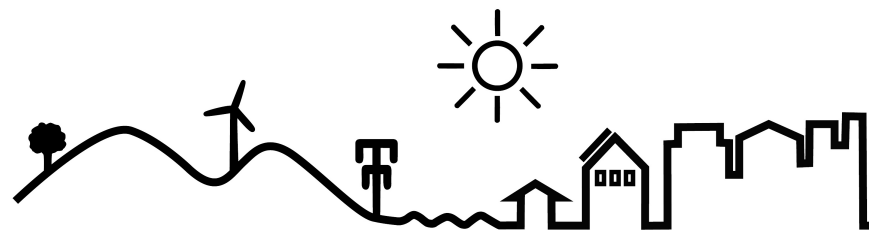


M2

**Pianificazione
Urbanistica ed
Energia**



SPECIAL

**SPATIAL PLANNING and ENERGY for
COMMUNITIES IN ALL LANDSCAPES**

MODULI PER LA FORMAZIONE A LUNGO TERMINE



Centro
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Urbanistici



Co-funded by the Intelligent Energy Europe
Programme of the European Union

M2



Pianificazione Urbanistica ed Energia

1. Le azioni possibili
2. Progettare la città sostenibile (1/2)
3. Progettare la città sostenibile (2/2)
4. Strumenti per le trasformazioni urbane low carbon
5. Contenimento di suolo e rigenerazione urbana



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Urbanistici



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Programme of the European Union

M2

**Pianificazione
Urbanistica ed
Energia**



2 Progettare la città sostenibile (1/2)

4 Green Oriented Development



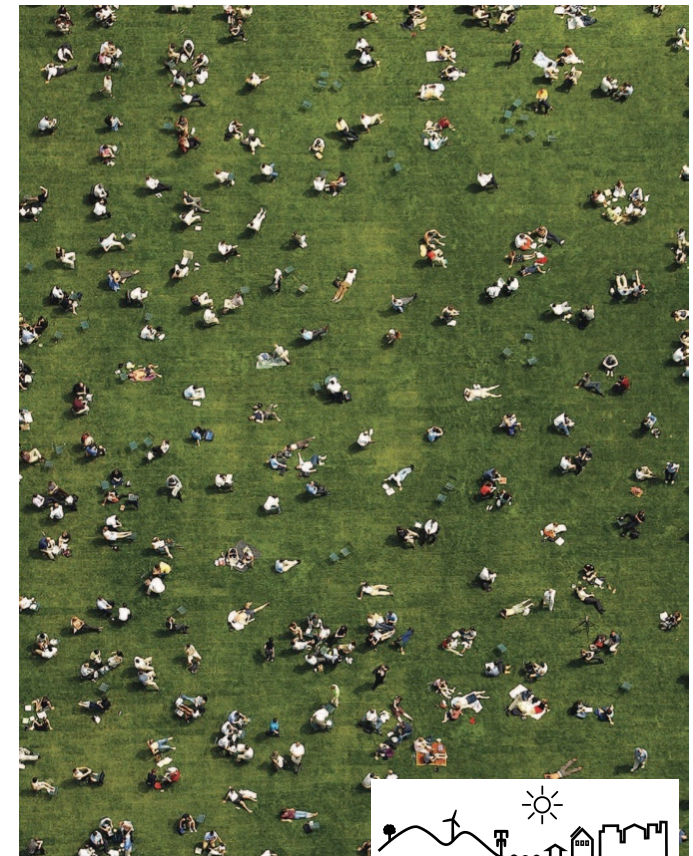
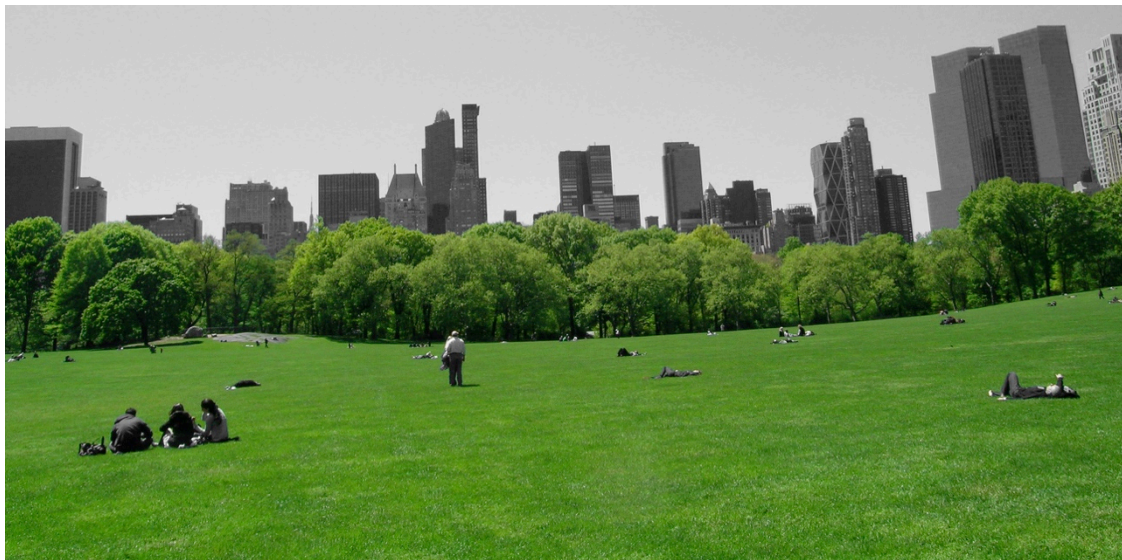
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Urbanistici



Co-funded by the Intelligent Energy Europe
Programme of the European Union

Tecniche di pianificazione per la riduzione del consumo energetico: Nuove sfide per il progetto della città sostenibile

green oriented development



infrastruttura verde

planning approach

An interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife and environment.

infrastruttura verde

“una rete interconnessa di spazi verdi multifunzionali che conserva i valori naturali e le funzioni degli ecosistemi e fornisce molteplici benefici alla popolazione umana”

McMahon e Benedict, *Green Infrastructure: Linking Landscapes and Communities*, 2006.

infrastruttura verde

stormwater management approach

Green stormwater infrastructure refers to systems and practices that use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater or runoff on the site where it is generated

infrastruttura verde

Used in this context, green infrastructure is the ecological framework for environmental, social, and economic health—in short, our natural life-support system.

What makes green infrastructure so different?

And what can green infrastructure do for us?

nuovi paradigmi per il progetto del verde urbano

is the opposite of gray infrastrucutre



nuovi paradigmi per il progetto del verde urbano

is the opposite of gray infrastructure

Elements of Gray Infrastructure
Systems Include:

Roadways and
Other Paved
Surfaces



Utilities, and
Communications



Water Supply, Treatment
and Disposal Facilities.

nuovi paradigmi per il progetto del verde urbano

Perchè l'infrastruttura verde



Perchè l'infrastruttura verde

Green infrastructure challenges popular perceptions about green-space planning and protection.

- To many people, open space is simply land that is not yet developed, and green space refers to isolated parks, recreation sites, or natural areas.**

Perchè l'infrastruttura verde

- **While green space is often viewed as something that is nice to have, green infrastructure implies something that we must have.**

Protecting and restoring our natural life-support system is a necessity, not an amenity.

While green space is often viewed as self-sustaining, green infrastructure implies that green space and natural systems must be actively protected, managed, and in some cases restored.

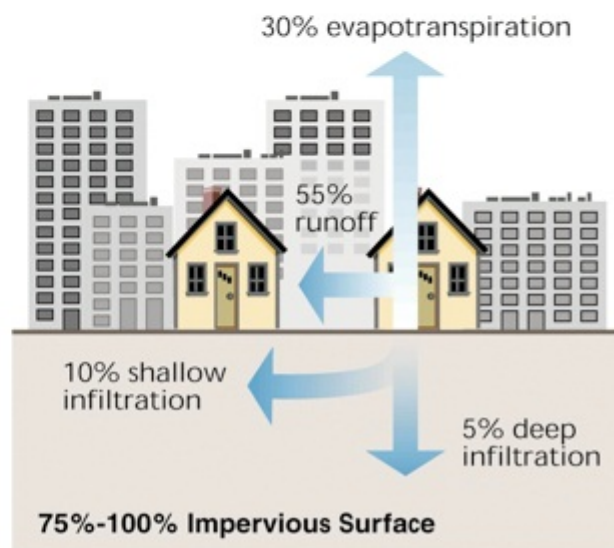
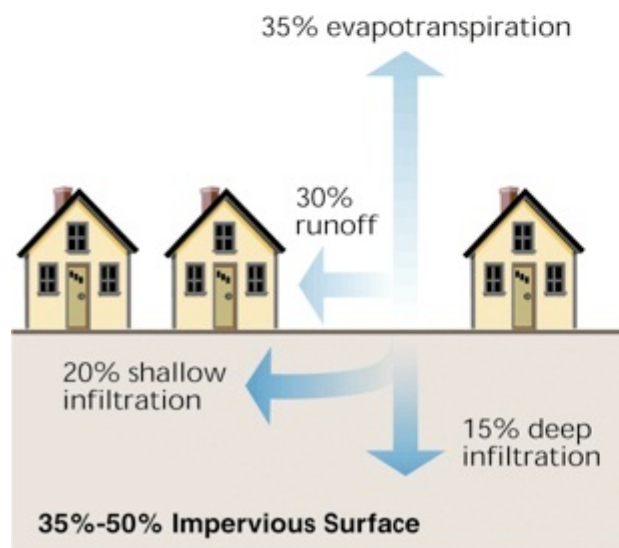
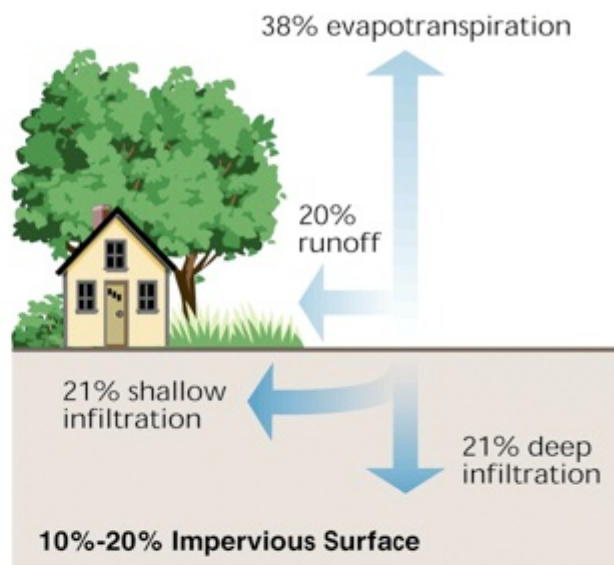
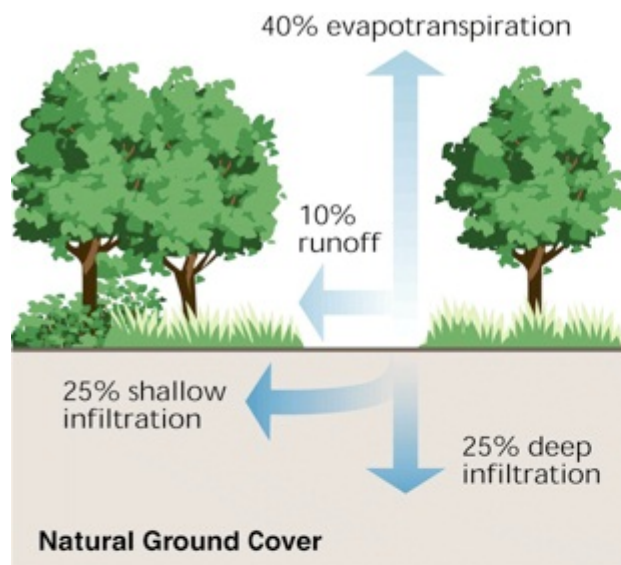
Green infrastructure differs from conventional approaches to land conservation and natural resources protection because it looks at conservation in concert with land development and man-made infrastructure planning.

