Urban Planning and Design

Contemporary City.
Descriptions and Projects
A.A. 2011/2012

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Contemporary city: descriptions and projects

Urban Planning Section

Prof. Patrizia Gabellini

“Urbanism Today”

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Composition and Recomposition

The lesson about the **Great References** has had the aim to recall the main concepts (and their technical translation), which are present in the **urbanism legacy.**

Flashes on some famous contemporary projects for new towns and new districts have underlined the hybrid and not always innovative re-use of those references.

The problems of urban expansion (with new cities foundation) are today present together with the problems of a general transformation. They characterize the diverse parts of the world, according to their development dynamics.

In the "old" world (Europe and the North America), **in front of the urban diffusion and sprawl** as typical problems, **new concepts and techiniques** are emerging in urbanism, giving it an ecological dimension too.

Urban Ecologies and Urban Design

"In the last 60 years, the world's population has shifted from urban centres, largely in the compact European metroplises powered by coal, to dispersed Asian megacities that include agriculture and meganodes, largely powered by oil. …

"The rapid success of the petroleum-powered megalopolis produced its own urban problems, in terms of the abandonment of the metropolis, its dependence on oil –rich supplier nations and the global impact of fossil-fuel dependence on climate change. With just over 50 per cent of the world's population in cities, urban design offers the potential to address some of these urgent questions. Urban designer in the future will have to reckon with this carbon economy, not so much in terms of reducing carbon footprints through ecological interventions, but through altering the shape of cities to ensure human survival on the planet."

See: David Graham Shane, Urban Design Since 1945. A Global perspective, Wiley 2011, p. 312

New green megalopolis

Referring to metropolises (compact such as New York, Munich and Paris, or fragmented such as Vancouver) and megapolises (growing in Asia, South America, and Africa), through the analysis of meaningful projects, Shane identifies various solutions, which are related with the shapes of the cities, that is with their different patterns and composition.

As an example of green megalopolis, he considers the **Foster's Masdar**, the new city of 50.000 inhabitants started in 2007 in Abu Dhabi.

"This compact, shaded new town with underground transport systems and solar power is planned as a demonstration project in one of the most inhospitable deserts of the world, which will get even hotter by the end of the next century. Such show places, heterotopias of illusion, have always played a role in imagining future scenarios, as at World's Fairs and Olympic meetings." (p.321) .

" Many eco- city proposals resemble gated communities for a social élite and complex machines of technological experimentation, rather than general operative models: they are paradoxical eco-cities, precisely due to the un-sustainability of their costs, their vast consumption of energy (even if renewable) and their blatant subordination to the requests of the real estate market which pushes for the creation of new urban terrains through enormous mevements of earth …" (Pavia, p.13)

Masdar City

United Arab Emirates

Foster and Partners

I.

http://www.masdarcity.ae/en/index.aspx

II.

http://www.youtube.com/watch?v=yWVsi0UtmgI&feature=related

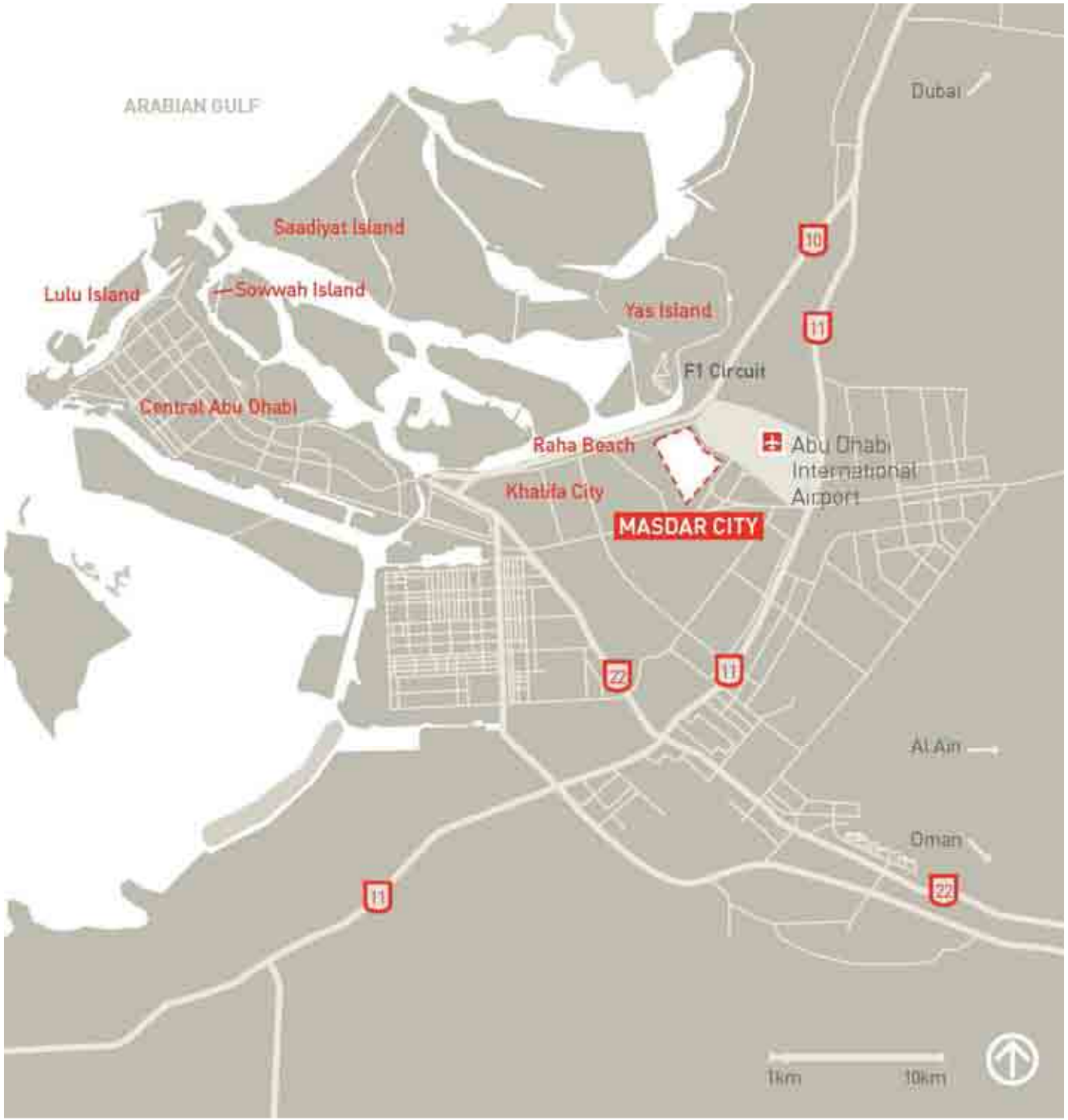
http://www.youtube.com/watch?v=8V7UpFOm8w0

http://www.youtube.com/watch?v=F3Wtze716QY&feature=related

http://www.youtube.com/watch?v=YjL1ug-PU9g&feature=related

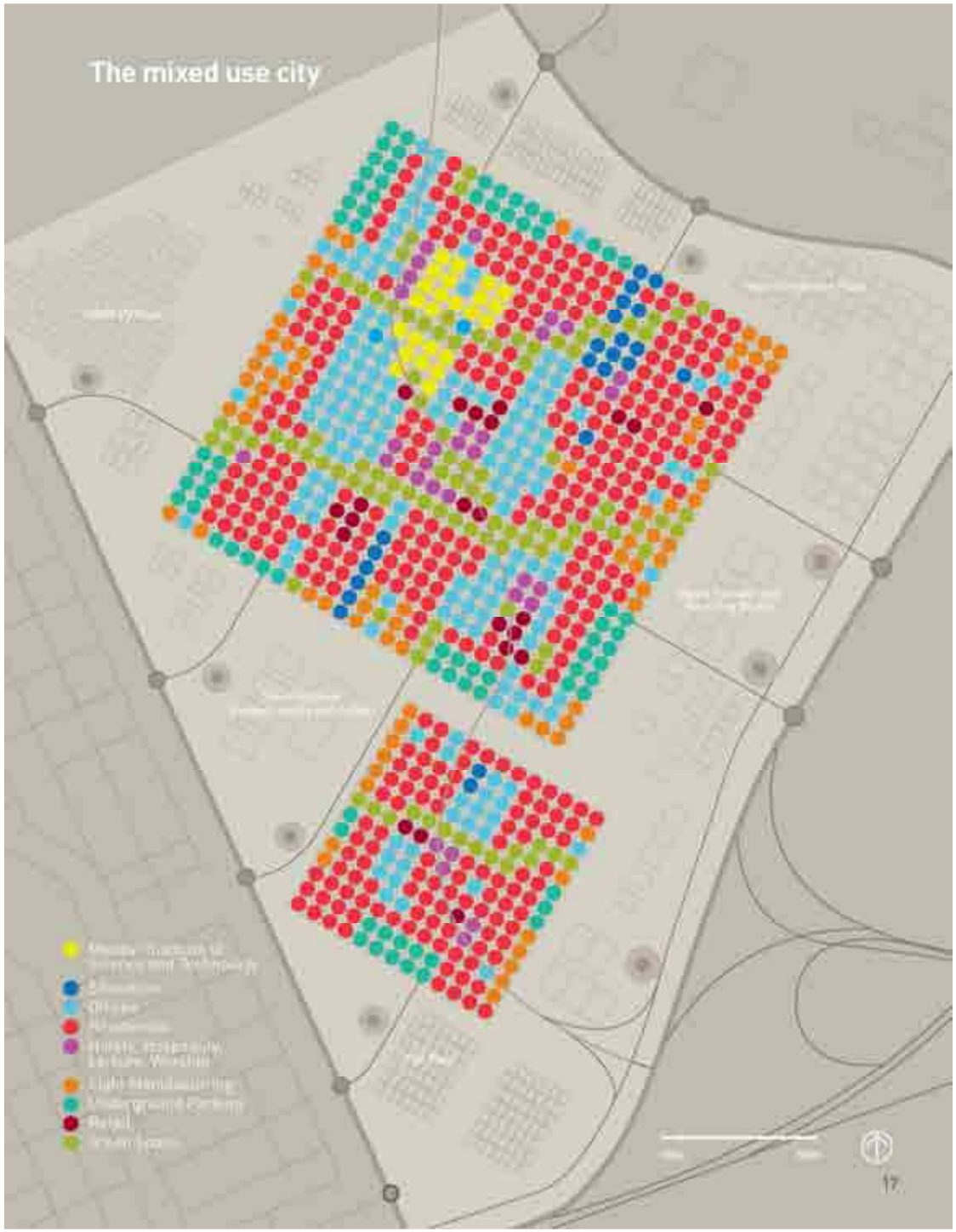
III.

http://www.youtube.com/watch?v=42GLexIPjrs (Italian language)


ARABIAN GULF
Dubai
Saadiyat Island
Lulu Island
Sowwah Island
Yas Island
F1 Circuit
Central Abu Dhabi
Raha Beach
Abu Dhabi International Airport
Khalifa City
MASDAR CITY
Al Ain
Oman
10
11
22
1km
10km


MASDAR CITY
مدينة مصدر

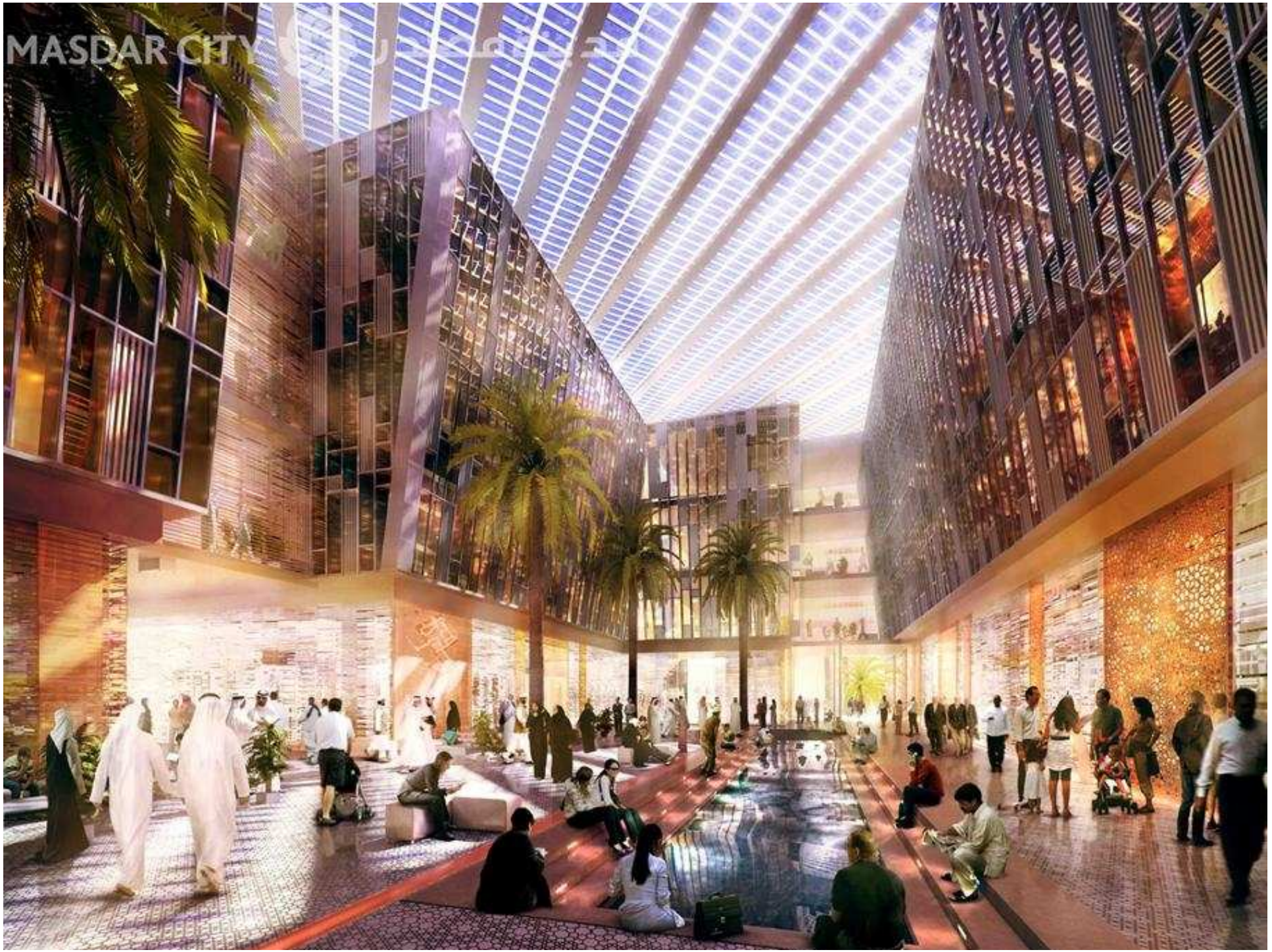

MASDAR CITY
مدينة مصدر


The mixed use city
17


MASDAR CITY
مدينة مصدر


MASDAR CITY
مدينة مصدر


MASDAR CITY
مدينة مصدر


MASDAR CITY


MASDAR CITY
مدينة مصدر

Existing cities and metropolises

Existing cities and metropolises, particularly the fragmented ones in the Western part of the world, have to face the challenge of reducing carbon having an **automobile-based network of transportation** and often a **historic structure** and a **huge quantity of old buildings**.

The **European strategy of 20/20/20** in 2020 (less 20 per cent of CO2; less 20 of energy consumption; plus 20 per cent of renewables) and the adaptation to the climate change must be pursued according to **specific conditions**.

Before looking at the experience of Bologna, we will consider two main movements, which reviewed the urban design approach in front of the contemporary urban phenomena: **the New Urbanism** and **the Landascape Urbanism.**

Lanscape Urbanism *vs* New Urbanism

New Urbanism and **Landscape Urbanism** are two famous enough expressions which indicate **two movements** which have **different ways of judging contemporary urban phenomena and projecting solutions**.

André Duany, a leader of the New Urbanism wrote : « The new urbanism operates to reform the reality, not by expressing the situation trough critique or art. That is **the difference between the CNU [Congress for the New Urbanism] and the other comprehensive urban theory, that proposed by the Office for Metropolitan Architecture (OMA)** … There is nevertheless much overlap …because **both are interested in the same urban degeneracy**. OMA and its excellent research arm, the Harvard School of Design, are, in fact, very useful to all us. **What is to be done with what is learned is where the movements differ**».

Important differences are in the **judgement on the contemporary city** (which is not refused by Landscape Urbanism and sometimes considered as expression of a new aesthetics), in the **core of the project** (the space in-between), **and in the tools** (the program and the diagram).

New Urbanism

Urban Design Manifesto: the roots of New Urbanism

The text by **Allan Jacobs and Donald Appleyard** titled "Towards an Urban Design Manifesto", 1987, is useful to understand New Urbanism.
Jacobs and Appleyard taught at the University of California, Berkeley, and worked closely with Kevin Lynch.

They refer to the **Charter of Athens** and to the **Garden City Movement**: two powerful movements, and two different utopias against the ills of the nineteenth-century industrial city, which influenced many developments. **They discuss both proposals.**

This Urban Design Manifesto was written about 50 years after the Charter of Athens and 30 years after the **first Urban Design Conference held at Harvard in 1957.** Referring to the **phenomenological view of the city** (see the approach of **Kevin Lynch** and **Jane Jacobs),** it introduces a new vocabulary depended on the senses, **humanizing urban design** with attention to its **social meaning and implications**.

About contemporary city

" Allan Jacobs and Donald Appleyard **deplore many of the same aspects of …large cities** …: vast anonymous areas developed by giant public and private developers; dangerous, polluted, noisy, anonymous living environments; fortress-like buildings which present windowless façades to the street; and pervasive semiotics that tell "outsiders" they are not welcome in subtle and not-so-subtle ways. …**to set out goals for urban life and advance ideas for how the urban fabric of cities might be designed to encourage livable urban environment**".

New goals

Following the method of the Charter of Athens, these authors begin showing the problems and continue indicating the (consequent) **new goals** for urban life:

- livability
- identity and control

(*they outline the difference from CIAM, considering the value of conservation*)

- access to opportunity, imagination and joy
- authenticity and meaning
- community and public life
- urban self-reliance
- an environment for all.

From the goals, they formulate **some specific ideas "for how the fabric or texture of cities might be conserved or created to encourage livable urban environment ... the grain of the good city"**.

5 physical characteristics

Particularly, **five prerequisites, five physical characteristics** are essential and must be **present together** in city building and rebuilding:

- **"livable" streets and neighborhoods**;
- **some minimum density of residential development** (*to have a certain number of people living and using an area of land, a "perceived" density*) as well as intensity of land use (*about 15 dwellings units per acre - 30-60 people or 120-140 per hectare - are necessary*);
- **an integration of activity -living, working, shopping-** in some reasonable proximity to each other (*relatively small, of a few blocks, close and relatively accessible by foot and houses within them*);
- **a manmade environment,** particularly buildings, that defines public space (as opposed to buildings that, for the most part, sit in space): *streets, plazas or squares not too wide in relation to the building;*
- **many, many separate, distinct buildings** (*different buildings and spaces*) with complex arrangements and relationships (as opposed to few, large buildings): *small buildings and parcels.*

The Charter of NU

The theory of **New Urbanism** has redirected planning back to **some basic, realistic principles of community building, mainly used for new interventions in suburban areas**.

Reading the **27 principles of the Charter of the New Urbanism**, devoted to the **Region (9)**, the **Neighborhood (9)** and the **Block (9)**, it is possible to verify the connection with many traditional principles of urban design, and to recognize for instance **the legacy of Kevin Lynch, Jane Jacobs, Jan Gehl, Gordon Cullen …, and also of Ebenezer Howard,** together with the teaching of traffic calming and environmental sustainability practices and theories.

They recall the values of community, democracy, identity, but they are market oriented too.

Principles

To underline the proximity of the New Urbanism's aims with the Urban Design Manifesto I recall some of its principles for neighborhood and blocks:

- transit friendly
- street patterns of articulated grids (*without cul-de-sac, to have cars next houses: curbside and underground parking, parking in front of houses, individual garages*)
- middle density for row houses, town houses and apartment buildings
- dense setting and a pedestrian oriented commercial center
- consistency and not stylistic architecture.

Echoes in the Urban Renaissance

Other echoes of the New urbanism may be found in the **Final Report of the Urban Task Force** chaired by Lord Rogers of Riverside: «We need a vision that will drive **the urban renaissance**. We believe that **cities should be well designed, be more compact and connected, and support a range of diverse uses** -allowing people to live, work and enjoy themselves at **close quarters**- with a **sustainable urban environment which is well integrated with public transport and adoptable to change**», 1999.

In fact **the ideas of the New Urbanism,** diffused by different means (a Congress, a Charter, a Report of Best practices, a Code, a website) **have had a large success** during the last thirty years, starting from the USA and reaching European countries: France, Germany, Italy, UK. **Overall, many projects have been realized.**

NU and ecology

The fundamental idea is to avoid both the excess and the obsession of standard, and to pursue **"reasonable" solutions.**

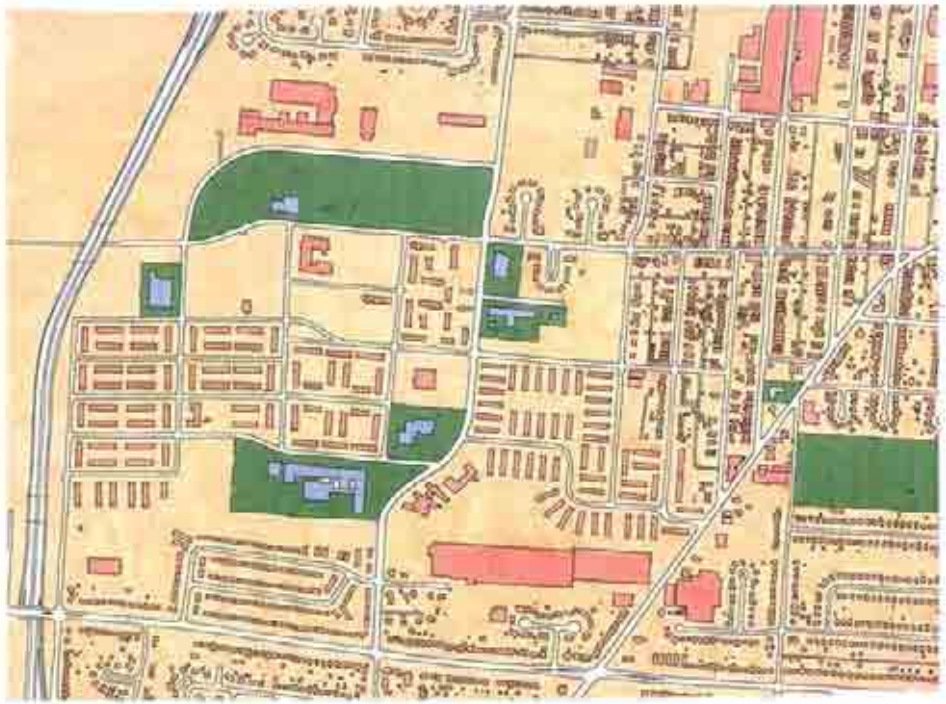
All these prerequisites can be interpreted as suggesting solutions for different contexts. Anyway it refers to the **model of the European old city, a compact city** to re-create, adopting an approach referred to districts and blocks. We could summarize: **to save the contemporary city it is necessary to create or re-create a multitude of livable units.**

On the one hand the compact city of the NU **could be sustainable** for the density, because mixed uses and proximity allow a pedestrian movement for daily needs (less energy consumption).
On the other hand the attention for the built fabric prevailes over that for the green and the **landscape, which is "a nature of surfaces: the ground is not understood in its diverse dimensions; preserving natural spaces against the arrival of infrastructure and technology, it is not converted into a complex tool for the transformation of the environment and the city.**"

See: Rosario Pavia, *Eco-Logics*, "Piano Progetto Città", 25-26, 2012, p. 22-3

The names of "fathers" : Andreas Duany, Elizabeth Plater-Zyberk (Miami), Peter Calthorpe, Elizabeth Moule, Stefanos Polyzoides, Daniel Solomon, Peter Katz (West Coast), Maurice Culot, Léon Krier, Gabriele Tagliaventi (Europe).

Seaside, Mexico 1983, is the first city projected by Duany and Plater-Zyberk, followed by about one hundred interventions in Miami, Portland, Boston, Los Angeles, Milwakee, Phoenix, Toronto, Charleston, Baltimore, San Francisco, Alessandria (Italy), Dorchester (UK), Brandevoort (Netherland), Berlino (Germany)…



31. Existing plan of Park Du Valle, Louisville, Kentucky, by Urban Design Associams. The site was dominated by two urban-renewal era public housing projects and a badly deteriorating apartment complex.

32. Master plan of Park Du Valle, Louisville, Kentucky, by Urban Design Associates, 1995. The form of the new infill public housing, inspired by traditional Louisville neighborhoods, has a street and block structure supporting smaller-scale residential and mixed-use development.

John Dutton, 2000, New American Urbanism, Skira, Milano

7. The master plan of the first phase of the new town of Liberty by Cooper Robertson, 1998, a 2,907 acre community located on Southern California's largest natural lake. (Drawing by EPT, landscape architects)

John Dutton, 2000, New American Urbanism, Skira, Milano

John Dutton, 2000, *New American Urbanism*, Skira, Milano

21. Master plan for Kentlands, Maryland, by Duany Plater-Zyberk and Company, 1988. This 356 acre development includes 1,600 residential units with a population of over 5,000 total residents.

