and 4.6; and for high crime rates – MD 'Ligovka-Yamskaia' (historic) and MD 'Sennoi Okrug' (historic) 8.9 and 8.19. The last selection included only historic districts due to crime rates being high only in historic MDs. These MDs' population sizes range from 16,825 to 63,793, with a mean population of approximately 50,638.

There is a certain hierarchy and chronology between historic MDs. MD 'Posadsky' is the oldest, close to main architectural and historical landmarks such as Peter and Paul

fortress (founded 1703) and Peter I's house (first ever house in St. Petersburg). However, the majority of buildings date to late nineteenth century and the art Nouveau style. MD 'Sennoi Okrug' was built around Haymarket in the 1740s and remained the market area till its reconstruction in the early 2000s. The majority of buildings date back to the mid- and latenineteenth century. MD 'Ligovka-Yamskaia' emerged around driver's settlement founded in 1713 and developed along the major roads in and out St. Petersburg. The majority of buildings date back to the midand late-nineteenth century. MD 'Chkalovskoe' differs in landscape from other MDs and includes three islands—Kamennyi, Krestovski and Elagin—all of them served as official residences for prominent Russian statesmen of the eighteenth century. This MD was gradually developing around the islands and has buildings dating back to the late nineteenth-century as well as post-WWII and very recent neighbourhoods. Two new MDs—Ivanosvkoe and Vyborgsky district no. 15—are post-WWII, however, with different architectural and historical heritage. MD 'Ivanosvky' dates back to the eighteenth century, when it was a gate keeping territory of St. Petersburg. It included mostly industrial and military settlements. The majority of housing was built in the 1930s, then destroyed during the WWII as well as the population was removed. It was rebuilt in the 1950s. MD 'Vyborgsky' is a very district with the 1970s and 1980s architecture to accommodate growing population of then Leningrad.

Based on case studies of these MDs we have constructed a hypothesis: (1) spatial distribution of crime codepends on a number of predictors such as historic pattern of the district, urban landscape and design, correlation between residents and non-residents, access to cultural, religious, educational and sports facilities and entertainment venues; (2) spatial distribution of crime increases in historic districts in connection with functionality of historical centre versus periphery: the proportion of non-residents in historic districts creates social disorder by exhibiting patterns of behaviour non-characteristic to their places of residence.

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Depended Variable:

The depended variable, that is crime rate of the MD in question. Crime rate was operationalized as a monthly average based on twelve months of 2012 of all criminal offences in each MD per capita (100,000 residents). We have recorded only criminal offenses according to Russian Criminal and Administrative codes.

Independent variables:

Social disorganisation and economic institution independent variables
Social disorganization and economic institutional predictors are generally assumed to obstruct the development of the community normative order. Concentrated disadvantaged variable included the following items: percent unemployment, percent pensioners, percent female-headed households with children, percent non-Russian. Concentrated disadvantage represented economically disadvantaged populations in respective MDs and hypothesized to be positively associated with crime. Population density was measured based on the Petrostat data of 2012 for each MD in relation to average density of the city. Economic institutional predictors included: 24-hour shops ("easy money" for opportunistic criminals); market places (traditional informal economic space with high propensity of illegal behaviour) and entertainment establishment density as a number of bars, taverns, pubs, restaurants in each MD per sq km.

Features of the physical environment
Percentage of green space was derived using a GIS that mapped all the green areas in respective MDs. Percentages of road bumps, road construction, and space renovation activities were derived from the municipal report statistics. It was hypothesized that high levels of environmental improvements and greenery negatively influence crime rates.

Non-economic institutional independent variables

The set of variables representing noneconomic institutions is assumed to invoke values of restraint and reinforce norms of conformity. Cultural institutions such as theatres, museums and opera houses are operationalized as a rate per sq km. They are supposed to influence the educational and cultural level of the population and negatively associated with crime rate. Same goes for educational institutions rate and sport facilities rate per sq km. Church density rate is a number of churches per sq km in each MD. At the same time, these institutions attract a significant numbers of nonresidents, but is it hypothesizes that as nonresidents come with cultural intentions this shall still negatively influence crime rates.

Results

Many of the hypothesized relationships between the independent and dependent variables were significant although often not in he expected direction. The general pattern of findings indicated that social disorganization and other economical institutional characteristics increased crime rates behaved unexpectedly in two historic MDs with the lowest crime rate – 'Posadsky' and highest crime rate – 'Sennoi'.

Being very similar in size, population, and concentrated disadvantage characteristics, they exhibited different criminality patterns. Two variables worked to influence crime: percent marketplaces and entertainment establishment density. In Sennoi 1.82 marketplaces per sq km and 94.55 entertainment establishments per sq km indicated were positively connected with high crime rates. At the same time, in other MD with high crime rate – 'Ligovka-Yamskaia' – marketplaces accounted for 0.00 and entertainment establishment for 21.21 per sq km which is lower than in Posadsky (24.12 per sq km), that highlighted that there should be other predictors for high crime rates. Such predictor included church density: in both MDs with high crime rates church density accounted for 2.42 (Ligovka) and 3.64 Sennoi per sq km while in Posadsky it was 0.59 and in other MDs with low or medium crime rates it was between 0.00 and 1.61. Posadsky church density is also an exclusion as it has only a Mosque (which is the historic cathedral Mosque and the only one in St.

Petersburg) and one small orthodox church built very recently. However, Muslim believers' behaviour and Christian Orthodox behaviours in terms of social disorder happened to differ significantly.

Thus, such social disorganization variable as a number of trash bins and street dumps are clearly connected with crime rates: in MD Sennoi there is 152.73 m3 dump per sq km while in MD#15 (low crime rates) there is no dump at all (0.00). However, MD Posadsky has 39.41 m3 per sq km, which is still a significant difference with Sennoi.

Concentrated disadvantage percentages remained similar in all six MDs, which is due to specificity in work and gender related patterns and state welfare and social security institutions in Russia. Female headed households with children although disadvantaged compared to full families, but not necessarily poor due to the visible women's presence in the labour market (single mothers predominantly work and arrange childcare through state and private childcare facilities or family support) and state support for single mothers and families with children, which provides low but safe income. Pensioners although also disadvantaged but due to traditionally low pensions and inherited egalitarian social structure and informal and in-kind support systems (such as family support or gardening allotments) they do have same low but safe income. Taken together these predictors do not create a positive association with high crime rates.

Such noneconomic variables as cultural institutions density have no significant bearing on crime rates, however, considering that the predominant majority of these institutions are concentrated in the historic centre (MDs Posadky, Sennoi and Ligovka), which has higher crime rates than new districts, it reflects the functionality of the historic centre as an attractor of nonresident populations. Both MDs Sennoi and Ligovka exhibit high cultural institutions density (2.73 and 3.33) and high crime rates while new districts with low cultural institutions density have low to medium crime rates (0.24 and 0.68 for 0.78 and 4.32 crime rates).

Physical environment features such as green spaces have a negative effect on high crime rates: both MDs with high crimes rates exhibit significant lack of green spaces (11.15

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and 53.91 per sq km) while other MDs with average and low crime rates have high green space density (between 62.59 and 182.46 per sq km). Sport facilities also have a negative effect on crime rates in combination with physical environment features: more sport facilities and green spaces (parks, gardens) give lower crime rates, which is connected with value attitudes to healthy way of life, and non-consumption of alcohol. In Ligovka MD 3.33 sport facilities per sq km and 11.15 green spaces per sq km give 8.42 crime rate while in Posadsky MD 12.94 sport facilities and 62.59 green spaces give 0.37 crime rate.

Another negative predictor is connected with physical environment features and includes road bumps density: there is a clear dependence between high density of road bumps and safety. In MD Posadsky 5.88 road bumps density gives low crime rates while in Ligovka and Sennoi 1.21 and 0.00 road bumps highlight high crime rates.

Discussion

The study was design to expand the nascent body of research developing and testing the cross-disciplinaty ecologic conceptual frameworks rooted in the social ecology, criminology, and economic literature. It has taken into particular account largely overlooked factors of historic functionality of urban environments and crime and found that high crime rates are influenced by historically functional spaces such as the centre of the city as crimes are often committed by non-resident offenders.

The study of six cases of contrasting MDs identified the following major trends:

1. Socio-demographic characteristics of MD residents are not related to the crime rates. There is a weak trend in the growth of crime and the percentage of female-headed households with children. According to the World Values Survey and European Values Survey both confirm that Russians have high degree of tolerance to single mothers and working mothers; these categories are not viewed as negative and single motherhood is not connected with producing delinquent adolescents (Muravyeva 2014). Heritage of social egalitarianism and strong welfare system of social support for disadvantaged groups (such as pensioners) produce certain homogeneity in historic MDs, which is not even influenced by high property prices. The advantages of residing in the historic centre of St. Petersburg are greater than a wish to improve a housing situation by moving out to the new districts, therefore, communal apartments continue to exist despite official attempts to provide their residents with better housing but in new suburban areas.

2. There is a strong trend to suggest that crimes are committed mostly by non-residents who come to the area, especially to the historic centre. By non-residents we understand those who do not reside in this particular MD and commute there for work, shopping or entertainment purposes. Therefore, the external environmental factors and the MD's development are seen to be crucial in establishing the association between the influx of non-residents and deviant behaviour.

3. St. Petersburg historic centre is not, however, homogenous in terms of criminality. It is obvious in contrasting examples of MD Posadsky and MD Sennoi. In these MDs the same predictors have opposite effect on crime. These predictors include:
   - 24-hour-shops, where people often can buy alcohol at a late time (although, in 2012 sales of alcohol was prohibited in St. Petersburg between 23.00 and 8.00, which was changed in 2013 to 22.00 to 11.00). However, some of these shops were converted into bars with a possibility to take away alcohol;
   - playgrounds, which usually have a positive effect on conforming behaviour as mothers with children tend to prevent offending. But linear dependency is highly problematic in this case. Some mothers tend to reproduce social control, others engage in anti-social behaviour such as alcohol consumption or smoking while children play at the playground. In MD Sennoi there are twice as many playgrounds as in MD Posadsky, but the same rate per child per playground (80 for one playground), which removes playgrounds as an influential predictor.

4. Since the centre of St. Petersburg is the centre not only from a geographical point of view, but also a cultural, architectural, and economic centre, the daily density of non-residents on the streets increases. In addition, historic MDs have different building

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and urban design patterns due to different architectural styles and functionality as they developed historically. MD Sennoi and Ligovka are two oldest districts which emerged as neighbourhoods for low classes, they developed around markets (Sennoi is translated as Haymarket) and professional occupation neighbourhoods (Ligovka-Yamskoi was a neighbourhood for post and cab drivers as Ligovsky avenue was an old Novgorod road; therefore, in included inns and low-scale motels for incoming and outgoing passegners). MD Posadsky evolved around professional working classes and trade populations, who preferred this area because it was close to the river and several important manufacturers and mills. Rebuilt in 'Northern Modern' style, Posadsky is right behind major official landmarks such as Peter and Paul Fortress and Peter I's old house (boutique).

5. Marketplace density proved to be crucial to high crime rates exhibiting a historical pattern of association of crime and the market place. Markets attract a lot of non-resident populations, provide a crime-prone environment through illegal transactions and difficult policing (Clifford and Edwards 2011). Together with the marketplace density, entertainment establishment density and dump rates are strong predictors of high crime rates.

6. The positive effect of church density on crime is connected with the parish organisation of St. Petersburg and the role religion plays in general. Many churches were destroyed during the 1930s, as well as official atheism produced generations of non-believers. Those churches which re-opened in the 1990s did not form the parish. New districts and suburbs have been built without churches. Therefore, believers need to travel to the historic churches of St. Petersburg centre to join their fellow believers. There is only one Mosque in St. Petersburg (in Posadsky MD), which attracts Muslim believers from the city and distant suburbs. Moreover, Russian Orthodox urban churches traditionally were centres of illicit and deviant behaviour: they attracted beggars, the churchyards served as spaces of underworld cultures; churchyards were also used for trading purposes especially those close to marketplaces (as in Sennoi MD, Yurkova 2013). As Orthodox population is residential and local, Muslim believers are perceived as a minority and their behaviour is strictly policed by both the Muslim community and by the authorities. At the same time, St. Petersburg Mosque was built in 1913 for the Tatar community, traditionally residing in St. Petersburg which was a capital of the multi-national and multi-confessional Russian Empire. It was built in the proximity of the Trinity Cathedral, which was the oldest church in St. Petersburg built in 1709 and served as a royal church till the 1720s, and demolished in 1933. Therefore, in Posadsky MD Muslim and Orthodox populations have traditionally resided together which often provided a competition in moral policing.

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Conclusion

St. Petersburg represents an interesting case for studying interdependence of social disorganisation, economic and non-economic institution predictors of crime contextualised in the historic environment. Such historic landmarks and predictors as marketplaces, churches, and entertainment venues concentrated in historically functional areas proved to be stronger predictors of high crimes rates than usual variables of social disorganisation such as poverty levels or educational and cultural levels of the populations. In old historic cities, the functionality of landscape and environment defines the setting for crime-prone behaviours whose patterns are often reproduced based on their historical precedents. Therefore, historical functionality and urban design shall be included as compulsory predictors of crime rates.

References

Antrop, M. (2004) 'Landscape change and the urbanization process in Europe', *Landscape and Urban Planning* 67, 9-26.
Brantingham, P. J. and Brantingham, P. L. (1991) *Environmental Criminology* (Prospect Heights, IL, Waveland Press).
Braunfels, W. (1988) *Urban design in Western Europe: regime and architecture, 900-1900* (Chicago, Uni. of Chicago Press).

Bursik, R. J. Jr. and Grasmick, H. G. (1993) *Neighbourhoods and Crime* (New York, NY, Lexington Books).

Clifford, M. and Edwards, T. D. (2011) *Environmental Crime* (Burlington, MA, Jones and Bartlett Publishers).

Crowe, T. D. (2000) *Crime Prevention Through Environmental Design: Applications of Architectural Design and Space Management Concepts* (Woburn, MA, Butterworth-Heinemann).

Kornhauser, R. (1978) *Social Sources of Delinquency* (Chicago, Illinois, University of Chicago Press).

Messner, S. F. and Rosenfeld, R. (1994) *Crime and the American Dream* (Belmont, CA, Wadswort).

Muravyeva, M. (2014) 'Traditional Values and Modern Families: Legal Understanding of Tradition and Modernity in Contemporary Russia', *Journal of Social Policy Research* 12(4), 625-638.

Sampson, R. J. and Groves, W. B. (1989) 'Community Structure and Crime: Testing Social Disorganization Theory', *American Journal of Sociology* 94, 774-802.

Wilson, W. J. (1987) *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy* (Chicago, IL, The University of Chicago Press).

Yarwood, J. (2013) *Urban design: three types of continuity, case studies by John Yarwood* (Newcastle upon Tyne, Cambridge Scholars).

Yurkova, Z. (2013) *Sennaia ploshchad': vchera, segodnia, zavtra* (Moscow, Tsentrpoligraph).

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Jerusalem: Urban Development in the last hundred years between Planned Growth and 'Spontaneous' Adaptations

Giuseppe Francesco Rociola
Dipartimento DiCEM, Università degli Studi della Basilicata, Matera, Italy
Keywords: Jerusalem, urban growth, informal city, planned city

Abstract

The study is part of the search field covering specific transformative processes of many cities in the south of the Mediterranean, characterized by political-religious tensions and economic, where the planned cities are in conflict with spontaneous urban fabrics. In that sense, the paper proposes a critical analysis of urban-architectural processes taking place in Jerusalem, which reflect three coexisting morphogenetic approaches: the first, related to the influences of the International Rationalism applied to the development of the Zionist "New Jerusalem", after the beginning of the British Mandate in 1917; the second, represented by adaptation of the Palestinian-Arab Jerusalem, transformed from "spontaneous" housing and urban fabrics built in the interstices of the Walled City in response to the Jewish development after the war in 1967; finally, the third, related to the fragmented Palestinian ghettos, which consist of a series of fringe belts constantly evolving. The coexistence of these distinct processes defines today a scenario where the "spontaneous" Palestinian-Arab building is hybridized by linguistic elements taken from the National architecture of the Jewish neighborhoods, with Israelis in turn engaged in a "territorial urbanization", to envelop the "spontaneous" Palestinian neighborhoods.

This study aims to analyze first the effects that this threefold process has produced and produces on the urban structure of Jerusalem and its identifying characteristics; secondly, It aims to investigate the relationship between the three different transformative approaches, verifying the possibility of developing new syntheses towards a new polycentric organicity of the Holy City, also applicable to other south-Mediterranean cities having similar issues.

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Introduction

The studies regarding the development of modern Jerusalem are often focused on the social and urban issues of Arab-Israeli conflict, in their relationship between the Old City and the new quarters. However they don't investigate, except brief overviews, the urban structure of the Palestinian adaptation processes, that after 1948 contributed to the progressive development of a "spontaneous" Jerusalem as a reflection of political crisis, expressed by self-build both inside the walled city that outside. A response to Israeli planned city on which this research will investigate.

The transformations of Jerusalem and surrounding areas since the first half of XX century were based on two opposing ways of "building the city": the first one, Jewish, concerns the integrated planning as a tool of territorial control; the second one, Palestinian-Arab, regards "spontaneous" architectures and "self-built" urban fabrics, inside the courtyards of Mamluk monuments, or extended beyond the walls.

One of the most important results of these phenomena is the morphological dichotomy between two separate "Holy Cities": first, the Israeli New Jerusalem, where since 1917 Western architects, geographers and planners applied architectural and urban principles consistent with the international debate; second, "Al-Quds", the Islamic Jerusalem where the Haram Al-Sharif acts as a centripetal node connecting the spatial continuum of the courtyard urban fabric. All this, at a certain point, entered in relationship with the historic palimpsest, as well as with the Palestinian neighborhoods built after 1948.

By comparing these coexisting transformative processes, still ongoing, it emerges the search for a Jewish "national identity", which uses architectural design and regional planning to balance imported models and vernacular references, trying to define a specific design approach for the Promise Land. On the other hand, the Palestinian-Arabs spontaneous settlements gives rise to phenomena of building filling and increments, showing typical characteristics of the Medieval processes in the courtyard urban fabrics.

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The "Zionization" of Jerusalem

In the Ottoman period, different urban and architectural traditions coexisted organically in Jerusalem, built over centuries of simultaneous adaptations among Muslims, Jews and Christians. After the British conquest in 1917 and the later Mandate, the ethno-religious influences on urban morphology have been gradually accentuated, turning Palestine into an experimental place where architects and city planners discussed two different visions: the one tied to International Rationalism as an attempt of Zionism to identify the national "style" and the approach influenced by Garden City Movement, whose principles conditioned also the debate on the suburbs and the historical centers, on which Gustavo Giovannoni was one of the most fervent scholars in Italy. In the case of Jerusalem, the discussion was focused in strengthening Jewish identity of Old City, that according to British it was compromised by late Ottoman transformations, depriving Jerusalem of typical quality of a modern city (Roberts, 2013. p. 8). Furthemore, Charles Robert Ashbee stated that the Ottoman interventions was the cause of the urban decay, which had to be cleared to show Medieval image of the Old City (Ashbee, 1921). The same conclusions concerned the new Ottoman western quarters: Patrick Geddes wrote that 'the new town, outside the walls, has lacked much good laying out hitherto. It has too many dull and confused masses of buildings, even in overcrowding and slum' (Geddes, 1971).

Therefore, in the early Twenties it began the isolation of the Old City, from a place of morphogenetic synechism, to a manufact to be preserved as a perpetual symbol of the past.

These are the main features of the British masterplans that, unlike the projects for Indian colonies, they have no a British city superimposed on the indigenous city, showing a sort of "Colonial Regionalism" (Fuchs and Herbert, 2001) that leaded the activities of Pro-Jerusalem Society, in which architects and archaeologists worked out several plans sharing the protection of the Old City. Among them: the William McLean's plan in 1918, the one by Patrick Geddes in 1919, the Charles Ashbee's plan in 1922 and finally the masterplan by Henry Kendall in 1944. Thus Old City became an outdoor museum whose importance

Figure 1. The urban development of Jerusalem at the beginning of British Mandate.
Below: the masterplan of 1918 by William McLean with the Cartesian urban fabric around the Old City, in comparison to the masterplan of 1919 by Patrick Geddes, which shows the adaptation of the roads to the morphology of the land. This last approach was a model for the later Israeli settlements.
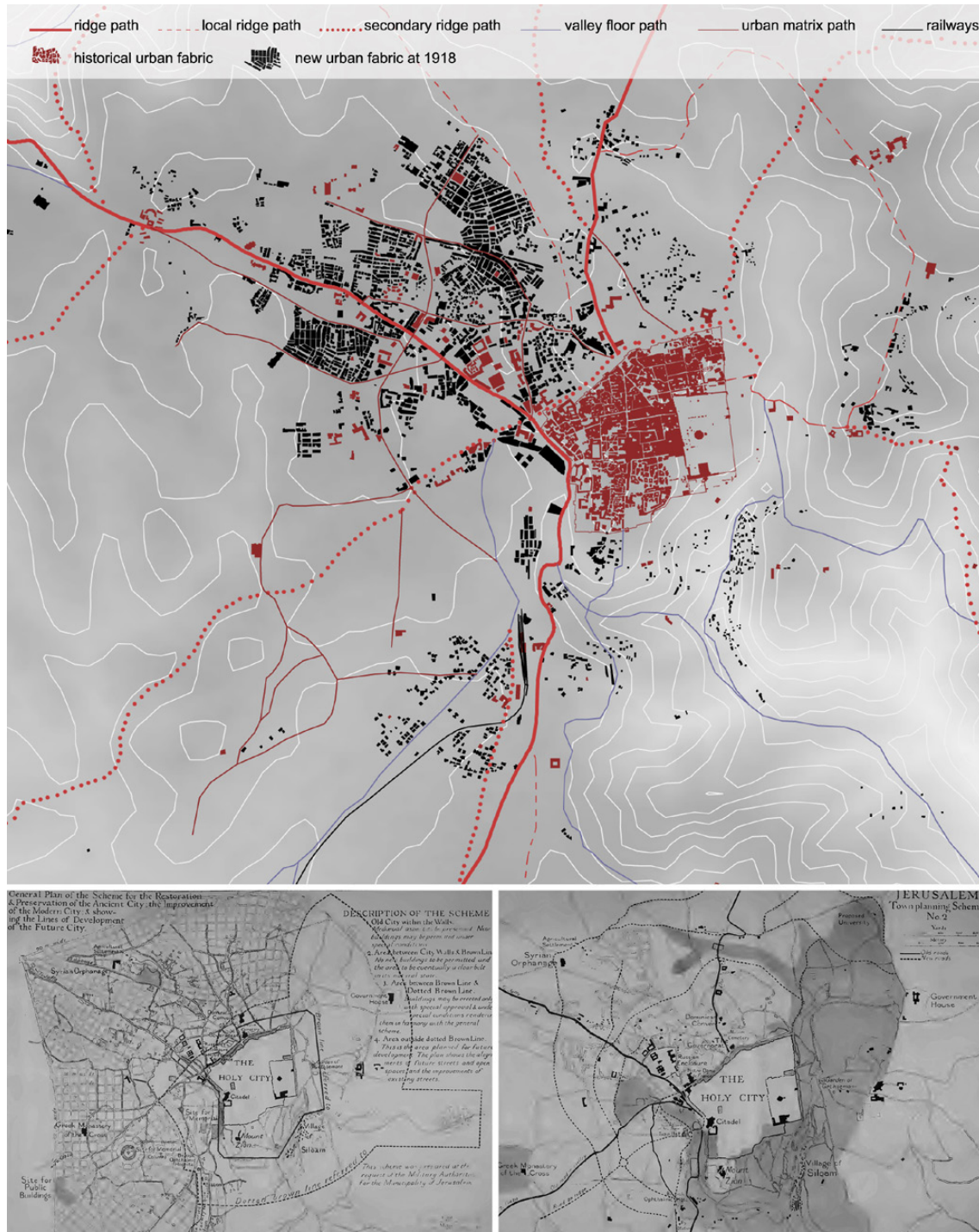
was the symbolic image of history and archeology, not the logical structure of its urban fabric. 'The distinctive quality of McLean plan [...] Is that it isolated the Holy City; sets it, so to speack, in the center of a park, thus Recognizing the appeal it makes to the world - the city of an idea - that needs to be protected as such' (Ashbee, 1921. p. 12). This principle,

shared by Geddes, frozen the development of Jerusalem, except the demolition of parts hindering the reading of the historic selection and artistic, that in the Western vision represented the Holy City. From this selection obviously was excluded the late Ottoman transformations, the reason who made Jerusalem a "filthy medieval town" (Ashbee, 1923).

Paradoxically, however, the north-western settlement built in the second half of XIX century under the Ottoman administration reforms became an integral part of the masterplans: in McLean's plan, particularly, the urban fabric, arranged on the basis of the routes linking Damascus, Jaffa and Hebron to the Old City, became the nucleus in relation to which a Cartesian grid was superimposed, similar to the plan for Delhi designed by Edwin Lutyens (Ben-Asher Gitler, 2003. p. 42). One of its key aspects is the adaptation of each block to the existing routes and the slopes of the hills. The administrative and commercial areas was placed between the monumental city and the new quarters, on the edge of the buffer zone around the Old City. One year after, Patrick Geddes designed a second plan, more tied to the territorial structure and its orography, in which existing matrix roads define the lots of the new blocks, disposed following the contour lines, unlike the McLean's plan in which the Nineteenth-century neighborhoods are unavoidable "presences" to be incorporated. A few years later, in 1922, in the plan of Charles Ashbee it was introduced the first zoning system (Ashbee, 1924. p. 18) with a second area of development in the south for industries and craft.

The distance between typological autochthony and Colonial Regionalism in Palestine is especially evident in the New Jewish Garden Suburbs, many designed by Richard Kauffmann in the early '20s. For instance, Talpioth, Janjirien, Boneh and Bayit Antimus Porah, are characterized by structures in which built lots, detached houses on the edge of the roads, urban hierarchies and location of public buildings are consistent with Howardian principles of the Garden City. Within each garden suburb the buildings have a range of styles, spacing from Art Nouveau to neo-Renaissance, from neo-Romanesque to Eclecticism, until the Modern Movement.

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In Palestine Kauffmann experimented the integration of the garden city with the urban density of the row-houses urban fabrics of north Europe. The coastal cities of Tel Aviv, Haifa and Acre, and the several new towns He designed, traced the outlines of the rising Eretz Yisrael. For theorists of Zionism, Jerusalem took only a symbolic role (Ricca, 2007. p. 26) for the over-presence of non-Jewish architecture. According to this, the "critical distance" of Zionist vision from Palestinian tradition emerged also in the typological principles applied to the dwellings of the new neighborhoods. By refusing relationships with the indigenous urban characteristics, architects used the building-type of detached house with backyard, consistent with the geographic area from which Jewish settlers have come.

In this period, the Arab-Muslim population lived in the Old City, in addition to the outside areas near Jaffa gate (Bahat, 1989) and in those suburbs placed from the north-east to the south-east, like Sheikh Jarrah or Bab Al-Zahara.

The growing politic tensions and immigration of European Jews persecuted by Nazism influenced another masterplan, who was carried out by Henry Kendall in 1944 (Kendall, 1948), which confirmed the development to the north, west and south of the Ashbee's plan, with the green buffer zone surrounding the Old City (Sharon, 1973), and the new garden suburbs arranged in the territory according to the principles set by Geddes in 1919.

With the 1948 First Arab-Israeli War and the self-proclamation of the Israeli State the first phase of post-Ottoman Jerusalem ended.

The contradiction between the myth of the *kibbutz* - small self-sufficient farming villages - promoted by Zionists and the opposed desire to urbanize the whole territory, appeared after the Armistice of 1949, with whom the Old City and East Jerusalem became Jordanian, forcing the Jewish residents to move into the new neighborhoods in the west, emphasizing also the symbolic role of Mount Scopus, the seat of the Hebrew University.

In the plan of 1950, stand out the areas for new residential neighborhoods on the hills around the Old City and the productive areas along the outer boundaries. Furthermore the administration zones are located along the matrix roads of the Ottoman development toward Jaffa gate, defining a new urban core alternative to the monumental city, for "mend" at the same time the existing urban fabric with new north-west suburbs.

Figure 2. The urban development in 1948 after the proclamation of the State of Israel. The armistice line highlights a divided city whose Israeli development was concentrated to the western hills, leaving the eastern lands for the Palestinian villages.
Below: The project of Talpioth neighborhood designed by Richard Kaukkmann in the early 20's.
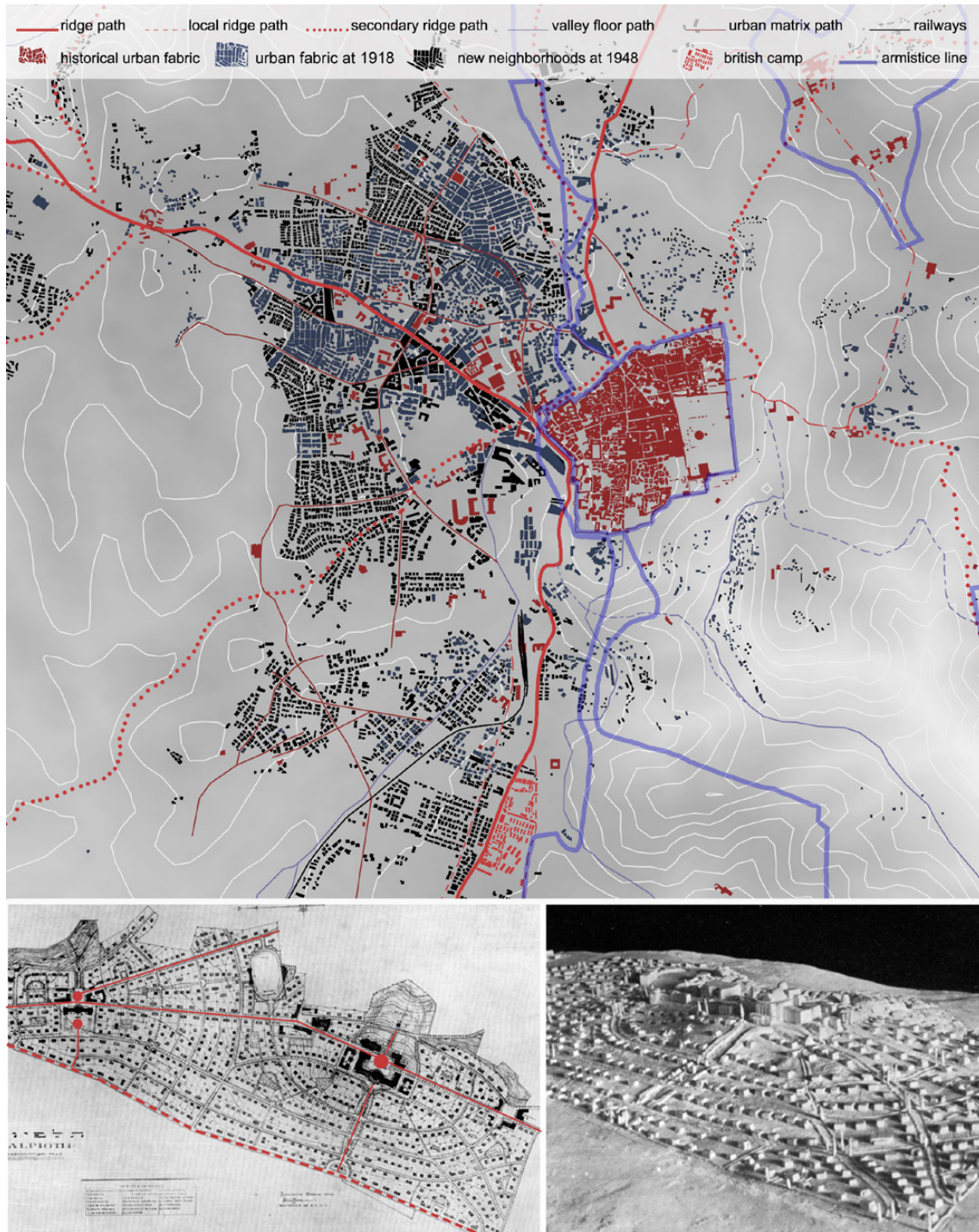
The realization of the above-mentioned masterplans contributed over time to the ethnic and religious separation of Jerusalem: the Jews were concentrated in the new neighborhoods to the west and east, while Muslim Arabs moved from the northern and western suburbs to the eastern territories or inside the Old City (Kaimari, 2005). The latter, contrary

to the "incremental" logic of Israeli planning, it continued to grow within itself since the end of the Nineteenth century, when many Mamluk madrasas were converted to dwellings for the African community of *Tukārina*, responsible for custody the areas around the Haram Al-Sharif (Burgoyne, 1987. p. 119). But because of the expulsion of Muslims from the western quarters after the war of '48, the Mamluk urban fabric became the main dwelling areas for Palestinians immigrants, through the filling of the spaces in the inner courtyards with single-space houses, initially made of wood as the shacks around the gates of Jaffa and Damascus, according to Turkish-Ottoman tradition.

The "United - Divided" Jerusalem

The symbolic role of the Old City, considered by the British only a rich historical-artistic manifesto, changed radically in 1967 after the Six Days War, with the unilateral annexation of the entire city in Israeli State. Jerusalem as united capital required therefore a profound rethinking of the settlement strategies to give a Jewish identity: this was both because of Arabs damage in the Jewish quarter during the Jordanian control (Zevi, 1979, p. 15), and the rapid development in the Palestinian Territories (Severino, 2013). Three complementary ways were adopted: the first concerned the liberation of the walled city from the Muslim Arabs; the second used archeology as a tool of history selection, emphasizing the Herodian period and the phase of the II Temple; finally, the third strategy was aimed to expanding Jerusalem in the outside territories, introducing the extensive colonization still under way.

Thus, after decades of standstill, the transformations in the Old City resumed with two objectives: the recovery of the Jewish Quarter as a symbol of the State and the enhancement of the Jewish roots of Palestine (Bar and Rubin, 2011, p. 777). The two objectives were linked, because the diffuse decay of the buildings imposed an urban redevelopment alongside a careful restoration, coordinated by the Company for the Reconstruction of the Old City. Key elements were synagogues and yeshivas, around which would have built the new urban fabric. Their restoration ignited a long debate on the need to underline the "medieval spirit" of the Nachmanides synagogue, in opposition to the strong Mamluk-Ottoman identity of the Old City. Therefore the reconstruction of the Jewish Quarter and the redevelopment of the Western Wall area was the occasion to remove the only obstacle in realizing the ideal Jewish urban continuum: the Moroccan Quarter. Therefore it was destroyed after having forced Muslim residents to move toward east of the city. Those demolitions opened a large gap in the urban fabric, not coherent to the small scale of its blocks. Indeed Bruno Zevi asserted the necessity to a careful urban renewal instead of demolish, to safeguard the perceptual relationships among the Wailing Wall and the narrow access roads (1979, p. 16). But all this was in contrast with the desire to give a new identity to Jerusalem. A great help in this sense derived from the archaeological excavations, that enlarged the boundaries of the quarter influencing also the design strategies, these last focused on the restoration of the existing edifices and the rebuilding of those destroyed, in both cases using traditional techniques of stone masonry (Sharon, 1973. p. 177). The reconstruction, however, was primarily interested to a stylistic reclamation, not to the typological aspects: the traditional courtyard urban fabric with the cul-de-sac system, that defines both a secondary system of urban accesses and a neighborhood unit, was interpreted only as a linguistic reference in the use of local stone. The hierarchies of the blocks are arranged according to a precise functional zoning: along the Byzantine *Cardo* are located the residential and commercial buildings, while institutions are placed close to the Wailing Wall. The roads are exclusively pedestrian, supported by small squares which introduce extraneous spatiality in the urban structure.

One of the emblems of the new Jewish Jerusalem is Hurva synagogue, destroyed after the war of '48. The debate about its reconstruction confirmed the ambiguity of the choices on urban scale: after the initial involvement of Louis Kahn, it was rebuilt only an arch as a historical document, then the synagogue was completely rebuilt according to its late Ottoman phase. The Kahn's project, beyond the known critical discussions on the relationship between the archaism of the interior space and the clear articulation of primary volumes that define it, it tried to interpret the new synagogue as a symbol for the

Figure 3. The urban organism of Jerusalem in the current phase: the Israeli planned city in comparison with Palestinian spontaneous neighborhoods, these last separated by the "wall" and interrupted by the by-pass roads.
Below: An "informal" Palestinian neighborhood and the Separation Wall close to the Armistice Line.
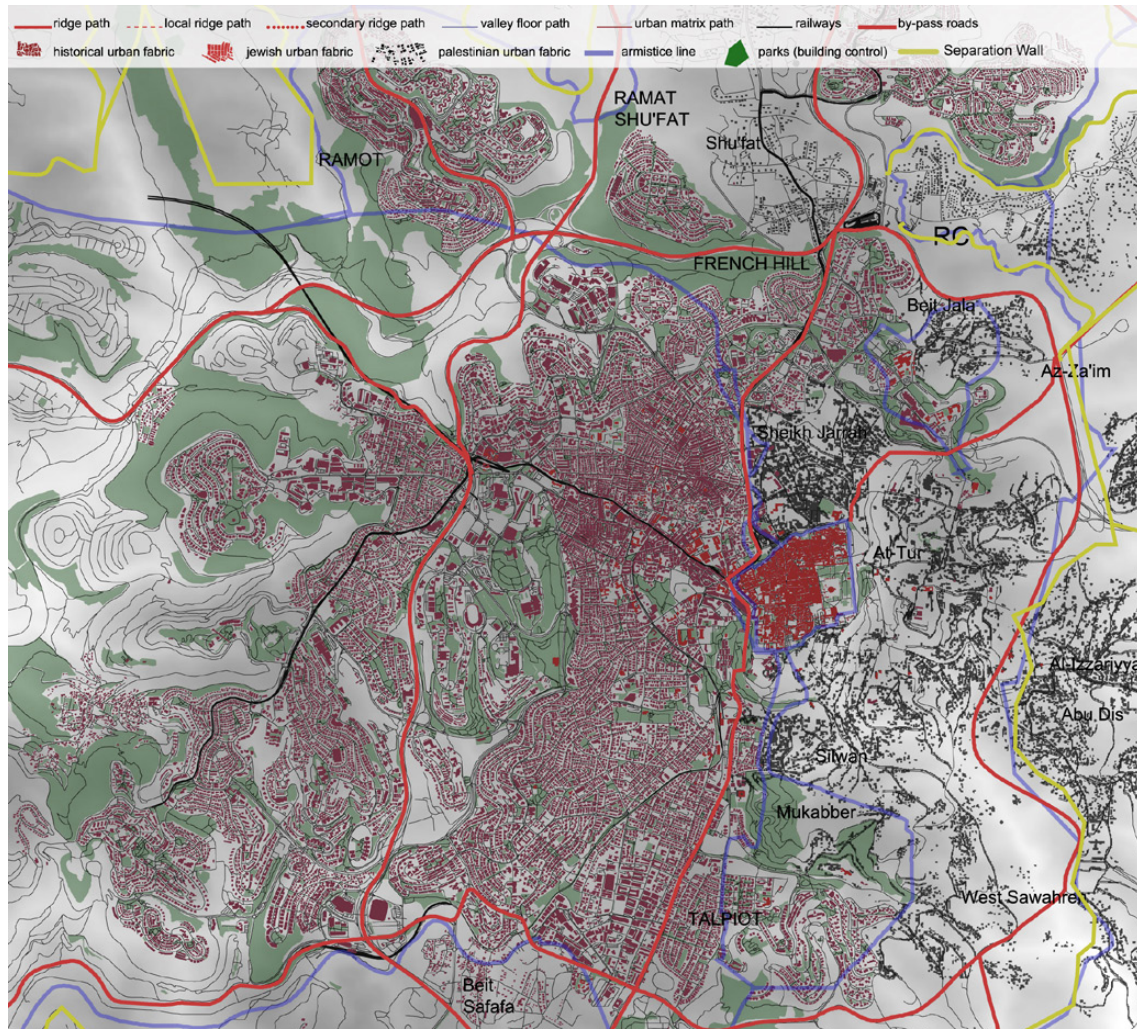
united Capital, with a building 25 meters high that reaches the total height of the Dome of the Rock. But public opinion considered the Kahn's synagogue not fit for purpose: too strong was the temptation to rebuild the Old City through a "historical narrative" connecting the non-Muslim phases of Jerusalem.

Figure 4. New spontaneous dwellings inside the historical buildings of the Old City. A process in progress.

city as organism | new visions for urban life

Anyway, the reconstruction of the Jewish Quarter is linked to another architect: Moshe Safdie. He was involved after his project "Habitat '67" (Goldberger, 2009, p. 17), an experimental block characterized by dwelling-modules as minimum elements of an aggregation system in which the different position - in three dimensions - of each house cites the diachronic stratification of the Palestinian-Arab city, using the obtained interstitial spaces as semi-open public areas.

His first project for Jerusalem, the Yeshiva Porat Yosef, is distinguished for the reinterpretation of the traditional elements of Palestinian architecture - the wall, the arch, the dome - re-assembled according to the modular logic of Habitat '67: so the masonry intersects the prefabrication.

The second project, in 1974, concerns the redevelopment of the space in front of the Wailing Wall, caused by the demolitions of Moroccan quarter. Safdie proposed a further excavation of 9 meters to discover the previous phases of construction of the Temple, connecting the different levels by a terraced plaza whose underground spaces contain public services and pedestrian paths. But the dispute among the various Israeli factions has so far prevented the realization.

Integrated organically in the reconstruction of the Jewish Quarter, it was the building up of the areas outside the walls, including the new neighborhoods to the northwest and south, together the urban fabric close to the gates of Damascus and Jaffa. It was the beginning of a long-term strategy aimed to develop Jerusalem as a city-region (Hyman, 1985).

This development was planned with the 1968 masterplan, which sought to tie the Old City, the green buffer zone, the Mount of Olives and the existing outskirt, with a metropolitan area that includes twenty-eight villages and two Arab cities: Ramallah to the north, Bethlehem to the south. Moreover the Old City and the surrounding neighborhoods were included within "special zones", divided into homogeneous areas under specific building control. The first aim was to connect the different urbanized parts as a holistic set, while the other concerned the enhancement of historic and archaeological Jewish heritage. Several strategies were derived from the plans of the British Mandate, such as the protection of the Old City, the green belt and the use of local stone.

The 1968 masterplan is the precondition to the construction of Jewish colonies aimed to the ethnic and geographical control (Weizman, 2007), which changed gradually the relationship between settlements and landscape: ridges, water sources, hill passes, were the morphogenetic nodes to prevent or stop the territorial continuity of Palestinian-Arabs settlements.

The standards of this masterplan ignited a strong contrast between the Jerusalem Municipality and the Ministry of Housing. The first one, assuming the proposals of speculators, it proposed tall buildings spaced and surrounded by gardens, squares and commercial services; the Ministry instead wanted to protect the perception of the Old City and the landscape. But the economic interests of investors prevailed (Kutcher, 1973). Thus began the allotment of the hills, with buildings over twenty-story high that changed definitively the landscape of the city, replacing the landmarks of walls, Dome of the Rock, Holy Sepulchre, Russian Compound and King David Hotel with a periphery without hierarchies and no relations neither physical nor perceptive with the historical city and the territory, which in fact were been annihilated gradually. All of this allowed the construction of invasive buildings such the Housing Estate on French Hill, the Plaza Hotel and its park, the Omaria tower, that was a part of a wider program not approved, and the Hyatt House Hotel on Mount Scopus, among the others.

In the years, the hill urbanization process in Jerusalem has been integrated in the Jewish colonies, these latter connected to each other by the *by-pass roads*, that are special streets designed to isolate the Palestinian villages, these last as a sort of settlements-islands forced to develop themselves only in the narrow residual spaces granted by Jews.

Jerusalem in this sense is the focus of the entire program, a Jewish city continuously in growth. Compared to the projects by Patrick Geddes and Richard Kauffmann, from which were inherit some general characteristics, the recent Jewish colonies introduce specific principles. Their urban fabrics in fact, consisting of row houses and detached houses, define a relationship between landscape and architectural density which is very

different from the Zionist garden cities of the Twenties. One of the most enlightening, in this sense, is the new town *Modi'in* designed by Moshe Safdie in the late '80s and taken as a model for later Israeli settlements. Its structure is based on the aggregation of buildings along terraced matrix roads that follow the contour lines, building a "polycentric organism" with apartment blocks and mansions connected by large parks around which are concentrated the public buildings.

The most recent phase of Palestine territorial division is the building of the concrete wall that since 2002 is isolating gradually Jerusalem from the Palestinian villages (Brooks, 2007), causing the rapid growth of Arab neighborhoods toward east and south, a process based on the "spontaneous consciousness". But in this case, unlike the slums in the peri-urban areas of metropolis and megalopolis, often structured according to an additive logic of temporary shelters, one of the unifying principles of Jerusalem case study is the integration and the overlapping of single dwellings on the existing buildings, coherently with the phenomena already in place in the Old City from the late Nineteenth century, where many public buildings were converted into housing for the Muslims from Sudan. In this sense, the development of the outer villages is characterized by an abundance of building-types and variants, where apartment blocks with different heights are surrounded to detached houses, with superfetations and spontaneous paths. Nevertheless the Palestinian self-built dwellings show some affinity with the slums of South America and Asia, as the lack of public spaces except streets, the typological promiscuity and the absence of clear alignments in the urban fabric. The relationship of these villages with the Jerusalem territory is expressed also by the fringe belts spread in the valleys among the hills, reflecting a phenomenon ongoing.

This unplanned process of "urban adaptation" reinterprets spontaneously some characteristics of traditional urban culture, as the urban continuum and the connection between routes and courtyard-types, typical of the Arab-Palestinian urban fabrics. In a specific way, this features identify the filling process of *ribats* and *madrasas* in the Old City, whose perpetuation over time has defined typical modes of transformation, according to three diachronic phases: in the first, several single-space dwellings are added to the original structure of the building, increasing its size; in the second phase there's the gradual filling of the open space of the courtyard, which loses its original purpose becoming a system of cul-de-sac that provide access to each dwelling; the third phase is characterized by the growth in height. This latter has two variants: either by overlapping new single-space houses on those below, as in Ribat Al-Mansouri, or by adding prefabricated dwellings connected by walkways, as in madrasa Al-Khatuniyya. Therefore, in current moment, the transformations in Jerusalem identify two distinct processes: the first one Israeli, concentrated mainly to the west and north beyond the Old City but also extended to the colonies in Palestinian Territories; the second one, Palestinian-Arab, carried out both in East Jerusalem and in the intensive reuse of the open spaces in the ancient city.

Common feature of these processes is the mutual exchange of "linguistic elements": while the new Israeli buildings simulate, but only in the façades, the wall textures of the Old City, the spontaneous Palestinian dwellings introject building systems and some architectural language features derived from the outskirts of the Israeli neighborhoods.

Methodology

The close link between routes and settlements in their historical-processual development, according to the theory stated by Saverio Muratori and Gianfranco Caniggia, then continued by subsequent generations of scholars, allows to decode the anthropic structure of the territory at different scales, while also providing a theoretical base to understand the phenomena ongoing regarding the outskirts and the urban sprawl. These phenomena, unlike other history periods, they are developing with chronological and structural discontinuity, thus opening additional scenarios of investigation looking for a method of integrated analysis, as highlights Conzenian theory on morphogenesis of Fringe Belts.

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Forming process

Based on historical documents and analyzing the maps, it was possible to investigate specific aspects of the structure of Jerusalem from the territory to the building types, by relating the transformations of the Old City and the urban development outside the walls started during the second half of XIX century and still ongoing. Comparing the oldest routes with Israeli *by-pass roads*, putting then in relationship the infrastructures with new neighborhoods, it was possible to outline a preliminary framework of the intricate process that in the last fifty years is changing definitively the territorial structure of Palestine.

Conclusion

Among the most interesting elements of morphogenetic process in Jerusalem, there is the spontaneous transformation of the Old City by Palestinian-Arabs, in a manner directly related to indigenous tradition both in filling the courtyards with dwellings and in the outer suburbs expanding continually. This no-planned development is the contrary of the Israeli planning, aimed to the urbanization of the whole metropolitan area of Jerusalem, occupying furthermore the empty spaces among the Palestinian villages. These different processes represent also two opposite approaches of living and transform the territory, comparing the Palestinian "informal" Jerusalem to the Israeli planned city.

Anyway there's a new process concerning Palestinian planned new towns, like Rawabi or Jericho Gate, under construction outside the Jerusalem metropolitan area in Gaza Strip and West Bank, which are paradoxically similar to the urban characteristics of Jewish Modi'in designed by Safdie, according to a general strategy focused to building the future Palestinian State.

This dual - but integrated - transformation process stimulates speculations on the relationships between the permanence of spontaneous consciousness in the contemporary city and the "critical distance" between the stratified identity of the place and the urban and typological principles that from over a century have programmatically superimposed a new identity, often denying a real comparison with the history, proposing often imported models.

References

Ashbee, C. R. (1921) *Jerusalem 1918-1920* (The Council of Pro-Jerusalem Society, London).
Ashbee, C. R. (1923) *A Palestine Notebook 1918–1923* (Doubleday, New York).
Ashbee, C. R. (1924) *Jerusalem 1920-1922* (The Council of Pro-Jerusalem Society, London).
Kaimari, M. (2005) 'Understanding the Socio-Cultural facts Created by Planning East Jerusalem', in Auga, M. et al. (ed.) *Divided Cities in Transition: Challenges Facing Jerusalem and Berlin* (The International Peace and Cooperation Center, Jerusalem) 35-51.
Bahat, D. (1989) *Illustrated atlas of Jerusalem* (The Israel Map and Publishing Company Ltd., Israel).
Bar, D. and Rubin, R. (2011) 'The Jewish Quarter after 1967: A Case Study on the Creation of an Ideological-Cultural Landscape in Jerusalem's Old City', *Journal of Urban History* 37 (5), 775 –792.
Ben-Asher Gitler, I. (2003) ' "Marrying Modern Progress with Treasured Antiquity": Jerusalem City Plans during the British Mandate, 1917–1948', *Traditional dwellings and settlements review* 15 (1), 39-58.
Brooks, R. D. (ed.) (2007) *The wall: Fragmenting the Palestinian Fabric in Jerusalem* (The International Peace and Cooperation Center, Jerusalem).
Burgoyne, M. H. (1987) *Mamluk Jerusalem: An architectural study* (Jolly and Barber Ltd., Great Britain) 119.
Freda, G. (2011) *La collina della primavera. L'architettura moderna di Tel Aviv* (Franco Angeli, Milano).
Fuchs, R. and Herbert, G. (2001) 'A Colonial Portrait of Jerusalem: British Architecture in Mandate-Era Palestine', in AlSayyad, N. (ed.) *Hybrid Urbanism: On the Identity Discourse*

and the Built Environment (Westport: Praeger) 85.

Geddes, P. (1971) *Cities in Evolution: An Introduction to the Town Planning Movement and to the Study of Civics* (HarperandRow, NewYork) 601.

Goldberger, P. (2009) 'Rebuilding Jerusalem', in *Moshe Safdie I* (Images Publishing, Mulgrave).

Hyman, B., Kimhi I. and Savitzki J. (1985) *Jerusalem in Transition. Urban Growth and Change 1970's – 1980's* (The Institute of Urban and Regional Studies, The Hebrew University of Jerusalem, Jerusalem).

Kendall, H. (1948) *Jerusalem: the city plan: preservation and development during the British mandate, 1918-1948* (His Majesty's Stationery Office, London).

Kutcher, A. (1973) *The New Jerusalem: Planning and Politics* (Thames and Hudson, London).

Ricca, S. (2007) *Reinventing Jerusalem: Israel's Reconstruction of the Jewish Quarter After 1967* (I. B. Tauris, London).

Roberts, N. E. (2013) 'Dividing Jerusalem: British Urban Planning in the Holy City', *Journal of Palestine Studies* 42 (4), 7-26.

Severino (2013) 'Gerusalemme. Da «città celeste» a «città che muore»' in De Martino, C. (ed.) *Su Gerusalemme: strategie per il controllo dello spazio urbano* (Castelvecchi Rx, Roma).

Sharon, A. (1973) *Planning Jerusalem: The Master Plan for the Old City of Jerusalem and Its Environs* (McGraw – Hill Book Company, Jerusalem).

Weizman, E. (2007) *Hollow land: Israel's architecture of occupation* (Verso Books, London).

Zevi, B. (1979) 'Dalla ricostruzione di Gerusalemme ai segni di James Stirling', *Cronache di architettura* 13, 15-17.

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The return of an interest in Typomorphology in South African Urban Design

Henri Pierre Comrie
School of Architecture, Planning and Geomatics, University of Cape Town, Rondebosch, Cape Town 7701, South Africa
Keywords: intensification, post-apartheid integration, typomorphology, South African urban design

Abstract

Given the fact that urban morphology is greatly concerned with an appreciation of historic urban form, post-apartheid South African urban designers have been faced with a moral predicament. An aversion to the physically discernible Eurocentric past has greatly influenced the pedagogy of urban design in South African universities since 1994. The aversion towards the past related particularly to the mostly gridded and densely built up inner city areas of Johannesburg, Durban, Pretoria and Cape Town that rose rapidly on African soil under white minority rule since European colonization in the 17th century.

Rather than lambasting modernism and leaving the argument there, the Finding Lost Space theories of Roger Trancik and the Recombinant Urbanism theories of David Graham Shane consider the voids left by modernist traditions opportunities for creative analysis and revitalisation in the cities of the global North. Acceptance of the physical remnants of both colonialism and apartheid is similarly being considered as a context of new opportunity in the South African urban design discourse. The ideologically lapsed but physically pervasive 'white man's inner city' with its established but under-utilised infrastructure is now increasingly considered a site for both catalytic public sector investment and vigorous commercial redevelopment in the resource scarce, developing country context of South Africa. The Eurocentric typologies that built the apartheid city is gradually being replaced by nuanced stitching, hollowing out and gradual overlay by a new generation of entrepreneurs (Gardner.

This necessitates reconciliation and engagement with the tainted colonial/apartheid morphology of the inner city and a subjugation of the moral dilemma that recently denied it as South Africans gradually move away from their segregated past.

This paper will consider this emerging dynamic, both in terms of current practice and inherent potential.

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Introduction: An escalating lack of cohesion in South African Cities and towns

A recent study of the regional morphology of five mining towns in South Africa by the author demonstrates the perpetuation of low density urban sprawl. The seemingly never ending pattern of continued subdivision on the fringes of already sparsely populated towns and cities persist despite national policy that aims to intensify and integrate. The determinist, colour-coded fragments that have been left behind by a combination of both apartheid policy and modernism has struggled to find a more equitable substitute.

The extent of- and the political, professional and cultural causes of such continued and escalating fragmentation is first discussed in this paper, before evidence of a return to more tangible typomorphological analysis as a basis for transformative urban design is presented.

The uncertain political and professional context in which urban form is shaped

The urban landscape of South Africa is highly politicized and confused. Salient amongst the problems facing design-minded urbanists who value compact form is the fact that planners have been subdividing new extensions to urban land in ways which seem the only alternative. The gross size of Cape Town compared to other world cities and the explosion of its urban footprint demonstrates the extent of the problem. The wilfd fire expansion of the remote mining town of Kuruman post-apartheid presents even more startling evidence (figure 1).

Prior to 1984, planners were loosely organized and urban layouts were often done first by land surveyors, and later by prominent architects in larger cities. Some of the best urban contexts remaining in South Africa date from the early land surveyor drawn era when subdivisions often occurred along simple orthogonal street grids with the edges of blocks typically consolidated in an *ad hoc* fashion over time. The authors of such loosely defined grids were pragmatists who had little cause with the divisive strategies behind what was to follow. The pioneering spirit allowed for laissez-faire overlays devised by common folk in a variety of colonial styles.

Groupings concerned with making a career from township establishment eventually organized themselves into a politically induced profession under the threat of an end to apartheid. Not surprisingly, it were right leaning schools that became the most vocal proponents of professionalisation. The enduring problem with the Regional Planner' Act (No 19 of 1984) is the fact that it '*was drafted to protect the public interest, but that interest was subject to governmental interpretation, which not surprisingly meant one of forced segregation mandated at the highest level*' (Muller, 2003).

When the walls of apartheid came down soon afterwards, an entrenched army of un-critical, colour-crayon wielding professionals had been suitably firewalled. Not only had they become conditioned to subdivide and zone, but had no substitute in Town Hall in the short to medium term. Though a swathe of new policy was drafted and promulgated post 1994, it is not difficult to recognize the perpetuation of this apartheid era conditioning in both attitudes and urban form today. The legacy is particularly evident in remote towns such as those serving the secluded mining industry, where little transformative debate has taken place. Transport engineers had similarly been spoilt by the apartheid state, which saw road and highway building as the ultimate and undeniable demonstration of achievement, unwittingly supported by the perfectly fitting handmaiden of segregating modernist ideals.

Architects continue to fill the exclusive spaces pegged to the coloured land use maps still drafted by planners today. They do in a manner which mostly require them to simply work within such predefined rights. Statutory approvals amount to non-discretionary mathematical exercises of straightforward bulk and coverage compliance. There is no need for discretionary engagement or the negotiating of appropriate rights in context. The only real conceptual challenge is to satisfy each individual client, given the predetermined rights captured on file. With this comes all the form and taste preferences of architect and/or client. When combined this results in chaotic mix of form and style. Often style is blamed but it is largely the lack of frameworks and coding that creates the dominance of form over balanced composition.

Figure 1. Pre- and post-apartheid. Figure ground study of unchecked sprawl in the mining town Kuruman (study by author, 2015).

1990

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Any consideration of the capacity of built form to frame public space through dialogue is thus made a peripheral, voluntary pursuit generally seen as being wasteful towards impressing clients or having projects move onto site with the necessary expediency.

The impact of cultural preferences towards sustaining low density urban form

Though modernism and apartheid combined to create a professions-driven momentum away from compact urban form and rooted dialogue in South African urbanism, individual, culturally embedded aspirations that favor the free standing house on its subdivided plot contributes equally to the blight. Such aspirations are held across the spectrum of race and class and is little different to that embedded in American frontier or consumerist cultures for example. For anyone convinced of the simple merits of perimeter blocks, party walls and living on top or below your neighbor the challenges remain steep.

On balance, compactness beyond today's squatter settlement or central city development dating from early land surveyor laid out towns and cities is an alien concept. Compactness is seen as a metaphor for inviting crime-ridden ghettos to your neighborhood. The stigma of compact mine workers' hostels and decayed inner city apartment blocks of Johannesburg and Durban in particular do little to further the case towards supporting dense and sustainable types. Superficial attention is thus drawn to type as scapegoat for urban ills.

For vote-seeking politicians and bureaucrats who have achieved or sustained middle class status and employ a newly earned value system, there is often little political will to transform the urban landscape towards one which is less individualistic. Moreover, regimented public participation and environmental impact assessment processes makes spatially literate urban designers mute bystanders in processes that seem focused on abstract check lists rather than integrated built form.

Placatory participation and the fixes on dynamic form

Office bound professionals of the built environment generally continue to compete for work in a top down, positivist manner. This has an immediate effect on the way that they engage in participatory processes that have been made compulsory by the state in the development of spatial frameworks.

Technical, profession-specific scenarios are generally presented to audiences through exclusionary and expedient jargon, set to the clock of spin doctors who have recognized the gap. Such attitudes provide little scope for considering nested hierarchies or for urbanists concerned with the fourth dimension of time to argue for the empowering

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capacity of more dynamic conditions. It is imperative that professionals collaborate via charettes and users via the presentation of a greater range of individual choices.

Apart from the procedural austerity, it is also the scale of the South African problem, combined with the post-apartheid obligation to engage broadly whilst having to rely on scarce of resources that results in much of the superficiality.

Despite this, some are trying to escape the tyranny of not being given space to apply their minds to the inherent values of appropriate urban form at scales where it matters. Such limited empirical work becomes vital in supporting the case for greater urban design involvement.

A new drive towards catalytic projects and the influence of NGO's and the private sector

Despite all the obstacles of scale, culture, and quantitative abstraction presented above, there is a growing awareness of the poor urban environments associated with the legacy of apartheid and the inadequate responses that this has cultivated within the professions. Empirical divergence from the *status quo* occurs at six levels:
- First, in the work of a handful of non-aligned public sector urban designers who have managed to gain a foothold as pioneering public sector officials in the aftermath of apartheid.
- Second, in the work of non-governmental organisations that had advocated for change during apartheid but naturally begun to lose their *raison d'etre* with the release from prison of Nelson Mandela in 1990. In time these organisations began to re-emerge as failures by the post-apartheid state to deliver on its promises became increasingly evident. This sector is today particularly active in the context of squatter settlement upgrade, violence prevention through urban form and affordable housing delivery.
- Third, by private sector entrepreneurs who have devised formulas to build higher density, affordable structures partially facilitated by state subsidies but without the state's innovation-stifling control. Increasingly such entrepreneurs, who label their products *social housing*, work with urban designers in achieving more appropriate built form.
- Fourth, fully privatized and commercially driven New Urbanist ventures that act as surrogates for 'safe and clean' pubic environments in the wake of capital flight from declining inner city zones.
- Fifth, in the work of urban designers who use large, state-delivered projects such as new universities to craft form-based interventions into what Trancik (1986) would identify as the *lost spaces* of postindustrial cities and towns.
- Sixth, in work guided by specialized divisions within state or para-statal organisations who control dedicated budgets for catalytic projects at precinct scale. Such more recent initiatives generally fall outside the ambit of conventional planning law and is increasingly focused on smaller towns which suffer from institutional neglect.

All six types described above rely on typomorphological work. It is influenced by what Moudon (1989) calls '*systemic studies of urban form*'. This suggests increasing awareness of- and need for the study of urban form and to subscribe to the long held values of ISUF. This is particularly important in the context of demonstrating the universal qualities inherent in compact urban form.

Typomorphological variant Type 1: Work of urban designers in the public sector

The most discernable contribution at this level has been made by the Spatial Planning Unit of the City of Cape Town as described by Barbara Southworth (2003). The initiative was driven by public funding under the auspices of *The City of Cape Town's Dignified Places Programme*. These ideas, which were partially brought to fruition in the late 1990's, were shaped at the urban design school of the University of Cape Town. The thinking of this school '*was driven by the precepts of physical design since its origins in the early 1970's*' (Muller, 2003). The idea of using limited, public seed funding to leverage a private

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Figure 2. Example of a typomorphologically inspired code for the development of a catalytic node by urban designers of the City of Cape Town (Southworth, 2003).
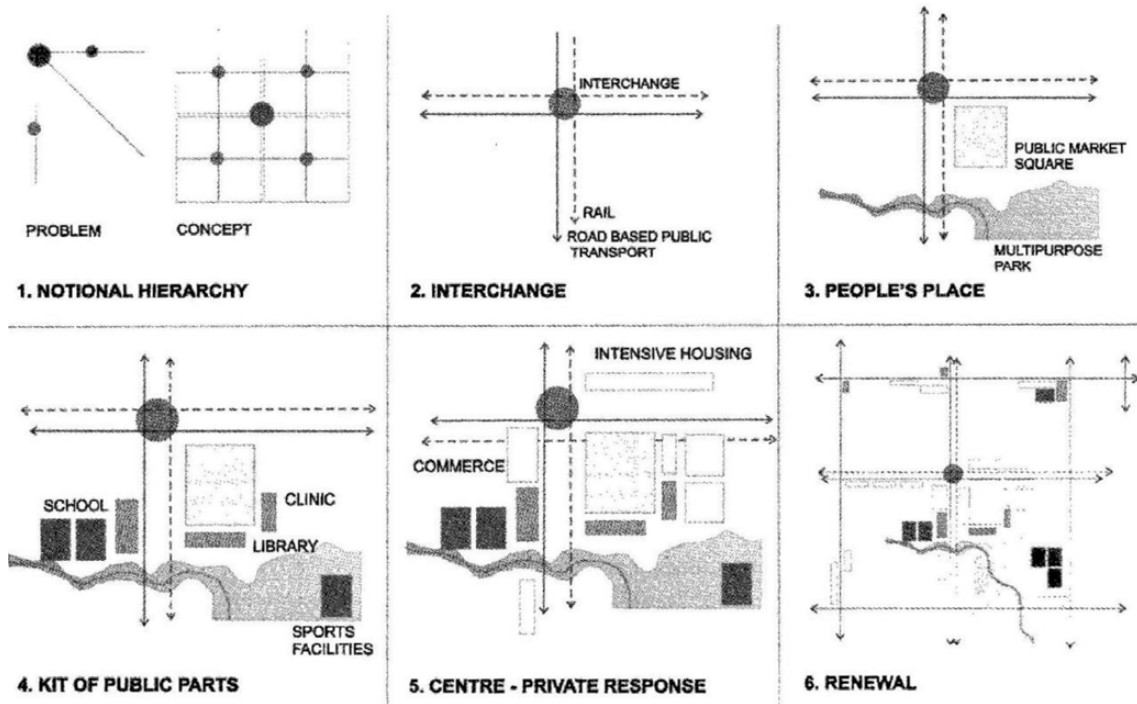
sector responses along corridors of inequality became the driving force behind the work of Southworth and her colleagues.

Codes were set for nodes of focused public investment and some of these nodes such as the Nyanga Node were developed with the intention of them developing incrementally into modern day agoras. Though recorded to have in some instances been shunned by surrounding poor communities in the face of more urgent basic needs, it may be too soon to evaluate the lasting success.

Typomorphological variant Type 2: Work by non-governmental organisations

Key examples of this are found in the work of non-governmental organization such as *Slum Dwellers International* who typically facilitate re-blocking of dense squatter settlements in order to facilitate incremental upgrade and to rationalize urban space for the retrofitting of municipal infrastructure.

The option of national government accepting informality as a route towards tenure is fraught with legal and environmental difficulties, as is generally the case internationally. Despite the overwhelming need for formal housing, this has limited the ability of squatter settlement upgrade to find support beyond a limited number of pilot projects. The Flamingo Crescent re-blocking exercise in Lansdowne, Cape Town is one of several pilot projects supported by the City of Cape Town as part of a broader commitment the City made in 2012. The pocket-sized but extremely dense settlement, hemmed in between established industrial structures, made it possible to engage in a contained and thus less risky venture. There was broad involvement from a range of organisations including Slum Dwellers International South Africa and its associates, The City of Cape Town, Habitat for Humanity, Worcester Polytechnic Institute (USA), Cape Peninsula University of Technology and the Early Childhood Development Centre. (Flamingo Crescent, 2015). http://sasdialliance.org.za/projects/flamingo-crescent/)

Whilst the community themselves participated in mapping the status quo, design input was provided by students from the Cape Peninsula University of Technology and

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Worcester Polytechnic Institute in the USA who also assisted in conceptualising plans for a crèche and a play park. The re-blocked settlement pattern displays close resemblance to the early typomorphological texture found in historic towns such as Graaff Reinet, established by the Dutch on a consistent 270m x 190m grid in 1785. These early foundations of urban form were established outside the stifling land use planning dictates we find today (Fransen, 2006). Graaf Reinet is one of the most memorable towns in South Africa because of a fine grained perimeter block assembly that has been shaped patiently from small scale agricultural beginnings over a period of time.