What makes green infrastructure so different?

And what can green infrastructure do for us?

infrastruttura verde

nuovi paradigmi per il progetto del verde urbano



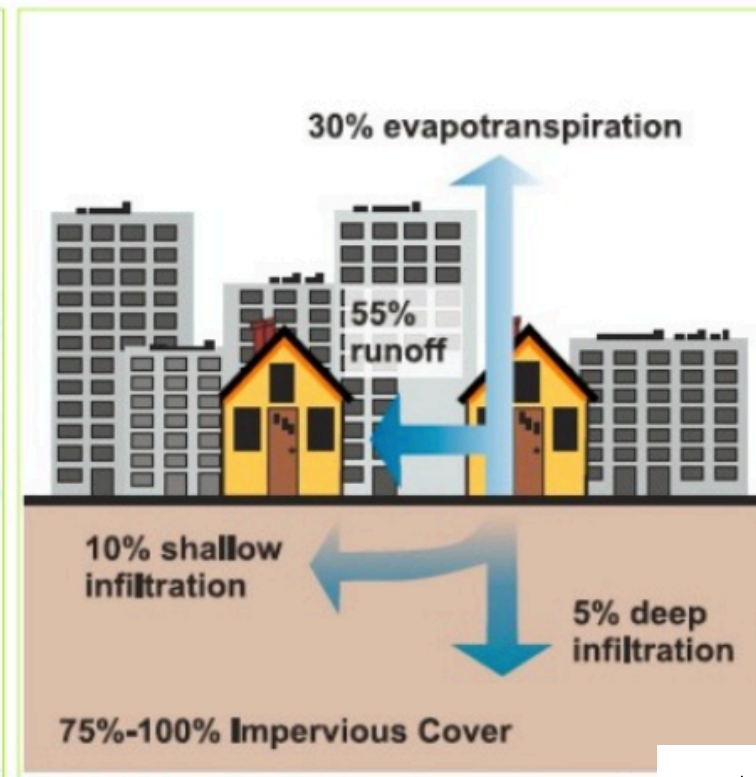
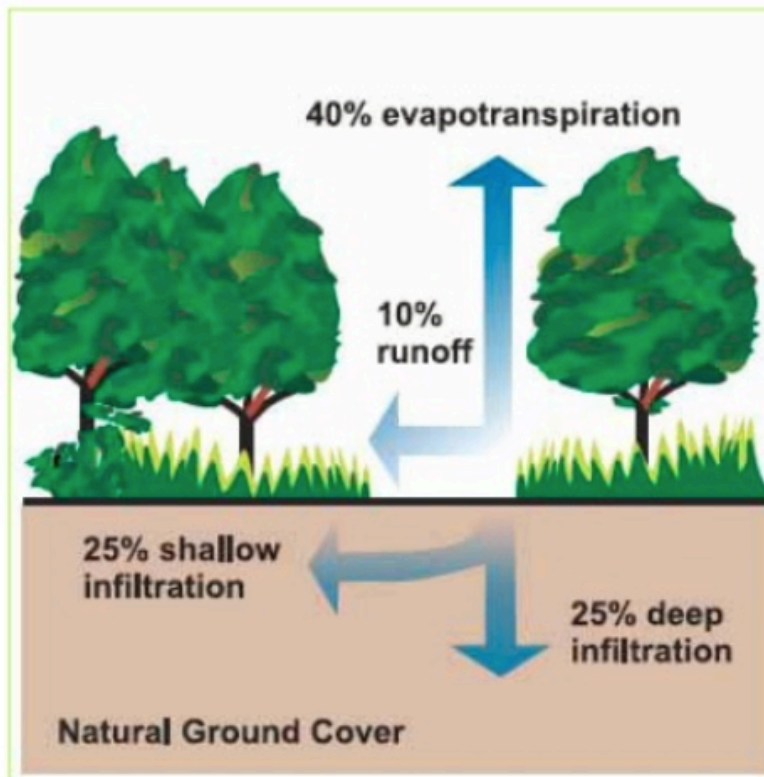
stormwater runoff

The Difference

stormwater runoff

○ Pre-development

○ Post-development



Traditional Approach to Stormwater Management:

- move water off the site as quickly as possible



Green Infrastructure Approach

- Treat stormwater runoff at the source where it is generated



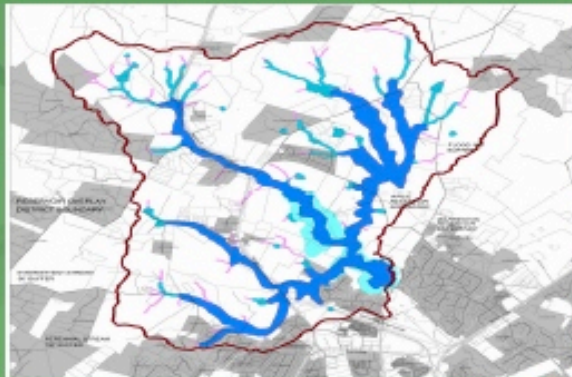
stormwater runoff

- ❖ Protect and link parks and open spaces for the benefit of the human community
- ❖ Preserve and link natural areas to benefit biodiversity and reduce habitat fragmentation



The Challenge - Balancing Resource Protection and Growth

- *What should be conserved?*
- *Where should development occur?*
- *Where should roads and utilities be located?*



Traditional

- First, plan for public utilities - roads, pipes, *grey* infrastructure.
- Green space located in leftover/unbuildable land.
- Green space planning limited to development site – tot lots, internal trails, pocket parks.



Green infrastructure

- First, inventory and assess natural and historic features and functions.
- Develop a protection/management strategy.
- Plan green spaces (parks, trails, habitat connections) **BEFORE** locating built elements.
- Connect habitats across regions and across ownerships.

■ Both Require:

- Strategic planning to ensure functional systems
- Financing for design and maintenance
- Management to maintain services



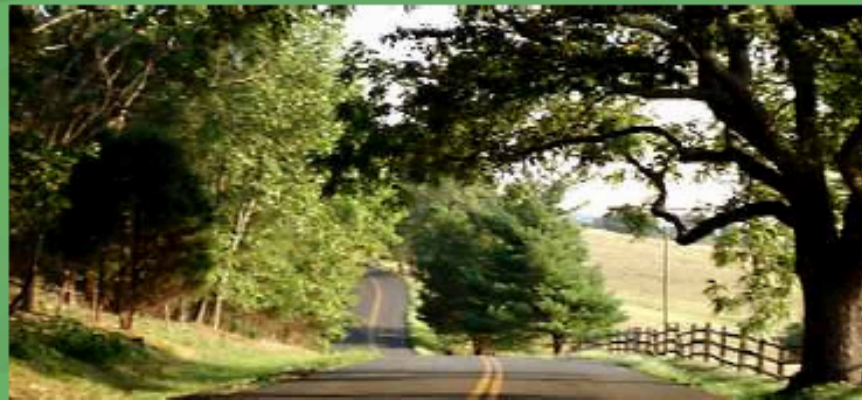
■ Ideally Are:

- Planned simultaneously
- Given equal priority in the planning process
- Planned as complimentary systems
- Equally considered in the funding process

- Ecosystem benefits
- Storm water management
- Drinking water protection
- Groundwater recharge
- Support working lands
- Increased property values
- Enhanced quality of life