22. Aerial view of part of Kentlands, Maryland.

23. View of street of single-family houses in Kentlands, Maryland. Duany Plater-Zyberk and Company.

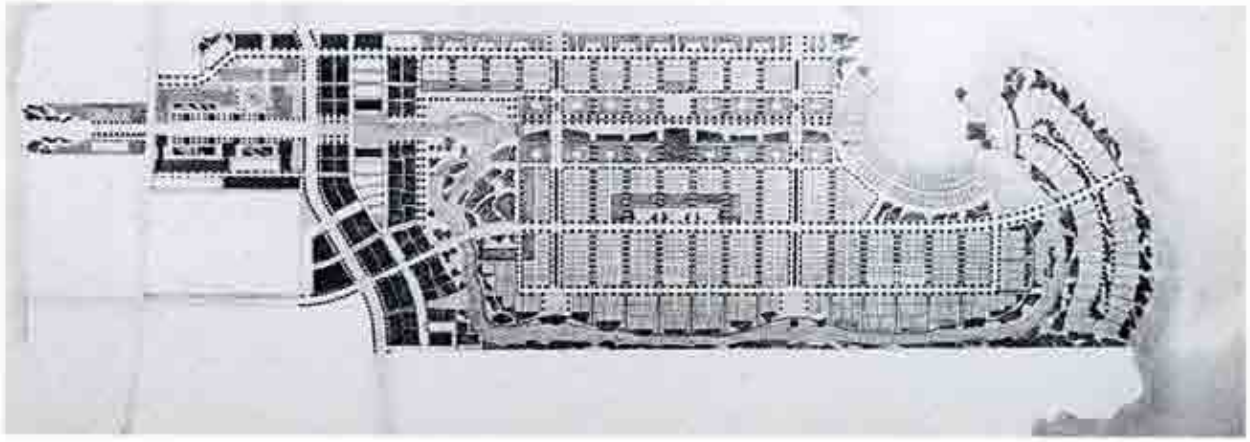
John Dutton, 2000, *New American Urbanism*, Skira, Milano

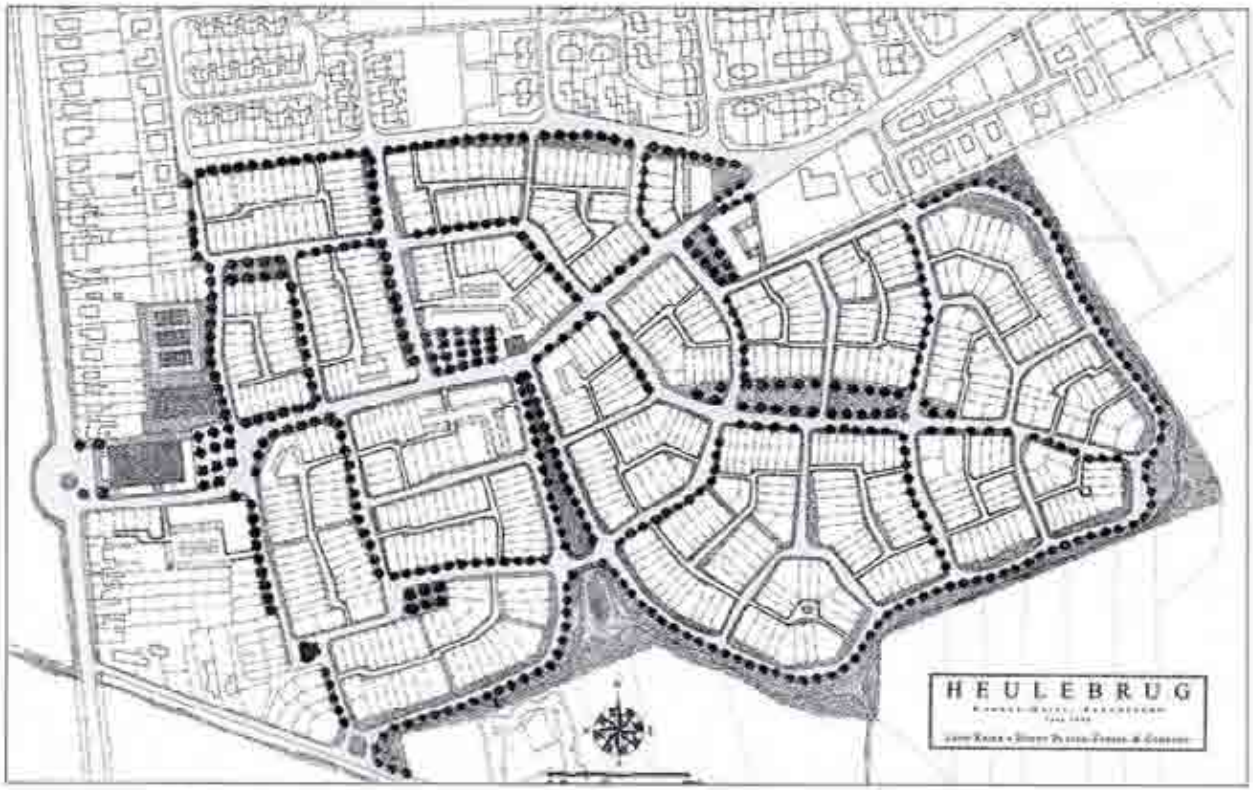
29. Master plan of Civano, Tucson, Arizona, by Duany Plater-Zyberk, Moule and Polyzoides, and Wayne Moody, 1997.

John Dutton, 2000, New American Urbanism, Skira, Milano

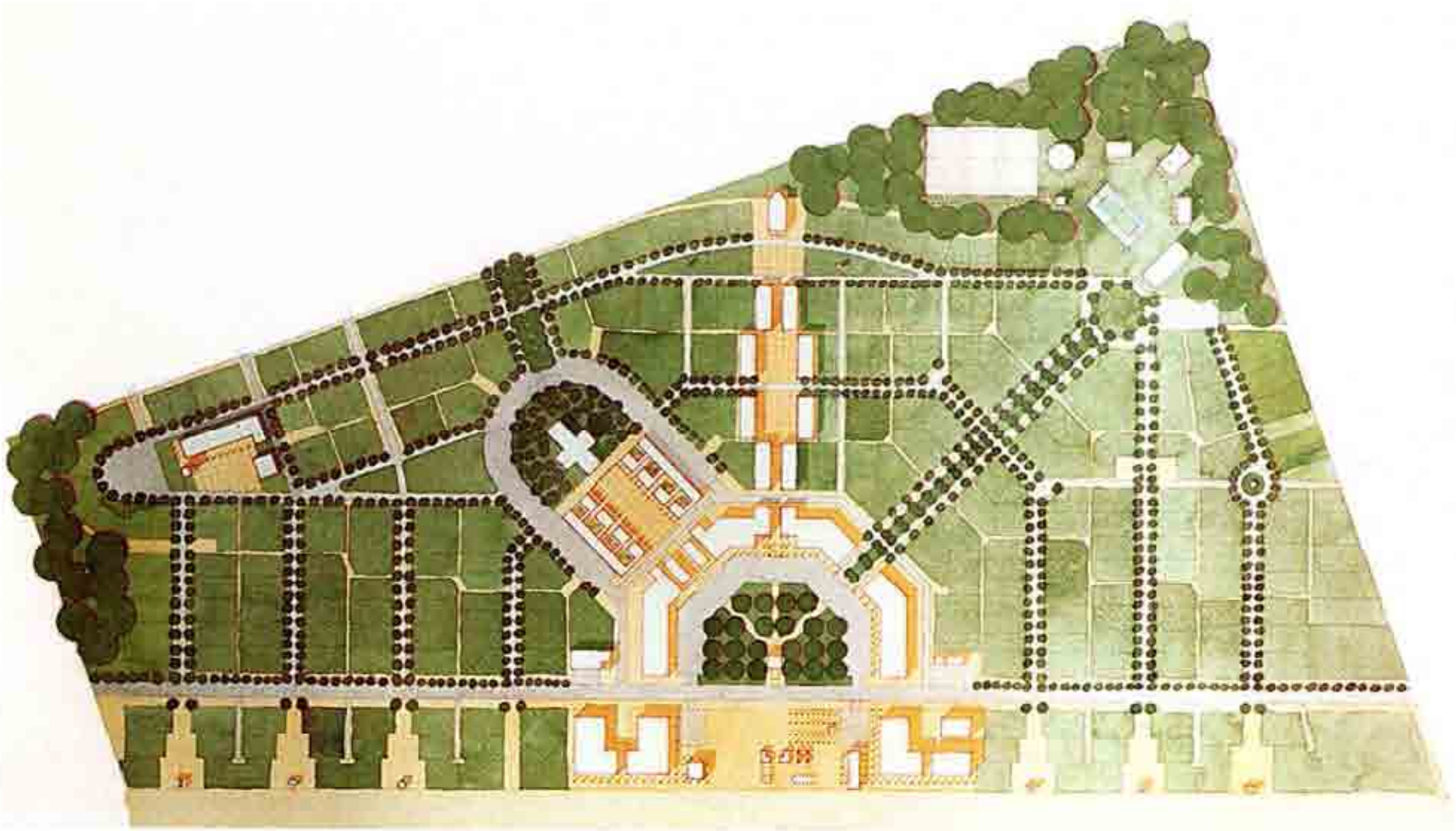
40. Master plan for Cayman Island development, by Moore Ruble Yudell Architects, 1997.

41. Master plan for Heulebrug, in Knokke-Heist, Belgium, by Duany Plater-Zyberk and Company and Leon Krier, 1998.





John Dutton, 2000, *New American Urbanism*, Skira, Milano



5. Plan of Seaside, Florida, by Duany Plater-Zyberk and Company, 1980. Although primarily a resort community, Seaside is probably the first and most influential of New Urbanist new towns.

John Dutton, 2000, *New American Urbanism*, Skira, Milano

4. Regulating Plan for new town of Huetro in El Paso, Texas, by Moule & Polyzoides Architects and Urbanists, Duany Plater-Zyberk and Company, 1991. The original plan of the 436-acre project is based on early Spanish settlement towns governed by the Laws of the Indies. (The plan is being significantly revised.)

5. The master plan for Bahcesehir, Istanbul, Turkey, by Torti Gallas CHK, 1996-97. Incorporates the infrastructure and architectural design for over thirty housing types (2,300 units) and numerous educational and public facilities on a steep site.

6. Perspective rendering of Bahcesehir, Istanbul, Turkey, by Torti Gallas CHK.

John Dutton, 2000, *New American Urbanism*, Skira, Milano

Landscape Urbanism

The centrality of landscape

«Today **the ubiquitous sprawl of suburbia** is a primary characteristic of metropolitan areas»: this is the **start point for the Landscape Urbanism**.

This movement considers the **centrality of landscape** because of the breakdown which makes it impossible to distinguish the city from the country at any scale. **The landscape is in-between buildings**. «Yet this dialogue is not limited by the traditional definition of the terms "building and landscape"; it allows for the simultaneous presence of the one within the other, **buildings as landscapes, landscapes as buildings**».

The artificial landscape is the title of a book which presents the Dutch School, and it is significant of an approach to the project.

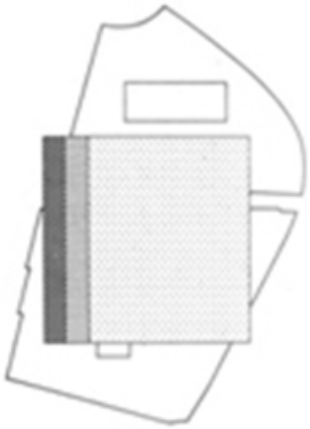
See: Mostafavi, M., Najle, C. (2003) (eds.) **Landscape Urbanism. A Manual for the Machinic Landscape**, AA Print Studio, London.

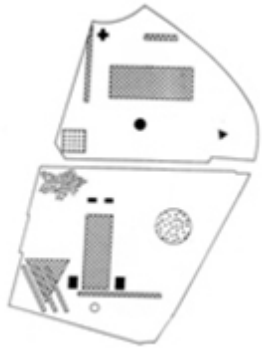
At the beginning

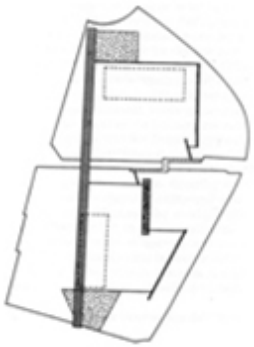
An early landscape urbanism project, **Paris's Parc de la Villette**, has been decisive for both its actual built environment, designed by architect Bernard Tschumi, as well as the runner-up's (unbuilt) design, by Rem Koolhaas. **Design competitions have been an influential stage for the development of the theory.**

The "father" of the movement is **Rem Koolhaas** and the differences from the method of the New Urbanism (with its code and its rules) can be synthesized in this phrase, which described its **project of Melun Senart:** «Rather than a series of drawings that show what a finished project looks like or how all the different parts fit together, I am arguing for the thinking through a program – not a description – that outlines the performative dimensions of a project's unfolding» (OMA, Ville nouvelle Melun-Senart, 1987).

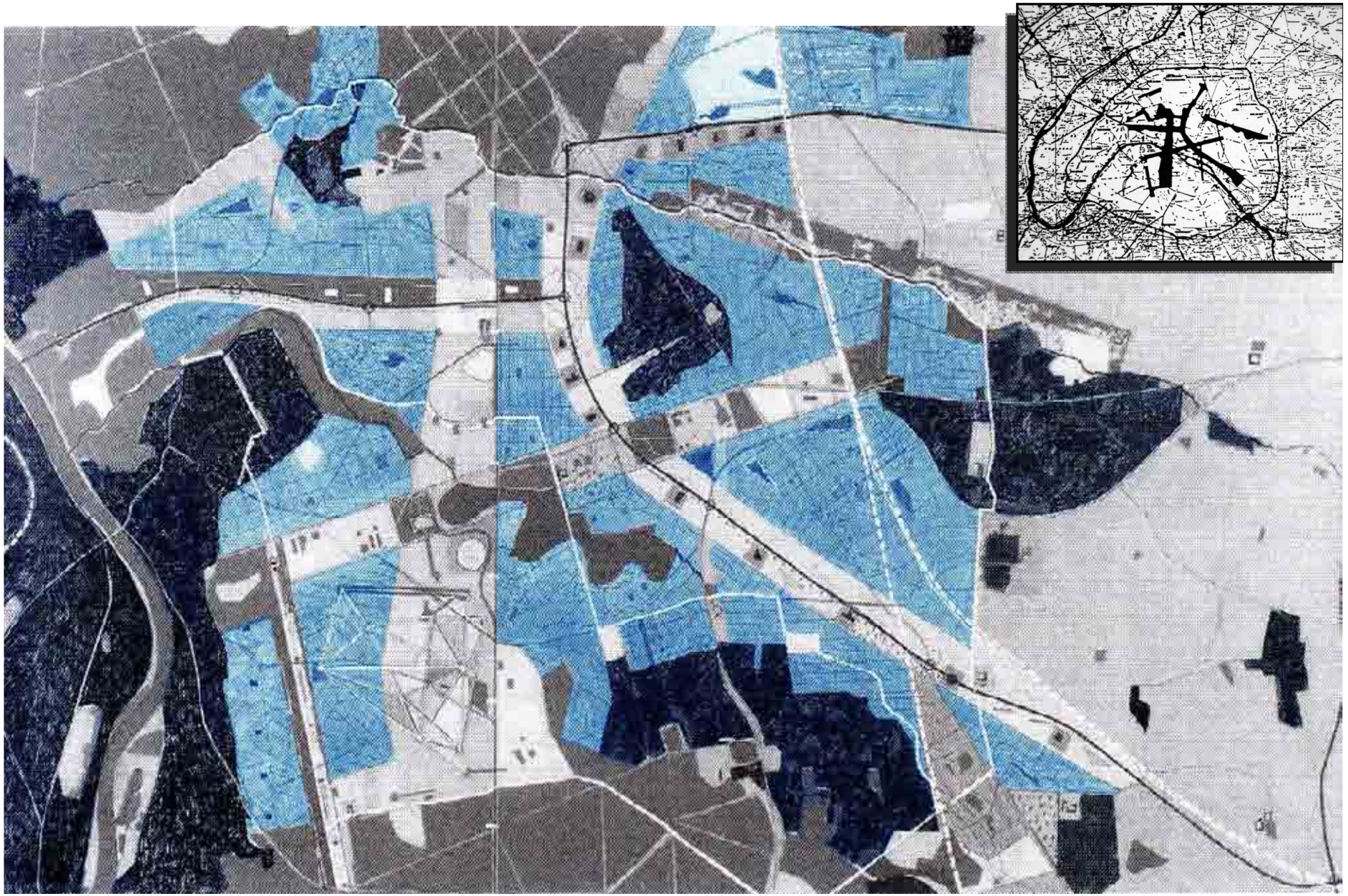
DIAGRAMMATIC ARCHITECTURE







OMA, *Parc de la Villette,* 1983 (competition).



OMA, New town of *Melun-Senart,* Paris, 1987 (competition).

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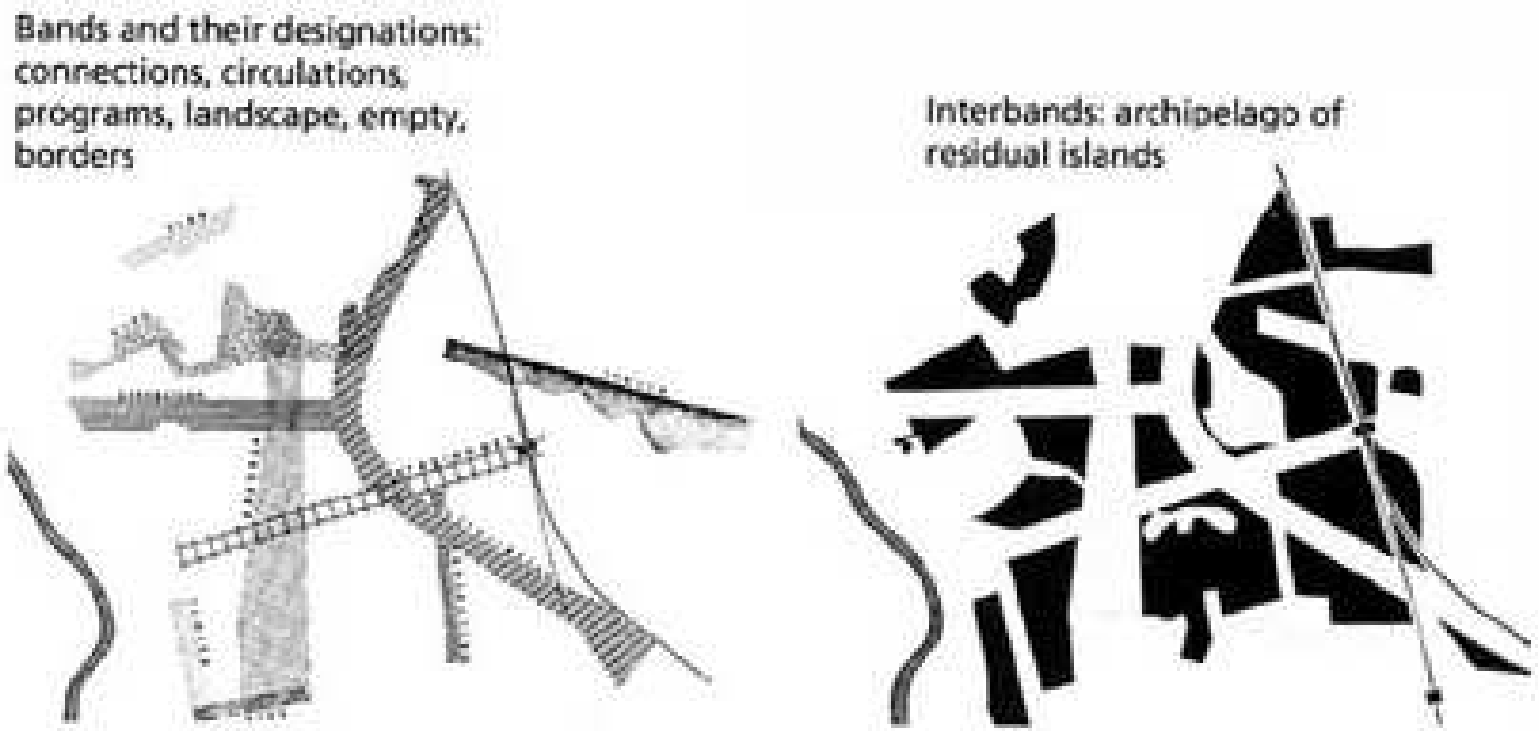
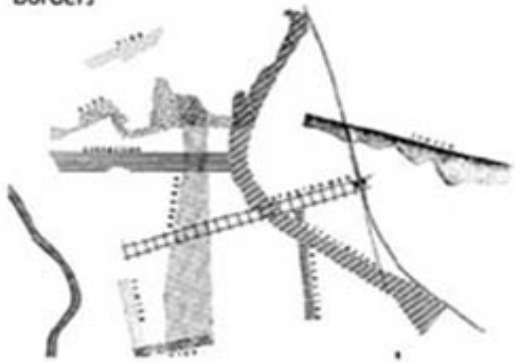


OMA, New Town of *Melun-Senart,* Paris, 1987 (competition).

Bands

Bands and their designations: connections, circulations, programs, landscape, empty, borders

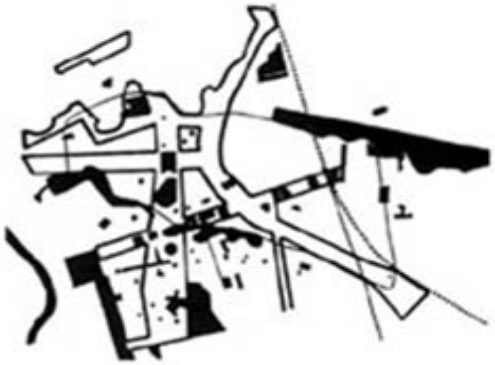


Interbands: archipelago of residual islands

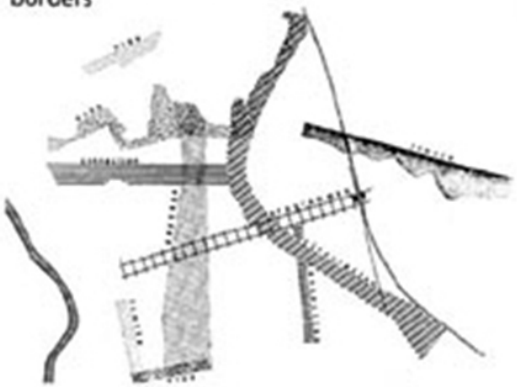
Circulation in the interbands

Principal circulations

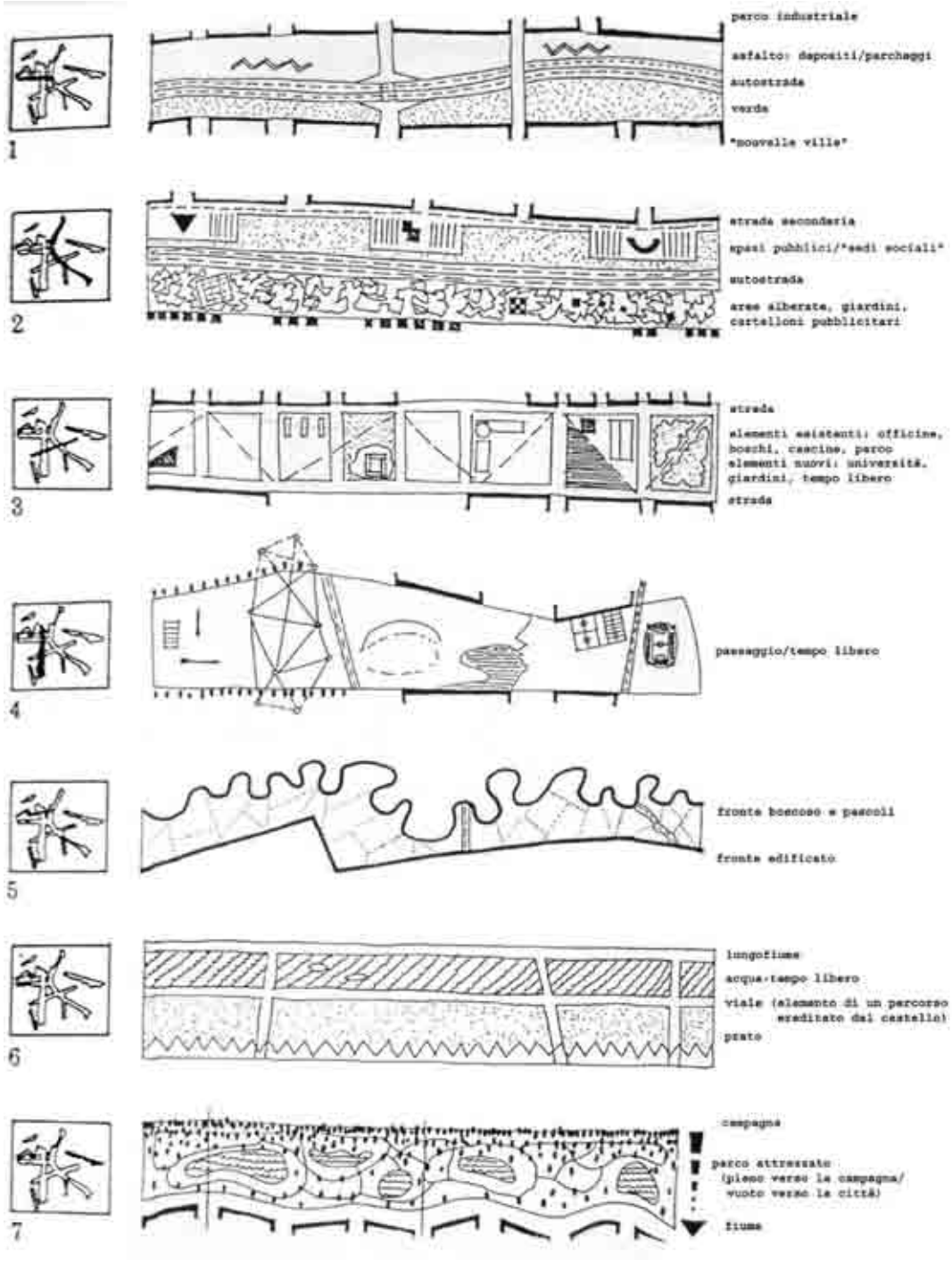
Recreational facilities



Bands and their designations: connections, circulations, programs, landscape, empty, borders



Rather than a series of drawings that show how a finished project looks like or how all the different parts fit together, these drawings aren't a description but a program that outlines the performative dimensions of a project's unfolding.