Typomorphological variant Type 3: Work of private sector entrepreneurs

This has been the most influential sector in terms of changing perceptions around form and type. This is perhaps not surprising, given the fact that the state is weaker than what it will readily admit, both financially and institutionally.

The government has struggled to provide affordable mass housing of quality under post-apartheid programmes such as the much anticipated but spatially disingenuous *Reconstruction and Development Programme* and the *Breaking New Ground Programme*. The sterility of repetitive, minimum standard, single storey houses driven by the political currency of quantity over quality mirrors the blightedness found in post war housing in Europe or that built under the auspices of unchecked, speculative house builders in many countries today. This is compounded by many instances of low build quality referred to as 'tenderpreneurship' in South Africa. Tenderpreneurs are under skilled individuals or companies who consider the winning of tenders as an end in itself, with little regard for the quality of the physical products that they leave behind.

It is increasingly being recognised that such housing is no better than, and in fact often worse than settlements built by the apartheid state in dormitory townships of the 1950's and 1960's or through delegated power in the ethnically segregated homelands in the 1980's. The latter at times yielded very good examples of quality affordable housing because the layers of bureaucracy in the so called 'puppet states' (homelands), to which the apartheid government had delegated powers were less. This liberated architects and urban designers from the blanket national policies that have all but excluded them from involvement in responsive, context-specific design of state housing post-apartheid.

The clusters of housing at Mmabatho designed by Llew Bryan and John Mehl and built in 1983 serves as a good example of typologically astute housing from the 1980's. The typology is strongly influenced by local Tswana traditions as well as by Christopher Alexander's Pattern Language (Beck, 1985). It is very similar in its fine grained quality to the much celebrated and widely published single storey housing built by Charles Correa and Balkrihna Doshi in India at around the same time.

The state model of delivery described above has mostly been based on subsidised ownership of houses of a very limited number of wholly detached types, compounded by the short-sighted prospect of cumulated savings through mindless repetition. One of these, the infamous RDP House, of which 2.4 million had been '*rolled out*' by 2010, is found on the fringes of towns up and down the country with the only distinguishing feature being differences in paint colour. The repetition itself is not the problem. It is rather a case of such repetition not being considered as part of a wider place making strategy through clustering or proper scale considerations.

More recently, with the advent of a rising lower-middle class in South Africa, has come the involvement of private sector entrepreneurs, who are increasingly facilitating the development of denser, more sustainable typologies for consumption within the expanding rental market. Enter the four storey perimeter block with its efficient densities and ability to be built on more expensive but better located land. Increasingly urban designers are being given a voice and are involved in negotiating rights with politicians and officials alongside their clients. Frameworks that demonstrate both quantitative and qualitative dimensions of the solution provide new currencies. Some of these combine state subsidies, public land that had been donated and foreign donor funding. These are combined in creative ways to leverage higher levels of affordability for those on a low income, as well as securing a profit for the entrepreneurs.

All this comes with a catch, but one that is worth ignoring for the sake of longer term urban design achievement. The need for efficient rent collection in this type of housing temporarily limits freedom of movement between public streets and private units as a necessary part of the entrepreneurial formula. This is by implication reliant on a gated perimeter block typology that limits ground level access to potential squatters as can be seen at the Drommedaris Project designed by the urban designer/architect Jac Snyman. The inherent fortress-potential of the perimeter block typology, with a manned control gate allows for access controlled semi-public courts. Access to individual units is for now obtained exclusively from the controlled rear. This means that the street perimeter is sterilised, with gates leading from dummy front doors to surrounding streets being welded shut. This is however all part of a plan that saves the type from being rejected outright because of short term concerns.

The strategy is that, as rental stock units convert to ownership, the need for rent collection and controlling the outer perimeter will be reduced and the gates along the perim-

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Figure 4. Extent of fragmentation in Kurumam and proposal for housing to define a hierarchy of public spaces on a 90 x 90 m grid (URBA Architects and Urban Designers, 2015).

GRAIN EXTRACT FROM PERIPHERY

AERIAL PHOTOGRAPH OF PERIPHERY

TRANSECT FROM CORE TO PERIPHERY

GRAIN EXTRACT FROM CORE

AERIAL PHOTOGRAPH OF CORE
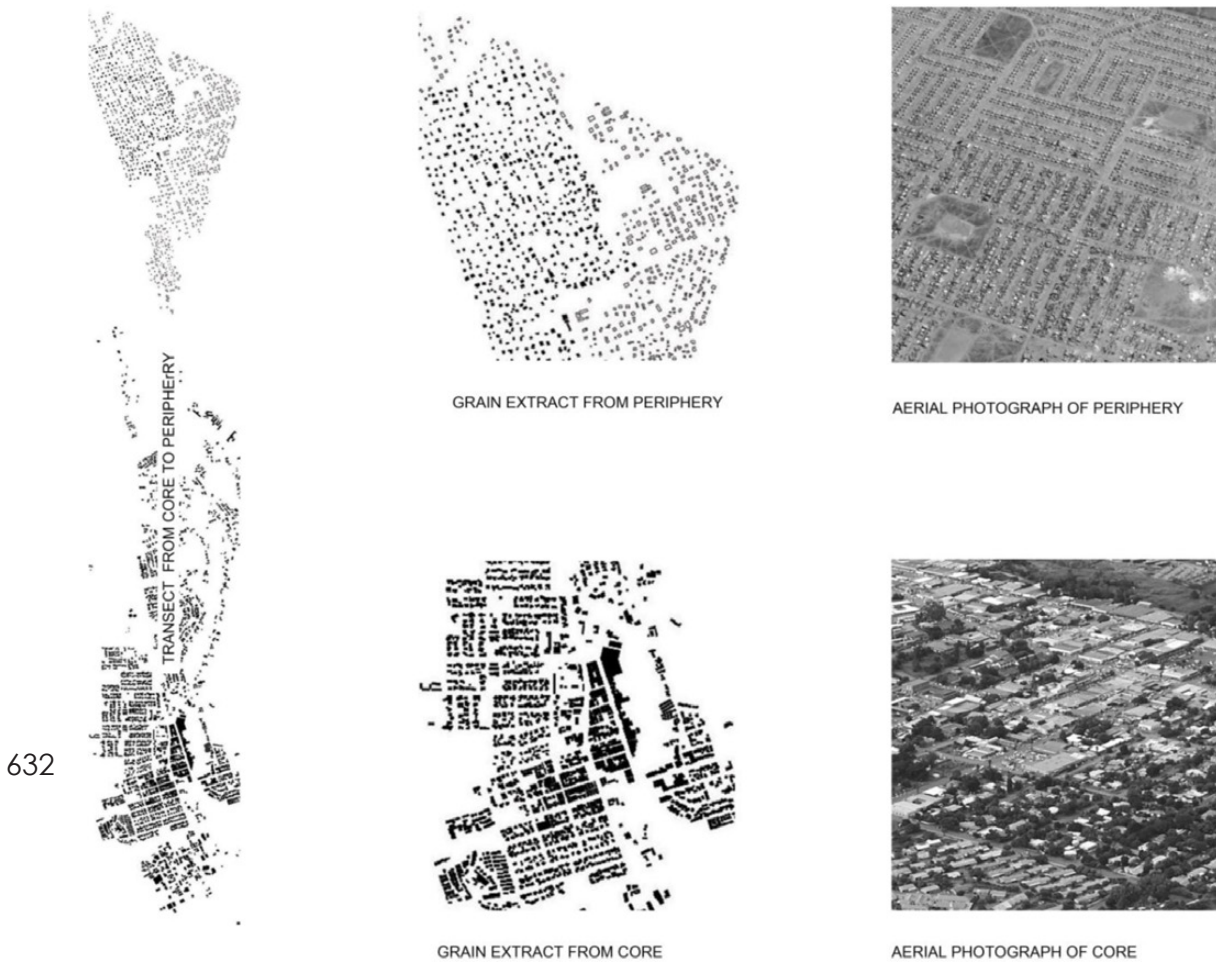
eter opened for individual control at each front door. Only when this happens can the perimeter block reach its universal potential of containing and supporting vibrant street life and accommodating other uses than residential at ground floor.

The entrepreneurial/private/site specific rental model has started to introduce a dense, perimeter block typology that has been hard for the state to implement under conditions where the single plot/single house is the preferred typology. The greatest contribution of these entrepreneurial efforts is towards providing new precedent that challenges mind-sets and facilitates design-conscious housing development at more sustainable densities. It provides a much needed challenge to flawed democratic processes that unwittingly favour poorly uninformed suburban types that, when compounded as they have been, lead to extreme poor quality in the built environment.

Typomorphological variant Type 4: New Urbanism

New Urbanism arrived in South Africa during the second half of the 1990's. Paul Wijgers and Leta Moesienyane, who had then both recently returned from postgraduate urban design studies at the Joint Centre for Urban Design in Oxford (JCUD), were involved in the early planning stages of a large redevelopment that was later to be called Melrose Arch. They argued for the involvement of Paul Murrain, one of the co-authors of the influential book Responsive Environments, with colleagues Bentley, McGlynn, Alcock and Smith who then all taught at the JCUD.

city as organism | new visions for urban life

Wijgers and Moesienyane understood that Murrain had the necessary skills of *urban designers needing to be good performing artist* as defined by Bentley (2002) to advance the very carefully researched typological ideas presented in Responsive Environments towards reality. It was Johannesburg's own manifestation of '*The Death and Life of Urban Blocks*' as described by Samuels et al (2004) in the context of a return of pre modernist typological ideals.

At the time of Murrain's arrival the financial core of Johannesburg was characterised by flight of 'white capital', which resulted in instant collapse. It has since recovered significantly. Melrose Arch thus created its own surrogate for authentic, compact mixed use when most private developers were building segregated office parks, shopping malls and gated residential communities on the extreme peripheries of all South African cities.

Rather than being responsive to its immediate context, Melrose Arch was built over a purpose-demolished, well located and low density suburb some distance outside the old commercial core of Johannesburg. It was therefore always going to be criticised for diminishing the historic core's chances of revival, as well as being an island of transplanted wealth in a transformation-conscious South Africa. It became South Africa's much talked about equivalent to New York's Battery Park or Berlin's Potsdammer Platz. The academic intelligentsia have been weighing in relentlessly, mostly considering it a folly for the rich (e.g. Murray, 2013, Chipkin 2008).

The development as it stands today, after several phases of extension to the perimeter block typology within set codes, is a manifestation of many of the ideals presented in Responsive Environments. With several incremental extension to the perimeter block typology, it is turning into an urban quarter with greater critical mass and vibrancy and less of the stigma of a defined, branded development. As Johannesburg's progressive new public transport system catches up with demand, the notion of it being an enclave serving only the car owning elite will become eroded.

Robustness is dynamic quality, a fact which Melrose Arch needs to prove over time. Regrettably, local copycat developments mostly lack the typological finesse or patient, process-driven nous. There is a near complete lack of understanding that the perimeter block is only as successful as the ground level uses and the level of engagement with pedestrians at street level that it permits. A great number of superficial copies lack an optimal mix of uses and reduces the perimeter block's built-to-lines to blunt facades behind deep bands of impenetrable security fences and off-street parking. This all for the sake of earning the New Urbanism tag, for branding purposes.

Despite the criticisms, these examples represent a divergence away from the free standing commercial building of the 1970's and 1980's towards a more compact, mixed use urban form.

Typomorphological variant Type 5: New Universities

Ludwig Hansen, who worked with Paul Murrain, Paul Wijgers and others at Melrose Arch (refer previous section) and who now teaches in the urban design programme at the University of the Witwatersrand, was commissioned to develop urban design frameworks for two new universities in South Africa. The first phases of both state funded universities are currently under construction and are located in two remote South African provinces. The smaller capital towns of these provinces previously had no universities serving potential resident students or those from their larger provincial hinterlands. One of these new universities is located at Kimberley, Northern Cape Province (Sol Plaatje University) and the other at Nelspruit, Mpumalanga Province (Mpumalanga University). Because the towns are relatively small and serve vast rural hinterlands of marginalised populations, the need to also provide residences for students from remote areas became a necessary part of the brief and a dynamic part of the mix.

After the stormy years following the discovery of diamonds in Kimberley in 1867, the town initially grew at a frenetic pace under British rule and then declined to a sad state as mining activities were reduced and extraction processes became mechanised. It too suffers from the endless peripheral sprawl of state housing provided both pre- and post-1994.

It therefore desperately needs the injection that a new university offers. Hansen recognised this need and fashioned a tightly knit insertion of perimeter blocks into re-assembled, underdeveloped land on the immediate fringe of the historic diamond mining town.

Apart from direct links to the Oxford School in Hansen's approach (via Wijgers and Murrain at Melrose Arch), it reinforces ideas around Rowe and Koeter's *Collage City* and Trancik's *Finding Lost Space*. If Melrose Arch had a voice, it will almost certainly recognise this as one of its children, in an unexpected context.

Typomorphological variant Type 6: Smaller Catalytic Projects

A sixth variant of efforts towards creating compact form is the establishment of dedicated or parallel task forces within larger state organisations to facilitate targeted public investment, with the explicit purpose of yielding urban development of demonstrable quality:
Two such initiatives are:
- first, National Treasury's Neighbourhood Development Programme *Urban Hub Design Toolkit*;
- second, the Housing Development Agency's *Catalytic Housing Projects in Mining Towns*.
Both recognise the failures of the many big plans and big budgets that have attracted big players but have seldom yielded public spaces of any quality on the ground. Designers and builders of new roads and expansive stretches of stereotypical housing have been recognising no other layer in the urban hierarchy but their own. In larger cities, with more capacity, such focused projects stand a better chance of being realised. In remote areas this is left to chance in a context of severe institutional incapacity. These programmes thus aim to facilitate a dedicated refocusing effort.

The National Treasury's *Urban Hub Design Toolkit* is a simplified instrument that enables smaller councils in remote areas the opportunity to produce urban design overlays or to overwrite the prohibitive dictates of one dimensional land use planning on key sites.

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The involvement of *National Treasury* suggests that use of the kit will assist councils in motivating for central government funds, to be spent in a more focused manner around existing transport infrastructure. It can otherwise be read as an urban design protocol in the absence of anything better under conditions of institutional weakness. The toolkit demonstrates generic '*structural typologies*' in the contexts of stations and intermodal interchanges where higher densities are required. Simple orthogonal grids and perimeter block typologies are the primary building blocks, thus reintroducing forgotten typologies of South Africa's early land surveyor laid out towns.

The Housing Development Agency's *catalytic housing programme* is a second variant of this type. It actively seeks urban design input in the development of higher quality housing in mining towns. A spotlight has been cast on poor conditions around mines with the Marikana Massacre attracting world-wide media attention in 2012.

The Housing Development Agency (HDA) works alongside the Minister of Human Settlements to fast-track the acquisition and release of state, private and communally owned land for human settlement developments in strategic locations.

Conclusion

The six typomorphological variants discussed here indicates a distinguishable trajectory towards typomorphological analysis in dealing with problems of urban quality at a tangible, local scale in South African cities and towns.

The increasing realisation that overly abstract, grand plans have delayed efforts towards meaningful engagement with place is gradually being recognised. The next challenge is to find ways of making this a generalist, less specialised pursuit that is part of a new urban vernacular.

References

Beck, H. (ed) (1985) *UIA International Architect: Southern Africa* (International Union of Architects).
Bezzolli, M. Marks, R. & Kruger, M. (2002) *Texture and Memory. The Urbanism of District Six* (Cape Technikon, Cape Town).
Bentley, I. (2002) 'Urban Designers as Artists', *Urban Design International* vol 7, 143–152.
Chipkin, C. (2008) *Johannesburg, Architecture and Society from 1950* (STE Publishers, Johannesburg).
Dewar, D. & Uytenbogaardt, RS (1991) *South African Cities. A Manifesto for Change* (Urban Problems Research Unit, Cape Town).
Fransen, H. (2006) *Old Towns and Villages of the Cape* (Jonathan Ball Publishers).
Moudon, A.V. (1989) *The Role of Typomorhological Analysis in Environmental Design*. In EDRA Changing Paradigms.
Murray, N. (2013) 'The Quandary of Post-Public Space: New Urbanism, Melrose Arch and the Rebuilding of Johannesburg after Apartheid', *Urban Design Quarterly* vol. 8, issue 1.
Muller, J. (2003) *Thought and Action. A Personal and Partial History of the South African Planning Profession* (QS Publications, Johannesburg).
Pinfold, N. (2015) 'Community Mapping in Informal Settlements for better Housing and Services Delivery, Cape Town, South Africa', *INSPIRE-Geospatial World Forum 25-29 May 2015*, Lisbon, Portugal.
Saunders,D. Gosztola,I. & Rendall, A. (1989) *Towards a Spatial Development Strategy for Graaff Reinet* (University of Cape Town).
Samuels, I. Panerai, G. & Depaule, J.C. (2004) *Urban Forms: The Death and Life of the Urban Block* (Architectural Press).
Savides, M. (2014) *RDP Houses up for grabs on Gumtree* (http://www.timeslive.co.za/thetimes/2014/03/31/rdp-houses-up-for-grabs-on-gumtree) accessed 15 April 2015.
Slum Dwellers International (undated) *Flamingo Crescent Informal Settlement Upgrading* (http://sasdialliance.org.za/projects/flamingo-crescent/) accessed 17 April 2015.
Southworth, B. (2003) 'Urban Design in Action: the City of Cape Town's Dignified Places Programme', *Urban Design International* vol. 8, no 3, 119- 133.
Trancik, R. (1986) *Finding Lost Space* (New York, van Nostrand Reinhold).

Chair_Anna Rita Donatella Amato
DiAP Department of Architecture and design, "Sapienza" University of Rome,
53A, via Gramsci, 00197, Rome, Italy
Co-Chair_Ario Nasserian
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

Urban Regeneration
Conflicts and Contested Areas
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Spatial and organization patterns in informal settlements. A morpho-typological approach

Oscar Carracedo García-Villalba
Department of Architecture, School of Design and Environment. National University of Singapore
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Abstract

The common perception of the physical space organization in slum and informal communities is that they develop spontaneously and in an unplanned way. Discontinuous and misaligned street spaces, lack of urbanity, use of multiple materials in buildings, density, congestion or poor hygiene conditions are some of the aspects that show a hardly comprehensible picture under the parameters of the planned city, which lead us to understand these marginal areas as disorderly and chaotic.

However, a careful analysis and a detailed examination of the urban morphology of these marginal areas allow us to understand that there are spatial patterns of organization, an underlying order and a "spontaneous" hierarchy, which are non-obvious at first sight.

Recent approaches to the regeneration of low-income and informal settlements are evolving into strategies characterized by improving their existing conditions, minimizing relocations of their inhabitants. This 'on-site upgrading' approach, together with improvements based on the street as the main public space in informal areas, constitute a very effective eviction alternative that facilitates the urban regeneration of informal areas.

This research studies the urban form and the physical organization of open spaces in four lowincome areas in Thailand, Sri Lanka, Philippines and Colombia in order to understand their underlying order and the spatial patterns. As a conclusion, the paper shows how the improvements in low-income and informal settlements based on the understanding of physical organization patterns and on street-based upgrading constitute very powerful catalysts for the revitalization and regeneration process of informal areas, preserving the social organization network of communities and securing land tenure rights.

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Introduction

The common perception of the physical space organization in slum and informal communities is that they develop spontaneously and in an unplanned way. Discontinuous and misaligned street spaces, lack of urbanity, use of multiple materials in buildings, density, congestion or poor hygiene conditions are some of the aspects that show a hardly comprehensible picture under the parameters of the planned city, which lead us to understand these marginal areas as disorderly and chaotic. However, a careful analysis and a detailed examination of the urban morphology of these marginal areas shows up an underlying order, a "spontaneous" hierarchy and a series of spatial patterns of organization which are non-obvious at first sight.

Recent approaches to the regeneration of low-income and informal settlements, the so-called 'on-site schemes', are evolving into strategies characterized by the understanding of these organization patterns in order to create layouts that improve the existing conditions, maintaining the spatial organization of the community and minimizing the relocation of their inhabitants.

This article examines the spatial organization patterns and the formalized layouts of different on-site regeneration projects in low-income settlements, either adopted from conventional planning solutions or defined by the informal settlers. The study focuses on the definition and formalization of the physical space of streets and open spaces as a process of formalization of property rights, and suggests that proposals based on existing patterns rather than on theoretically produced models, have a better capacity to generate living environments adapted to the economic capacity, cultural background and particular needs of low-income populations.

The paper is organized in four parts, after an introduction to the recent approaches to regeneration policies in informal settlements; the second part studies and classifies the physical and spatial organization patterns in five informal settlements. In the third part the paper explains the relationship between spatial patterns, regeneration strategies, urban model and public participation, to finally compare quantitatively and qualitatively the impacts of the spatial patterns in the five study cases. Through this comparative method, the paper concludes with some ideas for the regeneration of low-income and informal settlements through onsite strategies and the use of spatial patterns.

On-site schemes. Formalizing spaces to formalize land rights

As mentioned, there is a remarkable a change in the recent approaches of urban policies regarding the regeneration of informal settlements. Extensive literature addresses how in the 1950's and 60's, informal areas were generally considered urban, social, environmental and health trouble spots. Under the influence of urban regeneration policies developed after World War II in the west, many countries began the demolition, development and eradication of these informal areas by mainly focusing on the provision of public and lowcost housing. After sixty years of eradication and relocation policies, the objective to achieve social improvements, eliminate poverty and eradicate spatial disorder of informal settlements has not been effectively achieved due to the complex social and economic problems in the informal settlements (Zhu Haibo, 2009). This has led to rethink urban regeneration policies in informal settlements in many cases, shifting to more thoughtful approaches with communities to relocate.

One of the evidences of this shift in the mindset can be found in the types of development proposed in Thailand by the Community Organizations Development Institute (CODI, 2000). They classify the on-site development strategies in three different types: *on-site reblocking*, *on-site relocation* and *on-site upgrading*. These strategies deal with the layout and physical formalization of streets and open spaces in order to address land tenure security and improve the living environments. For the purpose of this article we use these three strategies as the theoretical basis for the definition of the on-site strategies.

The strategy of *on-site reblocking* consists in the improvement of the physical conditions and infrastructure in existing communities, making adjustments to the layout of

Figure 1. Morpho-typological classification of spatial organization patters (Drawing Jia Li Goh, Kow Xiao Jun, Loh Pei Qi-MArch-MLA/NUS).
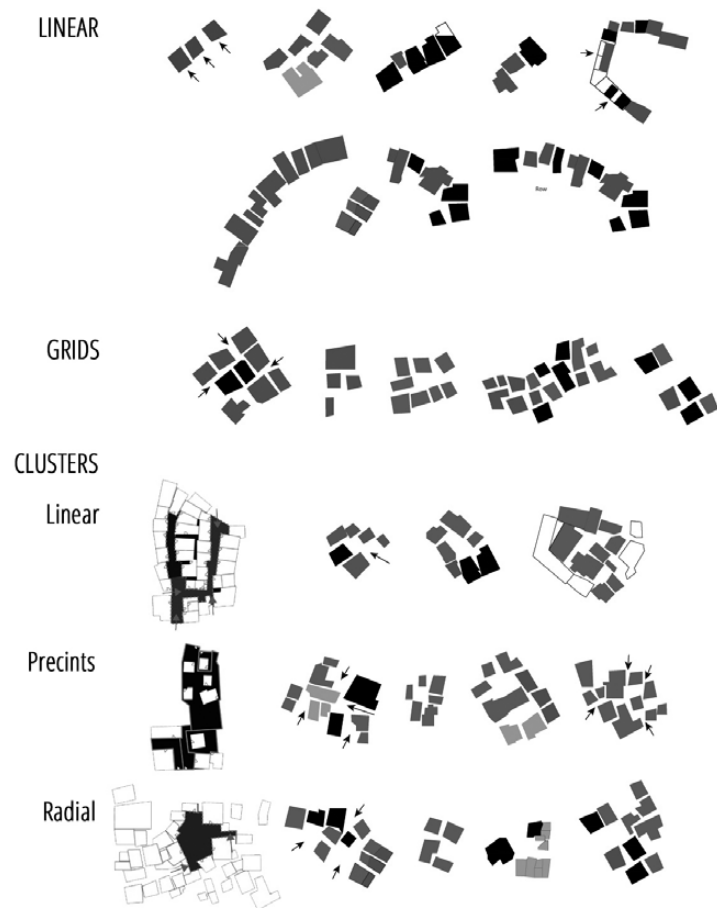
streets in order to install sewers, drains and walkways, and to establish a balanced plot division. The implementation of this strategy needs a detailed site analysis of the existing settlement in order to propose a new street layout that keeps the largest number of existing houses, optimizes the land division, and maximizes the effectiveness of infrastructure.

In the *on-site reconstruction* strategy, existing communities are totally demolished and rebuilt on the same land. The new developments usually imply important physical changes with completely new street layouts, generally based on very rational geometric patterns that, in a similar way to the reblocking strategy, aim to maximize the optimization of land and infrastructures.

Finally, the *on-site upgrading* strategy consists in the improvement of the physical environment and basic services in existing communities, while preserving their location, character and social structures. This type of development, which constitutes the less aggressive strategy towards the community and the most siteadapted strategy for upgrading, needs also a detailed site analysis of the existing spatial patterns of the neighborhood, since the aims are to reinforce the ties established in the community, and improve the houses, streets and open spaces without changing the general layout of the neighborhood or even the plot sizes and its distribution.

While the formalization of new layouts and space organizations as a system for formalization of land tenure is something we find in many other experiences, the greatest contribution of these schemes it the important step towards land tenure security based on their interest in relocating the communities on-site, preventing their eviction and displacement to places far from the original settlement, and the resulting social and economic disruption.

Figure 2. Spatial patterns in the original settlements. Build form and streets. GK Baseco, Panchikawatta, Ruam Sammakkee, Charoenchai Nimitmai, Juan Bobo. (Authors' drawing).
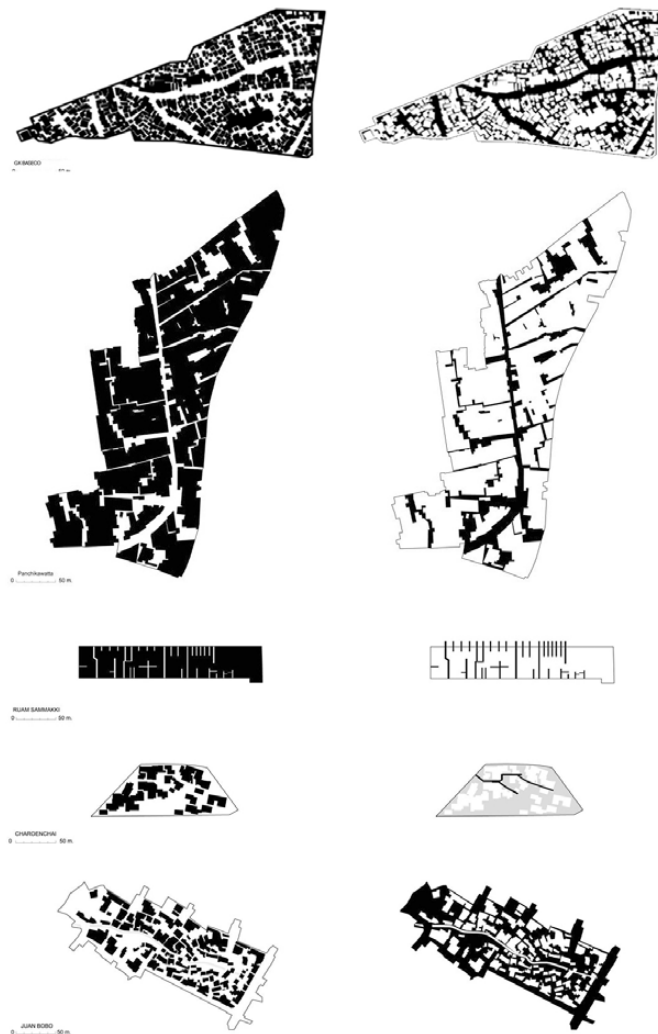
Planned and unplanned spatial patterns in low-income settlements. A morpho-typological approach

The emphasis of this research is on the settlements urban form and the layout and organization patterns of open spaces in order to understand their underlying order. The study conducted in different informal areas in Thailand, Sri Lanka, Philippines and Colombia shows that, despite their apparent chaotic picture, the aggregations defined by informal settlers reveal, indeed, an underlying order and a series of spatial organization patterns in relation to the open space. Thus, we identify three '*unplanned patterns*': linear or strips patterns along the streets, grid extensions, and cluster organizations around small-scale spaces for community or collective use. This last form of organization is subdivided in three subcategories: radial clusters, linear clusters and precincts.

In order to analyze how the new layouts use these patterns to plan living environments adapted to the lowincome communities, this research studies five urban regeneration projects. The cases studied are representative, on the one hand, of the application of different types of existing patterns, and on the other hand, of the three on-site strategies mentioned before. According to the physical and spatial organization of the layouts developed by these projects, we can classify their spatial patterns schemes in four basic types: linear schemes, homogeneous grids, clusters and hybrid grids.

Ruam Sammakkee. Bangkok. Thailand - On-site reconstruction / Linear plan

The neighborhood of Ruam Samakkee occupies 0.8 hectares of land of the Crown Property Bureau (CPB) in Ramkhamhaeng Soi 39 area in Bangkok. The area was originally an interstitial space that started to be occupied by rural migrants in the early 90's. As the location was an access point to many job opportunities, the informal settlement grew rapidly through social connections becoming an over dense and over populated community with 124 families. In 2003, the Thai government adopted the "Baan Mankong Housing Program" or "Secure Housing Program", an ambitious policy that channels infrastructure subsidies and soft housing loans directly to existing poor communities so they can upgrade their housing, infrastructure and community environment. Ruam Samakkee was nominated as one of the communities to develop a new layout plan for the neighborhood as a pilot project for future housing development in other communities. In the three months that followed, they demolished all the old houses, raised the level of the land to prevent flooding and laid the new streets and infrastructure. By the end of 2004, the construction of 82 housing units was completed, and by 2008, they had completed the construction of the 124 units, which increased the perception of security of tenure among residents (UN-Habitat, 2009; Archer, 2010).

The proposed layout for Ruam Sammakkee, developed from scratch, consists in a linear plan organized in a predominant direction, where the 6 meters width and 250 length street constitutes the main spatial organization spine and public space. The houses are arranged in three rows, two flanking the main street and one facing the exterior road. The land is divided into 124 plots each measuring 4.5 meters wide and 11 meters deep.

Navagampura. Colombo. Sri Lanka - On-site reconstruction / Cluster plan

Navagampura sits on a 5,17 hectares property of the State in northeast Colombo (Sri Lanka). The National Housing Department Authority (NHDA) and the Massachusetts Institute of Technology developed the design plan for the area in 1982, as a result of a workshop for governmental planners, and with no participation from the communities.

The proposed physical environment and street layout follows the cluster plan scheme. This scheme organizes the land subdivision in small communities around 'cul-de-sac' streets and open spaces, which play the role of common spaces. Each cluster consists of two alleys of 3 meters wide leading to a community space. All alleys connect with the main street, a space 11 meters wide that links to the city. Thirteen clusters of varying sizes are bounded by row houses, being the smallest twenty-four houses and the largest fifty-five, with a total of 425 houses. The implementation started in 1985, with the intervention of the NHDA in the definition of the clusters, each of which is subdivided into two sizes of plots, 50 m2 and 37.5 m2.

Juan Bobo. Medellín. Colombia - On-site upgrading / Hybrid grid

The process of occupation of the area of Juan Bobo, located in the northeast area of Medellín, starts in the 50's as an area of agricultural production, but it is not until the 60's and 70's that its densification started as a result of the processes of migration from rural areas. The scarcity of land, and the lack of housing programs and policies, made the slopes of the city the ideal place for informal development. Due to this situation, the 2,29 hectares of Juan Bobo suffered a process of occupation of invasive nature, which caused the gradual disappearance of the agricultural spaces and the green areas (EDU, 2013). As a result, the few existing public spaces were limited to a very precarious path system, and a series of residual natural spaces where, due to the topography, housing occupation was not possible.

In 2004, an on-site upgrading and resettling plan was proposed for the area with the principles of no evictions and no expropriations. To achieve this objective, and with the help of the community, an infill strategy dealing with the existing community and minimizing the number of demolitions was implemented.

This strategy consisted, on the one hand, in the construction of multistorey buildings to relocate in the same area the affected population, and on the other hand, to establish interventions such as improvements to buildings worth to preserve, the provision of public services, and improvements to environmental and public spaces.

The spatial pattern plan consists in a hybrid grid based on the layout of the existing urban fabric, without any pre-defined or pre-formalized geometry. In this case the street layout becomes the public and open space that adapts to each local situation, resulting in a heterogeneous grid with no clear hierarchy that covers the whole neighborhood.

Charoenchai Nimitmai. Bangkok. Thailand - On-site reblocking / Homogeneous grid
The community of Charoenchai Nimitmai is one of the informal areas located between the Prem Prachakon drainage canal, the railway tracks and the Sirat expressway in Bangkok's Chatuchak district. Originally 41 families were living in the 0.7 hectares, who had been renting the land from a private landowner for over 50 years. Similarly to Ruam Sammakkee, the community was also selected as one of the pilot projects in the Baan Mankong programme. In 2003 the community started an on-site reblocking project increasing the number of plots to bring down the cost of relocation per family. A new spatial site plan was set with a total of 89 plots of varying sizes, incorporating 48 new plots to accommodate vulnerable families squatting nearby as well as a community centre. In order to fit the new street layout, 15 houses had to be demolished and relocated within the site. In this case, the proposed spatial pattern is a homogeneous grid formed by three parallel streets, each one 3.5 meters wide. Along the streets individual plots from 40 to 100 m2 are linearly organized.

GK Baseco. Manila. Philippines - On-site reconstruction / Homogeneous grid plan
Finally, GK Baseco is developed over an area of 4.6 hectares occupied initially by a dense informal fabric. After a fire in early 2004 that affected more than 2,000 houses, emergent solutions were needed to solve the housing situation, and Gawad Kalinga (GK) and Habitat for Humanity Philippines, two Non-Governmental Organizations, started the on-site reconstruction of the new street layout and the houses without participation of the community. The solution adopted was a homogeneous grid plan formed by access streets to housing (4 meters wide) and secondary service alleys (1.5 meters wide). Each alley serves two lines of row houses, which in turn make up one block. Each line of row houses is subdivided in plots of 6 x 3.5 meters.

In the same way as in the previous case, in GK Baseco the homogeneous grid pattern seeks to democratize the land, maximize the number of households and optimize infrastructure with a pattern of regularly spaced streets that divide the land and delimit the blocks.

Regeneration strategy, urban model, spatial patterns and public participation, four interrelated aspects

Finding which strategy should be applied to each community is not an easy task. With the selection of the strategy we will be determining a physical and spatial pattern that will determine the life of people in the neighborhood.

In order to facilitate the cultural, physical and economical adaptation of the communities to their new environments, it is recommended that, whatever the strategy we choose, the proposed street layout should be based on the reading of the physical and spatial organization patterns of the original community.

As a consequence of the implementation in the case studies of the reconstruction, reblocking and upgrading strategies, we can state that two different urban models are derived. On the one hand, those based on '*formal planned patterns*' that, with the objective of rationalizing the land division and the infrastructures impose entirely new spatial patterns and street layouts. On the other hand, those urban models that we define as '*on-site reading plans*', that rely on a rigorous site analysis to understand the spatial organization patterns of the community with the aim of replicating them, give them continuity or adapt to them. Charoenchai Nimitmai, Navagampura and Juan Bobo represent this second type of urban models based on patterns defined by settlers, while GK Baseco and Ruam Sammakke belong the first type, where patterns from conventional planning were adopted without any relation to the settler's spatial organization.

Furthermore, it is interesting to note that, in the cases studied, the type of spatial pattern is synonymous of a particular model of public participation. Thus, we see that those schemes

Figure 3. Implemented spatial patterns. Build form and streets. GK Baseco, Panchikawatta, Ruam Sammakkee, Charoenchai Nimitmai, Juan Bobo. (Authors' drawing).

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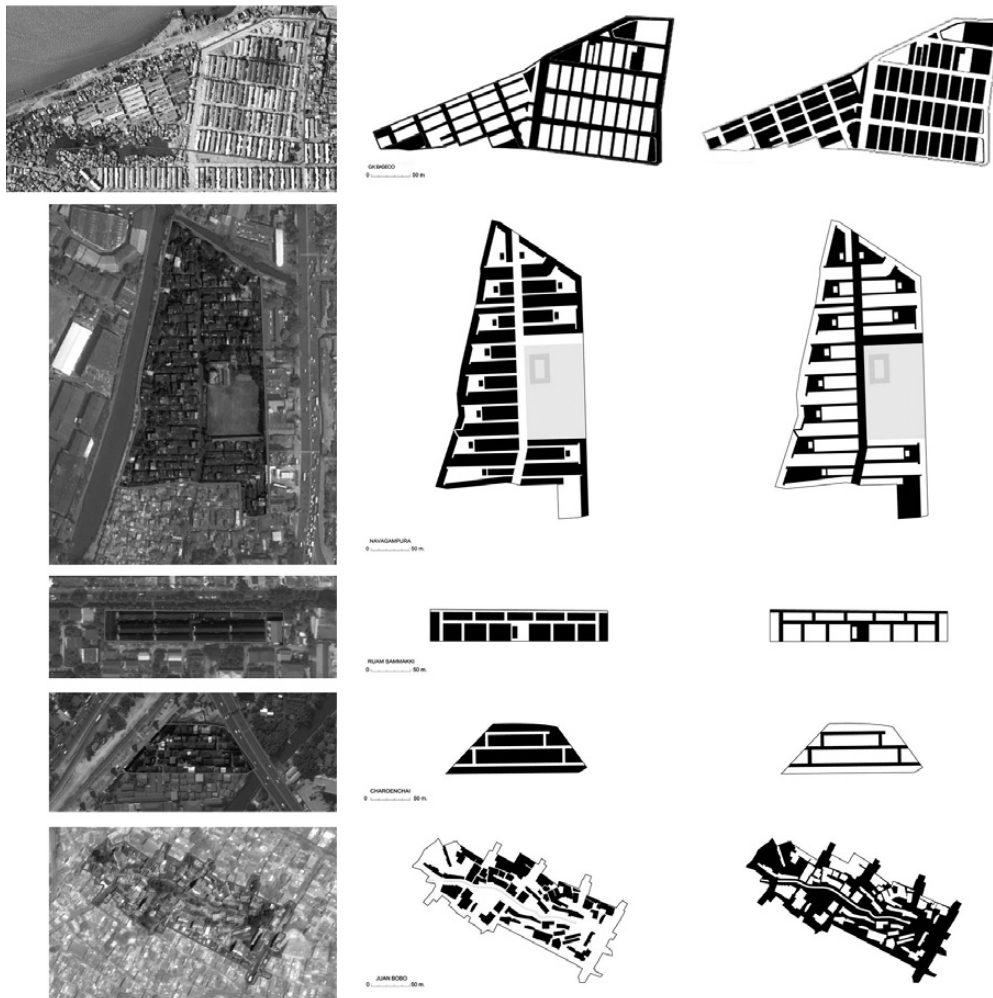
based on formal planned patterns, are the ones who have been developed from a top-down perspective. While models based on on-site reading patterns had a more bottom-up approach, with greater involvement of the community. As an example of these two different approaches we have, on the one hand, the case of Ruam Sammakkee where, according to the residents, the community participation in the design process was limited to the consultation and consensus by voting on their preference from options provided, suggesting that there was minimal dialogue in the decision-making, except for the construction phase, when the residents participated in the building labors. And on the other hand the case of Charoenchai Nimitmai, where according to the surveys, residents responded that the community members mostly undertook the design of the layout, and underwent multiple iterations of planning, going through eighteen different layouts as a part of the process (Sim, 2014).

Quantitative and qualitative consequences of formalizing through spatial patterns

The formalization of the physical open space through the implementation of spatial patterns is a primary and transversal issue for all cases studied. As a result of the spatial patterns implemented and due to the definition of the physical space configuration, all the neighborhoods increased the sense of land tenure security among neighbors. This is the case for example of Juan Bobo, where they achieved the improvement and legalization of 100% of households.

	GK BASECO (Manila, Philippines)		RUAM SAMAKEE (Bangkok, Thailand)		NAVAGAMPURA (Colombo, Sri Lanka)		CHAROENCHAI NIMITMAI (Bangkok, Thailand)		JUAN BOBO (Medellin, Colombia)	
STRATEGY	ON-SITE RECONSTRUCTION						ON-SITE REBLOCKING		ON-SITE UPGRADING	
SPATIAL PATTERNS	HOMOGENEOUS GRID		LINEAR / STRIPS		CLUSTER		HOMOGENEOUS GRID		HYBRID GRID	
URBAN MODEL	FORMAL PLANNED PATTERNS						ON-SITE READING PATTERNS			
SPATIAL COMPLEXITY	- spatial diversity & complexity ←								→ + spatial diversity & complexity	
SITE	BEFORE[1]	AFTER	BEFORE	AFTER	BEFORE[2]	AFTER	BEFORE	AFTER	BEFORE	AFTER[6]
AREA (Ha)	4.60	4.60	0.88	0.88	5.17	5.17	0.78	0.78	2.29	2.29
HOUSING UNITS	1,144	784	124	130	313	425	41	89	375	366
POPULATION	4,576	3.136	486	486	1,220	1,828	164	356	1,353	1,320
HOUSING DENSITY (HU/Ha.)	249	170	141	148	61	82	52	114	164	160
POPULATION DENSITY (People/Ha.)	995	682	553	553	236	353	209	454	591	577
OUTDOOR SPACE (% streets and open space)	41.7%	26.0%	8.9%	31.3%	21.0%	33.7% [3]	66.6% [5]	22.8% [5]	3.0%	34.6% [6]
OUTDOOR SPACE RATIO PER INHABITANT	4.2	3.8	1.6	5.7	8.9	9.5	1.4	5.0 [6]	0.5	6.0
							31.8 [4]		10.9	11.5
INCREASE OF HOUSING DENSITY		-78		7		22		61		-4
INCREASE OF POPULATION DENSITY		-313		0		117		245		-14
INCREASE OF OUTDOOR SPACE		-15.7%		22.4%		12.7%		-43.7%		31.7%
INCREASE OF OUTDOOR SPACE RATIO		-0.4		4.1		0.6		3.6 [7]		5.5
PUBLIC PARTICIPATION	+ top-down ←								→ + bottom-up	
LAYOUT	NO		NO		NO		YES		YES	
HOUSING	NO		YES		YES		YES		YES	
	top down		top down-bottom up		top down-bottom up		bottom-up		bottom-up	

(1) Dubai South data. Baseco, (2) Panchikawatta data. Colombo, (3) % and Ratio including open spaces between houses, (4) Ratio according to drawing,(5) % and Ratio according to EDU, (6) Corresponds to project (7) Considering only access infrastructure

In addition, when studying the characteristics of the formalized physical space, we note that, generally, all the patterns applied tend to increase the area of open space and the ratio of outdoor space per person. In quantitative terms, the layouts devote between 23% and 35% of their area to open spaces, representing an average of 4.4 m2 of outdoor space ratio per person. When compared to the original situation, the upgraded projects involve, in most cases, significant increases, such as Navagampura (12,7% open space, 7% ratio per person), Ruam Sammakee (22,4% and 356% respectively) and specially Juan Bobo (31,7% and 1.200%) with the highest increase among the different cases. In this last case, the provision of parks, plazas and walkways (5,087m2); open spaces related to environmental improvements of the neighborhood[1] (3,000m2), and the reduction of 15% of the building footprint (EDU, 2013), carried out residential improvements such as the decrease of the housing density, the relocation of dwellings located in risk areas or the increase by 31% of the average housing living space.

However, we observe the opposite situation in GK Baseco and Charoenchai Nimitmai. In both cases, the comparison between the original informal tissue and the new patterns implemented in the form of homogeneous grid, shows, in quantitative terms, a significant reduction of the open spaces. In the case of GK Baseco, the open space is reduced by a 15.7%, while in Charoenchai Nimitmai by a 43.7%. In the first case, this is due to the reduction in the diversity of the types of spaces that proposes the new homogeneous grid.

While the inhabitants in the original settlement had streets, community private spaces for their own use, the rationalization of the new spatial arrangement simplifies the complexity to a single and undifferentiated space. With respect to Charoenchai Nimitmai, the reduction is mainly due to the notable increase of housing density (219%), caused by the densification of the in-between spaces with new housing.

Moreover, the qualitative assessment of the spaces proposed by the new patterns also indicates notable differences in the formalization, distribution and types of open spaces, affecting the way they are inhabited.

Thus, we note that the layouts that adopt formal planned patterns, such as the homogeneous grids and the linear schemes, suffer major informal modifications and adaptations of open spaces by residents.

This is the case of GK Baseco and Ruam Sammakee. In the first, the reduction in the diversity and complexity of spaces, together with the standardization to a single type of housing, has led to the informal appropriation of the street space by residents. As a

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[1]The differences in the table respond to the spaces considered as open spaces but not of public use. The ratio according to EDU considers only public space, while the second figure shows the ratio for the total amount of open spaces, including environmental spaces with no public use.

consequence, over 90% of the houses extended into the open spaces. This widespread of housing extensions reflects the insufficient indoor space and causes a reduction of the outdoor space in the pursuit of increasing the private space. In the case of Ruam Sammakkee, although the layout provided a small public space, the surveys conducted reflect the lack of spaces dedicated to the community. In reaction to this deficiency the residents responded with the informal appropriation of the space of the sidewalk in front of their houses, transforming it into a semi-private open space and the main site for social interactions within the community (Sim, 2014).

By contrast, the formalization of the patterns used in Navagampura, Charoenchai Nimitmai and Juan Bobo, seem to better suit the needs of residents. In these cases, it is remarkable to note that, in general, there are not significant informal appropriations of the open space due to the big size of plots, the short width of streets or to the diversity of well-defined public spaces, each with a strongly differentiated character.

From the point of view of the urban spaces created by the different patterns, we note that the complexity and diversity of open spaces decrease in the formal planned patterns, while the models based on on-site reading patterns provide greater diversity and complexity. This leads us to believe that the strategies, spatial patterns and urban models based on sensitive approaches to the existing communities, are most likely to be successful in adapting to the spatial organization patterns of the community and in achieving their regeneration.

To summarize, the layouts that adopt formal planned patterns, although they rationalize the infrastructure and establish equitable land division systems, diminish community spirit due to the lack of positive relationship between indoor and outdoor space. In these cases the street loses part of its function as a public space to become just a functional space, and the informal appropriation and the modification of the pattern shows the need for more diverse and complex spaces that allow greater social interaction and privacy of homes. In this sense, homogeneous grids patterns, although easy to plan and efficient for infrastructures, circulation, and services lines, should be more concerned about sense of community and common spaces, incorporating the diversity and multiplicity of spaces of the original communities.

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Conclusion

We can conclude, therefore, that both the formalization of settlement patterns adopted from conventional planning and those adopted from informal settlers affect the behavior of residents and the use of space. The physical form of the streets and open spaces and their spatial patterns are a relevant issue for the upgrading of informal settlements. The use of patterns to formalize the physical space of the open spaces and streets not only provides the support for the land security or for setting the infrastructure, essential aspects in the regeneration of informal settlements, but also defines the physical environment of the neighborhood, which helps to develop the sense of community and promotes social relationships and local economies. Far from being an accessory component, urban regeneration strategies based on patterns defining open spaces and streets, constitute a very powerful catalysts for the revitalization and regeneration process of the informal areas.

Moreover, the need to better understand the concrete reality of the neighborhood, implicit in any of the onsite strategies should imply, on one hand, a better adaptation to community spaces, and on the other hand, greater and indispensable participation of residents in the analysis and design process, which will result in a more open and adapted regeneration project most likely to succeed.

In words of the director of Asian Coalition for Housing Rights (ACHR), Somsook Boonyabancha, 'on-site upgrading is by far the best, cheapest and easiest way to preserve community systems and to maintain development from the past to link with future. With the proper assistance, simple, culturally appropriate, creatively-built, diverse forms of housing will automatically appear, forming community's own physical identity in the city'.

References

Archer, D. (2010) *Empowering the urban poor through community-based slum upgrading: the case of Bangkok, Thailand* (http://www.isocarp.net/Data/case_studies/1648.pdf) accesed 24 May 2015.

Boonyabancha, S. (2005) 'Baan Mankong: going to scale with 'slum' and squatter upgrading in Thailand'. *Environment and Urbanization* 17: 21.

Carracedo, O. and Hwang, Y.H (2014) *Urban revitalization strategies for low-income communities in Manila* (CASA, Centre of Advanced Studies in Architecture. National University of Singapore).

Carracedo, O. (2014) 'Shaping informality. The role of street-based strategies in revitalizing informal and low-income areas', in *Designing Productive Cities* (Urban Design Conference, Adelaide, Australia) 15-31.

Carracedo, O. (2013) 'Regenerating neighborhoods through identity and community places Planning and developing strategies for resilient informal settlements', Conference Proceddings, *7th Conference of the International Forum on Urbanism (IFoU)* Tainan. Taiwan.

Carracedo, O. and Noguer, N. (2013) 'Upgrading suburbs in the Latin American context. A managment and transformation review of the slums', Conference Proceddings, *25th Conference of the European Network of Housing Research*, Tarragona.

Carracedo, O.; Noguer, N. (2013) *Retrofitting suburbia and informal slums in the Latin American context. Recovering neighborhoods in extreme poverty conditions with tactical urbanism and new urbanism principles* (http://www.cnu.org/sites/www.cnu.org/files/retrofittingsuburbiaandinformalslumslatinamericaoscar. pdf) accessed 24 May 2015.

Castro, F. A., Dorotan, A.K. et al. (1987) 'Understanding the spatial patterns in a slum community. A case study of Baseco, Manila, Philippines', College of Architecture, University of the Philippines, Diliman Campus, Quezon City.

Community Organizations Development Institute (CODI) (2006) *Urban development towards sustainable cities and housing for the urban poor in Thailand. Bangkok.* Community Organization Development Institute. (http://www.codi.or.th/downloads/english/Paper/Urban_Poor_in_Thailand_062006.pdf) accessed 24 May 2015.

Echeverri Restrepo, A.; Orsini, F.M. (2010) 'Informalidad y urbanismo social en Medellín' in Hermelin, M., Alejandro Echeverri Restrepo, A., Giraldo Ramírez, J. (ed) *Medellín Medio Ambiente Urbanismo Sociedad* (Universidad EAFIT, Centro de Estudios Urbanos y Ambientales - urbam, Medellín).

Empresa de Desarrollo Urbano EDU (ed.) (2013) *Medellín. Modelo de transformación urbana. Proyecto Urbano Integral-PUI en la zona nororiental* (EAFIT, AFC, EDU, Alcaldía de Medellín).

Fernandes, E. (2011) *Regularization of informal settlements in Latin America*. Policy Focus Report. Lincoln Institute of Land Policy.

Hernández Correa, C. A. (2006) *Proyecto urbano integral en la zona nororiental de Medellín. Un modelo de transformación de ciudad*. International conference on human development, Madrid. (http://www.reduniversitaria.es/ficheros/CesarHernandezCorrea. pdf) accessed 24 May 2015.

Portela, M. C. (1992) 'Settlement Patterns in Unplanned Areas: Case Study San José de Chirica, Ciudad Guayana, Venezuela', unpublished Thesis. Faculty of Graduate Studies and Research. Degree of Master of Architecture. McGill University.

Sim Junhui, D. (2014) 'Autonomy of a community: subjectivity of participation in the Baan Mankong Housing Programme', unpublished MArch Dissertation. National University of Singapore.

UN-Habitat (ed.) (1987) *Navagampura and Aramaya Place: 2 Urban Case Studies of Support Based Housing and Basic Services* (UNCHS and the Government of Sri Lanka. Supporting community-based housing).

UN-Habitat (ed.) (2009) *Community development fund in Thailand. A tool for poverty reduction and affordable housing* (UN-Habitat. United Nations Human Settlements Programme).

Zhu Hai-bo (2009) 'The Research of Upgrading Models of Informal Cities in Developing Countries', *World Academy of Science, Engineering and Technology International Science Index* Vol: 3, No 6.

Understanding the City as a Whole: An Integrative Analysis of Rio de Janeiro and its Informal Settlements

Kimon Krenz, Fani Kostourou, Sophia Psarra, Caue Capille
University College London, Bartlett School of Architecture 140 Hampstead Road,
London NW1 2BX, United Kingdom
Keywords: favela, informal settlement, morphology, space syntax

Abstract

Informal settlements are an increasing global phenomenon. Since the mid-century Rio de Janeiro went through a series of paradigmatic changes, trying to cope with this phenomenon. The scope of these interventions ranged from entire eradications of these settlements in the 1960s to present in situ programmes of infrastructural upgrades. Up to now favelas are seen as independent parts of the city, spatial manifestations of urban poverty and intra-urban inequality in the need to be solved. Even recent attempts to integrate favelas socially and spatially with the city failed to remove the physical and conceptual boundaries between the formal and the informal. Underlying these approaches is the perception of those areas as something different, rather than an integral element of the complex urban system. Trying to overcome the fragmentation of the city this study combines formal and informal parts into an integrated model of the whole city. Following a syntactical analysis using GIS mapping and space syntax, this study explores the morphology of favelas in the context of metropolitan Rio throughout different scales and in relation to their topographic location. 60 different local areas are then selected and compared against each other according to their configurational characteristics. The analytic results highlight the affordances and constrains of informal and formal structures. Understanding the particularities of those two differently perceived systems and the ways in which they interact with each other can inform future analysis and policymaking.

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Introduction

Informal settlements are increasingly becoming dominant parts of contemporary cities around the globe, housing in some cases as much as the thirds of the city's population (Financial Times 5/6/2015). Portrayed either as precarious shantytowns encroached within developing nations, or self-organised communities in advanced capitalist countries, since their emergence informal settlements have been stigmatised for being areas of extreme poverty, violence and marginality. Having started out as illegal occupations of unclaimed land by poor population groups and in spite of having been consolidated over time, they usually are not integrated into the cities within the limits of which they are located. This paper looks at the metropolitan spatiality of one of these cities, namely Rio de Janeiro, so as to overcome the distinction between formal and informal. It provides one of the first representations and space syntax analysis of informal settlements in Rio forming a study that is the first of its kind. The purpose is to understand informality in the context of the city as a whole and any potential interdependencies between the two sides. In Rio de Janeiro, despite three decades of public policy efforts to tackle informality, informal settlements have rapidly increased both in terms of number and size. According to the *Instituto Brasileiro de Geografia e Estatistica* (2000), during the 1990s and 2000s the favela growth rate was almost four times higher than the growth of the formal city. However, many studies (Leeds and Leeds 1970, Castells 1974, Portes 1972, Valladares 2008, Perlman 2010, Fernandes 2013, Lacerda 2015) have outlined the overriding perception of favelas as being socially, culturally, politically and economically excluded – if not marginal – from the rest of the city. Furthermore, Novaes (2014) has recently demonstrated through a series of cartographic examples how the mental model of exclusion has also shaped the spatial representation of the metropolitan Rio over the years, strengthening its impression as a divided city. To add to this, the urban development strategies pursued by the local municipality to deal with informal growth such as Favela-Bairro, PAC and Morar Carioca have been criticised for reinforcing even further this prejudicial notion of inequality between the formal and the informal areas (Brandão 2006, Pamuk and Cavallieri 1998, Acioly Jr 2001, Riley, Fiori, and Ramirez 2001, de Oliveira 2008, de Souza Pereira 2010, Samper 2011, McGuirk 2014). It is noteworthy that the "Rio-Cidade Project" which was simultaneous to the "Favela-Bairro Project" recognised the local centres in favelas to be different from the rest of Rio (Andreatta 2005, Soares and Soares 2005, Mendes 2006). Even with the ideological shift of the 70s towards refusal of the myth of marginality (Perlman 1979) and instead appraisal of the ingenuity of these communities (Turner and Fichter 1972, Turner 1976), there is still an underlying view that favelas are different and closed territories, an archipelago of enclaves rather than an integral element of the urban structure. In most cases such perspectives are not based on analytic approaches that can deal with urban complexity and the ways in which favelas relate to the global street network. In light of the 2016 Olympics and the multimillion-dollar infrastructure invested for re-shaping the city and its image, it is more urgent than ever to understand the relationship of favelas with the city of Rio de Janeiro as a whole.

So far, analyses of the network structure of favelas have been mainly visual with only recent maps representing the actual conditions (Novaes 2014). Thus few findings have been supported by precise quantitative evidence combined with visual representation. While scholars (Leeds 1969, O'Hare and Barke 2002, Dovey and King 2011) agree that Rio favelas are located in peripheries, steep hillsides and close to the infrastructural network, there is no adequate explanation of the effect of their location and topography in their spatial performance. Furthermore, in 2002 O'Hare and Barke (2002) presented a more dynamic spatio-temporal analysis of favelas both in relation to the rest of the city and to each other. Although the authors rightly avoided treating favelas as a homogeneous entity, they plotted data in five planning zones (APs) and thirty administrative regions (RAs) defined by the planning of the city since 1930 (Borges 2007). Their statistical analysis based on these zoning boundaries raises questions regarding the accuracy of results. At the same time their analysis fails to capture the micro-spatial patterns of these communities' growth.

The present paper employs a detailed street-network model for the whole metropolitan Rio. The road-centre line model is analysed configurationally with the help of space syntax theory and methods, revealing the spatial constraints and affordances of movement in favelas across all scales. Its syntactical values are related to their physical morphology and investigated in relation to topography. The objective is to understand the spatial structure and logic of favelas along the metropolitan region and identify their inherent potential for further development and consolidation. To do so, 60 morphologically distinctive areas from both the informal and formal parts of the city are selected and compared. The findings show that favelas have a dense and complex network, which lacks of clear hierarchy between foreground and background network (Hillier, 2004). The spatial identity of these settlements appears to be internally weaker than their formal counterparts. Yet they are linked to the global structure of movement. Building on the concept of movement economy (Hillier and Penn 1996), the specific approach can be beneficial for future planning and design interventions in Brazilian favelas or other similar contexts.

Socio-spatial representation of favelas over time

The growth of Rio de Janeiro and its informal settlements has been strongly influenced by public policies, the development of academic discourse (Valladares 2008) and critical cartography (Novaes 2014). It is true that the social and spatial representation of favelas contributed to the image of a divided city defining its past, present and certainly future. By the early 20th century, 20-25% of Rio population lived in poor living conditions in the centre of the city (Vaz 1985 cited in O'Hare and Barke (2002, 232)). During the 1900s and the governance of Pereira Passos, almost 3000 cortiços (slums) were demolished relocating the residents to social housing schemes in the urban periphery (Brandão 2006, 39). Unable to afford such relocation, the poorest families started squatting at steep slopes in downtown determining in this way the beginning of favelas' emergence (Figure 2). Furthermore, rural to urban in-migration of 1920s-1940s led to a rapid increase of the number of favelas. Different employment opportunities attracted poor working class first to the Zona Norte (north zone), and later to the Zona Sul (south zone). Eventually, favelas grew almost ten times in 40 years (1920-1960), despite the fact that through the 1930 Plano Agache public authorities aimed to relocate urban poor to state housing projects in the suburbs (Brandão 2006, 40). This plan was never materialised due to lack of financial resources. However, this period marked the first time that the hitherto 'cidade maravilhosa' (marvelous city) was losing control to a 'cidade partida' (divided city). Now the distinction between the favela and the city was mainly grounded upon social, cultural and economic differences and the need for social reform (Valladares 2008, 4). According to the *Atlas for Social Exclusion in Brazil Vol. 2* (Campos et al. 2003), between 1960-1980, favelas were considered socially excluded because of their low income, education level, and high percentage of migrants, women and Afro-Brazilians (Perlman 2005, 12). Cartographically, favelas had neither social nor spatial representation. They were absent in the press – mapped as either empty or green areas (Novaes 2014). Authorities regarded them as ephemeral – *fait accompli* – in the expectation of an imminent disappearance but even more as 'a social problem' (Valladares 2008, 5).

Only after the mid-1960s, favelas started attracting serious attention. A number of political and economic events such as economic recessions, post-war industrialisation and weak governmental presence helped favelas to grow in numbers and consolidate themselves into self-organised communities. Having gained the attention of politicians, social scientists and academics (Valladares 2008), they started to get cartographically highlighted but only as "marginal clusters" (Jornal do Brasil 1963 quoted in Novaes (2014, 210)). Mapmaking gradually shifted to a stigmatizing representation exclusively emphasising drug trade, (ibid., 214) and further reinforcing divisions within the city.

In the beginning of 80s, favelas got recognised as part of Rio's reality by the public authorities. Social scientists and architects were no longer considering favelas as a problem but more of a bottom-up solution to housing problems or an inspiration for self-organising

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Table 1. The two tables on the left show the rotated component matrix of normalised integration (below) and normalised choice (above). Each matrix shows the correlation of 19 metric scales with the two respective components. The diagram on the right illustrates the distribution of the loadings for each component (NACH 1, NACH 2, NAIN 1 & NAIN 2). The peaks indicate the individual components theorised as local and global network.

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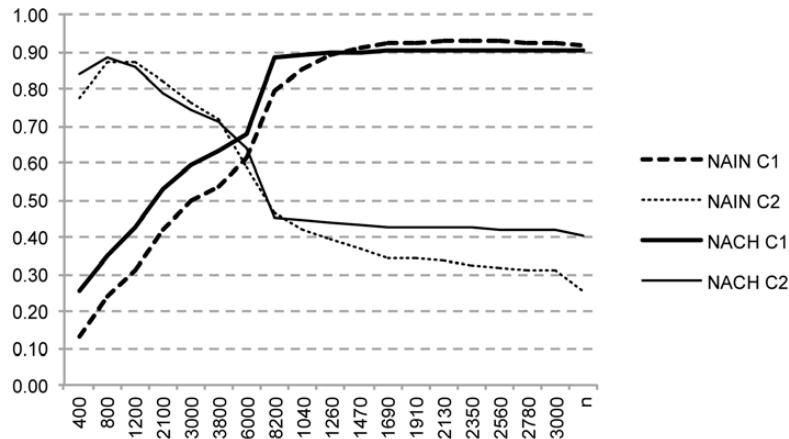
Rotated Component Matrix^a

NAIN metric	Component	
	1	2
400	0,131	0,776
800	0,239	**0,874**
1200	0,309	0,872
2100	0,418	0,822
3000	0,500	0,763
3800	0,537	0,718
6000	0,613	0,590
8200	0,796	0,463
1040	0,851	0,421
1260	0,888	0,394
1470	0,910	0,365
1690	0,921	0,343
1910	0,924	0,341
2130	0,928	0,336
2350	**0,930**	0,325
2560	0,927	0,319
2780	0,924	0,311
3000	0,922	0,309
n	0,915	0,253

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Rotated Component Matrix^a

NACH metric	Component	
	1	2
400	0,254	0,840
800	0,348	**0,883**
1200	0,423	0,858
2100	0,529	0,789
3000	0,591	0,742
3800	0,630	0,707
6000	0,675	0,637
8200	0,886	0,451
10400	0,893	0,444
12600	0,896	0,438
14700	0,900	0,433
16900	0,902	0,429
19100	0,903	0,427
21300	0,903	0,425
23500	0,904	0,424
25600	0,904	0,422
27800	**0,905**	0,421
30000	0,905	0,420
n	0,902	0,403

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

communities to learn from when designing anew. A series of upgrading programmes *in situ* such as Rio Cidade, Favela-Bairro, Growth Acceleration Programme (PAC) and Morar Carioca proclaimed to remove the physical and conceptual boundaries between the formal and the informal and integrate favelas into the rest of the city. There are conflicting opinions regarding the success and failure of these programmes. Accord-

ing to McGuirk (2014, 128), the policies lacked a holistic approach tackling both the social and spatial sphere of the phenomenon. Even recent interventions ahead of the 2014 World Cup and 2016 Olympics focused mainly on building up physical walls or establishing armed police forces within favelas further contributing to the perception that favelas are different and dangerous to the outsiders (Novaes 2014). It is proposed that together with the public policies the social and spatial representations of favelas have reinforced the image of otherness in the subconscious of Brazilian people. The perception of favelas being distinctive areas of poverty, fear and marginality is reproduced to such extent that cariocas belonging to middle and upper class treat them as one single segregated entity, entirely different from the rest of the city (Valladares 2008, Novaes 2014).

By criticising the division, this paper does not suggest there are no differences between favelas and the rest of the city. Instead, it seeks to shed light into their spatial structure within the metropolitan region of Rio, and explore the contribution of space in better understanding their relationship within the city as a whole. Studies using space syntax argue that favelas and their embedding within the urban context can affect their development, degree of consolidation and participation in the wider socio-economic networks (Hillier, Greene, and Desyllas 2000). Parham (2012) discussed how their spatial structure differs from the wider city leading to their natural isolation. Mohamed et al. (2013) noticed that informal settlements in other contexts, such as Cairo, show a strong internal structure and are weakly linked to their immediate surroundings and the city as a whole. The issue of integration of favelas into the formal city is particularly difficult and certainly not just a matter of spatial analysis. However, what is argued here is that since informal communities are part of Rio's socio-economic practices and everyday reality, it is essential to have an understanding of how they work spatially, independently as well as in relation to the whole city.

Methodology

The paper sheds light on the spatiality of Rio de Janeiro with a particular focus on informal settlements in relation to their spatial configuration and topographic location. Their structural particularities such as the degree of 'accessibility', 'structure' and 'order' are compared to those of formal areas exhibiting further clues about the process of their formation. Rio is analysed by applying space syntax, a theory and method that describes configurational characteristics of street networks and relates them to patterns of use, social activity and cultural meaning (Hillier & Hanson, 1984). The strength of such an approach is that street networks constitute systems, which can be analysed across different scales, allowing comparisons of localities to city or even region wide structures. Research has shown that cities share two fundamentally similar structural characteristics (Hillier, 2012). They have few long or continuous lines constituting a foreground network that optimises movement attracting economic activity, which in turn stimulates further movement (Hillier and Penn 1996). These are set against many short lines creating a background network of primarily residential activity. While the foreground network is economically driven, easing movement through the city, the background network tends to restrict movement and is culturally oriented, varying from city to city.