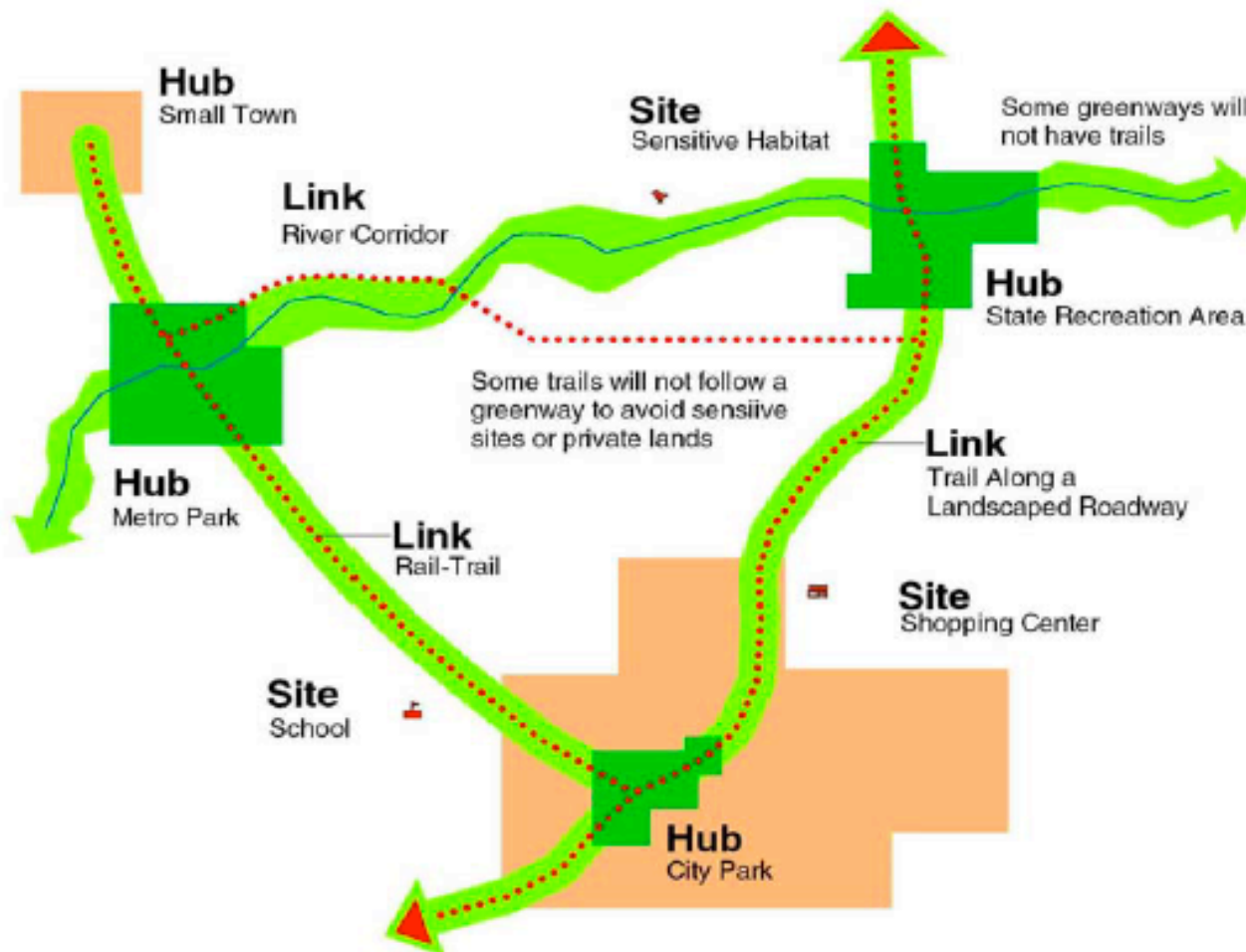


- Six basic steps:
 - Inventory natural and historic resources;
 - Identify opportunities and constraints;
 - Determine risks to identified resources;
 - Determine community interests and priorities; and
 - Integrate findings and goals into local comprehensive plans and amend local ordinances to reflect identified goals.



Hubs and Links

infrastruttura verde



Anatomy
of a
Greenway
System

What Is Green Infrastructure?

○ Green Infrastructure Technologies

- Green Roof
- Tree Trench/Vegetated Swale
- Planter Box
- Rain Garden
- Permeable Pavement
- Urban Forestry
- Rain Barrel and Cistern

Rain Gardens

- typically allow for 30% more infiltration than a conventional lawn
- Effectively remove pollutants, >40% nitrogen
- Reduce runoff



green infrastructure technology

Green Roofs

- Can retain 30-80% of total annual precipitation falling on the surface
- Reduce air pollution
- Save energy cost
- Last up to twice as long as traditional roof



green infrastructure technology

Stormwater Planter Boxes

- Reduce stormwater volumes and velocities
- Suited for urban redevelopment sites



Vegetated Swales (Bioswales)

- reduce the volume of run-off by 15% or more, as compared to curbs, gutters, and sewers
- Suspended solids: 30% to 70% removal,
- nutrients: 10% to 30% removal.



green infrastructure technology

Permeable Pavement

- Runoff reduction & groundwater recharge
- Pollutant removal:
 - heavy metal, 98%;
 - Suspended solid, 82-95%
 - Nutrients, 65-85%



green infrastructure technology

Rain Barrels & Cisterns

- Reduce runoff generated from rooftops
- Delay & reduce peak runoff flow rates
- Reduce water consumption



Additional Benefits of GI

- *Cleaner Air*
- *Reduced Urban Temperatures & energy demands*
- *Source Water Protection*
- *Cost Savings*
- *Native habitat creation & connection*
- *Urban/community beautification*
- *Increased land & property values*
- *Economic stimulus & job creation*

nuovi paradigmi per il progetto green oriented

infrastrutture verdi e patrimonio edilizio

GREEN WALL e LIVING WALL



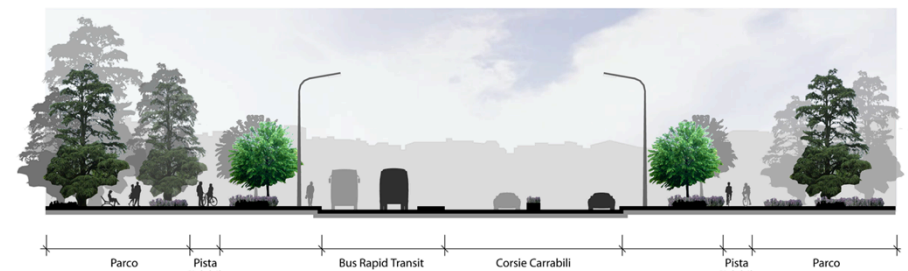
Le superfici verdi presentano un assorbimento di calore e un inerzia termica minore delle superfici di calcestruzzo o asfaltate. L'integrazione della vegetazione nelle facciate e sulle coperture degli edifici contribuisce a bilanciare le temperature degli interni e a proteggere le strutture. (Hall, 2000)

nuovi paradigmi per il progetto green oriented infrastrutture verdi e patrimonio edilizio



green streets

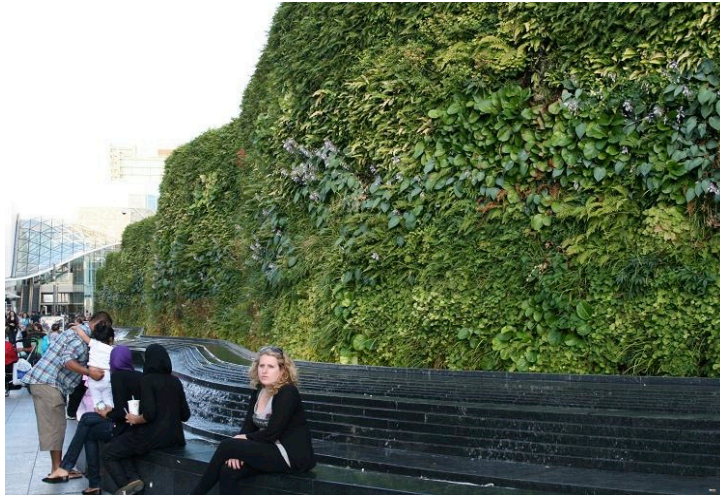
nuovi paradigmi per il progetto green oriented



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nuovi paradigmi per il progetto green oriented

infrastrutture verdi spazio urbano

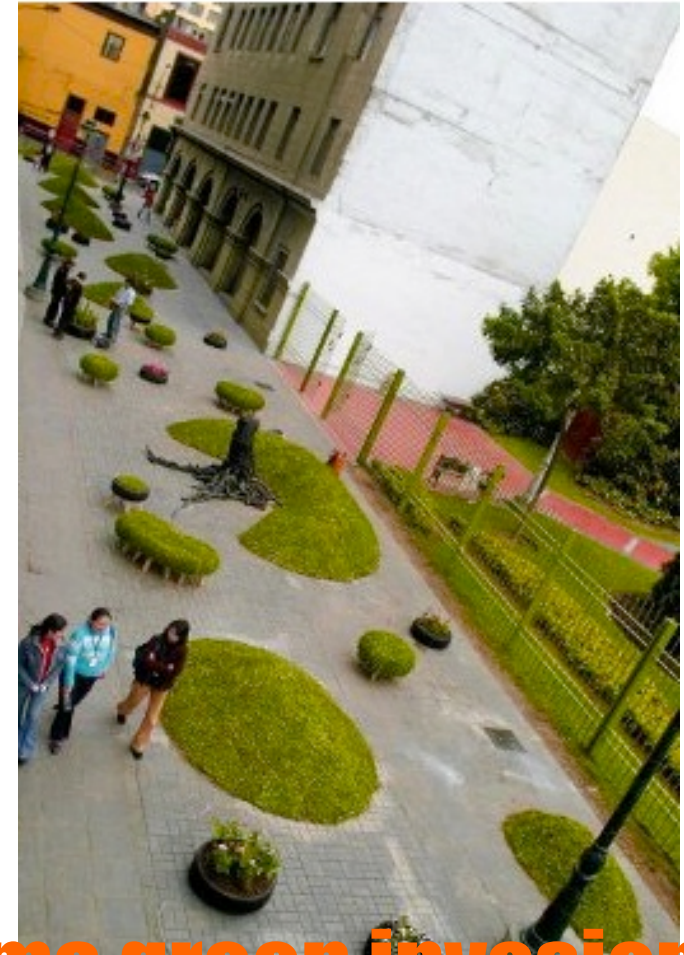
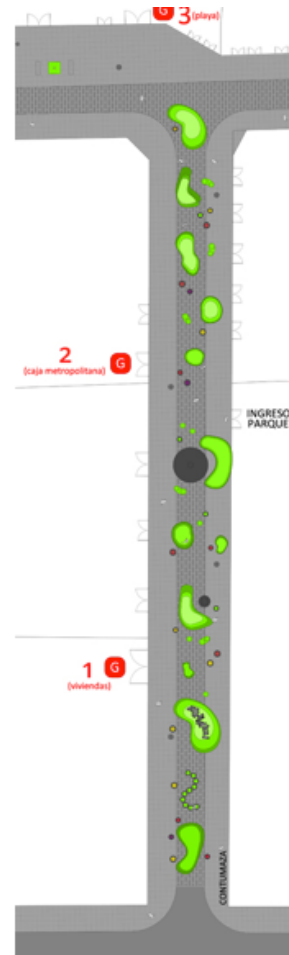


Westfield Green Wall – Londra (170mx4m - 250.000 piante)



nuovi paradigmi per il progetto green oriented

infrastrutture verdi spazio urbano



Lima green invasion

nuovi paradigmi per il progetto green oriented infrastrutture verdi e nuove forme di agricoltura