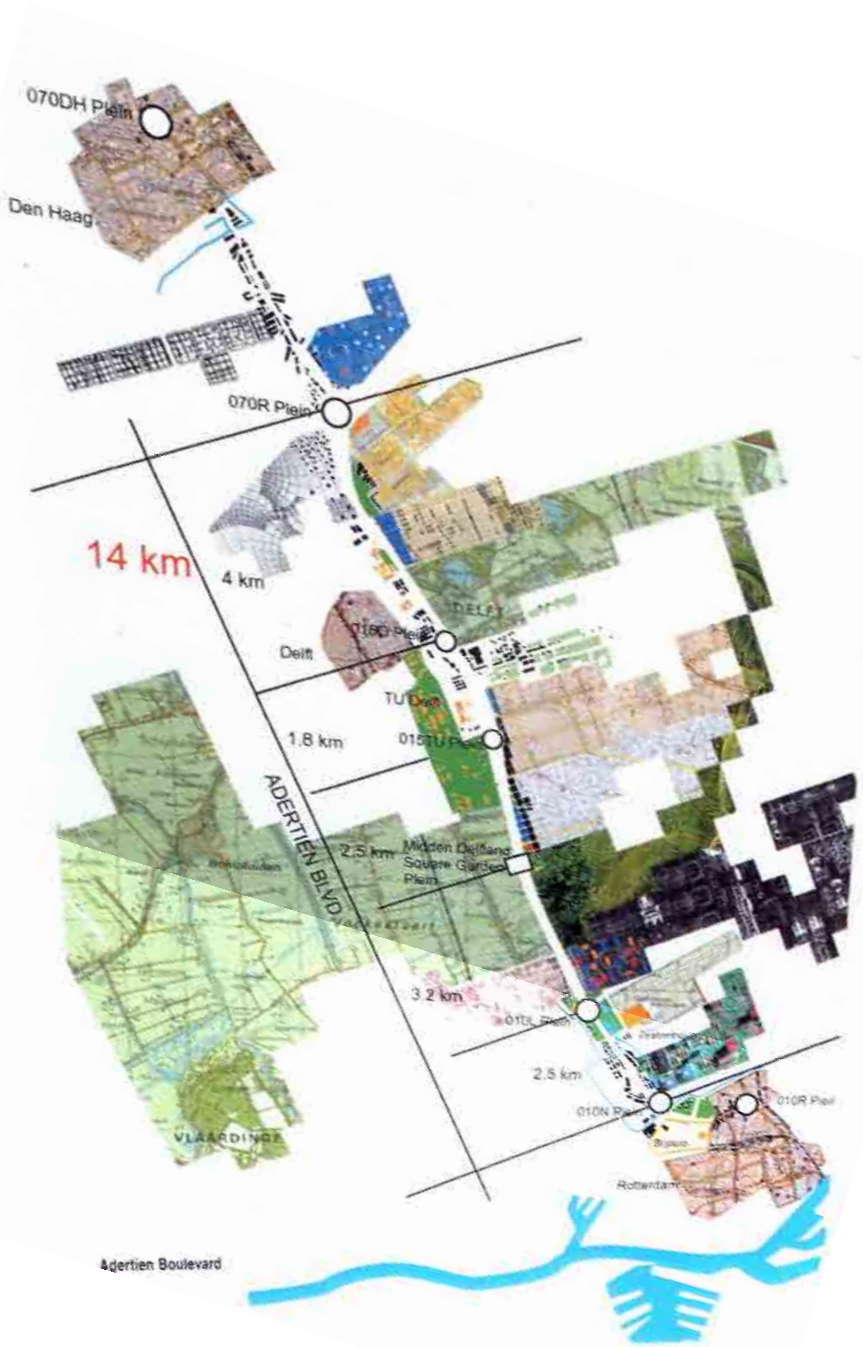


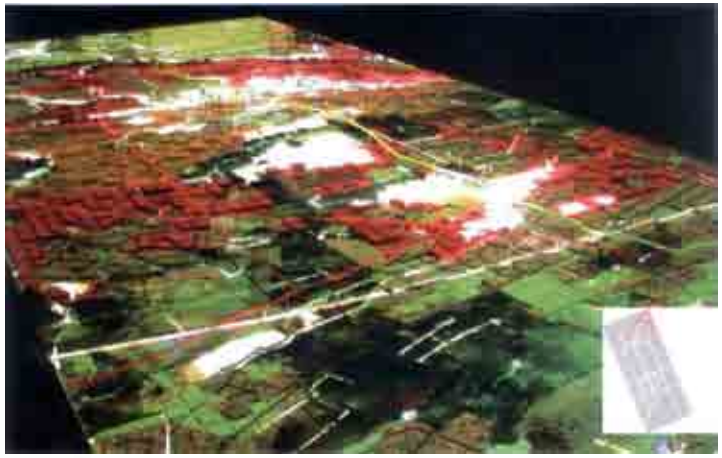
Becoming a movement

Landscape Urbanism is a theory of urbanism arguing that **landscape, rather than architecture, is more capable of organizing the city and enhancing the urban experience**.

It has emerged as a theory in the last ten years and is far from being a coherent doctrine. Charles Waldheim, James Corner, and Mohsen Mostafavi are among the instructors, practitioners, and theorists who have been most responsible for articulating the terms of landscape urbanism.

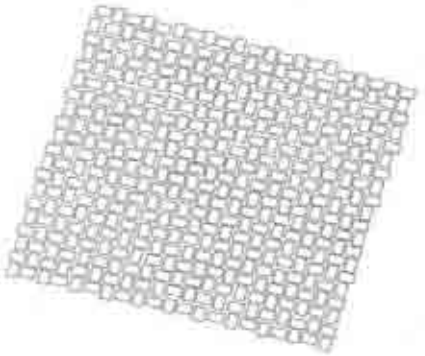
See: Waldheim, C. (ed.) (2006), **The landscape urbanism reader**, Princeton Architectural press, New York.


070DH Plein
Den Haag
070R Plein
14 km
4 km
Delft
1.8 km
2.5 km
Midden Delfland
Square Garden
Plein
ADERTIEN BLVD.
3.2 km
2.5 km
010R Plein
VLAARDINGEN
Rotterdam
Adertien Boulevard



Edoardo Arroyo,
Urban Genetics in Saint Denis,
1999 (competition).

Host determinant cells at the beginning of the inoculation cycle
EXISTING URBAN STRUCTURE

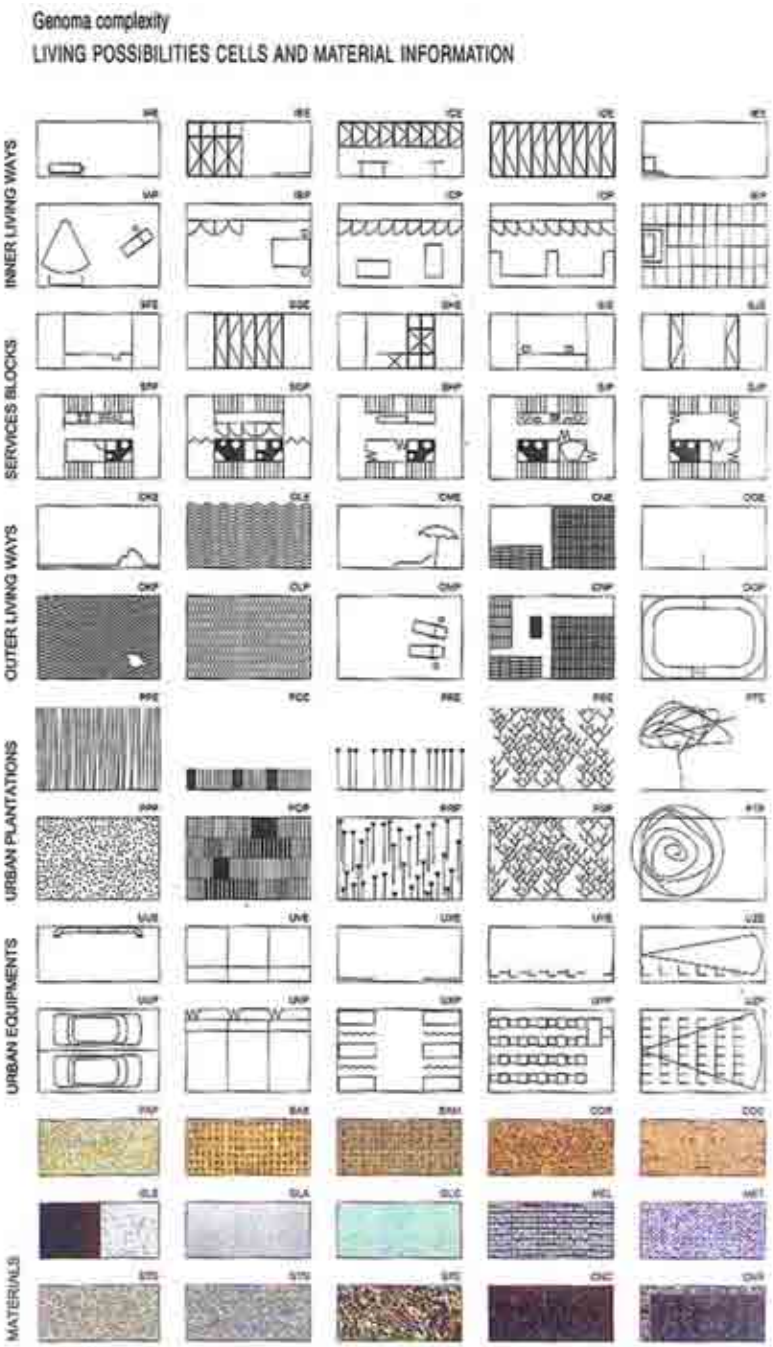


Fluid stability of 'fast' proliferation genetic culture
URBAN VEHICULAR STRUCTURE. SPEED>20 km/h

Replicated regions of 'slow' kinetic transfer vectors
PEDESTRIAN-CYCLING STRUCTURE. SPEED<20km/h

Genetic dissemination and early pathogenic mutation
NEW HYBRID URBAN STRUCTURE

Detection of hybrid formations in the host cells
FINAL MISCELLANEOUS GREEN AREAS



Edoardo Arroyo,
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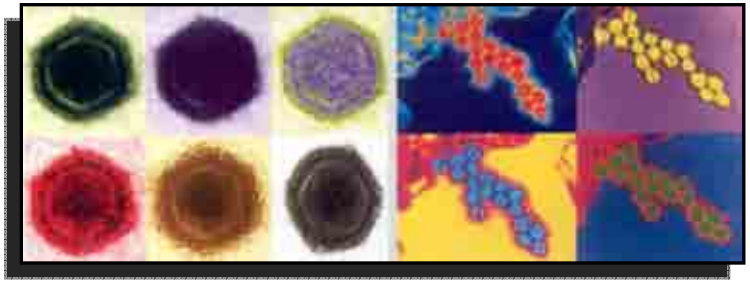


Process of genetic hybridization.

The plan consists in the coding of new cultivations inoculated into the existing tissue of city, to favor “the final mutation” from the genetic proliferation.

The configuration of the program is defined from the pedestrian-cycling and vehicular structure.

Regarding to the architecture, the plan does not preview a “form” but it indicate possible performances through a notation system.

Main features

James Corner, in an essay entitled *Terra Fluxus*, describes the main qualities of Landscape Urbanism:

- **Process in time**: urbanization is a dynamic process characterized more by terms like **fluidity, spontaneous feedback, and non-linearity,** than stability, predictability, or rationality. Ecology and systems theory are concepts inherent to the city.
- **Surface, not form**: **horizontality and sprawl in places** like Los Angeles, Atlanta, Houston, San Jose, and the suburban fringes of most American cities is **the new urban reality**. **As many theories of urbanism attempt to ignore this fact, Landscape Urbanism accepts it and tries to understand it.** … Landscape urbanism … finds thinking in terms of **adaptable 'systems' instead of rigid 'structures' as a better way to organize space**.
- **Form** is the traditional **character of the city**; **formlessness characterizes nature**, that which has been untouched by human intent. This city/nature duality is critical to most theories of the city and nature. **Landscape urbanists argue that this duality is naive and argue for a conflation of landscape and building**.

See: http://en.wikipedia.org/wiki/Landscape_urbanism

The attention focused on the "in-between" opens to ecological networks (green corridors, agriculture, parks, forestries, …) where nature and infrastructure can be also recomposed in a more complex system.
"Infrastructural-environmental networks constitute the primary pattern that brings efficiency and equilibrium to the territory and the city, and which consents us to measure space and construct the meaning and quality of the landscape. …. They bring order and promote densification, as well as porosity and the rarefaction of intensely urbanized spaces"

See: Rosario Pavia (2012), **Eco-Logics**, "Piano Progetto Città", 25-26, p.21

3 Positions

The **Landscape Urbanism gives suggestions about the project of what is "in-between"** so many different patterns, gives **a key to conceive a re-composition** without codifying it, without a previous formal idea, considering landscape as a project, and projecting new "artificial" landscapes where city and nature are not in opposition.

As in the case of the New Urbanism, there are **many ways to interpret Landscape Urbanism:** the feature of a movement is to be fluid.

In an article published in the magazine "Monograph.it" (2010.2), Douglas Spencer distinguishes **3 main positions**: a first one in North America, represented by figures such as **James Corner**, a second one proposed by **Kenneth Frampton** and pursued in Europe by practitioners such as **Kelly Shannon**, and a third one developed in the Graduate School of the Architectural Association of London under the direction of **Mohsen Mostafavi** and **Ciro Najle.**

1. The post-Fordist, and post-urban: " … has been, at times, acquiescent, if not 'fatalistic' and opportunalistically instrumental to the logic of systemic transformation";

2. The critical-regionalist, phenomenological/humanist: "…whilst clearly articulating a certain politics of landscape, has, in its strategies of resistance, focused upon a place-making approach through which 'cultural difference' might be conserved";

3. The post-structuralist: " … has forged a distinctive framework of practical knowledge, responsive design instruments and theoretical perspectives developed in an ongoing dialogue with the conditions and locations" (p.12).

1. The post-Fordist/post-urban and **2. The critical-regionalist, phenomenological/humanist**: "The projects informed by these positions, whilst often imaginatively and rigorously oriented towards ecological concerns, and articulated in relation to the powers of mobile capital, are thus not required to think or engage with either the relations between built elements of the urban fabric and the concommitant processes of subjectivification which follow from this, or the transformative potentials of these since both perspectives are explicitaly anti-metropolitan.

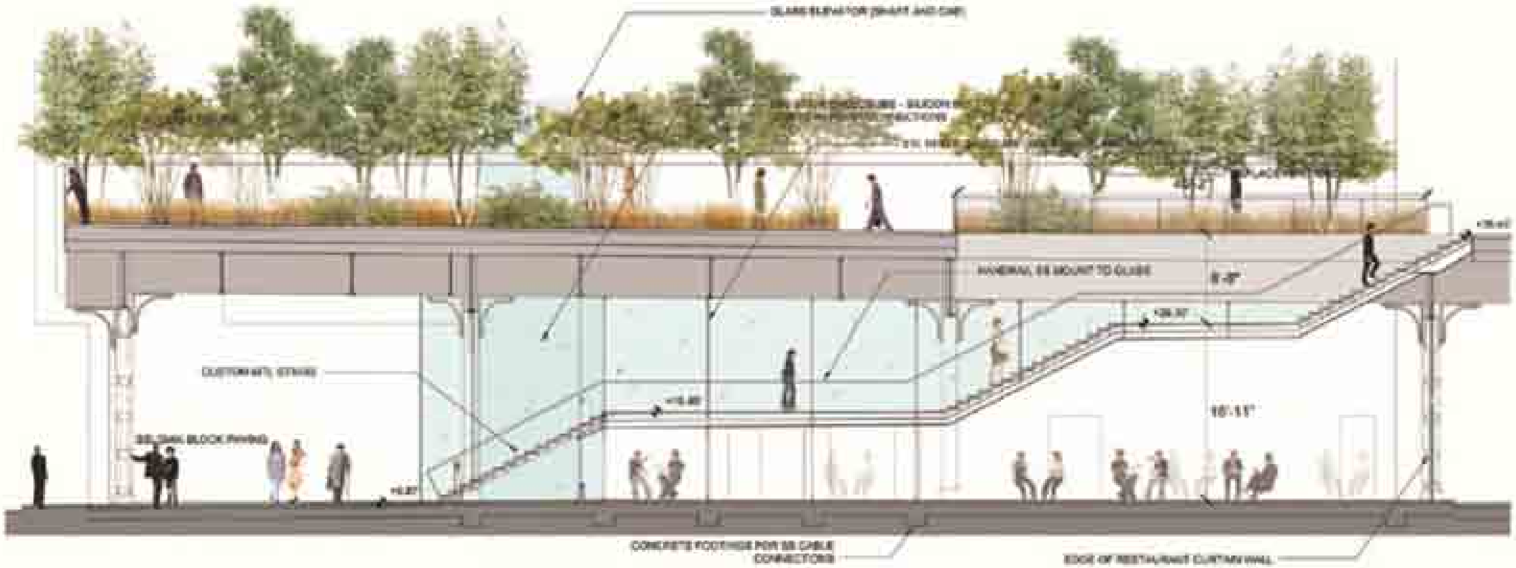
Within both of these currents of Landscape Urbanism there is then a sense in which **landscape's primacy as a means of conceiving and producing territories** constitutes not only **a disciplinary victory over architecture**, in a hegemonic struggle over claims to urban design, but **an historical one over urbanism and the metropolis as such. Landscape is proposed as a holding ground against development and in anticipation of a post-urban society**" (p. 17).


SECTION 3 (RAILYARDS)
W. 30TH ST– W. 34TH ST
SECTION 1
GANSEVOORT ST – W. 20TH ST
SECTION 2
W. 20TH ST– W. 30TH ST

PIER 64
HL23
CHELSEA WATERSIDE PARK
CLEMENT CLARKE MOORE PARK
GALLERY DISTRICT
CHELSEA PIERS
CHELSEA
100 ELEVENTH AVENUE
METAL SHUTTER HOUSES
FULTON HOUSES
IAC
THE KITCHEN
HIGH LINE RESTROOM
CHELSEA MARKET
HUDSON RIVER
14TH ST PARK
MEATPACKING DISTRICT
STANDARD HOTEL
GANSEVOORT ST
WEST VILLAGE
HORATIO ST
WHITNEY MUSEUM
JANE ST
ABINGDON SQUARE
WASHINGTON ST
BETHUNE ST
BANK ST
HUDSON RIVER PARK
WESTBETH ARTIST HOUSING
GREENWICH VILLAGE
PERRY ST
CHARLES ST
BLEECKER ST
GREENWICH AVE
HUDSON ST


event lounge
gassevoort entry


TENTH AVE
W 14TH ST
TENTH AVE


GLASS ELEVATOR (SHAFT AND CAR)
HANDRAIL SS MOUNT TO GLASS
8'-9"
15'-11"
BELGIAN BLOCK PAVING
CONCRETE FOOTINGS FOR SS CABLE
CONNECTORS
EDGE OF RESTAURANT CURTAIN WALL


12


13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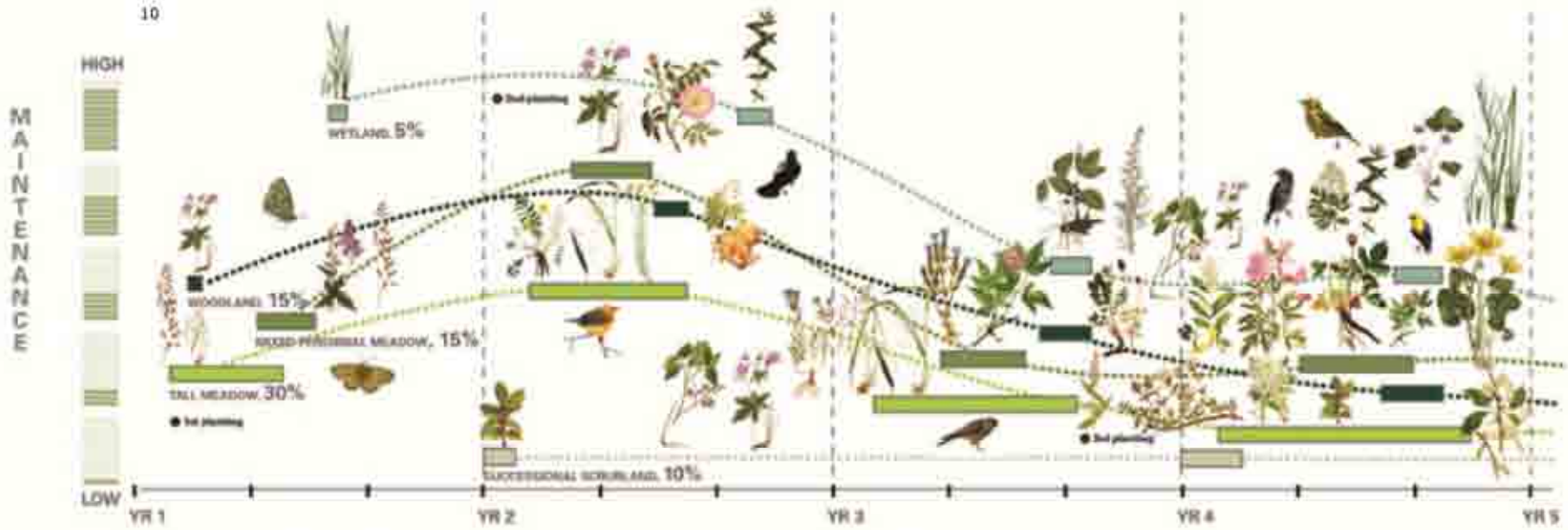

DIVERSIFICATION IN TIME (STABILIZED MAINTENANCE / ENHANCED BIODIVERSITY)

13. [illegible]

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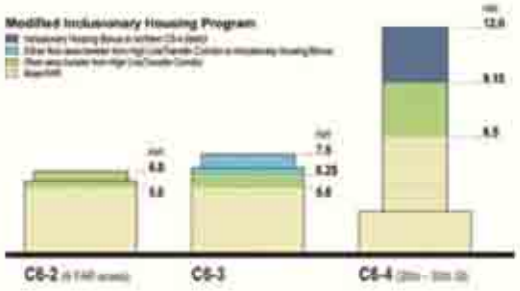
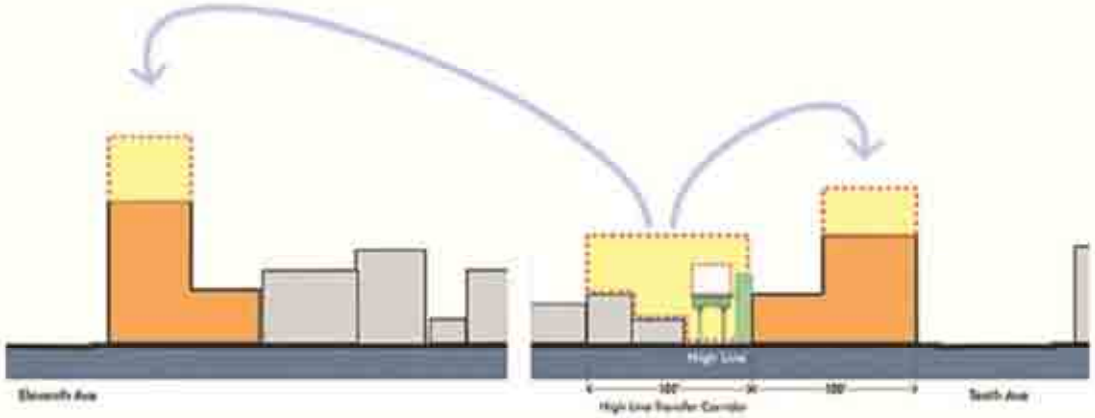
CAFE & DINER

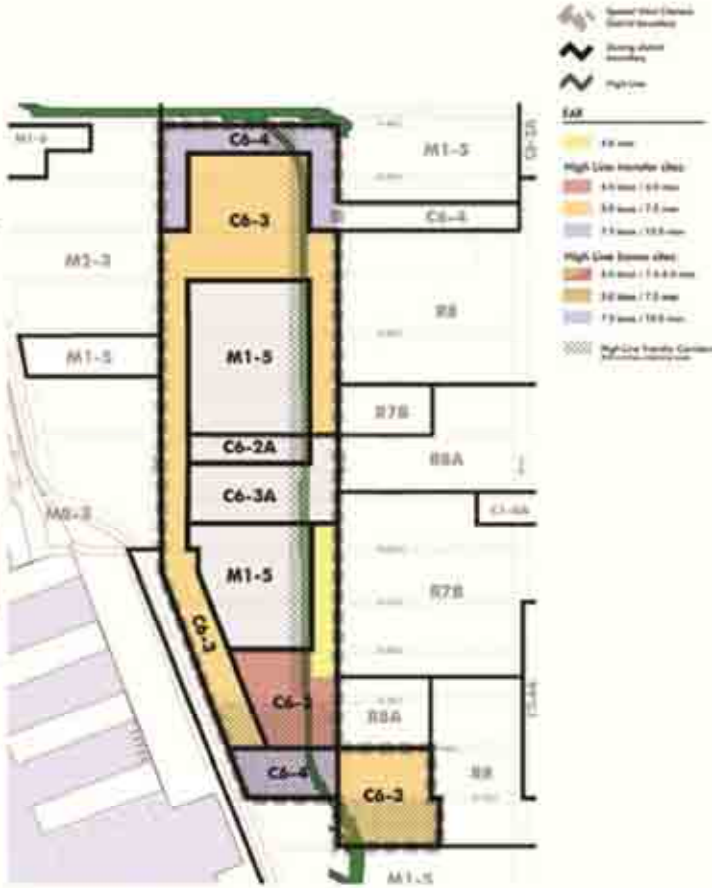




12 Schematic 3D simulation of the Special Chelsea District Rezoning (2005)

13-14 15 Quantitative and spatial diagrams of the new building rules in the Special West Chelsea District Rezoning (2005)

16 NEXT PAGE A part of the High Line from above

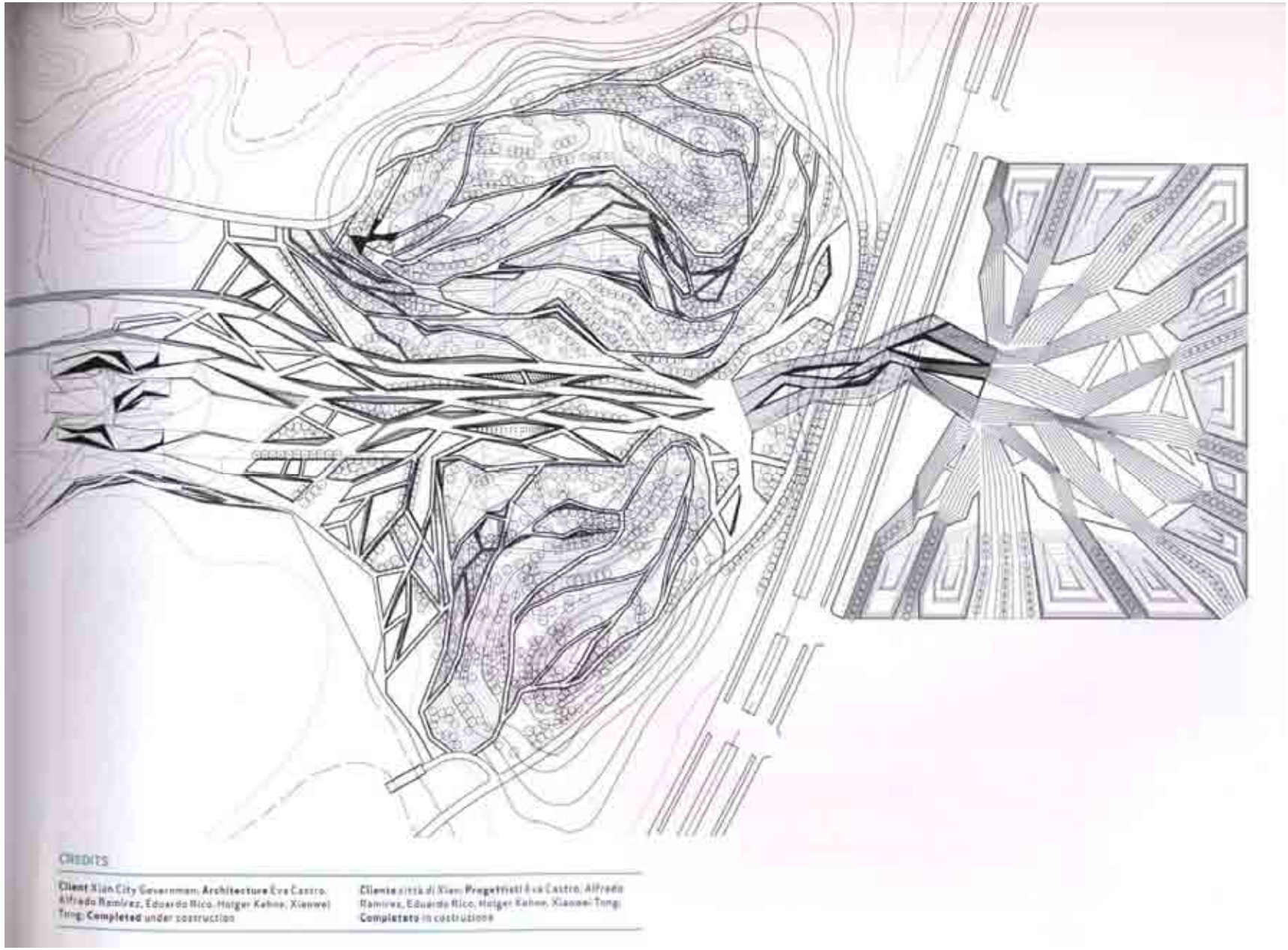


3. The post-structuralist: "One in which **buildings are landscaped and landscape becomes architectural.** … the 'urban situation' is not posited as a site for the remediative strategies of landscape, but as a territory in which this mutual redefinition of landscape and architecture can be productively mobilized.