Space syntax uses two main measures, 'integration' (closeness centrality in network analysis terms) and 'choice' (betweenness centrality) at different kinds of distance (topological, angular and metric distance) and radii (varying from the walkable scale of 400m to metropolitan scales of 10,000m or 30,000m to n(global) meaning the entire system). 'Integration' is an indicator for accessibility, measuring to-movement potentials, while 'choice' accounts for through- movement between any pair of origins and destinations in an urban complex. The normalised angular choice (NACH) and normalised angular integration (NAIN) serve as the principal measures in this paper, allowing comparisons between different urban elements and areas in Rio (Hillier et al, 2012).

The analysis is organised in three parts: The first part uses street network analysis based on a road-centre line map of Rio de Janeiro, derived from the Instituto Pereira Passos (IPP). It features the road network and includes streets and alleys within most of the fave-

las. This enables to put local areas into regional context and understand the informal settlements in an integrative way. The street network is analysed on 19 different radii from local metric distance (400) up to global (n). In order to overcome the arbitrariness of radius selection, a principle component analysis (PCA) was applied to the dataset, first introduced in space syntax research by Serra (2013). PCA is a statistical procedure that aims to identify patterns in datasets by reducing their dimensions, while maintaining minimal loss of information. The number of components is at least less than or equal to the number of initial variables.

Different from Serra, PCA was applied to the normalised measures of choice and integration (NACH, NAIN), resulting in two components for each measure (Table 1). The rotated component matrix highlights the extent to which each original variable is contributing to each component. This contribution should be seen as a smooth transition rather than a precise separation, as cities and regions consist out of 'pervasive centralities', which blend into each other (Hillier 2009). Two components are derived for NACH and NAIN the first of which can be thought of as a *local* network (radius 800) describing the neighbourhood scale, while the second as a *global* network (radius 12600 up to 30000) embedding the former within the city and region. These two scales form the basis for this analysis.

The second part of the analysis looks at the spatial topography of Rio de Janeiro, which plays a crucial role in the development of the city and region. For this reason syntactic analysis is combined with an examination of the topographic conditions of favelas. The spatial distribution of favelas has been always related to the condition of topographical height in research literature (O'Hare and Barke, 2002). One assumption is that favelas are more likely to emerge on unclaimed land, such as sloping sites or railway sidings. To investigate to what extent this is a valid assumption, especially after the spread of favelas for more than 110 years, we calculated the steepness degree for 997 favelas. This was done by generating the mean altitude difference between geodesic points of 5-meter distance based on 10-meter contours over the region. The resulting map illustrates area steepness based on values ranging from 0.1 to 7.0 (0% to 85% incline) of difference in height between geodesic points.
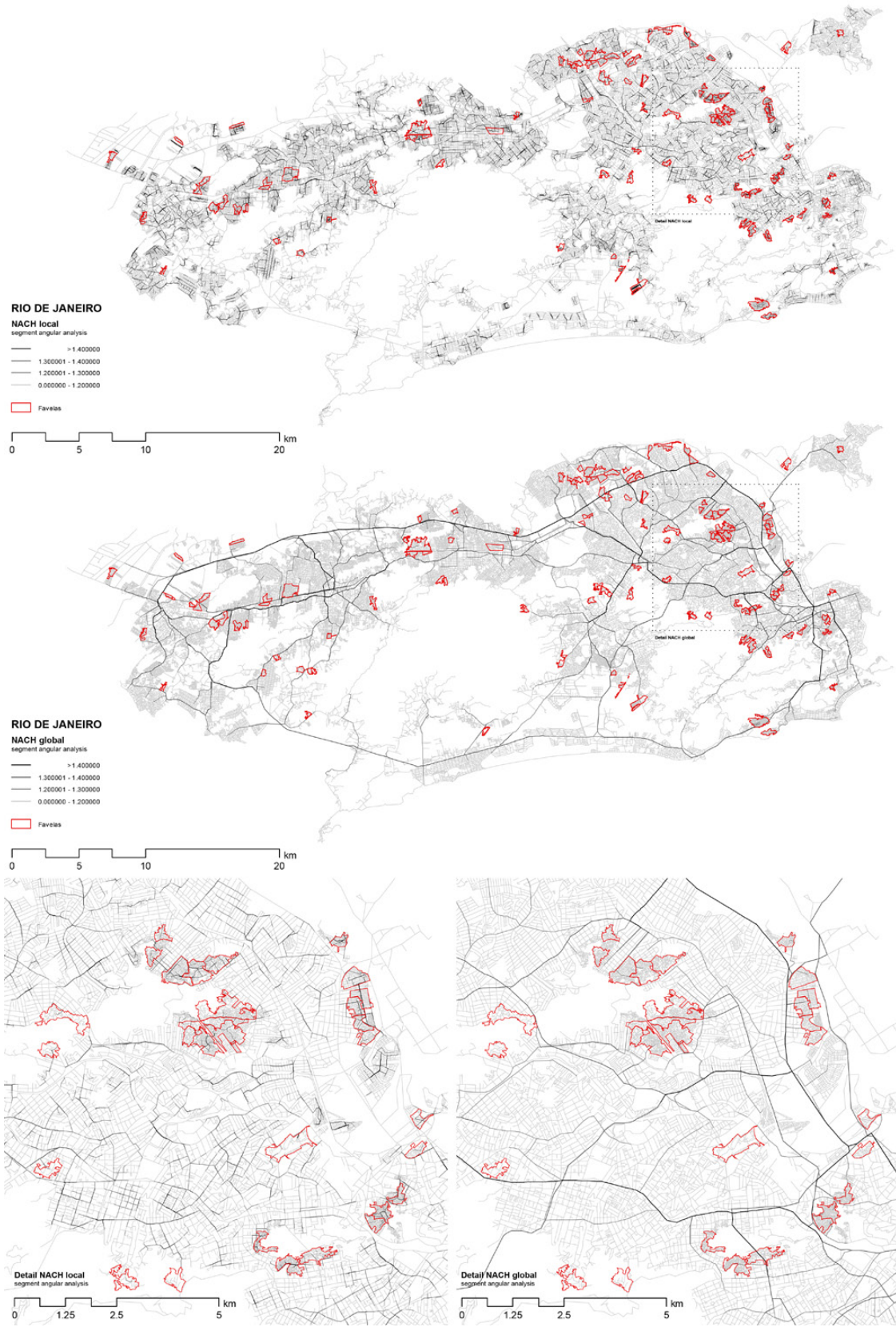
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The third and final part of the analysis investigates the spatial structure of 30 informal and 30 formal areas. The aim here is to understand the structural differences and similarities between them as well as the processes by which they were created. These areas are selected by applying the syntactic measure of metric mean depth (MMD) for consecutive metric radii. This method helps identify morphologically distinctive regions within the urban system revealing characteristics that reflect their 'natural area-isation' (Hillier et al. 2010). In the case of Rio, the radius for MMD analysis is based on the previously identified local scale, that is, metric 800 (Figure 4). Upon the selection of 60 syntactically identifiable areas, their mean and max values of normalised choice (NACH) and integration (NAIN) are plotted on four radar charts. Mean and maximum values of choice (NACH) for radius n are considered as indicators of the degree of 'structure' and 'order' in spatial structures respectively. The higher the mean NACH, the more regularised and continuous is the background grid with direct connections but not high structure. The higher the maximum of NACH, the more structured is the foreground in relation to the background network (ibid.,163). The mean and maximum of NAIN for radius n indicate the 'accessibility' of the foreground (max) and background (mean) networks. These values provide clues about the spatial performance and structural particularities of these local areas in relation to the regional whole.

Metropolitan spatiality

Looking at the *NACH global* analysis (Figure 1), one can identify the metropolitan spatial structure of Rio forming a ring that connects suburban areas with the wider whole. The historic regional growth is legible through this analysis. High values cluster in the historic east and indicate the starting point of development, followed by a spread over the industrial northeast and towards the western parts of the region. A view on the locations of favelas within this structure shows that favelas are not segregated, but in most of the

Figure 1. Spatial analysis of Rio de Janeiro. At the top: NACH global and below NACH local, segment angular analysis, including highlighted 1.4, 1.3 & 1.2 structures (dark grey) and the location of 100 largest favelas (red). At the bottom: details of the NACH global (right) and NACH local (left) analysis.

RIO DE JANEIRO
NACH local
segment angular analysis

>1.400000
1.300001 - 1.400000
1.200001 - 1.300000
0.000000 - 1.200000

Favelas

km
0   5   10   20

RIO DE JANEIRO
NACH global
segment angular analysis

>1.400000
1.300001 - 1.400000
1.200001 - 1.300000
0.000000 - 1.200000

Favelas

km
0   5   10   20

653

Detail NACH local
segment angular analysis

km
0   1.25   2.5   5

Detail NACH global
segment angular analysis

km
0   1.25   2.5   5

city as organism | new visions for urban life

cases are in close proximity to it. Focusing on the 100 largest favelas out of the 1049 in total, one can identify three different types of favela locations in relation to the foreground structure: *a)* in immediate proximity, on or next to a high choice value road (value >1.4) (57% of all favelas); *b)* in a distance of at least 500 metres from second range high value roads (value > 1.2) (34% of all favelas); and *c)* a small percentage that does not have proximity to the foreground structure (9%). The majority of favelas is hence located very close to the global structure of movement. This finding contradicts results of similar analysis in the context of Cairo (Mohamed et al. 2013). This could be an indicator for a development that favours beneficial locations in terms of relation to the formal city rather than following the principle of unclaimed land. The *NACH local* analysis demonstrates a wide spread of clusters of high choice value – potential local centres – over the region of Rio de Janeiro (Figure 2). It can be observed that informal as well as formal parts of the city feature such centres. Their distribution however is slightly different. While the formal parts constitute a more continuous network of the clusters distributed in linear way, favelas display in most cases centrally such core. This core extends throughout large parts of the favela, but is segregated from the formal network.

In terms of *NAIN global* analysis, the wider region shows a strong structure in the industrial north-east extending towards the west, with a wide continuous pattern of values above 0.7. It is interesting to see how this structure traverses the entire northern region but excludes favelas (Figure 2, detail). A view of the *NAIN local* analysis reveals similar results with those observed in relation to the global structure. Local centres are widely spread throughout the region forming clusters, while favelas are not captured by the analysis. This is a surprising finding, as previous authors emphasise the strong internal structures of favelas in other cities. So, in the case of Rio, informal settlements do not have strong internal structures. Following Parham's theory (2012), it is the complex, dense and irregular spatial structure of favelas that turns them into identifiable urban patches, forming an archipelago of isolated 'islands'. This is visible through their central cores – local centres – as they form discontinuous islands in relation to the global structure. However the theory that favelas are isolated cannot be affirmed. Instead, favelas feature a disparity between NACH and NAIN structure particularly in relation to formal areas. Therefore, the arising question is what drives the process of spatial production of these informal settlements and whether the location plays any role in this process.
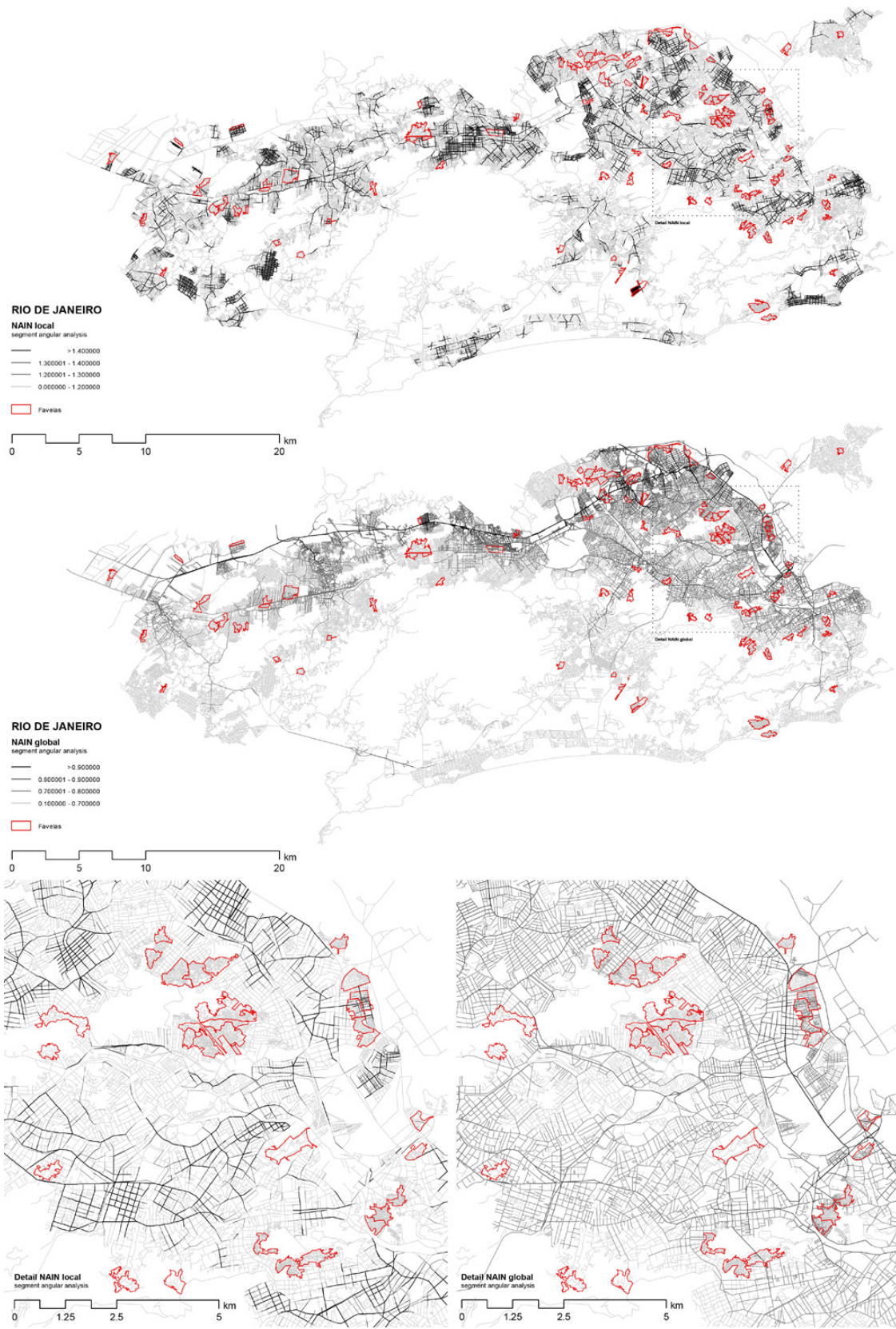
So far, the location of favelas in Rio de Janeiro has been related to hillsides and high degree of steepness. A view on the topographic location of 997 favelas (Figure 3) shows that the assumption that favelas are predominantly located on steep sloped locations is not correct. The regional map shows that favelas on steep sloped locations are found around the historic core of the city. However, a remarkable number of favelas are located on different kinds of topography ranging from sloped to rather flat areas. This detailed view gives account on the methodology, but moreover on how certain areas are characterised by steep slope, slope, entire flatness or a variety between those. The histogram (Figure 3) presents the distribution of values in the data set. Almost 60% of all favelas are found on ground that is below 2.0 (10% grade) which is regarded as not steep slope. 40% however feature a steepness degree above 2.0 (>10% grade). The analysis shows that the emergence of favelas is a more diverse and complex phenomenon that incorporates a spatial production at flat as well as at incredibly steep areas.

Is this truly a divided city?

As aforementioned the authors plotted the mean and max for NACH and NAIN for 30 selected formal and 30 informal areas. Based on the previous analysis of favela locations in relation to their topography, the samples comprise 10 favelas on steep sloped areas, 10 favelas on sloped areas and 10 favelas on flat areas. The thirty formal areas, all located on flat land, were selected according to their size and degree of comparability. All selected areas are highlighted centres by the metric mean depth (MMD) analysis for metric 800. Their standardised mean and maximum of values of NACH and NAIN were plotted in 15 radar charts (Figure 4). Three diagrams for each of the topographic category of fave-

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Figure 2. Spatial analysis of Rio de Janeiro. At the top: NAIN global and below NAIN local, segment angular analysis, including highlighted 1.4, 1.3 & 1.2 structures (dark grey) and the location of 100 largest favelas (red). At the bottom: details of the NACH global (right) and NACH local (left) analysis.

RIO DE JANEIRO

NAIN local
segment angular analysis

>1.400000
1.300001 - 1.400000
1.200001 - 1.300000
0.000000 - 1.200000

Favelas

km
0   5   10   20

RIO DE JANEIRO

NAIN global
segment angular analysis

>0.900000
0.800001 - 0.900000
0.700001 - 0.800000
0.100000 - 0.700000

Favelas

km
0   5   10   20

Detail NAIN local
segment angular analysis

km
0   1.25   2.5   5

Detail NAIN global
segment angular analysis

km
0   1.25   2.5   5

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Figure 3. Topographic analysis of Rio de Janeiro. At the top: Showing the mean degree of incline for each favela within Rio de Janeiro (The colour gradient shows roughly the degree of incline from blue, yellow sloped and red steep sloped areas). At the bottom left: Detailed section of the analysis underlying the region map, showing a 5 meter grid of geodesic points for each favela. At the bottom right: Histogram of the mean degree of slope for the 997 sample areas, a dotted line shows 10% quantile breaks clustering equal numbers of favelas with the same value.
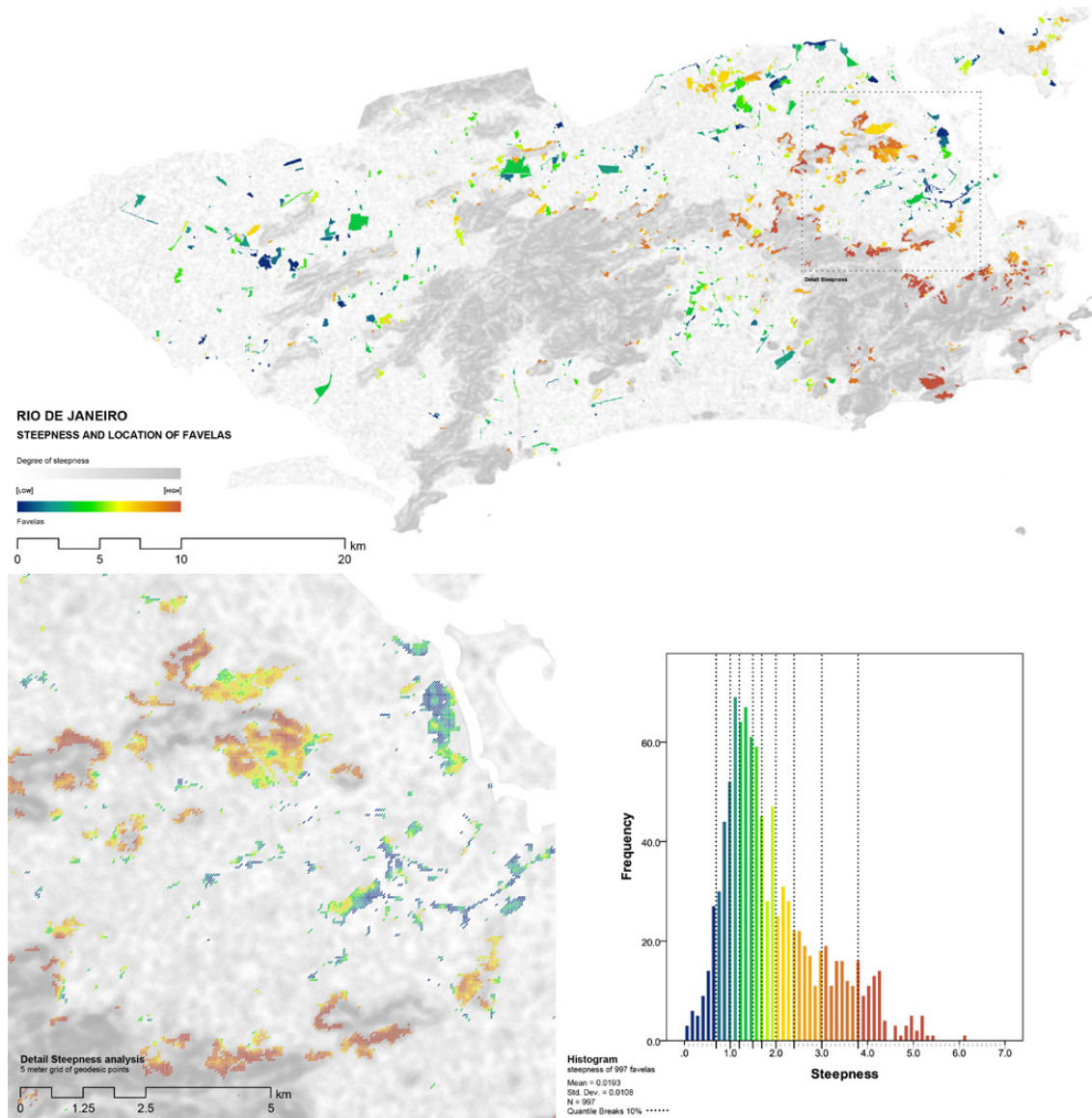
las and formal areas are drawn. The first two highlight statistical outliers next to their corresponding spatial structure and the third one contains the entire sample picturing the tendency of the specific type. Looking at the form of the entire city overlaid with Hillier's (2012) database of 50 world cities and the former star model for the whole city of Rio de Janeiro (Figure 4), the new model – including favelas – is significantly different to Hillier's original one. According to Hillier (2012, 185), Rio de Janeiro has a rather weak foreground network – in comparison to other cities – limited to a few 'single lines running east-west in the northern part of the city' and few more 'linking relatively discontinuous parts of the city together' in a tree-like form. The presented model however, which includes a higher degree of detailed street network, shows a more structured foreground network depicted by a high maximum of NACH. Then, a view on the comparison of formal and informal

Figure 4. At the top: Metric mean depth analysis for Rio de Janeiro on a radius of metric 800. Black indicates cluster and patches of areas with distinctive spatial patterns, depicting favelas as well as formal areas. Red and blue shows the 60 selected informal and formal areas. In the middle: Radar charts of the 60 selected areas, divided in subcategories. Light blue, flat informal areas; orange, sloped informal areas; red, steep sloped informal areas and dark blue, flat formal areas. On the left selected statistical outliers of each category and their spatial configuration. At the bottom: Three radar charts showing (left) 50 sample cities in comparison with Hillier's and the presented model of Rio, (middle) 30 selected favelas divided in to topographic categories and (right) 30 formal and 30 informal areas.

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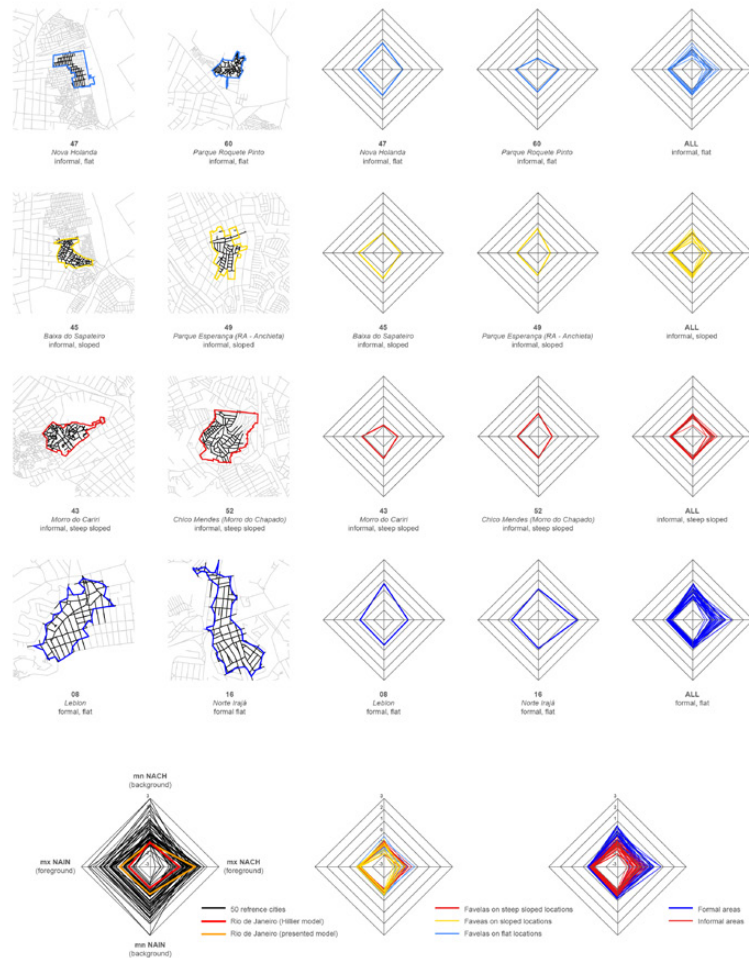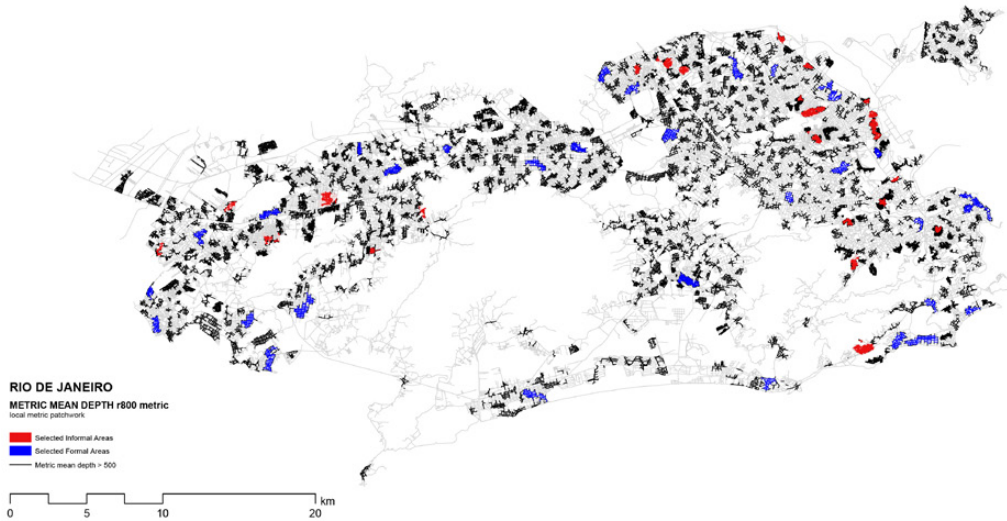
areas reveals strong differences between them. On the whole, formal areas perform with higher values in the mean and maximum of NACH, while informal areas perform slightly better in both the mean and max NAIN values. The comparison in all cases is relational, nevertheless it demonstrates that formal local areas have better 'structure' and 'order' than informal streets, whose complex internal geometry imply a rather fragmented system which grew incrementally without an 'all-at-once' conceptualisation.

A more diverse picture emerges when comparing the 30 favelas throughout the different topological conditions. With only very little variation in the dataset, steep sloped favelas perform very equally and create perfect diamond shapes, with a tendency to slightly higher max NACH values. This means equality in terms of both 'order' and 'structure', yet weak movement potential in both networks. Equality in values means that background and foreground, integration and choice tend to evenly match, making all-to-all destinations invariable to area-to-area relations. The diamond shapes are especially the case for favelas that are in close proximity to the city centre.

Favelas in sloped areas on the other hand present surprisingly the highest difference in 'order' and 'structure' of the three topographical types. They have the lowest values as well as the highest variation between mean and max NACH. This could be because those areas tend to be more often closer to the urban fringe and much more distant from strong global arteries than flat or steeply sloped favelas. Favelas on flat locations feature a value distribution similar to formal areas. Although the values are on average lower, than in the other two cases, their steady mean and max NAIN values and a tendency to either higher mean or higher maximum NACH values, makes them still very comparable. This could be an indicator that topography has indeed an impact on the spatial production, but that the particularity of informal settlements in general creates a much stronger variation does not lead to a clear pattern.

In the formal areas, the background tends to be stronger than the foreground network, which translates into more 'order' and less 'structure', that is an uninterrupted grid-like background and a foreground network that connects with disruptions. This pattern indicates that movement in the global structure is distributed equally to both background and foreground networks. This can be explained by the fact that city growth may have been led through the years by the background structure of residential use rather than a comprehensive urban planning which accommodates economic activity in certain parts of the city and connects disconnected pieces into a whole. This one-sided understanding of the formal city-creation may be sufficient to explain its informal counterpart as both are possibly underlined by the same logic: a 'rapidly developing residential process' of creation (Hillier, 2012, 187). This can be explained by the fact that while formal areas have stronger 'order' than 'structure', neither they nor the informal areas have strong foreground structures that connects the parts into a whole.

Conclusion

Due to length limitations, no socio-economic data are presented in this paper. Therefore, the confidence is placed on the syntactic performance of the global metropolitan region of Rio de Janeiro and a sample of local areas across it. The objective is to understand in a comprehensive way the spatial characteristics of the systems: their location and their degree of 'accessibility', 'order' and 'structure' in order to overcome any existing perceptions of Rio being a divided city. To conclude, the paper forms a contribution in understanding favelas in an integrated way, analysing the spatial structure of favelas in a regional context. The paper showed that favelas are indeed different in their spatial structure, but form an integral part of Rio's spatial structure. Moreover in a regional spatial context favelas are far from being segregated islands. However, they are characterised by very weak internal structures, particularly when compared to formal areas. Light was shed on the role of topography in the location of favelas highlighting that favelas in Rio de Janeiro form a more complex phenomenon that being considered as always developing on steep slopes. This paper stresses the need of additional research in field and the importance to understand the phenomenon of informal settlements in a comprehensive way.

References

Acioly Jr, C. (2001) 'Reviewing urban revitalisation strategies in Rio de Janeiro: from urban project to urban management approaches', *Geoforum*, 32(4), 509-520.

Andreatta, V. (2009) 'Rio de Janeiro: Planes de Ordenación y Orígenes de la Urbanística Carioca', *Revista Iberoamericana de Urbanismo*, 1(1), 15–26.

Borges, M. V. (2007) *O Zoneamento na Cidade do Rio de Janeiro: Gênese, Evolução e Aplicação. Dissertação de Mestrado*, IPPUR, UFRJ, Rio de Janeiro.

Brandão, Z. (2006) 'Urban planning in Rio de Janeiro: a critical review of the urban design practice in the twentieth century', *City & Time*, 2(2), 37-50.

Campos, A., Pochmann, M., Amorim, R., and Silva, R. (2003) *Atlas da exclusão social no Brasil, Vol 2: dinâmica e manifestação territorial* (São Paulo, Cortez).

Castells, M. (1974) *Clase, Estado y marginalidad urbana. Estructura de clase y política urbana en América Latina* (Buenos Aires, Ediciones SIAP).

de Oliveira, M. P. (2008) 'Projeto Rio Cidade: intervenção urbanística, planejamento urbano e restrição à cidadania na cidade do Rio de Janeiro', *Scripta Nova: revista electrónica de geografía y ciencias sociales* (12), 113.

de Souza Pereira, L. A. (2010) 'O programa favela-bairro: mais do mesmo? Quais as possibilidades para a superação dos "problemas" existentes na cidade do Rio de Janeiro?', *Scripta Nova: revista electrónica de geografía y ciencias sociales* (14), 54.

dos Santos Oliveira, N. (1996) 'Favelas and ghettos: race and class in Rio de Janeiro and New York City', *Latin American Perspectives*, 71-89.

Dovey, K., and King, R. (2011) 'Forms of informality: morphology and visibility of informal settlements', *Built Environment*, 37(1), 11-29.

Fernandes, F. (2013) *Sociedade de classes e subdesenvolvimento* (Global Editora e Distribuidora Ltda).

Hillier, B. (1999) 'Centrality as a process: Accounting for attraction inequalities in deformed grids', *Urban Design International* 4(3-4), 107–127.

Hillier, B. & Penn, A. (1996) 'Cities as Movement Economies', *Urban Design International* 1(1), 49–60.

Hillier, B. (2004) *Space is the machine* (Cambridge, Cambridge University Press).

Hillier, B. (2009) 'Spatial sustainability in cities: Organic patterns and sustainable forms', *Proceedings of the Seventh International Space Syntax Symposium*. Stockholm, Royal Institute of Technology, 01.1-20.

Hillier, B., Greene, M., and Desyllas, J. (2000) 'Self-generated Neighbourhoods: the role of urban form in the consolidation of informal settlements', *Urban design international*, 5(2), 61-96.

Hillier, B. and Vaughan, L. (2007) 'The city as one thing', *Progress in Planning*, 67(3), 205-230.

Hillier, B., Yang T., and Turner, A. (2012) 'Normalising least angle choice in Depthmap-and how it opens up new perspectives on the global and local analysis of city space', *Journal of Space Syntax*, 3(2),155-193.

Lacerda, D. S. (2015) 'Rio de Janeiro and the divided state: Analysing the political discourse on favelas', *Discourse & Society*, 26(1), 74-94.

Leeds, A. (1969) 'The significant variables determining the character of squatter settlements', *América Latina*, 12(3), 44-86.

Leeds, A., and Leeds, E. (1970) 'Brazil and the myth of urban rurality: urban experience, work, and values in" squatments" of Rio de Janeiro and Lima', Paper presented at the St. Thomas Conference 1967.

McGuirk, J. (2014) 'Rio de Janeiro: The Favela Is the City', In *Radical Cities: Across Latin America in Search of a New Architecture* (Verso Books).

Mendes, I. C. R. (2006) Programa favela-bairro: uma inovação estratégica? Estudo do programa favela-bairro no contexto do plano estratégico da cidade do Rio de Janeiro. Master Dissertation. Universidade de São Paulo.

Mohamed, A. A., Van Nes, A., Salheen, M. A., Kohlert, C., and Schwander, C. (2013) 'The socio-economic implications of the spatial configuration in greater Cairo metropolitan area', *Proceedings of Ninth International Space Syntax Symposium*, Seoul, Korea, 95.

Novaes, A. R. (2014) 'Favelas and the divided city: mapping silences and calculations in Rio de Janeiro's journalistic cartography', *Social & Cultural Geography*, 15(2), 201-225.

O'Hare, G., and Barke, M. (2002) 'The favelas of Rio de Janeiro: A temporal and spatial analysis', *GeoJournal*, 56(3), 225-240.

Oliveira, M. P. (2008) 'Projeto Rio Cidade: intervenção urbanística, planejamento urbano e restrição à cidadania na cidade do Rio de Janeiro. Diez años de cambios en el Mundo, en la Geografía y en las Ciencias Sociales, 1999-2008', *Actas del X Coloquio Internacional de Geocrítica*, Universidad de Barcelona (http://www.ub.es/geocrit/-xcol/338.htm).

Pamuk, A., and Cavallieri, P. F. A. (1998) 'Alleviating urban poverty in a global city: new trends in upgrading Rio-de-Janeiro's Favelas', *Habitat International*, 22(4), 449-462.

Parham, E. (2012) 'The segregated classes: spatial and social relationships in slums', *Proceedings of Eighth International Space Syntax Symposium*, Santiago de Chile, Chile.

Perlman, J. E. (1979) *The myth of marginality: Urban poverty and politics in Rio de Janeiro* (University of California Press).

Perlman, J. E. (2004) 'Marginality: From Myth to Reality in the Favelas of Rio de Janeiro, 1969-2002', In A. Roy and N. AlSayyad (Eds.), *Urban informality in an era of liberalization: a transnational perspective* (Lexington Books) 105-146.

Perlman, J. E. (2005) 'The Myth of Marginality Revisited: The Case of Favelas in Rio De Janeiro. Becoming global and the new poverty of cities', In Hanley, L. M., Ruble, B.A., and Tulchin, J. S. (eds.) *Becoming Global and the New Poverty of Cities: Comparative Urban Studies Project* (Woodrow Wilson International Center for Scholars).

Perlman, J. E. (2010) *Favela: Four decades of living on the edge in Rio de Janeiro* (Oxford University Press).

Portes, A. (1972) 'Rationality in the slum: an essay on interpretive sociology', *Comparative Studies In Society and History*, 14(03), 268-286.

Riley, E., Fiori, J., and Ramirez, R. (2001) 'Favela Bairro and a new generation of housing programmes for the urban poor', *Geoforum*, 32(4), 521-531.

Samper, J. (2011) *Urban regeneration in a context of violence: The case of the Favela-Bairro in Rio de Janeiro. Informal Settlements Research (ISR) Network* (http://informalsettlements.blogspot.co.uk/2011/06/urban-regeneration-in-context-of.html).

Serra, M. L. A. (2013) Anatomy Of An Emerging Metropolitan Territory: Towards an Integrated Analytical Framework for Metropolitan Morphology. Unpublished PhD Thesis. Faculty of Engineering University of Porto.

Serra, M. L. A., and Pinho, P. (2013) 'Tackling the structure of very large spatial systems-Space syntax and the analysis of metropolitan form', *The Journal of Space Syntax*, 4(2), 179-196.

Soares, F., and Soares, Y. (2005) *The Socio-Economic Impact of Favela-Bairro: What do the data say?* (Inter-American Development Bank, Washington DC).

Taschner, S. P. (1995) 'Squatter settlements and slums in Brazil: twenty years of research and policy', In Aldrich, B.C. and Sandhu, R. (eds.) *Housing the Urban Poor. Policy and Practice in Developing Countries* (Zed Books, London) 185–223.

Turner, J. F. C. (1976) *Housing by people: Towards autonomy in building environments* (Marion Boyars London).

Turner, J. F. C., and Fichter, R. (1972) *Freedom to build: dweller control of the housing process* (Macmillan).

Valladares, L. (2008) 'Social science representations of favelas in Rio de Janeiro: A historical perspective', *LLILAS Visiting Resource Professors Papers Retrieved*, 9(03), 1-31.

Ventura, Z. (1994) *Cidade partida* (Editora Companhia das Letras).

Wacquant, L. J. D. (1996) 'The rise of advanced marginality: notes on its nature and implications', *Acta sociologica*, 39(2), 121-139.

Reading the form of informal Roma settlements in the light of everyday life

Milena Grbic, Olivera Stankovic Grujicic
Faculty of Architecture, University of Belgrade, Serbia
Keywords: Romani, informal Roma settlements, everyday life, culturally adjusted environment

Abstract

The intention of this paper is to point out how several basic interdependent characteristics of the functional organization of Roma communities based on everyday-life represent the ethos of the formation of spatial settings in informal Roma settlements, which not correspond with modernist public housing estates and their ethnically and socially deprived residents. The paper starts with the broader interpretation of territorialisation which suggests the existence of a relation between the spatial and the social level of Roma settlements; one that provides the understanding of the effects this group actualize in space. The physical spatial patterns of informal Roma settlements were created without professionals influence and represent a quality induced by the need to functionally organize a community where everyday activities take place, but also spatial forms which were built by the residents themselves. In this sense, the settlement morphologies resulting in unplanned Roma settlements process of formation are both culturally adjusted environment and human resources potential. The main purpose of the paper is to emphasize the fact that the Roma micro-environments already offer their own ways to participate in the creation of cities of future from the standpoint of urban planning and social policies that have emerged as a response to residential assimilation policies, which as a principle can be alternative or a new complement to housing planning and design. The study is based on multiple methods which include qualitative approach to constituents of Roma everyday-life and case study of their manifestation in representative spatial typology in informal Roma settlements.

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Introduction: An escalating lack of cohesion in South African Cities and towns

Roma settlements have represented part of Belgrade's urban tissue for decades. The living conditions in these settlements came to be as consequences of a never-ending cycle of poverty in which general deprivation leads to bad education and thus a low possibility of getting employed which further leads to harder access to the social protection and health systems, which again ends in poverty and a low social status. Settlements inhabited by the Roma population are characterized with a legally unresolved status, insufficient infrastructure, overpopulated, general poverty and no access to basic social content and services.

Even though the Roma housing issues are perceivable in everyday life, it wasn't until the beginning of activities of the international NGO sector that the problems Roma face in achieving housing rights were mapped out. The practice of resolving the housing issues of the socially endangered Romani is a process in the making through the constant interaction of the theoretical and practical framework. This practice serves as the basis for learning and broadening the future activities and initiatives, recommendations and lessons. At the institutional level, resolving the issues of socially endangered Romani housing is made even more difficult by the circumstances of the broader social context. The housing sector in the Western Balkans withstood (and still does) reforms and structural changes as a result of transition from socialist governmental structures into market-oriented economic structures. The weakened institutional and legal governing framework along with a lack of funds led to the issue of illegal and informal housing which particularly negatively affects the endangered social groups, including the Romani, but also the rest of the society. This led to a shift from uniform solutions and only using public sector resources in the approach to social and housing policy with the goal of increasing the availability and the affordability of adequate housing solutions. One of such solutions was the plan to move Roma families from informal settlements into households across Serbian villages which were adapted for the occasion. This practice could directly lead to the splitting up of the Roma communities which exist inside the aforementioned settlements and also lead to the permanent destruction of urban neighborhoods which as described by King, [stretch] across nations, just as migration and diasporic cultures extend nations beyond their geographic territories. Such a phenomenon – of a city developed and directly influenced in its social, ethnic and cultural composition, in its architecture and spatial form (King, 2004).

Methodology: *Logos* vs. *Nomos*

The concept of this article is based on considering the present confrontation of to opposing spatial 'strategies', the *Logos* and the *Nomos*, which are present when conceiving activities for illegal settlements in the field of *redevelopment as land management, planning, and new construction or reuse on previously used sites*. One strategy, the Logos, develops theoretically or institutionally as an abstract space of professionals (e.g. architects, urban designers, planners), and the other – the Nomos, represents a concrete space of the users, which is subjective and develops spontaneously. Terminologically, the denotative determinants of these two spaces are based on the structuration of space according to Gilles Deleuze and Félix Guattari. The Logos represents an 'called for' conception of existence and offers an image of space that is primordially created in various ways, which simultaneously limits it. This space is considered 'furrowed'. On the other hand, the Nomos indicates that the space has no institutionally imposed organization and thus needs to be understood as open or, as Deleuze and Guattari call it, smooth space (Parr, 2005). Henri Lefebvre methodologically indicates that investigating any (urban) phenomenon, therefore including those related to illegal settlements, needs to start with formal characteristics of space, and only later refocus on investigating the discrepancies within spaces and contents because every urban phenomenon methodologically already depends on familiar notions – dimensions and levels (Lefebvre, 2003), with clear awareness of the fact that urban phenomena contain not one but several

systems of signs and meanings, on several levels. With the goal of showing that several basic, interdependent characteristics of the functional organization of Roma communities (based on everyday patterns which make the ethos of spatial structure formation in informal Roma settlements) conflict public housing estates and their ethnically and socially excluded residents, the article commences with the broader interpretation of territorialization expressed in the attitude that there is a relation between the spatial and the social level in Roma settlements – one that enables the understanding of what this cultural group produces in space. Eagleton explicitly states that a complex of cultural values, traditions, habits and beliefs is contained within the everyday lifestyle of a certain group (Eagleton, 2000). The physical patterns of informal settlement spaces were constructed without professional influence and represent a space built by the residents themselves as well as a quality originating from the need for a functional organization of a community and realization of everyday activities. In that sense, the settlement morphologies that came to be as part of the process of unplanned formation simultaneously represent culturally adapted environments. The reason for this claim lies in the findings of Romani studies and sociology that Roma microenvironments represent the best protection for dynamically changing cultural characteristics including social and cultural patterns of behavior - the Romanipen - which still have the key role in defining the everyday life of the Romani (Saul and Tebbut, 2005). It is the Roma mahala that represents the urban framework for Roma communities and conserves the ethnic compactness and social and cultural behavioral patterns according to Romanipen. In that sense, the article relies methodologically on research results from a case study based on on-site explorations of informal Roma settlements in Belgrade, Serbia which also includes observing the housing practice in five settlements as well as interviews with their inhabitants. In the key of representing the findings of a dominant social ethics, analyzing materials and synchronizing the legal framework, a context was set in order to use it for comparative analysis with on-site exploration findings.

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Logos: The Dialectics of Dual Development

The current housing issues regarding socially endangered Romani and strategic principles of achieving appropriate solutions are outside the design practice. The Romani housing topic is a subject of a strategic discourse duality within legal framework and social policy - in achieving housing standards and social treatment of Romani as a 'European minority'. Their creation and applicability is appropriate for a culturally diverse contemporary society.

In the national legal framework of the Republic of Serbia, Romani are categorized as a socially endangered and vulnerable groups which for economic, social and other reasons and limitations cannot meet their housing needs in the given market and its conditions. They, then, see the law enable support from the state in achieving their rights to housing of a certain standard which is enabled for that group and social category.

In the social policy frameworks, Romani are describes as a highly deprived ethnic community of a specific lifestyle which disables them from achieving their rights or makes them silently assimilate with the majority of the population and their lifestyle through adapting to established institutional and administrative frameworks. In order to surpass this condition, international, governmental and non-governmental organizations defined an array of documents which point towards the need to have none of the projects, including those related to housing, enforce ethnic or racial segregation.

In that sense, the synchronization of the strategic duality in resolving housing issues for socially endangered Romani in the social concept of cultural diversity shows the desired strategic direction in establishing the relation everyday-space. This relation forms the fact that norms and regulations regarding housing of socially endangered and vulnerable groups do not close the area of interest, but instead induce projects focused on Roma housing which include certain spatial needs which enable the development of the users' cultural characteristics. At the same time, this context is compatible with the choice that cultural diversity represents the way to mutual education through exchange of cultural components whose differences are accepted and understood as independent values.

In that sense, the forms of Roma everyday life show a significantly different image which questions the rationality of splitting up a community and taking care of a single family as-is.

Nomos: Screen of the Mundane in Informal Roma Settlements

In the context of institutional space, informal settlements are understood and analyzed as a set of 'primitive huts' in places they were not planned. However, except for the necessary concretisation of existential space, their meaning can be deepened when enclosed spaces are perceived as *constructed places*. In terms of phenomenology, informal settlements, especially Roma settlements, represents 'an *inside* inside an *outside*', meaning a space inside a space, but not just in terms of a housing unit created through enclosing and separating a segment of space, but also in terms of symbolical representation of the builder (encloser) in social space. There are no design pretensions of institutional space in informal Roma settlements, and the organic connection between man and unbuilt environment is practically claimed through reflex. That means that the formed living space of the informal settlement didn't withstand the influences of *l'habitat* in its organization - l'habitat, which, to use Lefebvre's understanding, reduces housing to its basic elements and neglects the relation of the 'human being' to the world, the 'nature' and its own nature (Lefebvre, 1970, 2003). Given the context, it, as a physical space formed by its inhabitants, represents a *smooth* space, in contrast with the sharpness of the city environment, which is to say it represents a spatial quality that came to be through reflex, according to the needs of everyday life. Observing the Roma settlement as a place opens the possibility of accepting such spatial organization that includes the basic elements of family life, lifestyle, cultural models and other values in relation to everyday life. When the phenomenon of informal settlements is understood in that manner, further research is conceived so that it uses analysis to try to showcase the fact that these settlements contain the general philosophical problem of the man-space relation which can be explained using the basic principle of the methodological creation of architecture.

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In that sense, a formulation of several conceptions of physical structure was noticed in slum-typed informal Roma settlements in Belgrade and Serbia, studied by the authors of this article since 2006. Through a series of circumstances, these physical structures integrated, at different scales, spontaneously achieved principles of spatial formation, and thus the potentials for further acceptable improvements in the area of resolving the housing issues of the socially endangered Romani. In the societal sense, surrounded by material poverty and outside the usual social systems, and living strongly dominated by cultural behavioral patterns based on Romanipen principles, the lifestyle and behavior of occupants was determined as *collective* and had the pivotal role in forming a settlement subsystem in terms of object grouping and open space treatment. In relation to the primary spatial function analysis conducted mostly through observation, it is notable that family structure and everyday life patterns contained in the community lifestyle differentiate several aspects of that social relation: familial neighborhood, proximate neighborhood and settlement community, which all reflect onto the physical and functional dimension of the space and degrees of privacy, thus additionally emphasizing the cultural dimension of the communal lifestyle.

The familial neighborhood represents a form of social organization where inhabitants are family members and spatially near each other, as well as interdependent in terms of social capital (e.g. taking care of the children, splitting up responsibilities, material goods...).

The proximate neighborhoods refers to member dependency partially relativized by familial connections, and primarily conditioned by physical proximity. The proximate neighborhood includes both permanent and temporary members.

The settlement community represents a social space of a same lifestyle and perception of the world, a system of mutual patterns and practices with a strong element of individual identification with the community. The residents in the community are economically, socially and culturally closely connected through mutual interests. In regard to the familial neighborhood, the basic conception of the physical and social structure that

represents the building unit of the settlement was formulated: the *yard object group* (Gr-bic, 2014). It is an organizationally and socially dependent unit containing several house-holds. This special socio-cultural micro-ambience is the monitor of the most notable char-acteristics of Romanipen – familial connectedness, relation to children and the elderly – which enables mutual aid when it comes to facing everyday challenges – from looking after the kids, collecting secondary resources to sharing construction and building reno-vation skills and knowledge. Physically, the yard object group is a semi-atrium formation containing five to seven housing surrounding a large inner yard. Even though every unit belongs to a separate household, they are not recognized as single-family housing units as the social relations inside of a familial neighborhood determine that every house, as well as every housing unit has a strictly determined position inside the spatial structure and that its annexation and expansion happens based on functional needs and ac-cording to a predetermined construction model, following the structures perimeter, firmly enclosing the yard as the mutual space of collective housing. In the broader settlement sample, it was noted that cultural capacities of communities affect the daily rhythm of the residents in way that turns the streets into spaces of extended housing activities. Such context induced the spatial disposition of yard object groups such that they open to-wards the street as the public space. Visually and functionally indirect connection of yard object group ambiences along with the familial connections of the residents led to the formation of the social relation that is the proximate neighborhood. In the physical sense, the functional and cultural dimension of the proximate neighborhood reflects in the usage of the unbuilt spaces between streets and yard object groups as gathering spots of the proximate neighborhood which further formed the transient degree of pri-vacy between the communal and the public – the semipublic.

Every observed settlement included at least one gathering space inside its borders which functionally represents a genuine public space of the settlement, available to all. This social relation gave way for a certain temporary function for certain unbuilt spaces which includes wedding celebrations, baptisms, and other celebrations where all community members take part. Their position is flexible, but their function represents a collective need inside a community, compatible to housing as a commonplace of cultural interaction.

In relation to the analytical angle of observing housing in slums, it is clear in the synthesis of physical, functional and other cultural dimensions that certain spatial structures stand out as culturally adapted environments: the yard object groups, gathering places inside proximate neighborhoods and gathering places inside settlement communities. Explained using the usual architectural discourse, the Roma settlements can now be brought into relation with the pragmatic design approach of Roma housing in the conditions of the real social context. Using the words of Jean Baudrillard, architecture can only now be perceived as an expression or even a sociological and political transformator of the social reality which makes the reality face its own radical illusion (Baudrillard and Nouvel, 2005).

Conclusion

Research has clearly shown the presence of the collective lifestyle in the form of the yard object group as a spatial system characteristically present in all observed settle-ments. In certain, more spread out settlements it can be clearly seen, while in other, more densely constructed ones, it is the spatial effort to achieve this concept of housing grouping that is most visible. Also, the presence of numerous gathering places inside neighborhoods and settlements themselves points towards the need for numerous col-lective realizations of different everyday life aspects. It is non-disputable that a hygienic house is always better than a non-hygienic one, but in relation to research results the development of a singular parcel is predictable and it seems that the paradigms which recommend splitting up Roma communities and changing the housing form from collec-tive to individual need to be revisited.

In that sense, in the wider context, the paradigm regarding one homogenous, codi-fied housing standard is tilted towards relativizing in regard to the specific of the social profile of a social group. The above defined methodology which follows the contempo-

rary multidisciplinary approach to complex housing phenomena research shows that it is necessary to also question the processes of everyday life through usage of spaces and can be applied in resolving actual housing issues of other Romani groups. Everyday life processes are important because the multiple impacts of various orders (economic, political, ideological, etc.) on the part of the macro-society, in which the Romani live have left their significant imprint on their overall development as community and the common structure of their identities. It means that each Roma group is unique and its particularities should be treated carefully. It also means that, in this context, it is time to leave the practice which relied on idealized and uniform notions of families and communities, apartment inhabitants and living environments, their general needs and the assumptions of what is without a doubt necessary and '*a priori*' for them. In the conditions of contemporary urban society organization as culturally diverse and with the tendency to mitigate unwanted social consequences, it is necessary to aim towards setting up new relation systems in Roma housing – systems which are appropriate for the Roma community, but also open for the formulation of other notions which apply to the newer social needs.

Many of them can already be found inside the Roma settlement microenvironment – they only need to be looked for.

References

Baudrillard, J. and Nouvel, J. (2005) *The Singular Objects of Architecture* (University Of Minnesota Press, Minnesota).

Eagleton, T. (2000) *The idea of culture* (Blackwell Publishers).

Grbic, M. (2014) 'Principles of Sustainability in Romanipen-based Informal Roma Settlements', in *14th SGEM Geoconference on Nano, Bio and Green – Technologies for a sustainable future*, vol. 2 (STEF92 Technology Ltd, Sofia) 589-596.

King, A. D. (2004) *Spaces of global cultures* (Routledge, New York and London).

Lefebvre, H. (2003) *The Urban Revolution* (University Of Minnesota Press, Minnesota).

Parr, A. (ed.) (2005) *The Deleuze dictionary* (Edinburgh University Press Ltd, Edinburgh).

Saul, N. and Tebbut, S. (eds.) (2005) *The role of the Romanies: images and counter-images of 'Gypsies'/Romanies in European cultures* (Liverpool University Press, Liverpool).

Informality of sprawl? Morphogenetic evolution in post-socialist Tirana

Blerta Dino, Sam Griffiths, Kayvan Karimi
The Bartlett School of Architecture, University College London, 132-140 Hampstead Road, NW1 2BX, London, UK
Keywords: Tirana, informality, morphogenetics, Conzen, beady ring

Abstract

This research focuses on the urban transformation of Tirana, the capital of Albania, following the end of the communist regime in the early 1990s. While rapid urbanization fuelled by mass migration from the countryside to cities is commonly observed in many East European countries Albania's post-socialist urban form has been strongly influenced by the dramatic upheaval in land ownership that has taken place in the context of an inadequately developed legal system and involved the systematic appropriation of open space by developers. The impact of this urbanisation on Albanian society has been profound, but currently there are no systematic studies of the morphological processes that have transformed Albanian cities. This paper begins the process of addressing this deficiency. It identifies four distinctive patterns of informal growth in contemporary Tirana. The variety of post-socialist urban transformation morphologies can tell us much about the particular nature of urban growth in Albania under conditions of unrestrained, loosely regulated, development. The paper draws on the Tirana case study to comment on the nature of social change in the Albanian context, and the way in which 'planned' and 'unplanned' urban environments have contributed to the emergence of distinctive modes of urban life. Conzenian and space syntax approaches provide the methodological basis for morphological research into Tirana's post-socialist built environment. The configurational data is mapped to geo-referenced datasets of Tirana at the building scale, including details of building age and legal status. An initial survey of land uses is done for the case study areas. This integrated methodology is intended to help elucidate both the morphological dynamics of post-socialist Tirana and the broader implications of this urban transformation for Albanian society.

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Introduction

This paper focuses on post socialist urban developments within the urban area of Tirana, compromising of the area within the 'yellow line'- that is the administrative boundary of the Municipality of Tirana. A comparative analysis is made between two periods: a) Tirana's built form from 1992 to 2007 and, b) socialist era developments 1945-1991. The paper focuses on describing Tirana's morphological evolution pre- and post- 1992, in order to identify organisational typologies and assess how far these ideas can be explained by contrasting ideologies of governance during these periods.

Tirana, was until relatively recently, a small town. It became a city in 1921 when it was also named the capital of Albania. Since then there have been three distinct ideologically influenced urbanization periods in Tirana: a) the pre-war period 1921-1945 which was mainly influenced by Italian architectural style and planning model; b) socialist era development 1945-1991 influenced by Soviet architecture and planning practices and c) post-socialist development from 1992 a period characterized by unregulated urban expansion and illegal construction. Table 1 shows how these distinct ideological periods are associated with distinctive character and architectural styles.

Conceptualising post-socialist development

During the Soviet period of hegemony in Eastern Europe, Hamilton et al. (2005: 42) argue that urbanisation is attributed on the one hand to inherited urban patterns and on the other hand to different types of economies and cultures. "Socialist" cities changed radically through the construction of new housing estates whilst in city centres far less physical change occurred than in cities of similar size in western countries with market economies (*Ibid*: 40). After the fall of totalitarian regimes all across socialist Eastern Europe a capitalist city model emerged (*Ibid*: 71). The changes leading to the dissolution of the socialist city model, initiated partly by the state, partly by the market, and partly by unplanned development processes, occurred in different forms across the Eastern European countries (*Ibid*: 71). Research has suggested that there is no single post-socialist transformation model but a range of analogous cases bearing general trends (Stanilov, 2007, Nase and Ocakçi, 2010, Tsenkova et al., 2009,). In south-eastern Europe a particular form of urbanisation process has been proposed. Scholars have used various metaphors to refer to this process" "Balkanization" (Hirt, 2012), "Turbo-urbanism" (Jovanović Weiss, 2006) and "Turbo-architecture" (Jovanović Weiss, 2006). These metaphors reflect cultural dispositions expressed through spatial outcome; such terms directly associate to geographical context and cultural characteristics of the Balkan region.

In the early 1990s 'informal development' was the common denominator of spatial evolution across the post-socialist Balkan Peninsula. There is much insightful research about informal development and urban sprawl, particularly focusing on large scale regional case studies. However, at the micro scale this process is still under researched (Neuwirth, 2005, Huchzermeyer and Karam, 2006, Stanilov, 2007). Relevant literature on informality Besussi et al., (2010: 21) defines urban sprawl as 'low density development with a segregation of uses'. Yet, as Batty et al., (2004) argue there is no firm definition of what other land use characteristics must be existent for a development to be classified as sprawl. As an alternative conceptual frame for sprawl, 'informality' tends to be categorized as a land use *problem* and thus often 'managed through attempts to restore order' (Roy, 2005: 155). Sometimes though, it is simply considered easier to define sprawl by what is not rather than the other way around (Ewing, 2008). Besussi et al. (2010: 17) state that when defining sprawl the arguments conflict with each other on almost everything, from their conception and rationale through to the measurement of sprawl. Of particular interest in terms of this paper's argument is that informality as a process, and sprawl as an outcome are associated with modes of human settlement that occur outside of formal legal structures and processes (Porter et al., 2011, Dovey, 2012, Longley et al., 1991). As systematic studies on informal settlements have shown, cities are built from informal processes as much as formal ones (Dovey and King, 2011). For instance, the

Table 1. Ideological and architectural perdiodization of Tirana's development since 1921. Source: ALUIZNI, 2015, Aliaj, 2003, INSTAT, 2001.

PERIOD	HISTORY	BUILT ENVIRONMNENT
PRE SOCIALIST	Tirana became a city in 1921.	Italian architectural style influence.
I. 1921-1938	During this period Albania's urban population was small with just15.4% of the population living in urban areas.	Vernacular architecture.
II. 1939-1945	Forced migration towards urban areas increased for security reasons associated with World War II. There is a slight increase of population living in urban areas, 21.4%.	Italian style inspired architecture and planning model.
SOCIALIST DEVELOPMENT	Soviet socialist dictatorship.	Soviet-influenced state-planning.
III. 1946-1959	The ongoing increase in urban population achieved its peak in the early 1950s. During this period the national annual growth of urban population was 1.4%.	Soviet planning models and architectural typologies.
IV. 1960-1991	Urbanisation slowed down with annual population growth dropped to ~0.1%.	The introduction of prefabricated building systems.
POST-SOCIALIST DEVELOPMENT	Unregulated illegal construction. From centralized- to free market economy.	Informality.
V. Early post-socialist 1992-2007	Heavy migration towards urban areas with, 65% of the migration moved towards to Tirana. Unregulated urban development, 520,000 illegally constructed dwellings were constructed all over Albania, of which more than 100,000 units were built within the county of Tirana.	Turbo-architecture, Turbo-urbanism, "Self-made" cities.
VI. Post-transition period 2007-present	In 2007, ALUIZNI digitized the built form of Albania on GIS platform, including fine resolution imagery. Consolidation of planning legislation and authorities. General improvement of infrastructure, public realm and facilities.	Semi regulated development.

medieval fragments of many European cities are amongst the oldest of informal settlements in time (Dovey and King, 2011: 12). Dastidar argues that regardless of the level of irregularity in the their structures, the basis of spatial practice in society remains the same and it doesn't differentiate whether it is in formal organized blocks or the informal settlements (Dastidar, 2007: 4). Understanding spatial form and practice is important, in particular when dealing with complex phenomena att multiple scales such as characterise informality. However, what Dastidar suggests is that discourse on urbanism may help in developing new paradigms for dealing with informality (*Ibid*, 2007: 5).

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This paper focuses on post-socialist urban development starting around the last decade of the 20th century. In Albania the process of illegal construction started in early 1992 straight after the collapse of Hoxha's socialist dictatorship (Aliaj et al., 2004, Felstehausen, 1999). Privatization and the occupation of land and buildings opened the city to rapid development, heavy traffic, and booming construction of shops, houses, and squatter settlements (Felstehausen, 1999: iv). The 2001 PHC showed that 65% of the total migrants shifted towards the capital from all around the country (INSTAT, 2001) as a consequence Tirana's metropolitan area almost tripled its population from 225,000 to 600,000 inhabitants (Felstehausen, 1999). All across the country, during the early years of post-socialist urbanisation, there was a marginalization of architects and Town Planning Institutions (Aliaj et al., 2004) leaving the process of planning and design in the 'hands' of the inhabitants. In contrast to other countries in the region, in Albania almost the entire dwelling stock built during these early years of transition was "*self-made*" a term used to describe informality and informal settlements by UNECE (Tsenkova et. al., 2009) in their report on Informal Settlements in Southeast Europe.

Research of post-socialist urban development in Eastern Europe reflects that most post-socialist urban development trends share similarities with western European developments. However, studies so far exclude Albanian and some ex-Yugoslavian cities from this tendency, as their post-socialist urbanization process was different if compared to all the other eastern European models (Hamilton et. al., 2005: 74). Albanian cities faced a quick transition from the socialist to an unregulated "developing countries" city-development model (*Ibid*, 2005: 73). During the post-socialist era there have been limited formal capital investments, especially during the first decade of transition. By contrast, there have been significant investments by the Albanian population in the illegal construction of commercial and residential property (Pojani, 2013, Hamilton et. al, 2005). Albania's development of a free-market economy led to the dissolution of all previous types of public control without the introduction of new types of formal control over the land market, planning and building process. This lack of regulation led to densification concentrated in central areas and sprawl outside the centres.

Methodological Approach

This section outlines two methodological approaches that inform our research into the post-socialist transformation of Tirana. The study of urban form, often referred to as urban morphology, features a number of different perspectives. One method that has attracted increasing interest since the early 1980s (though it has a much longer genealogy) is Conzenian plan analysis (Whitehand, 2007: ii). The methodology for the study area in Tirana is informed by the three morphological levels of Conzenian analyses: the town plan, or ground plan (comprising the site, streets, plots and block plans of the buildings); building fabric (the three dimensional form); land and building utilization (Conzen, 1960,1968, (Whitehand, 2001, 2007). The concept of 'morphogenetic priority' will be explored to provide understanding of lifespan of the elements that form complexes as contributors to the landscape – which are ground plan, land and building utilization, buildings (Whitehand, 2007: 6). Evidence presented in this paper relates to the first of these. During the last years of the twentieth century Conzen's ideas and perspective were taken up widely, possibly due to versatility of how these notions could be applied to both specific and more general case studies. An interesting notion of the Conzenian research is the 'neighbour effect', which explores the spatial relationship between physical changes to dwelling houses at a plot scale (Whitehand, 2001: 107). This notion will be used to rationalize post-socialist development at a fine scale throughout the case study areas.

The second methodology used to inform this research is Space syntax theory. Space syntax (Hillier and Hanson 1984, Hillier et al. 1976) argues that morphological arrangements contain social information. Hillier and Hanson (1984: 55-66) develop this idea using the notion of the 'beady ring', that is a spatio-temporal unfolding of a simple local rule. 'Beady ring' is formed as a result of generative process which bears a number of formal properties. The 'beady ring' concept is applied to help to understand how local, informal

processes encode social rules and to enquire what this might mean for the development of Tirana in different ideological periods. The local rule is consistent with prevailing social and cultural norms and can therefore be regarded as phenotypical and as settlements grow global genotypes emerge (*Ibid*, 1984: 55-66). This research is pitched at understanding the process through which, and the extent to which, the range of phenotypical (local rules) in Tirana emerge as genotypical forms of relation at the, global, urban scale.

Regardless of the significant differences between these two research traditions, the value of promoting a dialogue has been acknowledged by previous studies (Larkham ,2006, Griffiths et al., 2010). This research endorses a combined approach of these two methodologies. On one hand noting the Conzenian concern for the historicity and materiality of urban form, on the other hand space syntax's emphasis on how emergent spatial arrangements are also patterns of social information.

Changes of human circulation, land use and building form can give a more accurate insight of how urban form in regard the block as a structure is altered over time. It is interesting to consider these evolutions at two scales; at individual plot scale; and at block scale. Morphological studies have acknowledged (Maitland, 1984, Siksna, 1997, Hillier, 1999) the importance of the block as a fundamental element of the physical structure of urban areas, in both planned and unplanned settlements (Siksna, 1997). Sikna's approach demonstrates that certain block forms and dimensions perform better than others in terms of adapting to past and present development requirements; his findings suggest that initial block forms and sizes lead to predictable outcomes in successive development (*Ibid*, 1997: 19). For instance, his research claims that in case of incompatibilities between plot size and building form the issue can be resolved either by developing new building forms in response to constraints posed by plots, or by creating plots through subdivision or merging in response to required building form (*Ibid*, 1997: 29), This will be considered in the Albanian context where post-socialist development transformed existing block structures and at the same time led to the creation of new blocks with a wide range of sizes and form. In the context of Tirana, this research takes into consideration the specificities of different cultural, social and economic forms have in common when seen from a spatial point of view. To represent the post-socialist urban evolution in Tirana, figure ground analysis has been integrated to the final analyses in order to graphically testify development patterns -which then are compared to the socialist built form.

Due to its complex nature, sprawl presents a challenge to traditional analytical methods and requires an interdisciplinary approach in terms of methodology in order to derive a coherent description of patterns and trends of urbanization (Besussi et al., 2010: 29). It is important to apprehend cities simultaneously as spatial entities and social dimensions. This paper asks what distinctive morphological patterns of growth characterize post-socialist Tirana and how we can understand these patterns both as a spatial and social phenomena?