IBA EMSCHER PARK 1989-1999

Ricerca di una nuova identità per i paesaggi post-industriali della Ruhr

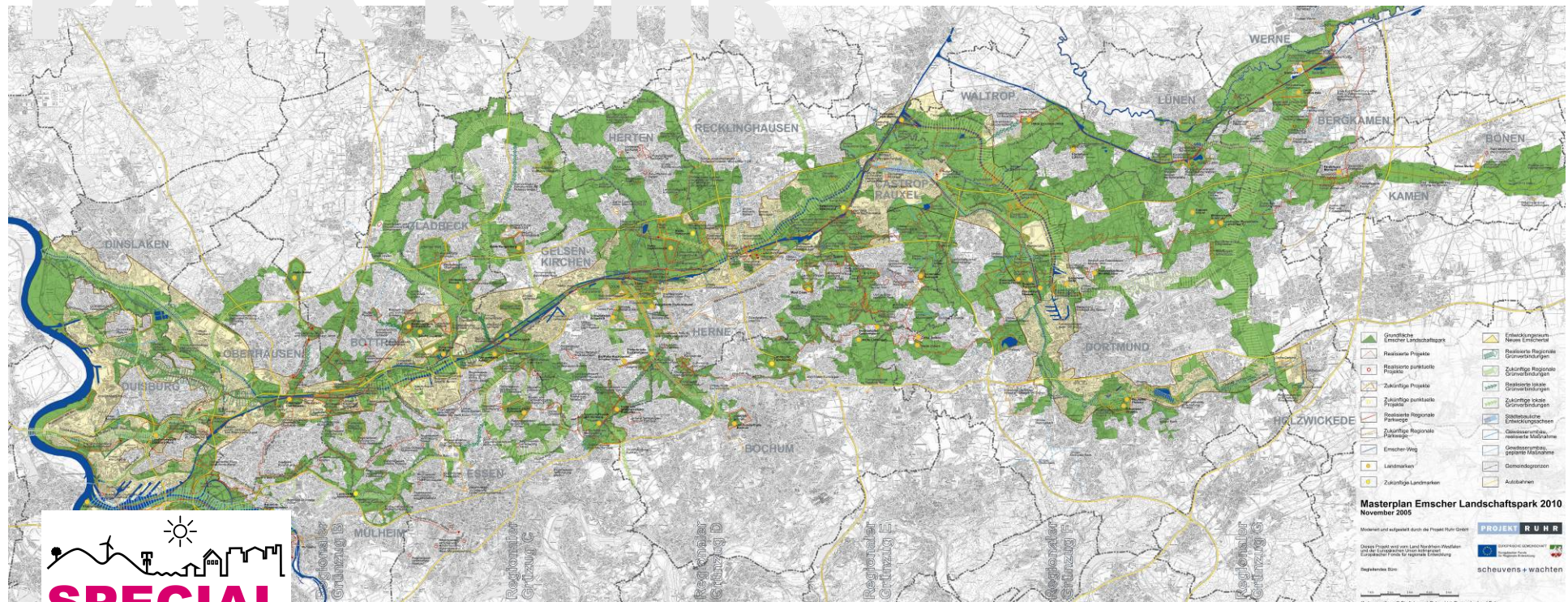
Planning area **800 km²**

17 cities

Concerned inhabitants **2.500.000**

150 projects

Invested **4.000.000.000 €**



IBA EMSCHER PARK 1989-1999

Ricerca di una nuova identità per i paesaggi post-industriali della Ruhr

EES

Ecologico+ **E**conomico + **S**ociale

Paesaggio delle vecchie industrie► Nuovo paesaggio culturale urbano
Regione delle vecchie industrie► Moderna Regione Europea metropolitana

'recuperare il paesaggio - proteggere, connettere, e riqualificare'



Gasometro/ Centro-O Oberhausen



**CAPITALE DELLA CULTURA 2010
Zeche Zollverein Essen**



Halde Hohenwart Recklinghausen

ThyssenKrupp-Quartier / Krupp-Park, Essen

Kernbereich des Krupp-Gürtels

Vision eines städtebaulichen Konzeptes

ThyssenKrupp Quartier
Krupp-Park

Krupp-Park (in der Realisierung)

1. Plaza Nord
2. Seeplateau mit Amphitheater
3. Begehbare Lärmschutzgabhione
4. Waldspielplatz
5. Kleinkinderspielfeld
6. Fitnessbereich
7. Multifunktionalsfeld
8. Beachvolleyball
9. Skatefläche
10. Plaza West
11. Aussichtsplateau

ThyssenKrupp Quartier (in der Realisierung / Planung)

14. Entrée-Welle
15. Allee der Welten
16. Wasserachse
17. Schnelle Wege
18. Headquarter
19. Forum

Anbindung Altendorfs an den Park (Planungsstudie KLA / KZA)

12. Wohnen am Krupp-Park
13. Stadtteilzentrum



0 100 200



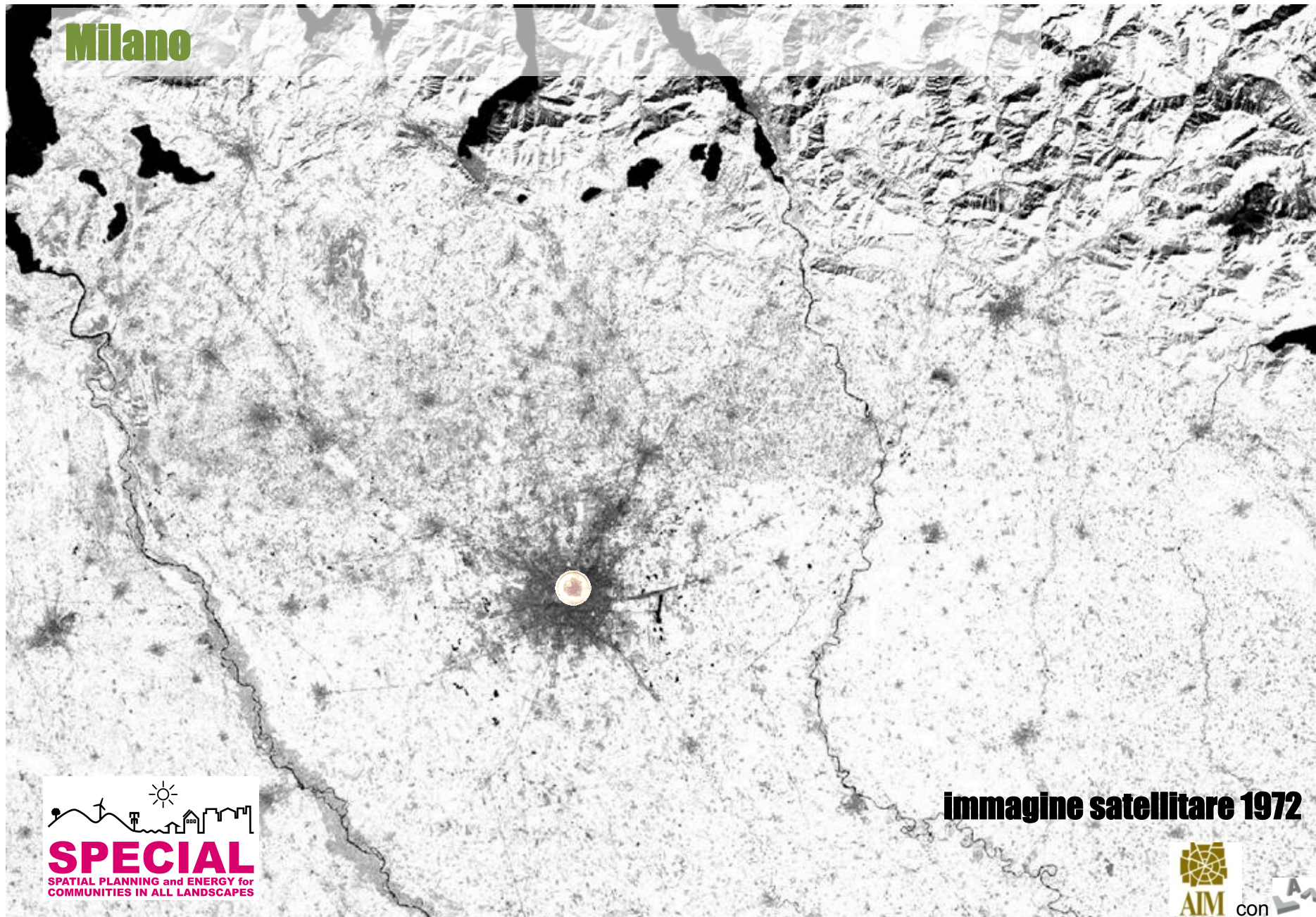
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COMMUNITIES IN ALL LANDSCAPES

casi di studio

infrastruttura verde

ThyssenKrupp-Quartier / Krupp-Park, Essen





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infrastruttura verde

Milano

immagine satellitare 2002



RAGGI VERDI – MILANO (Arch. Andreas Kipar)

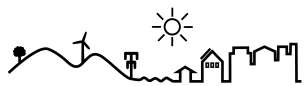
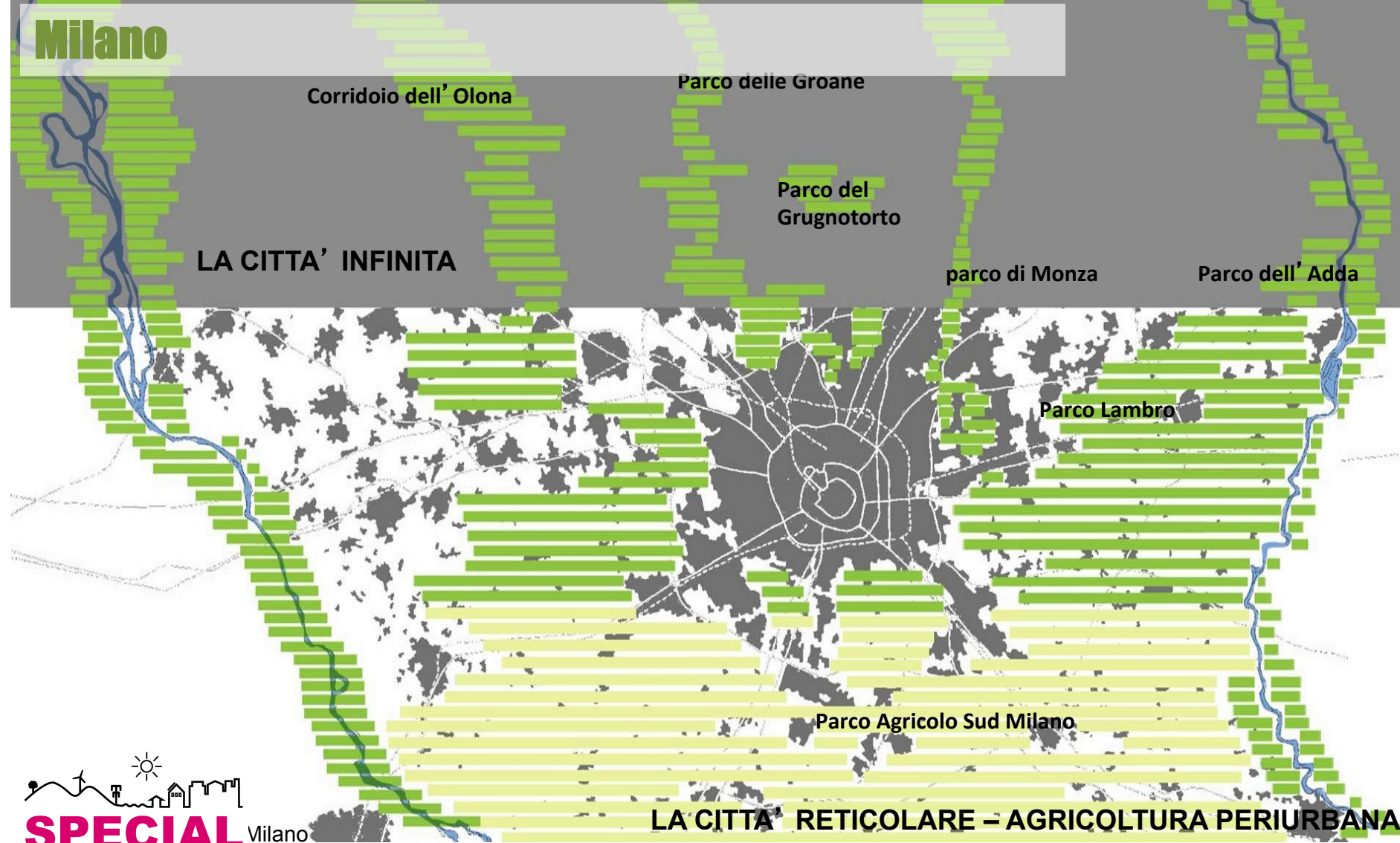
Otto raggi che da Piazza Duomo arrivano ai confini della città. 72 km di piste ciclabili, 50.000 nuovi alberi da piantare. Otto percorsi diversi che si collegheranno ai grandi parchi periferici.