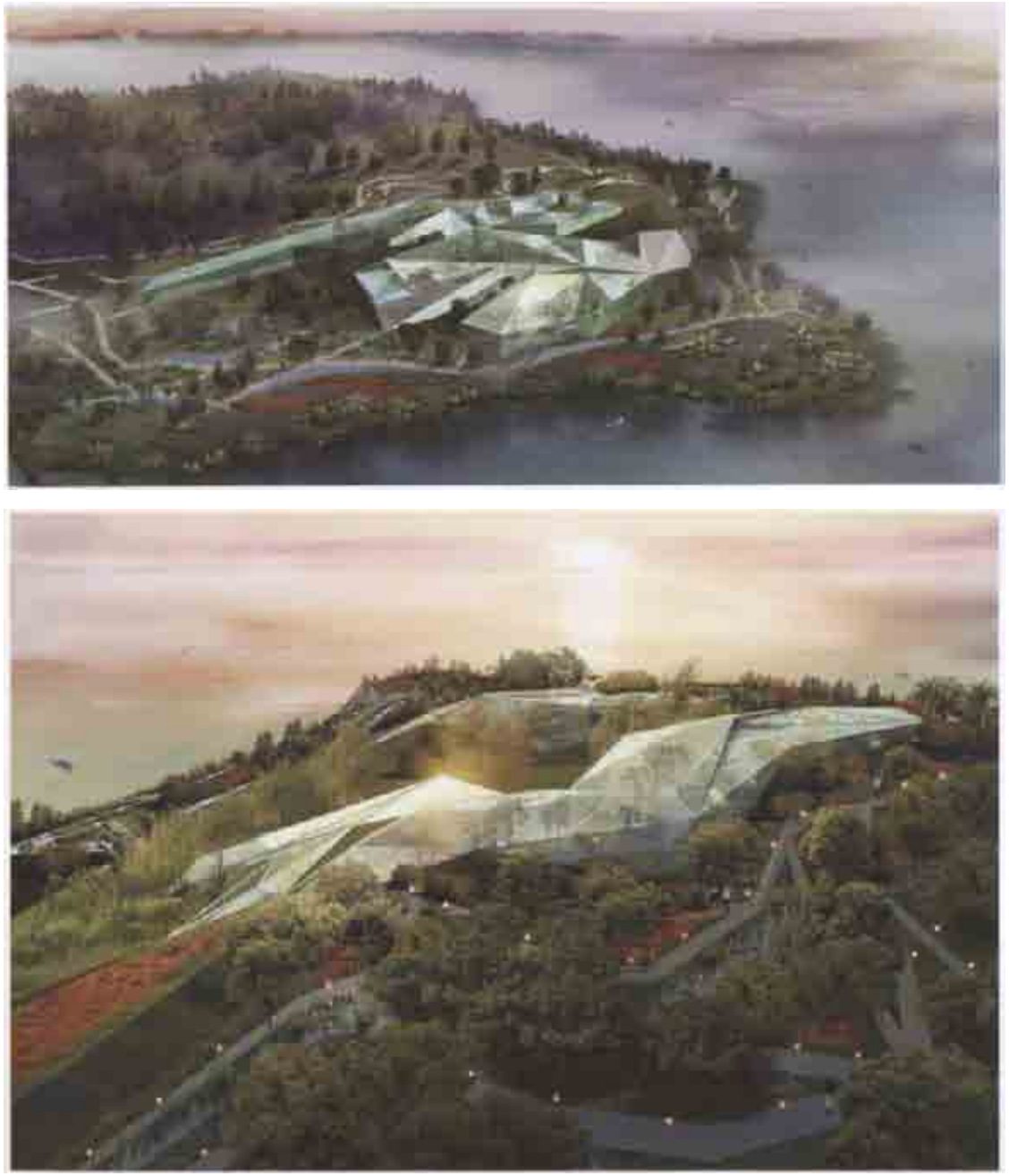
For architecture, then the model of landscape outlined here suggests, rather than a pastoral condition, a model through which built form becomes topographic. … an architecture as landscape suggests the capacity to produce more complex articulations within the urban fabric. **A topographically, even topologically, directed architecture also provides the means through which to recompose and invent new configurations of infrastructure, agriculture, inhabitation and mobility** within urban space and across the wider territories in which these are networked" (p.19).

Some projects by Plasma Studio, Gasparrini Studio, and Ricci&Spaini, are examples of this position.


05
INTERNATIONAL HORTICULTURAL EXPO
ESPOSIZIONE ORTICOLA INTERNAZIONALE
Xi'an - China - 2009/2011



International Horticultural Expo Xi'an - China (Plasma Studio, 2009-2011)



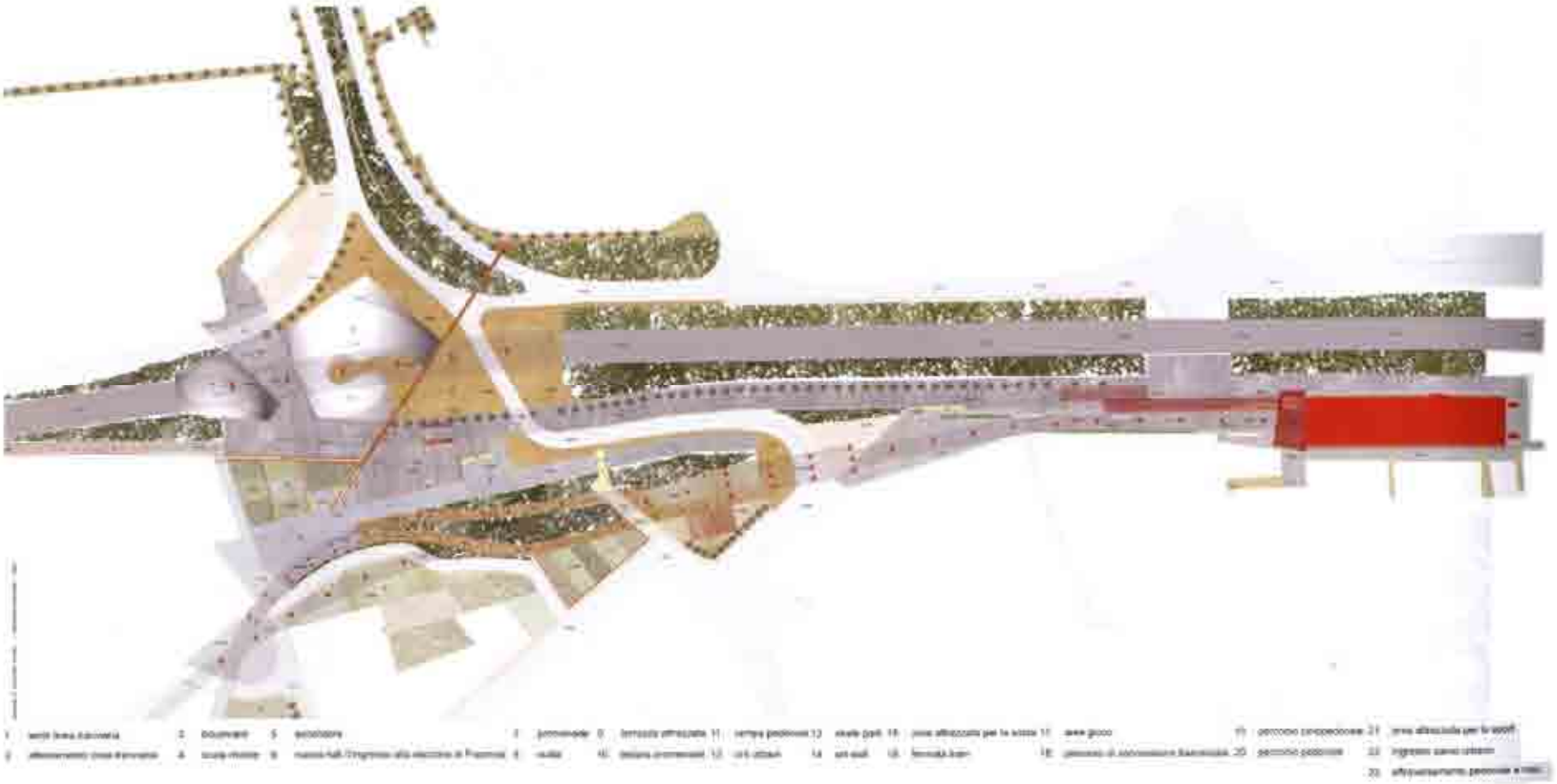
International Horticultural Expo Xi’an - China (Plasma Studio, 2009-2011)

International Horticultural Expo Xi’an - China (Plasma Studio, 2009-2011)

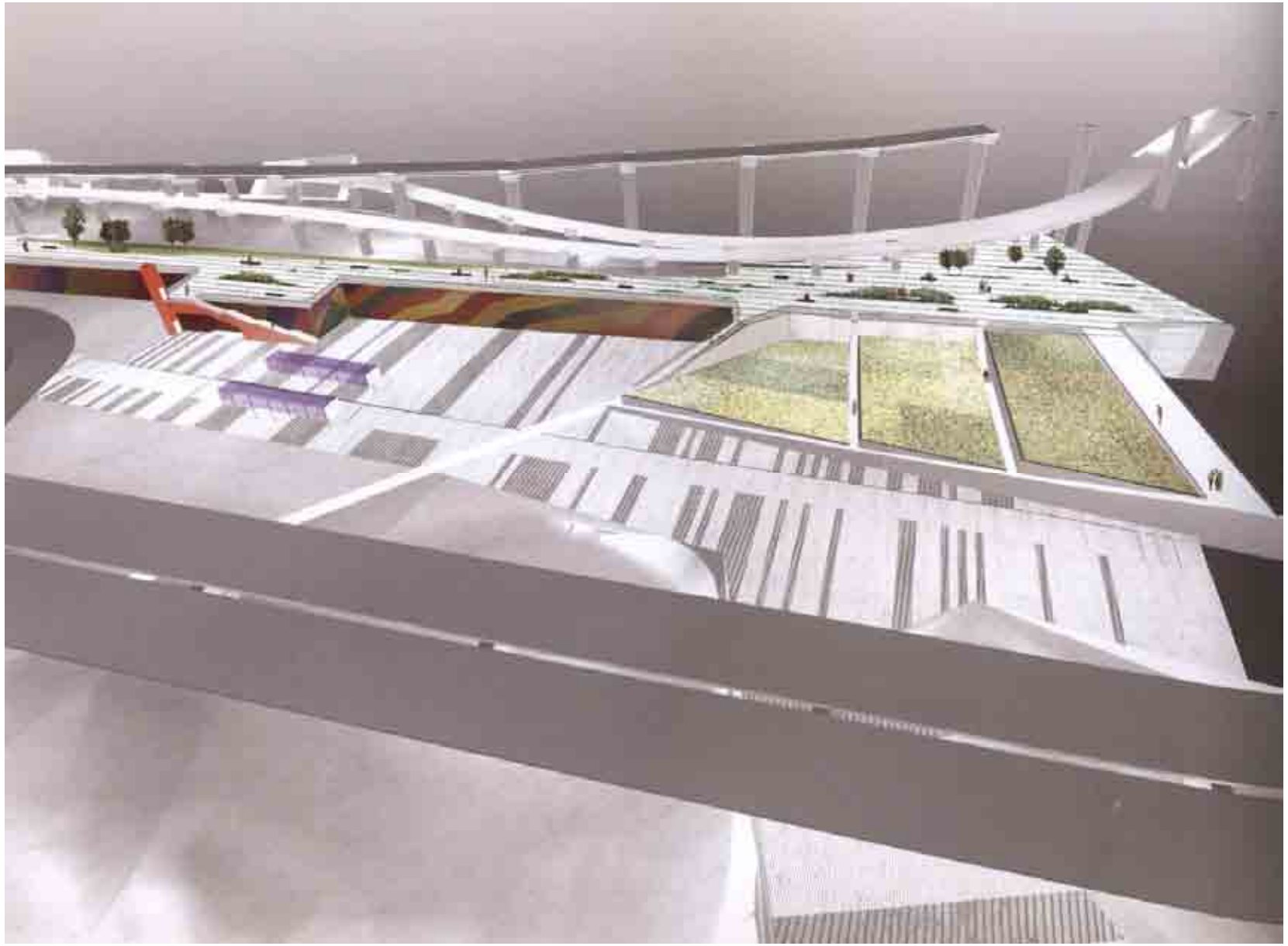
02 TRAM IN THE NORTHERN AREA OF THE CITY

TRAM NELL'AREA NORD DELLA CITTA

Piscinola/Villaricca - Napoli - Italy - 2005/2006



Tram in the northern area of the city (Gasparrini Studio, 2005-2006)



Tram in the northern area of the city (Gasparrini Studio, 2005-2006)

Tram in the northern area of the city (Gasparrini Studio, 2005-2006)

Tram in the northern area of the city (Gasparrini Studio, 2005-2006)

Ricci&Spaini Studio

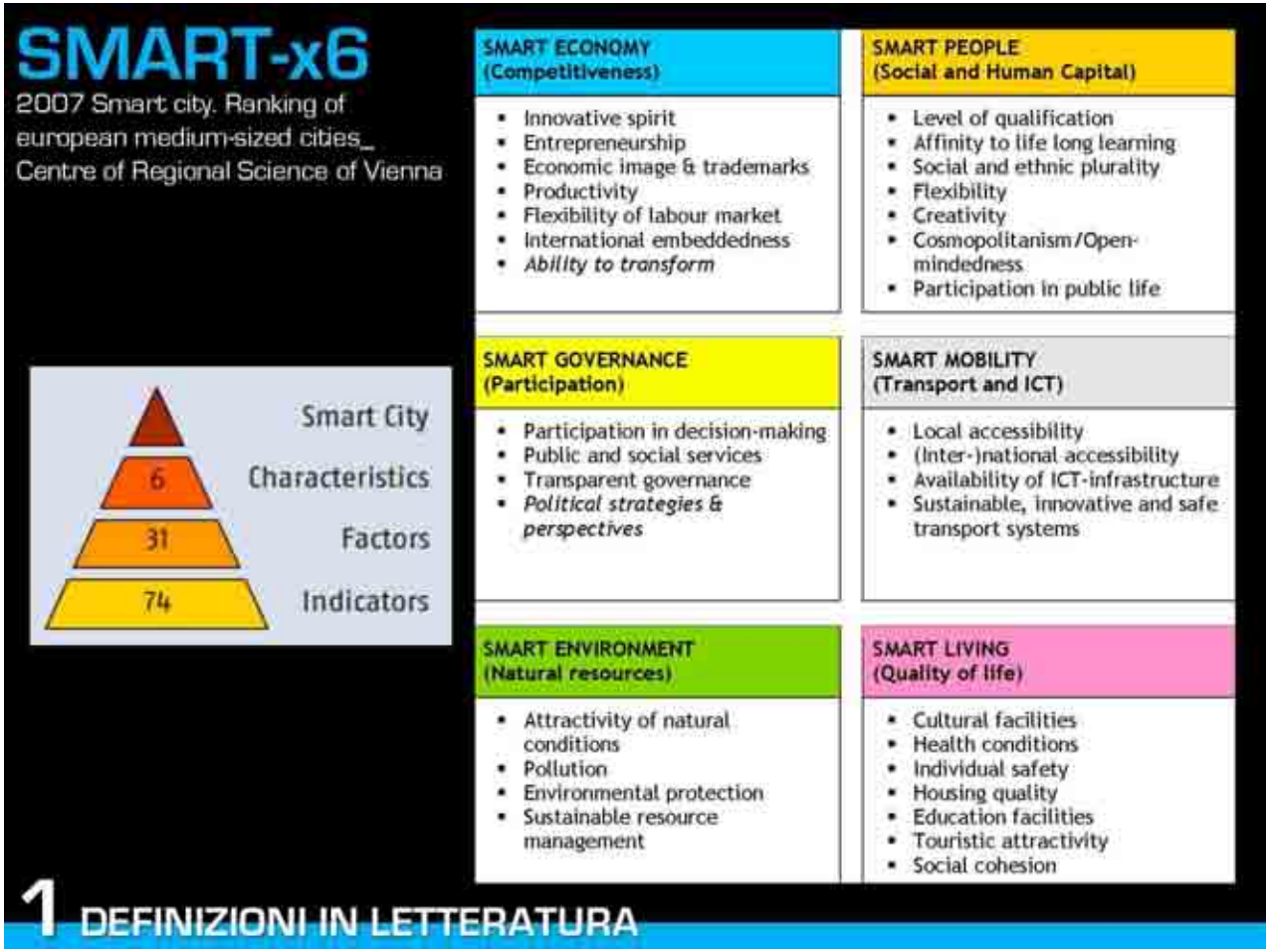
"We are **at the down of a new process**: there are numerous design iniziatives at the scale of settlement and the territory, though **they have yet to reach the critical mass and dimensions** to be able to contrast, on their own and without a cultural and political change the models of growth, the effects of he environmental crisis."

Quoting Saul Griffith: " at the technical and industrial level it is possible (to reduce the levels of CO2), though I cannot see how it would be possible at the political level" (Pavia, p.11).

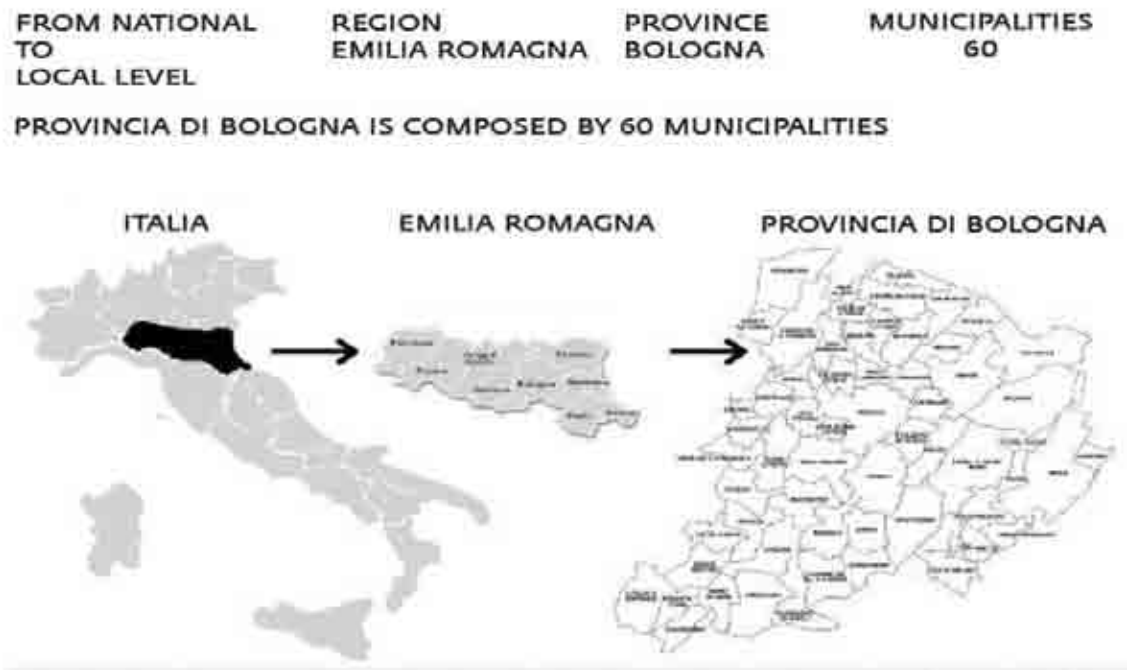
Bologna has begun its own process with an integration of ecological actions into the urban planning tools, then with a plan for the energy (SEAP), a pedestrian plan for the historical centre, a European program (LIFE_GAIA).