Identifying morphological patterns in post-socialist Tirana

An essential element of the morphogenetic approach from its early days was the mapping of the different physical forms within urban areas (Whitehand, 2007). Urban morphologists Birkhamshaw and Whitehand emphasise the fact that the recognition and delimitation of various types of urban form are fundamental in morphological studies (Birkhamshaw and Whitehand, 2012). The evidence presented in this paper seeks to elucidate on the morphological evolution of the post socialist urban forms in Tirana. In this context, raising the question of differences in development patterns between these two periods; in terms of ideology and architectural language in Tirana since 1990. During the initial phase of this process, importance was given to establishing criteria for the selection of the case studies. To achieve this first, the most recent aerial map of Tirana was put in GIS platform superimposed with the geo-referenced built form and road network. All the data was acquired from the institutions that produced these 'official' data as three separate layers. Second, the distinctive patterns were identified and cross checked within the case study areas and across the city in a heuristic process. Third, a series of case

Figure 1. Morphological patterns of post-socialist development in Tirana.
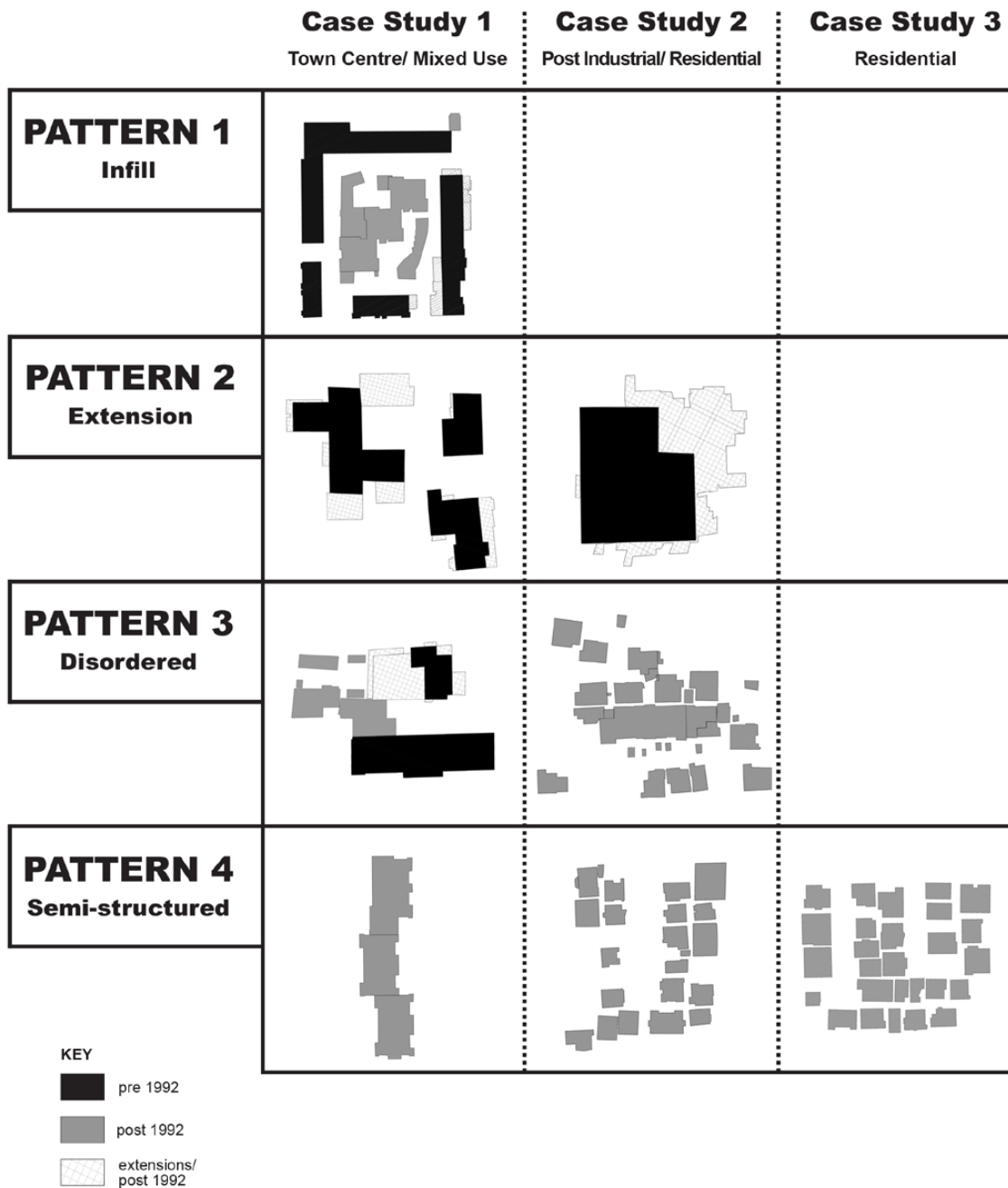
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study areas characterized by illegal post-socialist settlement were identified. After careful analysis and an in depth studying of Tirana's aerial map, a repetitive set of development patterns was evident. Finally, the morphological patterns could be seized down to four distinctive patterns.

Case Studies

The three case study areas have been chosen as a result of their ability to represent the main morphological patterns of development identified in post socialist Tirana as presented in Table 1. The criterion was to choose areas which have different character in regarding morphogenetic descriptions and land use.

Table 2. The four principal morphological patterns of post-socialist urban development in Tirana.

Category	Characteristics	Land Use	Legal Status
Pattern 1 infill.	Mostly present on previous recreational open public spaces. This development pattern is represented both by single family units to multi storey apartment blocks. The main characteristics of this pattern include: occupation of (former) public spaces, steep decline in surface of recreational public open spaces, fragmentation of existing blocks, increasing of through movement, densification of the block, intensification of the active facades.	Mainly residential units, with ground floor allocated to business and services.	The vast majority of the units have been built without official permit from adequate authorities. However, only a small percentage has been built 'legally'- holding a permit- in conform to the law.
Pattern 2 extension to existing buildings.	This pattern is primarily present in areas of apartment block quarters built during the socialist period. The extension occurs when an addition is built on existing (pre 1992) building, usually starting off from ground level up to the last floor. The surface of the extension can vary from 5m2 to +100m2. These extensions where created to serve the original function of the existing building which was mostly residential. However, with time the majority of the ground floor extension has been converted into shops and service units. These extensions were built from the owners themselves rather than just as a result of an illegal construction from an outsider.	The vast majority of the extensions have been built in order to increase the size of residential units. However, in the majority of the cases, especially along streets, the extension on ground floor has been converted to business or services.	Most of the units have been built without official permits from adequate authorities. However, many of these extensions have obtained legal tenure after being built.
Pattern 3 disordered.	This pattern can be found predominantly in brand new neighbourhoods and at a smaller ratio in recent developments among existing built areas. Usually, when Pattern 3 is represented through newly formed neighbourhoods, they are located in parts considered as outskirts or suburban in terms of pre 1992 Tirana. However from a contemporary Tirana's perspective, these areas are very much part of the city's urban area. The common denominator in these cases is disordered development, where chaotic relationship between the buildings among themselves and the building, the plot and the street are prevalent.	Mostly, residential units, excluding only a few cases where the ground floor has been turned into business or service.	The majority of the units have been built without official permits from adequate authorities. However, the owners of these buildings –who do not have legal ownership yet- have applied for legal tenure right and their application is pending to be processed.
Pattern 4 semi structured development.	Semi structured pattern refers to post-socialist development that has a level of structure in the way new units and new unit groups are formed. In this case the new developments	Mostly, residential units, excluding only a few cases where	The majority of the units have been built without official permits from adequate authorities.
	forms semi structured blocks with direct connection to the street. The road network this pattern creates when at block scale shares features of orthogonal grid system, especially when formed on previous empty land.	ground floor has turned into business or service.	However, the owners of these buildings –who do not have legal ownership yet- have applied for legal tenure right and their application is pending to be processed.

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Case study 1 - Figure 2.
    This area can be categorized as heterogeneous. The built form and land uses varies hugely within the blocks. The ground floor of the buildings over time has often lost its residential function in order to gain new functions; mainly shops, cafés and services. Another characteristic of this area is that on a considerable amount of buildings new extension were built, from the ground floor to the top floor, changing not only the buildings footprint but allowing a varying amount of two- and three dimensional changes to happen. For instance, one building that had only one access point or connection with the street now has four or five connections to the street. Additionally, this led to the creation of new alleyways often not longer than 5 to 7 metres to facilitate the new functionality which made the building itself accessible from more than one edge of the facade. These extensions –even though
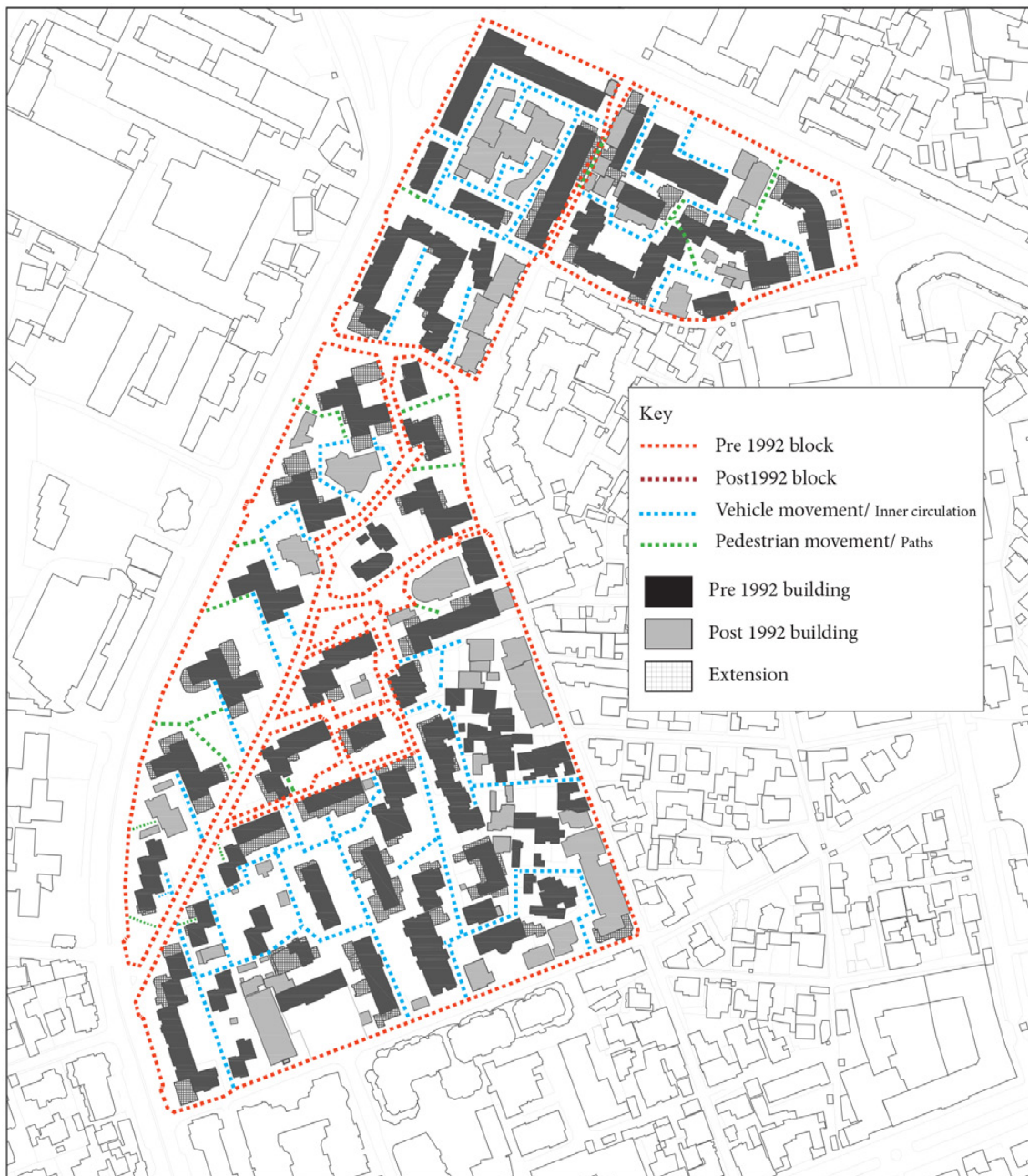

Figure 2. Case study 1.

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only at a minimal ratio- have also been added to the top floors of the pre- 1992 buildings. Another distinct development pattern is that of infill, where vast public spaces where transformed to accommodate single family in dwellings or several families in high rise apartment blocks. All the post-1992 transformations have led to the fragmentation or separation of existing blocks, recreating the way these blocks work, the way they connect to each other and the way they can be accessed and moved through. These patterns of development are significant in shedding light on what this research aims to understand: the morphological evolution of the urban grid with particular interest in the consequences land use change and built form development brings to existing blocks. In this case study from the four identified patterns the most predominant pattern are 'Pattern 1' and 'Pattern 2'.

Case study 2 - Figure 3.

Is one of the largest post-industrial sites in Tirana. Previously, the 'Kombinati' area hosted the biggest textile industry in Albania, providing hundreds of jobs. The area of "Kombinati" was segregated structurally from the rest of the city, and was perceived as an outskirt of Tirana that was disconnected from the city's everyday life. This specific area was previously occupied only by the factory sites and was a pure industrial zone. Nowadays, it accommodates many families who built their dwellings around the industrial complex or even adapted part of the industrial buildings to their living purposes. However, the industrial building stock nowadays mostly serves as warehouses or as service units. The former industrial buildings over time faced several low quality architectural interventions which mostly consisted of extensions to the existing buildings or building of smaller units

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Figure 3. Case study 2.

in close proximity to the original units. Post-socialist transformations contributed towards an amalgamated spatial outcome for the entire site. Possibly, this nature of somewhat chaotic development is mainly attributed to the serious amount of legal issues that are present among the legitimate owners of the area. In this case study from the four identified patterns the most predominant patterns are 'Pattern 2' and 'Pattern 3'.

Case study 3 - Figure 4.
   What is distinctive about this case study area is the fact that the site itself does not have any pre 1992 building stock. The entire area before 1992 was just empty land. It only became part of built areas in the city post 1992, despite the fact that it lies on one of the main arteries that connects Tirana to other cities. In this study area the most prominent land use category is residential, excluding the land strip at the southern edge, where priority is given to commercial activity. The layout of the built form in relation to the road network is somewhat a structured orthogonal grid creating direct connection between the plot (the building) and the street. All these units are detached dwellings that vary from one to three storeys in height. In this case study from the four identified patterns the most predominant pattern is 'Pattern 4'.

Figure 4. Case study 3.

Emergent processes and historically resilient structures

The generative component of space syntax theory shows that as objects are placed in space, a *structure* of some kind emerges in that space (Hillier et al., 2007). Throughout the analyses the diagrams reveal this *structure* does emerge. The new *structure* in this case has caused a deep fragmentation of the original block form. New streets and alley roads have opened up the pre- 1992 blocks in order to integrate the new buildings and facilitate the new land uses –especially in parts that formerly were considered as quiet inner residential areas.

Morphological research sheds light on how changes in form, density and land use of individual buildings contribute to fragmentation or even creation of new blocks. The path dependency and the skeletal structure of the built form in a city is important particularly because this structures' built form and movement routes accommodate the loci of socio-spatial activities (Besussi et al., 2010: 14) According to Batty and Xie, another factor that influences *structure* is the change that occurs in cities as a result of addition of new activities; this due to the change of patterns of development through the process of redistribution (Batty and Xie, 1999). Batty and Xie suggest that the change of location for an activity sets off a chain reaction so that other activities are motivated to move, finally, such activities readjust their locations to the changed circumstances (Batty and Xie, 1999); this could be supported also by this research as most of the case studies unfold this argument where the post-1992 developments have served as generators to the new land uses which subsequently raised new activities. Whole blocks, before 1992 had single land use -that of residential. However, what the surveys have shown is that post-1992 a new pattern on land use change was initiated –especially on the ground floor of the residential units. These changes led to the transformation of these buildings land use, which simultaneously raised the need of these buildings to adapt how they could be accessible from the streets. Multiple entrances were added to buildings which previously had only one access point, enhancing the amount of connections of buildings with streets. In order to facilitate these new entries, new alleyways were added on other facades of the buildings.

Regardless of Tirana's relatively 'young' age, the concept of 'morphogenetic priority' can be applied after analysing the case study areas (Whitehand, 2007: 6). For instance, in Case study 1 the road along the western edge of the study area is part of the ring of Tirana. It is one of the oldest structured roads of the city; its importance to the road network has been relatively resistant to change over time, and it is still recognizable in the landscape today. What the analyses reveal is that historical elements (the ring in our case) constitute a morphological framework that influences the development of the city's formation (Whitehand, 2007: 6); in contrast as the research has suggested land use and building utilization tends to be more temporary (Whitehand, 2007). What is contrasting though with the same theory is that in Tirana's case buildings are not always intermediate in their resistance to change; buildings did change their function briefly after most of them were built -that on the ground level indeed. However, this shift from the perspective of the 'morphogenetic priority' concept can be interpreted not only as a result of transformation in space, the strong political and economic changes within the pre and post dictatorial regime context should be acknowledged. The Conzenian concept of 'neighbour effect' (Whitehand, 2001: 107), seems to be a strong generator of some kind of domino effect- which is present in all three case studies. This study reinforces what previous analyses have shown, that changes are clustered over time and space according to various studies of spatial diffusion (*Ibid*, 2001: 107). In the case of central areas, represented through Case study 1, this effect is distributed almost evenly achieving its peak point along major road connections where it can be hypothesized that one of the major contributors is the perspective of changing original land use from residential to commercial activity. The diagrams show that where these extensions where made, often new movement routes were added which have led to the fragmentation of the block or even to creation of new blocks in more rare cases. In the other two Case studies, the building stock is almost entirely developed post- 1992. Here the domino effect can be observed if considering sprawl- as the way these residential units where developed is somewhat

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of self-regulated or 'self-made'. Extensions where only made to the pre- 1992 built form, which in this case as the diagrams reveal is unique to the industrial site. The analyses suggest that there is a level of interaction between access points and the four patterns of morphological developments. This relationship will be the focus of a subsequent stage of research initiated by this preliminary study.

Persisting land ownership issues, lack of planning and design intervention and continual economical drive have led to ongoing transformation through some main already identified patterns. The purpose of this of this study has been to outline an approach to 'informality' embedded in the ideological context of the pre and post-socialist development of Tirana, The four patterns described in the three case study areas provided a starting point for this enquiry into morphological pathways of social change in Albania.

References

Aliaj, B. (2003) 'A Short History of Housing and Urban Development Models during 1945-1990'. Tirana.

Aliaj, B., K. Lulo and G. Myftiu. (2004) 'Tirana: The challenge of urban development', Sloalba.

ALUIZNI (2015) *online* (http://www.aluizni.gov.al) accessed 26 March 2015.

Batty, M. and Xie, Y. (1999) 'Self-organized criticality and urban development', *Discrete Dynamics in Nature and Society*, 3, 109-124.

Batty, M., Besussi, E., Maat, K. and Harts, J. J. (2004) 'Representing multifunctional cities: density and diversity in space and time', *Built Environment*, 30, 324-337.

Batty, M. and Xie, Y. (1999) 'Self-organized criticality and urban development', *Discerete Dynamics in Nature and Society*, 3, 109-124.

Besussi, E., Chin, N., Batty, M. and Longley, P.. (2010) 'The structure and form of urban settlements', In *Remote Sensing of Urban and Suburban Areas*, 13-31. Springer.

Birkhamshaw, A. J. and J. Whitehand (2012) 'Conzenian urban morphology and the character areas of planners and residents', *Urban Design International*, 17, 4-17.

Conzen, M. R. G. (1960) 'Alnwick, Northumberland: a study in town-plan analyses', *Transactions and Papers (Institute of British Geographers)*, iii-122.

Conzen, M. R. G. (1968) 'The use of town-plans in the study of history', *The study of urban history*, 114-130.

Dastidar, S. (2007) 'Planning Spaces for Informality', *Essay submitted to the Development Planning Unit*, University College London.

Dovey, K. and R. King (2011) 'Forms of informality: morphology and visibility of informal settlements', *Built Environment*, 37, 11-29.

Ewing, R. H. (2008) 'Characteristics, causes, and effects of sprawl: A literature review', In *Urban Ecology*, 519-535. Springer.

Felstehausen, H. (1999) 'Urban growth and land use changes in Tirana, Albania: with cases describing urban land claims', Land Tenure Center, University of Wisconsin-Madison.

Griffiths, S., Jones, C. E., Vaughan, L. and Haklay, M. (2010) 'The persistence of suburban centres in Greater London: combining Conzenian and space syntax approaches', *Urban Morphology*, 14, 85-99.

Hamilton, F. I., Andrews, K. D. and Pichler-Milanovic, N. (2005) *Transformation of cities in Central and Eastern Europe: towards globalization* (Tokyo, United Nations University Press).

Hillier, B. and J. Hanson. (1984) *The social logic of space* (Cambridge university press ,Cambridge).

Hillier, B., Leaman, A., Stansall, P. and Bedford, M. (1976) 'Space syntax', *Environment and Planning B: Planning and Design*, 3, 147-185.

Hillier, B. (1996) *Space is the Machine* (Cambridge).

Hillier, B. (1999) 'Centrality as a process: Accounting for attraction inequalities in deformed grids', *Urban Design International*, 4, 107-127.

Hillier, B., Turner, A., Yang, T., and Park, H. T. (2007) 'Metric and topo-geometric properties of urban street networks', *Proceedings Space Syntax. 6th International Space Syntax Symposium*, Istanbul.

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Hirt, S. A. (2012) *Iron curtains: Gates, suburbs and privatization of space in the post-socialist city* (John Wiley and Sons).

Huchzermeyer, M. and A. Karam (2006) 'The continuing challenge of informal settlements: An introduction'.

INSTAT (2001) *Population and Housing Census of Albania* (INSTAT, Tirana).

Jovanović Weiss, S. (2006) *Almost Architecture* (Stuttgard, Akademie Schloss Solitude).

Larkham, P. J. (2006) 'The study of urban form in Great Britain', *Urban Morphology*, 10, 117.

Longley, P. A., Batty, M. and Shepherd, J. (1991) 'The size, shape and dimension of urban settlements', *Transactions of the institute of British Geographers*, 75-94.

Maitland, B. (1989) 'Australian urbanism: the struggle for urban form', *Transition* (Summer/Autumn), 153-60.

Nase, I. and Ocakçi, M. (2010) 'Urban Pattern Dichotomy in Tirana: Socio-spatial Impact of Liberalism', *European Planning Studies*, 18, 1837-1861.

Neuwirth, R. (2005) *Shadow cities: a billion squatters, a new urban world* (Routledge, New York).

Pojani, D. (2013) 'From Squatter Settlement to Suburb: The transformation of Bathore, Albania', *Housing Studies*, 28(6), 805-821.

Porter, L., M. Lombard, M. Huxley, A. K. Ingin, T. Islam, J. Briggs, D. Rukmana, R. Devlin and V. Watson (2011) 'Informality, the Commons and the Paradoxes for Planning: Concepts and Debates for Informality and Planning Self-Made Cities: Ordinary Informality? The Reordering of a Romany Neighbourhood The Land Formalisation Process and the Peri-Urban Zone of Dar es Salaam, Tanzania Street Vendors and Planning in Indonesian Cities Informal Urbanism in the USA: New Challenges for Theory and Practice Engaging with Citizenship and Urban Struggle Through an Informality Lens', *Planning Theory and Practice*, 12, 115-153.

Roy, A. (2005) 'Urban informality: toward an epistemology of planning', *Journal of the American Planning Association*, 71, 147-158.

Siksna, A. (1997) 'The effects of block size and form in North American and Australian city centres', *Urban Morphology*, 1, 19-33.

Stanilov, K. (2007) *The post-socialist city: urban form and space transformations in Central and Eastern Europe after socialism* (Springer Science and Business Media).

Tsenkova, S., Potsiou, C., and Badyina, A. (2009) *Self-made Cities: In Search of Sustainable Solutions for Informal Settlements in the United Nations Economic Commission for Europe Region* (United Nations Publications).

Whitehand, J. W. (2001) 'British urban morphology: the Conzenion tradition', *Urban Morphology*, 5, 103-109.

Whitehand, J. W. (2007) 'Conzenian urban morphology and urban landscapes', In Proceedings, 6th International Space Syntax Symposium, Ýstanbul.

Chair_Brenda Case Scheer
College of Architecture & Planning, University of Utah, Salt Lake City, USA
Co-Chair_Nicola D'Addabbo
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197,
Rome, Italy

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Sustainable Planning Framework: Case Study New Delhi

Amit Sarma
B.Arch (Delhi), M.Sc Built Environment (London), Sushant School of Art and Architecture, Ansal's University, Sector 55, Gurgaon 122003, India
Keywords: New Delhi, Sustainable Masterplan, Energy Density, Space Syntax, Resource Performance Index

Abstract

This paper proposes an alternative to land-use based city planning. It posits that energy and other resources need to be distributed more equitably and that a Resource Performance Index (RPI) based planning framework provides the necessary parameters for a range of growth patterns. To achieve environmental, social and economic sustainability, planning of cities must be demand based, bottom up and within the city's ability to provide utilities.

Using RPI in terms of units/sqm/year as the primary planning tool, planners can effectively plan energy, water and waste disposal systems to reflect actual and future growth patterns. Individual residents (and localities), freed of land-use and FAR restriction, can develop a range of functions and forms suited to demand at various scales within the applicable resource allowances. Efficient, low resource consuming buildings would be able to achieve proportionately greater built area than energy intensive structures.

Space Syntax literature clearly demonstrates the correlation of the public realm network with movement patterns, and is used to identify least-energy accessible centres at the local, intermediate and global scales. Additional resource allowance is made for these areas.

The outcome of such a framework ensures bottom up development, where each individual (and locality) determines the best use of resources on their site, with environmental benefits such as more efficient buildings, growth within limits and reduced number of journeys; social benefits such as localisation of appropriate functions and integration of private property within the public realm; and economic benefits such as increased FAR for efficient buildings.

The framework is articulated in the case of New Delhi

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Introduction

The Arcadis sustainable cities index   report (Arcadis 2015) states that "today, cities dominate in population numbers (54% of the total), economic output (70-80%), energy consumption (80%) and greenhouse gas production (80%)" (p6). It further declares that in a rapidly urbanizing world, the way in which cities are planned, built, operated and redefined has a huge social, environmental and economic impact. City leaders need to find ways to balance the demands of generating strong financial returns, being an attractive place for people to live and work in, whilst also limiting their damage to the environment (p8).

While the report uniquely presents the current scenario in terms of urban sustainability, it leaves for city government the task of developing effective frameworks to improve their sustainable credentials.

Much literature is available on the definition of sustainability, and particularly in the area of sustainable development. While this paper does not set out current discourse on the subject in detail, it is critical to establish the three basic sets of *services* provided by the natural world:

1. The provision of resources for human activities;
2. The absorption and recycling of wastes caused by those human activities; and
3. The provision of additional ecological *services* (such as climate regulation, pollination and soil fertility) (Porritt 2007)

Porritt (2007) also establishes four key concepts or system conditions that must be collectively met for society to be able to live sustainably within the Earth's supporting biosphere.

The key elements for sustainability can be classified into

1. Minimising material extraction;
2. Minimising the need for absorption and recycling of wastes;
3. Managing and optimizing the use of resources; and
4. Equity in using our resources that the needs of all humanity are met or stand the best chance of being met.

Thus, we can identify the primary goal of a sustainable city as:

A City whose ecological footprint is within the ecological limits of its region and the planet and which promotes equity amongst its citizens.

The primary aim of any sustainable city would thus be to understand the planet-wide and region-wide capacity of the Earth to provide resources and absorb waste; develop means to plan, construct and operate the city within these limits; and provide the distribution systems to ensure equitable access to them. In doing so, a city would also have to engage with the idea of economic growth, providing the framework for business and industry to flourish.

The primary use of resources occurs in the extraction of fossil fuels and minerals used in the process of building construction referred to here as *Embodied Resource*[1], and in the continuous use of fossil fuels to provide electricity and gas used to heat and cool buildings, light the city and provide for the typically extensive public and private transportation systems. Waste, too occurs in the manufacture of building materials, and conversion of fuel into useable energy. These can be termed *Operating Resource*.

Many international and national certifications are available which set out to measure and manage embodied resource during the process of building. LEED, BREEAM and GRIHA (in India) are a few. While variations in focus, weightage and criteria exist between rating systems, the primary aim remains to manage the externalized environmental costs of building and construction (Liu, Nolte and et.al. 2010). These ratings are primarily given during the planning and construction stages, and while the may engage with building life-

[1]Embodied Resource addresses energy, water and waste as a resource considered through the process of extraction, transportations, manufacturing, finishing, assembly, disassembly and reuse as the case may be.

cycle parameters, they generally do not engage (with the exception of GRIHA) in reviewing, rating or verifying actual operating environmental costs over the life of the building.

Thus, conceptually, there is a lacuna in which, though a building may be rated to have used best practices during the process of construction, this does not necessarily entail low operating resource cost through the life of the building. Primarily, this cost includes electricity, gas and water consumption, sewage and waste generation and a degree of air pollution. These, as it happens, are the main utilities which the city provides its citizens. City planning (particularly industrial city planning) is primarily engaged in the distribution of these networks and can thus play a pivotal role in managing the ecological impact of a city.

City planning, historically derived from the reaction against the disorder of the industrial city in the mid-19th century, is focused on the improvement of the built environment based on key spatial factors. These factors include exposure to direct sunlight, movement of vehicular traffic, standardized housing units, and proximity to green space (Hall 2008). While planning has evolved significantly since then, employing better analytical and predictive tools, public participation etc, most plans continue to guide 'the orderly development of settlements and satellite communities which commute in to and out of urban areas or share resources with it. It concerns itself with research and analysis, strategic thinking, architecture, urban design, public consultation, policy recommendations, implementation and management.' (Taylor 2007)

Critically, in modern planning, for example in the Master Plan for Delhi 2021, the primary means by which 'order' is imposed is through:

a. Building Controls, where overall geometry-volume, height, floor area- is clearly de fined; and

b. Zoning, where the use (or group of related uses) are specified for a portion of land and all the buildings within it.

What is key here, is that though sustainability may be part of a plan, the primary means of communicating this idea on the ground—building control and zoning—are not intrinsically engaging with the need to manage embodied resource or operating resource.

Thus, this paper proposes an alternative to zoning and building controls, where resource consumption is at the heart of the planning process.

Sustainable Plan Framework

The first step in preparing a sustainable plan framework is to assess the planet's and region's ability to provide primary resources, absorb waste and provide additional ecological services. For example, an assessment of a nation's ability to generate electricity sustainably could provide a starting point in estimating how much electricity each city may consume to remain within national limits. Further, an assessment of the global/national/regional ability to provide water, absorb various wastes and maintain biodiversity would help set the overarching parameters for city development. Even such a basic step involves major political and lifestyle choices; a structured vision for the planet and nation; and economic decisions with international ramifications.

With these in mind, a sustainable plan would identify the total resource available to the city, and plan suitable ways to distribute this equitably within the city. The plan would also identify resource shortfalls and locate mitigation at neighborhood, district, city, regional and/or national level.

The key to a sustainable plan lies in the idea of equitable distribution of resource. As mentioned earlier, resource consumption can be categorized as *embodied resource* used primarily in the construction of buildings and city infrastructure; and as *operating resource* consumed in operating and maintaining the city. Mechanisms exist, or can be easily modified, to manage embodied resource consumption. It is, therefore, the distribution of operating resource that needs to become the primary mechanism of urban planning.

Operating resource cannot be distributed uniformly across the city. Commercial and high activity *foreground* building uses require substantially larger proportions of resource than lower activity, generally residential *background* functions. Thus, any resource distri-

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Figure 1. a. Map of NCR showing built and unbuilt spaces, superimposed with axial map. Source: Author. b. Axial Map of Delhi NCR showing line segments identified as RPI 0, 1, 2 and 3. Source: Author.
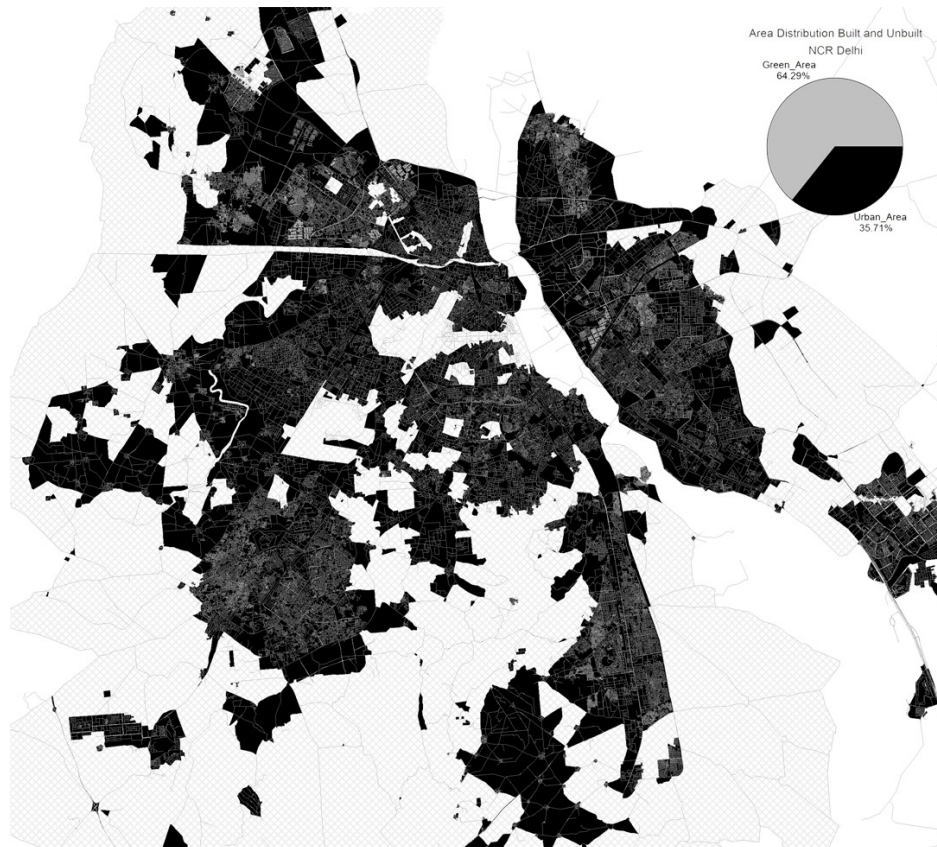
bution plan has to take into account the variety of city functions and distribute resources in varying densities. Thus, like an Energy Performance Index, established by the International Organization for Standards in its ISO:50001 in June 2011 (ISO 2011), this paper proposes an equivalent *Resource Performance Index (RPI)* measured in units per square metre of site area per year for all resources consumed. The RPI would be measured include primary city utilities like electricity and power, water, gas and sewage and can be extended to provision of green spaces, maintaining biodiversity, engagement with public space and provision of street parking, etc.

An RPI for every plot within the city would permit any form of development provided the total resource demand remains within the parameters set by the RPI. Delivery of utilities is typically measured, even in developing countries, and thus the actual consumption of resources like power, water, gas and sewage can be easily measured and monitored. The advantage of such a system is that the emergent building function is a derivative of its actual resource consumption, and not fixed as a result of a zoning plan. Thus, on any given site, the site owner/developer has the flexibility to determine whether the building(s) is most valuable as a shop, office, residence, institute or a combination of them (mixed use). This paper proposes that, resource availability being equal on all similar sites across the city, the emergent mix of actual functions will be more responsive to actual, changing demand. Assuming all plots can be developed as shops, only those which respond to actual demand for specific types of retail will thrive, and other plots will naturally develop in response to demand for other functions. Thus, such a system will not only respond to current demand, but also retain the flexibility to adjust to saturation and changes in demand over time.

Similarly, the volume of the building is also a derivative of its actual resource consumption. With the absence of building controls in the form of Floor Area Ratio (FAR), ground coverage, height restrictions and mandatory setbacks, a variety of building envelopes would also result. Here, a building consuming a higher degree of resource per square meter site area would per force be a smaller building, while one aggressively pursuing passive heating and cooling systems, green technologies, water harvesting, waste management and on-site power generation would be able to achieve much higher built area available for personal use, rent or sale. Thus, energy and resource efficient buildings, would achieve a higher FAR; and self-generated/managed resources like solar panels, wind mills, water recycling and harvesting, sewage and waste management on site would all add to the available resource and result in even greater built area. The corollary of this is that on similar sites there is the potential to achieve vastly different built forms: a two storey lavish single family residence, or multiple storeys of affordable housing. The choice remains the prerogative of the entrepreneurial site owner and would typically be a response to demand at various scales. Such a system would permit a multitude of spatial variations engendered by social, cultural and economic factors, responding to actual demand. However, the impact of such emergent patterns does not affect the primary means of planning. This is to say that though different building functions and forms may emerge, the basic plan determinant—resource delivery—does not require constant adjustment.

The primary driver, then, is the individual, who determines the form and function optimally suited to a particular site. A secondary layer—local bodies, resident's welfare associations or *mohalla sabhas*—would be the prime drivers of neighbourhood development. They would manage neighbourhood level resource, plan neighbourhood level interventions, and provide the necessary oversight of individual plot owners. The tertiary level—the city planner—would provide the necessary enabling framework.

Equitable Resource Distribution

This enabling framework is typically a Land-Use Plan. This identifies a residential background with specific zones identified for commercial, industrial, institutional and other activities. All buildings within these zones must meet the specific functional mix prescribed. Utilities are provided in greater and lesser volumes to these areas to meet their demand.

This paper suggests an alternative way to identify foreground and background networks using space syntax methodologies. Hillier (2009) articulates the need to bring the

'syntactic concepts of structure… to bear explicitly on the problem of sustainability'. He says 'the dual generic form of the city brought to light by syntax, as a foreground network of linked centres at all scales set into a background network of largely residential space, seems already to be created by the interaction of economic and social factors, against a background of the minimisation of the energy required for movement through the creation of what we might call general accessibility, that is the accessibility of all points in the system to and from all others'. The generic form of cities fundamentally comprises of a foreground (highly accessible) network of centres set against a background (less accessible) network at all scales, and such a pattern where centrality is diffused everywhere in the system is found in most cities (Hillier 2009). He posits that these foreground structures form the 'movement economy' (Hiller 1996) and it is the reciprocal forces of space and movement and the multiplier effects on both that arise from patterns of land use and building densities that give cities their characteristic structures.

Thus, imagining the city as a network of local, intermediate and global centres set against a background of mainly residential spaces can provide the theoretical framework to distribute resources in a least cost manner. There are a number of advantages to such a system. Unlike zoning where an entire urban block or precinct is deemed commercial (or high resource consuming), here only those specific parts of the network that meet some minimum criteria of general accessibility are identified for a higher RPI. Secondly, these areas directly respond to the structure of the city as it is, and not as some sort of idealized model or subjective understanding of where the city centre or business district should be. Thirdly, these areas are objectively identified and not subject to political pressure.

Thus, balance is required between the resoures available to the city and their equitable distribution through the city. The first step is to identify the scales or radii at which foreground networks exist; second, to determine the minimum spatial value which would qualify to be part of the foreground network at that scale; and finally to evaluate the proportion of resource to be distributed to the foreground network at each scale.

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This process inherently provides city planners the means and opportunity to empirically evaluate the relationship between space, movement, function, density and multiplier effects independently and fine tune the system to respond to the environmental, social and economic realities of the city and incorporate their vision for the city within the plan.

The Case of Delhi

`In the case of Delhi, an axial map[2] has been prepared reflecting the public space structure in Delhi and its surroundings. This has been converted to a segment map in line with reading distance by the least angle method (Hillier and Iida 2005). Primary metrics include Choice (rN) to reflect the city level foreground network; Choice (r5000m) as an intermediate network; and Choice (r1000m) as a local measure. A 5km radius spatial structure has been identified as most closely related to the high end retail character of the city (Sarma 2007) and therefore Choice r5000m became the preferred option. At the local scale, most retail oriented movement responded to the 1km scale, particularly of the lower income groups within the city (Sarma 2007), and so Choice r1000m has been used. These calculations were undertaken using UCL Depthmap.

The Master Plan for Delhi (DDA 2007) identifies approximately 10% of the city for commercial and industrial use, though rampant commercialization of residential areas is observable. Thus, a more realistic target of around 20% of city area has been assumed for high resource, foreground activity. Further, well established patterns of foreground activity can be observed in the city, and it is important that the spatial foreground networks derived from the segment map be in close alignment with the observed patterns of retail and commercial development.

[2]Axial Map is the network of least number of longest lines that represent the whole system. In the case of Delhi, the Axial map has been prepared from data available on the open street network (https://mapzen.com/metro-extracts/) and modified/updated based on observations and other inputs.

Table 1.

RPI ZONE	SPATIAL MEASURE	QUALIFYING VALUE	NO. OF LINE SEGMENTS	% OF LINE SEGMENTS	% OF LAND AREA
3	Choice radius N	9.69e8	3743	1.27 %	11%
2	Choice radius 5000m / Total Depth radius 5000	50.0	5366	1.82 %	8%
1	Choice radius 1000m / Total Depth radius 5000	3.0	32992	11.2 %	21%
0	All other lines	n/a	252200	85.71 %	60%

Here it is important to note that Delhi seems to form a number of sub-systems best reflected by the 5km structure. Each of these sub-systems displays substantial variations in size, number of line segments and density of line segments and therefore, some form of relativisation is required to effectively compare these sub-systems. A best fit may be empirically arrived at by dividing the Choice value by Total Depth of the network at a 5km radius[3] as shown in the table 1.

Urban blocks have been created by 'subtracting' the axial lines from a background assuming an average road with of 20m. These urban blocks are given an RPI value as the maximum RPI value available on the line segments immediately proximate. Several blocks identified for future development have areas well in excess of 1 million sq m, and all such areas have been subsequently devalued to an RPI of 0. It is envisaged that these areas can be revalued once primary grids are in place.

The derived RPI values of these urban blocks have been represented in a proposed RPI Map (figure 2) graded from dark to light. The highest RPI value of 3 (coloured black) reflects the city level foreground network suitable for city level facilities. Similarly an RPI value of 2 (coloured dark grey) represents the intermediate (sub-city) centres, while RPI of 1 (coloured light grey) corresponds to local neighbourhood centres. All other areas have an RPI of 0 denoting the background (mainly residential) network of the city. Here, approximately 19% of the city forms the high resource consuming foreground network, with the remaining 81% forming the mainly residential background fabric.

This map, though similar in some respects to the land-use map, is based on natural accessibility patterns of the city network, clearly articulates the preferred corridors of commercial development in the city, provides an analytic approach to identifying these corridors and forms the primary tool for planning a sustainable city.

Energy

Delhi consumed around 22833MU (million units) of electricity in 2011-12, of which the share of domestic consumers was 10861MU (Economic Survey of Delhi 2012). The Master Plan of Delhi also identifies the urbanised area of Delhi to be 70162 Hectares as of 1999, of which approximately 30% was circulation and Green Areas (DDA 2007). Thus, approximately 46.5 kWh of Electricity are consumed per sq.m of site area annually.

At the same time, the Global Buildings Performance Network (GBPN 2014) identifies Delhi as a Composite climate and suggests that on average, surveyed residential buildings consume in the range of 57 kWh/sqm/yr. Herein lies the inherent contradiction: a typical residential plot with four floors over half the site (an FAR of 2) would require 2x57= 114 kWh/sqm/yr while average supply remains at 46.5 kWh/sqm/yr. This implies that to

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[3]Total Depth (r5000m) of a line segment reflects the sum total of (angle change) distance for all journeys from that line segment to all other line segments within a 5km radius.

Figure 2. Proposed RPI master plan for NCR. Source: Author.

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fully develop the city to middle income standards under business as usual conditions would require 2.5 times more electricity. As it is, there exists the equivalent of the trickle-up effect in economics: the large bulk of the energy of the city is consumed by the few, with around half of residences in Delhi of non-institutional stock (squatter settlements, slums, urban villages etc) (DDA 2007) consuming only a tiny portion of the energy available.

How then to equitably distribute energy? The GBPN (2014) suggests that in the case of Delhi an aggressive (ECBC+) approach to energy reduction in line with the Energy Conservation Building Code could bring demand down to the range of 28 kWh/sqm/yr. Of this 8 units is used by air-conditioning and 20 units by all other appliances including lighting and fans. As discussed earlier, under business as usual (BAU) conditions we could expect a residential plot to consume an EnPI (Energy Performance Index) of 114 units. In a best practice scenario the EnPI could be reduced to (2x28 =) 56. A further decision to consider air-conditioning as non-essential could reduce the EnPI to 40.

Distributing an EnPI of 40 to all of its Energy Zone 0 areas would be within the capacity of the city. This would have a number of ramifications: Efficient (non air conditioned) buildings would achieve existing FAR; use of renewables like wind and solar energy would allow for a greater FAR or limited air conditioning; high energy intensive residences would per force be smaller; non-institutional (very low energy consuming) building stock (for which demand is approximately 90%) would have the opportunity to redevelop and upgrade; and finally, such a system would encourage a culture of resource consciousness.

Subsequently, higher EnPI values would be distributed to Resource Zones 1, 2 and 3.

Should greater population densities be required in the future, the EnPI could be raised

Figure 3. a. Electricity Consumption in Delhi. Source: DERC Website, quoted in Economic Survey of Delhi 2012, chapter 11; b. EnPI (kWh/sqm/yr) for all climate and building types. Source: GBPN 2014

Mode	Modal Split (%)		
	2001 (Actual)	2011	2021
Public Transport (including Rail/ Light Rail /MRTS/IRBT/Bus/ Tram)	64.1	70.25	80.00
Personal modes (including Personal Fast Modes/ Hired Fast Modes/ Hires Slow Modes/Bicycle)	35.9	29.75	20.00

S. No.	Mode	Daily Trips- 2021 (Intra City)	Modal Share (%)	Daily Trips- 2007	Modal share (%)
1.	Car	2983510	17.1	1806380	15.5
2.	Two Wheeler	3490954	20.0	2976832	25.5
3.	Auto	549351	3.2	518329	4.4
4.	Public Transport	10409024	59.7	6369088	54.6
	Total	17432839	100	11670629	100

Table 2. Resource Performance Index Chart (Sample). Source:Author.

Resource Zone	Area %	Area (Million sqm)	Energy (EnPI)	Water L/sqm/yr	Sewage/ Waste kL/sqm/yr	Green%	Public Interface	On Street Parking
Zone 0	60%	726.4	40			25	Low height boundary walls permitted (say)	On road
Zone 1	21%	264.8	45			25	Active Façade, no boundary walls (say)	On road
Zone 2	8%	92.3	100			35	Active Façade, no boundary walls (say)	1 layer
Zone 3	11%	139.0	200			50	Active Façade, no boundary walls (say)	2 layers
Total Demand	100	1219.7	78002 MU					
Total Available	100							
Balance Required	0							

Table 3. NCR ENERGY BALANCE CHART (SAMPLE). Source:Author.

Energy Zone	% Area	EnPI	Total
Energy Zone 0	60%	40	29056 MU
Energy Zone 1	21%	45 (say)	11916 MU
Energy Zone 2	8%	100 (say)	9230 MU
Energy Zone 3	11%	200 (say)	27800 MU
Total	100%		78002 MU

along with suitable macro level provisions (like power generation, water supply etc); or, should new technologies develop, the EnPI could be lowered or raised as required.

In a similar manner, Performance Indices for all other resources could be developed in accordance with existing practices, best practices and desired outcomes.

Figure 4. Modal Split Delhi. Source a. MPD 2021 and b. RITES 2010.

Sale of Energy (MU)	2007-08	2008-09	2009-10	2010-11	2011-12 (E)
Domestic	7128	7747	9058	9860	10861
Non Domestic	4430	4958	5164	5262	5921
Industrial	2831	2857	2964	3055	3218
DMRC/ Railways/Street Lighting	522	576	624	812	982
Others	1074	1085	1301	1723	1853
Grand Total	15984	17222	19112	20714	22833
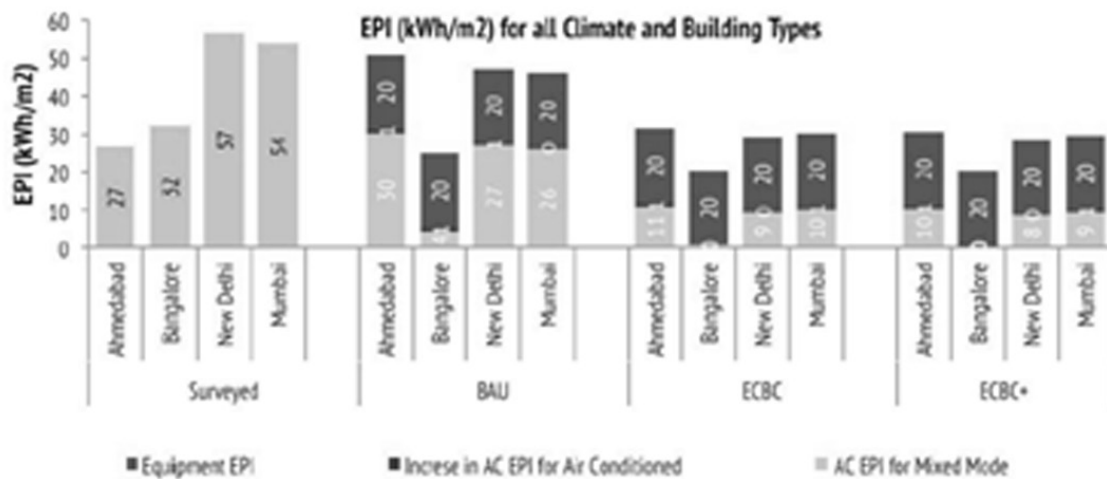
Outcomes

The outcome of such a system affects the environment, society and the economy.

Planning accommodates the idea that resources are finite, and city planning needs to engage with planetary, national and regional limits;

The primary means of development control are access to resources measured as a Resource Performance Index (resources available per square metre site area annually). This gives complete control of resource consumption of a city to the planner;

Planning can take into account local climatic conditions, socially acceptable comfort conditions, dependence on resource consuming appliances to establish suitable RPI;

The distribution of resources over the city is not uniform, but equitable. This gives opportunities to determine high resource consuming (foreground) areas of the city and low resource consuming (background) areas at all scales, and provide resource densities accordingly;

Individuals and local area bodies are given flexibility in determining function and form to best utilize the available resources according to demand at various scales;

Local development issues are addressed at the local level, while developments of city-wide importance can be considered by city planners;

Pressure to maximize built area in response to demand would result in pressure to construct low resource consuming structures and low resource consuming social behaviors;

Competition for resources would ensure only the most efficient and appropriate functions and forms would accrue where they are most needed;

Such appropriate functions and forms would maximize economic benefit to the owners/operators and maximize social benefits to the community considering that such activities will accrue where they are most needed;

Planning is flexible, where a single genotype-RPI can result in a wide variety of phenotypes;

city as organism | new visions for urban life

Planning is responsive: by increasing or decreasing RPI the city can easily accommodate greater population, cater to newer technologies and respond to changing planetary/regional resource availability.

Considering that city functions are distributed according to demand at various scales, it is most likely that local demands will be met at the most appropriate locations locally and city level demands at suitable locations globally, substantially reducing the need for vehicular and long distance public transport journeys. Particular to the case of Delhi, as of 2011, is that the modal mix indicates only 30% of all journey is by personal vehicles reduced from 36% in 2001 (DDA 2007). RITES differs slightly, identifying the 2011 share as 40% (RITES 2010). However, the reality is that both population and car ownership per person has risen exponentially (Das 2010). This is characterized by high pollution, road congestion and parking shortage (Delhi, Transport 2010). Considering that the primary variable is the total number of journeys, and that more short journeys are undertaken than long ones, it seems reasonable to suggest that in a situation where most origin destination pairs are closely located (due to demand and supply mechanisms) the total number of trips required would substantially reduce.

In conclusion, such a framework ensures flexible, bottom up urban development within the planetary, national and regional limits, where each individual (and locality) determines the best use of resources on their site, with environmental benefits such as more efficient buildings, growth within limits and reduced number of journeys; social benefits such as localisation of appropriate functions and integration of private property with the public realm; and economic benefits such as increased FAR for efficient buildings.

Using New Delhi as a case study, this paper demonstrates that such a framework is possible, and in general can well reflect actual emergent patterns of development.

References

Arcadis (2015) *Sustainable Cities Index* (http://www.sustainablecitiesindex.com/) accessed 25 April 2015.
Das, D. D. (2010) 'Car Ownership Growth in Delhi', *Decision*, Vol 37, No 2.
DDA. (2007) *Master Plan of Delhi 2021*. (New Delhi, Delhi Development Authority).
Delhi, Govt. of. (2010) *Transport. Department of Transport, Govt of Delhi*. (http://www.delhi.gov.in/wps/wcm/connect/6f2ff080486859d58728c7e83e6e4488/Chapter2.pdf?MOD=AJPERES&lmod=-36296642&CACHEID=6f2ff080486859d58728c7e83e6e4488&lmod=288106174&CACHEID=6f2ff080486859d58728c7e83e6e4488) accessed 25 April 2015.
Delhi, Govt. of. (2012) *Economic Survey of Delhi 2012*. (http://www.delhi.gov.in/wps/wcm/connect/doit_planning/Planning/Misc./Economic+Survey+of+Delhi+2012-13) accessed 30 April 2015.
GBPN. (2014) *Residential Buildings in India: Energy Use Projections and Savings Potentials. Ahmedabad*. (http://www.gbpn.org/sites/default/files/08.%20INDIA%20Baseline_TR_low.pdf) accessed 30 April 2015.
Hall, P. (2008) *The Cities of Tomorrow* (Blackwell, Oxford).
Hiller, B. (1996) 'Cities as Movement Economies', *Urban Design International*, 1, 49-60.
Hillier, B. (2009) 'Spatial Sustainabilies in Cities: Organic Patterns and Sustainable Forms', *Proceedings of the 7th Space Syntax Symposium*, (p. Key Note 1), Stockholm.
Hillier, B., & Iida, S. (2005) 'Network and psychological effects in urban movement', *Proceedings of Spatial Information Theory: International Conference, COSIT*, 475-490.
ISO (2011) *ISO International Standard 5001: Energy Management System* (http://www.iso.org/iso/home/standards/management-standards/iso5001.htm) accessed 12 September 2013.
Liu, G., Nolte, I., & et.al. (2010) 'Longlife Comparison of worldwide certification systems for sustainable buildings', *SET 2010 - 9th International Conference on Sustainable Energy Technologies*. Shanghai (http://www.longlife-world.eu/res/dnl/en/TT18.149.pdf) accessed 30 April 2015.
Porritt, J. (2007) *Capitalism as if the world matters* (Earthscan, London).

RITES (2010) *Transport Demand Forecast: Delhi*. RITES.
Sarma, A. (2007) 'Spacial Logic of Shopping: Case Study New Delhi', *Proceedings of the 7th Internation Space Syntax Symposium*, Istanbul.
Taylor, N. (2007) *Urban Planning Theory since 1945* (Sage, London).

Ecological pattern mode of landscape city on the basis of habitat networks

Ying Tan[1], Qingshan Yao[2]
[1]School of Architecture, Southeast University; Key Laboratory of Urban and Architectural Heritage Conservation (Southeast University), Ministry of Education, China; No. 2, Sipailou, Nanjing, China
[2]School of Architecture, Southeast University, No. 2, Sipailou, Nanjing, China
Keywords: habitat network, landscape city, the mode "nucleus - patch - corridor – island" to lay out habitat networks

Abstract

Urban landscape environment, derived from nature with distinctive uniqueness, definitely provides unique background conditions for ecological network of city. Urban ecological network is not stiff demarcated by the administrative boundaries or transportation planning, but planned after finding out the operation laws of urban mountain-river ecological system, with basic researches on ecological continuity.

In the perspective of animal and plant protection, the status quo of existing landscape and habitat network in sample city was firstly analyzed. Following the principles of reducing urban habitat fragmentation, protecting the health of biodiversity and ecosystems, basic features and target strategies of urban morphology in landscape city were proposed, and eventually an ecological pattern mode were established.

Through four perspectives of analysis, specific plans were formulated for the four elements composing habitat network. These four perspectives of analysis respectively were the elements of habitat network, the condition of habitat, the index of habitat network pattern, and the protection of ecological sensitive areas. On that basis, two technical methods, that is, the pattern index and the evaluation of ecological sensitivity were used to explore the pattern of habitat network. In addition, the mode "nucleus - patch - corridor island"(NPCI) was put forward to lay out habitat networks, and plans were made for the four elements, namely core protection areas, habitat patches, corridor structures and springboards. Finally a security pattern was established to protect biology in response to urban landscape, and to achieve integrity and stability of ecological processes.

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Introduction

Urban landscape environment is derived from nature, with distinctive uniqueness which will also inevitably bring the city an unparalleled urban form, definitely providing unique background conditions for ecological network of city. To guarantee the relative integrality of landscape pattern, together with the relative stability of ecosystems, continuous natural space is required both in and outside the city. In the periphery, continuous natural space can delimit boundaries for urban expansion, while inside the city it can form systematic and networking pattern of urban ecological green space. That kind of network is not bluntly demarcated by planning of urban space, administrative boundaries or transportation. Actually, on the basis of researches on the ecological continuity, it needs to find out operation laws governing urban landscape ecosystems, and then to deal with urban ecological construction under the large background. As a special branch of researches on ecological networks, the theory of habitat network plays an important role in reducing the impact of habitat fragmentation. In addition, habitat networks can also protect biological diversity, maintain ecosystem healthy and play many other roles. From habitat and migration corridors construction of a single species (such as birds) to urban landscape planning-based habitat networks, a large number of theoretical studies and planning practices need to be carried out (Binyi Liu, 2010).

Concept interpretation and basic theories
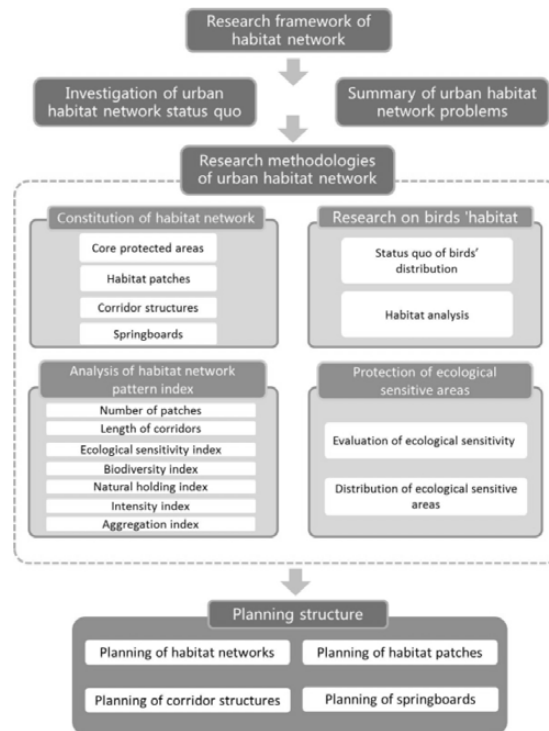
Urban Habitat and Habitat Network
1) Urban habitat
It is Grinnell (1917) from the United States that first put forward the term habitat. Generally it refers to the place or the geographical environment creatures dwelling and living. As for the understanding of habitat in urban areas, there are mainly two kinds of viewpoints in domestic and foreign academia. On the one hand, some scholars pay attention on the habitat itself, focusing on elements of habitat and its structure. They admit the diversity of habitat, and think that all natural and urban spaces are habitats with differences. It is considered that the city is mosaic habitats composed of artificial, natural and semi-natural ones (Xianpu Wang, 2004). On the other hand, some think that natural mountains and water with many other green spaces constitute habitats. As cities are regions with highly artificial interference, it's necessary to complete integral construction of habitat network. Thus, it can protect local species living in natural and semi-natural habitat patches; it can also maintain the structure between habitat patches where species move. Besides, it's useful for the protection of urban ecosystem and biodiversity as well (Kun He, 2012). This paper argues that habitats can be natural space in the study area, or some space that has stable vegetation and is artificially connected in accordance with natural laws. From that perspective, habitats are main places with vegetation, rivers and agricultural lands (including man-made natural landscapes).
2) Habitat Network
Distribution and activities of biological communities are with characteristics of multi-patches and interrelation. So they rely on the connectivity between habitats (Hehl-Lange, 2001). Through ecological corridors, habitat islands can be connected together, especially together with larger natural patches. And then a network of interconnected systems is built, which is a critical landscape pattern to protect habitat patches, confront landscape fragmentation and maintain biological diversity. It's also conducive to keep the migration and proliferation of species safe (Jonathan Humphrey, 2003). As for the phrase Habitat Network, in North America, Greenway Network is more used, while European is more likely to use Ecological Network. Their meanings are quite similar, all deriving from landscape ecology and some other thoughts. Fundamentally they are kind of planning patterns to solve environmental problems from the aspect of spatial structure (Peng Wang, 2007).

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Figure 1. Research framework of habitat network.

Layout of Habitat Network

The layout of Habitat network is not equivalent to the planning of urban green space system, but belongs to the category of ecological landscape security pattern (Table 1). Considered from the target, it should maintain the level of ecological environment in all areas not worse than a predetermined level for reference. Thus it can ensure ecological environment will not be damaged by urban construction.

Approaches of empirical research

According to the characteristics of habitat network, and the practical development of empirical research area, this study starts from four analysis dimensions, and makes specific plans for the four elements composing habitat network. Four analysis dimensions respectively are the elements of habitat network, the condition of habitat, the index of habitat network pattern, and the protection of ecological sensitive areas. This paper examines the construction of habitat network from four aspects above. By investigating the status quo of urban habitat network, and excavating corresponding issues, constituent elements of habitat network and the status of city in and outside are explored more in-depth. On that basis, this paper explores the pattern of habitat network through the analysis of its pattern index and the evaluation of ecological sensitivity. Thus, it can make guidelines for the layout of habitat network with sufficient basis and its four elements, which namely are core protected areas, habitat patches, corridor structures and springboards (Fig. 1).

An research on the Habitat Network of sample city

Taking Bengbu, a landscape city in Anhui province, as an example, this paper explores the combination of habitat network and urban landscape pattern, in order to establish an ecological pattern mode for landscape cities.

Basic features and main problems

Bengbu is located in the Huaihe River Basin, with four distinctive seasons and mild climate. In its municipal area, there are Jing Tushan, Hei Hushan, East and West Lushan, Caoshan, Laoshan, Lao Hushan, Xue Huashan and some other mountains. As to water, there are rivers such as Huaihe River, Tianhe River, Longzi Lake, Zhanggong Lake, Bei Fei-he River, Huai Honghe River, etc. In addition, Sifang Lake Wetland, Sanchahe Wetland, Diaoyutai Lake Wetland and more than 20 parklands at different levels also exists in that city (Bengbu Local Chronicles Compilation Committees, 1995).

1) characteristics of the status patten of urban habitat network

The proportion of core protected areas in Bengbu is broad. Regard the hills in the Southeast and southwest, with the northern and southern woodland or farmland, as well as wetlands in the north as core protected areas. Those areas cover a lot, and surround urban lands. Ecological corridors in Bengbu are main river corridors. There are many types of ecological corridors in the city. But in terms of the number and length, river corridors account for most proportion, of which the most important is the east-west Huaihe river corridor crossing through the city. Corridors else relying on Bali Gou, Xijia Gou and other rivers are all perpendicular to the Huaihe River corridor.

Core protected areas are evenly distributed in the corners of Bengbu, relying on hills, lakes, and wetlands. In the corners of the city, there are core protected areas, such as the Diaoyutai Wetland, Jing Tushan-Hei Hushan-Tianhe River, Longzi Lake-East and West Lushan. Those areas provide a good basis for the establishment of a balanced habitat network (Fig. 2a).

2) Current situation of urban bird habitat

Bengbu is located on the routes from East Asia to Australia of migratory bird, like Oriental white storks, swans and ducks. Many areas are important channels for those birds' migration and places for their foraging and rest, including the basin and key wetlands along the Huaihe River, together with Longzi Lake, Sifang Lake, Qianhe Lake, Tianjing Lake, Tuo Lake, Tianhe River, Nine Bay wetland, Sanchahe Wetland and some other lakes and wetlands.

There are five kinds of first class protected wild animals in Bengbu, namely, cranes, the Great Bustard, the Oriental white stork, black storks, and white imperial eagles. They are concentrating distributed in Tianhe River, Sifang Lake Wetland, Sanchahe Wetland, Diaoyutai Lake Wetland, Huaihe River and other places. The second class protected wild animals existing in Bengbu are mainly seven kinds, most distributed in wetlands and rivers of the city. Other existing wild animals are mainly five kinds, distributed in Tianhe River, Longzi Lake, Sifang Lake Wetland, Sanchahe Wetland, Diaoyutai Lake Wetland, Huaihe River and the woodlands along both sides (Fig. 2b).

Table 2. The pattern index of habitat networks status quo in Bengbu.

Type of index	Number of patches	Length of corridors (km)	Ecological sensitivity index (%)	biodiversity index (%)	Natural holding index (%)	Intensity index (%)	Aggregation index (%)
Pattern index in Bengbu	48	772.3	32.1%	91.4%	33.9%	9.1%	30.2%

3) Problems of existing urban habitat networks

Status problems of habitat networks in Bengbu mainly exist in three aspects:

The distribution of habitat networks is uneven. There are obvious differences among the number of ecological corridors, habitat patches, and springboard on both sides of the Huaihe River. The habitat network on the north side of the city needs improvement.

The links between core protected areas located in the corners of the city are weak. Those areas are relying on hills and mountains, and between them are large tracts of farmland. They lack safe and adequate corridors to link up.

Habitat patches and springboards inside the city are of broken distribution. They are relying on various types of urban green space within the city, but small and fragmented, with partial long distance. It is difficult for them to achieve their function as activity space for birds.

Objectives and strategies of habitat networks

Through the calculation of habitat network pattern index together with the evaluation and judgment of ecological sensitivity, this case study determines specific protected areas of habitat networks in Bengbu, as well as its planning objectives of overall pattern.

By analyzing bird habitats and ecological sensitivity, this paper determines that highly sensitive ecological areas are those with rare plants and animals, or the reserves with rich biodiversity and places with ecological forests. Such areas need strong protection; As to the protected areas with moderate biodiversity and places with economic forests, they are moderately sensitive ecological areas, and can be properly exploited and used; while those habitats of not rare plants and animals, together with the reserves with poor biodiversity and places with other types of forests, are seen as ecological areas of low sensitivity. Construction can be implemented there.

With the calculation of the pattern index of habitat network status quo in Bengbu (Table 2), this paper finds that, its overall landscape complexity of habitat network is high. But the proportion of patches and corridors is close, while there is large difference between corridors and matrix; the patches in core protected areas cover larger space, mostly in the outskirts of the city, with high connectivity; however, patches of habitat patches and springboards are more concentrating distributed inside the city, smaller and more dispersed.