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infrastruttura verde

SPAZIO APERTO – SPAZIO COSTRUITO: CONFRONTO TRA IL NORD E IL SUD DELL' AREA METROPOLITANA MILANO

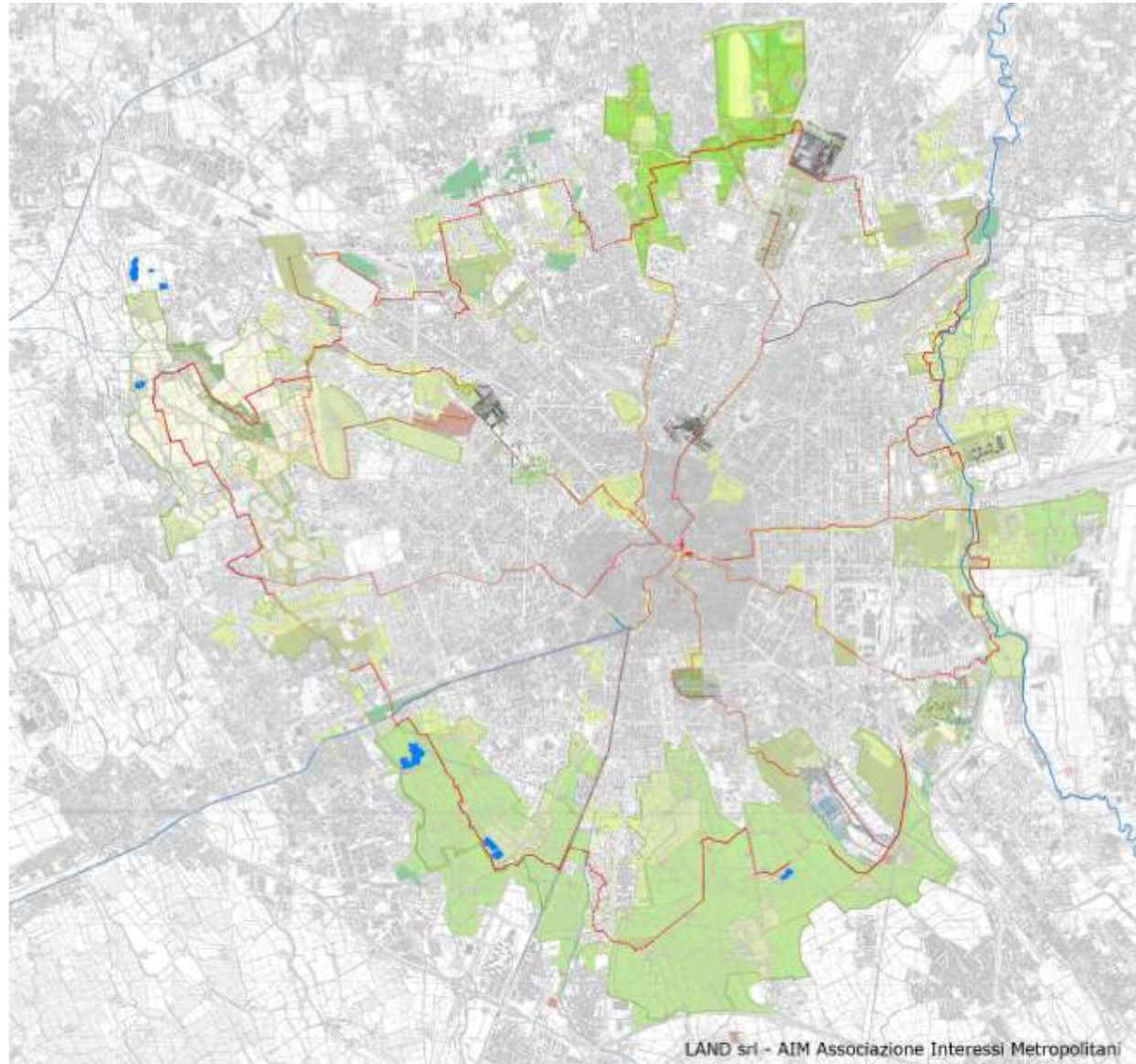


SPECIAL Milano
SPATIAL PLANNING and ENERGY for
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Milano

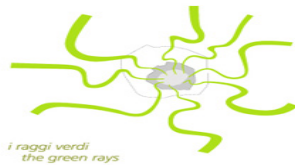
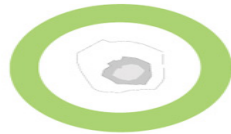
infrastruttura verde



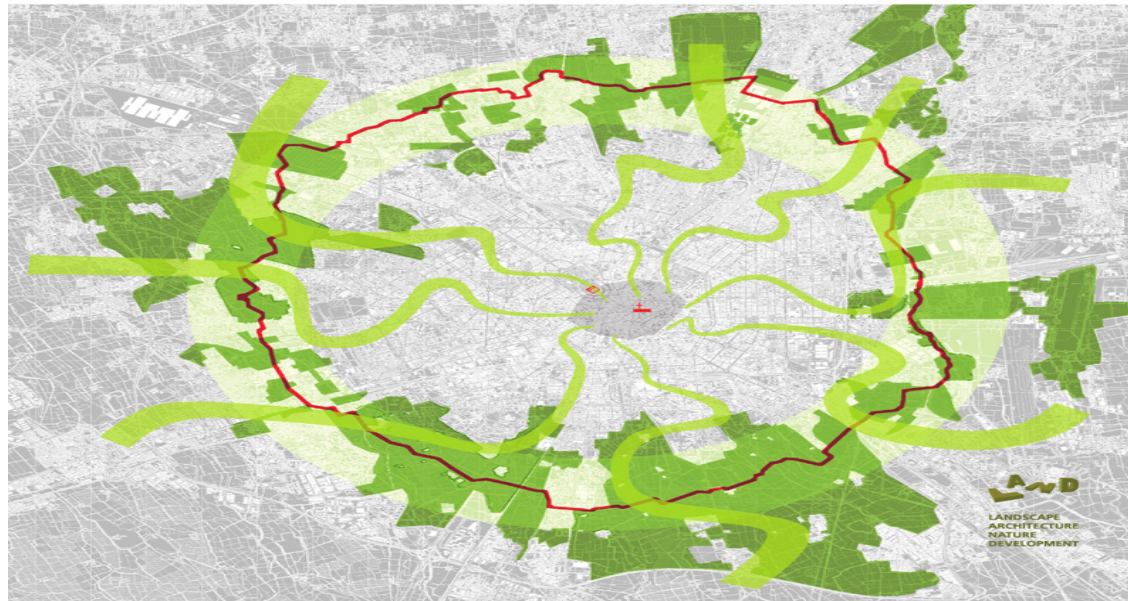
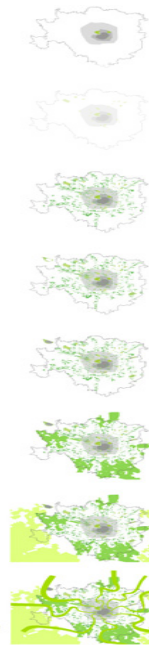
LAND srl - AIM Associazione Interessi Metropolitani