Bologna’s process

The label “smart city” gives an idea of the multi-level intervention

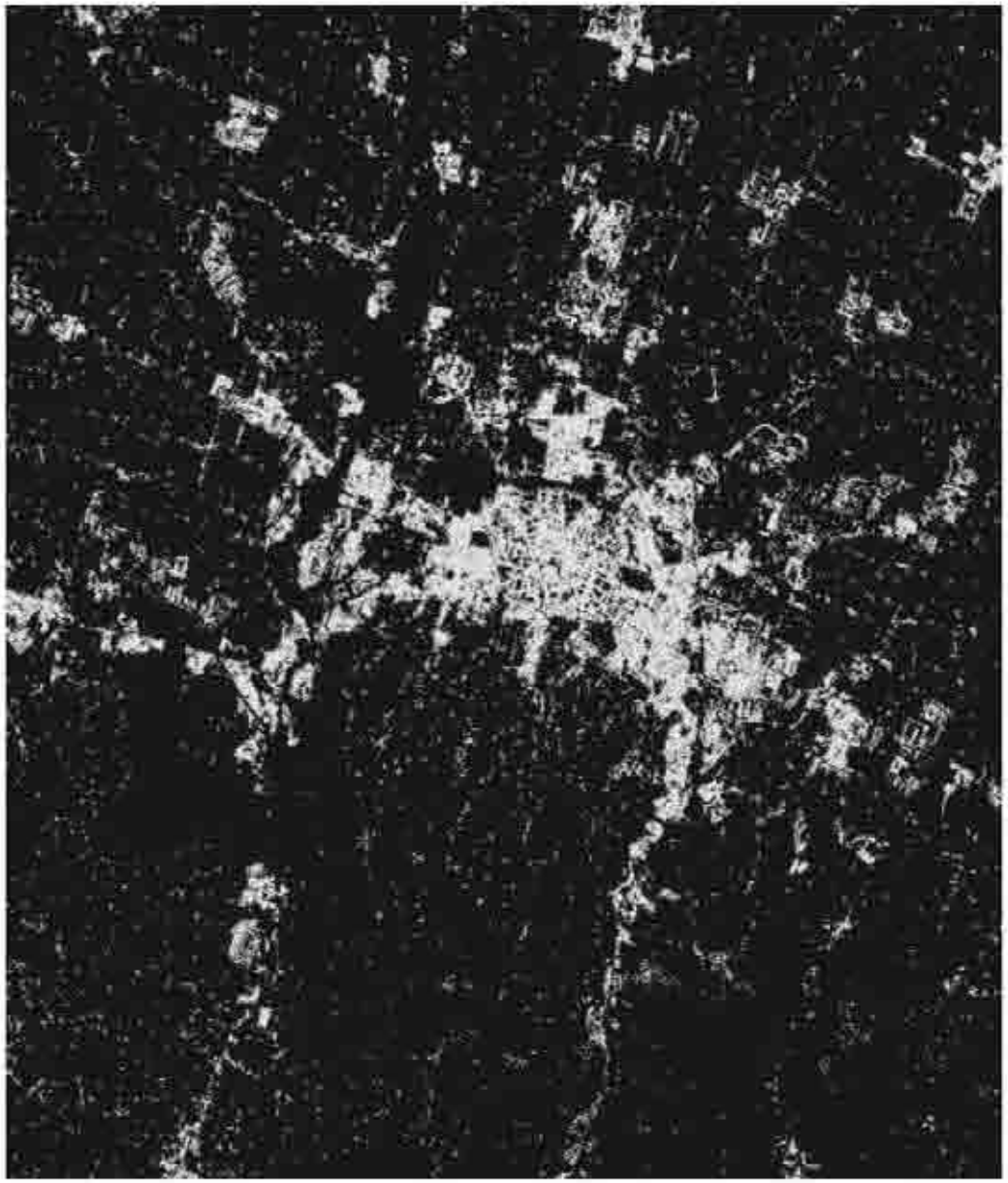


About Bologna



- **Capital of *Emilia-Romagna Region***
- **Population:** *373.592* ***inhabitants*** *(900.000 in metropolitan area)*
- **Land area:** *140,846 Km²*
- **Crucial railway and motorway junction**
- Strong presence of **small and medium industry** (Emilian model)
- Historical **University:** almost 100.000 *students*


Atlante *Booklet*
Workshop *una nuova alleanza tra città e campagna*



La citta' diffusa *The sprawl*

Inhabitants province bologna	984.342 (2009)
Common inhabitants Bologna	377.220 (2009)
Inhabitants in the conurbation bolognese	650.000 (2005)
Inhabitantes expected in 2015	1.000.000 (2005)
Extension of the province	3.700 km
Urbanized area	210 km
Daily trips to and from Bologna	400.000 (2005)
Average daily highway traffic crossing	45% (2005)
Average daily highway traffic exchange	55% (2005)

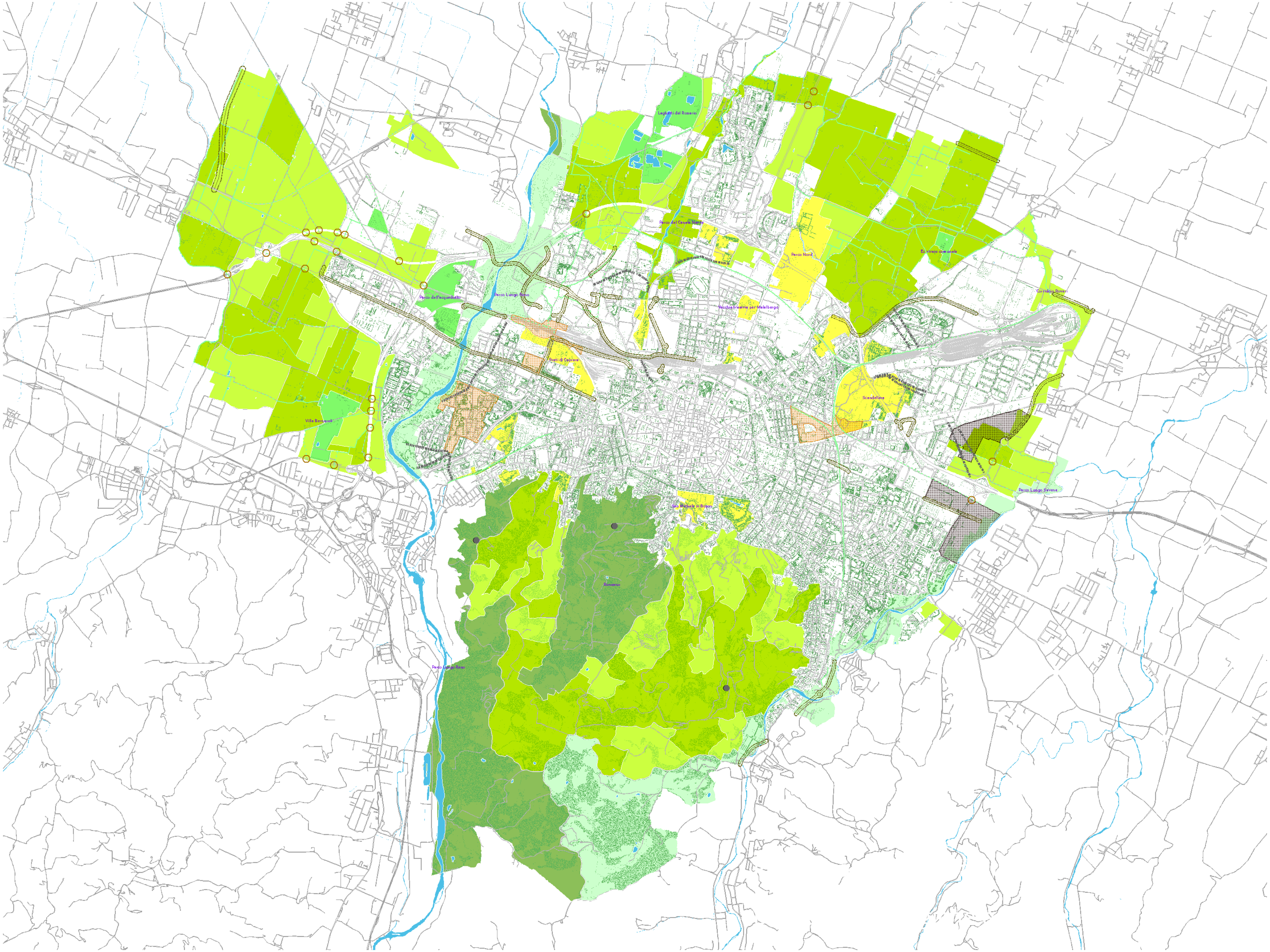
Urban Planning

In 2008 the Municipality approved the new **Municipal Structural Plan** (*Piano Strutturale Comunale* - PSC), a planning tool defined by regional laws (L.R. 20/2000).

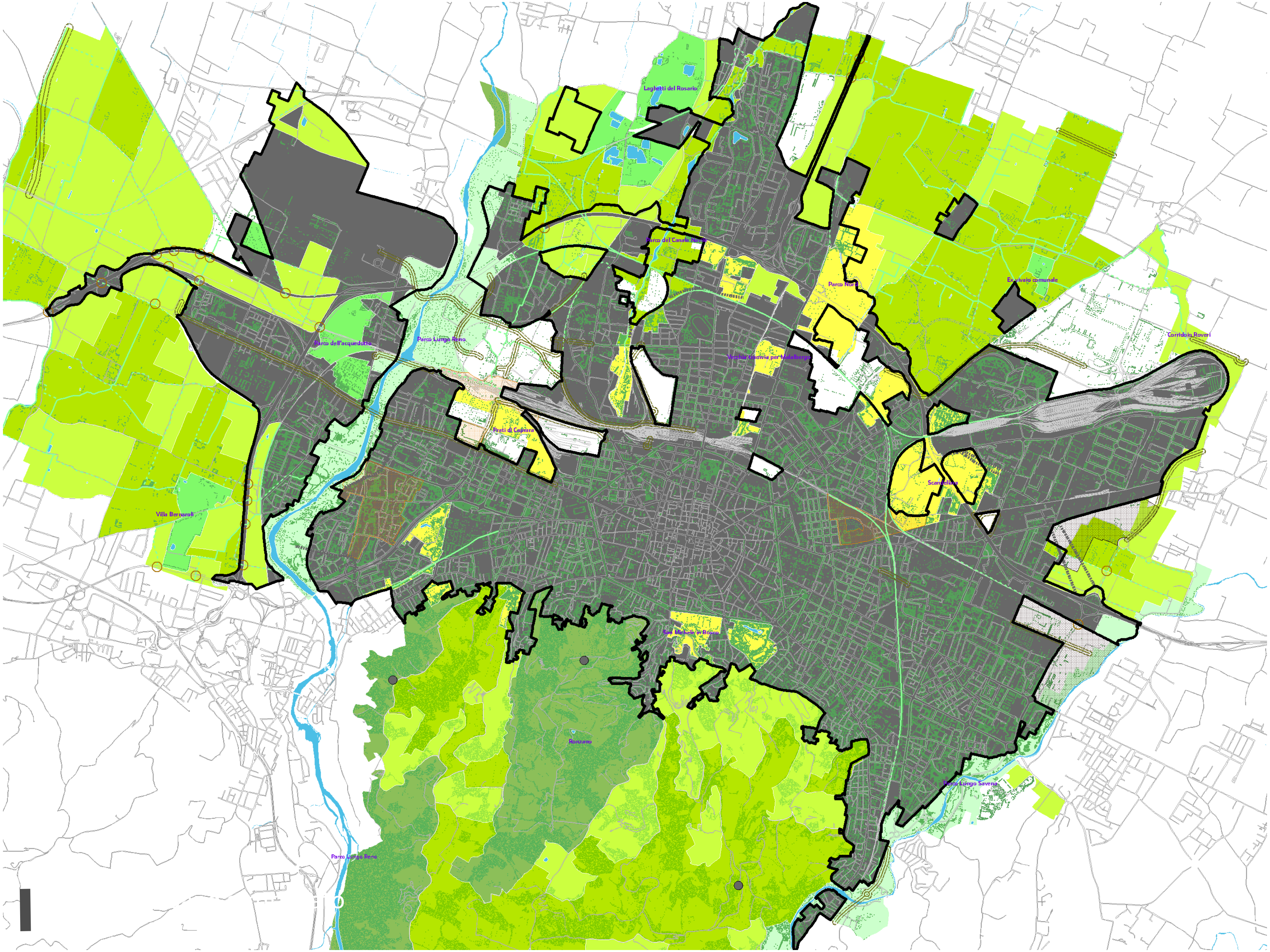
The Structural Plan is valid for the mid-long term (around fifteen years) and lays down the general aims that are then interpreted by the **Municipal Operative Plan** (*Piano Operativo Comunale* – POC) approved in 2010, which however has a term of five years, and by **Urban Building Code** (*Regolamento Urbanistico Edilizio* – RUE) approved in 2009.

The Municipal Structural Plan bases the feasibility of its forecasts on an **Environmental and Territorial Sustainability Assessment** (VALSAT) which considers the environmental impact of proposed actions, associating them with the rules and limits pointed out in environmental sector plans.

The first "smart" choises for a sustainable process are the preservation of agricultural areas and the identification of "Seven Cities", strategic figures linking together many different patterns-urbanscapes in a common program of transformation.



Laghetti del Rosario
Parco del Canale Navile
Parco Nord
Ex vivaio comunale
Corridoio Roveri
Parco dell'acquedotto
Parco Lungo Reno
Vecchia tramvia per Malalbergo
Prati di Caprara
Scandellara
Villa Bernaroli
Parco Lungo Savena
San Michele in Bosco
Ronzano
Parco Lungo Reno



Laghetti del Rosario
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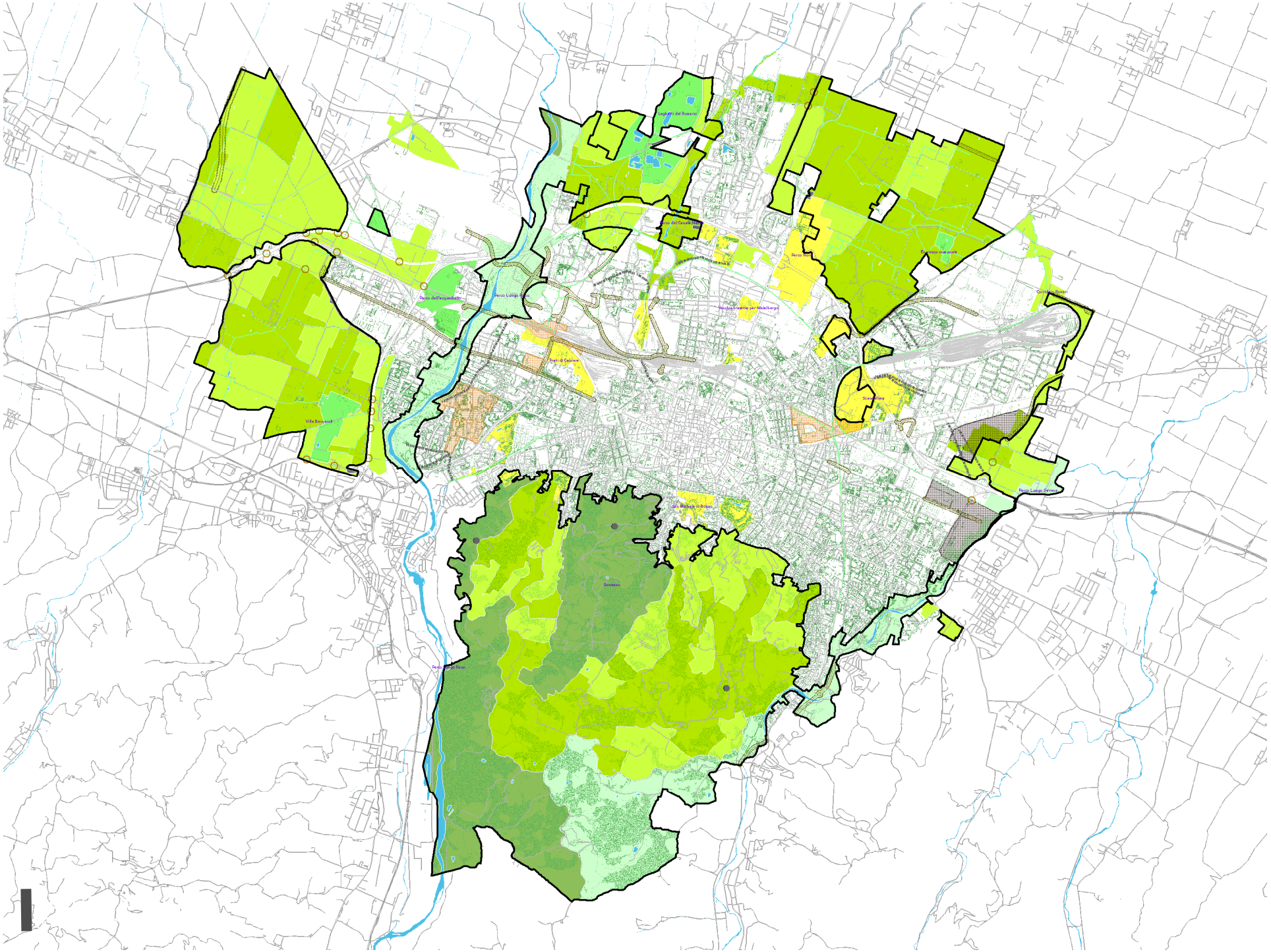
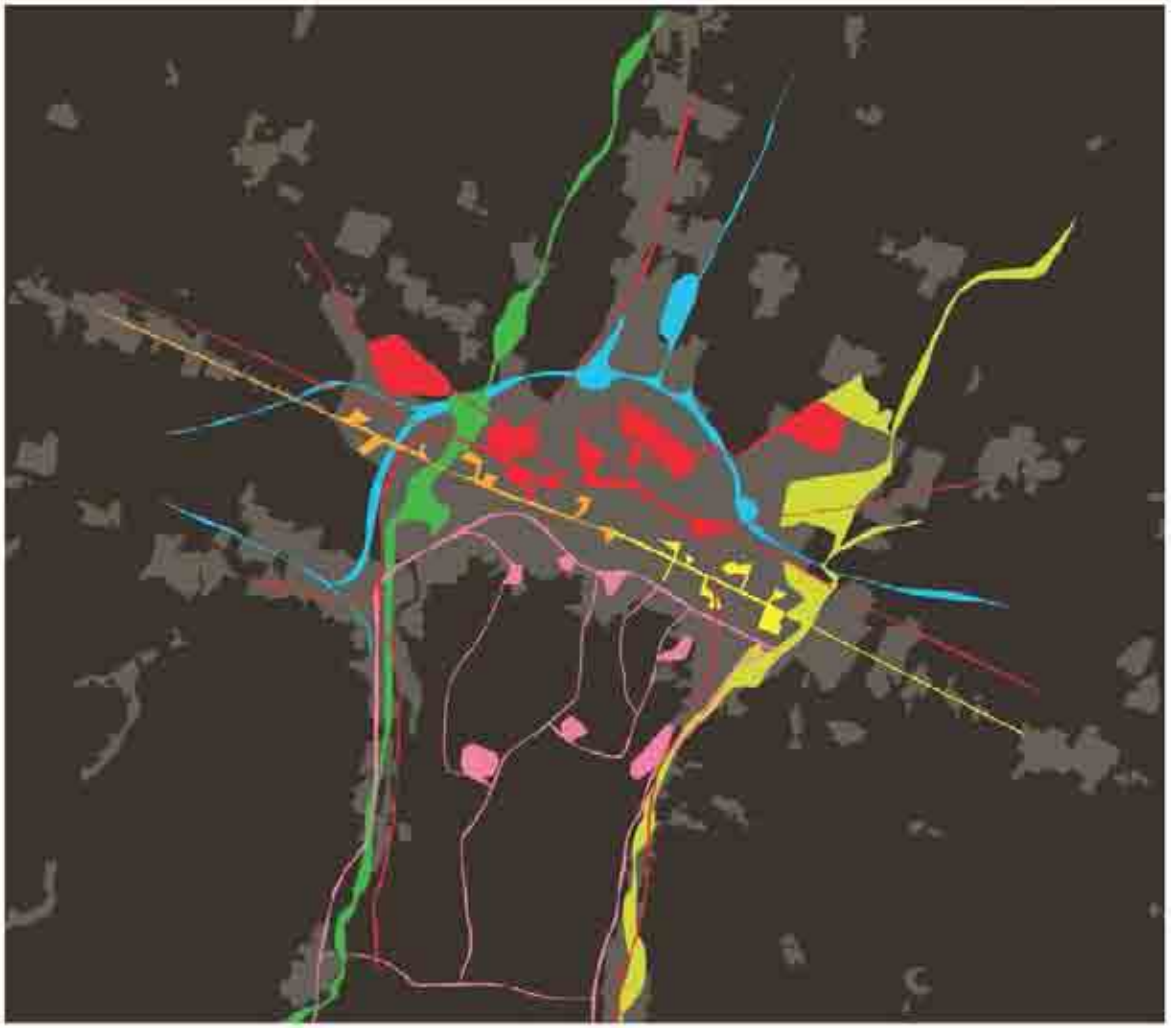
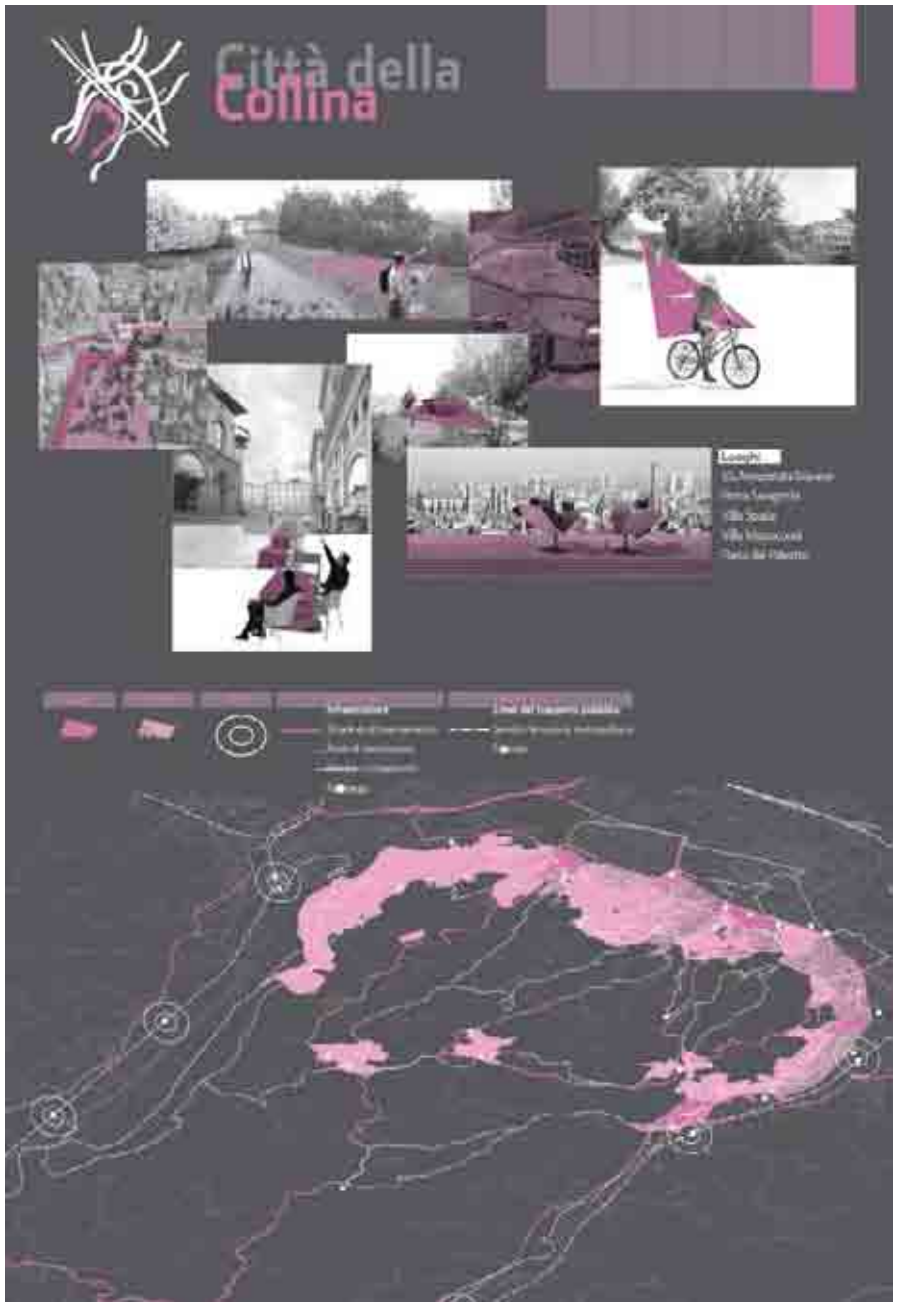


Comprehensive scheme of the Seven Cities

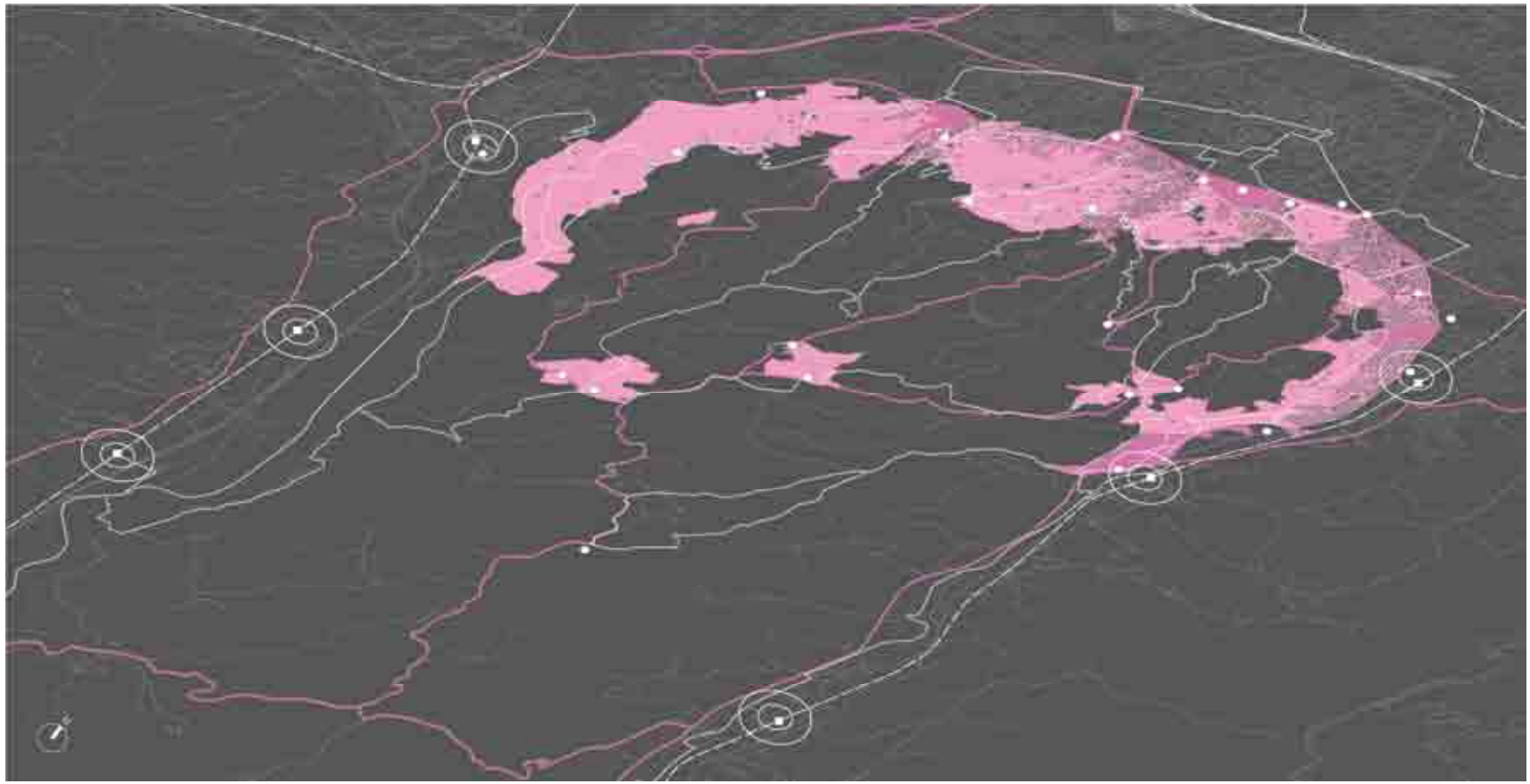
PSC
PIANO
STRUTTURALE
COMUNALE





The City of Hills seeks to give a new identity to the part of the metropolitan area which has been subjected to a process of progressive privatization and reduction in its use (almost entirely luxury housing). So, it is important to reconstruct a system of links (corridors, footpaths, car parks) for public use, the identification of places to be designed so that the hills become a "mosaic" of ecological, agricultural, and semi-urban environments that are available for various types of living.