According to the results of the pattern index, through relevant analysis, this paper puts forward some specific planning strategies as the following: (1) to increase the number of patches, and optimize their size and spatial relationships. Inside the city, planning should correspond with urban natural conditions. While increasing the number of green space patches, it still has to protect the ones existing. (2) To dredge corridors so as to enhance spatial continuity and landscape connectivity. Greenbelts planning can use linear green space, such as urban roads and railways, to provide protection paths for the migration of all types of animals. By planning wider terrestrial corridors along mountains, farmlands, shelterbelts and transit roads in the city, integration of urban periphery ecological matrix will be realized. (3) To break through the category of urban planning areas and built-up areas. Consider the construction of biological habitat from the perspective of the environment throughout the city or even the region. Mountains, forests, farmland, water, and other scenic areas in the outskirts, should be included in the scope of habitat network planning. Thereby a urban and rural habitat network system can be constructed covering the entire city (Junyan Yang, 2013).

The mode "nucleus - patch - corridor – island" of Habitat network
In accordance with components of habitat networks, based on its status quo in Bengbu, this paper puts forward the mode "nucleus - patch - corridor - island" to lay out habitat networks. Referring to the overall planning of Bengbu, this pattern mode emphasizes on the connectivity among core protected areas in the north and south. Besides, it suggests increasing habitat patches along rivers and springboards in the outer central city of Bengbu, in order to establish corridors between different components.

1) The pattern of overall planning (Fig. 3a): taking the forests, farmland, rivers, lakes and other natural elements rich in Bengbu as the basis of green space, the planning constitutes a basic landscape skeleton "mountains in the south, bays in the north, hills and rivers in the middle". Ecological forests and economic farmlands are taken as ecological matrix, while urban green space is taken as core patches. In addition, linear or strip lands like rivers and traffic roads are regarded as ecological corridors. It forms a pattern of overall planning "green space in the corners connected into districts, patches gathered along the side of mountains and rivers, five vertical and four horizontal corridors linking up, springboards scattered like stars".

2) Specific planning features: core protected areas are decreasing. Expand urban construction lands around the center of the city in a circle way and reduce internal agricultural and forest lands. On the whole, southeastern and southwestern hilly areas with southern lakes and hills, as well as northern wetlands are still taken as the core protected areas, surrounding lands in the city. Increase ecological corridor types, and construct buffer zones along both sides of roads, rivers and railways. Finally a network structure based on patches, corridors, springboards and core protected areas covers the whole city. After planning, core protected areas in the north and south of Bengbu are connected, patches and springboards are dotted throughout the city while corridors organize whole habitat networks.

Ecological pattern mode of sample city on the basis of habitat networks

In consideration of resource-rich landscape in Bengbu, the planning has generated an ecological landscape pattern with rich landscape habitats.

Planning of core protected areas in urban landscape of Bengbu
Core protected areas existing in Bengbu are with huge resources, composed of natural mountains and water together with the agricultural and forest lands around. Based on the principles of landscape connectivity, the core protected areas after planning constitute two districts extending from the south to the north. They connect the reserves from Jing Tushan - Hei Hushan - Tianhe Reserve to Sifang Lake Wetland, as well as Longzi Lake - East and West Lushan - Miaoshan core protected area to Sancha Lake Wetland. Those protected areas throughout the north and south, form an urban landscape pattern with the feature "green space in the corners connected into districts" (Fig. 3b).

Planning of habitat patches in urban landscape of Bengbu
Habitat patches are places selected by animals and plants, with the most suitable environmental conditions for living. In urban landscape, they mainly are urban parklands and other green spaces with larger areas. The planning of habitat patches should follow "Classification Standards of Urban Green Space", in accordance with its service radius standards of parklands at different levels. Combined with natural conditions inside the city, planning should protect existing green space patches, increase their number and average proportion, and then optimize the spatial layout of green space (Lang Zhang, 2014). Habitat patches existing in Bengbu, mainly consist of parklands with large area, some low hills and roadside green space, such as Zhang Gong Shan Park, Lao Hu Shan Park, Zhui Zi Shan Forestry Park and so on. In order to strengthen the continuity and integrity of green space, and enrich plant community structure, according to "Classification Standards of Urban Green Space" and its service radius standards of parklands at different levels, planning suggests adding another 11 patch-shaped strip green spaces along

Figure 3. a) The planning of habitat networks in Bengbu. b) The planning of core protected areas in Bengbu. c) The planning of habitat patches in Bengbu.

the river. Thus, it forms an urban landscape pattern with the feature "patches gathered along the side of mountains and rivers" (Fig. 3c).
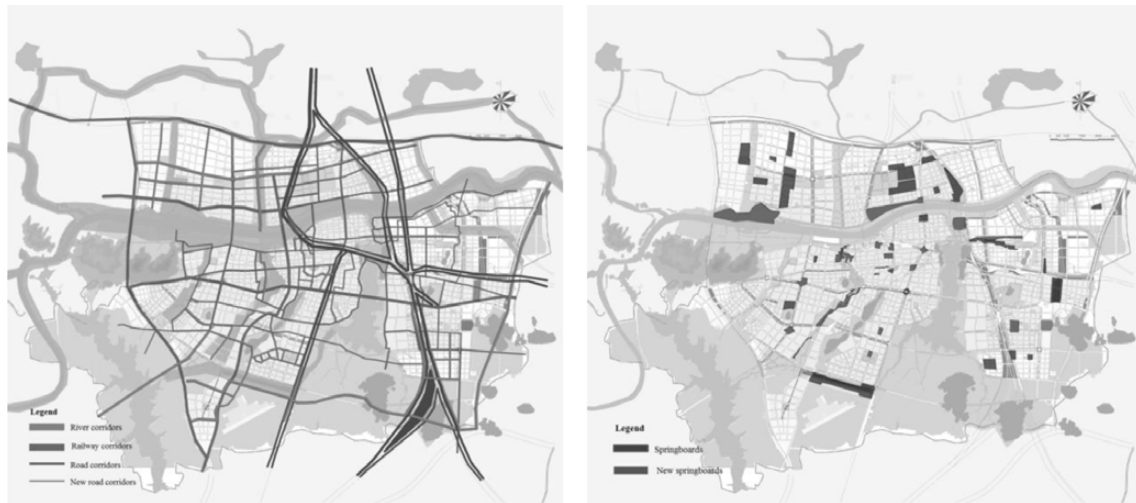
Planning of corridor structures in urban landscape of Bengbu
    The status of corridors in ecological networks is outstanding. They play an important role in the richness, migration and proliferation of biological species. Biological corridors in urban green space system are mainly two kinds: one is the water system biological corridor planning through the rivers and canals inside or outside the city; the other is the land biological corridor. Planning should rely on linear green space like urban roads and railways to plan roadside green belts. Then it can provide protection channels for the migration of various animals in and out of the city. What's more, it also can improve the connectivity of urban green space (Junyan Yang, 2009), conducive to the migration and proliferation of species in habitat networks.
    Corridor structures in Bengbu are mostly linear structures relying on urban roads, railways, rivers and strip green space around, such as the co-Xu Expressway, Donghai Avenue, Jiefang Road, Beijing-Shanghai high-speed railway, Beijing-Shanghai railway and so on; after planning, 25 corridors of varying lengths are increased to connect the springboards with patches and protected areas. In the overall urban landscape pattern, it has the feature "five vertical and four horizontal corridors linking up" (Fig. 4a).

Figure 4. a) The planning of corridor stuctures in Bengbu. b) The planning of springbords in Bengbu.

Planning of springboards in urban landscape of Bengbu

The springboard structure in urban landscape is a type of patches as well. It is a small isolated greening node in the city, and can be used as stepping stone for birds and other animals when they move in habitat patches. They are "springboards" for the communication between species of ecological base and urban ones.

Urban transport and various types of lands separate urban landscape, resulting in landscape fragmentation. Hence, increasing the connection between patches is the key point in designing habitat network. Based on the level of green space landscape connectivity, in the critical points affecting species' circulation, planning should retain these habitats beneficial for their survival and rest. Besides, it should add small patches around large ones, in order to provide transition points between patches and springboards of the network pattern. Then it can increase the connectivity and reachability habitat networks [2]. The springboard structure in Bengbu is composed of neighborhood green space at different levels, such as Zhabei Park, Huaishang Park, Nanshan Children Park, Chu Park, etc.; to balance the number of green space, and reduce the gap between elements, together with make springboards the habitats and migration transfer stations of urban organisms, planning add another 21 springboards. In the overall urban landscape pattern, it forms the feature "springboards scattered like stars" (Fig. 4b).

Conclusions

Habitat network is an important part of urban ecological environment. It is the core to maintain urban ecological functions, and can provide continuous, stable living space for creatures. It is indeed the ecological foundation to achieve sustainable development in modern landscape cities. Based on theoretical studies, and from the perspective of biological conservation, this paper starts from the analysis of the status of existing landscape and habitat networks in sample cities. Then it explores how to construct habitat networks in urban scale, in order to build a more systematic and perfect ecological pattern of landscape cities.

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Table 1. An analysis of the variance between Habitat Network and Urban Green Space System.

Name	Habitat network	Green space system
Connotation	A natural diverse efficient and dynamic green landscape system with certain self-sustaining capacity	An urban spatial system with better environmental afforestation and the function of ecological balance, can play an positive role in urban ecology, landscape and residents' leisure life
Components	Core protected areas, Habitat patches, Corridor structures and Springboards	Various types of urban green space
Function	Ecological role	To improve the environment, play an ecological role, provide recreation, beautification, security, promote economic development , etc.
Contents of planning	Planning of core protected areas, habitat patches, corridor structures and springboards	Planning of the structure, classification, layout, index system, planting, landscape of green space and its recent construction
Scope of planning	Because of the continuity of biological activities, planning covers but not limited to the scope of urban planning area.	The area is what designated in urban overall urban planning, including urban areas, suburban areas and places needing planning control in urban administrative areas due to urban construction and development.
Methods of planning	Through green patches, corridors, greenways, as well as wedge-shaped green space, a lot of elements are brought into green space ecological network, including urban parks, roadside green space, nature reservs, agricultural land, rivers along with waterfront green belts, mountains, etc.	Investigating current status of regional ecological environment and green space, understanding the structure of local afforestation and space arrangement, with the relationship between green space and water systems, analyzing the evolutionary trends of green space system, as well as its status of use and relevant problems, then carrying out urban green space system planning.

References

Bengbu Local Chronicles Compilation Committees, (1995) *Chronicles of Bengbu* (Chronicles Press, Beijing).
Binyi Liu, Peng Wang, (2010) 'Development of green ecological network planning and Chinese frontier researches', *Chinese Landscape Architecture* 03, 1-5.
Hehl-Lange, Sigrid, (2001) 'Structural elements of the visual landscape and their ecological functions', *Landscape and Urban Planning* 54, 105-113.
Jonathan Humphrey, Adrian Newton, (2003) *The restoration of woodland landscapes* (The Forestry Commission, Edinburgh).
Junyan Yang, Jianguo Wang, (ed.) (2009) 'Landscape control at the level of overall urban design in Wuxi', *City Planning Review* 2, 78-83.
Junyan Yang, Xinyu Hu, (2013) 'Approaches and methods of urban space characteristics planning', *City Planning Review* 6, 68-75.
Kun He, Yang Zhao, (ed.) (2012) 'Urban green space system planning based on the concept of habitat networks – a case study in the downtown of Yuyao in Zhejiang Province', *Chinese Agricultural Science Bulletin* 28(31, 305-310.
Lang Zhang, (2014) 'Features of basic ecological network planning in Shanghai', *Chinese Landscape Architecture* 06, 42-46.
Peng Wang, (2007) 'Urban green space network planning – a case study of Shanghai', unpublished Master thesis, Tongji University, Shanghai.
Xianpu Wang, Wencheng Li, (2004) 'Maintenance and creation of urban habitat', *Modern Urban Research* 11, 46-52.

Mediterranean Cities and Gardens. Structures and Sustainability

Giulia Annalinda Neglia

Dipartimento di Scienze dell'Ingegneria Civile e dell'Architettura, Politecnico di Bari, Via Edoardo Orabona, 4, 70125 Bari, Italy

Keywords: Mediterranean cities, productive gardens, sustainability, inter-scalar consistency

Abstract

In recent years researches on new 'sustainable urban forms' were influenced by theories based on polycentric growth, integration between town and country, enhancement of ecological corridors, and urban agriculture. This displays the necessity to bring back to an inter-scalar vision of the ratio between 'elements', 'structures' and 'systems', which make a territory 'sustainable' - focusing on the design of gardens and orchards, intended as 'linking structures' between architectural, urban, water and territorial systems – as well as to develop design theories for urban agriculture, intended as one of the inter-scalar components of the landscape, new centralities for peripheral areas.

In a time when agriculture and gardens are having a new significant role in defining urban and territorial sustainability, a clear Mediterranean individuality hasn't been found yet. This entails the consequence that urban and territorial plans for Mediterranean cities are poorly integrated with the real environmental vocation of sites and, consequently, improper to their specific historical, cultural, and hence territorial individuality.

This paper aims to demonstrate, through the reading of sustainable Mediterranean urban landscape structures, the possibility of re-propose high degree self-sustainability 'urban systems', appropriate, in their architectural form, to regional characteristics. Case studies will be taken into account, in order to highlight their inter-scalar consistency with territorial organism and architectural elements.

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Introduction

While in the recent years researches on new sustainable urban forms were influenced by theories based on polycentric growth, integration between town and country, enhancement of ecological corridors between natural areas, rural and urban gardens, nevertheless to date a clear Mediterranean individuality hasn't been found. This entails the consequence that urban and landscape design is poorly integrated with the real characteristics of sites and, consequently, improper to the specific historical, cultural, and hence environmental individuality.

It becomes therefore necessary that new design models for the Mediterranean urban and landscape regeneration shall be grounded in the individual features of a site (Giannini, 1980). In other words, we have to 'rethink' the sustainable form of the Mediterranean city in the light of the peculiar characteristics that have historically characterized its structure. In these cities, indeed, the relationship between architecture, neighborhood and city has always been mediated by the presence of 'production areas', in the form of courtyard gardens or areas pertaining to row houses; gardens at the core of the neighborhoods; or agricultural fabrics planned within the urban development logics. The sustainability of these cities has been historically determined by formal and structural relationships between buildings and productive gardens at these three different scales. It follows, that Mediterranean urban design has always been grounded on an innate 'systemic vocation' with buildings, city and gardens. Consequently, it seems necessary to 're-root' contemporary design process of new settlement principles for Mediterranean cities into this relationship between garden and urban and territorial structure, in order to safeguard and redefine local identity.

In a time when global strategies for urban development are aimed at orienting towards the redevelopment of a sustainable and inclusive city growth (melting the physical structure of the built environment with gardens and orchards), to lay the groundwork for 'individual development projects' for the Mediterranean cities means to identify in the 'productive gardens' new urban cores, real 'nodal areas' for the urban landscape reorganization, which could be at the same time production and leisure places. Indeed, if we think organically and in inter-scalar sense to the city form, then it becomes clear that 'urban landscape' is not an abstract, perceptual super-scalar unit, but it rather represents the connecting link between different urban scales and architectural forms. It is therefore the nexus on which we have to work for 'urban sustainable regeneration processes'.

In a time when we need to theorize new urban models for Mediterranean cities, the analysis of traditional typologies, aggregates and urban structures, displays the necessity to bring back to an inter-scalar vision of the ratio between 'elements', 'structures' and 'systems' (Caniggia, 2001), which made 'sustainable' territories along the region.

In particular, in this approach, we shall focus on the design of gardens and orchards, intended as 'linking structures' between architectural, urban, water and territorial systems – as well as on the development of design theories for urban agriculture, not just intended as one of the inter-scalar components of the urban landscape, but also as new cores for central and peripheral areas.

This paper aims to demonstrate, through the examples of some Mediterranean urban gardens, the possibility of re-propose high degree self-sustainability 'urban systems', suitable, in their architectural form, to regional characteristics. Case studies will be taken into account, in order to highlight their inter-scalar consistency with urban organism and architectural elements.

Theoretical Framework

During the last decades the term 'urban sustainability' has been largely used and interpreted. Despite the increased popularity of the word, the possibility that 'urban landscape sustainability' will be truly reached in the near future continues to be questioned, in light of definition of tools to achieve this purpose.

Nowadays, when the economic crisis urgently poses the question of saving energy resources, sustainability cannot be artificially created or maintained anymore. 'Urban

Figure 1. Garden as a building structure: courtyard house in Aleppo, Syria.
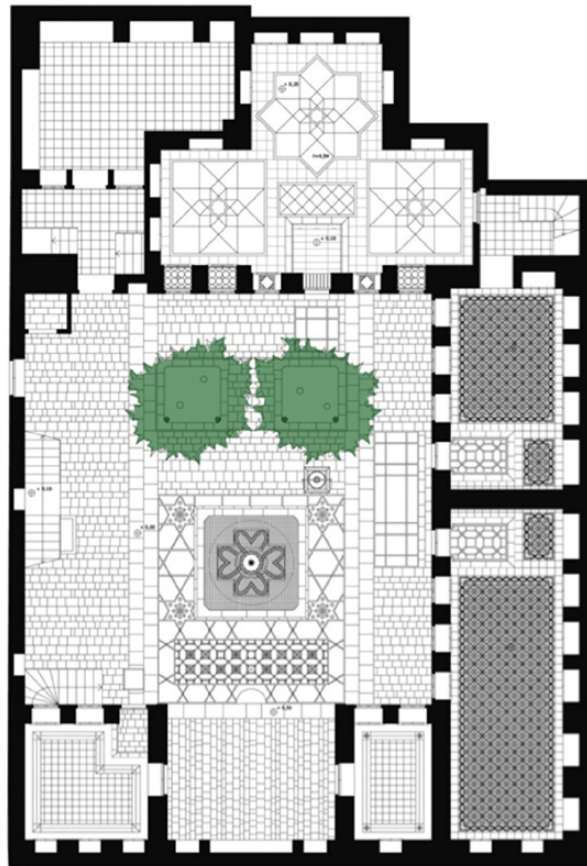
sustainability' cannot be given by building man-made renewability, but it needs to be grounded into inter–scalar relationship between buildings, urban fabrics (given by the relationship between buildings, streets and open areas), cities and the territorial organisms.

In a time when agriculture and gardens are having a new significant role in defining urban and territorial sustainability, a clear Mediterranean individuality hasn't been found yet. This entails the consequence that urban and territorial plans for Mediterranean cities are poorly integrated with the real environmental vocation of sites and, consequently, improper to their specific historical, cultural, and hence territorial individuality.

But what does 'sustainability' really mean?

Into today's architectural practice many smart and green buildings, cities or landscapes are designed on the basis of diverse sustainability ideas. Moving towards sustainability is an ethic challenge that entails also urban design and architecture. But while in general the term 'sustainability' refers to how systems remain diverse and productive, in more specific terms, we can state that sustainability of 'healthy environments' is given by the ratio between 'territorial systems' and 'local processes', necessary to the survival of landscapes and other 'urban organisms'.

So, what really 'sustainability' means?

Is the sustainability a cultural data?

In order to create a truly 'territorial and urban sustainability' we must exclusively rely on technological development, or shall we design landscape structures related to local cultures, which provide maximum flexibility and are conducive to future sustainability endeavors?

And what is 'urban landscape'?

Landscapes, their characteristics and qualities, help define the image of a region.

Figure 2. Garden as a building structure: Patio de los Naranjos in Cordoba Friday - Mosque.

Combining both physical structure and cultural overlay of human presence, often created over millennia, they reflect the living synthesis of people and place, crucial to local and regional identity. In this sense we can assume that an 'anthropic landscape' may be further reviewed as a 'cultural landscape', given by the sum of elements that composed and shaped it.

Urban landscape is the 'palimpsest where are recorded all the physical traces of a civilization'. For the overlay of phases in its formation processes and its cyclical nature it can be defined as 'environment – history'. In other words, the landscape is the 'history's formal structure'. (Muratori, 1967)

It follows that 'landscape sustainable development' must be designed in continuity with its natural and anthropic structures, in other words, its 'cultural identity'.

Knowledge and 'sustainable enhancement of urban landscapes' are therefore interpretive actions at the basis of the analysis, development and maintenance of a specific and unitary context.

This is particularly true for some regions, as in the Mediterranean, where the relationship between 'natural landscape', 'human actions' and 'cultural identity' has always been grounded on a 'patient' remodeling of the environment - to make it livable, and turn it into a rich historical 'cultural landscape'.

This action was only apparently based on local works of urban transformation: a territorial network of a number of architectures, gardens and orchards, water structures, oasis systems, scattered throughout the region, instead constituted it, laying the basis for the Mediterranean pre-modern 'territorial sustainability'.

In the last decades, all over the world as well as in the region, traditional balance between 'natural landscape' and 'human actions' has shifted towards an 'in-patient' use of technology, which brought to new forms of sustainability that - to be maintained - need a considerable amount of energy. Their use, moreover, has profoundly changed the physical structure of places, no longer characterized by 'local identity', but 'globalized'.

Nowadays, when the economic crisis urgently poses the question of saving energy resources, sustainability cannot be artificially created or maintained anymore.

Instead, in a time when agriculture and gardens are having worldwide a new significant role in defining urban and territorial sustainability, this paper aims to demonstrate the possibility of re-propose high degree self-sustainability systems, functioning thanks to wise techniques of local resources control and, above all, appropriate, in their architectural form, to regional characteristics.

Methodology

The present relationship between architecture, city, and territory in the Mediterranean region displays the necessity to bring back to an inter-scalar vision of the ratio between 'elements', 'structures' and 'systems', which make an urban organism 'sustainable'. (Caniggia, 2001)

To this aim we need to analyze case studies that, working in synergy with natural and built environment, form 'sustainable relationships' which are at the basis of the 'urban organism', and compose the complexity of the urban landscape.

In particular, we shall focus on the design of gardens and orchards, intended as linking 'structures' - that is components of the urban organism which are made of elements bound by a relation of dependency and recognizable by a coherent form -, between architectural, urban, water and territorial systems. In other words, the design process should be carried on within the mutual inter-scalar relationship between 'gardens' and:

- 'urban elements', such as buildings or streets, which are the simplest components of the urban organism;
- 'urban structures', such as gardens or neighborhoods (which are both made of architectures, water channels, paths or streets, vegetation, etc.). Structures can be isolated by their specific function in the organism;
- 'urban systems', such as networks of gardens or neighborhoods, which are in turn composed of structures connected by a relationship of necessity and dependency;
- 'urban organism', which is a structure of systems with an autonomous feature.

The analysis of these 'linking structures' (formal and productive gardens set inside the houses, in the aggregates, close to the city or widespread in the region) in relation to the different territorial scales reveals the 'sustainable relationships' which are at the basis of the Mediterranean landscapes 'cultural structure'.

From this analysis it comes out that the relation between tradition and upgrading, preservation and urban renewal, cannot be adequately dealt with unless it is accompanied by an in-depth knowledge of the 'urban organism'. Not just in its historical form or in recent reorganizations and transformations but, moreover, within the diachronically mutual relationship between its parts and scales.

Mediterranean gardens and cities

Mediterranean landscape is characterized by a strong human transformation and by a close relationship between architecture, city and territory: similar architectural structures and forms were equally declined in urban and agricultural fabrics; same sustainable techniques have been applied to cities and landscapes.

According to that, we could probably state that along the Mediterranean basin, where the built environment structure is based on the careful control of natural resources, 'everything is garden': houses, palaces, places of worship, places of production, the city and the territory. Here since ancient times, formal outcomes resulted from 'logical' - later identified as 'sustainable' - techniques, and the gardens aesthetic from agricultural skills.

In this way, in urban and peri-urban areas, the orchards became places of delight and entertainment and, at the same time, centers of work activities. They were provided by the all elements of the formal urban gardens - being surrounded by walls and equipped with pergolas and shaded areas for seating, cisterns, wells and fountains, as well as being geometrically organized by paths. In predominantly agricultural societies, productive

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Figure 3. Garden as a neighborhoods structure: orchards in Hama, Syria.

gardens and orchards were the real centers for the urban and peri-urban activities; this determined their role for a long time, leading to the codification of precise architectural and plant forms at the base of their structure.

Today, when agriculture is recovering its significant role in the definition of the urban form, to lay the foundations for the development of an identity project for the southern Mediterranean cities, means starting from the research of characteristics and architectural forms of these new urban polarities.

It follows that 'productive gardens' can no longer be considered as suburbs or pertinent areas, but they shall be designed in their inter-scalar relationship with architecture, city and landscape, that is as 'elements', 'structures' and 'systems' of the 'urban organism'.

Garden as a building structure

The first scale of relationship that becomes significant to analyze is that between garden and architecture: how garden structure is central for buildings, which are the 'elements' of the urban organism. In the southern Mediterranean that is particularly important because of the extensive presence of courtyard typologies.

This is the case of Aleppo in Syria, where traditional courtyard houses of the historic city center have rooms looking onto and strongly tied to the internal garden, which is 'formal' and 'productive' at the same time. Rooms such as the *iwan* (covered open space used as summer living room from which the courtyard can be enjoyed) are axially oriented towards gardens elements such as tanks or fountains and flower beds containing citrus trees such as orange and lemon, and decorative planting such as climbing jasmine and rose bushes. Along this axis there are also raised platform used as open-air reception and seating areas and venue for evening events such as the playing of music. The *iwan* is usually oriented toward the north, to catch the cool breeze during the summer; this gives an orientation to the garden structure, strongly tied to the *iwan*, as well as to the house structure and, consequently, to the entire urban fabric. (Fig. 1)

This is also the case of Cordoba in Spain, where the Patio de los Naranjos (Orange Tree Courtyard) in Cordoba Friday - Mosque can be considered Europe's oldest 'living' garden, given that it was established at the time of the initial works on the Great Mosque, under Abd al-Rahman I in 784. It is an enclosed 'productive garden' with rows of trees aligned along irrigation channels, and set into a courtyard measuring approximately 50

x 30 meters, divided into three parts, each with a fountain in the middle. It originally contained plants such as pomegranate, cypress and palm trees. Today it has orange trees planted in rows, dating back at least to the end of the 18th century. From the time of the Muslim conquest of Spain to the Reconquista, this 'productive garden' has represented the city main public space. (Fig. 2)

Garden as a neighborhoods structure

Different facets of the relationship between productive garden, building fabric and urban structure give the most distinctive cultural forms of Mediterranean peri-urban gardens. Here the relationship between natural water systems (rivers and seaside), artificial water structures (*qanat*, *norie*, aqueducts), natural ground form transformations for agricultural purposes (terraces, ridges, embankments), and land division or reclamation resulted in typical agricultural, urban and peri-urban landscape forms.

This is the case of Hama in Syria, where the 'cultural urban landscape' along the Orontes River, which runs inside the city limits, derived from a strong relationship between gardens structure, architecture, and nature. This was due to the presence of wide cultivated plots and orchards along the riverbanks, which - during the summertime - were used as real meeting and living places. This system was so widespread to arrange, at the urban level, a kind of 'productive garden system' set between courtyard houses and river. (Fig. 3)

Even if the agricultural plots or orchards along the riverbank don't have a geometrical or axial layout, they are peripheral to the city center, and they seem unrelated to the house structure, nevertheless their presence strongly influenced the Hama's courtyard house structure, which, in Ottoman times, slightly changed its form, modifying its layout from the Syrian introverted courtyard typology to the outward-looking house.

Garden as an urban systems

The Agdal Gardens is a royal country estate located to the south of the medina of Marrakech, Morocco. Its name derives from the Berber language and stands for 'walled meadow'.

The gardens were created as an orchard in the 12th century by Abd al-Mu'min of the Almohad dynasty, later renovated by the Saadi dynasty, and then enlarged during the reign of Moulay Abderrahmane in the 19th century, when they were enclosed with pisè walls. Extending for about 400 hectares of surface, the gardens include groves of orange, lemon, fig, apricot and pomegranate trees in rectangular plots, linked by olive-lined walkways.

A network of underground channels and ditches, known as *khattara*, bring water down from the High Atlas Mountains. The gardens are then irrigated using a number of pools and ditches. Beside the largest pool, the Sahraj el-Hana (Tank of Health), which was used both for irrigation and swimming, stands the Dar El Hana, a small pavilion or *minzah*. (Fig. 4)

The archeological prospection of the Tasltante plain, close to the Agdal (Palazòn, 2013), has allowed defining a model of country state and a settlement pattern, which is also followed by this royal property.

Sustainable forms of the city - garden relationship

Despite the prospective rich and complex inter-scalar relationship between 'productive gardens' and urban elements, structures and systems, as shown in the examples of Aleppo, Cordoba, Hama and Marrakech, present theories and design experiments on 'productive urban gardens' haven't achieved yet significant results on the identity of forms and structures that they might have in Mediterranean cities.

Rethinking to 'appropriate' forms for this environmental resources means, instead, give 'new' sustainable returns (both inside the garden structure, and with respect to the urban and territorial environment) to urban contexts that could represent the arising nodal areas of southern Mediterranean cities. In other words, rethinking at the organic relationship traditionally existing in Mediterranean cities between 'productive gardens' and 'urban - as well as territorial - organism' means to try to find a 'new' way for the sustainable design of their forms.

These preconditions urgently pose the need to agree that 'productive urban gardens' form must be grounded on a close relationship with the natural and built environmental structure, instead of on the idea of urban areas disconnected from the global settlement logics.

In a time when urban design theories are focusing on the need to link (in a necessary way) agricultural and urban activities, it becomes therefore urgent to think at the 'sustainable arrangement' of 'productive gardens', interpreting this relationship as a consistent connection between territorial (and urban) structure and agrarian fabric; with the aim to define 'productive gardens' as new urban centers, core of the productive and associative life.

To this end, it is therefore necessary to develop design methodologies focused on the idea of the 'garden as oasis', that is an anthropic system tied in a 'sustainable' way to its context; in other words, to consider the garden as one of the inter-scalar components of the urban design. Unlike the current meaning of the term, the oasis, in fact, is not isolated from the territorial system; it is instead an environmental niche artificially created in unfriendly environments, using wise control techniques of scarce land resources. Therefore it is the 'sustainable landscape architecture', which determines a virtuous circle within natural and built environment, able to produce self-feeding and self-regeneration processes (Laureano, 2001).

It is therefore necessary to design 'productive gardens' grounding them into their 'oasis' condition, which is ensured both by their link with territorial, water and urban fabric structure - and therefore with a 'homogeneous' and 'sustainable' environment - and by their interior arrangement.

In this way we could really start opening the debate on new possible arrangements for the Mediterranean city, designing new public gardens combining the multifunctional value of public space with the typical features of productive gardens; to this aim we should try to 're-discover' typical garden structures and elements already existing in a region where urban and productive gardens were historically strongly tied.

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Cities to Gardens. Towards a 'new' approach to the Mediterranean urban sustainability

The examples given here refer to three different 'sustainable conditions' of relationship between city and garden.

Indeed, in the 'Mediterranean cultural landscape' the relationship between architecture, city and territory was grounded on the presence of gardens and orchards, which were, at the same time, places of leisure and farming.

The phase of historical, economic and cultural hiatus during which, in the last decades, 'Mediterranean cities cultural landscapes' were transformed into 'globalized landscape', led to a 'removal process' of the awareness of the structural role these gardens had in the historic city.

Today, when the need for a general rethinking of urban form has led to re-evaluate, because of environmental, economic and social needs, agricultural areas in the urban environment, globalizing orchards models coming from the West are often thought or planned as 'vegetable gardens', whose function overrides aesthetics, and seems to exclude the highly symbolic and aestheticized form and role that, instead, the 'garden' has always had along the Mediterranean basin.

The question that arises, then, is whether it is possible to design agricultural areas and peri-urban productive gardens following the example of the Mediterranean gardens model, combining the need for multi-functional significance of public space with typical features of productive garden.

In the search of new urban paradigms, indeed, it is necessary to bring back 'productive gardens' to their own historical role: true urban centers, orchards but, at the same time, leisure places.

If new urban models will be designed according to this close relationship between urban fabric and 'productive gardens', they would define a complex landscape, no longer characterized by the division between urban and agrarian fabrics, but where green infrastructures and urban agriculture could become new polarities for the city life.

Figure 4. Garden as an urban system: The Agdal Gardens in Marrakech, Morocco.

To this end, we have to develop theories for the design of 'productive gardens', no longer intended as systems isolated from the 'urban or territorial organism', but thought as one of the inter-scalar components of the landscape, new centralities for peripheral and core areas.

In this approach, an in-depth knowledge of the 'urban organism', given by the analysis of its formative phases and the mutual relationship between its parts and scales, has to be at the basis of the design process.

References

Assunto, R. (1973) *Il paesaggio e l'estetica* (Giannini, Napoli).

Balletti, A. and Ghersi, A. (2014) *Paesaggio Urbano* (Franco Angeli, Milano).

Caniggia G. and Maffei G. L. (2001) *Architectural composition and building typology: interpreting basic building* (Alinea, Firenze).

Conan, M. (ed.) (2007) *Middle East Garden Tradition: Unity and Diversity- Questions, Methods, and Resources in a Multicultural Perspective* (Dumbarton Oaks, Washington DC).

Costa, P. M. (1983) 'Notes on Traditional Hydraulics and Agriculture in Oman', *World Archaeology*, XIV, 3.

Giannini, A. (1980) *L'individuo territoriale* (Istituto di Progettazione Architettonica, Genova).

Laureano P. (2001) *L'atlante dell'acqua. Conoscenze tradizionali per la lotta alla*

desertificazione (Bollati Boringhieri, Torino).

Lehrman, J. (1980) *Earthly Paradise: Garden and Courtyard in Islam* (University of California Press, Berkeley).

Muratori, S. (1967), *Civiltà e territorio* (Centro Studi di Storia Urbanistica, Roma).

Nordahl, D. (2009) *Public Produce: The New Urban Agriculture* (Washington DC, Island Press).

Palazòn, J. N., Carretero, F. G., Torres Carbonell, J. M. and Triki H. (2013) 'Water, architecture and power in an Islamic capital: the royal country state of the Agdal of Marrakech (12th-20th Centuries)', *Arqueología de la Arquitectura*, 10.

Petruccioli, A. (1988) *Dar-al-Islam, Architetture del territorio nei paesi islamici* (Carucci, Roma).

Petruccioli, A. (2007) *After Amnesia: Learning from the Islamic Mediterranean Fabric* (ICAR, Bari).

Ruggles, D. F. (2008) *Islamic Gardens and Landscapes* (University of Pennsylvania Press, Philadelphia).

Sereni, E. (1961) *Storia del paesaggio agrario italiano* (Laterza, Bari-Roma).

Smit, J., Ratta A. and Nasr J. (2001) *Urban Agriculture: Food, Jobs, and Sustainable Cities* (The Urban Agriculture Network, Inc., New York, NY).

Tosco, C. (2009) *Il paesaggio storico. Le fonti e i metodi di ricerca* (Laterza, Bari-Roma).

Viljoen, A., Bohn K. and Howe, J. (2005) *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities* (Oxford, Architectural Press).

Urban Form as an Open-Ended Sysyem. Merging Maki's Group-Form With The Design Structure Matrix for a New Methodological Approach to Real Estate Planning

Nicola D'Addabbo, Valentino Danilo Matteis
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy
Keywords: design structure matrix, group-form, collective form, urbanism, planning, programming

Abstract

Cities are becoming increasingly complex to grasp and our traditional instruments are lagging behind. By the sixties, critical — but still unsolved — questions were discussed internationally about the relationships between architecture and cities: Maki's approach focused on studying this relationship from the perspective of collections of buildings and quasi-buildings, developed in his famous essay 'Investigations in Collective Forms', as possible solution for contemporary projects within historical context. Nowadays, this organic approach has the potentiality to be applied as universal method, with flexible adaptation for local cases. As Thom Mayne states in his book 'Combinatory Urbanism': «The true territory for innovation in urban architecture is not in the production of platonic solids, but rather in the design of operational strategies that deal with the multiple and overlapping forces of a highly complex and entirely uncertain 'collective form' » (Mayne, 2011). Facing issues related to the scarcity of resources to solve urban crisis, Maki's approach can be merged with technical tools to support the unavoidable economic feasibility of the projects. This paper wants to show how the holistic process of analysis / planning / realization can be reinforced with new evaluation methods through the application of DSM (design structure matrix). The DSM is applied to rationalize the project decisions and the different steps of the building process to obtain time and costs reduction for achieving faster investment returns, supported by specific market analysis. In this way a stronger interaction between different steps of the building process can be granted while the unplanned iterations and their consequent wasting of resources can be reduced.

The first part of the paper emphasizes the strategic role of interdependencies between urban elements for the urban process and how the space-time scenarios shaped the different links. Maki's project represents a multidimensional approach in space and time and indeed an example of how to plan an urban process. Lean on this consideration, the second part of the paper investigates – with a more technical lens – the possibility to deal with a contemporary urban process and presents the DSM as a tool to manage it.

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Part I[1]

Cities as organisms

The city as an organism, ever developing and changing, is a difficult environment. How to approach the issues of a new development? How to insert a new building in a pre-existing, historical tissue? Is there a simple, yet flexible set of rules to follow? Is there a way to interpret the history of the city and its reasons, to deal with its multiple forces? Answering those question would simplify the first phases of a design, and would lead to results better integrated and appropriate to the context. The organic nature of parts of the city forces us to deal with a subtler time concept, that deals with the constant evolution and decay in cities. Maki warns on the mistake of overlooking this aspect:

«If we allow all the old dwellings in a given area to become unsuitable for use at the same time, we are forced to declare extensive blight, clear hundreds of acres, and build new housing. There is, then, no link between such a cleared and renewed area and the city around it. People who, by choice or by force of economic circumstances, move into such developments feel isolation so keenly that they do not regard themselves as anything but 'project' people. There is nothing less productive of cosmopolitan mixture than raw renewal that displaces, destroys, and replaces in such a mechanical way» (Maki, 1964).

Too many times we are faced with designs that only partially solve a problem and are usually confined in the physical space of the construction area. As stated by Caniggia and Maffei in *Composizione Architettonica e Tipologia Edilizia* already in 1975 and true even today, there is a

«Gap between results and intentions that produces highly characterized group of buildings lacking in reciprocal correlation [...] the result is a urban landscape made of single monuments to themselves, it has the uniformity of an indefinite group of objects only superficially different, without (or with a weak) relationship» (Caniggia and Maffei, 1979).

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Instead the very concept of the city as 'an organism' builds on the idea of a *tissue* made of coordinated cells, where everything exists because of something else and its development is the result of a multitude of forces overlapping and relating in time.

An instrument to operate could be the idea of 'group forms' (Maki, 1964). This concept was defined by Fumihiko Maki, in his essay *Investigations in Collective Forms*. He analyzed three main paradigms, two of them already used at the time, compositional form and mega-form, and then introduced a third paradigm: 'group-forms'. The first one, compositional form, is commonly used even today, it is the idea of designing a group of buildings with functional, visual and spatial relationship on a two dimensional plan (ibid.). For example projects like the Chandigarh Capitol Complex designed by Le Corbusier in 1951, where the buildings are carefully arranged in positions, relations and shape, chosen by the architect in that specific moment of the design process. The mega-form was a newly introduced concept in the sixties, used especially by Metabolists (led by Kenzo Tange) in Japan. It consists in a single large frame-structure, where various functions, usually dispersed in the city, are housed. Some examples are the Agricultural City Plan of Kisho Kurokawa, or the Marine City by Kiyonori Kikutake. Other examples that veer more and more towards utopia are the 'Instant City' by Stanley Tigerman, and also in Italy there are several proposals of megastructures like the 'Helicoidal Skyscraper' by Manfredi Nicoletti and Sergio Musmeci and the 'City-Structure' by Aldo Loris Rossi and Donatella Mazzoleni, a massive building for 2.500.000 people, and the 'Vector-Habitat' by Luigi Pellegrin, a linear city floating above plains and passing through mountains.

The group-form instead is a set of «forms which evolves from a system of generative elements in space» (ibid.). In other words, the focus here is more on the relations of those buildings, rather than the building itself. Maki analyzed some examples of group-forms found in traditional Japanese villages, medieval cities in Europe and in Greek islands.

This analysis has much in common with the work of Gianfranco Caniggia and Gian

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[1]Due to the nature of this paper topics in the following section don't pretend to be exhaustive but only necessary for the general comprehension of the argumentation.

Luigi Maffei on the continuity of typological processes. The clear and orderly development of the Japanese village, with its houses faced on the main road with courtyards on the rear, al sequentially placed, is the result of the urban development constantly referring to the typology, or rather, to the *relations* that define that particular resulting typology. Every single house-unit is a 'generator of the village form' (ibid.). In other words, they define a group-form.

Maki says:

«A unit can be added without changing the base structure of the village. The depth and frontage of the unit, or the size of the court and barn may differ from unit to unit. But there prevails an understanding of *basic structural principles* in making the village» (ibid.).

Another example frequently mentioned by Maki is the village of Hydra, in Greece. When recalling his visit to Hydra, he commented:

«it was a dramatic experience to see the entire town made of these solids as 'genetic forms' along the contours of the hills»

and then continues

«the community, the collective form, was composed of quite simple spatial elements such as rooms arranged around a small courtyard, which conveyed an expression of regional culture» (Maki, 1994).

The problem of Linkage in Collective Forms

Maki considers another example, the Dutch housing of the 16th century. The *stoep*, a little porch or a paved area that functions as a 'threshold' for the house itself and it is considered as one of the many 'built-in links' that help in growing a system. The relations between the *stoep* and the canals, paved roadways, windows and rear gardens emerged «through long experience and the wisdom of the people» (Maki, 1964), an idea very similar to the 'spontaneous conscience' (Caniggia and Maffei, 1979) of Caniggia. He defined this attitude as the spontaneous comprehension of what is necessary to define a building in a specific culture. It has always happened in the course of history when people have built houses or other structures without the need of architects: they adhered to a spontaneous set of rules on 'how to build a house', in that specific time and cultural area, a set continuously adapting to technical advancements and cultural setting. Recognizing the nature of this 'background' is an important starting point for the design: those rules suggest a manner of growth, and that, in turn, demands further development of the elements, in a kind of feedback process.

Of course it's impossible to pretend to follow this 'spontaneous conscience' the same way those unnamed builders did. As Caniggia explained, as soon as we recognize the existence of this state we lose it, since those builders weren't aware of this 'spontaneous' way of building, they were just following what seemed appropriate (ibid.). Still, analyzing the evolution of a typology in an urban tissue is a resource for setting the properties of a form meant to be 'linked' with others.

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Figure 2. Three examples of main paradigms, drawn in scale. From left to right: Capitol Complex of Chandigarh by Le Corbusier (compositional form), Agricultural City by Kisho Kurokawa (megastructure), Japanese road village (group form).
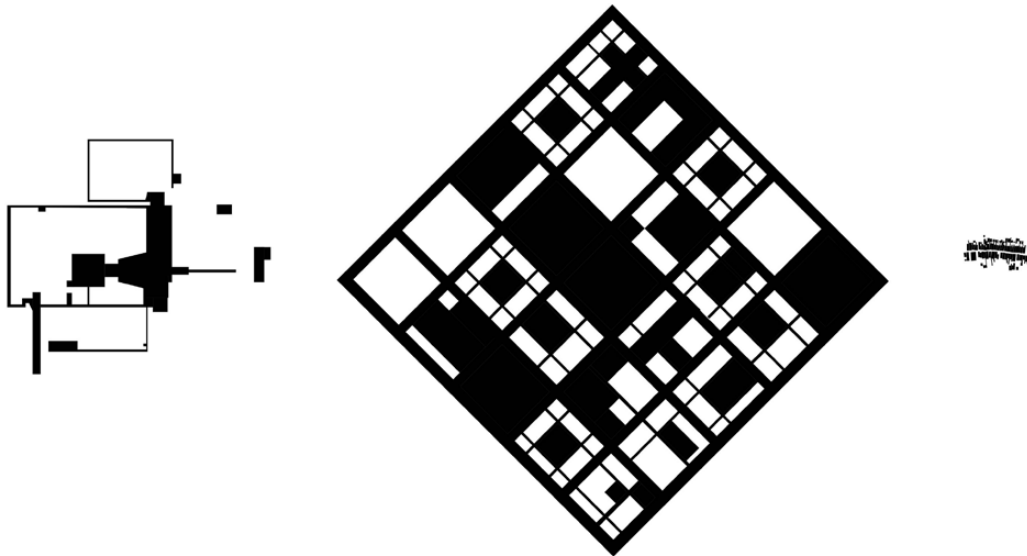
The nature of this 'link' is the focus of a second part of *Investigations in Collective Forms*, aptly titled *Linkage in Collective Form*. A city is a combination of discrete parts, and the nature of the 'linkage' between buildings defines the 'grain' of an urban tissue. In his essay, Maki exemplified all the different ways to connect units of a urban tissue in five basic linking operations: to *mediate*, to *define*, to *repeat*, to *make a sequential path*, and to *select*.

«To *mediate*: to connect with intermediate elements or imply connection by spaces that demonstrate the cohesion of masses around them.

To *define*: to surround a site with a wall or any other physical barrier and thus set it off from its environment.

To *repeat*: to link by introducing one common factor in each of the dispersed parts of a design or existing situation.

To *make a sequential path*: to arrange buildings or parts of multi-use buildings in a sequence of useful activity.

To *select*: to establish unity in advance of the design process by choice of site» (Maki, 1964).

This analysis of linkage can be compared with the research on the aggregation of buildings by Caniggia. He also recognized the existence of a set of spontaneous rules to define the 'aggregation' of buildings, continuously changing and connected with the historical evolution of the typology of the single building. Caniggia further develops this analysis and defined the concept of '*aggregato urbano*' (Caniggia and Maffei, 1979) (urban aggregation) and 'urban tissue' (a spontaneous idea of a group of buildings). This relations-focused approach can be extended to bigger units: from the singular cell of 'the building', to the aggregations of a urban cluster, to a whole portion of a city, to the very form of the city itself.

Maki's group form and linkage are exemplified by the Hillside Terrace project in Japan, a medium-density mixed-use development of apartments, shops, restaurants and cultural facilities, built in several phases spanning over twenty-five years. It is considered by Koolhaas as an example of "slow-growth urbanism" (Koolhaas and Obrist, 2011). The whole project is more than architecture, it is a process of architecture able to accommodate the uncertainty and ambiguity that emerged through the project's long evolution. The general ambiance of the complex maintained its consistency although the complex was phased in over a long period. The inherent order of the elements lies in the relationship between each building and the street, as well as the public spaces defined by the elements themselves.

A (partial) conclusion

To operate in a city and to define a meaningful collective form, knowing and approaching the ideas of 'linkage' and 'group-form' becomes a useful tool for designing and programming. By considering an historical tissue as a collective form, a result of different interrelated forces over time, the setting where to insert a new building can become clearer. By verifying the compatibility of determined functions with the form typology, the possibilities of expansion of the building (also implied when designing a group-form) and the actual conditions of the tissue can be an instrument to better plan how to add functions. It becomes useful to obtain better results also in those urban projects with the aim of reconfiguring parts of cities that lack identity, or even for brand new settlements, especially in developing countries where western type blandness is spreading (the new towns built in Africa by Chinese investors, for example).

Designing with group-forms in mind is an approach that can combine coherently instances of vernacular and traditional architecture, planning and evaluation together, in a different, more flexible, way of designing urban plan: a '*master program*' where time becomes an essential dimension of the process.

Part II

What is a process?

'A process is an organized group of related activities that work together to create a result of value' (Browning and Eppinger, 2002). By applying this definition to the city, real estate development can be considered as one of the main forces that shape urban transformations, 'the process of creating value by making tangible improvements to real property' (Bulloch and Sullivan, 2010).

Nowadays, the economic perspective influences the creation of new elements as well as the renewal of the old ones. For this reason it is possible to declare '*form follows finance*' (Willis, 1995).

This provocative assumption perfectly describes the '*new Industrial Era*' mindset (Parvin, 2013), considering how the urban morphology is dramatically related to private actors. The majority of investors manages urban interventions in a unidirectional way that focuses only on investment maximization. On the other hand, the public sphere is unable to canalize the private resources with urban planning guidelines and it cannot replace their powerful influence, due to the scarcity of resources and the omnidirectional emergencies towards which they should be allocated.

For this reason, urban planning needs to be reconsidered not only as a decisional tool, but also as an open-ended way of processing the city. The contemporary urban complexity requires tools that can deal with different synergic and mutable tasks and the uncertainty of their realization.

The following section of the paper will propose the idea of the *Design Structure Matrix*[2] (DSM), a matrix-based framework for activities management and realization, to evaluate operative strategy in urban processes and better organize tasks, their interactions and the use of resources.

There have been many studies focused on managing the process architecture and it has been confirmed that the best approach to deal with complex processes is to divide them into smaller tasks (Alexander, 1964). In this way, it is easier to analyze every part of the process 'not only by its decomposition into activities but also by how they work together' (Browning and Eppinger, 2002).

'Iteration is a feature of design process that lends itself to modeling' (Smith and Ep-

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[2]This paper refers to all the aspects related to the Design Structure Matrix (DSM), considering the wider literature in which it could be called 'dependency structure matrix, dependency source matrix, dependency map, interaction matrix, incidence matrix, precedence matrix, and others' (Browning, 2001).

pinger, 1997). Therefore, iteration is the repetition of an action due to feedback created from downstream activities. Iterations can be related to several factors but the main one is that an ideal process cannot exist. Iterations can be of 2 types (Pektas and Pultar, 2006):
- *Expected iterations*: considered on purpose to check the validity of the process;
- *Unexpected iterations*: related to unexpected failures of the fixed control criteria or to new factors that arrive later in the process.

How to deal with iterations

'Process improvement includes architecting an efficient and predictable process' (Browning and Eppinger, 2002), this because 'processes are systems and benefit from the application of systems thinking' (ibid.). By expanding this perspective on a whole field of applications it is possible to limit time and costs.

Since the 1960s, processes have always been treated as activity networks (ibid.), activity-on-the-node or activity-on-the-arc, depending on input/output role.

The Project Evaluation and Review Technique (PERT) represents one of the most successful applications of the project management tool. By ordering activities on the timeline flow, they are allocated considering parallel or sequential interaction between them, expected time and resources needed for each activity, and the application of the Critical Path Method (CPM). With this method, we can calculate the longest possible continuous pathway from the beginning to the end of the process, considering all of the activities that need to be developed sequentially.

Focusing on the building process, PERT and CPM can be applied to define the Gannt Chart, optimizing the process flow. However, the main problem for these tools is the lack of consideration for interdependencies between activities, preventing the organization of processes from dealing with rework likelihood.

The General Evaluation and Review Technique (GERT), an evolution of PERT, deals with the operative looping, still presenting limits for larger processes. In fact, it does not preserve a good level of tractability for the whole structure of the process (Smith and Eppinger, 1997a).

Steward (1981), who worked on previous tools for interdependency analysis, developed since the 1960s[3], was the first to define a Design Structure Matrix application for process architecture in productive design, overcoming the limiting factor of one-way progression (Browning, 2001).

DSM explanation

'*The DSM is a network modeling tool used to represent the elements comprising a system and their interactions, thereby highlighting the system's architecture*' (Eppinger and Browning, 2012).

The simplest use of the DSM focuses on a binary DSM. It is a square matrix of *N x N* elements, where rows represent a list of activities (that could be also individuals or components) that are repeated also into columns.

The set of listed elements and the analysis of their interaction is the critical starting point for DSM application because it represents the process decomposition. 'Not all the knowledge is well captured by design documents' (DSMweb, 2015), for this reason the DSM authors need to collaborate with all the actors involved in the process and collect

[3]Considering a wider framework about ordering tools, it is important to highlight some of the most important research that focused on different factors:
- a mathematical solution for physical problem (ref. Sobieszczanski-Sobieski, 1989), optimizing the process with a hierarchal structure, identifying typologies of similar vectors of interdependence between upper and lower levels, to reduce the number of variables;
- a method based on weighted cash flow (ref. Herroelen et al., 1993), considering that all of the process activities can be moved, according with an empiric analysis about the feasibility of the new chronological order. With this assumption, all the activities with a negative cash flow can be allocated at the end of the process and vice versa the ones with a positive cash flow can be allocated at the beginning of the process.

all possible experiences. Once the composition of the matrix is complete, diagonal elements represent labeled activities in the row/column and off-diagonal elements represent the interactions between those labeled elements.

In the majority of applications, the DSM can be read as following (considering counterclockwise direction):
- In the lower triangle, from left to right, there are inputs needed from the analyzed element to be completed. It means that all the signs marked into the row of the analyzed task represent the interactions between itself and the previous elements (corresponding to the elements labeled into the equivalent columns of those signs). In this case, the interactions can be considered as input for the analyzed element.
- In the upper triangle, reading from below to above, there are the outputs created when the analyzed element is completed. It means that all the signs marked into the column of the completed element represent the feedbacks between itself and previous elements (corresponding to the elements labeled into the equivalent rows). In this case, the interactions indicate operative loops because these typologies can change the upstream elements and their related inputs/outputs. The longer effect is caused with feedback, the greater the amount of rework there will be.

Considering the possible interactions between two elements, for example *A* and *B* (considering *A* followed by *B*), they can be:
- Parallel: If B does not need any input from A, both be considered independent and processed in parallel
- Sequential: If B needs input from A, without creating any feedback for A, they can be considered dependent and processed in sequence
- Coupled: If B needs A output to be processed, creating feedback for A, they can be considered interdependent and processed as iteration (or operative loop)

The main goal of the DSM is to minimize these iterations, optimizing the order in which the labeled elements can be listed.

There are several typologies of DSM and according to the literature, they can be divided into two main groups (Browning, 2001):
- Static DSM for:
1) components within product architecture
2) departments/teams/individuals within organization architecture
- Time-based DSM for:
3) (schedule DSM) activity networks within process architecture
4) (low-schedule DSM) relations between design and mathematical guidelines into parameter-based process architecture.

There is also a Multi-Domain Matrix (MDM): it represents an operative evolution, including all the possible coexistences of the different single typologies (Eppinger and Browning, 2012).

This paper focuses on the third type, the process architecture DSM, because it is the one that can better express the relationship between the different actions of the building process and deal with temporal flow, influencing time and costs of the strategies.

How to use a DSM

The first action needed in order to "*re-architect the process*" (Browning, 2001) is *partitioning*: reducing interactions, thus minimizing the upper-triangular marks. 'The goal of partitioning is to re-sequence the design tasks to maximize the availability of information required at each stage of the design process' (Gebala and Eppinger, 1991). Obviously, when the matrix is completely sub-diagonal (without iterations) it can be associated to a PERT graphic (Smith and Eppinger, 1997a).

Even though several methods - and algorithms - have been developed for partitioning and loops identification (Powers of the Adjacency Matrix Method, the Reachability Matrix Method, Triangularization Algorithm, Tarjan's Depth First Search Algorithm), the method of *path searching* is the one that offers the best immediate ordering effect on the matrix (see img. 4).

Once an operative loop is found, its elements are reduced into a coupled block (made

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Figure 3. DSM 7x7 example and possible interactions between elements (adapted from Browning, 2001).
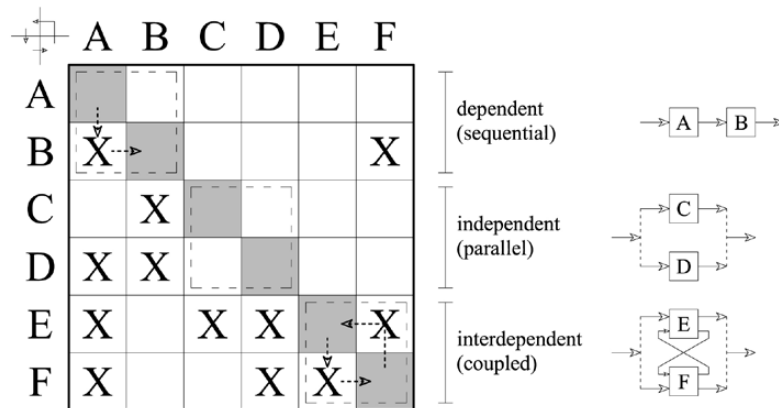
by coupled tasks) and partitioning proceeds. When the partitioning is finished, all the possible signs are under the diagonal except the ones that characterize the coupled blocks, meaning the part of the process that can cause the rework (Gebala and Eppinger, 1991).

Coupled blocks need to be solved or limited in the risk of alteration because 'executing an activity without a required input from downstream requires making an assumption about that input, which increases the risk level for the activity and the process as a whole' (Browning, 2001).

For this reason several methods have been investigated to solve these blocks:
- *Aggregation*: simplifying the list of activities, reducing the level of detail merging some feedbacks
- *Decomposition*: increasing the list of activities and reducing the feedbacks, but at the same time causing a longer time analysis
- *Tearing*: 'choosing certain dependencies about which to make assumptions that would allow the process to proceed. The least-damaging assumptions are made first, and their marks are temporarily removed or "torn" from the DSM' (ibid.).

The DSM has been improved by shifting away from binary method to a numerical one that considers different values instead of the simple marks of interaction. Here it is presented one of the most used numerical application, a four-level range about the quantification of the strength of the dependencies (Eppinger et al., 1994):

High: input is required to begin the task
Medium: input is required to end the task
Low: input is needed only to check result compatibility
Zero: any input is required to process the following task

Nevertheless the possibilities to implement the use of the DSM have been investigated in several forms.

Smith and Eppinger carried out implementations of the DSM, augmenting the numerical information about the iterations. They modeled the DSM proposing analytic solutions with:
- a *sequential iteration model* (Smith and Eppinger, 1997b) based on the assumption of the execution of one task at a time, with deterministic duration, that allows the computation of the total time of the process analyzing the probability that rework occurs.
- a *parallel iteration model* (Smith and Eppinger, 1997a), considering the execution of many tasks together and a deterministic consideration of repetition of activities.

Apart from the investigation of the two extreme configurations, they developed also an application for *hybrid processes* (Smith and Eppinger, 1998), covering the entire range of real cases[4].

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[4] Browning and Eppinger (2002) implemented the research analyzing the effects of varying input of costs and time into the process related to a risk factor.

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Figure 4. Identifying loops by path searching (adapted from Gebala and Eppinger, 1991).
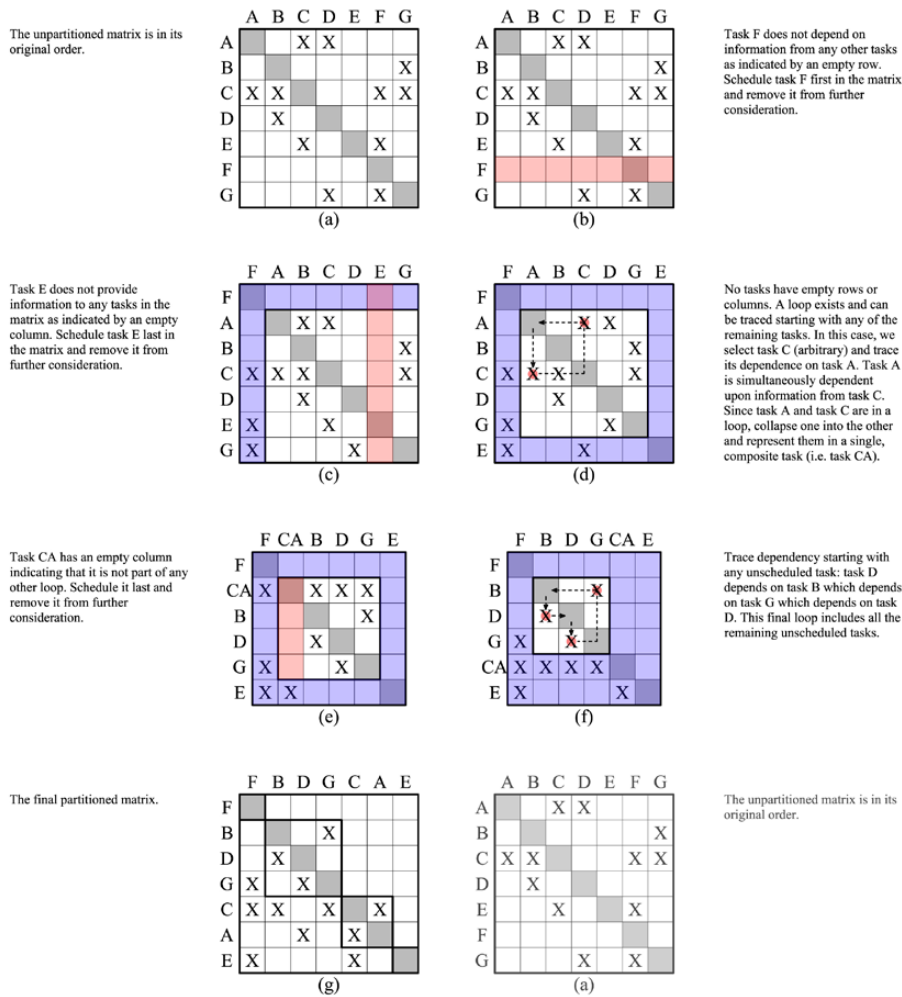
Focusing on urban processes, one of the most important aspects of the aforementioned research is linked to the sequential iteration model. The model takes into account tasks' duration and the repeating probabilities, considering the process flow towards the next task without any operative guideline, depending only from the system configuration of its previous task. Under these conditions, it is possible to adapt the DSM as a *Markov Chain*. This is because the Markov Chain is a system with a limited number of stages in which the probability distribution of the next stage depends only on the configuration of the last stage, without considering previous events. The way to move to the next stage can be randomly chosen. In doing so, a corresponding reward is generated according to the different choices (ref. Norris, 1997). The different rewards, collected after each stage, can be considered as the total expected iteration time. This value can be used as a common basis on which to evaluate the different sequences and choose the preferable ordering (Smith and Eppinger, 1997b).

Furthermore, the adaptability of the DSM to the Markov Chain could also be more effective when it is considered a further connection to the mathematical structure of the *Analytic Network Process* (ref. Saaty, 1996). This decision-making tool is used when there is a functional interdependence between criteria and alternatives in defining a choice. With the support of the Super Decisions Software (http://www.superdecisions.com/), it is possible to process criteria and alternatives considering them as nodes of different clusters. The influences of each node in the other nodes are gathered as elements that constitute a matrix (defined as *supermatrix*). This matrix can be transformed in a stochastic matrix (normalizing columns or rows to 1) to use it in a Markov Chain process. Raising the

matrix to powers, it is possible 'to capture the transmission of influence along all possible paths of the network' (Ishizaki and Nemery, 2013), evaluating direct and indirect influence of an element to another. This similarity between DSM and ANP can offer a further opportunity for urban planning, obtaining time risks and priorities evaluation in the same tool.

DSM applications

Several applications have been developed for the specific field of building process (Austin et al. 2000; Huovila et al. 1997; Bulloch and Sullivan 2009; Eppinger et al. 2013). Bulloch and Sullivan (2009) investigated how to apply the DSM within Real Estate Development (RED). They defined five distinct functional disciplines to organize all the tasks of the process (Market & Competition, Physical & Design, Legal & Political, Financial and Project Management), explaining the project as a spiral-process that passes several times through each discipline improving the definition of the actions.

These functional disciplines represent the different categories of tasks that are analyzed in the building process. This process is divided into 6 general stages (Idea Inception, Feasibility, Pre-construction, Construction, Stabilization, Asset Management) that are equipped with a decision-gate to evaluate if:
- Move forward, expending further resources on the project
- Stop, losing the invested resources
- Go back, reexamining interdependencies between downstream and upstream activities to create a new operative strategy
- Pause, waiting for some precise feedbacks or resources

According to this procedure 'the earlier information is known and shared, the less costly the changes will be' (Bulloch and Sullivan, 2010). For this reason, tasks in the last stages should be only sequential because iterations could cause a huge quantity of rework, meaning a further consumption of time and costs. The DSM application in the first three phases can strongly benefit cumulative investment, mainly reducing the risks before the construction phase.

A more building-design-oriented application of the DSM is presented within the Analytical Design Planning Technique (ADePT) (Austin, 2000). This multi-phase planning methodology is based on the cooperation between the DSM (in this case the tool is defined as Dependency Structure Matrix due to the wider influence) and a modelling technique for design, the Integrated Computer-Aided Manufacturing Definition, version IDEF-0v. The DSM is applied as check-tool for data collected within a dependency table obtained through an IDEF-0v application. The IDEF-0v manages technical input/output of several operative stages, from the general ones to the most detailed. The role of the DSM is to optimize tasks' order and the level of their dependencies.

Conclusions

After several applications of ADePT, a non-specific Design Process Model (DPM) has been proposed (ibid.). This can be obtained by offering a wider range of guidelines for every typology of building process and project categories, continuously increasing the database, and reducing the need of new special project additions.

Taking this research proposal as a basis, the next step of this paper should be the proposal of a further application analyzing Maki's approach.

Hopefully it will be a further step towards the definition of a new multi-dimensional well-being tool for public administration's choices regarding urban needs. An holistic support to manage community emergencies and private interests at the same time, realizing proper urban transformations through a real control of urban processes.

References

Alexander, C. (1964) *Notes on the synthesis of form* (Harvard University Press).
Austin, S. A., Baldwin, A., Li B. and Waskett P. (2000) Application of the analytical design
Browning , T. S. and Eppinger, S. D. (2002) 'Modeling Impacts of Process Architecture on Cost

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and Schedule Risk in Product Development', *IEEE Transaction on engineering management* 49 (4), 428-442.

Browning T. R. (2001) 'Applying the Design Structure Matrix to System Decomposition and Integration Problems: A Review and New Directions', in *IEEE Transaction on Engineering Management* 48(3), 292-306.

Bulloch, B. and Sullivan, J. (2009) 'Application of the Design Structure Matrix (DSM) to the Real Estate Development Process', MSc thesis, Massachusetts Institute of Technology, USA.

Bulloch, B. and Sullivan, J. (2010) 'Information - The key to the real estate development process', *Cornell Real Estate Review* 8, 78-87.

Caniggia, G. and Maffei, G.L. (1979) *Composizione Architettonica e Tipologia Edilizia* (Marsilio Editore).

DSMweb (2015) *A Proposed Approach for Building Credible DSMs* (http://www.dsmweb.org/en/dsm.html) accessed 30 November 2015.

Eppinger, S. D., Whitney, D. E., Smith, R. P. and Gebala, D. A. (1994) 'A model-based method for organizing tasks in product development', *Research in Engineering Design* 6(1), 1-13.

Eppinger, S. E., Bonelli, S. and Gonzalez A. M. (2013) 'Managing Iterations in the Modular Real Estate Development Process', *15th International Dependency and Structure Modelling Conference*, Melbourne, Australia.

Eppinger, S.D. and Browning, T. R. (2012) *Design Structure Matrix Methods and Applications* (MIT Press).

Gebala, D. A. and Eppinger, S. D. (1991) 'Methods for analyzing design procedures', *ASME Conference on Design Theory and Methodology*, Miami, USA.

Herroelen, W. S., Van Dommelen, P. and Demeulemeester, E. L. (1997) 'Project network models with discounted cash flows a guided tour through recent developments', *European Journal of Operational Research* 100(1), 97–121.

Huovila, P., Koskela, L., Lautanala, M., Pietilainen, K. and Tanhuanpaa V. P. (1997) 'Use of the design structure matrix in construction', in Alarcon, L. (ed.) *Lean Construction* (CRC Press) 417-425.