casi di studio

Milano



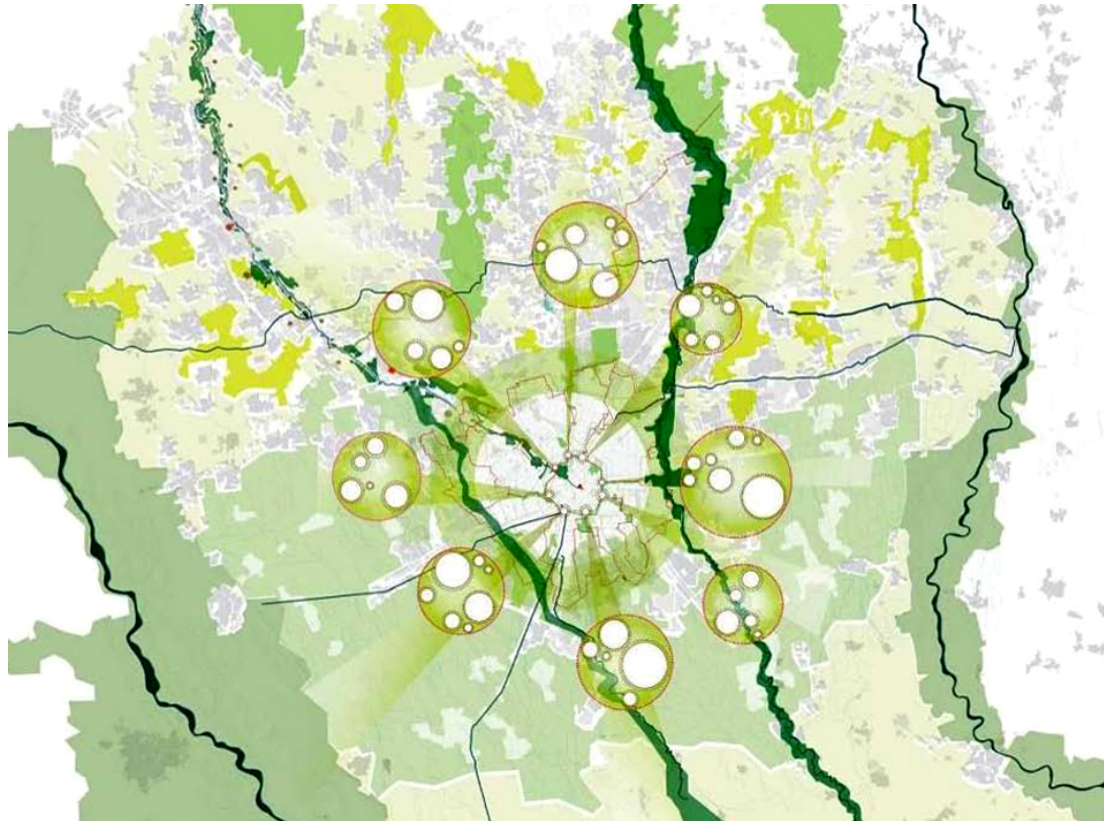
evoluzione dei raggi verdi
evolution of green rays



infrastruttura verde

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Milano



infrastruttura verde



l'isola urbana



l'area d'azione del raggio



il tracciato



il raggio si espande nell'area d'azione



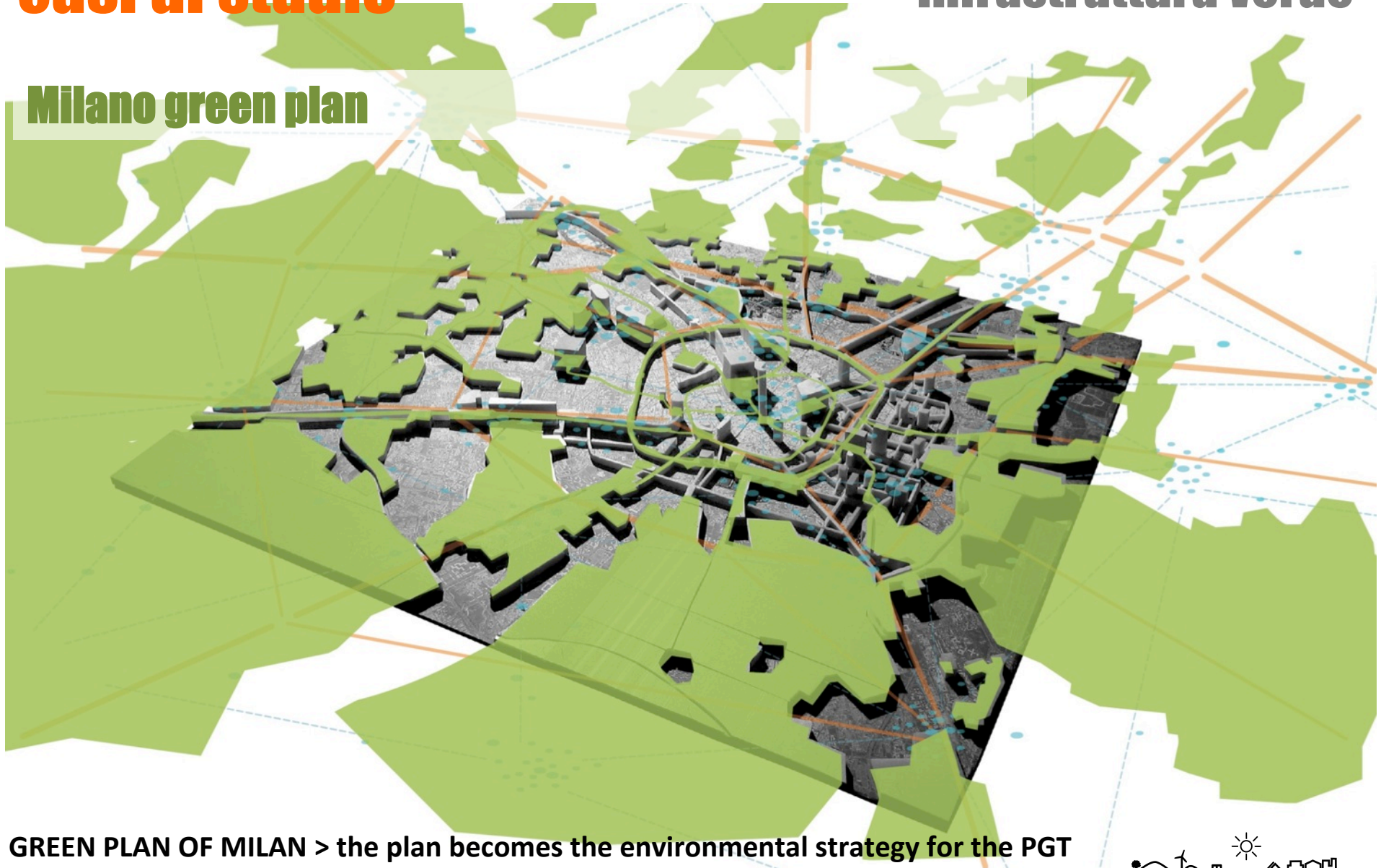
il raggio verde



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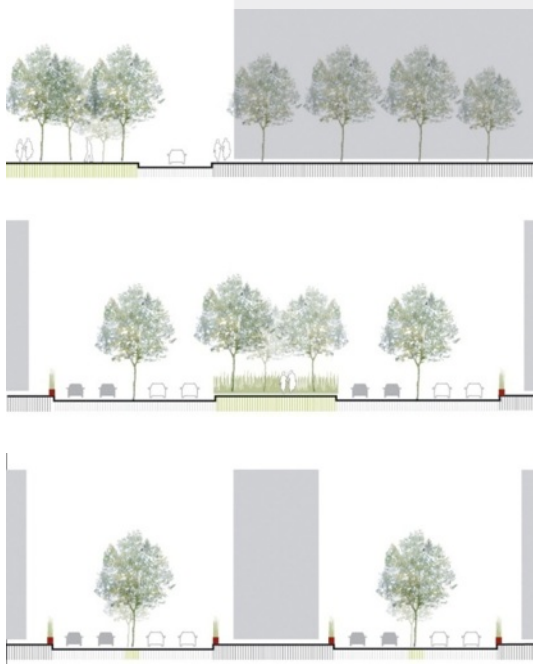
Milano green plan



GREEN PLAN OF MILAN > the plan becomes the environmental strategy for the PGT

casi di studio

Milano green plan



the green net > the main connection axis become available for pedestrians

Making linear gardens

New Greenways



GREEN PLAN OF MILAN >> USES OF SPACES > greenways

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infrastruttura verde

HAMBURG

European Green Capital 2011



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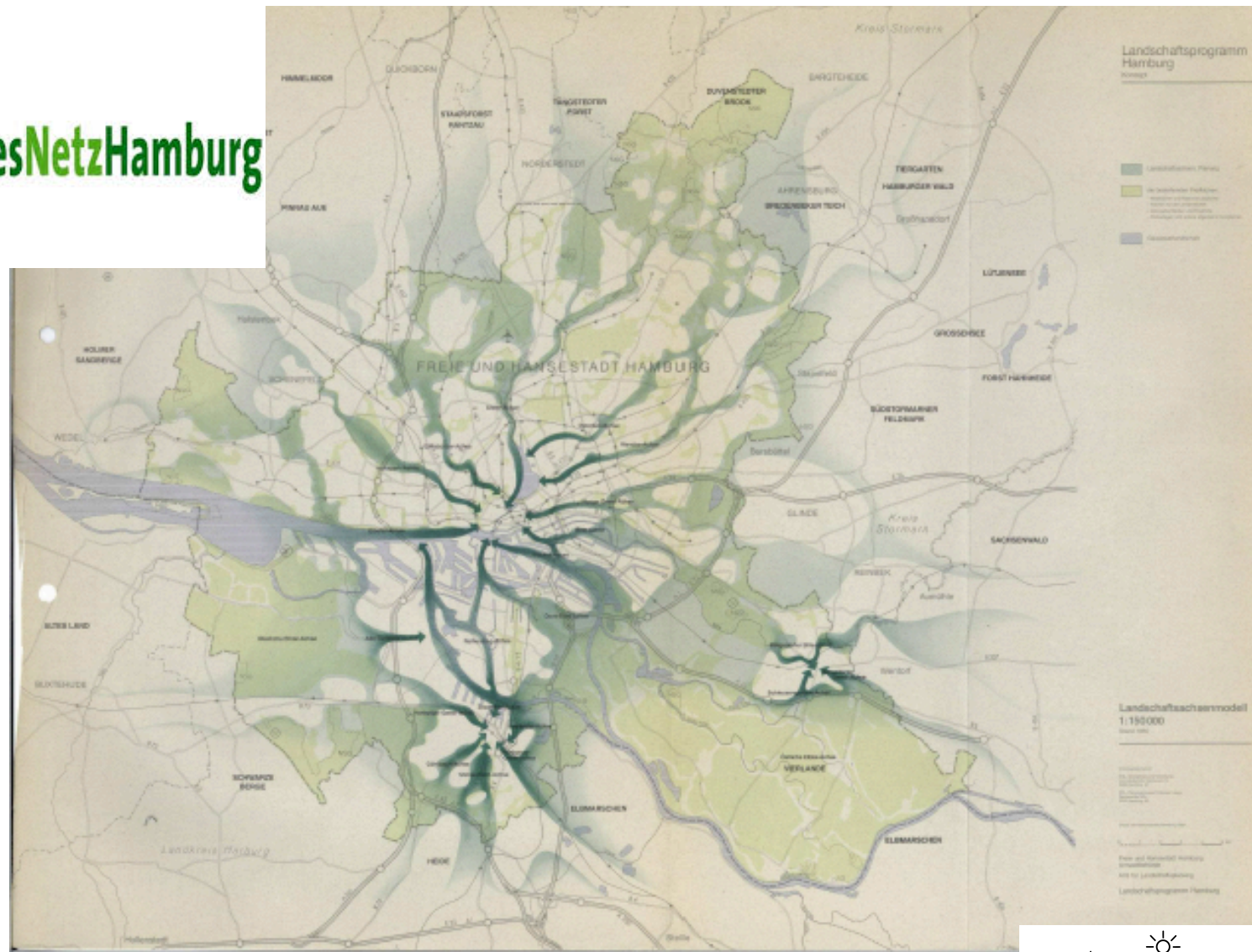
Hamburg has made real efforts to cut back on CO₂, with a Municipal Climate Protection Act, adaptation and research programmes. The climate protection programme, approved by the local government in summer 2007, identifies 10 areas of action covering over 450 individual measures. The city invests up to €22.5 million a year in these measures.