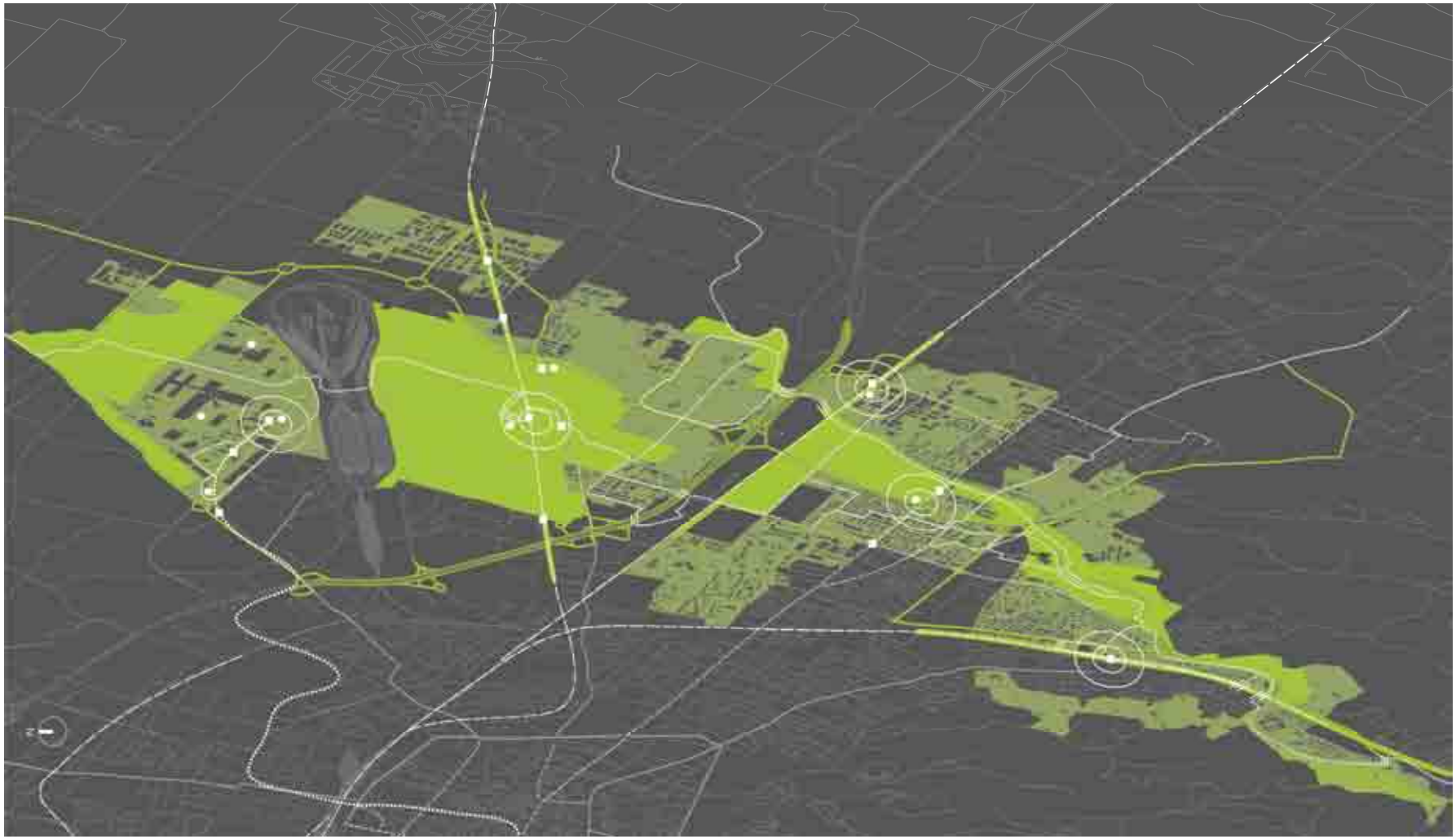
The City of Hills



The environment of the river Reno which flows on the west of the city is a unifying element in a discontinuous metropolitan area, consisting of developments which are mainly residential. The strategy is designing pedestrian and cycling links across nieghbourhoods and improving existing centralities. In the City of Savena, the stream which flows on the east, a new great road, the high speed railway, and new developments are creating a new metropolitan city where residential areas, quality manufacturing and service areas area developed together, interspersed by parklands and natural environments.

The City of Reno

The City of Savena



Urban Plan and energy

• The 2007 **Energy Plan of Bologna** (PEC) made a specific work based on territorial data and GIS system in order to define strategies for different areas of the city and evaluate the energy impact of new settlements and renewal projects.

• The PEC selects homogeneous city's areas (energy urban basins - BEU) for energetic, urban and environmental characteristics and defines a set of specific performance standards in each BEU to bring a **reduction of greenhouse gases emission in each new urban area** within the new city Urban Plan (PSC).

• The Building Code (RUE) gives **specific rules and requirements for urban projects**.

Energy and Urban Building Code

The PEC showed how most of greenhouse gases emissions of the city are determined by the building sector with an annual consumption for heating (170 Kwh/m2) more than double the actual minimum standard for new buildings (90 kwh/m2). In the meantime electric consumption for summer cooling have increased at a quick rate in the last decade.

The Urban Building Code (RUE) is characterized by setting performance to be obtained by buildings instead of defining solutions. The technical requirements about environmental quality of individual buildings and building complexes introduce additional elements to national and regional standards.

PSC and RUE have integrated at different scales the PEC policies.

At an urban scale

- study about relation with microclimate (orientation)
- integration of renewables
- extension of urban district heating networks

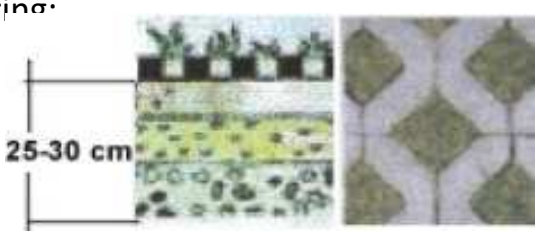
At a building scale

- GIS tool for solar energy availability
- excellence energy standards for new parts of the city and large regeneration
- local standards for efficiency of electric uses (cooling and lighting) in addition to national standards for thermal uses.

Urban Microclimate

The Building Code introduces an **index called RIE (building impact reduction)** which takes into account the microclimate quality of private and public open spaces by considering:

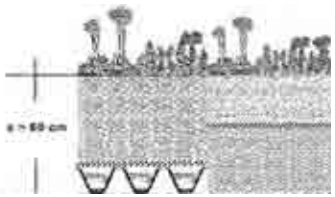
- **the amount of green surfaces**
- **presence and quality of trees**
- **colour and permeability of paved surfaces**

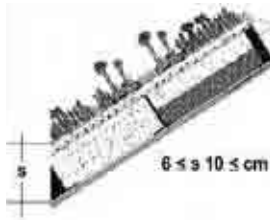


The RIE index applied to the entire area where the intervention is developed gives a value between 0 and 10. Low values of the index correspond to areas largely or completely paved, with no green spaces and no permeability. Values close to 10 are obtain with a high presence of green and permeable areas. In urban areas RIE has intermediate values.

For new constructions and building renovations the following values of RIE must be achieved:

- **basic level: RIE $\geq$ 4**
- **improvement level: RIE $\geq$ 5**
- **level of excellence RIE $\geq$ 6**





The **achievement of basic level** is compulsory while the achievement of improvement and excellence level contributes to the possibility of getting **incentives in terms of building volumes**.

Water

In the city of Bologna, the total amount of drinkable water after the peak of 37 and half millions m3 in 1998 fell to 35 milions m3 in 2006. The per capita daily consumption moved from 269 litres to 258 litres: 4.3% less. It is not enough.

PSC and RUE integrate water themes. At the urban scale:

- **deliver rain water in local rivers and channels instead of drainage network**
- **structures (basins) for the reduction of rainwater flow to drainage**
- **increased permeability of areas**

At the building scale:

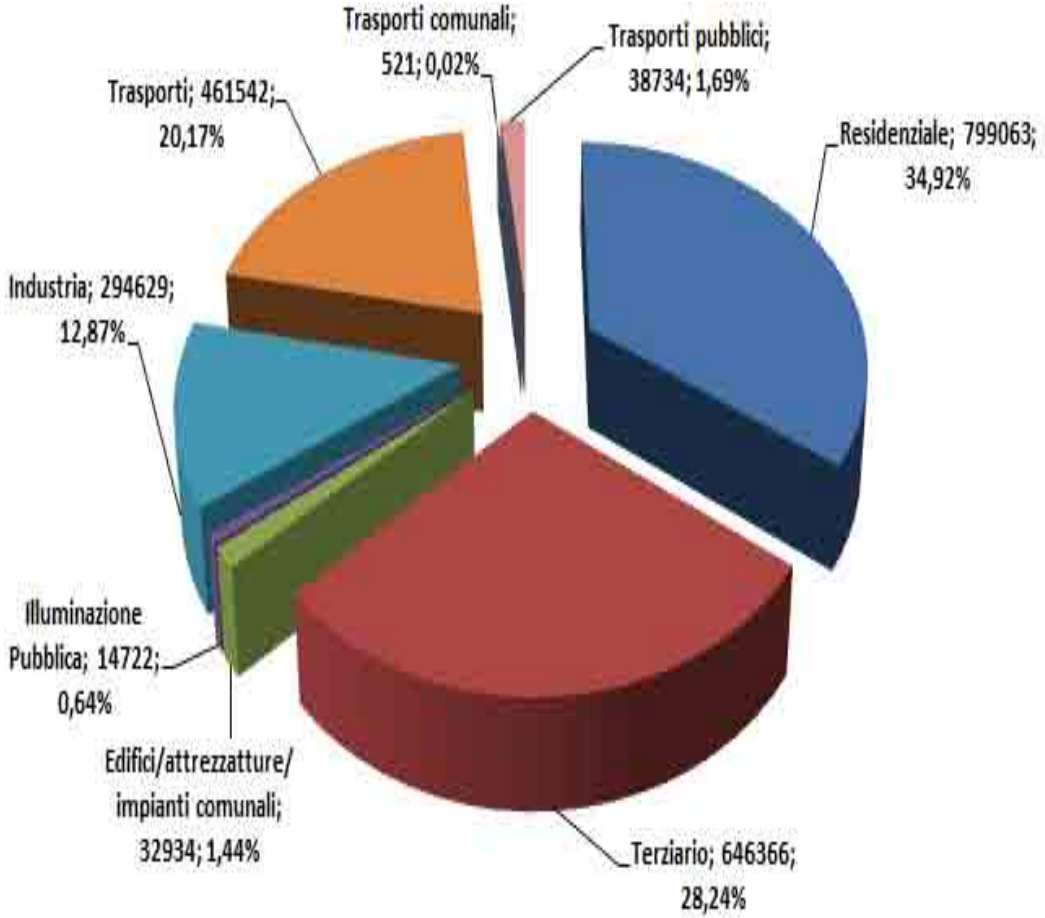
- **rainwater collection for non drinkable uses**
- **incentives for the re-use of grey water**
- **incentives for water saving technologies in new buildings**

The 2012 SEAP

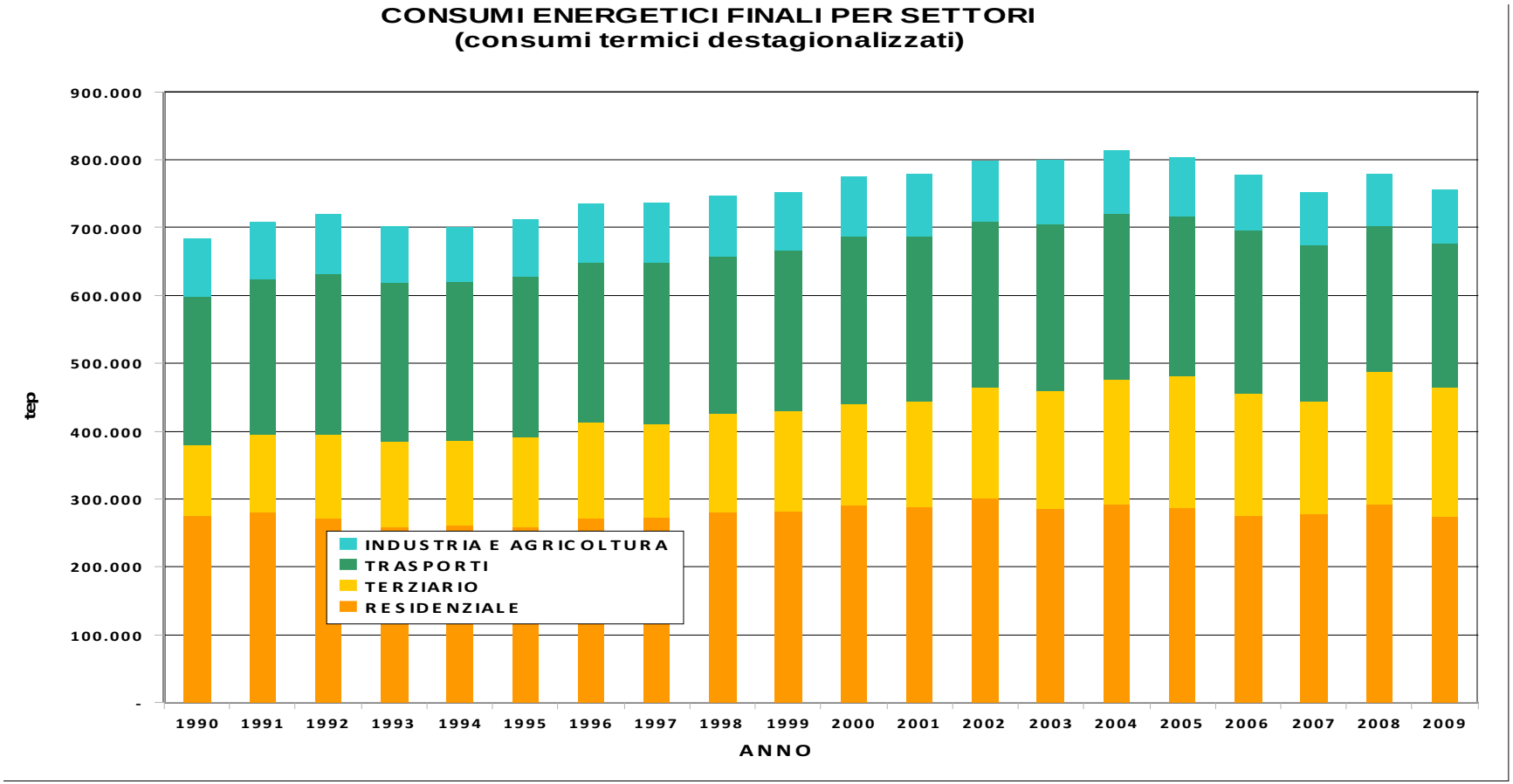
- **Bologna subscribes the Covenant of Mayors in december 2008**
- **3780 cities have signed the covenant to now (1856 in Italy). 1221 have submitted their Sustainable Energy Action Plan (343 in Italy)**
- **The 2007 Energy Plan (PEC) taken as a guide for the SEAP preparation.**
- **December 2011: first SEAP version provided for the phase of consultation and for the definition of public/private agreements in order to give a concrete framework of rules, resources and timing for SEAP implementation**
- **May 2012: SEAP approval**

Baseline emission inventory

- The Baseline Emission Inventory is the inventory of annual CO2 emissions relating to energy end-uses in city territory.
- Base year chosen: 2005
- Energy Data collected from 1990 to 2009
- Emissions breakdown substantially the same today



Current trends



Since 2004 energy consumption have started to decline gradually, reversing a long standing trend of growth.

Definition of 2020 objective

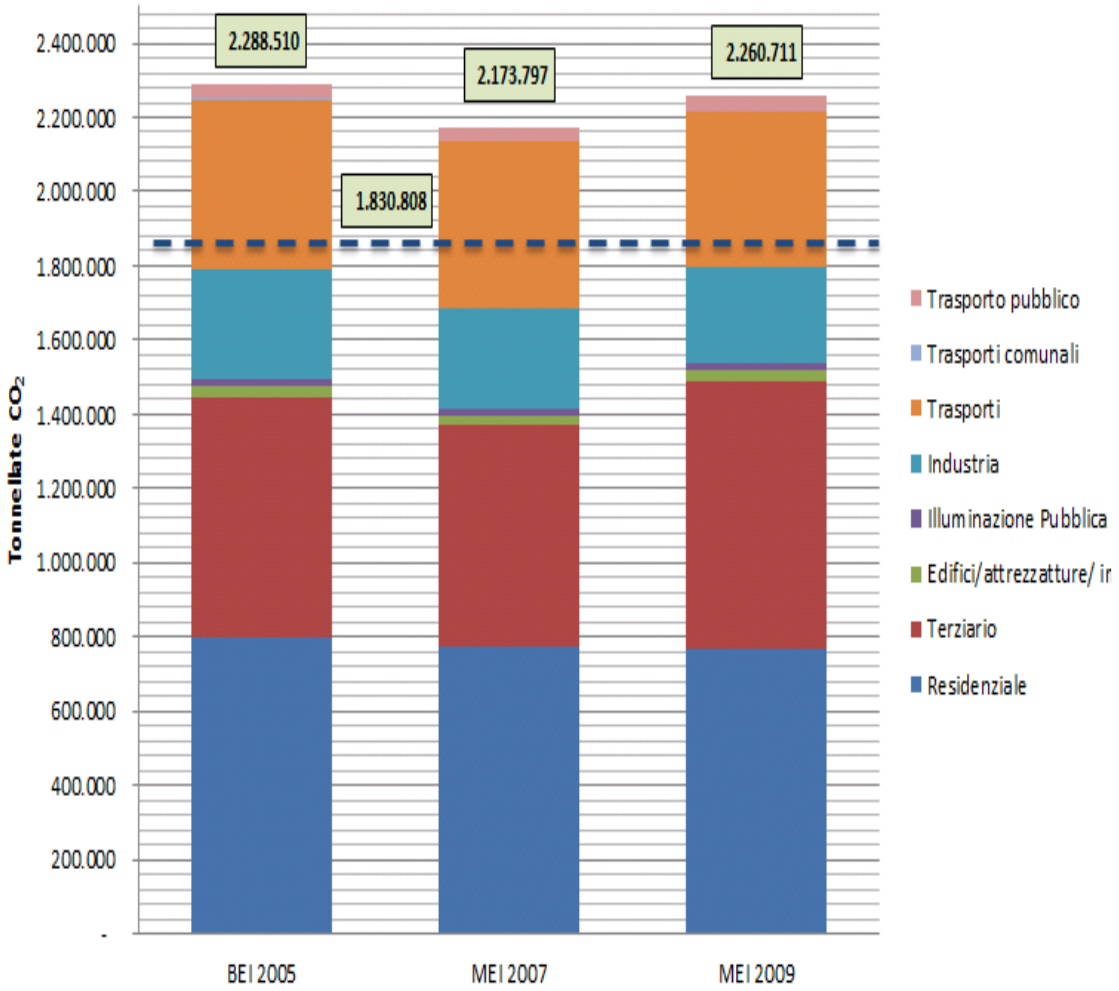
Acheiving the European taret fixed for 2020 will be a challenging task because:

- Municipality controls directly only 2,1 % of emissions;

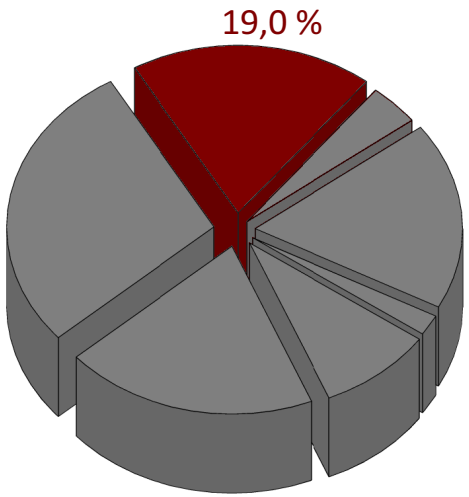
- The possibility to reduce emissiosions by use of local regulatory tools is limited by national legislation;

- Conseguentely, most action will be implemented in partnership with stakeholders on the basis of an assumption of shared objectives and interests.

For these reasons, Bologna confirmed locally the -20% European target.



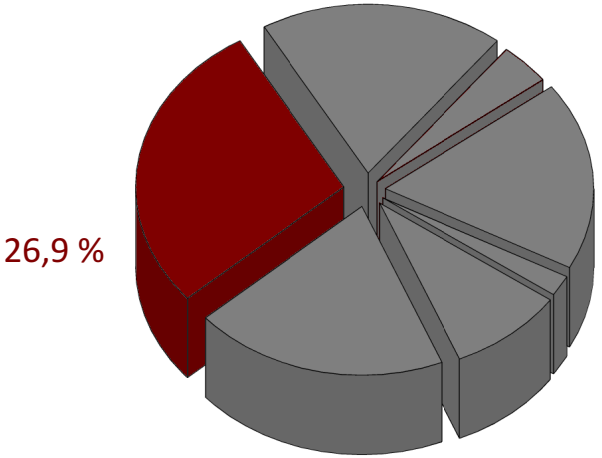
Actions



- The emissions reduction target means a reduction in City emissions of about 500.000 CO2 tons/year
- 19 % of this target has already been acheived
- Many actions are to be intensely undertaken in the next few years in order to meet this target
- Estimated overall investment is over 4.000 millions Euro. City energy bill (now 900.000 Euros/year) will decrease by 25 %
- Most actions are diffuse and involve a great number of subjects
- Six action areas: residences, services, industry, local energy production, mobility, City administration

Residences

- Actions on this sector are by far the main challenge of the SEAP
- Highest potential for emissions reduction
- Obstacles: Fractioned property and difficulty in investing
- Need for a strong and diffuse public information activity resulted from public discussion
- Agreement among stakeholders for the definition of standard intervention package and fnancing instruments
- Constitution of a local Energy Agency supporting these actions and organizing demand and offer for energy services
- Public call issued in march for the definition of a qualification plan of existing City



Historical buildings

- A vibrant City Centre with many residents, students and temporary population
- 22,4 % of existing buildings have been built before 1919
- City historical centre among biggest in Europe (approximately 400 hectares)
- New building code (RUE) updates criteria for intervention on existing buildings