Ishizaka, A. and Nemery, P. (2013) *Multi-criteria Decision Analysis: Methods and Software* (Wiley)

Koolhaas, R. and Obrist, H. U. (2011) *Project Japan, Metabolism Talks* (Taschen)

Maki, F. (1964) *Investigations in Collective Forms* (Washington University Press)

Maki, F. (1994) 'Notes on Collective Form', *Japan Architect* 248.

Maki, F. (2008) *Nurturing Dreams: Collected Essays on Architecture and the City* (MIT Press).

Norris, J. R. (1997) *Markov Chains* (Cambridge University Press).

Parvin, A. (2013) 'Architecture for the people by the people', *TED talk* (https://www.ted.com/talks/alastair_parvin_architecture_for_the_people_by_the_people) accessed 30 November 2015.

Pektas, S. T. and Pultar, M. (2006) 'Modelling detailed information flows in building design with the parameter-based design structure matrix', *Design Studies* 27(1), 99-122.

planning technique to construction project management', *Project Management Journal* 31(2), 48-59.

Saaty, T. (1996) *Decision Making with Dependence and Feedback: The Analytic Network Process* (RWS Publications).

Smith, R. P. and Eppinger, S. D. (1997a) 'Identifying controlling features of Engineering Design Iteration', *Management Science* 43(3), 276-293.

Smith, R. P. and Eppinger, S. D. (1997b) 'A predictive model of sequential iteration in engineering design', *Management Science* 43(8), 1104-1120.

Smith, R. P. and Eppinger, S. D. (1998) 'Deciding between sequential and parallel tasks in engineering design', *Concurrent Engineering: Research and Applications* 6(1), 15-25.

Sobieszczanski-Sobieski, J. (1989) 'Multidisciplinary optimization for engineering systems: Achievements and potential', in *Lecture Notes in Engineering* 47, 42-62.

Steward, D. V. (1981) *Systems analysis and management: structure, strategy and design* (Petrocelli Books).

Willis, C. (1995) *Form Follows Finance, Skyscrapers and Skylines in New York and Chicago* (Princeton Architectural Press).

Chair_Qian Li
School of Architecture and Urban Planning, Nanjing University, Nanjing, China
Co-Chair_Angela Fiorelli
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy

Urban Regeneration
Conflicts and Contested Areas
Informal Settlements
Sustainable Design
Sustainable Design and Technologies

city as organism | new visions for urban life

New Urban Patterns. Adaptations to sun and wind

Bengt Sundborg
Department of Urban Planning and Environment, School of Architecture and the Built
Environment, KTH, Royal Institute of Technology, SE-100 44 Stockholm, Sweden
Keywords: daylight, climate, urban design principles, urban pattern, street grid

Abstract

If we put daylight to good use in town planning, we could reduce the cost of lighting. The geometry of the street grid together with the height of the buildings is important for the amount of daylight. To achieve a good typology, researchers in the urban morphology in Birmingham, have been contacted. An important conclusion is that the typology developed must be adapted to daylighting analysis.

The paper deals with some of the findings of the research, "Energy Saving by Using Daylight in Town Planning" where daylight models are simulated in computer to calculate the savings of energy using one type of settlements instead of another. With the same exploitation coefficient it is possible to save energy through alternative geometrical solutions of the block, the street and the buildings.

Three different patterns for streets are evaluated and discussed in the paper. With straight streets, it is possible to save around 20 % of the electric energy for the exterior lighting compared to the bending streets during twilight. The main goal for the research is practical guidelines for "better" geometry in urban design, considering sun and wind.

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Introduction

If we put daylight to good use in town planning, we could reduce the cost of lighting and save energy. It would also make housing more pleasant and quite possibly more secure. Those other aspects are essential in the practical results but not possible to evaluate within the scope of this project. The project is an ongoing PhD Research by the architect and civil engineeer Bengt Sundborg. His experiences from town planning, summarised in a practical handbook (Sundborg, 2010), can now be developed scientifically. The funder for the research is the Swedish Energy Agency. Among the engaged people and enterprises connected to the project is the lighting division at the consultant company, ÅF, which is responsible for the daylight simulations and calculations in the computer models. The final report is planned to be finished in June 2018.

The geometry of the street grid, comprising of the courtyards and squares together with the height of the buildings, are all important for the amount of available daylight. Fundamental facts from research in daylighting and urban morphology are an important base for the project as the classic BRE report (Littlefair, 1991) and a recently published report from LSE Cities/EIFER (Rode, Keim, Robazza, Viejo and Schofield, 2014) show. An example of evaluating energy savings in town planning is the study of spacing between parallel houses conducted by DTU in Denmark (Strømann-Andersen and Sattrup, 2011) that shows savings up to 30%. To extend the distance between parallel houses naturally increases the amount of daylight but it also adds a higher cost for the land.

This project compares different solutions in the built environment with the same density and the same cost per land unit. If the daylight is accessible for a longer period of time during the day, both indoors and outdoors, the period of need for electric light will decrease. The savings that can be incurred from delaying the time for switching on the electric light in the evenings and for bringing forward the time for switching off the light in the early morning indoors are a direct result from the users individual limits for the acceptable light amount for daylight as their only light source. Outdoors, the savings are dependent on local sensors controlling the street lights instead of one central sensor for the whole city.

This paper deals with some of the early findings of the current doctoral research on "Energy Saving by Using Daylight in Town Planning". In this study, computer simulations are performed in order to calculate the savings of energy using various types of settlement typology. Different patterns for district and blocks are evaluated. Further research will also include results for single buildings and separate building elements so that the different levels of the urban form will be investigated. In order to not be overwhelmed by all the possible solutions, as some of them are very unlikely and odd, I have chosen to evaluate the most interesting solutions regarding daylight and, even fitness, for practical use.

To achieve a good typology for my research in the built settlement, I have been visiting researchers in the urban morphology at Birmingham City University and Birmingham University. An important conclusion is that the typology developed for the different alternatives must be well adapted to its use for daylighting analysis. The main goal for the research is identifying and determining practical guidelines for "better" geometry in urban design, with consideration of the sun and wind.

Methodology

Methodology
To calculate the energy savings, existing ideas were reviewed so that it was possible to make modifications. The research will study solutions in different levels from overall planning to detail (see Figure 1). The methodology for reaching useful results is as follows:

1) The basic research made within the fields daylighting and urban morphology will be studied with a special focus on energy saving by using daylight in town planning.

2) The choice of calculation method and simulation methodology will be used in various ways to present the results. The selection of areas, blocks and buildings will be taken into consideration. Proposed projects and new ideas will be included in the study.

3) The chosen subjects will be described geometrically; different types of blocks, open-

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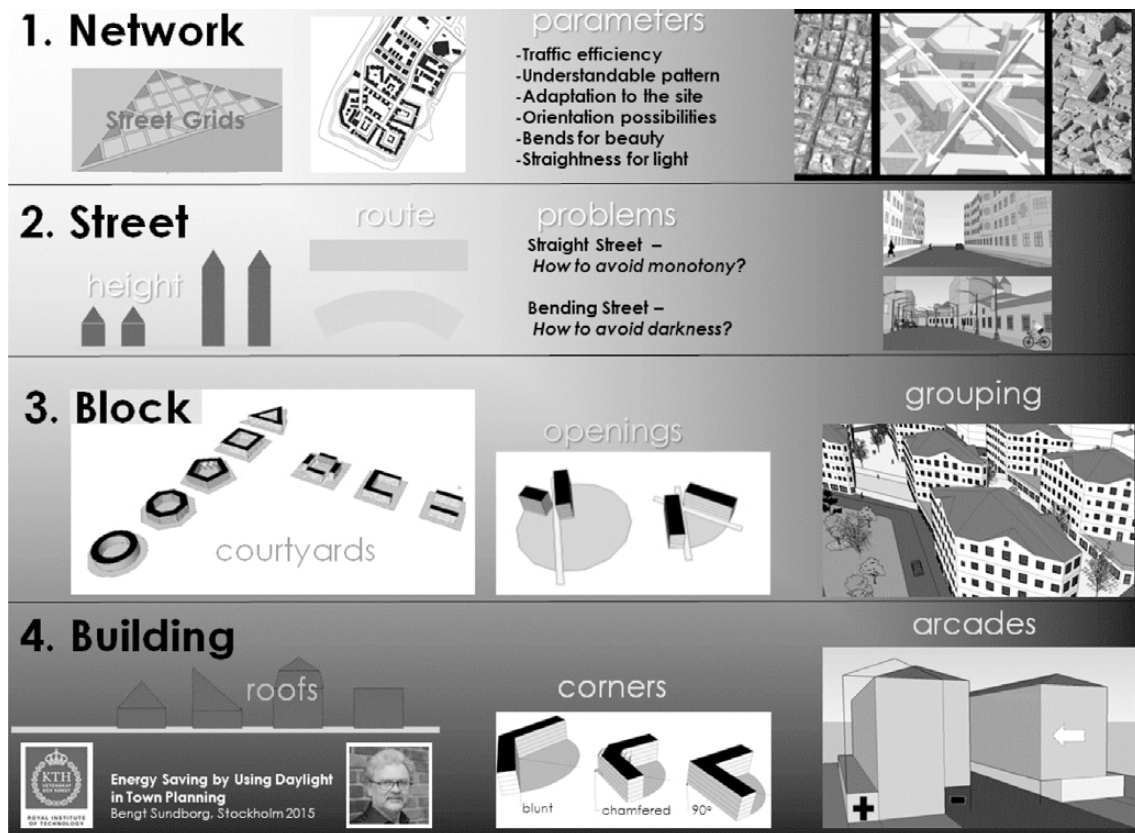
ings between houses, different types of houses, etc.

4) Assumptions on the typical placements for all the windows in the studied buildings will be made.

5) Daylight metrics will be measured, both for outside and inside, by using radiance software. The lighting and heating demands will be calculated in each situation.

6) The results will be processed and compiled in a report.

In this paper, two early and important aspects in the research will be described. Regarding the street grid, some simulations are already finished which compare a straight street with a winding street. A second approach studies the typology of a block in the city with street corners. This will be presented in a daylight perspective. These two important initial approaches will be followed by many others (see figure 1) during the different research phases. The work is planned to be finished in June 2018.

The Street Grid

The amount of daylight depends very much on the type of street grid (see Figure 2). The first grid (left) is a typical rectangular street grid which gives low angled skylight from four different directions. The photo on the right shows an irregular organic street grid with difficulties for direct sunlight and, even for, diffuse skylight to reach the ground within the bending and narrow streets. The picture in the middle shows one idea of a new type of grid with more possibilities for daylight accessability.

There are many possiblilities for different types of street grids. Some of the most typical, and interesting, will be evaluated in the project. The crucial aspect for evaluation is if the streets are bent, straight or a combination of both. The first simulations were, therefore, to evaluate the daylight distribution in a straight street and compare it with the distribution in a bending street (see Figure 3).

Figure 2. The distribution of daylight differs depending on the type of street grid. The second grid (middle) is a proposal which has especially good access to daylight. The third grid is the darkest but also has the largest variety of form of the urban blocks.
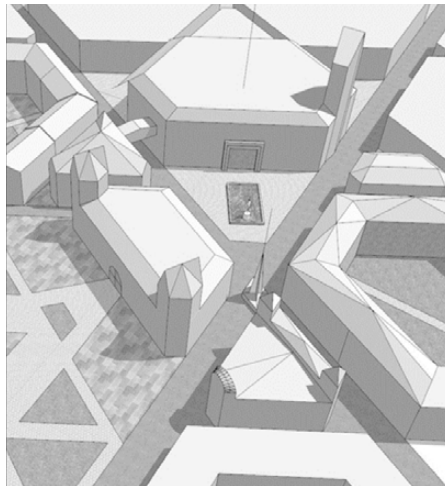
The energy savings for shortening the time for switching on the electric light are reachable during dawn and dusk when daylight is available in small amounts. With straight streets it is possible to save 13% of the electric energy for the exterior lighting compared with the bending streets during twilight.

Figure 3. Alternative A: A right angled street grid with straight streets. Alternative B: An oblique street grid with bending streets organized regularly and repetitively.
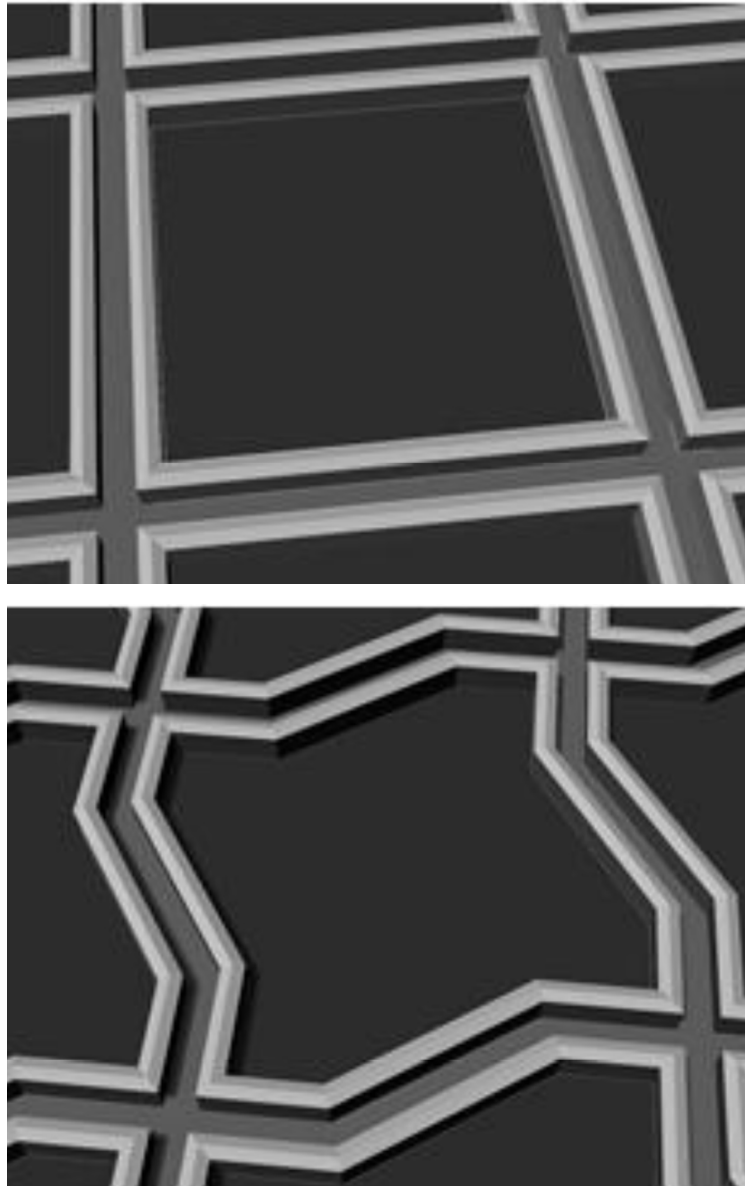
Twilight time is especially long in the northern countries with the peak occurring during the summer. For Helsinki, Oslo and Stockholm, an average day in June has three hours of civil twilight. The result, 13 percent, is relevant for only the straight street typology with specific geometry and adjacent buildings. With more articulated bending, or comparisons between streets with buildings higher than five stories, the savings for a straighter street will be higher than 13%. To summarize, the savings for planning a straight street instead of a bending street is considerable in the long run.

Occasionally, a terrain will have obstructions such as hills and existing buildings. These occurrences will complicate the planning of a straight street. In many cases, it is also aesthetically advantageous to bend the street and, as an added bonus, it can avoid monotony. Bending streets are, therefore, often being built despite the poor daylight distribution. However, it is possible to improve the daylight distribution with geometrical adjustments. Varying the height of the building along the street front and adding openings between the buildings can make for good daylight distribution like in the strategic

Figure 4. On the left: In an acute corner of a courtyard there is lack of privacy and it is dark. In an acute corner of a building it is difficult to furnish internally. On the right: Chamfered corners of a building provide daylight and views. Moving the acute part of the building (see figure 4a) into the courtyard will create such a chamfered building. (© Bengt Sundborg)
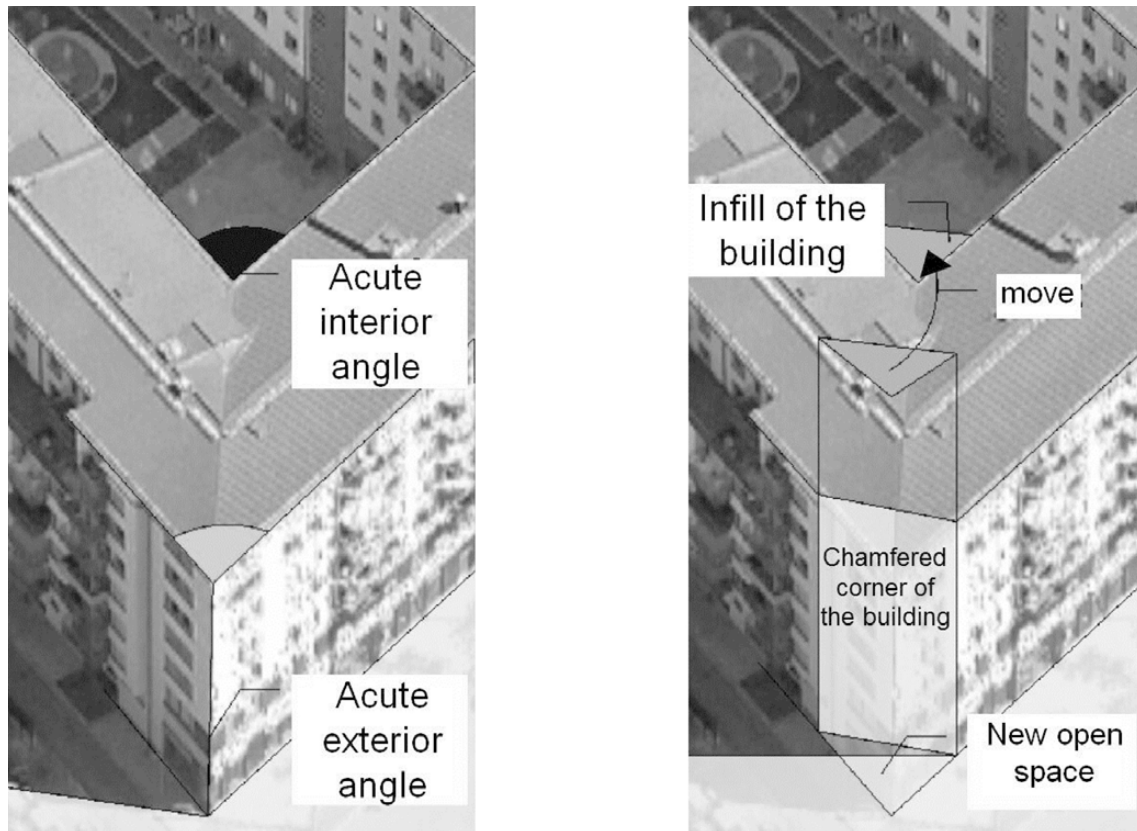
straight line format. The energy efficiency of the bending streets can be improved so the loss in energy efficiency compared to a straight street can be reduced by one third.

Basic Assumptions in the Computer Simulations
(The daylight simulations have been made by the consultant company, ÅF Lighting, with Majid Miri as responsible technician, at the request of KTH).

- 365 days a year.
- Latitude around 60°N; Stockholm, Oslo, Helsinki…..

The savings is specific for each latitude. The energy savings will be larger the higher the latitude is.

The target for the chosen mathematical model is the urban settlement. There are many local parameters in reality which hamper a good analysis of how town planning and the architecture impact the daylight situations. One example is that the local skyline including houses and terrain with hills give "distortions", situations which are not possible to generalise. All distortions complicate the research compared with observations in reality. This can easily lead to a chaos of parameters. The cleaner situations in a computer model give the possibility to compare a specific difference while keeping all other parameters the same. The model must simulate "reality" very well in such a clean situation. As an example, the nearest blocks in the surrounding areas of a measured street are of exactly the same type as the actual block.

Today, there are good software programs in the market to work with such models. For practical use of the results from this research, it is necessary to recognise the local condi-

tions at the plot and the surroundings. Such differences from the "clean" situation in the computer model require adaptations of the proposed solutions from the research. That should be done during the early considerations of important local facts in the project.

The results of the simulations show that when the suns altitude is in between 0° and -5°, alternative A consumes 388.72 kWh and alternative B 438.20 kWh (based on percentage recieved by calculating the sky to get 10 lux for switching on and 15 lux for switching off the street light), while the total value when using the central sensors measuring global horizontal illuminance without surrounding obstruction (switching the street lights on when the global horizontal illuminance is 25 lux and switching off when it is 35 lux) is 310.08 kwh for Alternative A, and 348.84 kwh for Alternative B.

The Block and its Corners

The daylight distribution in streets and squares is dependent on the adjoining facades and especially in the corner of the building which, at the same time, also is the corner of the block. The geometry of such a corner can be round, chamfered or with an angle which is acute, obtuse or perpendicular. Occasionally, even more complicated shapes are used.

Some basic impacts of the different conditions for daylight and wind with different corners of the buildings are possible to conclude through simple geometrical assessments. An example is that the acute exterior angle of the building will hamper the daylight distribution and also generate turbulent wind. The turbulence appears especially if the wind is parallel to one of the two actual facades. The forthcoming simulations will give a more detailed in depth knowledge how different shapes and angles impact the daylight and wind. The adaptation to daylight has a higher priority in the project than the adaptation to wind depending on its impact on saving energy for the electric light.

The testing of different corners of the buildings has led to some good and useful shapes. In the same way, I will investigate different openings between the street and the courtyard. It is both a question of the shape of the opening in itself and if it is placed in the middle of a façade in the urban block or in one corner of the block. By designing the shapes of the blocks in the surroundings, with the same strategy, it is possible to achieve a greater impact on energy efficiency. If the openings are repeated, in the same way, from one block to another, the low angled light can be spread long distances.

Implementation

A prerequisite for a successful implementation is, for building designers and urban planners, to pay attention to the new information about outdoor light and town planning principles. So, hopefully, the professionals will take into consideration these new facts. In order to be successful, the knowledge must also be implemented in the real processes for decisions in politics.

The quantitative results in energy from my research will be waged against all other aspects as: well-being, health, noise, wind and all local values. My research is intended to inform about solutions which best takes care of the daylight and, in the end, saves energy.

Conclusion

With the same spacing and the same exploitation coefficient, it is possible to save energy for electric light through alternative geometrical solutions of the block, the street and the buildings.

Good condition for daylight requires a low height of the buildings in the nearest surrounding areas and long distance between them. Another important aspect for good daylight, one that is not so recognized in urban design, is the straightness of the street. To reduce the energy consumption for electric light, it is good to plan for straight streets and straight corridors of open land as long lawns. With straight streets, it is possible to save around 13% of the electric energy for the exterior lighting compared to the bending streets during twilight. If choosing to design bending streets despite this information, it is

good to vary the height of the building along the street, with submersions of the buildings, to achieve a good daylight distribution in strategic straight lines.

This paper only gives some examples of the value of adaptations of the built settlement to sun and wind. Different patterns of the streets, the blocks and the buildings will be evaluated continuously during the ongoing research with an end in a PhD report estimated to June 2018.

References

Littlefair, P.J. (1991, revised 2011) *Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice* (BRE Press, UK).
Rode, P., Keim C., Robazza, G., Viejo, P. & Schofield, J. (2014) *Cities and Energy: Urban Morphology and Heat Energy Demand* (LSE Cities and EIFER at Karlsruhe Institute of Technology).
Strømann-Andersen, J. & Sattrup, P.A. (2011) 'The urban canyon and building energy use: Urban density versus daylight and passive solar gains', *Energy and Buildings* 43, 2011-2020.
Sundborg, B. (2010) *Ljus i bebyggelsen* (Stockholm).

Figure 2. Case study 1.

Density and solar radiation in the historical urban fabrics: Colle Oppio neighbourhood's case in Rome

Michele Morganti
Department of Civil, Environmental and Architectural Engineering (DICEA), Sapienza University of Rome, Italy
Keywords: Urban form, Urban density, Solar energy, Mediterranean compact city

Abstract

This research aims at determining the relationships among solar radiation and urban form of historical fabrics in Mediterranean compact city, taken density as useful parameter to illustrate their features. Despite the growing unsustainability of today's city, recent statistics have confirmed the increasing attractive power of metropolitan areas. An approach determining instruments and design methods at both urban and architectural scale, should be found in order to set out more appropriate conditions for the historical compact city. In respect of this kind of scale, the relationship between solar radiation and form takes a central role in the variation of energy performances. This comparative study investigates this relationships by models and simulations set up in order to control the correspondent factors. It is carried out for different historical morphologies existing in the Colle Oppio neighbourhood in Rome. The influence of urban morphology and built-form on solar access is shown by definitions of density indicators. Among these, are determined those more suitable to express reliable trends in relation to solar access. Built-form and typology are the main factors that occur in energy performances' variation of urban fabrics. The investigation of these kinds of performances achieved by density parameters facilitates the comprehension of the different behaviours in each urban texture. Moreover it offers a contribution to the energy analysis instruments at urban scale and permits more efficient conditions for the built environment. Methodological structure and the determined parametrical instruments show themselves as knowledge base for aware transformations of Mediterranean compact city.

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Introduction

In the last decade in the EU implementation of rules, requirements and energy protocols has intensified, letting sustainability enter the design practice. But, unfortunately, these design tools appeared inadequate so that the great part of research efforts failed in this field because focused on goals limited only to materials or building technologies or formal and typological building transformation. Furthermore they engaged an approach at larger scales rarely and difficultly. Constant statistics updating and the more alarming predictions of energy consumption, natural resources, production of waste, pollution or urban heat island phenomena clearly prove these fail. It is well-known that the complex of activities connected with built environment is responsible for 75% of GHG global emissions and 69% of energy consumptions (IEA, 2013).

In fact, in spite of their conditions of apparent unsustainability, cities exist and keep functioning, increasing their ecological mark and absorbing resources, proving that urban condition has become unavoidable in today's society. So it becomes a priority to concentrate research efforts on comprehension and definition of sustainable conditions within urban metropolitan context.

Experiences collected up to now in the field of architecture and sustainable city, if, on one hand, proved the possibility to imagine strategies and technologies that could redefine more appropriate conditions for metropolitan habitat, on the other hand, lacked in incisiveness. New settlement models designed by new simulations and modelling methods, based on technological innovations developed in these years, or on their different use due to the transformation of environmental and energy attention, represent a minimum percentage compared to the great building "mass" of "ordinary" city. The importance of these virtuous connections lays on the fact that they demonstrated to be a real alternative but, because of their exceptionality, they inevitably need some time before finding an adequate spread till changing into usual practice. Good practices undertaken into design and construction of new buildings are no more sufficient. They have to be accompanied by methods as well as actually incisive and effective strategies that let operate immediately on the ordinary city at a larger scale: firstly, for the comprehension of its functioning and, only then, for the definition of more sustainable conditions.

Especially in the European compact city of Mediterranean climate it becomes crucial the confrontation with the existing building stock – that definitely prevails over new settlements – and whose dedicated residential part is responsible for 65% final energy consumptions of the entire building sector (Market Observatory for Energy and European Commission, 2010). If it is true that, as proposed in *Roadmap 2050*, European Union is determined to reduce GHG emissions of 80% by 2050 (compared to 1990 levels), this ambitious goal especially requires the energy performance improvement of existing urban fabrics as well as innovative design strategies and technological solutions for new buildings in order to reduce energy demand. In this regard, a very significant analysis level englobes urban dimension internally, permitting so to study adequately spatial entities that constitute its structural nucleus: road network, plot patterns and built form. It has been observed that such features play a decisive role in influencing the interrelations "resources-environment-building". Urban form and typology are some of the principle factors that show more "resilience" to transformation, compared to those architectural, technological, building and of usage (Baker and Steemers 2000, Strømann-Andersen and Sattrup 2011).

In this scenery, our work aimed at analyse the solar energy performance of compact city providing a more systematic and comprehensive evaluation of the interaction with urban morphology and density. We use spatial density indicators as urban scale energy performance evaluation tool on widespread historical urban fabrics in Mediterranean climate. This work was initiated by a research project concerning the interaction between density parameters, morphology, typology and energy behaviour in the European compact city (Morganti et al., 2013, Morganti, 2013). Here we further expand the understanding of how this knowledge could influence urban planner, designers and policy makers to improve the solar energy performance of the compact city.

Density and solar energy at urban scale

Mostly used in urban planning in order to connote the deep process of transformation that has involved compact city in modern era, causing its transformation firstly into industrial city and then into metropolis, density has been closely related to the myth of progress that took form into the constant quantitative growth of urban phenomenon, following the interest in their relating studies (Pont and Haupt 2010). At the beginning, it became popular as analytical parameter of transformative processes and once arrived among us as the inheritance of modernist thought, today it plays roles that are beyond its original connotation regarding its usage, scale of reference and the same disciplinary field of application. If originally it was used in urban studies and urban plans mainly as a descriptive and prescriptive tool, it has gradually taken on more importance as a real designing tool, demonstrating an extreme variety and interpretative potentiality in the explorative use attributed to it by influent contemporary designers. This duplex declination that density easily suits for, let it transmigrate in the proper field of urban design and be connoted as the right tool for interpreting the building performance, able to link the results of morphological models with energy and environmental ones, relate different urban forms to the sustainability specific features of built environment, too. Then, density parameter can constitute the linking element between tools of analysis, urban design, energy performance prediction and current urban regulations.

Faced with the extreme complexity of environmental and energy interactions in metropolitan contexts, numerous attempts have been made at *neutral* comprehension supported by analytical parameters. Firstly, an attempt was made to overcome the multi-sided nature of the concept of density, by giving it objectivity and capacity for morphological description (Rapaport, 1975; Alexander, 1993; Churchman, 1999; Berghauser and Haupt, 2010). Following this, attention was focussed on the different aspects that influence the energy efficiency of the built form typologies that make up urban systems and on the definition of the concept of sustainability in the presence of high density (Ratti et al., 2005, Cheng et al., 2006, Zhang et al., 2012, Strømann-Andersen and Sattrup, 2011).

What appears clearly from these studies is the strong influence of the reference climate on the direction, the interest and the individual results of the research. The positive effect of the variation of a particular parameter (e.g. the density, the size of the urban canyon or the sky view factor) can be negative for other climactic conditions. It is certainly true that "in the already built cities of northern Europe, urban density is of particular concern, because the high latitudes and the associated low solar inclinations mean that the urban geometry affects solar access much more here than in other urban centres around the world. Yet if we refer to Mediterranean climates - where energy consumption depends on the ever increasing demand for summer cooling - dense urban contexts, reducing direct heat gain because of reciprocal obstructions, end up being more efficient. This efficiency at urban scale is directly attributable to the effect of morphology, layout and exposure and could be described by the assessment of the *urban solar and daylight availability* - interaction between incident irradiation and built environment (Compagnon, 2004). In the last years, there have been many examples of research looking at solar potential of cities (passive solar gains or harvesting energy) and related to density indicators. Some of these studies are based on abstract 3D models that tries to reproduce real urban texture (Cheng et al., 2006; Sanaieian et al., 2014; Li et al., 2015). Some others are based on methods that, starting from available statistical data, analyse real neighbourhoods (Compagnon, 2004; Sarralde et al., 2015). The former group, as described in Curreli and Coch (2013), could difficult represent the solar performance of real urban textures, especially when the effect of the urban obstructions is significant. The latter group can't relate the different built forms existing in the analysed neighbourhood to density indicators and general solar performance. Moreover, most of these studies focus on how to increase urban solar access in temperate climate, without considering the overheating negative effect for energy demand and internal comfort in summer season.

Concerning density indicators, it has been proven that in general they have different types of dependency on solar and daylighting parameters. Daylight factor, sky view

factor and solar potential of roofs are more dependent on floor space index (FSI), while solar potential on building façade is more related to ground space index (GSI) and the degree of horizontal obstructions (Cheng et al., 2006).

Research objectives

Our study seeks to understand the type and extend of the interferences between urban form, density and solar energy in European historical urban fabric with a Mediterranean climate. We provide a contribution on what impact a specific context has on façade solar gains of typical residential blocks different for built form and typology. The density indicators most reliable to parametrically represent urban forms (FSI and GSI) are investigated in a typical 19th century neighbourhood of Rome and compared with *sky view factor*: another indicator of the used in solar analysis. The comparison is shown by tendencies able to define a first approach on an urban density-based energy benchmarking.

Case studies

We carried out this comparative analysis on some urban islands located in the Colle Oppio neighbourhood in Rome. In this area, are located some of the typical historical urban fabric, widely spread in the European compact city with a Mediterranean climate. The Colle Oppio is the name of an area contained within via Merulana, via Labicana, via dei Fori Imperiali, via Cavour and via Lanza. Its urban development began with the masterplan of 1873 and 1883 but the real transformation started on the east side in 1886, with the prosecution of the nearby Esquilino neighbourhood layout composed by plot with mid-high rise buildings. In the area were already located some seats of religious institutions, *Palazzo Brancaccio*, *Domus Aurea* and *Terme di Traiano* archaeological sites (Rotondi, 1994). All these presences, mainly composed by urban green voids contributes to reduce building density and promote the formation of an urban texture with more morphological and typological variation than the nearby neighbourhoods, e.g. Esquilino and Celio. For all these reasons, in Colle Oppio coexist today some of the widespread residential typologies of 19th century compact city. The presence, for example, of the low-rise detached house near the East side of *Terme di Traiano* is the evidence of that characteristic and conducts the selection of the case studies area, as shown in Figure 1.

In more detail, we investigate the urban fabric within via Merulana, via Labicana and via Mecenate, where nine islands have been selected for their architectural and technological peculiarity –typical of the historical period– and also for their orientation and urban obstructions around. We assume that these cases could be a first-stage references for solar performance of the morphologies existing in the area.

• *Cases B1-B3*: Apartment block islands composed of five to eight storey housing buildings (plus basement) with small internal courts (height >> width) and high urban density values.

• *Cases L1- L3*: Court apartment block islands composed of six to seven storey housing buildings (plus basement) with internal courts and mid-high urban density values.

• *Cases D1-D3*: Single family detached house islands composed of four to five level (plus basement) with mid-low density values.

Methodology

In trying to define the spatial entities that make up the structural core of the urban space, Conzen (1960) and Muratori and Maretto (1960) identify three: the street system; the lot pattern; and the building configuration. This study takes as a scale of reference those in which the above-mentioned entities are central - the island (or block) and the fabric. On one hand, they are the most suitable for describing morphological properties through density parameters; on the other hand, they enable us to control the interactions between resources, environment and buildings, to a scale that has proved to be decisive for defining sustainability strategies. What is more, often urban scale have a greater
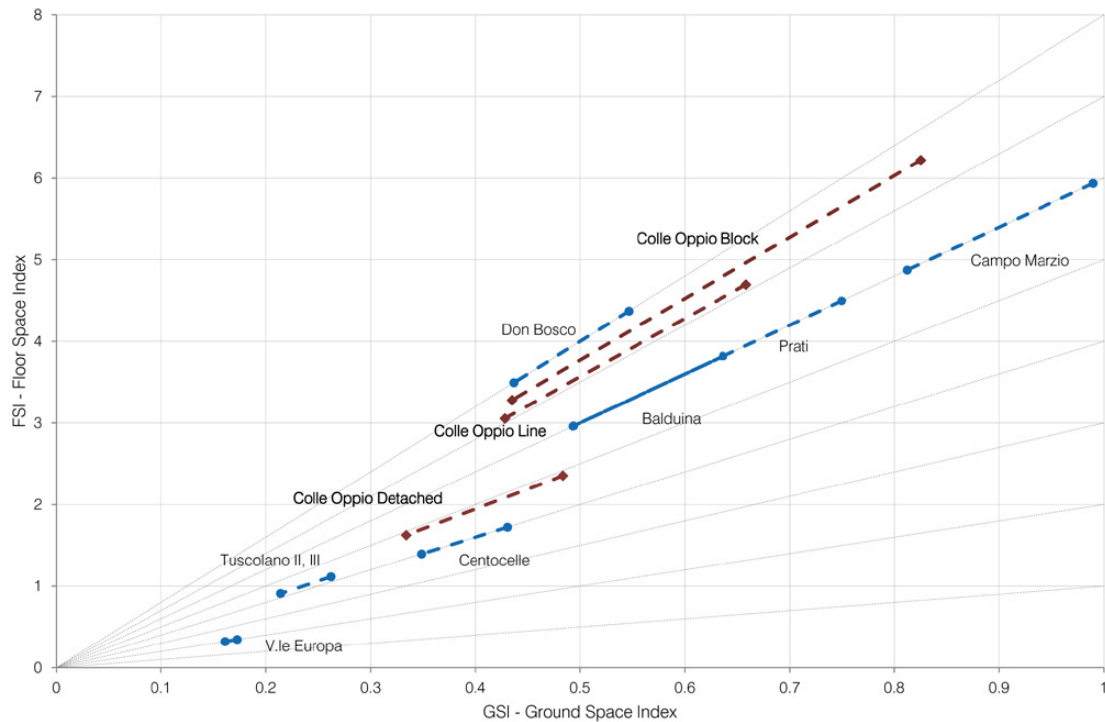
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Figure 2. Density data comparison for case studies and historical neighbourhood of Rome.

impact and resilience on the environmental and energetic behaviour of the building compared to the architectural and technological-constructive decisions, which are normally costlier (Strømann-Andersen and Sattrup, 2011). Therefore, this knowledge and the relative control in terms of environmental efficiency seem appropriate and necessary in order to achieve better results which can handle current challenges.

In thinking about the search for the relation density-solar energy, it was deemed in keeping carrying out the comparison on various levels: the description of the physical consistency and the evaluation of solar performance. Starting with analysis of the density of the real fabrics (using a series of indicators) and then using digital modelling (which reflected the observed properties) we were able to study the influence on solar access.

The methodological process has been developed starting from previous studies that revealed the importance of SVF, GSI and FSI to analyse the façade solar potential in the summer period (Morganti, 2013). The study is parametric in approach, with different urban island that represent typical models of 19th century morphology.

Physical consistency and the relative density of the nine selected cases were examined with reference to the most common definitions of indicators used by Berghauser and Haupt (2010) as shown in Figures 2-3. In this way it is possible to link the quantitative parameters with the built form typology for island scale and fabric scale. Underground floor area is included in the gross floor area calculation, while is excluded in the footprint.

Three-dimensional modelling is based on accurate geometrical survey and supported by original design documentation. In order to prevent the formal singularities and spatial inconsistencies of the actual blocks from affecting the interpretation of the performance of the distinct morphologies, the cases underwent a process of *normalisation* (Zhang et al., 2012). In this way, the urban contexts, modelled by tracing out the geometric structure of the actual fabrics, are made up of homogeneous blocks. Therefore, to avoid difficulties in the interpretation of results, the specific features effects of single elements are excluded and the understanding of actual solar performance is not compromised.

Using the *Heliodon 2* simulator, digital models were studied in terms of solar access. The calculation hypotheses underlying the software do not make it possible to determine

Case studies data and simulation results

	Gross floor area[1] m²	Footprint[1] m²	Base land area [Ai] m²	FSI [Ai][2] m²/m²	GSI [Ai][3] m²/m²	Base land area [Af] m²	FSI [Af][2] m²/m²	GSI [Af][3] m²/m²	Façade solar gain (mean) - Jun kWh/m²	Façade solar gain (mean) - Dec kWh/m²	Sky view factor
B1	10,827										
B2	26,587	48,578	6,443	7,809	6.22	0.83	14,810	3.28	0.44	30.45	16.06
B3	11,164										
L1	22,491										
L2	19,411	66,513	9,324	14,165	4.70	0.66	21,770	3.06	0.43	42.67	14.23
L3	24,611										
D1	824										
D2	1,390	3,406	700	1,447	2.35	0.48	2,095	1.63	0.33	46.28	14.17
D3	1,192										

Note: Sky view factor column values: B2 = 17.96, L2 = 21.71, D2 = 27.43.

[1] Residential only; [2] Building intensity: gross floor area/base land area; [3] Coverage: footprint/base land area; Ai and Af refer to Fig. 2.

Mean façade solar gain simulation
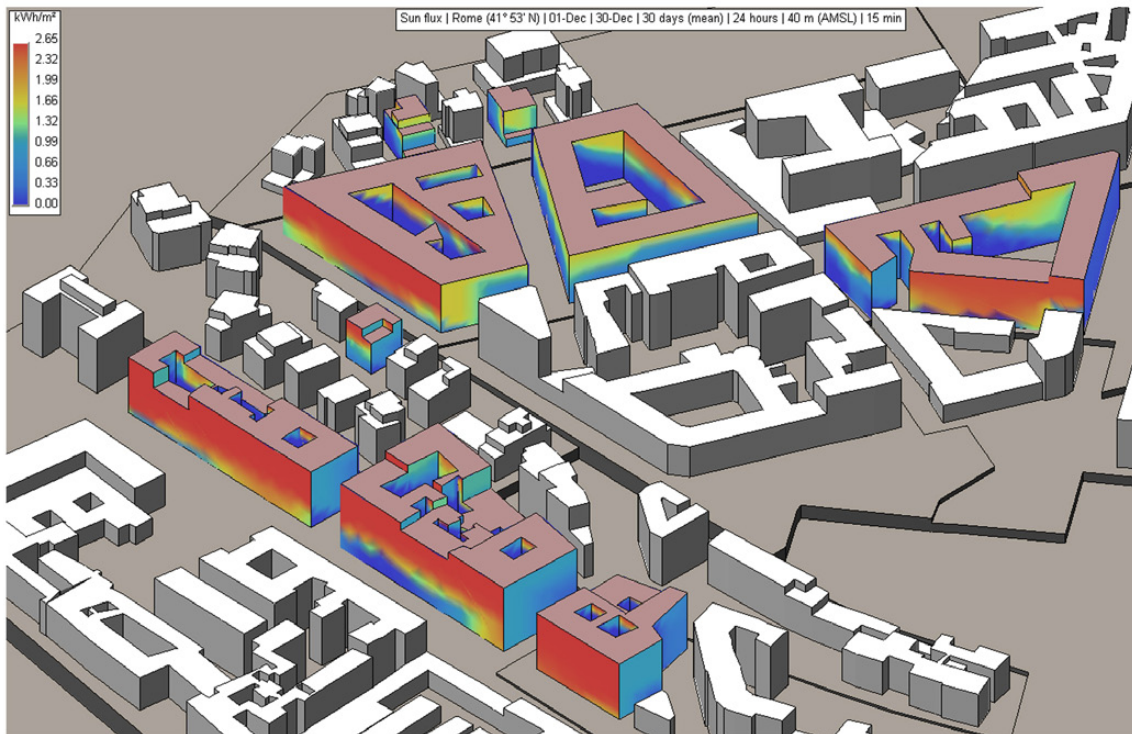
the exact incident radiation, but on the other hand, they closely relate it to the geometric properties of the objects, making it suitable for comparative studies on the relations between solar radiation, density and urban morphology. The performances are evaluated for the month of June and December as reference for summer and winter seasons. These periods are more suitable to express the effect of urban morphology on solar access because have the maximum solar radiation variation, therefore clearly describe the global solar performance. For each façade, the solar flux (kWh/m²) and the sky view factor [SVF] (%) are determined. Solar flux seems effective for comparing the different fabrics, e.g. by observing behaviour according to the floors and the orientation, whereas sky view factor clearly shows the urban obstruction effect excluding the orientation influence. Roofs have been excluded from simulation because their performance is less correlated to urban form and density.

Figure 4. Relation between density indicators (FSI left, GSI right) and façade solar gain (above) or sky view factor (below).
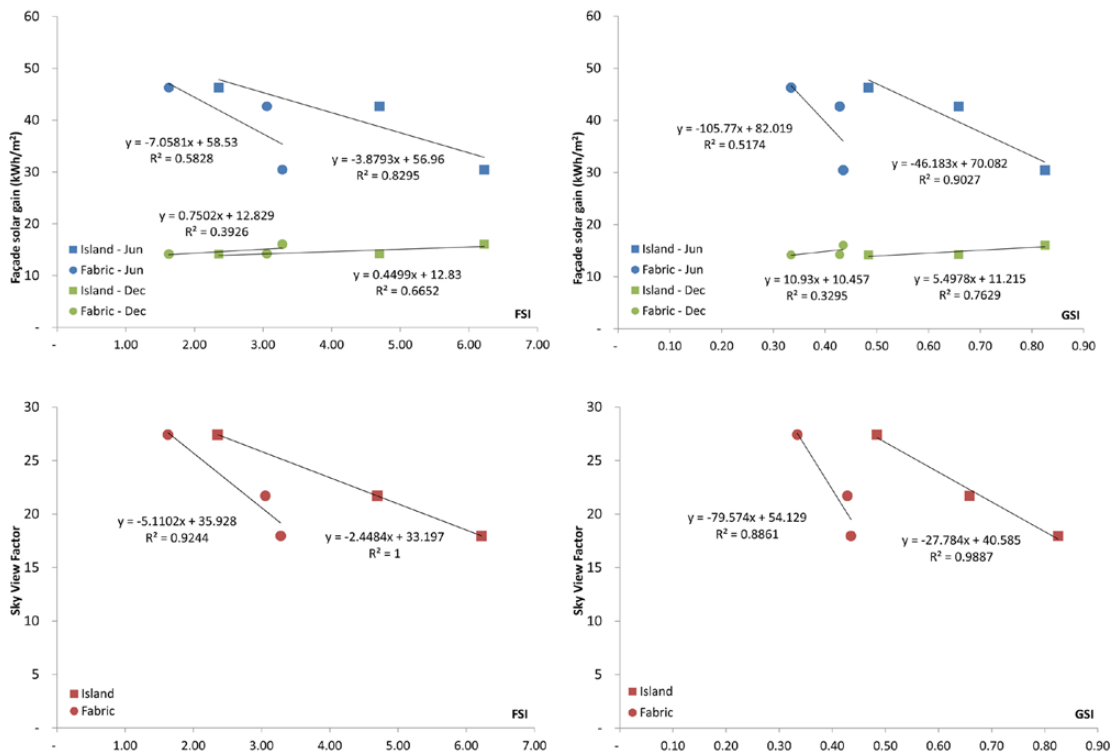
Results and discussion

Figures 2 and 3 shows the main spatial data and density indicators derived from case studies. The density indicators i.e. ground space index (GSI) and floor space index (FSI) have been related through a graph adapted from *spacemate* by Pont and Haupt (2010). This kind of spatial analysis shows that selected cases clearly represents different urban forms at both scale of analysis. The island scale appears more suitable to clearly show it: we found a variation for GSI and FSI between 1.72 and 2.64 at island scale and between 1.33 and 2.01 at fabric scale. This variance is because of open spaces influence (private open areas and networks) that affects more apartment block cases (B_i) and detached house cases (D_i). Besides, a comparison between case studies and few others historical neighbourhoods in Rome, is shown (Fig. 2). At island scale, B_i cases have high building intensity and coverage.

The computation of the mean values of the façade solar gain (for June and December) is presented in Figure 3. The greater the density is the less is the solar access in the urban fabric; moreover the façade solar gain in June increases by 51% while in December decrease by 13%. This could be because during winter the lower sun angle reduces the different obstruction effects on direct solar energy depending on urban forms. For this reason, is possible to predict that cases L_i and D_i will have higher annual energy demand due to overheating, comparing to B_i.

Results presented in Figure 4 show the existing tendencies between density properties and façade solar gain or sky view factor. The former point out that urban density has relevance on solar energy. The derived tendencies suggest that in the case of historical urban fabrics this relation is more evident at island scale and especially for summer performance as a rough approximation described by the fittings:

$y = -3,8793x + 56,96$ [FSI]

$y = -46,183x + 70,082$ [GSI]

where y represents mean façade solar gain (kWh/m²) and x density (m²/m²). At this

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scale results are less affected by the presence of open areas and road network and thus more linked to urban form. In particular, GSI appears more suitable to describe this relation as shown by higher R2 value.

The relation between FSI or GSI and sky view factor is even more stronger and, again at island scale, the fittings are:

y = -2,4484x + 33,197 [FSI]

y = -27,784x + 40,585 [GSI]

where both GSI and FSI are suitable to express this connection as shown by high R^2 values.

Our study suggest that solar energy performance of historical urban fabrics is clearly related to urban morphology that is strictly represented by density indicators, as suggested by the above mentioned tendencies. The two different density calculation scales could suggest that the islands scale should be more adequate for energy performance assessment in the 19th century residential neighbourhoods. In particular, this scale confirms what has been guessed by Cheng et al. (2006) using abstract models and in different climate conditions: façade solar potential is more related to GSI than FSI also for historical urban morphology in Mediterranean climate.

Conclusion

This work provides an approach to understand the interaction between urban form, density parameters and solar energy performance on historical urban fabrics, focusing on typical 19th century urban island of Colle Oppio neighbourhoods in Rome. In order to make this type of tool suitable in the early stages of planning, we aimed to develop a process that reduces the necessary input data, the calculation stage, and focuses on defining qualitative and quantitative features of the urban form, based on solar energy performance.

The investigation of this kind of performance achieved by density indicators facilitates the comprehension of the different performances in each urban texture. Moreover, it offers a contribution to the solar analysis methods at urban scale and permits aware transformations of Mediterranean compact city towards more efficient built environment conditions.

The explained tendencies represent the knowledge base for a methodology and a related density-based tool for solar energy benchmarking at urban scale. Such methodology is aware of the interactions between buildings and solar energy and their mutual effects. Further extension of the study, including more urban forms can lead to a more accurate tendencies definition and to a density-based solar performance evaluation tool for historical urban fabrics in Mediterranean compact city.

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Acknowledgements

References

Alexander, E. R. (1993) 'Density measures: A review and analysis', *Journal of Architectural and Planning Research* 10(3), 181-202.

Baker, N. and Steemers, K. (2000) *Energy and environment in architecture: a technical design guide* (E & FN Spon, London).

Cheng, V., Steemers, K., Montavon, M. and Compagnon, R. (2006) 'Urban Form, Density and Solar Potential', *PLEA2006 - The 23rd Conference on Passive and Low Energy Architecture, Geneva*, Switzerland, 6-8 September 2006.

Churchman, A. (1999) 'Disentangling the Concept of Density', *Journal of Planning Literature* 13, 389.411.

Compagnon, R. (2004) 'Solar and daylight availability in the urban fabric', *Energy and Buildings* 36(4), 321-328.

Conzen, M. R. G. (2009) '1960: Alnwick, Northumberland: A Study in Town-plan Analysis', *Progress in Human Geography* 33(6), 859-864.

Curreli, A. and Coch, H. '3-D geometrical modelling and solar radiation at urban scale - morphological or typological digital mock-ups?', *CISBAT 2013 - International Conference. Cleantech For Smart Cities & Buildings. From Nano to Urban Scale*, Lausanne, Switzerland, p. 1029-1034.

IEA [International Energy Agency] (2013) *Redrawing the energy-climate map: World Energy Outlook special report* (OECD-IEA, Paris).

Sarralde, J., Quinn, D., Wiesmann, D. and Steemers, K. (2015) 'Solar energy and urban morphology: Scenarios for increasing the renewable energy potential of neighbourhoods in London', *Renewable Energy* 73(0), 10-17.

Market Observatory for Energy and European Commission (2010) *Europe's energy position: markets & supply* (Publications Office of the European Union, Luxembourg).

Morganti, M. (2013), *Sustainable Density: Form, Built Environment, Energy* (http://www.tdx.cat/handle/10803/365041) accessed 28 march 2016.

Morganti, M., Pagès-Ramon, A., Isalgue, A., Cecere, C., and Coch, H. (2013) 'Urban Fabric Performance in the Mediterranean City: A Typology Based Mass-Energy Analysis', *CISBAT 2013 Clean Technology for Smart Cities and Buildings, From Nano to Urban Scale*, Lausanne, Switzerland.

Muratori, S. (1960) *Studi per una operante storia urbana di Venezia* (Istituto poligrafico dello Stato, Roma).

Pont, M. B. and Haupt, P. (2010) *Spacematrix: space, density and urban form* (NAI, Rotterdam).

Rapaport, A. (1975) 'Toward a Redefinition of Density', *Environment and Behavior*, 7 (2 June 1975), 133-158.

Ratti, C., Baker, N., and Steemers, K. (2005) 'Energy consumption and urban texture', *Energy and Buildings*, 37(7), 762-776.

Rotondi, S. (1994) 'La trasformazione del Colle Oppio', *Groma* (2), 103-122.

Sanaieian, H. (2014) 'Review of the impact of urban block form on thermal performance, solar access and ventilation', *Renewable and Sustainable Energy Reviews*, 38, 551-560.

Zhang, J., Heng, C. K., Malone-Lee, L. C., Hii, D. J. C., Janssen, P., Leung, K. S., and Tan, B. K. (2012) 'Evaluating environmental implications of density: A comparative case study on the relationship between density, urban block typology and sky exposure', *Automation in Construction*, 22(0), 90-101.

Microclimatic response of urban form in the Mediterranean context

Agnese Salvati[1,2], Carlo Cecere[1], Helena Coch[2]
[1]SOS_UrbanLab, Facoltà di Ingegneria, Sapienza Università di Roma
[2]Escola Tècnica Superior d'Arquitectura de Barcelona, UPC Barcelona
Keywords: urban textures, Mediterranean climate, Urban Heat island, Urban Weather Generator, microclimate

Abstract

The relationship between morphology, climate and energy has always influenced deeply the development of urban settlements. In the Mediterranean context, this process led to compact and dense urban textures, made of highly inertial materials and cladded with bright colors in order to prevent overheating and thermal discomfort. Nowadays, cooling and heating systems relieves the architectural design from climatic constraints. However this has resulted in increased energy consumption, especially in the summer season because of the widespread use of air conditioning systems. The problem is worsened by the Urban Heat Island (UHI) effect. Shape and geometry of a city affect its climate, and so the energy demand at the urban scale (Ratti 2003, Morganti 2012). The proportions of the urban canyon (height/width ratio) can produce multiple reflections of solar radiation. In addition, the cooling process is decreased during the night due to the low values of the sky view factor (Oke, 2012). Therefore, in a dense and compact urban texture, higher temperatures can occur especially during the night. The present study seeks to highlight the effect of urban morphology on the UHI intensity in the Mediterranean context. Several morphologically homogeneous textures of Rome and Barcelona are parametrically modelled and compared, by means of the Urban Weather generator tool (Bueno, 2012). The results show that air temperature substantially varies according to different urban morphologies. Understanding the microclimatic behavior of most recurrent urban textures can steer energy and retrofitting policies at urban scale and help to achieve the energy goals set by E.U.

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Introduction

In 1963, in the famous book "Design with climate: bioclimatic approach to architectural regionalism", Olgyay stated, "*It is a recognized fact that the forces of nature have a direct effect on the formation of objects. (…) As sometimes in physics, the knowledge of forms leads to the interpretation of forces that molded it, at other times the knowledge of the forces at work guides a better insight into the form itself*".

When it comes to urban form and morphology, a major contribution to the outcome is given by the local climate. Factors like the shape of the roofs, the proportion of solid surfaces to open areas, the street's vertical ratio and the house types are as much the result of traditions, culture and technical requirements as of climate and environment. Sure enough, a strong relationship has been found between the housing type and the climate zones, over a wide sample of locations in the world (Coch Roura & Rafael Serra Florensa, 1995; Olgyay, 1963). This holds true at both the building and city scale, especially in the pre-industrial original settlements. The texture of the city, in fact, is outlined as a complex mixture of different shapes but, on a larger scale, it reveals a specific layout as much dense and compact as resulting from either friendly or adverse climatic conditions (Cornoldi & Los, 1982; Givoni, 1998; Higueras, 2006; Olgyay, 1963). This is quite evident in Mediterranean context where villages and cities present some recurring features that denote a common historical background as well as the deep influence of the geomorphological, environmental and climatic conditions. Shaded and compact urban textures, made of highly inertial masonry construction cladded with bright colours, were meant to screen the summer radiation and to mitigate and delay hot temperatures.

In the past, urban planning aimed at the modification of the environment in order to enhance the beneficial effect of climate, in close relation with the culture, traditions and nature of its territory. With the industrial revolution though a crucial turning point was marked, because the technological, economic and environmental changes were of such a scale that the city underwent deep transformations (Higueras, 2006).

As much the availability of cheap sources of energy as the impressive urban population growth, led to urban structures and housing types completely freed from the natural context characteristics: the fuel-based transport system facilitated the urban sprawl as well as the development of air conditioning systems definitively relieved the architectural design from climatic constraints. This process worsened over the years, so that today the inertial walls have turned into glass skin anywhere in the world and, in most of the cases, instead of protecting us from adverse climate, "work worse than the weather itself" (Coch, 1998).

As a result, energy consumption at urban scale has deeply increased, especially in the summer season, due to the widespread use of air conditioning systems. Nowadays, the outlook of a global climate change, the acknowledged shortage of the fossil resources and the environmental threats have pushed the scientific community to investigate suitable solutions to achieve more sustainable urban environments. The studies on morphology and urban climate have become once again matter of interest, but from a different viewpoint: from the study of the building types that best respond to the climatic context, the focus has shifted to the urban morphologies that allow for the least impact on the climate and environment.

One of the most evident climate modification induced by human action is, in fact, the warming of urban areas compared to nearby rural areas, known as the Urban Heat Island phenomenon. Higher temperatures occur in compact and dense urban environments, which is definitely detrimental in Mediterranean climate to citizens' health and urban energy consumption. As the phenomenon varies with different densities, there are urban areas more affected than others, in which mitigation strategies should be particularly advised for a beneficial outcome at urban scale. The study of the relationship between urban morphology and urban climate in Mediterranean context is thus extremely useful to identify the most vulnerable areas within the city, with respect to climate change and urban heat island.

Furthermore, in the searching of more sustainable urban forms, the density of the development is still a crucial and debated topic; the present study aims at giving an original contribution, from the point of view of the urban climate modifications induced by different built densities.

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Figure 1. Selected urban textures and digital models.
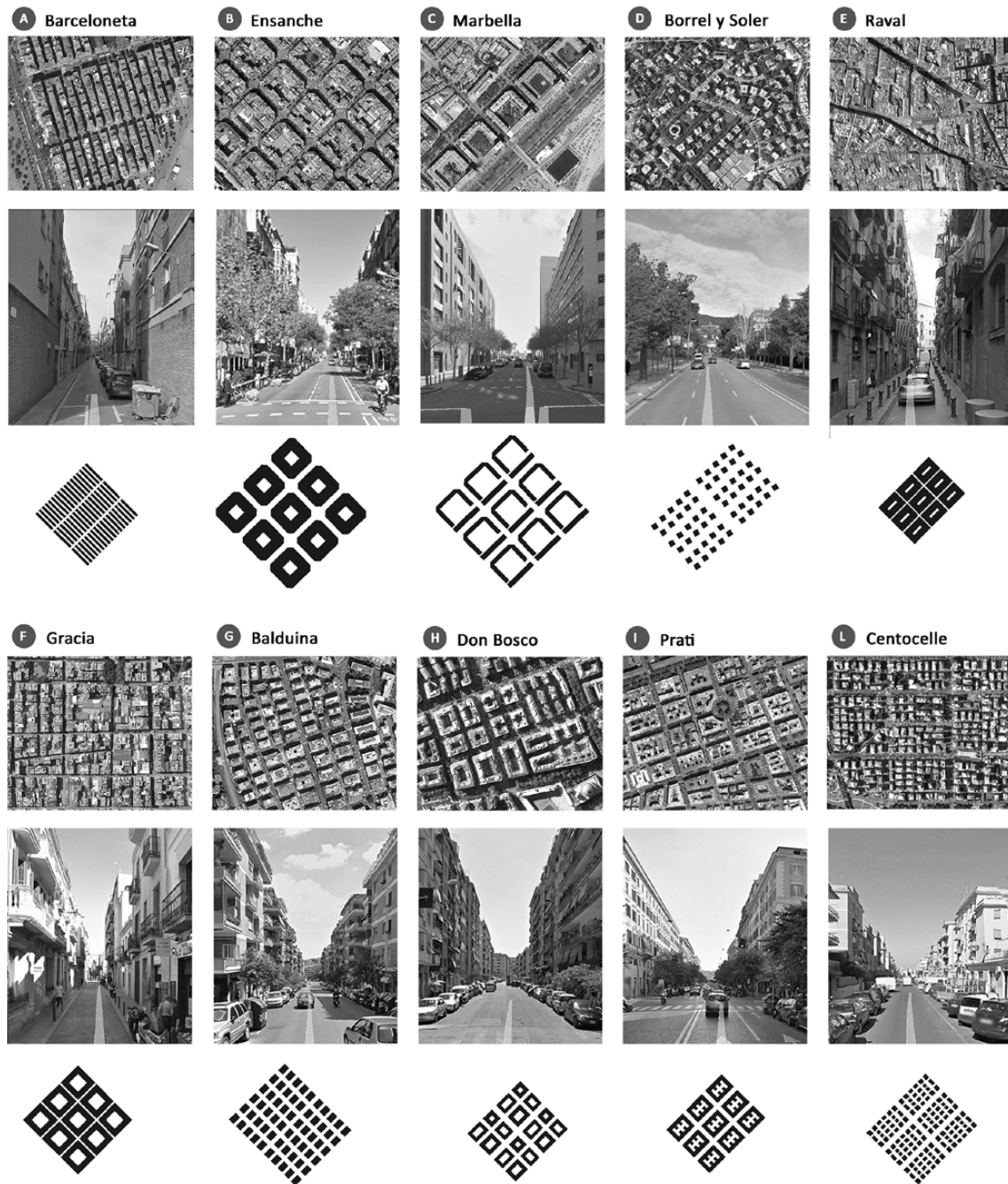
Urban heat island and Morphology: state of the art

The urban heat island (UHI) is probably the most evident and documented phenomenon of climate changes induced by man (Oke, 1987). The process of urbanization produces radical changes in the energy and water balance compared to a rural environment; impervious surfaces, anthropogenic heat sources, building density and vegetation scarcity transform the urban area in a big heat tank. Considering these major changes, it is hardly surprising that urban areas exhibit a different "urban climate", with generally warmer air temperatures, especially during the night.

Heat islands have been the subject of research in Europe for at least 100 years so far. Santamouris (Mat Santamouris, 2007) compared the results for measurements conducted

in different cities in Mediterranean zone (Rome, Parma, Lisbon, Aveiro, Madrid, Granada, Athens, Turky); the temperature gap between urban areas and rural areas was found in the range between 2°C and 9.0°C. The maximum UHI intensities were oserved during summer period in Athens, Rome, Madrid and Parma. Heat islands have a relevant impact on urban energy consumption, mainly because they exacerbate the buildings' cooling load and increase the peak electricity demand (M. Santamouris, 2014). At the same time, high urban temperatures considerably decrease the cooling potential of nighttime natural ventilation techniques.

However, the spatial distribution of temperatures is not uniform within the city (Álvarez, 2013; I. D. Stewart & Oke, 2012): higher temperatures occur in the most densely built areas. In effect, the geometry of densely built areas enhances the UHI effect through three processes: the solar radiation absorption is increased because of multiple reflections; the turbulent sensible heat transfer out of the canyon is reduced due to shelter; the long-wave radiation loss from within the canyon is reduced due to the screening by the flanking buildings (Oke, 1988). The sky is a very important energy sink in the infrared region. The surrounding urban morphology represents an obstacle to the surfaces' cooling process, so in a dense and compact urban texture, higher temperatures normally occur, especially at night. Hence, the urban form is an important variable in order to assess the microclimatic and energy performance at urban scale, and it is strictly climate-dependent.

According to Oke, "*traditional European urban forms are climatically more favourable than more modern, especially North American ones*" (Oke, 1988). He was referring to continental climates (latitude about 45°N), where urban density maximizes shelter against cold winds, enhances urban warmth through heat island effect and allow a good solar access. In Mediterranean climate, the desirable effects induced by urban morphology are actually the opposite; natural ventilation should be enhanced and the urban heat island effect mitigated. For what concern solar access, the topic is conflicting: On the one hand, high solar gains allow energy saving for space heating, on the other hand, the problem of the summer overheating is highly concerning at these latitudes. (Morganti, Coch, & Cecere, 2012).
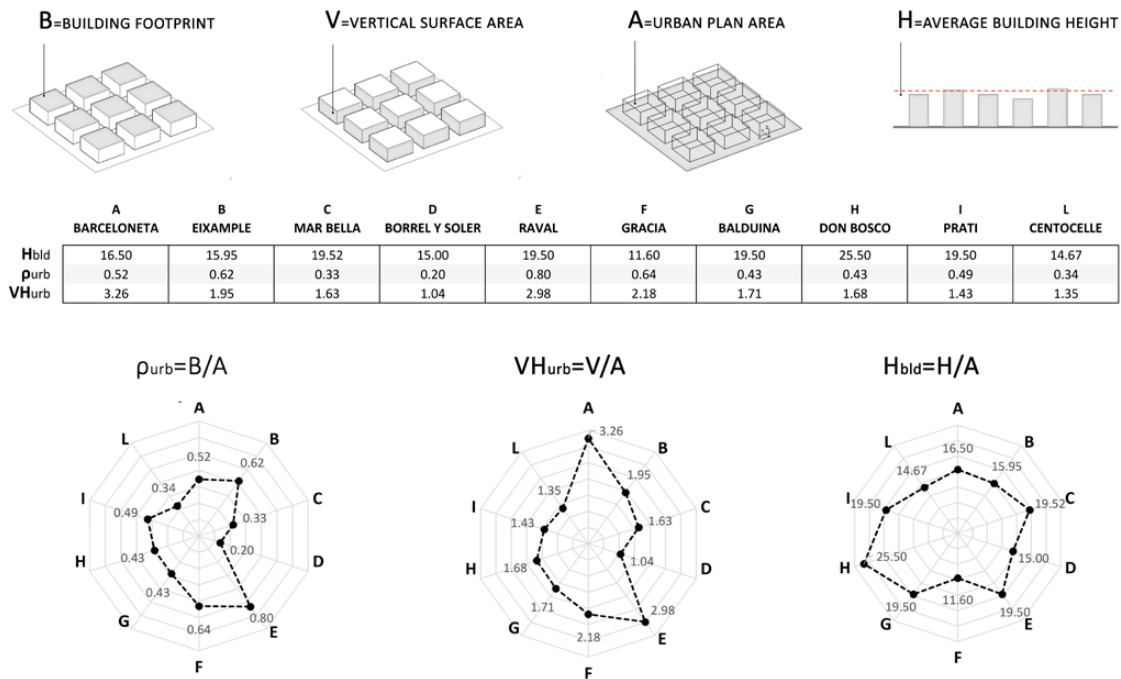
Several studies investigated the relation between urban geometry and UHI intensity (Cantelli, Monti, & Leuzzi, 2013; Oke, 1988; Res & Unger, 2004; I. D. Stewart & Oke, 2012; I. Stewart & Oke, 2009; Wong, Jusuf, & Tan, 2011) and the effect of urban morphology on building energy performance (Morganti et al., 2012; Ratti, Baker, & Steemers, 2005; Rode, Burdett, Robazza, & Schofield, 2014; Salat, 2009; Zhang et al., 2012). Despite that, results so far are not adequate to be applied at urban design strategies for Mediterranean context. The studies on urban morphology and energy performance, in fact, are mainly focused on solar access, not taking into account the UHI effect; the ones on urban geometry and UHI intensity only consider the canyons' SVF (or Height/Width ratio) which is not adequate by itself to describe the variety of urban forms that characterize Mediterranean cities.