A significant partnership programme, called 'Enterprise for Resource Protection', has already completed about 1 000 projects. The aim is to encourage voluntary investment in increasing energy and resource efficiency in enterprises. For each €1 invested by local government, participating

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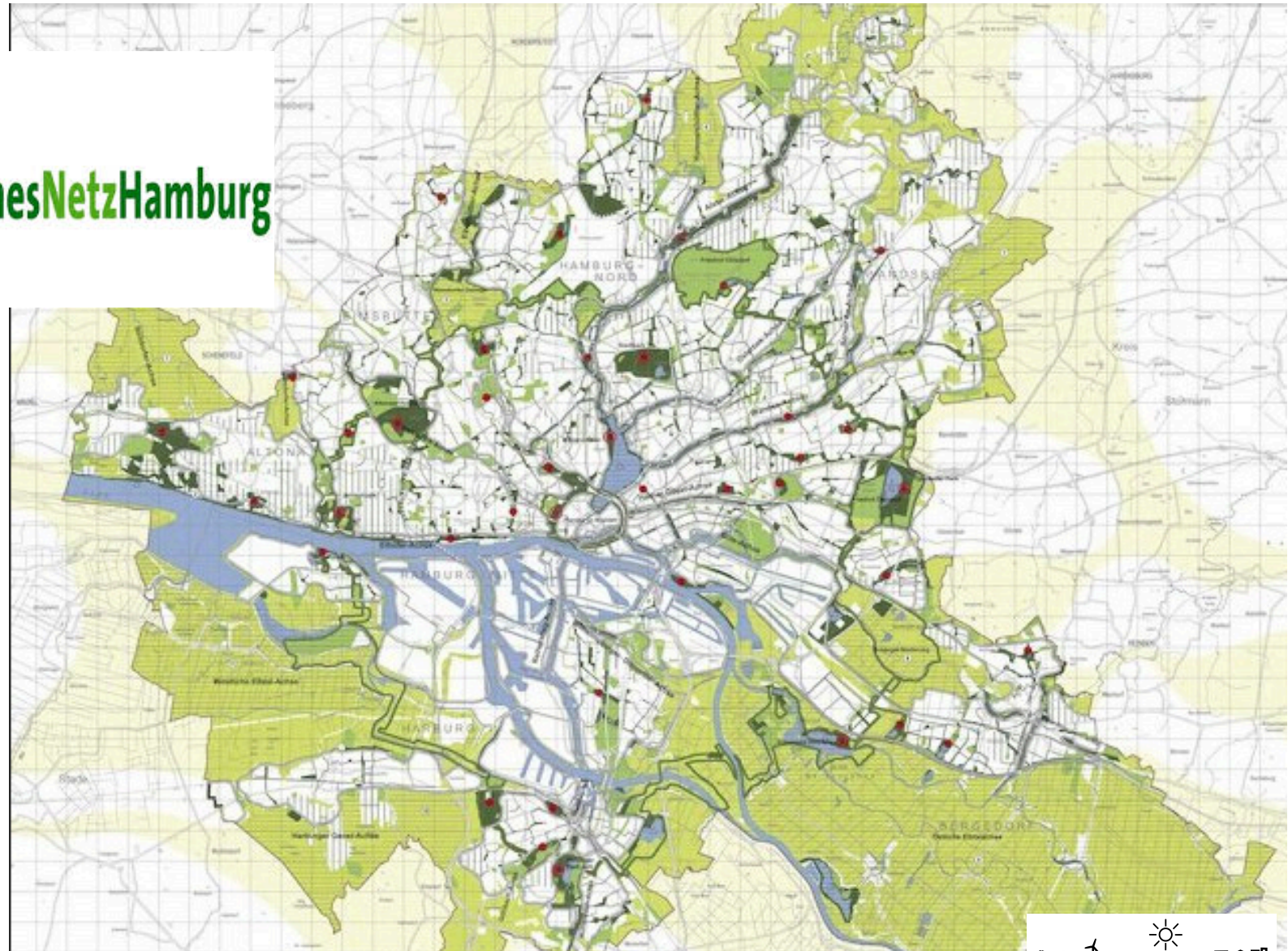


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Grünes Netz Hamburg



AMBURGO green capital
40% della superficie urbana destinata a verde.



**Eliminazione delle auto dal centro urbano
nell'arco dei prossimi 20 anni**



THE RINGS

many different types of open space and landscape can be e along its course – accordingly the choices of use are varied chance to circumnavigate the city by bicycle or on foot mos pleasant green spaces, while detours into the Landscape Ax parks and recreational areas are possible via attractive gree The Second Green Ring is a special feature of Hamburg due within the urban fabric. Green Rings or belts do exist in otl well, such as Hanover, Leipzig, London or Moscow, but the usually situated in the open countryside on the outskirts of th

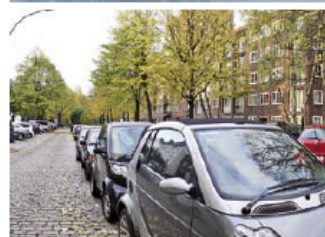


Lohmühlenpark

Narrow green corridors and footpaths in the shape of green streets with reduced traffic will connect the smaller green open spaces and create links to the Landscape Axes and the Green Rings. Many journeys home, to work, to the shops and to the recreational areas can be separated from the traffic and take place in pleasant green surroundings.



"Alpine meadow" – Hafacity, concept: Bjarke Ingels Group, Copenhagen



Düppelstraße, today



Düppelstraße, idea of development

The Future of the "GrünesNetzHamburg"

Green and public open spaces make up around half of Hai territory. They are highly important for the quality of life wit and therefore must be protected and strengthened. The "Gr Hamburg" connects – even if not completely – the parks, pl sports grounds, allotments and cemeteries within the city a its outskirts. It thereby creates routes among green surroun turbed by traffic. The "GrünesNetzHamburg" supplies the r with a range of public open spaces for recreation and in c increases the choices for leisure activities. At the same tim valuable for the town's green infrastructure, for ecological (the (micro) climate. Last but not least the "GrünesNetzHam tributes to Hamburg's distinctive cityscape. Therefore the "(Hamburg" is not only an important part of the Landscape P but can also be found in the latest development plans – Sp plan and Unitary Development Plan – as a general principl protection of Hamburg as a Green Metropolis.

Enhancing the existing open spaces and their interconnect of the scheme to improve key recreational areas and green Connecting the inner city to the site of the international ge in Wilhelmsburg, strengthening the Alster-Elbe-Green-Cor connecting the two large parks in Winterhude and Harburg "GrünesNetzHamburg" are some of the future plans.

The quality of the Landscape Axes and the Green Rings will and existing gaps v

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green oriented development **spazio pubblico**

infrastruttura verde

luogo urbano accessibile e fruibile da tutti, dotato di proprie caratteristiche spaziali, storiche, ambientali, sociali ed economiche

elemento chiave del benessere individuale e sociale, luogo della vita collettiva delle comunità, espressione della diversità e del patrimonio culturale e naturale e spazio dal valore identitario in cui la comunità si identifica



casi di studio **il progetto dello spazio pubblico**

infrastruttura verde

GREEN CITIES



ORESTAD COPENAGHEN



VAUBAN FRIBURGO



HAMMARBY STOCCOLMA



BEDZED SUTTON

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il progetto dello spazio pubblico

infrastruttura verde

Spazi pubblici di qualità



casi di studio **il progetto dello spazio pubblico**

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Spazi pubblici di qualità



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Spazi pubblici di qualità

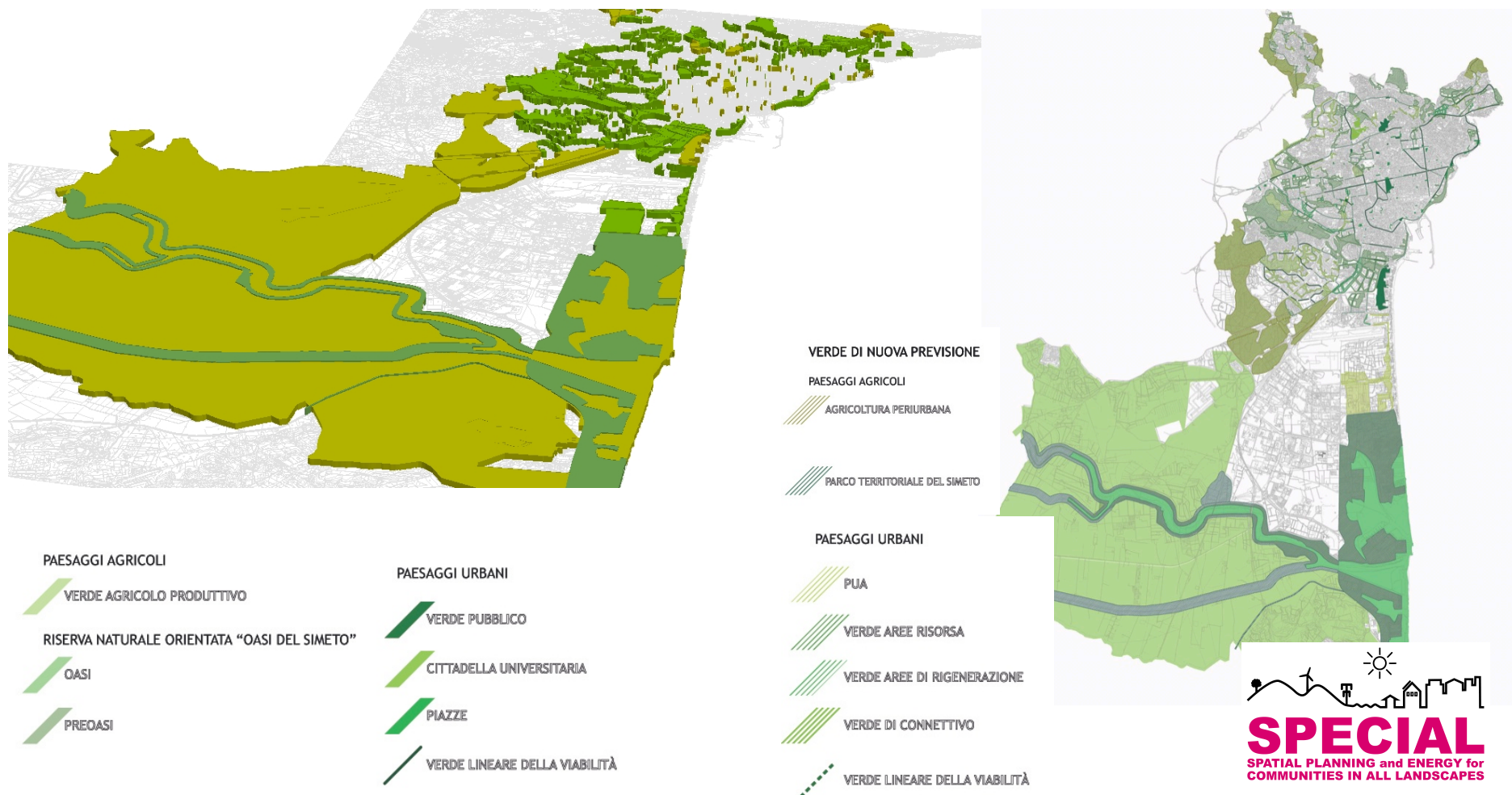
casi di studio **i luoghi delle infrastrutture**