residents

377.000

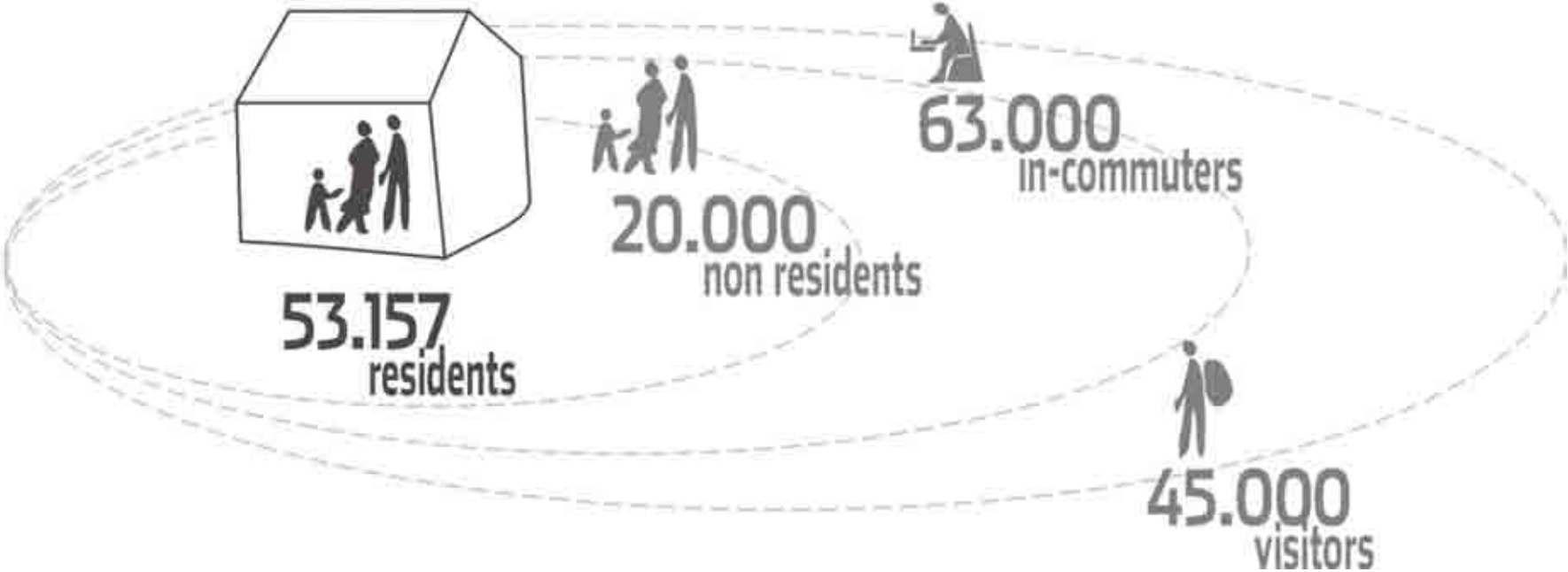
53.157

estimated daily population

550.000

181.157

historical center



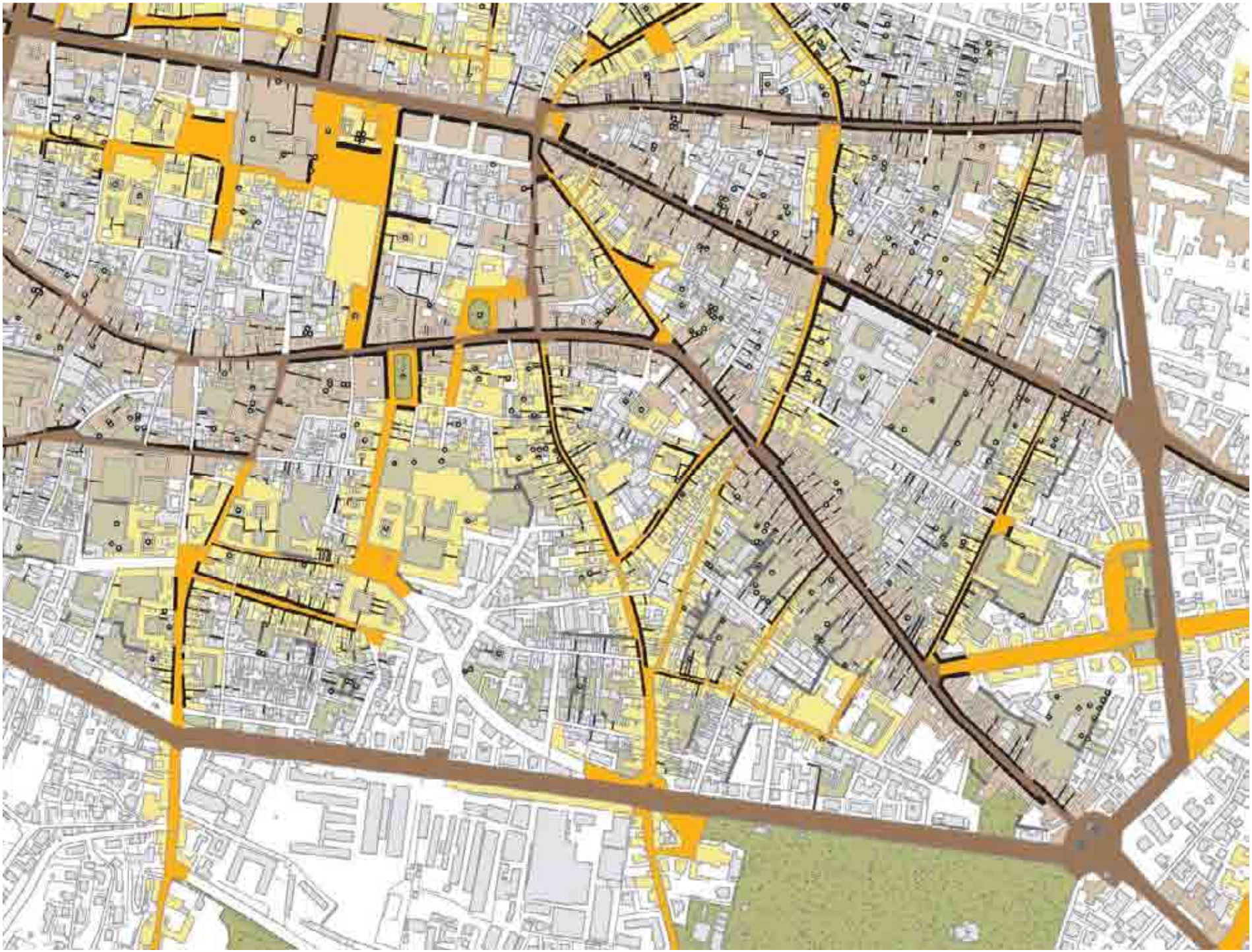
Bologna: about 400 ha

Barcellona: about 200 ha

Vienna: about 250 ha

RUE
URBANISTICO

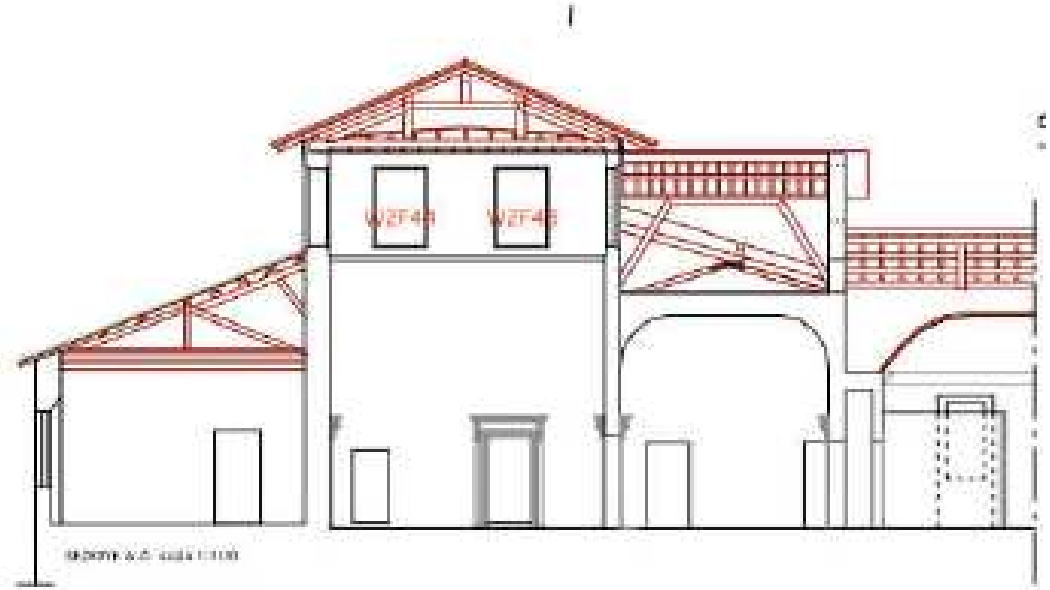
La Città storica
Ambiti e materiali
scala 1:5.000




Ancient shaped nucleus

Monumental buildings

- **Compatible solutions** are to be adopted for intervention in monumental buildings
- **Pilot actions** on City Palace (within GovernEE Central Eupe Project) and definition of a toolkit.



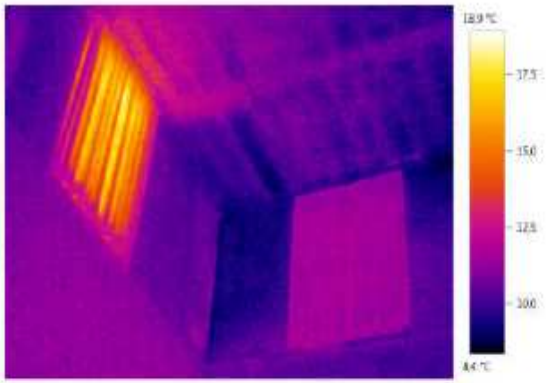


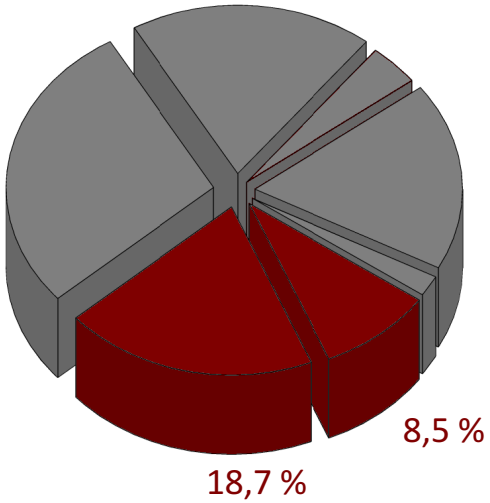
Image parameters:
Degree of emission: 0.95
Reflected temperature: 20.0

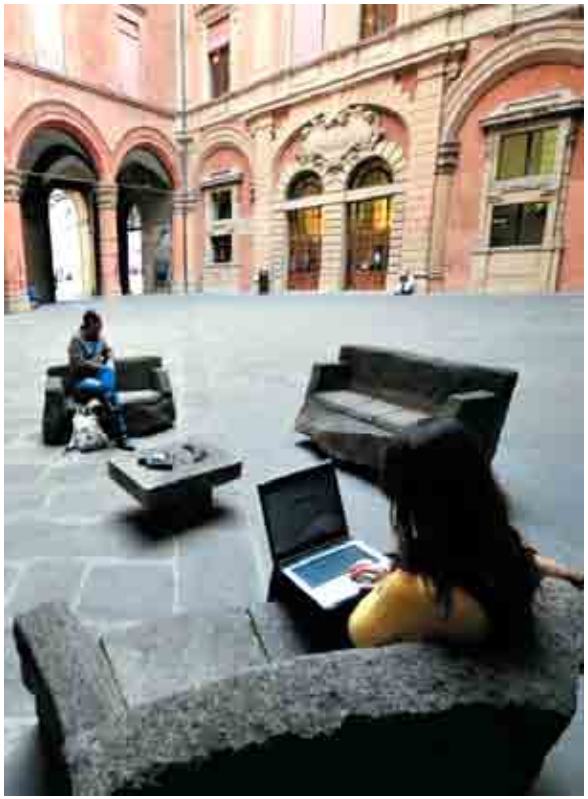
Public Housing

- **8 %** of residential buildings owned by the city (average scarce energy performances)
- Intervention on public housing allow the **substitution of entire built lots**
- The example shows an area in **San Donato** District where the intervention of substitution allowed a general increase of quality included green spaces and social inclusion

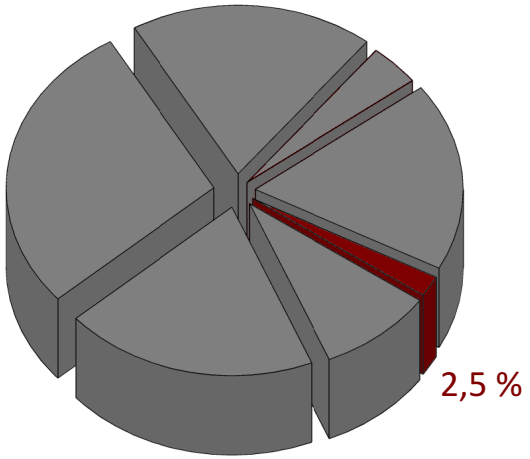
Services + industry

- Opportunity of huge reductions in energy consumptions for buildings (heating, electricity).
- Many interventions already underway (energy efficiency in large food stores, energy management of hospitals, airport, ...)
- No energy intense industrial processes
- Role of energy managers in the development of energy strategies for firms and companies
- Smart ICT as an oppurtinity
- Actions on services and industry are more likely to be undertaken: smaller number of stakeholders
- Most promising sector of SEAP



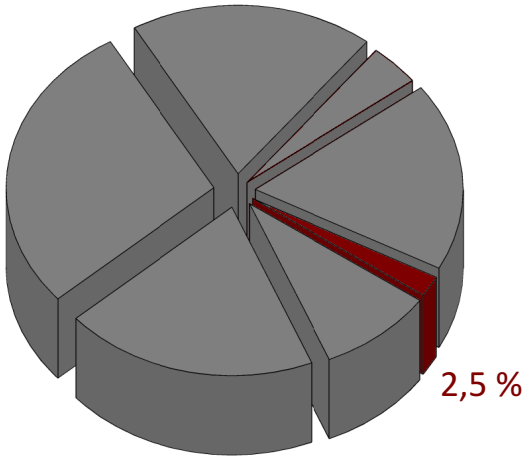


Energy production

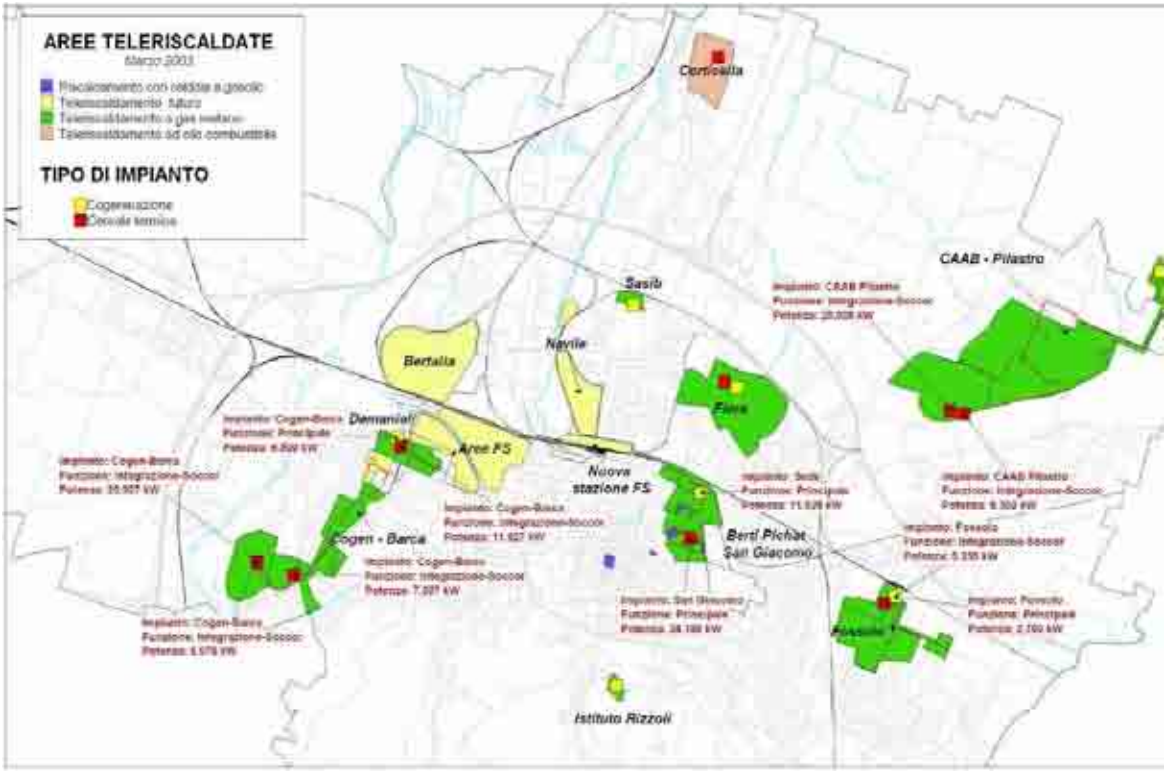


- Since 2007 strong diffusion of photovoltaic on city roofs
- 1MWp plant in former quarry (2011)
- 2,4 Mwp plant on public housing roofs (2009)
- Installation on public schools donated by parents associations
- Opportunity from the dismission of asbestos roofs in industrial areas

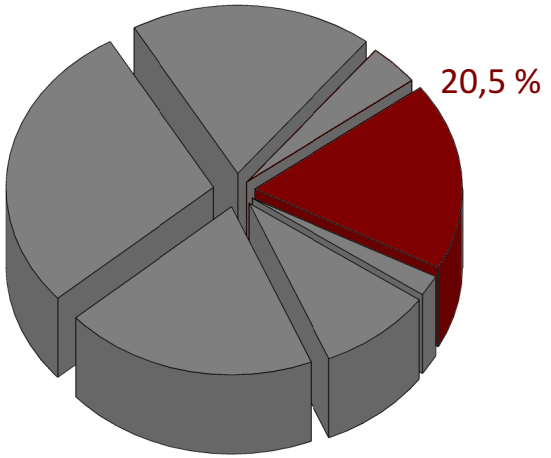
Energy production



- **District heated areas** mostly managed by local multiytility company Hera
- **Requalification** of existing disctrict heating plants and pipes
- Diffusion of **micro cogeneration** for buildings

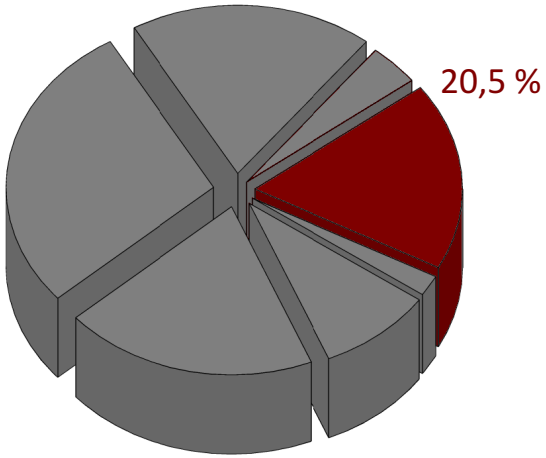


Mobility



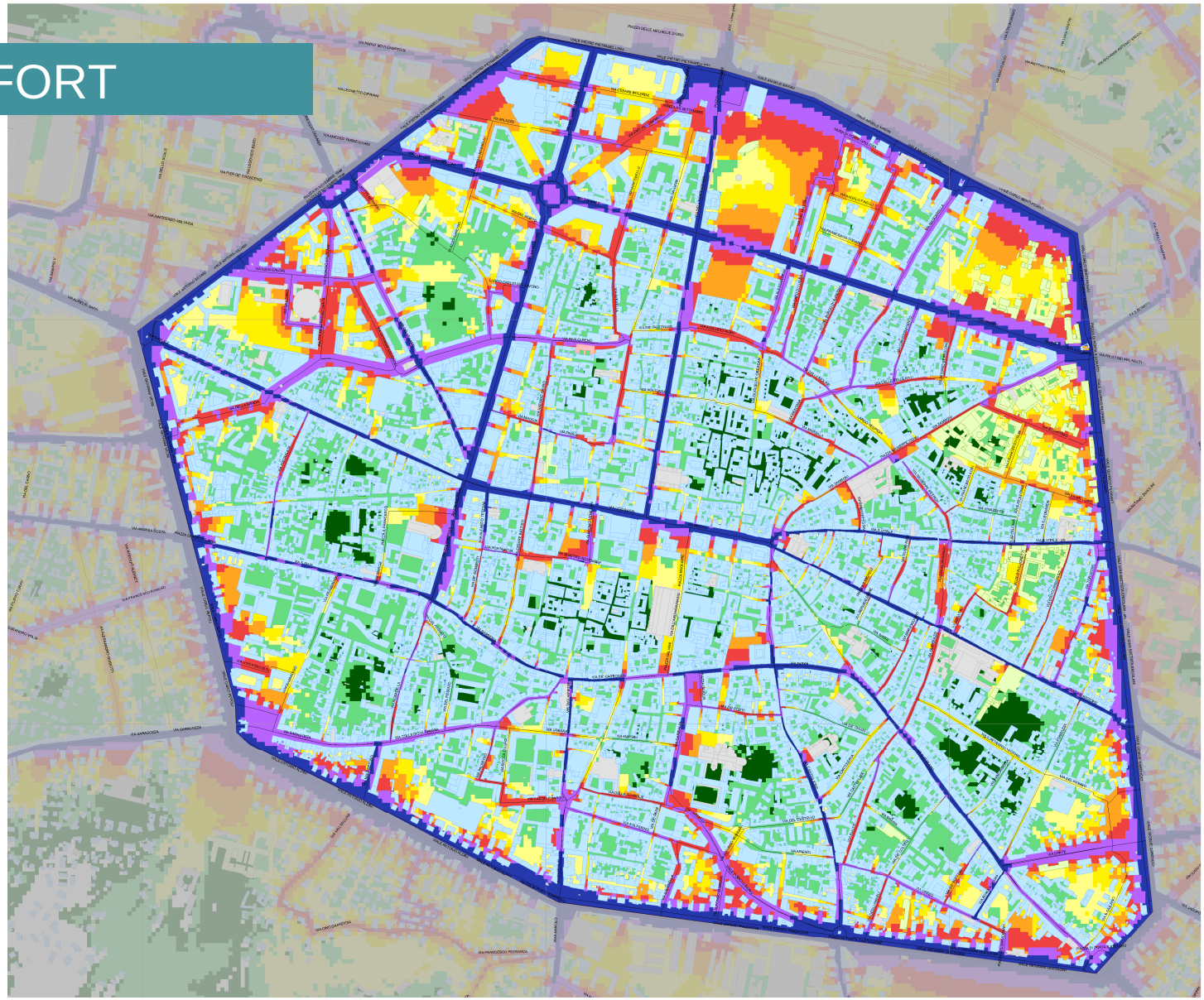
- Support a no car mobility
- Infrastructural interventions for more efficient bus lanes
- Promotion widespread ciclability and pedonability of the city (increase of reduced speed areas, integration of bike lanes, specific rules for city centre)
- Completion of Metropolitan Railway Service (SFM)
- Main obstacle: absence of dedicated local public transport infrastructures

Mobility



- **Comprehensive plan for the qualification of City Centre presented on dec 3rd 2011 “Di nuovo in centro”**
- **Extension of pedestrian areas and definition of areas with very restricted access (city centre alrealy traffic limited zone)**
- **Increase of pedestrian and bike accessibility**
- **Intervention on public spaces and valorization of selected districts**

NOISE DISCOMFORT

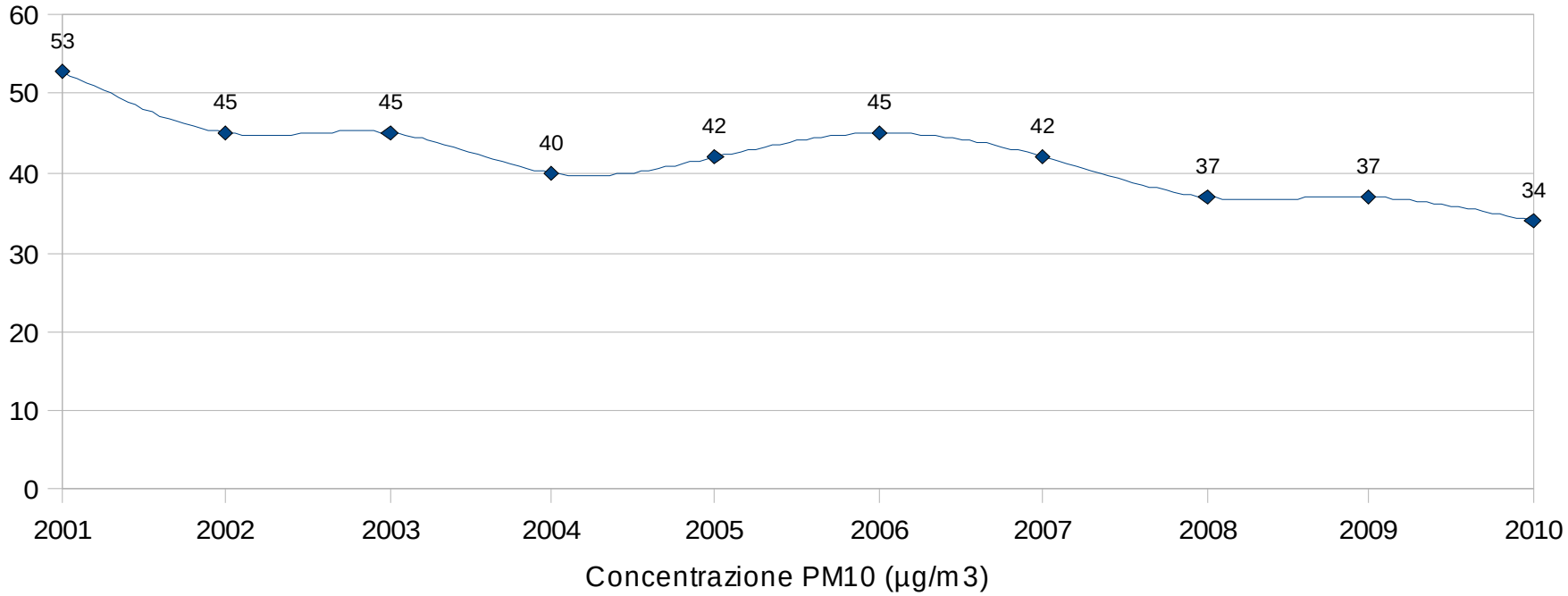


Livelli di rumore in dB(A)	Popolazione esposta
< 40	17.746
40 - 45	
45 - 50	
50 - 55	
55 - 60	4.003
60 - 65	4.549
65 - 70	9.506
70 - 75	13.144
>75	2.743