Objectives and Methodology

In order to extend the climatology findings to urban design, a relation shall be established between the density parameters commonly used in urban planning and the predicted UHI intensity. This is intended to provide a comparative assessment tool to analyse the performance of urban textures and their possible modification. The present study seeks to highlight the performance of different urban textures with regard to the UHI intensity in Mediterranean climate. To this purpose, Rome and Barcelona were chosen as survey sites. The two cities are classified in the map of Köppen-Geiger as Mediterranean climate, with hot and dry summers. Furthermore, they are located at a very similar latitude, respectively to 41.9° N Rome and 41.4° N Barcelona and have a comparable annual average temperature trend. Based on Morganti's previous work (Morganti, 2013), 10 building configurations were identified as case study in Rome and Barcelona. The chosen urban textures represent a typical range of urban densities recurrent in the compact city (Morganti, 2013). The scope of the present study is find the average trend of UHI intensity in different urban textures, which are characterized by a set of morphology parameters. The study is carried out at the local scale with regards to both the description of the urban form and the prediction of the average UHI intensities.

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Figure 2. Urban texture's morphological parameters.

	A BARCELONETA	B EIXAMPLE	C MAR BELLA	D BORREL Y SOLER	E RAVAL	F GRACIA	G BALDUINA	H DON BOSCO	I PRATI	L CENTOCELLE
H_{bld}	16.50	15.95	19.52	15.00	19.50	11.60	19.50	25.50	19.50	14.67
ρ_{urb}	0.52	0.62	0.33	0.20	0.80	0.64	0.43	0.43	0.49	0.34
VH_{urb}	3.26	1.95	1.63	1.04	2.98	2.18	1.71	1.68	1.43	1.35

This objective relies on two assumptions: firstly, it is more useful to understand the microclimatic behaviour of homogeneous urban fabrics than the microclimate of a single canyon, which can be affected by several random micro-scale variables; secondly, the canyons' SVF or H/W ratio are not suitable to describe adequately an urban form. In fact, very different urban textures can have the same H/W street ratio.

The approach of the study is parametric so to compare the microclimatic performance of each case study by only focusing on their morphologic characteristics. To this end, the Urban Weather Generator (UWG) tool was chosen to calculate the urban heat island effect in each urban texture (Bueno, Norford, Hidalgo, & Pigeon, 2013). The UWG calculates the average temperature increase in the urban canopy layer through a set of urban parameters, as input, that describe all the factors involved in the phenomenon, urban morphology included. The input weather data for the calculation were those of Rome-Ciampino airport. All the non-morphological parameters were kept constant at the average urban values, whereas the morphological parameters were changed according to the different urban textures. The morphological parameters involved in the calculation were (Bueno et al., 2013):

- Average Building height (h_{bld}): the average building height in the urban area, normalized on the building footprint
- Site coverage ratio (ρ_{urb}): ratio of the building footprint to the site area.
- Façade to site ratio (VH_{urb}): ratio of the vertical surface area (walls) to the urban plan area.

These parameters describe the most important urban morphology characteristics involved in the urban heat island phenomenon. They are three independent parameters, which yield quite different values in the 10 case studies. Furthermore, these parameters are quite common in the urban planning profession and available in geographic information systems for several cities, so that they perfectly fit to the objective of this research. The case studies were Barceloneta, Ensanche, Marbella, Borrel y Soler, Raval and Gracia in Barcelona and Balduina, Don Bosco, Prati and Centocelle in Roma (figure 1). To the purpose of investigating the general trend of the UHI intensity in recurrent urban morphologies, the morphological singularities of each fabric were neglected and the resulting approximated model refers to the dominant form of each fabric sample. Homogenous

Figure 3. a) Monthly average UHI intensity in different urban textures, b) August and January daily maximum, minimum and average UHI in the different urban textures.
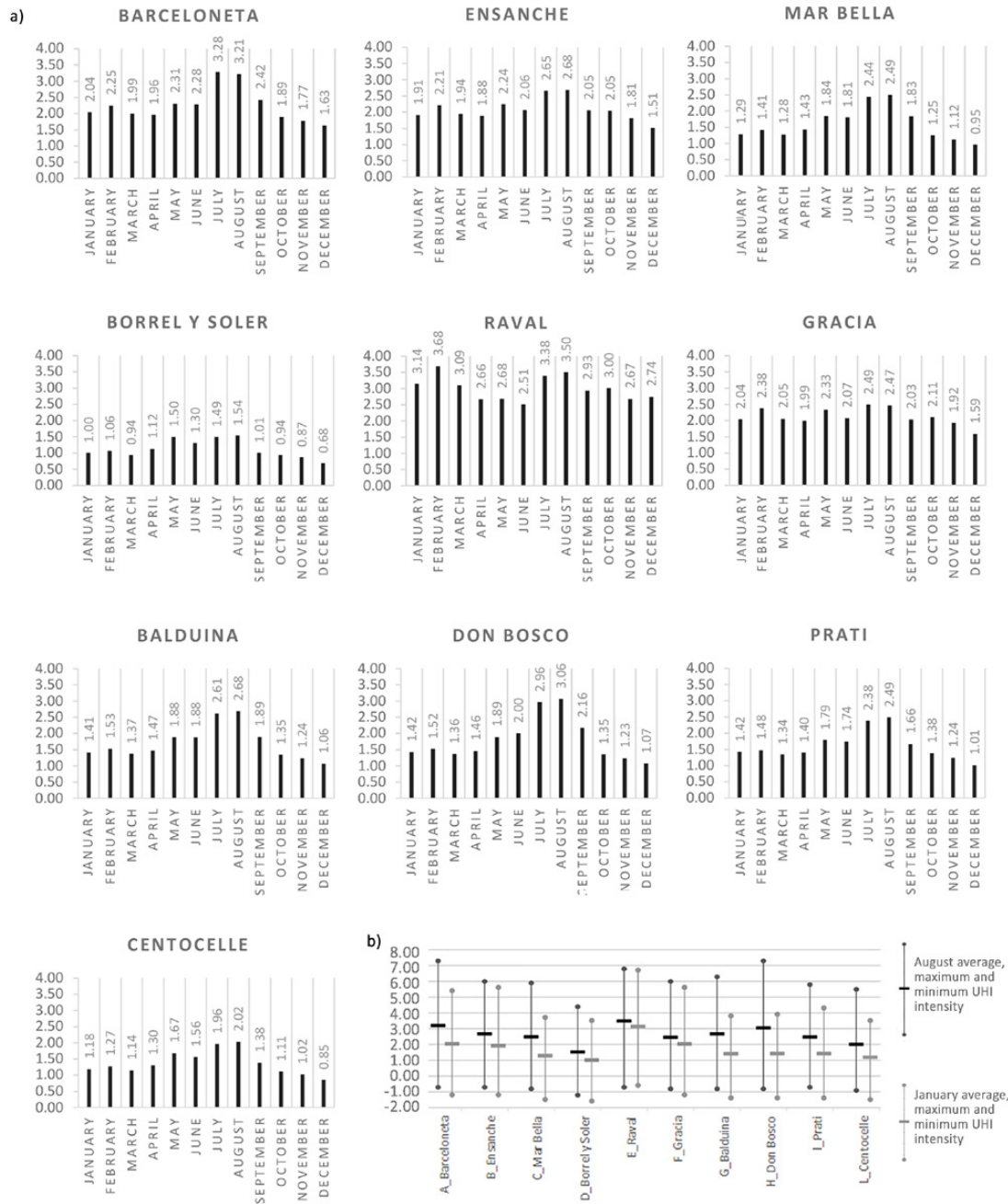
digital models were built following a "normalization and replication" approach (Zangh 2011), based on the repetition of the dominant building type in an urban grid structure similar to that of the real one. On these digital models, the morphological parameters were calculated (figure 2).

Average urban temperatures in the homogeneous urban textures were calculated with the UWG tool. The difference between the temperatures calculated with UWG and those of Rome Ciampino airport is defined as the average UHI intensity for each case study. Results were compared in order to highlight the difference in the average UHI intensity in each case study and the relationship between the UHI intensities and the urban morphological parameters.

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Results and discussion

The relevance of urban morphology on the UHI intensity has been confirmed; predicted temperatures show a significant difference in the monthly average UHI intensity according to different urban textures, both in winter and summer time. The difference in the monthly average UHI intensity between the most favourable and unfavourable urban morphology comes up to 2.6°C in February and 2.0°C in August (figure 1a). Both in winter and summer, the highest UHI intensity was in the district "Raval", with an average temperature increase of +3.5°C in August and +3.1°C in January, with respect to rural temperatures. Raval was the case study with high value of both the site and façade coverage ratio (0.8 and 2.98 respectively).

Actually, the site coverage ratio turned to be the crucial parameter to the UHI intensity; its value (from 0 up to 1) is, in effect, inversely proportional to the street network's sky view factor. Therefore, in those urban textures where the building footprint fill the most part of the space, the cooling potential at night is significantly reduced and the UHI intensity is steadily high during the year. The temperature gap between the Raval and less dense urban fabrics was particularly evident in the winter. Probably it happens because in the cold season the most important source of urban heat is the anthropogenic one due to buildings' HVAC systems, rather than the solar radiation absorption; so the denser the building texture is, the less this heat disperses back to the sky. Conversely, in the summer, the solar radiation absorption becomes more relevant. The most unfavourable urban textures, with respect to UHI intensity in summer, were in effect "Raval" and "Barceloneta", with highest values of façade to site ratio (2.98 and 3.26, respectively). In Raval the average daily maximum UHI intensity in August was 6.8°C and in Barceloneta 7.3°C (figure1b). Urban areas with high value of façade to site ratio are dense urban structures, composed of a building type that maximizes the building envelope exposed to the outside environment, compared to their volume. These building types optimize the solar radiation absorption at the facades. In summer, thus, this may lead to higher air temperature especially at night, because the surface cooling process is longer with respect to a more compact urban fabric. Another case study with strong UHI intensity during summer months was the district "Don Bosco" in Rome. In this texture, in August, the average UHI intensity was 3°C, with a daily maximum intensity of 7.3°C. Don Bosco presented quite higher summer temperatures compared to Balduina and Prati, which have similar values of site coverage ratio and façade to site ratio. Don Bosco is the case study with greater average building height; it means that the surfaces' sky view factors are on average lower compared to other textures with the same values for the two remaining parameters. Consequently, high values of building height worsen the effect of the other two parameters, which mostly govern the phenomenon intensity. Finally, it is evident the gap between Borrell y Soler's temperatures and all the other case study; Borrel y Soler was, in effect, a scattered low density urban texture, with the lowest values of both coverage ratio and façade to site ratio.

Figure 3b compares the daily maximum, minimum and average UHI intensities in August and January for each urban texture. The microclimatic performances of the different urban textures were generally variable during the year, with the exception of few cases that preserved a similar UHI intensity in both the summer and winter. The highest January temperatures occurred in the fabrics with higher value of coverage site ratio (ρ_{urb}), as Raval (+3.68°C), Gracia (+2.38°C), Barceloneta (+2.25°C) and Ensanche (+2.21°C), which had a purb value of 0.8, 0.64, 0.52 and 0.62, respectively. In August, instead, high UHI intensities occurred even in less dense urban textures. Two cases stand out, Barceloneta and Don Bosco, due to the very high UHI intensity in summer compared to winter one. They were the case study with the highest "facade to site ratio" among the others (Barceloneta, VH_{urb}=3.26) and highest "building average height" (Don Bosco, H_{bld}=25.5).

From the same diagram, we can deduce the UHI range in the different urban fabrics in Mediterranean climate. The monthly average UHI intensity varies from +3.5°C in summer in the Raval to +1°C in February in Borrel y Soler, and the maximum daily UHI intensity varies from +7.3°C both in Barceloneta and Don Bosco in summer to +3,5°C in winter in Borrel y Soler; the maximum daily UHI intensity always occurred during the night. The values are in line with the previous works on UHI in Mediterranean context (Mat Santamouris, 2007).

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Figure 4 finally illustrates the relationship between the two main morphological parameters and the heat island intensity, in order to provide an interpretation tool of the microclimatic behavior of different urban textures in Mediterranean city. The relation between "Average building height" and UHI is not presented, as it resulted to be not significant. The average height hence can be considered a subsidiary parameter with respect to the "site coverage ratio" and "façade to site ratio". In effect, the morphological parameters result to have a different significance with respect to the UHI intensity. Whilst the "site coverage ratio" rules the general trend, the other two parameters mostly contribute to the accuracy of the prediction.

In figure 4a, two hypothetical urban textures represent a morphological interpretation of the relevance of the "site coverage ratio" parameter: as ρ_{urb} increases so does the building's footprint, keeping constant the other two parameters. Therefore, the texture becomes much denser and the surfaces' sky view factor rapidly decreases. Thus, it is readily noticeable that an increase in this parameter entails a corresponding one in UHI intensity, over all the seasons. This is particularly evident in the winter and the annual average trends (Fig 4 a), in which the relationships between "site coverage ratio" and UHI intensity are linear and quite accurate (r^2= 0,88 in the annual average and r^2= 0,86 in winter average). The summer trend is less clear and the relation between "site coverage ratio" and summer UHI intensity less accurate (r^2= 0,57). In the summer microclimatic performance, a second parameter gains more importance, the "façade to site ratio", even if the "site coverage ratio" preserves its role. In figure 4b, two hypothetical urban fabrics are drawn with the same" building average height" and "site coverage ratio", but different "façade to site ratio"(VH_{urb}=1 for the left one and VH_{urb}=2 for the right one). The one with greater VH_{urb} value presents a denser street network and a larger amount of vertical surfaces exposed to solar radiation; it results in a worse microclimatic performance in summer with respect to UHI intensity. Figure 4b shows that the trend between summer UHI intensity and "façade to site ratio" is quite reliable (r^2= 0,72).

To understand these conclusions, it is better to analyse a case study. As an example, the results are given for two urban fabrics that had similar value for the "site coverage ratio", close to 0,5: Barceloneta (A) and Prati (I). Conversely, they were quite different for the value of VH_{urb}, respectively 3.26 Barceloneta and 1.43 Prati. Barceloneta is a urban texture composed of tight slab housing, arranged in a very dense road network, which presents a" facade to site ratio" much higher than the compact court building type of Prati. As a result, in the chart which correlates the average UHI intensity to the "site coverage ratio", Barceloneta had an heat island intensity higher than Prati, as particularly evident in the summer trend. Higher summer temperatures occurred in Barceloneta because it had a greater value of "façade to site ratio", with the same "site coverage ratio" value than Prati. A similar interpretation is valid for Don Bosco (H) with respect to Balduina (G) or Mar Bella (C); these case study had a very similar "facade to site ratio" value, but Don Bosco showed, in the summer, higher heat island intensity than the average. The deviation of Don Bosco's "average building height" from the mean resulted, in fact, to be the greatest and this accounts for the worsened microclimatic performance of the fabric.

Conclusions

Results showed that air temperature substantially varies with different urban morphologies. The monthly average heat island intensity in Mediterranean climate ranged, in the summer, between +3.5°C in the densest urban texture and +1°C in February in the less dense. The average daily maximum intensity was in the range within +7.3°C in the summer to +3.5°C in the winter, always during the night. The results are in agreement with previous works. Many relations have been found between the morphological parameters and the heat island intensity, in order to provide an interpretation tool of the microclimatic behavior of different fabrics, in Mediterranean city. The set of simulations have confirmed the relevance of the morphological features in the formation of local urban microclimate, but with a hierarchy between the three morphological parameters.

In effect, the three morphological parameters result to have a different significance

Figure 4. a) Average UHI intensity (annual, summer, winter) in relation to texture's "site coverage ratio" b) Average UHI intensity (annual, summer, winter) in relation to texture's "façade to site ratio".
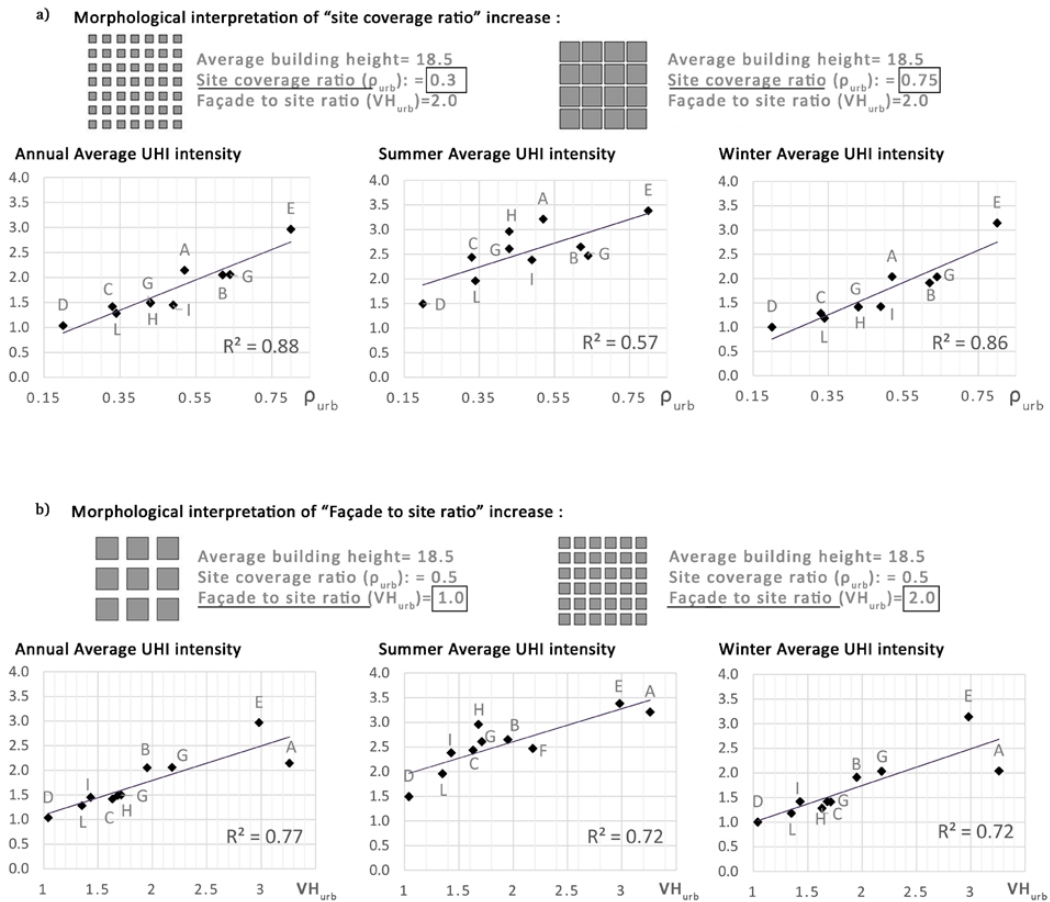
with respect to the UHI intensity. Whilst the "site coverage ratio" rules the annual trend, the other two parameters mostly contribute to the accuracy of the prediction for the summer heat island intensity.

The performances of the different urban textures were thus variable during the year, except from few cases, among which there was Raval, where in both the winter and the summer, the highest average temperatures occurred. Raval was effectively the case with highest "site coverage ratio", the most important parameters with regard to the urban heat island intensity throughout the year. When the buildings' footprint increases, the surfaces' sky-view factor rapidly decreases and, consequently, the cooling process slows down. The relevance of the "façade to site ratio" parameter in the summer was clear in Barceloneta case study, in which high summer temperatures occurred (+3.28°C) even if the value of site coverage ratio was close to the average. These kind of fabrics have a dense street network and a large amount of vertical surfaces exposed to solar radiation; summer solar absorption is thus optimized and therefore surfaces' overheating enhanced which results in higher urban heat island intensity. A similar conclusion can be drawn from the Don Bosco case study and the role of the "building average height" value. In the light of these results, it can be said that an increase in both "façade to site ratio" and "average building height" worsens the average UHI effect, which is mostly ruled by the "site coverage ratio".

More simulations and sensitivity analysis should be carried out to validate the prediction of the relationships between morphology parameters and the urban heat island intensity. Nevertheless, results so far demonstrate that the interpretation of urban morphology can be a useful tool to tackle the energy issue at urban scale. The knowledge of the microclimatic behavior of the different urban fabrics within the city, and their energy

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implications, allows determining the location of the most convenient mitigation strate-
gies, so to gain advantages at urban scale. Future implementations should delve into
the relationship between morphology, microclimate and energy performance at urban
scale, in order to develop design tools that can steer energy and retrofitting policies to-
wards more energy-sustainable cities.

References

Álvarez, J. R. (2013) 'Heat Island and Urban Morphology : Observations and analysis from six European cities', In *Proceeding of PLEA 2013: Sustainable Architecture for a Renewable Future*, Munich.

Bueno, B., Norford, L., Hidalgo, J., & Pigeon, G. (2013) 'The urban weather generator', *Journal of Building Performance Simulation*, 6(4), 269–281.

Cantelli, A., Monti, P., & Leuzzi, G. (2013) 'Numerical study of the urban geometrical representation impact in a surface energy budget model', *Environmental Fluid Mechanics*, 15(2), 251-273.

Coch, H. (1998) 'Bioclimatism in vernacular architecture' in *Renewable and Sustainable Energy Reviews*, 2(1-2), 67–87.

Coch, H., & Serra R.. (1995) *Arquitectura y energía natural* (Edicions UPC, Barcelona).

Cornoldi, A., & Los, S. (1982) *Habitat y Energía* (Gustavo Gili, Barcelona:).

Givoni, B. (1998) *Climate considerations in building and urban design* (Van Nostrand Reinhold, New York).

Higueras, E. (2006) *Urbanismo Bioclimatico* (Gustavo Gili, Barcelona).

Morganti, M. (2013). '*SUSTAINABLE DENSITY: Form, Built Environment, Energy*', Ph. D. Thesis, Sapienza University of Rome.

Morganti, M., Coch, H., & Cecere, C. (2012) 'The effect of urban obstruction in Mediterranean climates: built form typology, density and energy', *Architecture, City and Environment*, 19, 13–26.

Oke, T. R. (1987) *Boundary layer climates* (Methuen, London).

Oke, T. R. (1988) 'Street design and urban canopy layer climate', *Energy and Buildings*, 11, 103–113.

Olgyay, V. (1963) *Design with climate: bioclimatic approach to architectural regionalism* (Princeton University Press, Princeton, N.J).

Ratti, C., Baker, N., & Steemers, K. (2005) 'Energy consumption and urban texture', *Energy and Buildings*, 37(7), 762–776.

Res, C., & Unger, J. (2004) 'Intra-urban relationship between surface geometry and urban heat island: review and new approach', *Climate Research*, 27, 253–264.

Rode, P., Burdett, R., Robazza, G., & Schofield, J. (2014) *Cities and Energy: Urban morphology and heat energy demand* (LSE cities, London).

Salat, S. (2009) 'Energy loads, CO 2 emissions and building stocks: morphologies, typologies, energy systems and behaviour', *Building Research & Information*, 37(5-6), 598–609.

Santamouris, M. (2007) 'Heat Island Research in Europe: The State of the Art', *Advances in Building Energy Research*, 123–150.

Santamouris, M. (2014) 'On the energy impact of urban heat island and global warming on buildings', *Energy and Buildings*, 82, 100–113.

Stewart, I. D., & Oke, T. R. (2012) 'Local Climate Zones for Urban Temperature Studies', *Bulletin of the American Meteorological Society*, 93(12), 1879–1900.

Wong, N. H., Jusuf, S. K., & Tan, C. L. (2011) 'Integrated urban microclimate assessment method as a sustainable urban development and urban design tool', *Landscape and Urban Planning*, 100(4), 386–389.

Zhang, J., Heng, C. K., Malone-Lee, L. C., Hii, D. J. C., Janssen, P., Leung, K. S., & Tan, B. K. (2012) 'Evaluating environmental implications of density: A comparative case study on the relationship between density, urban block typology and sky exposure', *Automation in Construction*, 22, 90–101.

Toward an Asian Sustainable Urbanism: A Comparative Study of Model Eco-city Projects in Japan and China

Zhongjie Lin
School of Architecture, University of North Carolina at Charlotte

Abstract

The past decade has witnessed an accelerated growth of projects translating the Western concept of eco-city into practices of city building. Eco-city is now a global phenomenon, yet Asia sees particularly notable development with strong governmental interventions characterized by comprehensive national initiatives of model eco-city. In Japan, the central government launched an ambitious "Eco-Model Cities" scheme at the 2008 G8 Summit, and has by far designated twenty-three Eco-Model Cities, ranging from major cities like Kobe to small towns like Minamata. Meanwhile, a massive eco-city movement is taking place in China, where hundreds of towns have laid out their plans to become an eco-city. Chinese government took the lead by creating a few high-profiled demo projects such as Tianjin Eco-city. In both countries, the eco-city is promoted as innovative urban policy and planning concept under the overarching agenda of sustainable urbanization and restructuring of post-industrial urban economy.

This paper compares the planning and development of model eco-cities in Japan and China, using Kobe and Tianjin for case studies to examine their common and contrasting approaches to ecological urbanism, their respective design strategies and technological measures, the relationship between the eco-city building and local economic development, the roles played by the governments and the private sector in this effort, and the influence of such exemplary projects on the rest of the country. The comparative research method sheds light on several debates that we often encounter in the study of eco-city, say, between new town and retrofit, between top down directive and bottom up force, between eco-city as technology and as culture, as well as on the controversial role of "model" in contemporary urban forms. Through the analysis of the policies and implementations of model eco-cities in Japan and China, this paper aims to offer a critical insight into the changing ideas of urbanity in Asian society, and enhance understanding of the global issues of sustainable urbanism.

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Introduction

Although the concept "Eco-city" has been discussed and promoted for decades, it was in the past several years that we started to see an increasing number of large-scale projects translating it into practice. It refers to an ecologically healthy city that enables residents to live a high-quality life with minimal impact on environment, a goal accepted across many cultures. Eco-city is now a global phenomenon, yet Asia shows particularly notable development with strong governmental intervention, and witnessed ambitious, systematic national initiatives to build exemplary eco-cities. In Japan, the central government launched the "Eco-Town Project" initiative in 1997, then turned it into a more comprehensive "Eco-Model Cities" scheme announced at the 2008 G8 Summit in Hokkaido. So far twenty-three cities have been designated as Eco-Model Cities, ranging from large cities like Yokohama to small towns like Minamata. Financial incentives are provided to undertake major urban restructuring, low-carbon developments, and sustainable industries. The objective is to develop models of ecological urbanism that would subsequently influence the rest of the country.

Arguably the most ambitious eco-city program, at least in terms of the number of initiatives and scale of projects, is currently taking place in China, where more than 100 new eco-towns are under development and some 259 existing cities have declared their intention to become an "eco-city" or "low-carbon city" (China Urban Sciences Research Council, 2011). The central government has aspired to lead cities onto the path of sustainable urbanization by creating a number of high-profiled eco-city demo projects, such as Dongtan Eco-city (with technical support from the United Kingdom) in 2004 and Tianjin Eco-city (a joint venture with Singapore) in 2007. Eco-cities are promoted as innovative urban policy strategies and practices under the overarching paradigm of "ecological modernization", which seeks to de-couple economic growth from environmental degradation by incentivizing low-carbon, low-waste economic development.

754 This paper studies the planning and development of model eco-cities in Japan and China, using a comparative method to examine their policies and programs, design and development strategies, and technological specifics. It aims to extract some of the characteristics of contemporary Asian urbanism and map its path toward a low-carbon society. The comparison will mainly focus on the data of two model eco-city projects, Tianjin Eco-city in China and Kitakyushu in Japan, and address a few key issues of eco-cities in order to enhance the understanding of Japan's and China's policies and practices including their common, and contrasting, approaches to urban sustainability, the relationship between the building of an eco-city and local economic and cultural development, the roles played by the governments and the private sector in this effort, and the influence of these model eco-projects on the rest of the country.

The Rise of Eco-city Movements in Japan and China

Coined by Richard Register in *Ecocity Berkeley: Building Cities for a Healthy Future* (1987), the concept of "eco-city" originated from the fundamental objective of sustainability and the application of ecological principles on urban planning, design and management. The United Nations Earth Summit in Rio de Janeiro, 1992, and the resulted sustainable development programme *Agenda 21* formed the institutional background to support development of eco-city. Until the end of the twentieth century, however, there were still few practical examples of eco-city practices, and most of them were located in Europe and remained at modest scale, such as Schwabach, the historic town in Germany and BedZED, the carbon-neutral community in England. The beginning of the 21st century saw urban population surpassing rural population for the first time in human history. Asia emerged at the forefront of eco-city development because the region as a whole are rapidly urbanized, with a number of projects of international influence like Masdar in the United Arab Emirates and the Delhi-Mumbai Industrial Corridor supported with input from Japan (Joss, 2011).

Japan and China distinguish themselves among other countries in eco-city development, characterized by strong governmental intervention in this enterprise, and resulting in ambitious, systematic national initiatives to build exemplary eco-cities. In Japan, nation-

**Figure 1.** Tianjin Eco-City Master Plan and Concept of Neighborhood Unit.
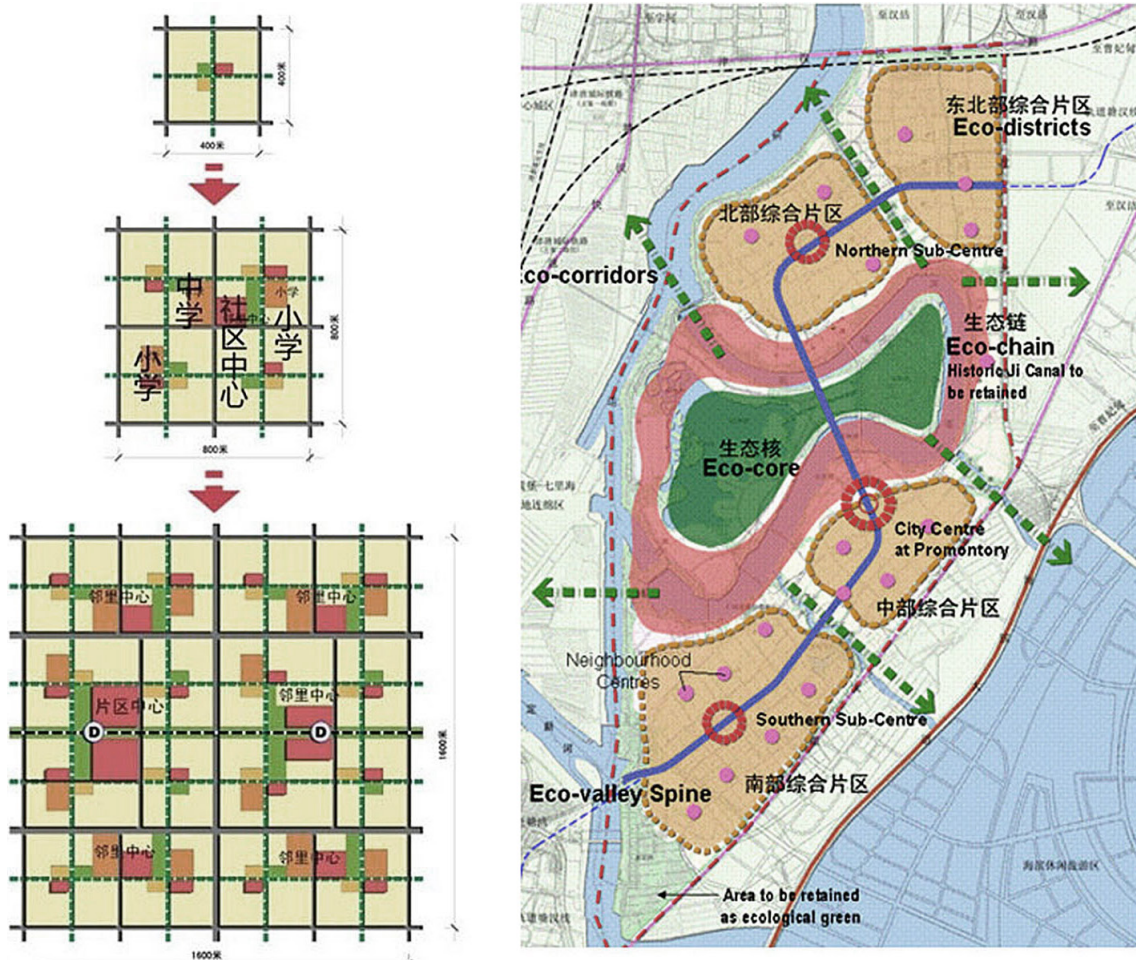
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al and local governments are spearheading the drive to bring together industry clusters to be more sustainable, which focus on energy conservation, material development and integrated waste management. The eco-city concept in Japan was formalized in 1997 with the passing of legislation that included a subsidy system for "Eco-Town" projects. The Ministry of Economy, Transportation and Infrastructure (METI) and the Ministry of the Environment (MoE) sponsor the program. The Eco-Town program focuses on making decisions at the local level and having industry and citizens work with the local government to make changes and to assist companies in declining industries such as steel and cement through the Zero-Emission concept (Global Environment Centre Foundation, 2005; Berkel, 2009). Kawasaki, Iida, Kani, and Kitakyushu were among the cities approved as Eco-Towns in the first year, and since then twenty-six cities have been included in this program. In February 2008, the Japanese government established a Cabinet-level Panel on Low-Carbon Society to study solutions to deal with global warming and a wide range of related issues, and to shift the country to a low-carbon society. One of the decisions made by the panel was the creation of "Eco-Model Cities." The panel chose model cities in order to promote drastic reductions of greenhouse gas emissions and encourage local communities to promote integrated efforts that incorporate existing knowledge and information into social and economic systems and make good use of local characteristics. Consequently, six cities – Yokohama, Kitakyushu, Toyoma, Obihiro, Shimokawa, and Minamata – were chosen from 82 total applications as the first group of Model-Eco Cities, which was announced at the G8 Summit at Hokkaido in 2008. Both the Eco-Town program and the Model Eco-City initiative address particular issues of Japanese society such as shortage of natural resources

Figure 2. Higashida Smart Community project in Kitakyushu.
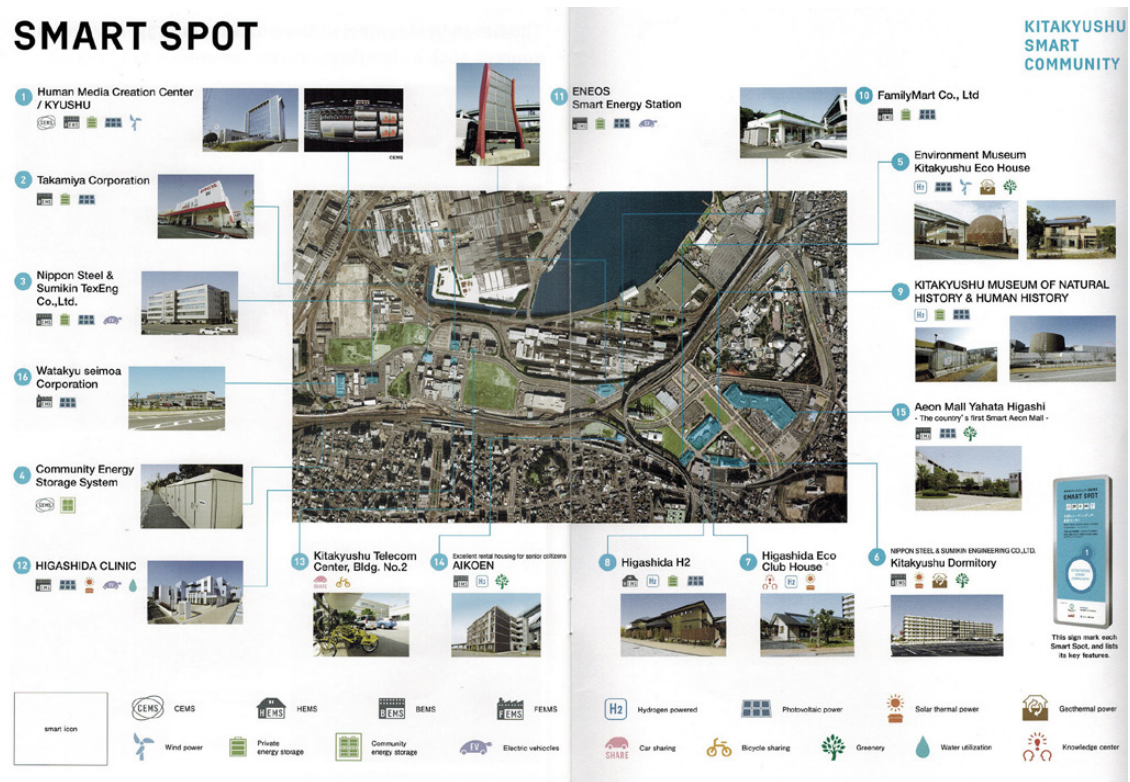
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and the aging population. The eco-city concept is also seen in Japan as an effective way to revitalize previously environmentally degraded cities, direct national government funding to the most effective areas, and deal with climate change in the face of the reduction of nuclear power as a result of the 2011 Fukushima disaster. The rise of trans-boundary environmental problems has also encouraged Japanese governments to work with their Asian neighbors, to share their know-how and promote low-carbon societies in the region.

China, on the other hand, is experiencing rapid and large-scale urbanization, and its urban environmental is facing unprecedented challenges under the dramatic growth. The government has recognized the urgency of coping with these challenges and incorporated agendas of developing sustainable cities since the nation's 11th Five-Year Plan, which announced a Renewable Energy Medium-Long Term Plan (Ghiglione, 2015). The 17th National Congress of Chinese Communist Party (CPC) in 2007 put forward the low-carbon eco-city model as an important part of the overarching agenda of "eco-culture" calling for the building of "a harmonious world characterized by sustained peace and common prosperity" (State Council of Information of China, 2005). More recently, "urbanization" was highlighted in the 18th National Congress of Chinese Communist Party, particularly advocated by Premier Keqiang Li, as the keyword of Chinese economic restructuring in the coming decade. Li called for leading the country's mass urbanization toward a sustainable path to create new venues for jobs, consumptions, and investments, to balance mega-cities with small towns, to correct economic disequilibrium between coastal and inland regions, and to improve energy efficiency and air quality. All these directives have encouraged local governments to pursue eco-city developments. By 2014, more than 230 cities have responded with initiatives to create eco-cities or low-carbon cities following the standards set by the Ministry of Environmental Protection (MEP) and the Ministry of Housing and Urban-Rural Development (MoHURD) (Ghiglione, 2015).

A comparison of the eco-city movements in Japan and China reveals both common approaches characteristic of eco-city development in Asia as well as fundamental differences in their respective policies and strategies toward urban sustainability. They

emphasize different aspects of eco-city, and involve the governments and the private sector for different roles in this effort, which lead to different model of eco-city. One of fundamental distinctions involves the models of retrofit versus new town development. Retrofitting existing cities appears to be the primary way of building low-carbon cities in Japan. It stands in contrast to China's approach of planning and building numerous eco-cities from scratch due to its explosive urbanization. Another issue to compare is the different approaches to eco-city between top-down and bottom-up. Both governments in Japan and China took the lead and played an important role in eco-city development, and the projects were carried through public-private collaboration. However, the roles that the national government, municipal governments, and private organizations play are different in Japan and China, and the public-private collaboration is implemented in various ways. In most cases, Japanese eco-cities followed a bottom up approach where it takes a good deal of effort on behalf of a city or town to apply for one of the national programs, and the projects move forward through cooperation between government, citizens and other stakeholders. Most of Chinese eco-cities, on the other hand, are top-down initiatives by the national or local governments that prioritize political influence and economic development, and carried out by developers associated to the government. Comparisons of these different models of retrofit versus new town and top-down versus bottom-up through the case studies of Kitakyushu and Tianjin Eco-city brings up more details of the policies, designs, and implementation of eco-city in Japan and China.

Kitakyushu and Tianjin Eco-city

Kitakyushu and Tianjin Eco-city are regarded as the "models" of eco-city development in Japan and China respectively. Both have a comprehensive ecological agenda and have established detailed environmental performance indicator system. Both receive substantial governmental support and enjoy extensive international exposure – Kitakyushu was among the first to be included in the Eco-Town program as well as in the Eco-Model City Initiative, and Tianjin Eco-city originated from the inter-governmental collaboration between China and Singapore. Both have developed incrementally for a number of years and seen the result of ecological planning. Tracking the transformation under the eco-city agenda, analyzing their spatial components, and comparing their indicator systems would provide insights into the different paths of sustainable urbanism in the two countries.

Kitakyushu is a city of approximately a million residents located in Fukuoka Prefecture in Kyushu. It rose as one of the early industrial bases of Japan in the early 20th century, and continued to develop developed through the post-WWII period. The growing manufacturing power, however, also impacted the city from the other side, making it one of the heavily polluted placed in the country. In the 1960s, the Women's Association in Kitakyushu launched the anti-pollution campaign, which pushed the local government to enact a Pollution Control Ordinance and the private sectors to sign on a series of pollution prevention agreements. The grass-root organizations continued to play an important role in the city's drive for sustainability, particularly after the emergence of Local Agenda 21 in 1996 (SCI, 2012). Despite all the top-down policies and incentives that the city has been readily received, Kitakyushu's pursuit of urban sustainability remains pretty much bottom-up practices and involved different walks of the city.

On the other hand, the Sino-Singapore Tianjin Eco-City (SSTEC), or simply Tianjin Eco-city, is a brand new town built from scratch. Although the eco-city is within the municipality of Tianjin, the third largest city in China, it is located in the seafront area of Binhai about 40 kilometers away from the center city. It was inaugurated in 2007 under the inter-governmental partnership between China and Singapore, which split the holding of this joint venture. The eco-city occupies a total area of 34.2 square kilometers and will be home to 350,000 residents when completely built in 2020. It aspires to be a "thriving city, which is socially harmonious, environmentally friendly and resource-efficient – a model for sustainable development" (Tianjin Eco-City website). The choice of the site with its majority being saline-alkali land and wasteland indicates the governments' awareness of ecological challenges and shrinking land resources and determination to tackle these issues. The parties creating this

project learned from the lessons of Dongtan, and were able to push forward the development with a comprehensive planning framework, higher density, yet less ambitious environmental agenda. By 2014, a 3km² pilot area has been completed with approximately 10,000 residents living there. In addition, about 1,000 businesses have registered in the Eco-city, attracted by some financial incentives. These are not impressive number as they are still far from the targets, nevertheless indicating the consistent progress of the project.

Planned by the government and developed primarily by state-owned companies along with their Singaporean counterparts, Tianjin Eco-city followed a top-down approach although the joint venture is operated like a corporation. The primary economic driver of such project is not incentives for environmental improvement, but rather financial return from land development. Most eco-city projects in China follow this path. They looked to Tianjin as a model for standards and implementation of planning and building an eco-city. They framed their indicators based on Tianjin's EPI system, and many sought international partners for importation of know-how and, more importantly, added brand value, such as Sino-Sweden Low-Carbon Eco-City and Caofeidian Eco-City (also with Sweden).

Environmental Performance Indicators

The Environmental Performance Indicators (EPIs) is an essential tool for planning and evaluating the eco-city. An EPI system defines a series of threshold or target indexes of social or environmental quality that the city intends to reach within a certain timeframe as the goals of sustainability. The approach to selecting indicators generally falls into two general categories, top-down or bottom-up. The top-down approach means policy makers define the goals and accompanying indicators, and the data collected is usually highly technical and requires experts to interpret. The bottom-up approach is community-based and involves extensive consultation with stakeholders to select appropriate indicators (SCI, 2012). Kitakyushu and Tianjin Eco-city represent two different approaches to controlling and measuring the development of eco-city. As a brand new city and a project controlled by the government, Tianjin followed a top-down method with a set of target indicators laid out by planning and technological specialists in Singapore and China. Kitakyushu's model is characterized by a model influenced both the top-down and bottom-up forces, and tends to more community-based and more flexible in responding to changing conditions.

Kitakyushu's indicators system is based on the so-called DPSIR (Driving forces, Pressures, State of the Environment, Impacts, Response) System. DPSIR is a framework for organizing information about the state of environment. It is a framework adopted by the European Environment Agency to assess and manage environmental problems by describing the interactions between society and the environment (SCI, 2012). The framework is composed of the following components:
- Driving forces of environmental change (e.g. industrial production)
- Pressures on the environment (e.g. discharges of waste water)
- State of the environment (e.g. water quality in rivers and lakes)
- Impacts on population, economy, ecosystems (e.g. water unsuitable for drinking)
- Response of the society (e.g. watershed protection)

Some limitations have been identified from past practices of the DPSIR system. For example, the system does not capture the complexity and dynamics of causes and effects of the problem. Therefore, Kitakyushu city has revised the DPSIR into a more community-driven system by adding new elements that reflect the changes in the environmental systems and making it more relevant for the local conditions of Kitakyushu itself as well as the Asian cities that were included in the Kitakyushu Initiative. The result is a set of indicators reflected in the table.

These Indicators were incorporated into the Kitakyushu Green Frontier Plan. Among other goals is a clear target of 50% CO_2 reduction by 2050 compared to the level in 2005, expecting 40% economic growth in the same period. In addition, the plan also calls for the reduction of CO_2 in the entire Asian Region equivalent to 150% of Kitakyushu's own emission. The mid-term goal, aiming for 2030, is to reduce the city's carbon emission by 30% based on the figure in 2005.

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Table 1. KPIs of Kitakyushu. Source: City of Kitakyushu, Kitakyushu Eco-Future City Plan, 2012.

No.	KPI Area and Detail	Indicative Value	Time Frame
I. Environment			
1	Carbon emission	11.8million ton CO_2 (25% cut based on 15.6 million in 2005)	2025
2	Generation of renewable energy	730,000KW (up from 40,000KW in 2010)	2025
3	Reduction of carbon emission with green Transportation system	2,362 ton CO_2 (29% cut based on 3,315 ton in 2011)	2025
4	No. of strategic international cooperation projects	10 (up from 3 in 2010)	2025
5	No. of international environmental trainees accepted	3,000 in 2021-2025 (up from 2,077 in 2006-2010)	2025
6	Bio-diversity	Zero loss of species in protected area	2025
7	No. of people participating in eco-tours	1 million (up from 100,000 in 2010)	2025
8	Amount of lithium-ion battery recycled	25,000 ton (25% of Japan, up from zero in 2010)	2025
9	Solar panel system recycled	80MW (up from zero in 2010)	2020
10	Household waste generation and recycling rate	450g/household (down from 506g in 2009), 40% recycled (up from 30.4% in 2009)	2025
II. Responses to Aging Society			
11	Citizens who feel the efforts of health promotion have been enhanced	30% (up from 26.7% in 2010)	2025
12	Citizens who feel the efforts of regional medical (home care, etc.) have been enhanced	20% (up from 15.9% in 2010)	2025
13	Proportion of elderly people feeling their own health as "good"	50% (up from 38% in 2010)	2025
14	Employment of elderly people	25% (up from 20% in 2010)	2025
15	Citizen feeling the increase of a network of mutual support	25% (up from 20% in 2010)	2025
16	No. of schools supported by the business community	All elementary and middle schools (up from zero in 2011)	2025
17	Proportion of parents feeling support by people in the region	70% (up from 52.2% in 2010)	2025
III. Others			
18	Support of reconstruction of Great East Japan Earthquake disaster area using the outcome of Kitakyushu smart community	Consultation is being conducted	immediate
19	Total floor area of the data center facility	50,000 m^2 (up from 15,000 m^2 in 2011)	2025
21	No. of contracts of international business projects at Asian Low-Carbon Center of Kitakyushu	A total of 100 by 2025 (only 1 in 2010)	2025
22	Technology and know-how related to water supply and sewage to be exported abroad	6% share of the projected 31 trillion yen business of water treatment	2025

Compared to Kitakyushu's model, Tianjin Eco-city's Key Performance Indicators System is more straightforward. This set of KPIs was developed in April 2008 based on the current Chinese national standards and best practices in Singapore. The framework includes 22 quantitative indicators and 4 qualitative indicators. The qualitative indicators appear to be general expectation without operational guidelines such as "maintain a safe and healthy ecology through green consumption and low-carbon operations," while the quantitative ones contain concrete criteria. The quantitative KPIs are grouped into four categories: natural environment, man-made environment, life style, and economy. A number of them represent standards that should be followed from the beginning, some other are expected to realize by 2013, and the rest are set as goals for 2020.

Within these KPIs are some standards that represent notable improvement from existing practice, such as preserving wetland, making tap water potable, and demanding all constructions to meet China's Green Building standards. It is also commendable that the eco-city set a concrete carbon density of 150 ton carbon emission per million dollar GDP,

Table 2. KPIs of Tianjin Eco-City. Source: http://www.tianjinecocity.gov.sg

No.	KPI Area and Detail	Indicative Value	Time Frame
I. Natural Environment			
1	Ambient air quality (days meeting National Ambient Air Quality II Standard)	> 310 / Y	Immediate
2	Quality of water bodies	Grade IV of China's national standards	2020
3	Quality of Water from Taps	Potable	Immediate
4	Noise Pollution Levels	Satisfy the stipulated standards	Immediate
5	Carbon Emission Per Unit GDP	< 150 ton/ $1 million	Immediate
6	Net Loss of Natural Wetlands	0	Immediate
II. Man-made Environment			
7	Proportion of Green Buildings	100%	Immediate
8	Native Vegetation Index	70%	Immediate
9	Per Capita Public Green Space	>12 m^2/person	Immediate
III. Life style			
10	Per Capita Daily Water Consumption	<120 L/day	2013
11	Per Capita Daily Domestic Waste Generation	<0.8 kg	2013
12	Proportion of Green Trips	90%	2020
13	Overall Recycling Rate	60%	2013
14	Access to Free Recreational and Sports Amenities	< 500 meter	2013
15	Treatment of hazardous and domestic waste	100%	Immediate
16	Accessibility	100% barrier-free access	Immediate
17	Services Network Coverage	100%	2013
18	Proportion of Affordable Public Housing	>20%	2013
IV. Developing a Dynamic and Efficient Economy			
19	Usage of Renewable Energy	>20%	2020
20	Usage of Water from Non-Traditional Sources	>50%	2020
21	Proportion of R&D Scientists and Engineers in the Eco-city Workforce	> 50 /10,000 workforce	2020
22	Employment-Housing Equilibrium Index (residents employed in the Eco-city)	> 50%	2013

and a goal of 90% green transportation. There are, however, some mediocre numbers. For instance, the renewable energy would account for only 20 percent of the total energy consumption by 2020, compared to China's national plan that requires 15 percent for renewable energy by 2015. Another KPI call for 20% of residential development to be subsidized affordable housing, but the number of affordable housing units in Tianjin has been around 50% of the total new housings since 2011 (Sina News, 2011).

It is neither simple nor very meaningful to compare the individual indicative values of the two cities' indicators system due to their different stages of economic and social development and the different emphases of eco-city agendas. However, it is illuminative to compare the set of data they chosen to include in their respective evaluation system as they indicate their understanding of the eco-city from their respective social contexts. Kitakyushu's system emphasizes reduction of carbon emission and economy of recyclability. Not only is there a firm target of carbon emission for the city in general, each district and many manufacturers have set a mission of carbon emission (Kitakyushu Green Frontier Plan, 2011). In addition, a subset of the indicators is dedicated to the goals of dealing with issues related to the aging society, which is not only a challenge to Kitakyushu, but one facing Japan in general. The populations in many Japanese cities, including other eco-model cities like Kobe, are declining, with young people moving to the country's few mega-cities (Tokyo and Osaka) for better job opportunities and the elderly left without sufficient care. A major objective of the eco-cities in Japan is to strike a balance between creating dynamic economy, through the development of recycling industries among other strategies, and enhancing social sustainability through redistribution of resources. The fact that the evaluation of social sustainability is based on the sur-

Figure 3. Bike lanes in Kitakyushu.

vey of degrees of satisfaction among residents also demonstrates that bottom-up force plays an important part in shaping the eco-city agenda.

In contrast, the indicators and means of evaluation characteristic of Tianjin Eco-city's KPI system appears to be more objective and technical, indicating characteristics of a top-down approach. As a brand new city, SSTEC focuses on attracting population and businesses through promoting a higher standard of living environment and unique opportunities. Even though urban population in China is growing dramatically, SSTEC is still facing fierce competition with many other new cities across the nations as well as those established urban centers. Economy assumes a high priority in the eco-city development as the administration shrewdly chose the indicators that could help most in enhancing the eco-city's competitive advantage without committing to some high-expense sustainable items. Some scholars also noted that the real estate sector has a lot of say in the direction of eco-city development. Developers view the concept of eco-city as a selling point and associate them with such values as "luxury" (Springer, 2012). Social equality is marginal in SSTEC's agenda, and it is not surprising the affordable housing accounts for much lower percentage than the average level in the city of Tianjin.

Figure 4. Urban Space in Tianjin Eco-city.

Conclusion

The concept of eco-city is changing the way cities are being built and resulting in new urban landscapes in Asia. It is applied in projects of different scales and in different urban setting such as greenfield projects or retrofit of existing cities. There is no one-size-fits-all formula. Differences in political system, economic conditions, and geographic characters necessitate different approaches to eco-city, as this comparative study reveals.

Japan and China represents two important models of implementing an eco-city. Eco-cities in Japan have a grassroots origin. Organized around national government's legislation and incentives, efforts within Japanese towns and cities are often driven by the local government, industry, and citizens, and involve support of the NGOs. As a result, Japanese eco-cities have a clear focus on citizen involvement and initiatives, as well as strong awareness of recycling and other environmental practices. The "Three R's: Reduce, Reuse, Recycle" is the principal theme for most of Japan's eco-town projects. In contrast, eco-cities in China are characterized by a top-down process. The central government made the policies and created the standards of eco-city, and the local governments and state-owned corporations took charge in implementing the large-scale projects, expecting financial returns from the development of land. Participation takes place amongst political and economic elites but does not involve communities. There seem to be an assumption that a sustainable lifestyle could be built into the city along with the introduction of recent technologies, which often turn out to be a naïve conception.

There are things that these two different models can learn from each other. Japanese cities could benefit from some experience of Chinese counterparts in stimulating economic vitality through the eco-city initiatives. Chinese governments, on the other hand, should investigate the means to bring the communities into this effort as a stakeholder, and enhancing the measures of sustainability with micro-scale interventions. As other scholars noted, Tianjin represents a unique position and possesses many advantages as a demo-project that other cities do not have. For example, government-sponsored low-carbon industries, such as film animation and environmental technologies, are encouraged to relocate to Tianjin eco-city. Other eco-cities will not have the same level of investment or national government support, and their success will depend much more upon how the market perceive a potential environmental premium (Flynn, 2012). In addition, the urban sprawl and massive new town building that have been going on in China for decades will likely slow down in a few years as land resource becomes limited and cities becomes too large to be efficiently manage. Should this be the trend, Japan's approach to retrofit eco-development within the existing cities would represent more valuable experience for Chinese governments that continue to pursue forms of eco-city.

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References

Baeumler, A. et al. (2012) *Sustainable Low-Carbon City Development in China* (The World Bank, Washington DC).

Berkel, Rene Van, et al. (2009) 'Industrial and Urban Symbiosis in Japan: Analysis of the Eco-Town Program 1997-2006', *Journal of Environmental Management* 90, 1544-1556.

China Urban Sciences Research Council (2011) *Report of China's Low-carbon Eco-city Development* (Beijing: China Architecture & Building Press).

City of Kitakyushu (2012) *Kitakyushu Eco-Future City Plan*.

Flynn, A. (2012) *Eco-Cities in China* (Cardiff Case Studies, Geography).

Ghiglione, S. and Larbi M. (2015) 'Eco-Cities in China: Ecological Urban Reality or Political Nightmare?', *Journal of Management and Sustainability* 5:1, 101-114.

Global Environment Centre Foundation (2005) *Eco-Towns in Japan: Implications and Lessons for Developing Countries and Cities* (GEC).

Joss, S. et al (2011) *Eco-cities – A Global Survey 2011* (University of Westminster).

Li, Y. et al. (2012) *Essential Building: The Emergence of Low Carbon Cities in Post-Industrial Urban China* (Institute for Building Efficiency, Washington DC).

Low, M. (2013) 'Eco-Cities in Japan: Past and Future', *Journal of Urban Technology* 20, 7-22.

Register, R. (1987) *Ecocity Berkeley: Building Cities for a Healthy Future* (North Atlantic Books, Berkeley).

Rowe, P. (2005) *East Asian Modern: Shaping the Contemporary City* (Reaktion Books, London).

State Council of Information of China (2005) 'White Paper: China's Peaceful Deveopment Road'.

Secretariat of the Kitakyushu Initiative Network (2010) *Kitakyushu Initiative for a Clean Environment: Final Report* (Institute for Global Environmental Strategies).

Sina News (2011) (http://news.dichan.sina.com.cn/2011/02/14/275182.html) accessed Dec. 14, 2012.

Springer, C. (2012) 'Directing the Demographic of the Sino-Singapore Tianjin Eco-City (SSTEC)' (http://ecocitynotes.com) accessed May 30, 2015.

Sustainable Cities International (2012) *Indicators for Sustainability: How Cities are Monitoring and Evaluating Their Success*.

Suzuki, H. et al. (2010) *Eco2 Cities: Ecological Cities as Economic Cities* (The World Bank, Washington DC).

Wong, T. and Yuen, B. (2011) *Eco-city Planning: Politics, Practice and Design* (Springer, Dordrecht).

The World Bank (2009) *Sino-Singapore Tianjin Eco-City: A Case Study of an Emerging Eco-City in China*.

Study Planned Economy Based Urban Plot Distribution and Urban Fabric: Casing Center District in Nanjing

Lina Zhang, Wowo Ding
School of Architecture & Urban Planning, Nanjing University, No.22 Hankou Rd, 210093, Jiangsu, P.R.China

Abstract

In the light of the research framework and the method of morphological analysis established by The Conzen School, the morphological analyses has executed in many countries, which continuously enrich and develop the urban morphological theories. It's important to note that the researches in these areas are all based on the following conditions: the private land ownership and land marketization. However, the land ownership system in China is considerable different. During the traditional planned economy period of China (1949-1977), the construction units were the allocated land under the state ownership and the sizeable landholders led to very different outcomes in the urban fabricated form. Subsequently, with accelerating the tendency of land market and activating land use right, the redevelopment of the allocated lands engendered a mass of the fragmented plots, which finally formed one of the main interferential factors on urban landscape management, and consequently resulted in the poor relationship between plot and its urban fabric.

This paper selected the center commercial districts in Nanjing as the sample area. Based on the investigation on the historical maps and construction documents from 1949 to 2010, this paper reviewed the plot transformation within this area. The historical investigation is aiming to develop the understanding on the following two aspects. The first is how the plots in contemporary Chinese city shaped. The second is if the research on the process of the plot transformation in this period of China could supplement the current morphological studies.

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Introduction

In China, there is a far-reaching social transformation in society since 1949 to now: from the planned economic system to the current market economic system. Those two kinds of political and economic system phases profoundly influenced the process of plot transformation in different way. During the period of the planned economic system, the plot pattern was shaped by the government control, such as free requisition or allocation. Until the period of the current market economic system, the trade of land-use rights has just been permitted. Comparatively, it is shows, in the previous researches of urban morphological studies, that the plot redevelopment was all based on the background of the private land ownership and land marketization. Meanwhile, the morphological studies on the historical-geographical transformation also show that the plot transformation was much more characterized by consistency. Those means the diversity not only exist in different social economic systems but also huge in the different processes of plot redevelopment and the resulted plot patterns. In order to understanding the micro-urban morphology of the current Chinese city, both on describing the urban fabric and explaining its formation mechanism, it is inevitable that to have a clear understanding not only on plot patterns also the processes and characteristics of plot transformation.

Study on the historical-morphological transformation

The study of urban form, referred to as urban morphology, is characterized by a number of different perspectives. One attracted increased interest since the early 1980s has become known as 'Conzenian'. In Alnwick investigation in 1960s, Geographer M.R.G. Conzen, clearly put forward a tripartite division of urban form into ground plan (or town plan), building fabric and land utilization as basic factors of townscape (Conzen, 1969). Furthermore, He pointed out that what he termed 'systematic form complexes' had markedly different degrees of persistence: the urban ground plan almost always contributes the most to urban landscape character as it is most persistent, buildings contribute somewhat less, and land utilization the least of all, because they can change quickly (Conzen, 1988). According to this, the followed morphological analyses by scholars are mainly concentrated on ground plan, staying with three interlocking elements: street system, street-block and plots (or plot pattern), block-plan of buildings (Slater, 1990). By describing urban form at a number of levels of resolution, Conzenian method of urban morphological study, especially plan analysis, is well recognized as a fruitful approach to examining the transformation of urban form (Moudon, 1979; Kropf, 1993, 1996,Gauthiez, 2004).

More important than the division of urban morphological elements are the concepts Conzen developed about the process of urban development. By working on the historical maps in Alnwick study, the historic-geographical analysis showed how the layout of the town had come into existence and changed over time, and how the various components of that layout fitted together (Conzen, 1969). Clearly, by employing this method, an understanding of the historical evolution of the form in towns and cities can be developed, and the research result could inform the development of planning policy in many useful ways.

Inspired by the above theoretical contribution, some scholars apply this historical approach to the cities and their studies demonstrated that the urban landscape is historically stratified, especially in traditional towns. Among those studies, some researches paid more attention to reflecting the distinctive residues of past periods (Whitehand and Gu, 2007; Zhang, 2015). Some researches emphasized that the transformation of block and plots also was the important survey and suggested that the result of historical analysis will be meaningful to understand post-modern landscapes and the morphological knowledge could be applied to urban design practice (Panerai et al, 2003; Whitehand, 1992, 2009, levy, 1999; Siksna, 1997). Therefore, it is clear that in the field of study concerned with the urban landscape, understanding the historical transforming process of the morphological elements is the important approach in urban morphological studies.

However, despite the increasing amount of research on the changing physical form of Chinese cities, the researches on Chinese urban form has hitherto been more descriptive rather than analytical. Some scholars contributed on the historical evolution of the

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physical form (Yang and Xu, 2009), and a few works inspected the transformation of block, plot, building fabric in China and its particular features (Whitehand and Gu, 2007; Gu et al, 2008; Chen, 2012, Zhang, 2015). The reason is the research on the historical-geographical studies in China is handicapped by the lack of major cartographical sources of information used in the West, namely true ground plan showing streets, plots and building block-plans are rare (Gu and Zhang, 2014). It is only possible for the few lucky urban locations with enough cartographical sources to have a thorough research inspecting block, plot and building as an evolutionary process. This means, in order to have a comprehensive morphological research in China, a method to deduce the historical maps also need to be developed. In this paper we try to employ the method of plan analysis developed by M. R.G. Conzen to work for the historical map and investigate the evolutionary process under the Chinese social transformations.

Focusing on the plot level

In China, Compared with the current intense practices, the corresponding academic researches which support urban landscape formation lag far behind. In term of the facts that Chinese cities have been undergoing the tremendous changes and developments in the process of urbanization during last thirty years, some scholars and urban designers become convinced that the intense practice of urban construction gave rise to extremely intricate urban patterns (Gaubatz, 1999; Ma and Wu, 2005). While this paper argues that the practice of architecture and urban design is not the fundamental reason for the chaotic urban landscape. According to our research (Zhang and Ding, 2013), the performance of plot in irregular shape and multiplex boundary conditions in Nanjing profound influenced the urban physical form. It's quite different from the situation in many west cities. However, to have a clear explanation, we need to investigate how those plot patterns formed? We suppose that the role played by urban historical transformation should be emphasized.

The morphological element of plot is the pivotal link between research and practice. At the theoretical level, the physical framework of street, plot and buildings are identified as three basic morphological elements, and the plot level have both interrelationship with street and building. Meanwhile, at the practical level, land use parcel (plot) is act as the urban planning unit and at the same time as the site conditions influence building setting. As the former research has already show that the difference of plot pattern exists between cities, (Siksna, 1997; Zhang and Ding, 2013), the particular scrutiny of the historical-morphological transformation on plot level deserve to be carried out, in order to have a better understanding on its plot patterns.

As early as in 1859, in modern urban planning of Barcelona, Ildenfons Cerdà had revealed the typical plot type in modern capitalist society, namely equal division of plot in both size and shape (even equal division of blocks) which could offer the maximum support to the fair development in modern city. This case fully demonstrated the plot characteristics in private land ownership market. Since then, most of modern urban planning schemes emphases the equality of plot division on the level of land-use planning, which is the law of land-use planning under the condition of capitalist economic system. In the previous morphological researches, even there is no explicit statement about the social background of the private land ownership and land marketization, through their research content and expression, we can still realize the analyses on plot level were conducted in this context (Conzen, 1969; Siksna, 1997; Oliveira, 2013).

Nevertheless, the way of plot development in China has obvious difference with those in the main capitalist societies. Chinese Constitution clearly specifies that land is owned by the state. From 1949 to 1988, the developers won the occupancy of construction unit by land requisition with the approval of the government. After 1988, as the land-use right separate from the land ownership, land-use rights could be traded separately and the developer won land-use rights from land market. As can be seen, besides the factor of natural typography, the plot division process is subject to social factors. Among them, political and economic system deeply impacted on the plot division process. Since the founding of New China in 1949, the planned economy system operate nearly half a cen-

tury (40 years), and gradually transited to market economic system in the late 1990s. Accordingly, in modern city construction, the manner of land acquisition transited from free requisition or allocation into land auction. The different manner of the plot acquisition in China produced the plot patterns with significant morphological differences (Zhang and Ding, 2013). Such characteristics and differences of plot division process make it necessary to conduct further discussion.

Therefore, the research mentality as the following: first, investigate the cartographical sources related with the morphological element of plot in the research scope during 1949-2010; Second, try the best to distinguish the plot transforming process through the archives, including the approved plot distribution document, land utilizing situation map, and satellite image map in different period, in order to deduce the historical maps in phases; Third, check the change characteristics of street and plots in the process of transformation, and explore characteristics and laws of plot distribution under the planned economic system.

Morphological investigation

Morphological periods
This paper takes Nanjing city as the study case. The selection of the research area was based on two principal considerations. One is that the city has the construction history of 1800 years, which means as early as before the founding of New China, the status of plot division basis had been existed and plot redevelopment was available. The other is the fact of the only megalopolis in Jiangsu province with population of eight million and built-up area of 700 sq.km. by 2013 indicates that urban central area of Nanjing should has plentitude and adequate construction activities in modern urban period of urbanization process.