infrastruttura verde



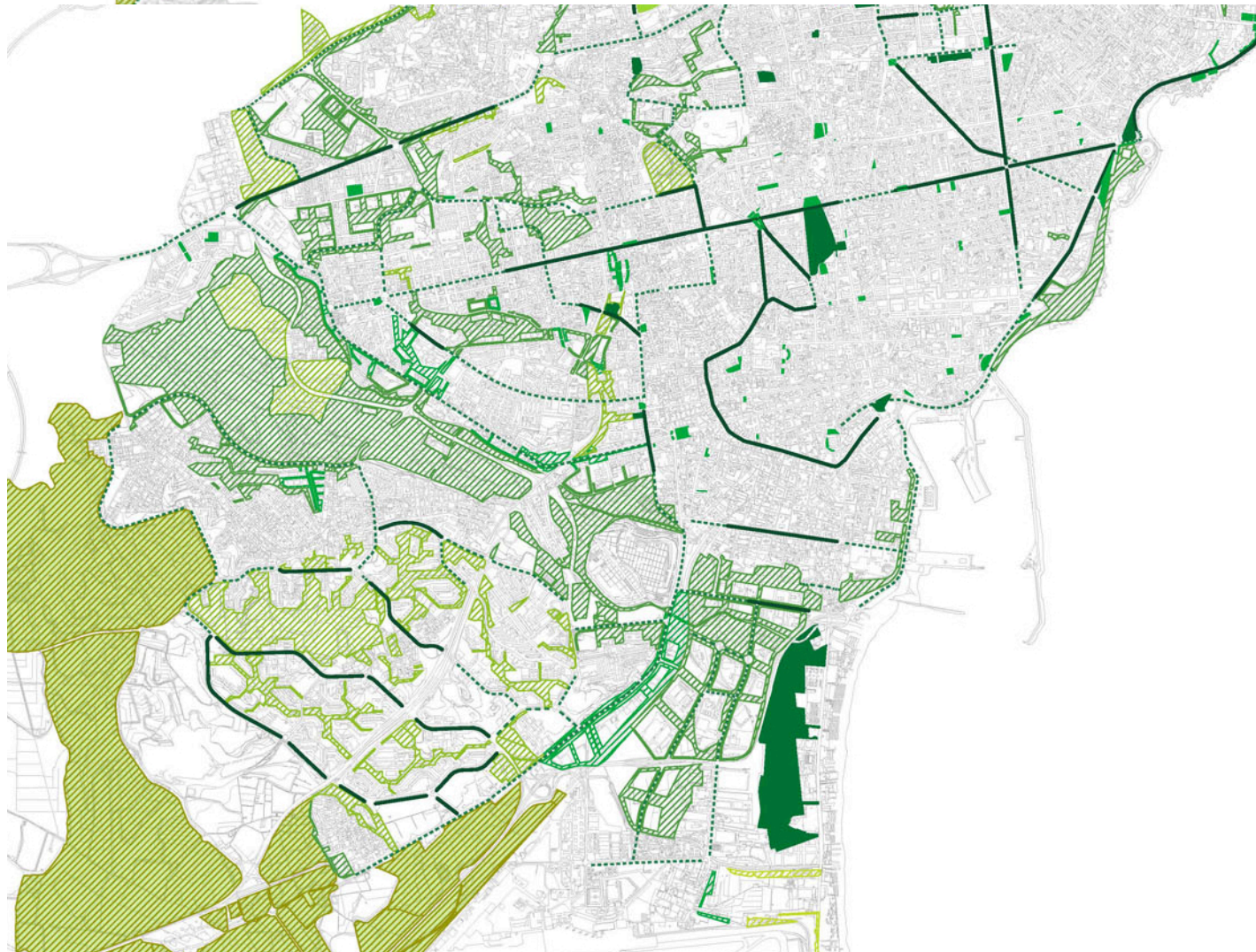
CATANIA – l'infrastruttura verde del prg la rete di aree verdi proposte dallo strumento urbanistico 2012



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PRG
PIANO REGOLATORE GENERALE
2012

CATANIA – l'infrastruttura verde del prg

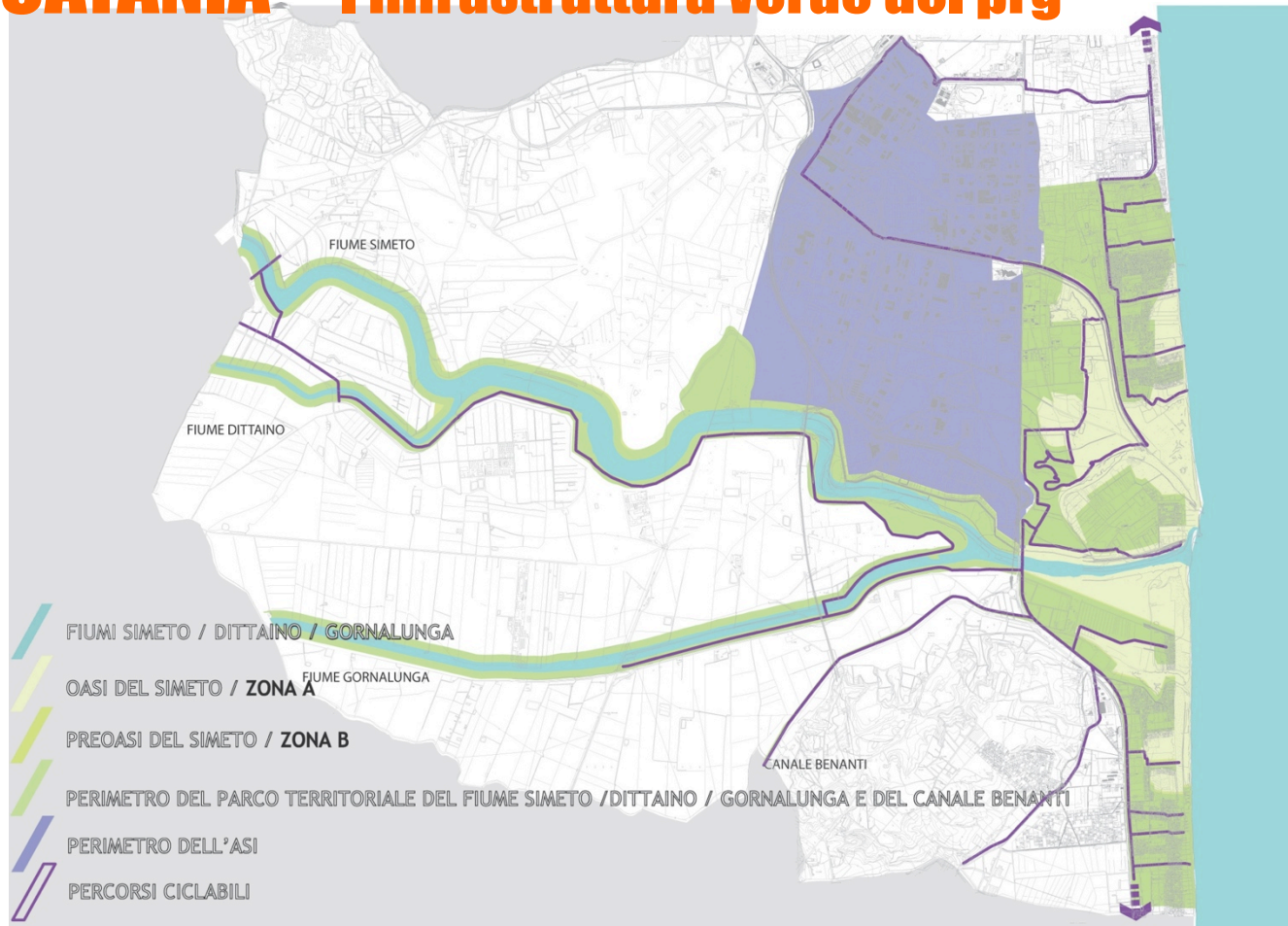


- PAESAGGI AGRICOLI
 - VERDE AGRICOLO PRODUTTIVO
- RISERVA NATURALE ORIENTATA "OASI DEL SIMETO"
 - OASI
 - PREOASI
- PAESAGGI URBANI
 - VERDE PUBBLICO
 - CITTADELLA UNIVERSITARIA
 - PIAZZE
 - VERDE LINEARE DELLA VIABILITÀ
- VERDE DI NUOVA PREVISIONE
 - PAESAGGI AGRICOLI
 - AGRICOLTURA PERIURBANA
 - PARCO TERRITORIALE DEL SIMETO
- PAESAGGI URBANI
 - PUA
 - VERDE AREE RISORSA
 - VERDE AREE DI RIGENERAZIONE
 - VERDE DI CONNETTIVO
 - VERDE LIP

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PIANO REGOLATORE GENERALE
2012

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Parco territoriale del fiume Simeto/Dittaino/Gornalunga

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PRG
PIANO REGOLATORE GENERALE
2012



Parco Territoriale del Simeto



Parco Territoriale Monte Po