Half residents

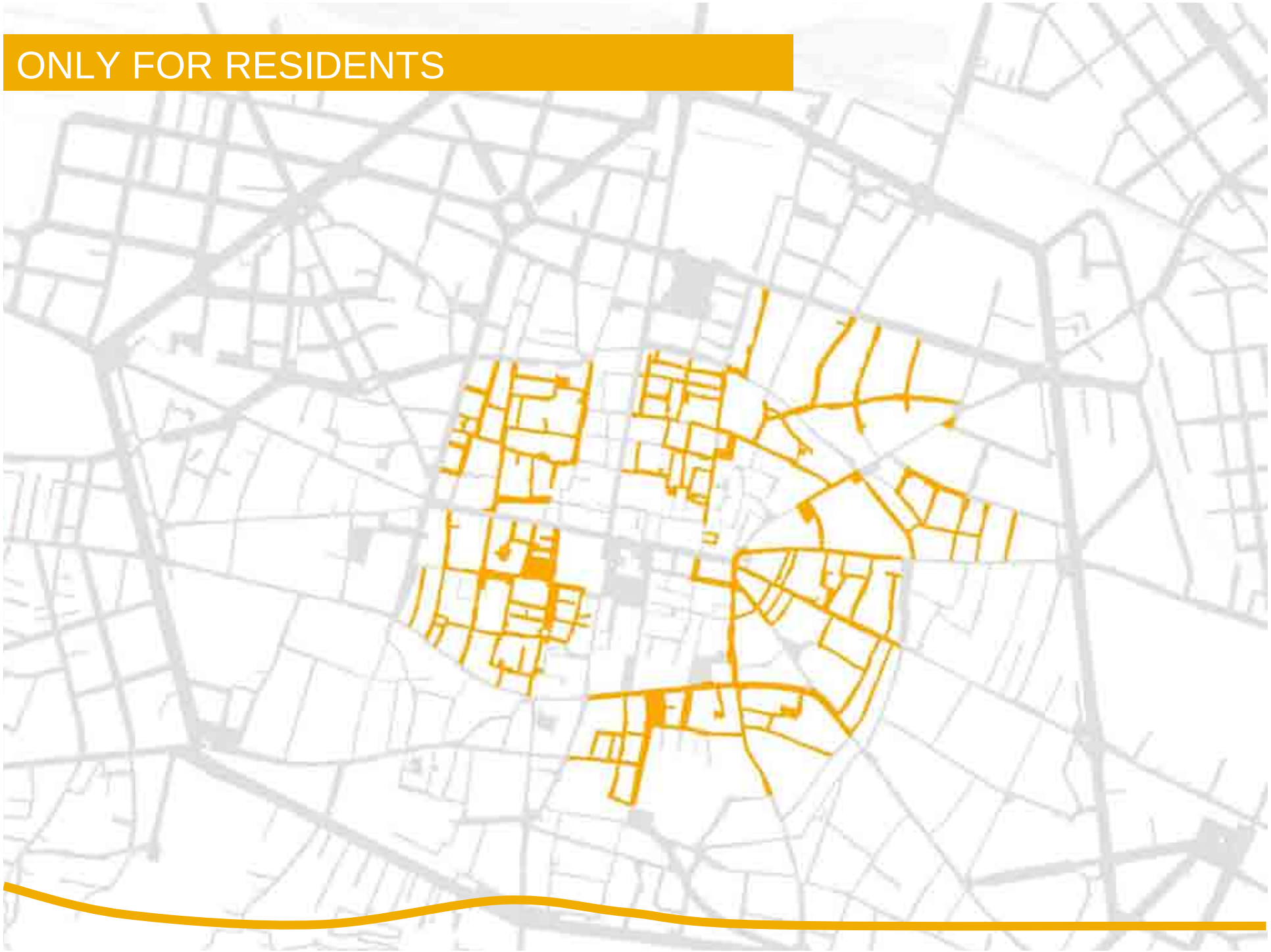
Exposed to more than 65 dB

ENVIRONMENTAL DISCOMFORT

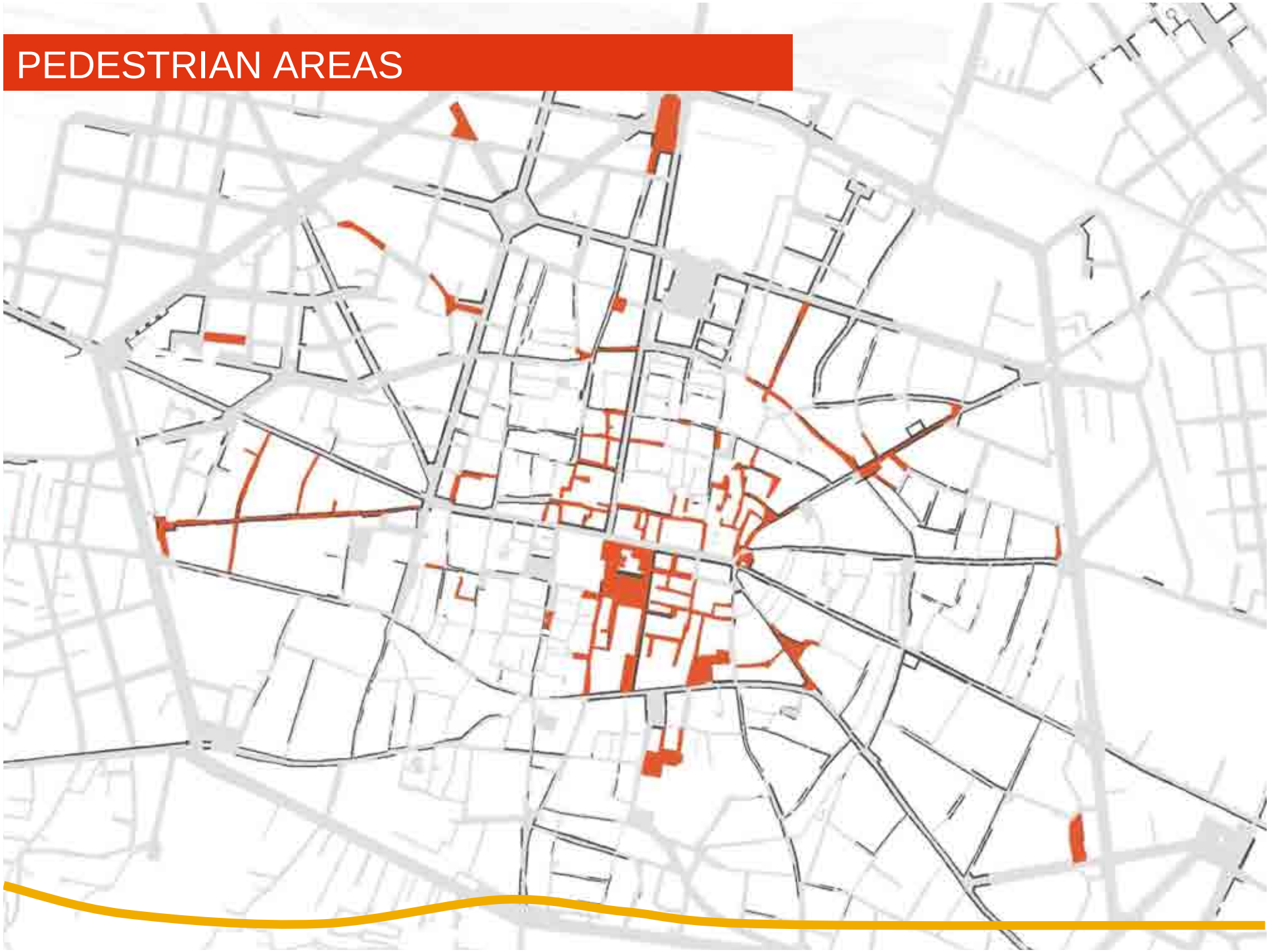


High number of days in which PM10 limit is exceeded (50 μ g/m3)

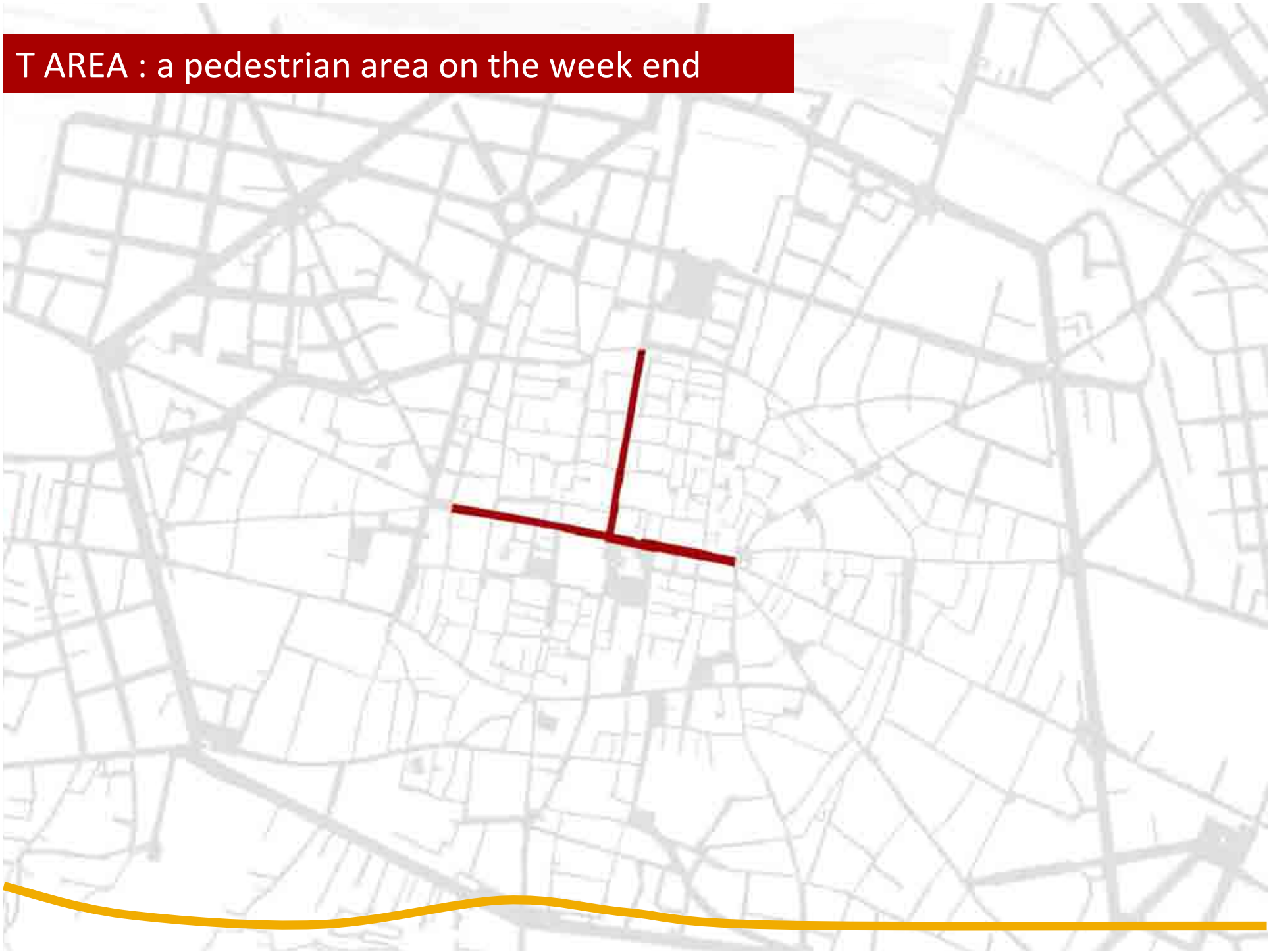
ONLY FOR RESIDENTS



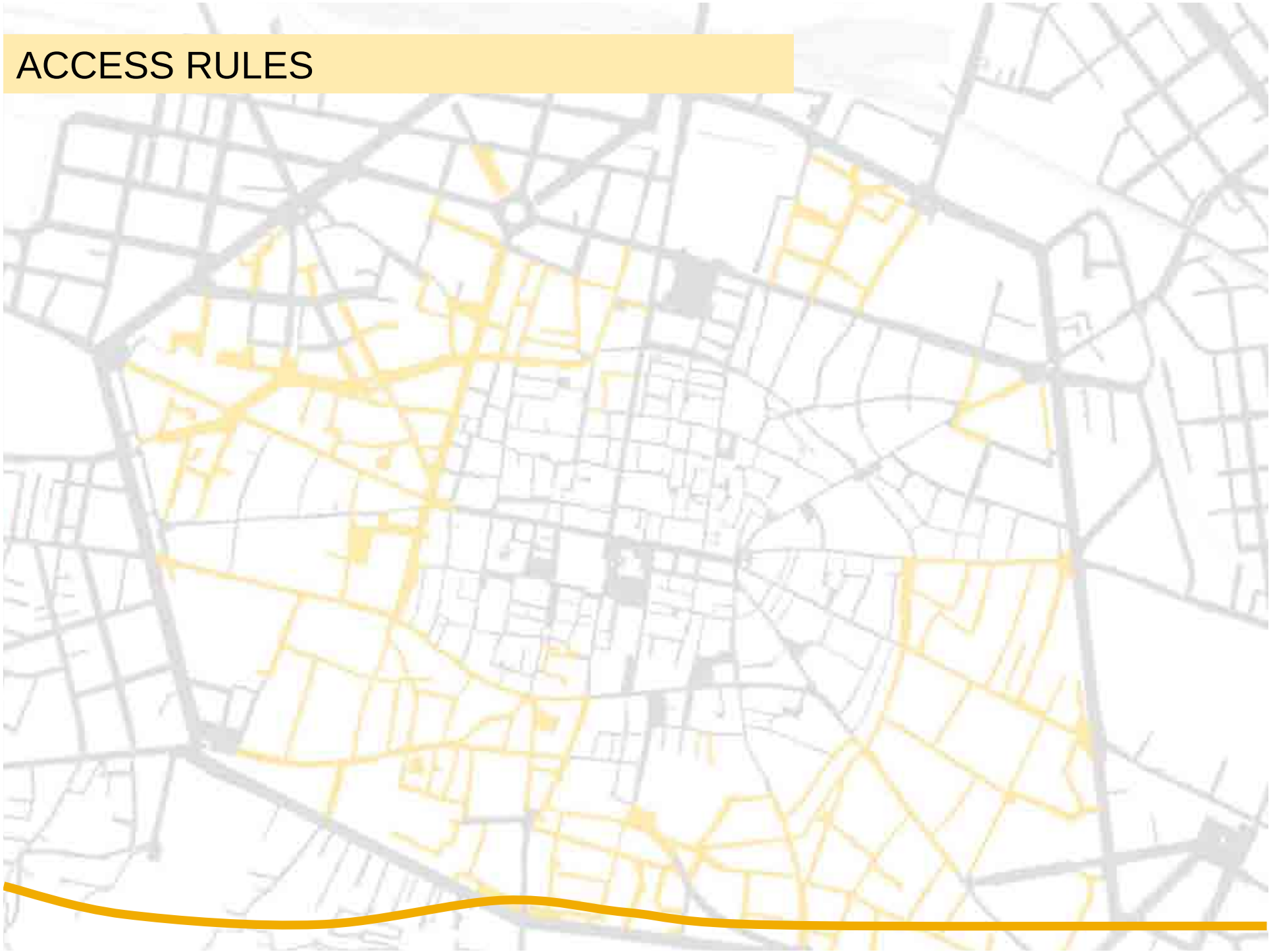
PEDESTRIAN AREAS



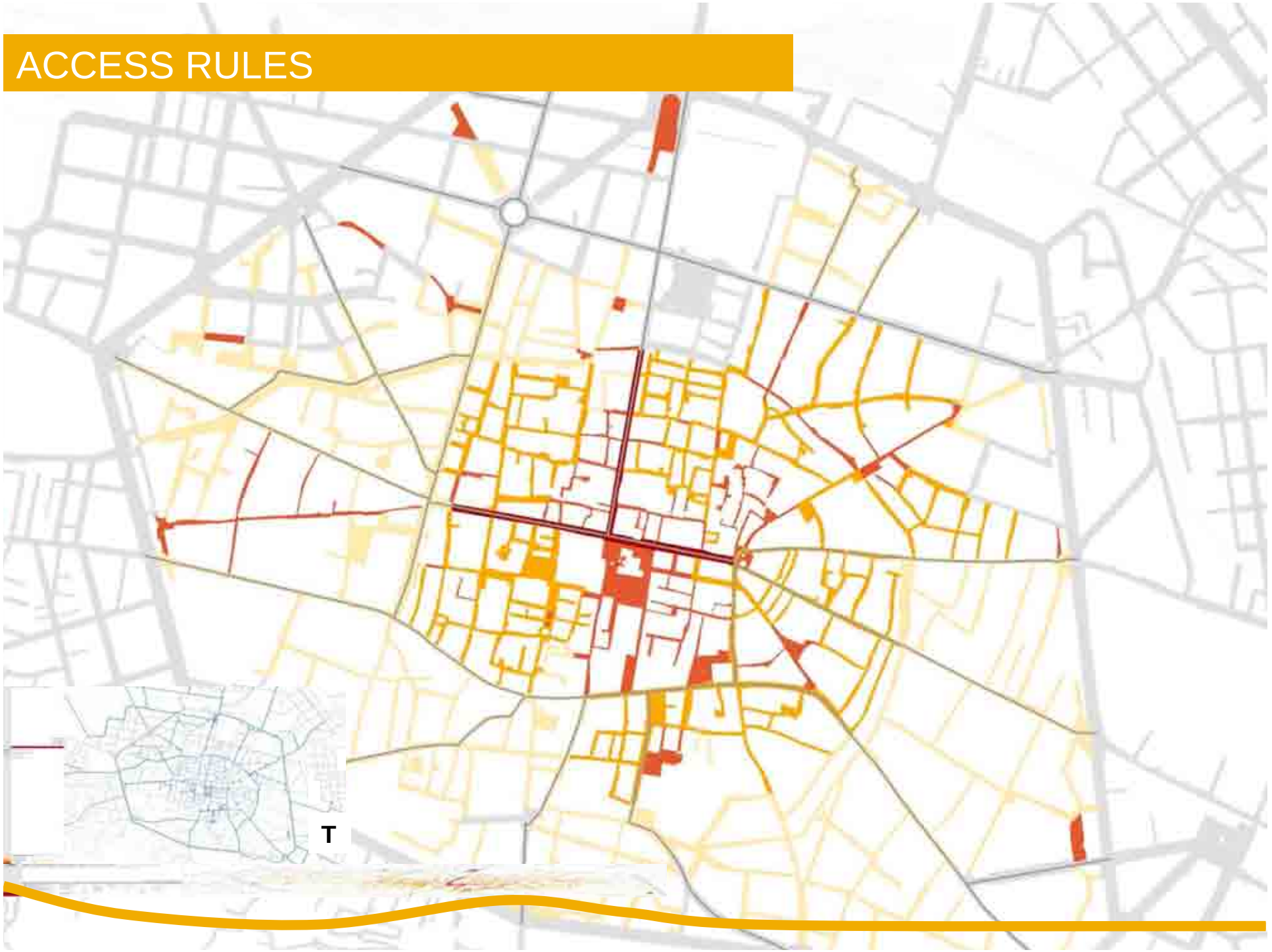
T AREA : a pedestrian area on the week end



ACCESS RULES



ACCESS RULES

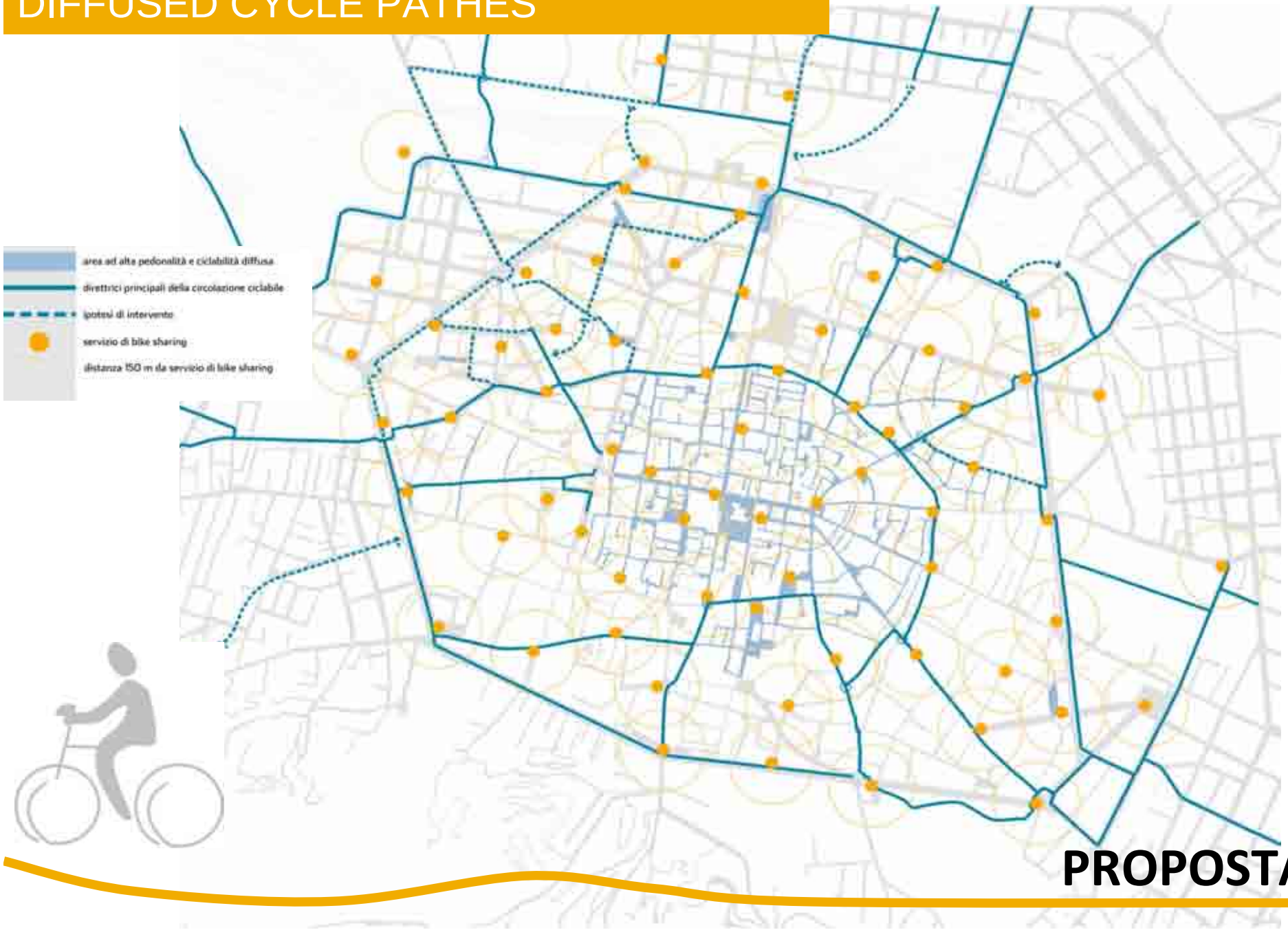


SERVICES FOR SUSTAINABLE MOBILITY

Bike sharing, car sharing, promotion of electric mobility, etc.

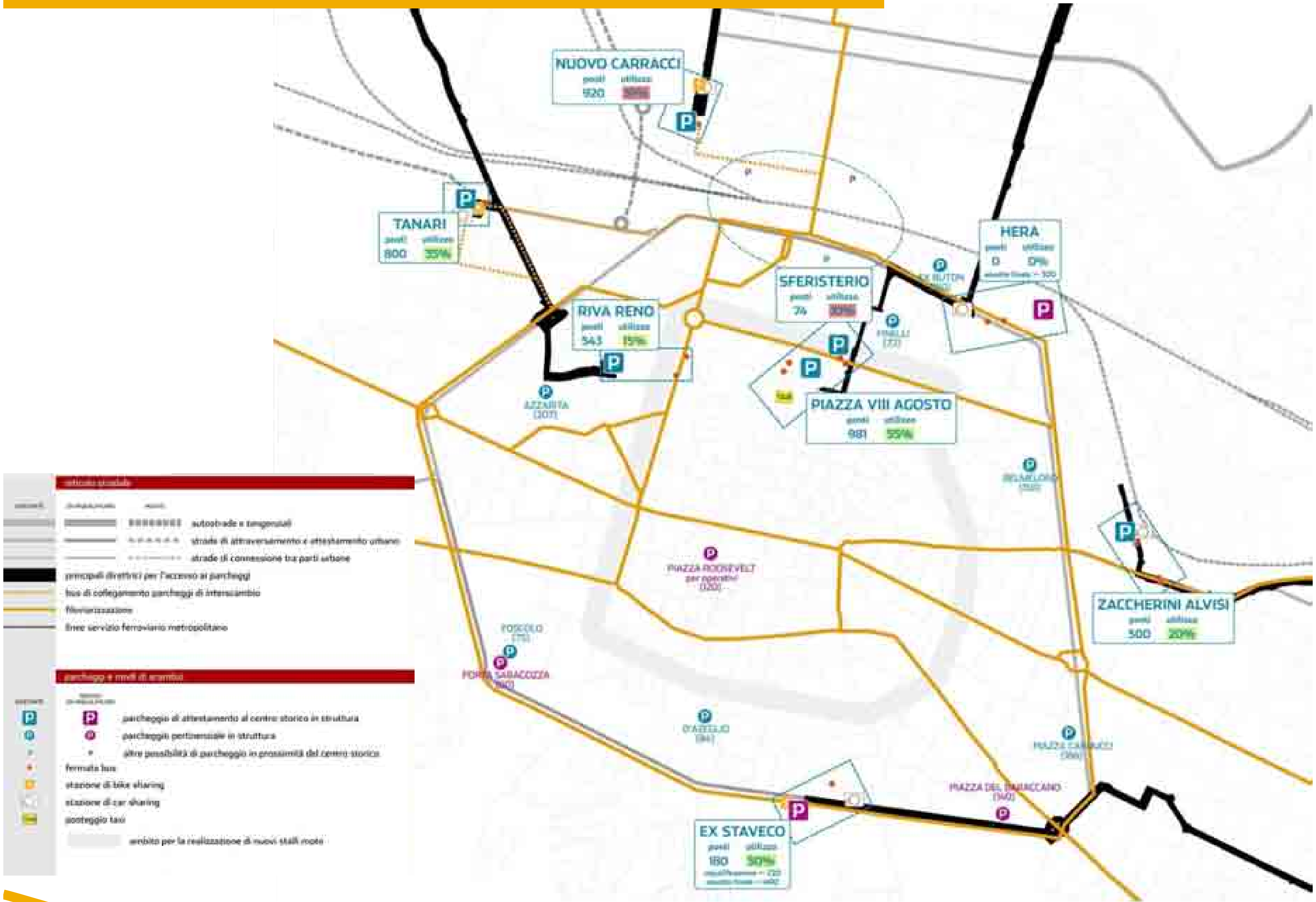
PROPOSTA

DIFFUSED CYCLE PATHES



PROPOSTA

PARKINGS



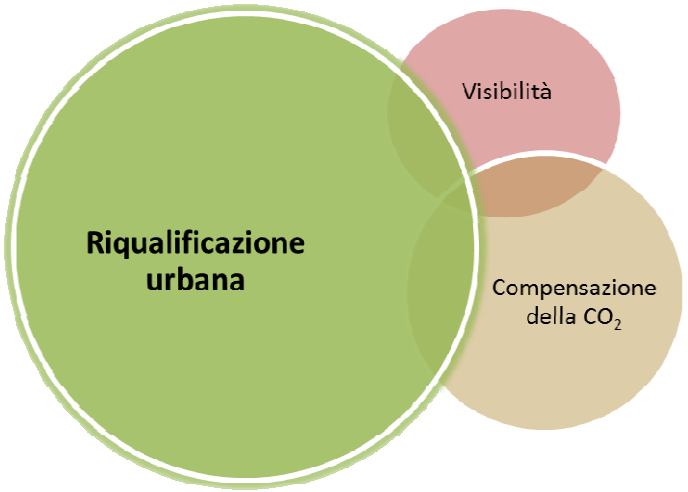
NUOVO CARRACCI
posti utilizzo
TANARI
posti utilizzo
800 35%
RIVA RENO
posti utilizzo
543 15%
SFERISTERIO
posti utilizzo
74
HERA
posti utilizzo
0 0%
PIAZZA VIII AGOSTO
posti utilizzo
981 55%
AZZARITA
(307)
PIAZZA ROOSEVELT
FOSCOLO
PORTA SARAGOZZA
D'AZEGLIO
PIAZZA CARDUCCI
ZACCHERINI ALVISI
posti utilizzo
500 20%
EX STAVECO
posti utilizzo
180 50%
autostrade e tangenziali
strade di connessione tra parti urbane
principali direttrici per l'accesso ai parcheggi
bus di collegamento parcheggi di interscambio
linee servizio ferroviario metropolitano
parcheggio di attestamento al centro storico in struttura
parcheggio pertinenziale in struttura
fermata bus
stazione di bike sharing
stazione di car sharing
posteggio taxi
ambito per la realizzazione di nuovi stalli moto

Urban Forestry

- **Public/private partnership for interventions of urban forestry within LIFE EU Project Gaia.**
- **Project objectives: CO2 absobrtion, better air quality, improve microclimate locally.**
- **Local companies finance forestry intervention thus reducing their carbon footprint**
- **Results achieved by companies are certified through a transparent accountability process.**
- **National Research Institute CNR evaluate results on air quality**

3000 trees will be planted by the end of Gaia project (april 2013)

Urban Forestry



First intervention in the big industrial area "Roveri" where ecological values will be integrated by the regeneration effect of abandoned areas.