Historically, Nanjing experienced three historical periods: absolute monarchy rule before 1912; big upheaval and great transformation period also the end stage of semi-colonial and semi-feudal society during 1912-1948; the comprehensive modern city construction period after the founding of New China in 1949. After 1949, the political and economic system transformation process is as follows: 1949-1978, the period comprehensively implementing planned economy, include a special period of the Cultural Revolution during1966-1976 in which urban construction and development stagnated or even retrogressed; 1978-1992, the period of transition from planned economy to market economy, during which two important events happened, one is the Chinese Economic Reform since 1978[1], the other is Shenzhen Special Economic Zone became the pilot of land transfer in 1987 and the revision was enacted to Chinese Constitution and Land Administrative Laws in 1988, which determined the land-use right could be traded according to the laws; 1992-2003, the period of comprehensively setting up socialist market economy system; since 2003, the socialist market economic system has been gradually improved.

Hereby, based on the reform in political and economic system and land transaction policy, we focus on five time slices in order to understand the impact of different land transaction policy on plot redevelopment. The five morphological period respectively expressed the plot statuses as follows: In 1949, plot pattern when New China was founded; In 1977, plot pattern during the process of planned economy system (before reform and opening-up policy); In1988, plot pattern at the end of planned economy system; In 2000, plot pattern during high-speed economic development period under market economic system; In 2010, stable status of plot pattern after the high-speed economic development period under the market economy system. It is interesting to know that the morphological period partition is in concert with another two related researches (Xu, 2005; Zhang, 2015), which indicates that there is a certain correlation among political and economic system process, plot redevelopment process and urban morphological changes.

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[1]Although reform and opening up policy was implemented in 1978, due to the inertia in political system and mode of thinking, urban construction still follow the model formed in traditional planned economy.

Figure 1. The satellite image maps of research area in 1949, 1976, 1990, 2001, 2010.

Research area

The paper chose the urban central commercial district, Xinjiekou, as the research area. Xinjiekou district are located next to two urban main streets of 40 meter wide, which designed in the first modern city planning of Nanjing Capital Plan in 1929 and constructed during 1928-1937.

Since the previous studies shows that the updating of urban street system may proceed simultaneously in the plot development process and the updating of urban street system include: broadening of streets, creating the branch roads and dissolution of branch roads (Zhang and Ding 2013), the paper concentrated on the research area containing two continuous blocks. For the study of historical-morphological transformation in Nanjing, it is necessary exam two morphological level of street-block and plot, which is completely different from the situation in some other cities. For example, Sander's paper showed that, in the urban development process of Queensland over one and a half century, the morphological element of street-block is constant, no matter the plot redeveloped happened within the blocks (Sander and Woodward, 2015).

Cartographical sources investigation

After the founding of New China, the construction documents of Nanjing are all kept by the Nanjing Urban Construction Archives (NUCA). The way we worked was to retrieve one by one the construction archives within the scope of research area in order to obtain plot redevelopment information, especially the cartographical sources.

Construction archives kept in NUCA are recorded and filed with will organization by years. The archives documents input the project name, street, construction enterprise as main retrieval items. Among them, except street name those items have many changes during and after the construction. Therefore we choose street names as retrieval item in our research.

As we supposed, if we know all street names within research area from 1949-2010, then we could possibly retrieve all the plot developments. By comparing the street information in the historical map of Nanjing, we found and selected the maps of six historical periods respectively in 1946, 1967[2], 1973[3], 1988, 2000 and 2010, the street name information displayed can reflect dynamics and renames of all streets.

According to the result of retrieving street names, our research found a total of 44 construction archives (1949-2010), among which 39 effective construction documents can be matched with counterpoints on the map (Table 1). Besides the drawings, five satellite image maps could be employed for this research (Figure 1)

There is a point need to be mentioned about drawing the cadastral plans in the historical period. Due to finite precision in satellite image maps, it will not be employed for drawing block-plan especially in the earlier ages (Figure 1). Meanwhile, the satellite image maps do not show plot boundary line, thus satellite image maps will only be engaged to help infer the construction situation, and not be regards as the direct reference for drawing.

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[2]There is a need to specially increase the street name information in 1967, although the street system was consistent with that in 1973, almost all the streets were renamed due to the influence of the Cultural Revolution movement.

[3]Due to ten chaotic years during 1967-1977, the urban construction was almost stagnant or even retrogressive, so street in 1973 can represent the street status in 1977.

Figure 2. The example of plot boundary deduction.
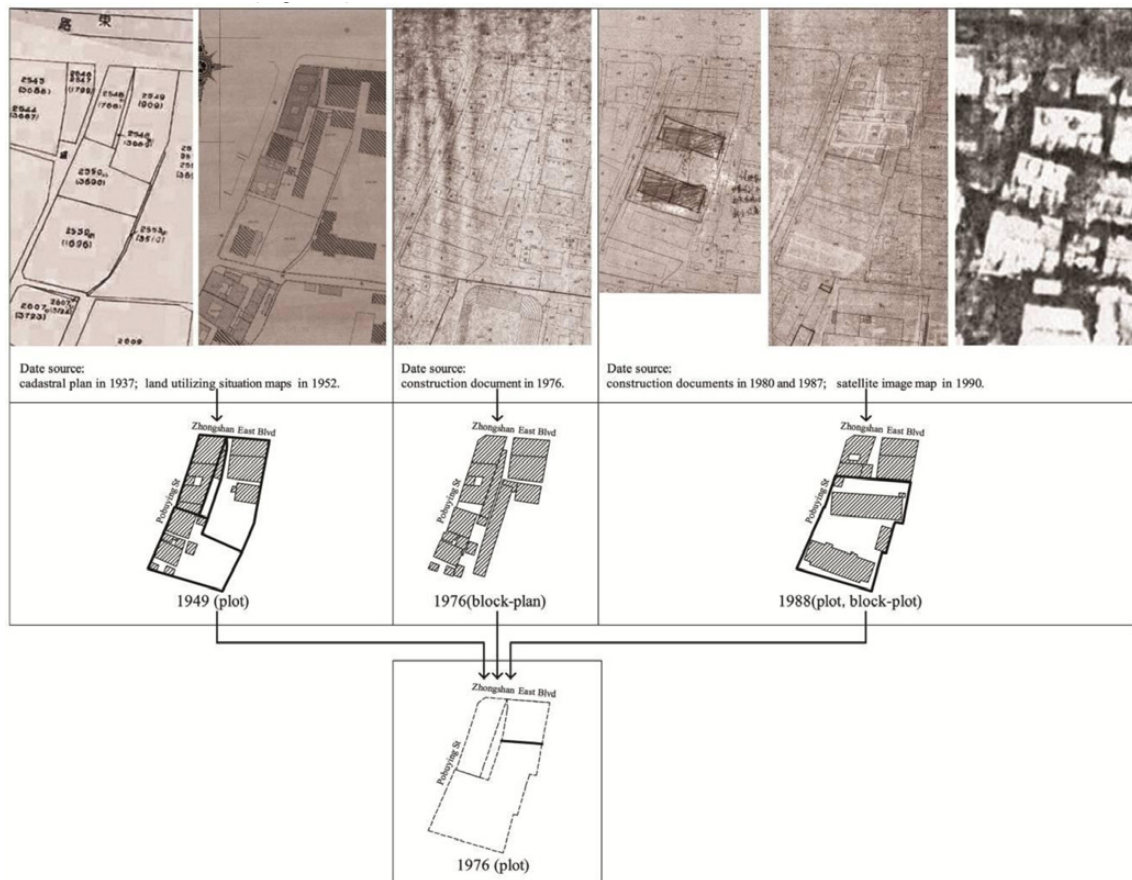
Plot Transformation

How to deduce the plot boundary

Among those 39 construction documents, there are mainly two kinds of maps, showing as the following (Figure 2-1, 2-2). They both display the block-plan of the buildings. The differences lie in that the one kind shows the boundary line of plots and streets, while the other kind shows only the boundary line of the streets.

Sorting those cartographical sources, it exhibits that in each morphological layer of street, plot, block-plan, there are some missing. One reason is that in some locations there are completely no maps, the other reason is that some maps do not have the information about plot. Table 2 shows how many cartographical sources from construction archives could be used for directly drawing.

It should mentioned that in NUCA the earliest construction document is in 1955. We use the cadastral plan in 1937[4], which is the nearest cadastral plan we could find, as the reference of the plot status in 1949, since there are almost no construction from 1937-1949 of the period of anti-Japanese war and from 1949-1952 of the economic recovery period after the founding of New China.

The inference methods for plots in each period are based on the cartographical maps. Mainly in the following two ways:

The first method is taking use of the former and later periods of the cartographical maps deduce the changes of plot boundaries. For example, comparing the information in 1949 and 1977, it is certain that the plot boundary has already changed, while it is can-

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[4]Date source: Academia Sinica Digital Center (ASDC).

Figure 3. Historical-morphological transformation from 1949-2010.

Figure 4. Plot redevelopment giving rise to the changes of the street system.

plot redevelopment giving rise to the changes of the street system
plot
street system
building update

N

0   40   80   120m
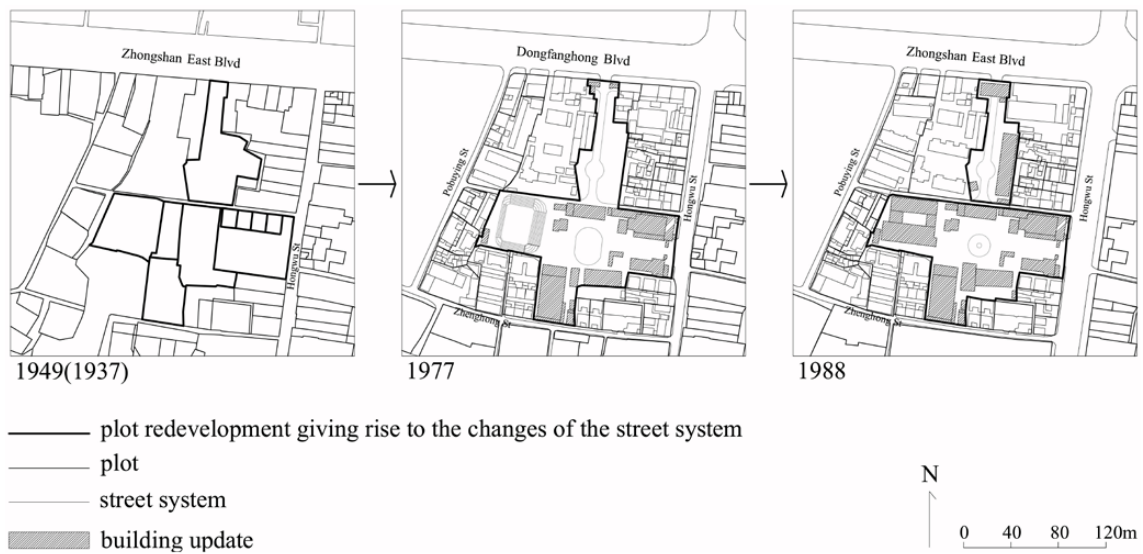
not be sure that how the plot transformed in 1977. The data in the former period of 1949 and the later period of 1988 helped to deduce the plot pattern in 1977. (Figure 3-1).

The second method is taking advantage of the construction information in between the research phases. For example, comparing the plot boundary in 1988 and 2010, it can be affirmed that the plot redevelopment has happened during those twenty years, while it is still not clear about the plot pattern in 2000. The data of construction documents in 1995 and 1996 helps. It is shows that for plot auction happened in 1995 and 1996 and finally it shaped into two new plots for high-rise buildings and the construction has finished in 2005, there for, the plot pattern in 2000 can be deduced (Figure 3-2).

Plot transformation until 1977, 1988, 2000, 2010

In this way, the plot transformation until 1977, 1988, 2000, 2010 could be deduced, exhibited in Figure4-1, 4-2, 4-3, 4-4, 4-5. The historical-morphological transformation process shows that great changes happened in street system (Figure 5). It can be seen that except the two main streets in research area, which finished the construction in 1937, the branch roads have changed greatly in many locations and many developing periods. It is necessary to sort the type of road changing. Figure 6 and table 3 illustrated the four different kinds of road changing. In case of new street emerging, it happened in two situations. Sometimes, with the plot split, the new street arose and located within the original plot. Sometimes, with the plot redevelopment, the new street formed just on the boundary of the original plot. Comparatively, in case of street dissolving, there are also two corresponding situations: the street transformed into the inner part of the plot, or the street disappeared into the plot boundary. Table 3 illustrate that there are two period of dramatic changing: from 1949 to1977 and from 1988 to 2000, and the street changes are completely different. During 1949 to1977, many new streets emerged in the location of plot boundaries, that means the insufficiency of the branch roads and at that time the street system cannot support the plot redevelopment. While the branch road dissolving during 1988 to 2000 reveals that in this period, the construction projects have a new requirement on plot size. Thus, along with the plot union, many branch roads dissolved, either transformed into the inner part of the plot, or disappeared into the plot boundary. Besides the above two kinds of changing in the street system, the road widening project was another kind of developing of street system, which is also another trigger of the plot redevelopment happened mainly in the 90s.

The interacting between street changing and plot transforming
    In this research, it is shows that the process of historic-morphological transformation is the interacting process of between the two morphological element of street and the morphological element of plot. The two cases below show the interactivity between street changing and plot redeveloping. The first case exhibit how the plot redevelopment led to the street changing. In 1977, Approved by the Nanjing Municipal Construction Commission, Nanjing Culture Commission employed several plots and built the culture institution of Workers Cultural Palace. The huge plot size occupied the about 13700 square meters and blocked the branch road which exist since 1937. In 1980s, the government vigorously encouraged the development of large-scale commercial project in Xinjiekou Central Area. The renewal constructions in the area exert pressure on the street system of 1977. The branch road occupied by Workers Cultural Palace resumed passing though in 1988 (Figure 7-1). The second case laid out that how road widening project trigger the plot transformation and plot redevelopment (Figure 7-2).

The urban physical form influenced by the process of plot transformation
    Not only the plot pattern, namely plot size, shape and location, impact on the physical form of the urban fabric (Zhang& Ding, 2013), the process of plot transformation also effect on it physical form. The constant churn on adjacent plot will give the influence on plot pattern. Meanwhile, during plot transformation and the process of plot union, the remained original building obstructed the unified planning inside the plot. Figure 8 shows the plot transformation and the plot development of a commercial department from 1949-2000.

Conclusion and discussion

    This research employed the Conzen's approach in Chinese city of Nanjing and exhibits the process of historical-morphological transformation from 1949-2010, especially focusing on the morphological level of plot. In the research area, the drastic changes on the morphological level of plot happened almost in each period. More than this, the process of transformation also happened on its street systems. The research exhibited the historical-morphological transformation in Nanjing of China and the local investigation enriched our understanding on the morphological processes.
    In a meaningful way, the research revealed the implicitly but effectively impact of political and economic system on the transformation of the plot pattern. With the transformation of political and economic system during 1949 to 2010, the manner of the plot development completely changed. In the planned economy period, the plot distribution policy of free requisition or allocation always make the plot development happened to the adjoining land or the relative idle land. In this way, the approved plot was glided to more fragmented and many new branch roads engendered to support the plot redevelopment. While, in the planned economy period, the manner of land acquisition transited into land auction and the approved plots are the results of the actively conscious planning. Meanwhile, the relationship between the plot and the street system is more structured. The differences and discrepancies in the way of land acquisition finally engendered the current plot pattern, which further works on shaping the urban landscape.
    In the end, our study suggests that the process of historical-morphological transformation deserves to be further excavated and the plot transformation during and after the planned economy period need to be more investigated. In our research, the period from 1988 to 2000 is the massive construction period, while the construction documents unfold some signs of deficiency. The construction documents in the north-west corner of the research area are still not abundant for study. The research of this paper inspected the interactive transformation process between the changes of street system and plot transformation. The further research about their interaction needs more investigated.

Acknowledgements

References

Abramson, D. B., (2008) 'Haussmann and Le Corbusier in China: land control and the design of streets in urban redevelopment', *Journal of Urban Design* 13 (2), 231-256.

Chen, F., (2012) 'Interpreting urban micromorphology in China: case studies from Suzhou', *Urban Design International* 16, 133-48.

Conzen, M. R. G. (1969) *Alnwick, Northumberland: a study in town-plan analysis*, Institute of British Geographers Publication 27, 2nd edn (Institute of British Geographers, London).

Conzen, M. R. G. (1988) 'Morphogenesis, morphological regions and secular human agency in the historic townscape as exemplified by Ludlow', in Denecke D. and Shaw G. (eds) *Urban historical geography: recent progress in Britain and Germany* (Cambridge University Press, Cambridge) 253-72

Conzen, M. R. G. (1981) 'The morphology of towns in Britain during the industrial era', in Whitehand, J.W.R. (ed.) *The urban landscape: historical development and management* (Academic Press, London) 87-126.

Gaubatz, P. (1999) 'China's urban transformation: patterns and processes of morphological change in Beijing, Shanghai and Guangzhou', *Urban Studies* 36, 1495-521.

Gu, K. and Zhang, J. (2014) Cartographical sources for urban morphological research in China. *Urban Morphology* 18(1), 5-21.

Kropf, K. S.,(2009) 'Aspects of urban form', *Urban Morphology* 12(2),105-20.

Kropf, K.S.,(2011) 'Urbanism, politics and language: the role of urban morphology', *Urban Morphology* 15(2), 157-61.

Ma, L. J. C. and Wu, F. (eds) (2005) *Restructuring the Chinese city* (Routledge, London).

Oliveira, V. (2013) 'Morpho: a methodology for assessing urban form', *Urban Morphology* 17, 21-33.

Panerai, p., Castex, J., Depaule, J. C., and Samuels, I.,(2003) *Urban Forms: The Deathand Life of the Urban Block*, (Architecture Press, Oxford, UK).

Sanders, P. S. and Woodward, S.A, (2015) 'Morphogenetic analysis of architectural elements within the townscape', *Urban Morphology* 19(1), 5-24.

Siksna, A. (1997) 'The effects of block size and form in North American and Australian city centers', *Urban Morphology* 1, 19-33.

Slater, T. R. (ed.) (1990) *The built form of Western cities: essays for M. R. G. Conzen on the occasion of his eightieth birthday* (Leicester University Press, Leicester).

Whitehand J. W. R. (2007) 'Urban morphology and policy: bridging the gap', *Urban Morphology* 11, 79-80.

Whitehand, J. W. R. and Gu, K. (2007) 'Extending the compass of plan analysis: a Chinese exploration', *Urban Morphology* 11, 91-109.

Whitehand, J.W.R., (2009) 'The structure of urban landscapes: strengthening research and practice', *Urban Morphology* 13(1),5-27.

Xu, N.,(2004) 'Study on urban transformation of XinJieKou district in Nanjing', unpublished master thesis, Nanjing University, China.

Yang, Z. and Xu, M., (2009) 'Evolution, plulic and design of center Pedestrian Districts in Large Chinese cities: A case study of Nanjing Road, Shanghai', *Urban Design International* 14(2), 89-98.

Zhang, J. , (2015) 'Urban morphological process in China: A Conzenian approach', *Urban Morphology* 19(1), 35-56.

Zhang, L. and Ding, W. (2012) 'Density, height limitation, and plot pattern: quantitative description of the residential plot in Nanjing China', ISUF 19th Conference, Delft.

Evaluation, financing, planning and design of contemporary urban interventions

Maria Rosaria Guarini, Nicola D'Addabbo, Marco Locurcio[*]
Faculty of Architecture, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy
Draco PhD School, "Sapienza" University of Rome, via A. Gramsci, 53, 00197, Rome, Italy

Abstract

The processes of transformation about urban settlements involve individual buildings, but also portions of consolidated urban tissue which characterize the structure and the form of minor historical centers as well as large urban centers. These processes are usually related to the objectives of enhancing the physical, economic and social aspects of the urban changes.

The technical, financial, procedural and managerial interventions should be developed and implemented focusing on specific objectives that justify the need and promote the opportunity to gain funding.

Nowadays funding performs a critical role to plan, design, implement, and possibly manage during operational phases. All the interventions must be coherent with the territorial "vocations" and satisfy the real needs of the individual and the whole community.

Over time, different assessment tools have been developed in order to check the congruence between choices about the "project" (technical, financial, procedural and managerial) and objectives of planning interventions, often related to the different funding opportunities for interventions.

This paper wants to build a framework concerning evaluation procedures that can be taken, even related to the different ways of financing. Moreover, the aim of this critical reflection is to highlight how the different choices about the project, operational phases and management must necessarily try to obtain the maximum benefit related to the least expenditure of resources, according to the objectives to be pursued with funding.

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*The work must be attributed in equal parts to the authors

Introduction

In the editorial comment of the first edition of *Urban Form*, Whitehand (1997) stated that interdisciplinary contributions are "particularly welcome" to support urban morphology. The journal was established in 1997 as a vehicle to grow awareness about the several research opportunities in different academic settings about urban morphology. It was a concrete attempt to overcome the compartmentalization of urban knowledge. Furthermore, it aimed to provide a different and more rational urban planning approach.

After 20 years, the contemporary urban condition is even more complex due to the scarcity of resources needed to solve urban emergencies. For this reason, the aim of this paper is to sustain studies on urban morphology and offer a different perspective through the analysis of economic forces that represent one of the most important osmotic factors in determining city transformation. It will be presented how maximization of holistic urban interventions can be better achieved through the consideration and evaluation of these economic forces.

Transformation processes related to single buildings or portions of the urban consolidated fabric, involving both smaller old town centers and bigger urban centers, are usually ascribable to local development goals that influence urban morphology. This is to reach the physical, economic, and social enhancement of the territories in which their influence acts (Guarini, 2010). Technical, financial, procedural and managerial solutions of interventions that are planned for the above fields, need to be elaborated and enforced in order to be coherent with both general and specific aims of protection, promotion and local development of the tangible and intangible[1] cultural heritage of these urban realities. In fact, only taking into account all these targets, needs and opportunities can be justified to gain the necessary financing to plan, design, realize and eventually manage activities that agree with territorial demands and are suitable to satisfy single and collective needs.

To correctly set an intervention of urban transformation, a deep knowledge in two fields is necessary:
- principles and methodologies to conform to, in order to preserve the features that characterized historical values and stratifications, related to single buildings or urban fabrics as a whole;
- instruments useful to endorse these elements throughout joined and integrated actions that concern managerial and financial support as well.

Referring to the Italian scenario and the interventions that could be realized in this context, the paper will present: i) the reason why single buildings or consolidated urban fabric inside old town centers need to be considered not only valuable but as well as resources of the territory; ii) how public and private real estate can be useful to satisfy collective needs; iii) the contemporary frame of potential financial channels; iv) a synthesis of the main techniques to express estimation and economic convenience evaluations (ECE) to define the elements for feasibility and sustainability; v) conclusion.

Values and resources within old town centers

Analyzing morphology of the historical urban centers and focusing on both single building and portions of consolidated urban fabrics levels, they need to be processed as holistic tools able to improve economic and social conditions of people. For this reason, they can be considered as:
- valuable elements, because they need to be protected and preserved for to the future generations;
- resources, since they trigger direct and indirect benefits for individuals and the collective society, connected to the potential uses.

The positive effects of these resources - merged with those about their conservation and promotion that can be generated in economic and social fields - need to be examined referring the use (or non-use) aspect of those resources by individuals.

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[1] UNESCO, Convention for the Safeguarding of the Intangible Cultural Heritage. Paris, 17/10/2003, Art. 2, par. 11.

In the economic field, the use value is directly linked to relationship between subject and goods. The majority of these goods are available, used and enjoyed by individuals (impossibility of exclusion), and they do not represent an impediment of use by other people (non-rivalry in consumption). Production and exchange activities linked to these goods lay in a market and price system in which the goods' effect on the individual cannot be stated (market failure). Indirect use values linked to this patrimony are determined by the activation of production chains. These chains need to be linked to the activities that can be developed according to goods' characteristics. Non-use values (indirect and external) are linked to the potential users' future possibility - even in absence of direct consumption – to benefit from the resource (Pearce and Mourato, 1998; Bariletti and Causi, 1998). In fact, the majority of single buildings and old town centers represent a cultural heritage characterized by non-reproducible goods, with:
- existence value, intrinsic in the same goods as fundamental expression of historic-
  chronological and civil statement that does not relate with the notoriety and the
  importance of the good;
- bequest value linked to the transmission of the good to future generations.

Values of both single and set of products, especially for real estate, history, architecture and/or archeology, are usually better understandable if related to cultural material and immaterial elements found in the surrounding area (context value). Due to restrictions imposed by specific legal references (community value acknowledgment), a consistent part of these goods is not exchangeable within the market ("pure" public goods) or it is exchangeable in a limited quantity ("mixed" public goods). So, from an economic perspective, even if they are classified as private goods, some of them can have the same characteristics of the public goods.

Therefore, during the planning phase, it is essential to not underestimate diachronic aspects related to: i) future use of those goods; ii) effects generated by the presence and the use of the set of goods - representing "preserved/renewed" patrimony without losing original features) - for life conditions of people in the same territory.

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Public and private goods and interventions

Interventions within dense fabrics concern actions related to both private and public goods. The Civil Code (Royal Decree n. 262/1942[2], and subsequent amendments thereto[3]) distinguishes state assets in two categories (Prete, 2010):
- state-owned properties; destined for the realization of public interest goals
  through their usage; legally subjected to public law;
- public assets; patrimonial goods used to realize a public interest with specific
  aims; using their economic utility (or their exchange value) they contribute to
  finance government spending related to the destination of the incomes obtained
  from their sale or use; legally subjected to private law.

From a functional perspective, public works (Chierchia, 2010) that relate to every intervention of the public sphere and are oriented to obtain - in the collectivity interest - a long-lasting modification in the physical world, can be classified as:
- public, those directed to satisfy collective needs in an undifferentiated way;
  considering them as useful means to achieve non-commercial or industrial goals
  outside of the perfectly competitive market;
- of public utility, those realized by private actors, too, that satisfy "individual interests
  related to general interests because of social reasons or connected to the general
  interest" (ibid.);
- of general interest, those related to technical plants and equipment that – although
  not strictly linked to the public administration (PA) - satisfy collective needs
  even if they are realized and managed by private actors.

[2]Regio Decreto n. 262/1942, "Approvazione del testo del Codice Civile".
[3]The following legislative references (including those listed in the tables) will always include subsequent amendments thereto without any further specification.

Public and private buildings that need to be requalified, enhanced or eventually realized within old town centers, together with the fabric itself, can be considered as elements that - both in their forms and functions - characterize the urban and territorial morphology (together with other spaces of social relation). Always considering an inter-temporal continuity dimension with peculiar elements that mark physical, productive and social aspects.

Therefore in this urban context, the action of local governments can be structured to coordinate the construction of an integrated tissue of collective services. According to contemporary needs, these services can improve life quality of citizens and at the same time they can represent the "high quality brand" of that context, sustaining and revitalizing all the original urban/regional peculiarities.

In this way, the interventions can be oriented (and financed) to support objectives like enhancing territorial peculiarities, touristic promotion, urban marketing, job growth, service and life quality improvement, promotion of new economic activities.

This means the activation of appropriate and integrated processes to increase the value of public and private assets and traditional production chains that require large investments.

An inadequate approach about these aspects could question the usefulness of the intervention or it could trigger further degradation processes within urban historical contexts. This deterioration could cause the alteration or total impairment of the cultural and historical heritage.

Public Administration needs to plan, organize, design, realize urban transformation activities – considering also the support of participatory tools for different stakeholders – by developing strategic plans to systematize integrated and synergic investments. All these plans need to look at existing relations and new ones that could be created between different institutions, as well as between public and private sectors (entrepreneurs, civil society representatives, individuals), in addition to the necessity of balancing financial and economic interests between different actors.

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Framework for Achievable Financial Support

In Italy, actions within integrated programs for public intervention, focused on the valorization of historical urban contexts, can be implemented – considering law indications and producing documentation for achieving financial targets – with economic support based on the following funding:
- For local development: they aim to reduce economic, social and territorial in
  equality between regions (regional politic or cohesion politic), and are allocated by
  the ongoing programming period (2014-2020), for the European level (European
  Structural and Investment Funds - ESI Funds) and the national level (FSC[4] - Cohesion
  and development fund)
- Ordinary or sectorial (defined by a multi-level institutional order: national, regional,
  provincial, local council): they are related to the supply of basic services such as
  transportation, education, healthcare, cultural heritage, etc.
- Additional or supplementary: they aim to support, at both European and national
  levels, the realization of interventions in sectors that need particular financing to deal
  with the lack of organized agencies, even for economic sphere, or unexpected and
  special events.
- Private, at the national, regional or local level:
  – activated by tax reliefs, insurance facilitations, other tools, to subsidize entrepre-
  neurs, non-profit organizations, or individuals
  – aimed to launch or sustain interventions through Public–Private Partnership (PPPs):
  contractual, institutional or for the valorization of governmental properties by disposal.

Furthermore, operational synergies are encouraged, following the guidelines for the integrated territorial development. This is to avoid the overlapping and lacking of integration

[4]Fondo per lo Sviluppo e la Coesione (FSC); http://www.dps.gov.it/it/politiche_e_attivita/Fondo_per_lo_Sviluppo_e_la_Coesione/

Figure 1. European Structural and Investment Funds (ESI Funds) Regulation.
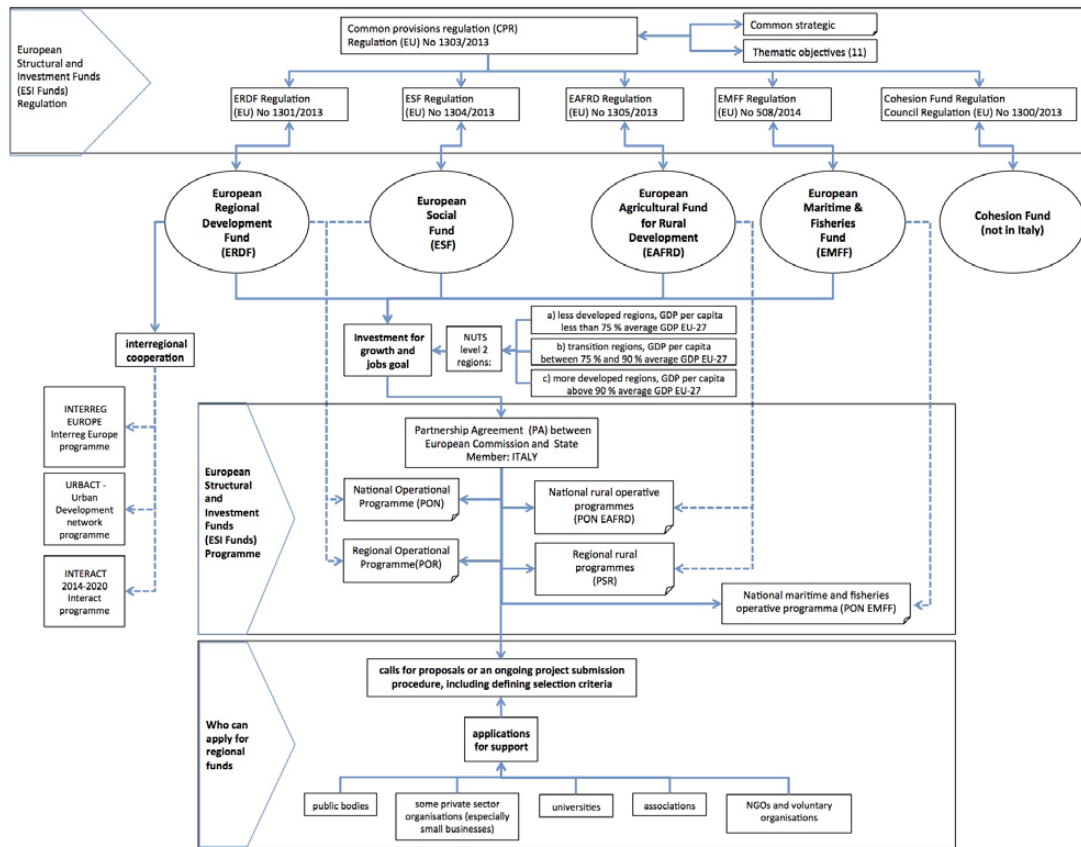
between different policies. In this way it is possible to enhance vertical and horizontal cooperation between levels and sectors of public administration (multi-level) and consequently between financing and interventions (multi-objective).

Local development funding

ESI Funds, allocated by European Union (EU) for every state of the Community, are mainly managed at the national level by central authorities (Figure 1). They represent a strategic co-financing to realize specific thematic objectives defined at the national level for regional and local levels (Partnership Agreements or operational programs), following general objectives of development policy for regional areas defined at the European level[5] (European regulations containing common and specific instructions for each ESI fund and Common Strategic Framework (CSF) 2014-2020). For this reason, a project

[5]ESI Fund Regulations 11 thematic objectives: (1) strengthening research, technological development and innovation; (2) enhancing access to, and use and quality of, ICT; (3) enhancing the competitiveness of SMEs, of the agricultural sector (for the EAFRD) and of the fishery and aquaculture sector (for the EMFF); (4) supporting the shift towards a low-carbon economy in all sectors; (5) promoting climate change adaptation, risk prevention and management; (6) preserving and protecting the environment and promoting resource efficiency; (7) promoting sustainable transport and removing bottlenecks in key network infrastructures; (8) promoting sustainable and quality employment and supporting labour mobility; (9) promoting social inclusion, combating poverty and any discrimination; (10) investing in education, training and vocational training for skills and lifelong learning; (11) enhancing institutional capacity of public authorities and stakeholders and efficient public administration.. Thematic objectives shall be translated into priorities that are specific to each of the ESI Funds and are set out in the Fund- specific rules.

needs to meet specific requirements in order to be financed. It must support the creation of a better context for productive development, oriented towards innovation and elevation of life quality. This can be achieved through improving service quality for citizens and companies, realizing more efficient infrastructures, upholding and enhancing the multi-equipped natural and cultural heritage of cities, in internal areas[6] and in Southern Italy[7].

According to UE, Cohesion and Development Fund supports strategic infrastructural and intangible projects, at national, interregional and regional level, ensuring homogeneity and complementarity of allocated resources at all levels both for territories' development and cohesion.

Additional funding

Among the additional available resources at the EU level, considering those requirements of specific calls, there are:
- fundings managed by General Directorates of the European Commission; they have the responsibility to manage transnational agendas coordinating both internal and external policies (such as Horizon 2014-2020 for innovation and tecnological development);
- fundings managed by European Investment Bank (EIB) financing strategic public and private projects in Europe[8].

At the national level the allocation and activation of additional funding is procedurally regulated by CIPE[9] (Interdepartmental Committee for Economic Planning), referring to particular funds that support investments for: i) financial measures, ii) sectors that need particular infrastructural investments (such as degraded urban areas, projects that can be immediately implemented, school buldings, etc.), iii) natural disasters that provoked extensive damage to building and productive activities.

In the last years, other additional resources have been defined or are in the process of being defined; some legislative provisions may represent other additional support tools for actions and resulting interventions by the PA and private sectors.

They can be activated to enhance:
- tangible and intangible cultural heritage within the historic centers;
- services and business activities that are present in these contexts, according to the needs of the territory.

Related to aforementioned points, it is useful to examine the Law Decree n. 83/2014 (Urgent dispositions for the protection of cultural heritage, the development of culture and the relaunch of tourism[10]).

Tax reliefs at national and local level

In Tab. 1, there is a list of a few fiscal tools aimed to trigger interventions in real estate assets by private investors and companies. According to these opportunities, local councils can create synergies among these different actors to set up renovations for the historical center

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[6]In 2014 a national strategy for internal areas (Uval, 2014) has been defined to protect and revitalize environment, settlement and fabrics that characterize the internal areas of the territory. The internal areas constitute one of three strategic options (with "Mezzogiorno" and City) of the regional policy for local development for the 2014-2020 programming period.

[7]Protection and rivitalization for peculiarities in historical or natural context can be the starting point for the three territorial strategies ("Mezzogiorno", City, Internal Areas), with multi-fund and multi-objective actions for multidimensional interventions or between several sectors and several actors.

[8] Through a specific fund, EU's investment funds (ESIF), constituted by EIB resources, in addition to EU budget guarantees, i twill be possible to finance projects for infrastructure, energy, instruction, research, environment protection, innovation and SMEs, with credit and investment tools.

[9]Comitato Interministeriale per la Programmazione Economica (CIPE) http://www.programmazioneeconomica.gov.it

[10]Decreto Legge n. 83/2014,"Disposizioni urgenti per la tutela del patrimonio culturale, lo sviluppo della cultura e il rilancio del turismo", converted with amendments into Legge n. 106/2014.

(or a significant area of the consolidated urban fabric), conceding further benefits for private properties (e.g. financing through free grants, total or partial exemption of the occupation-of-public-land fee for installation of scaffolding and preparation on the building site).

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Law	Purpose	Beneficiary	Content
Law decree n. 83/2014, (converted with amendments into Law n. 106/2014) *Cultural heritage protection, culture development and promotion of tourism*	ART BONUS: support to cultural activities: (art. 1)	- Individuals and non commercial legal entities - Business enterprises	- maintenance, protection and restoration work of cultural public goods - maintenance, protection and restoration work of cultural public goods (through concession or leasing) - support for cultural institutions and public sites (museums, libraries, archives, archaeological areas and parks, monuments, Law Decree 42/2004, art. 101) - realization of new structures or renovation and upgrading of existing ones, for non-profit opera foundations or public institutions carrying out cultural performances
	HISTORICAL CINEMAS TAX CREDIT (Art. 6, par. 2-bis) to support the artistic-cultural cinematographic supply	small and medium-sized cinematographic companies	restoration, structural and technological renovation of small cinemas (existing since 1 January 1980) or reactivation of inactive cinemas
	TAX CREDIT for tourist digitization to enhance competitiveness of tourism related activities encouraging their digitalization (art. 9)	Accommodation facilities, either stand-alone or offering ancillary services besides accommodation	for the purchase of: - websites and web portals, including their optimization for mobile communication systems - Software that can be used within websites and social media to expedite online booking and sale of services and accommodation as well as to enhance digital distribution channels supporting the integration of accommodation and extra services
		Travel agents and incoming tour operators (only those that bring tourists to Italy)	- communication and marketing services to generate visibility and web business opportunities on social media and virtual communities - apps for the promotion of facilities, services and local resources and for their marketing - advertisement for promotion and sale of services, accommodation and special offers on specialized websites, also managed by tour operators and travel agencies -digital design, implementation and promotion of innovative offers for the inclusion and accommodation of people with special needs - wifi systems
	TAX CREDIT for accommodation facilities' renewal To upgrade and improve hotel accomodation facilities and to encourage entrepreneurship in the tourism sector (Art. 10)	Hotel businesses (existing on 10/01/2012)	interventions: - Building renovation (Presidential Decree n. 380/2001, art. 3, par. 1, letter b, c and d) - elimination of architectural barriers (Law n. 13/1989 and Ministerial Decree n. 236/1989) - energy efficiency improvement - purchase of furniture and decor exclusively devoted to the buildings involved in the renovation, provided that he beneficiary does not lease these goods after the second tax period following the financing
Presidential Decree n. 917/1986 *Italian consolidated law on income tax*	Tax credit for the support of cultural initiatives	Business enterprises both single owner and partnerships (Art. 100, par. 2, let. m)	- To promote within the artistic and cultural field the purchase, maintenance, protection and renovation of territorial and cultural goods - To organize in Italy and abroad: - scientific and cultural exhibitions - studies and research to support these events - scientific and cultural events for educational and promotional aims - studies, research, documentation and cataloguing - publications related to cultural heritage
		Individuals (art. 15, let. h)	
		Non commercial organizations (art. 147)	
	Tax credit for the renovation of the housing stock and upgrade of buildings energy performance (art. 16-bis)	Taxpayers who own or hold, on the basis of a suitable title, the property on which the interventions are carried out:	The allowance of income tax for individuals (Irpef) covers expenses incurred in order to: - perform extraordinary maintenance interventions, refurbishment and restructuring works for single apartments and apartment buildings. Ordinary maintenance interventions qualify for the Irpef allowances only if they concern the common areas of residential buildings. The list of works that qualify for the tax allowances can be found in article 3 of the TUIR on legislative dispositions and regulations in the subject of construction, approved with D.P.R n. 380 of 6th June 2001, (previously listed in article 31, letters a), b), c) and d) of law n. 457 of 5th August 1978). - purchase of furniture and household appliances not lower than class A+ - antiseismic adjustments on buildings used as main residence or where there are activities in high seismic hazard areas
	Tax credit for renovation work aimed at improving existing buildings' energy performance	income tax for individuals (IRPEF) / corporate income tax (IRES)	The allowance of gross tax about costs effectively sustained for: - energy efficiency improvements to existing buildings, which reduce the yearly primary energy consumption for winter heating by at least 20% of the values recorded on a special chart. - thermal improvement (insulation - flooring - windows, including frames) - solar panels installation - replacement of winter heating systems

Table1. Principal tax breaks to support private interventions in Italy.

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Table 2. Contractual and institutional partnership in Italy.

Typology	Item	Legislative references	Content
Contractual	Public work concessions	Legislative Decree n. 163/2006: - art. 3, par. 11 - art. 142	Execution (that can involve the working plan and the final design), of public works/works for public utility, and all the works connected to them, considering also their functional and economic management (also potentially anticipated)
	Service concession	Legislative Decree n. 163/2006: - art. 3 - art. 10	Service provision
	Sponsorship	Legislative Decree n. 163/2006: - art. 26	Acquisition or realization, at the sponsor's expense, of several work typologies, services or supplies, according to legislative decree n. 163/2006 or restoration and maintenance of movable properties and decorated surfaces of architectural goods under protection according to legislative decree n. 42/2004
	Leasing in costruendo	Legislative Decree n. 163/2006: - art. 3, par. 15-bis - art. 160-bis	Provision of financial services and work execution for the realization, acquisition and conclusion of public works/works for public utility
	Availability contract	Legislative Decree n. 163/2006: - art. 3, par. 15-bis.1 - art. 160-ter	The construction and the provision, in favor of the contracting authority, of a private property's work for public service, at private expense and risk. The private actor must ensures the constant accessibility of the good, according to the parameters of functionality required by the contract, ensuring the perfect maintenance and the management of all possible problems, also occurred at a later stage
	Project financing	Legislative Decree n. 163/2006: - art. 153	The partial or the whole realization of public works or public utility works with private economic resources
Institutional	Urban development company	Legislative Decree n. 267/2000: - art. 120 (Consolidation Act of Local Authorities)	Establishment of Joint stock companies between local authorities (metropolitan cities, municipalities, provinces, regions) to plan and realize urban transformations, in accordance with the existing planning tools
	Hhigh quality tourist complexes at national level	Law n. 266/2005: - art. 1, paragraphs 583-593 (Financial Act - 2006)	Realization of high quality tourist complexes at national level, also with the concession of maritime state-owned properties (excluding those which already have concessions for tourism and recreation purposes) and also upgrading existing settlements
	Integrated intervention programs	Law n. 179/1992	Urban planning agreements to redevelop large and / or strategic private abandoned areas that can potentially be involved within real estate transformations through the negotiation between municipal administration, the owner/s, other potential stakeholders to define the characteristics of the transformation (quantity, functions, facilities, public and private benefits, resources to be used), through urban plan amendment
	Valorization and use of public assets through concession or lease for economic purposes	Law Decree n. 351/2001: - art. 3-bis	The concession or lease, in return for payment (considering market value), of State properties, with a particular value and for a period not exceeding 50 years, to private actors. This to ensure renovation and restoration of goods with new functions focused on the development of economic activities or service activities for the citizens, according to the provisions of the legislative decree n. 42/2004

Table 3. Legislative reference for enanchement of public asset in Italy.

Dispositions on privatization and enhancement of public asset		
1991 **Law Decree n. 386/1991** *Transformation of public economic institutions, [...] alienation of patrimonial goods eligible for economic management* (converted with amendments into Law n.35/1992)	**art. 2** (repealed by par. 97, art. 3, Law n. 662/1996)	Alienation of state assets and valorization of those eligible for economic management
1994 **Law 86/1994** *Foundation and regulation of closed-end real estate property mutual investment funds* (abrogated by Legislative Decree n. 58/1998)	**art. 14-bis** (it is the only article in force of the law) *Funds created with public assets support* (introduced in 1995 by Law Decree n. 406/1995, converted with amendments into Law n. 503/1995)	Real estate funds with public support
1996 **Law 662/1996** *Measures for the rationalization of public finance* (converted with amendments into Law n. 410/2010)	**art. 3,** paragraphs 86 - 119 *Set of rules for revenues*	Disposal of state-owned properties, public assets and some institutions
2001 **Law Decree n. 351/2001** *Urgent measures regarding privatization and valorization of public assets and development of real estate property mutual investment funds* (converted with amendments into Law n. 410/2001)	**art. 2** *Privatization of the public goods*	Securitization
	art. 3, par. 15-bis *Terms of the goods' transfer* (introduced in 2006 by par. 262, art. 1, Law 296/2006)	Unitary Valorization Programs
	art. 3-bis *Valorization and use of public assets through concession or lease for economic purposes*	Concession or lease for valorization
	art. 3-ter *Valorization of public goods* (introduced in 2011 by par. 2, art. 27, Law Decree n. 201/2011, converted into Law n. 214/2011)	Unitary Territorial Valorization Programs
2002 **Law Decree n. 63/2002** *Urgent financial and fiscal measures regarding [...] valorization of the patrimony and infrastructure financing* (converted with amendments into Law n. 112/2002)	**art. 7** *Public assets joint-stock company* **art. 8** *Society for infrastructure financing*	Securitization
Law Decree n. 282/2002 (converted with amendments into Law n. 27/2003) *Urgent measures regarding community and fiscal fulfillment, money collection and accounting procedures*	**art. 7** *Disposal of State assets*	Disposal
Law n. 289/2002 (Financial Act - 2003) *Measures regarding annual and multi-year budget plan of the State*	**art. 84** *Privatization of regional, local and other institutions' goods*	Securitization
2005 **Law decree n. 203/2005** *Measures to counter the fiscal evasion and tax/financial urgent set of rules*	**art. 11-quinquies** *Disposal of goods*	Disposal
2008 **Law decree n. 112/2008** *Urgent measures regarding economic development, simplification, competitivness and stabilization of the public finance and tax equalization* (converted into Law n. 133/2008)	**art. 58** *Survey and valorization of regional, local and other institutions' goods*	Survey and plan for the alienation and valorization of territorial authorities' assets
2010 **Legislative Decree n. 85/2010** *"State-owned property federalism" Assignment for the municipalities, provinces, metropolitan cities and regions of their own assets;* (as required by art. 19, Law n. 42/2009)	**art. 4** *Legal status of goods* **art. 5, par. 5** *Cultural federalism* **art. 6** *Enhancement of goods through the establishment of real estate property mutual investment funds*	Goods' recognition and free-of-charge transfer of goods, belonging to the public assets and some typologies of state-owned properties, in favor of municipalities, metropolitan districts, Provinces, Regions
Financial and corporate instruments to increase the economic and social value of public goods		
2011 **Law Decree n. 98/2011** *Urgent measures regarding financial stabilisation* (converted with amendments into Law n. 111/2011)	**art. 33** *Set of rules for the valorization of real estate patrimony*	"Fund of funds"
	art. 33bis *Tools for public goods management* (introduced by par. 1, art. 27, Law n. 214/2011)	Territorial funds for the valorization, transformation, managment and alienation of public assets
Procedures for facilitating the re-use of public asset		
2014 **Law Decree n. 133/2014** (converted with amendments into Law n. 164/2014) *Urgent measures regarding activation of construction sites, realization of public works, digitization of the State, bureaucratic simplification, hydrogeological instability emergence and reactivation of productive processes*	**art. 24** *Measures to support the local community participation for the safeguard and valorization of the territory*	Local goods
	art. 26 *Urgent measures for the valorization of the unused public goods*	State assets

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Public–private partnership (PPPs)

Pursuant to the "Green paper on public–private partnership" (European Commission, 2004), also in the Italian system there are different typologies of PPP, contemplated to realize interventions for collective needs (Tab. 2). They can be:
- contractual: the PA entrusts a private actor, with a public procurement procedure, with some services and/or performances related to planning and construction management (maintenance and conservation of the property and eventually of the service execution related to its intended use) of a public work. They are mainly regulated by Legislative Decree, n. 163/2006[11](Public Contracts Code) and relative Presidential Decree, n. 207/2010[12] (implementing regulation);
- institutionalized: based on a cooperation represented by a specifically established legal subject that can be composed by jointly different parts (according to Legislative Decree n. 267/2000[13] - Consolidation Act of Local Authorities), or formalized by private actors. Nevertheless, they will be always controlled by local authority and are generally subject to several legislative codes (however from the operative perspective they are also subject to Public Contracts Code).

To activate a PPPs with a public procurement procedure, typically in the project planning phase, the editing of the Feasibility Study (FS) and the Business (Financial) Plan (BFP) is required. The FS defines the elements that - through coherent and integrated operative processes for development of subsequent phases of the project (design, construction, usage) - allows those needs to be satisfied related to targets that validate the interventions. The FS identifies technical features of the project (distributive, functional, technological, plant engineering, structural, environmental, management, service provision, construction costs, scheduled maintenance, usage and possible incomes), starting from a state-of-the-art analysis (spatial, physical, market) of the context in which the project is situated to the analysis of any valuable components that allow for environmental, financial, socio-economic, procedural, administrative, technical feasibility and sustainability.

The BFP defines the conditions that allow the economic and financial balance of the intervention during the public concession period. A system of interdependent values considers costs and incomes during the investment starting phase and phase of use, allowing for: i) evaluation of the economic viability and the ability to refund the debt and to remunerate risk capital; ii) estimation of the profitability based on proposed rate/lease amount and on possible needs of public grants as investments.

Enhancement of the public assets

Due to the aforementioned scenario, it is necessary to focus on the valorization of:
- public assets (territorial authorities, other public agencies and subsidiary public companies) within historical and/or consolidated and/or environmental and high quality panoramic contexts;
- buildings with historical-artistic value that are being neglected or abandoned.

The public assets can be copious and heterogeneous. Therefore, they could present different levels of obsolescence and, consequently, different needs of enhancements also in compliance with the law and related to eventual new intentions for the use of these goods, enhancing their role into the surrounding urban settlement.

Unused public patrimony represent at the same time a real estate value and an unproductive cost (for requirements of passive conservation of buildings: protection, safekeeping, surveillance, maintenance, security, etc.). Each one of these goods can be associated to a different value (market, transformation, cost, etc.) depending on the analyzed economic aspect. Processes of enhancement of these goods through public

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[11]Decreto legislativo n.163/2006, Codice dei Contratti Pubblici relativi a lavori, servizi e forniture
[12]Decreto del Presidente della Repubblica n. 207/2010, Regolamento di esecuzione ed attuazione del decreto legislativo 12 aprile 2006, n. 163
[13]Decreto legislativo n. 267/2000, Testo unico delle leggi sull'ordinamento degli enti locali

concession, or demise tools used to regulate the relationship with private actors or non-profit organizations, can be oriented:

- to realize cost savings and new incomes for the public owner;
- to activate developing and enhancing processes of the public properties that are coherent with the planned interventions of different institutional levels for different economic-financial sectors, supporting the improvement of the urban context and life quality.

According to Legislative Decree n. 85/2010[14], the process for the fulfillment of the state-owned property federalism has started (referring to the art. 119 of the Italian Constitution, as modified by the Constitutional Law n. 3/2001[15], and undertaken by Law n. 42/2009[16]) through the free-of-charge transfer of goods, belonging to the state assets and other typologies of public goods, in favor of municipalities, metropolitan districts, Provinces, Regions (territorial authorities). The Legislative Decree n. 85/2010 is a continuation of the path for the demise of public goods, whose management was considered unproductive or too expensive, started in Italy at the end of the XXth century, to reduce the national debt deficit (since 1980s) and to satisfy balance obligations introduced with the creation of the European monetary union (since 1990).

To require the assignment of a good (or a set of goods), territorial authorities must arrange an explanatory report in which instruments and procedures are fully explained. These specifications regard the development of enhancing strategies (Guarini, 2012). The assignment assets (that become part of the available local assets) is related to the demonstration of maximum-functional-enhancement warranty of the building (art.1, par. 2), meaning direct and indirect advantages for the territorial collectivity that PA represents (art.2, par. 4).

Therefore, to foster the financial capability of territorial authorities – defined as "the necessary financial suitability to satisfy needs of protection, management and enhancement of goods" (art. 2, par. 5) – the Legislative Decree n. 85/2010 indicates that PA can choose (De Mare and Nesticò, 2011) to suggest/activate the typology of economic support:

- their own (directly), executing construction interventions of ordinary maintenance, renovation, restoration or functional reconversion;
- third subjects (indirectly), appealing to: (art. 4, par. 3); real estate investment fund (art. 6, par. 1); PPP; securitization.

Apart from interventions of ordinary maintenance, renovation, restoration or alienation without functional reconversion, the enhancement of goods starts with the establishment of a new intended use and the approval of this modification within the urban planning regulation (art.2, par. 5b). This allows the assignment of a new market value to the building, whose adequacy must be guaranteed from the State-owned Property Agency.

Since the beginning of the XXI century, useful instruments for the enhancement of public goods went through a significant evolution (Agenzia del Demanio, 2014) with modifications of Law Decree n. 351/2001[17] (urgent measures regarding privatization and valorization of public assets and development of real estate property mutual investment funds) (Tab. 3). Furthermore, another significant step was the approval of regulations that introduced new financial and corporate tools (Law Decree n. 98/2011[18]) and several procedures to facilitate the reuse of the municipal and national assets (Law De-

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[14]Decreto legislativo 85/2010, "Attribuzione a comuni, province, città metropolitane e regioni di un proprio patrimonio, in attuazione dell'art. 19 della Legge n. 42/2009".

[15]Legge costituzionale n. 3/2001, "Modifiche al titolo V della parte seconda della Costituzione".

[16]Legge n. 42/2009, "Delega al Governo in materia di federalismo fiscale, in attuazione dell'articolo 119 della Costituzione".

[17]Decreto legge n. 351/2001 ,"Disposizioni urgenti in materia di privatizzazione e valorizzazione del patrimonio immobiliare pubblico e di sviluppo dei fondi comuni di investimento immobiliare", converted with amendments into Legge n. 410/2001.

[18]Decreto Legge n. 98/2011, "Disposizioni in materia di valorizzazione del patrimonio immobiliare" converted with amendments into Legge n.111/2011.

cree n. 133/2014[19]), shifting from "simple" securitizations (already started with Law Decree n. 386/1991[20], Law n. 662/1992[21]) to the use of operative tools for the management of initiatives activated by *Agency of Revenue*[22] State Property Office[23], and/or local administrations.

The feasibility study and the business financial plan are required also to verify the financial and economic sustainability of enhancement strategy related to public assets.

Interventions evaluation: estimation and economic convenience evaluations

All of the evaluation techniques have a strategic role because they are needed to define elements of sustainability and feasibility of the intervention/s with different levels of analysis in the several phases of the urban action (identification, planning, design, realization, management in phase of use).

The selection of the techniques is strictly related to what is required by legislative and regulatory provisions and to the level of analysis required for initial inputs and desired output. Analysis needs to be proportioned according to the dimension of the intervention, to phases in which the evaluations are expressed and to procedures of the PA, considering also the role of the private sphere if involved.

Evaluation typologies indicated in the national and European legislative provisions and - jointly or not - applied in the Italian operative procedures are:
 - estimative: to define, depending on the aim of the evaluation and using synthetic or analytic procedures, the financial value of assets involved within urban intervention (cost value, market value, transformation value, etc.), through synthetic or analytic procedures;
 - financial and economic: to verify, using monetary parameters, sustainability and convenience related to the allocation of public and/or private resources for the realization of a specific intervention or program of interventions, considering the period of building's service life: revenue cost analysis; cost benefits analysis;
 - multidimensional: to determinate the optimal solutions, considering simultaneously different aspects, financial or not, with their interdependences, synergies and in coherencies among the different possible alternatives (e.g. multi-criteria decision analysis, MCDA).

Due to the nature of this paper, in the following section, topics don't pretend to be exhaustive but only necessary for the general structure of the argumentation.

Estimations are focused to define the value of:
 - intervention cost for the phase of investment (considering productive factors that need to be used for the production of a new work or to enhance an existent building) and for the phase of use (connected to the building use and its maintenance activities to keep the expected levels of satisfaction for individual and/or collective needs, defined during the planning phase);
 - market, linked to incomes produced by the building with its original function before the intervention and those related to the new functions, defined with the intended use plan;
 - transformation of the asset, evaluated with the difference between present value of costs that are necessary to enhance the asset and those related to its market value after the transformation.

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[19]Decreto legge n. 133/2014, converted with amendments into Legge n. 164/2014, 'Misure urgenti per l'apertura dei cantieri, la realizzazione delle opere pubbliche, la digitalizzazione del Paese, la semplificazione burocratica, l'emergenza del dissesto idrogeologico e per la ripresa delle cattività produttive'.
[20]Decreto Legge n. 386/1991, "Trasformazione degli enti pubblici economici, dismissione delle partecipazioni statali ed alienazione di beni patrimoniali suscettibili di gestione economica", converted into Legge n. 35/1992.
[21]Legge n. 662/1996, "Misure di razionalizzazione della finanza pubblica" art. 3, paragraphs 86-119.
[22]Agenzia delle Entrate: http://www1.agenziaentrate.gov.it/english/
[23]Agenzia del Demanio: http://www.agenziademanio.it/opencms/it/ValorePaese/ValorePaeseDimore/

According to the estimative result of the transformation value, it is possible to elaborate a judgment of convenience, focusing on the building reconversion project with a new function; this aspect, as previously underlined, is particularly relevant in many interventions related to the enhancement of private and public goods (also in case of partial or total new intervention). The international tendency in reaching this aim is oriented towards the application of Highest and Best Use method (HBU), defined as "the reasonably probable and legal use of vacant land or an improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value as of the date of the appraisal" (Appraisal Institute, 2004), in which the real estate value is = Current Use value + Future Use Value/ Option Value (Miller and Geltner, 2004).

In general, the financial, economic and multidimensional evaluations allow a rationalization of decisional processes that require choices among different alternatives of intervention, selecting the one that best satisfies needs, considering parameters based on general and specific targets both. Convenience evaluations are necessarily preceded by estimations, useful to define costs, incomes, revenues, benefits, effects and results linked to the intervention and originated from the cohesion of technical solutions, environment repercussions, position in the reference market (supply and demand), sustainability of the financial and economic results undertaken for each alternative, risks about the procedure and the realization.

In the revenue and cost analysis, every intervention is evaluated considering its financial cash flow, related to the building service life. Cash flows derive from parameters (prices referred to costs and revenues) linked to the planning choices that connote the quality of the intervention and define: i)quality and attractiveness of produced goods and services; ii) cost control and realization times; iii) financial plan of investment; iv) time-management of goods and services.

Through cost-benefit analysis, it is possible to measure and evaluate, in addiction to financial costs and revenues, also the economic ones (involving the collective inhabitants). These values are determined by transforming financial analysis' market prices into economic prices, and by considering the benefits produced with the intervention.

To evaluate and realize an intervention using the Project Financing method (building and management contract), or using only public resources (traditional contract), PA can use the PSC (Public Sector Comparator) (Cruz and Marques, 2013), a methodology that allows the translation of cost and risk analysis into monetary terms (Martiniello and Zaino, 2009).

The Multi Criteria Decision Analysis (MCDA) techniques can be used during the planning, organization, designing and works-concession phases. They permit the outlining of the rank of the proposed alternatives through weighted criteria, based on priorities defined by decision-makers. When decisional problems refer to spatial analysis, these techniques can be merged with territorial analysis developed with Geographic Information System (GIS), considering them as SDSS (Spatial Decision Support Systems) (Malczewski, 1999). It's impossible to define absolute categories related to these interdisciplinary tools, for the aforementioned reason, as it has been decided to not include a specific taxonomy suggesting a cross-reference on specific papers about the relation between input/output typologies and MCDA techniques (Guitouni et al., 1999; Ishizaka and Nemery, 2013).

In the Italian context, the Public Contracts Code (2006) and its Implementing Regulation (2010), indicate that to define the adjudication of contracts for public works or public utility, evaluating them through the Most Economically Advantageous Tender (MEAT) criterion, one of the following MCDA methods must be used (Guarini et al., 2015):
 - Weighted Sum Model (WSM) (Einhorn and McCoach, 1977);
 - Analytic Hierarchy Process (AHP) (Saaty, 1977);
 - ELimination Et Choix Traduisant la REalité (ELECTRE) (Roy, 1968);
 - EVAluation of MIXed criteria (EVAMIX) (Voogd, 1982);
 - Technique for Order of Preference by Similarity to Ideal Solution (Topsis) (Hwang and Yoon, 1981).

A detailed technical focus is needed during the choice of the method because each technique has limits that could compromise the entire decision-making process (Bouyssou et al., 2000).

Conclusion

This paper highlights how planning choices are strictly linked to needs and targets and how the evaluation tools could have a good influence in understanding and rationalizing contemporary forces that influence urban morphology. Considering the limited availability of financial resources to plan, realize, and manage urban interventions, due to the current phase of economic crisis, PA should actuate an accurate examination of available tools. In order to do so:
- Inter-Institutional, multilevel, and inter-sectorial synergies and collaborations
- Inter sectorial planning of interventions
- Procedures oriented not only towards traditional contract for the works' realization, but also towards the involvement of private capital through contractual and institutional PPPs
- Actions to support also small-scale interventions, focused on technical plans adjustment and maintenance and protection of the public goods as well as the whole territory.

For these reasons, in the explanation of the operative strategy that need to be adopted for the urban interventions, also within historical context, it is essential the evaluation techniques' use. These are the key tools that can support the definition of better planning choices and at the same time can ensure the achievement of public and private financing for new urban opportunities.

References

Agenzia del Demanio (2014) Studio EPAS: *Strategie e strumenti per la valorizzazione del patrimonio immobiliare pubblico* (http://www.agenziademanio.it/export/download/demanio/agenzia/EPAS_Strategie-e-strumenti-per-la-valorizzazione-del-patrimonio-immobiliare-pubblico.pdf) accessed 30 November 2015.

Appraisal Institute (ed.) (2002) *The Dictionary of Real Estate Appraisal* (Appraisal Institute).

Bariletti, A. and Causi, M. (1998) 'Risorse e occupazione nei beni culturali', in Accademia Nazionale dei Lincei, *Sviluppo tecnologico e disoccupazione*, Roma, Italy.

Bouyssou, D., Marchant, T., Pirlot, M., Perny, P., Tsoukiàs, A. and Vincke, P. (2000) *Evaluation and Decision models: A critical perspective* (Kluwer Academic Publishers)

Chierchia, C. (2010) 'Vincoli urbanistici', in Rota, G. L. and Chierchia, C. (ed.) *Edilizia e Urbanistica* (Wolters Kluwer Italia S.r.l.), 1551-1570.

Cruz, C.O. and Marques, R.C. (2013) *Infrastructure Public-Private Partnership: Decision, Management and Development* (Springer).

De Mare, G. and Nesticò, A. (2011) 'La centralità delle questioni estimative e valutative nell'attuazione del federalismo demaniale. Riflessioni sulla valorizzazione del patrimonio immobiliare pubblico', *SIEV-Valori e valutazioni. Teorie ed esperienze* 7, 21-38.

Einhorn, H. J. and McCoach, W. (1977) 'A simple multi-attribute utility procedure for evaluation', *Behavioral Science* 22, 270-282.

European Commission (2004) *Green Paper on public-private partnerships and Community law on public contracts and concessions* (http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52004DC0327) accessed 30 November 2015.

Guarini, M. R. (2010), 'Beni culturali. Valorizzazione', in Rota, G. L. and Chierchia C. (ed.) *Edilizia e Urbanistica* (Wolters Kluwer Italia S.r.l.), 327-406.

Guarini, M. R. (2012) 'Lo Stato di attuazione delle intese e degli accordi stipulati ai sensi dell'art.112. Lettura critica e prime valutazioni', in Sciacchitano, E. (ed.) *Ministero per i beni e le attività culturali, Direzione Generale Valorizzazione. Primo colloquio sulla valorizzazione. Esperienze, Partecipazione, Gestione. Roma, 12 ottobre 2011* 2, 114-120.

Guarini, M.R., Buccarini, C. and Battisti, F. (2015), 'Select the most economically advantageous tenders in public works contracts: MCDA models and MACBETH used to analysis and comparison using a case study', *International Journal of Economics and Statistics Volume* 3, 1-8.

Guitouni, A., Martel, J. and Vincke, P. (1999) 'A framework to choose a discrete multicri-

terion aggregation procedure, *Technical Report* 3.

Hwang, C. L. and Yoon, K. (1981) *Multiple attribute decision making: Methods and applications* (Heidelberg Springer).

Ishizaka, A. and Nemery, P. (2013) *Multi-criteria Decision Analysis: Methods and Software* (Wiley).

Malczewski, J. (1999) *GIS and Multicriteria Decision Analysis* (John Wiley & Sons).

Martiniello, L. and Zaino, A. (ed.) (2009) A*nalisi delle tecniche di valutazione per la scelta del modello di realizzazione dell'intervento: il metodo del Public Sector Comparator e l'analisi del valore* (http://www.utfp.it/docs/Pubblicazione%20PSC%20def.pdf) accessed 30 November 2015.

Miller, N. G. and Geltner, D. M. (2004) *Real Estate Principles for the New Economy* (South-Western Educational Pub).

Pearce, D. W. and Mourato, S. (1998) 'The Economics of Cultural Heritage: World Bank Support to Cultural Heritage Preservation in the MNA Region', Report to the World Bank, Washington, USA.

Prete, S. (2010) 'Demanio', in Rota, G. L. and Chierchia, C. (ed.) *Edilizia e Urbanistica* (Wolters Kluwer Italia S.r.l.), 755- 783.

Roy, B. (1968) 'Classement et choix en presence de points de vue multiples: La méthode ELECTRE', *Revue Francaise d'Informatique et de Recherche Opérationnelle* 8, 57-75.

Saaty, T. (1977) 'A scaling Method for priorities in hierarchical structures', *Math psychology* 15, 234-281.

Uval (2014) *Strategia nazionale per le aree interne, definizione, obiettivi, strumenti e governance* (http://www.dps.gov.it/opencms/export/sites/dps/it/documentazione/Aree_interne/Strategia_nazionale_per_le_Aree_interne_definizione_obiettivi_strumenti_e_governance_2014.pdf) accessed 30 November 2015.

Voogd, H. (1982) 'Multicriteria Evaluation with Mixed Qualitative and Quantitative data', *Environment and Planning* 9, 221-236.

Whitehand, J.W.R. (1997) 'Why Urban Morphology?', *Urban Morphology* 1.

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