Back from the Past and the Future towards Sustainability
Part-II

18:00-20:00, 7th March, 2017
@Chu Hai College of Higher Education

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Past Vice-president of UIA

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* NRW: Land Nordreihn Westfahlen

4.1 Ökologische Siedlung Kassel, Germany (1984~1993)

Bundes Republik Deutchland

Federal Republic of Germany

Ökologische Siedlung Kassel, Germany

Planning together,

Building together,

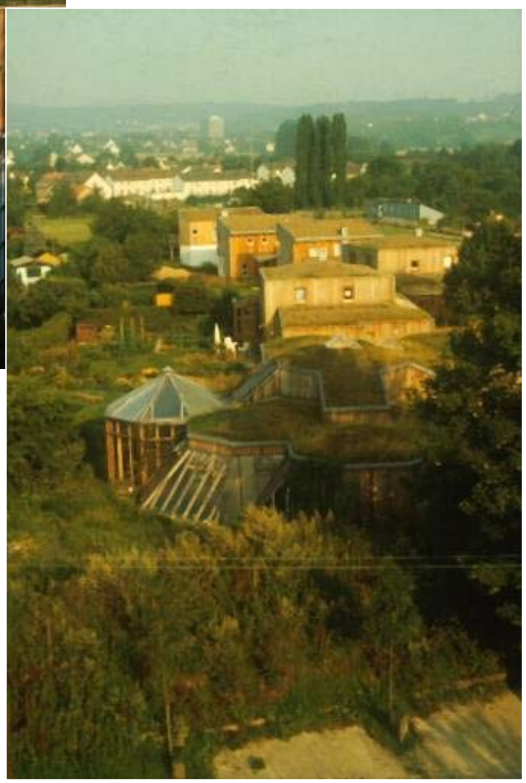
Operating & Living together

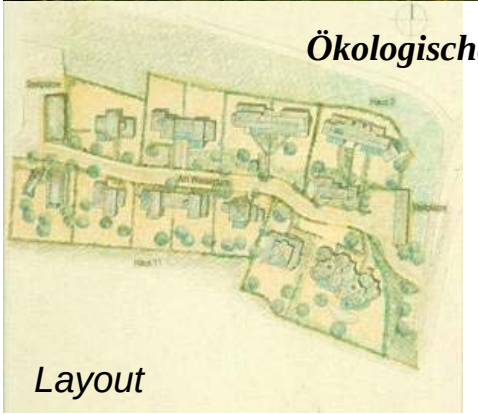
for a Sustainable Future.

An ecological settlement, implemented through cooperative design process (application of B-plan)

Haus Hegger

Pioneering project of co-operative eco-housing





Layout

Ökologische Siedlung Kassel

(1984~1993)

Co-operative initiative of the residents for a sustainable community

Development guidelines for the Kassel Okologische Siedlung (as of 1981)

01. Circulate rainwater into the earth	15. Calculate the basic thermal load
02. Reduce land area for street	16. Provide comfortable thermal condition
03. Reduce the amount of storm water	17. Reduce the heat-loss through openings
04. Green the rooftop	18. Design energy-efficient openings
05. Mitigate the wind through greenery	19. Enhance thermal insulation of roof & walls
06. Mitigate the heat load through greenery	20. Attach a green house for thermal use
07. Clean the air through greenery	21. Reduce basement construction
08. Provide passive solar solutions	22. Design a compact plan
09. Reduce the heat-loss by ventilation	23. Bring together the service pipes
10. Provide thermal buffer-zones	24. Use rainwater for flushing toilets
11. Install healthy heating system	25. Use rainwater for watering greenery
12. Select safe and healthy materials	26. Support to reduce household waste
13. Install healthy heating system	27. Provide kitchen gardens
14. Install energy-efficient heating system	28. Encourage DIY

Ökologische Siedlung Kassel : Along the street


Hedge


Curved inner street


Permeable street-side

■**Returning rainwater into the earth**


View along the inner


Haus HEGGER as of 2007

Ökologische Siedlung Kassel : Haus HEGGER

Ökologische Siedlung Kassel : Haus HEGGER

Wood & Green

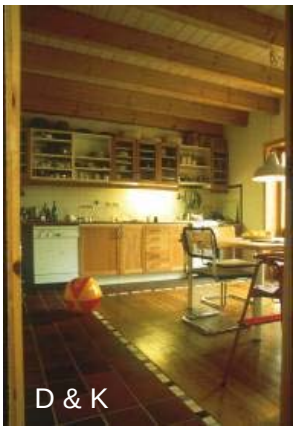
Ökologische Siedlung Kassel : Haus HEGGER as of 2000


ENTRANCE


ATRIUM


NICHE

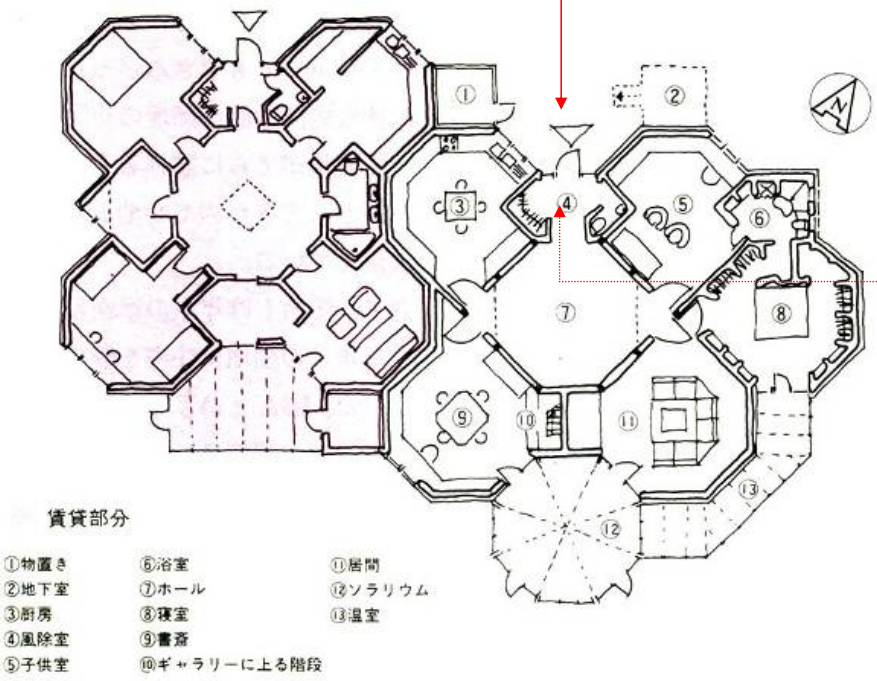

STAIR


D & K

Ökologische Siedlung Kassel : Haus MINKE


Southern Facade

Ökologische Siedlung Kassel：Haus MINKE



■Plan

Ökologische Siedlung Kassel：Haus MINKE

■Topside light

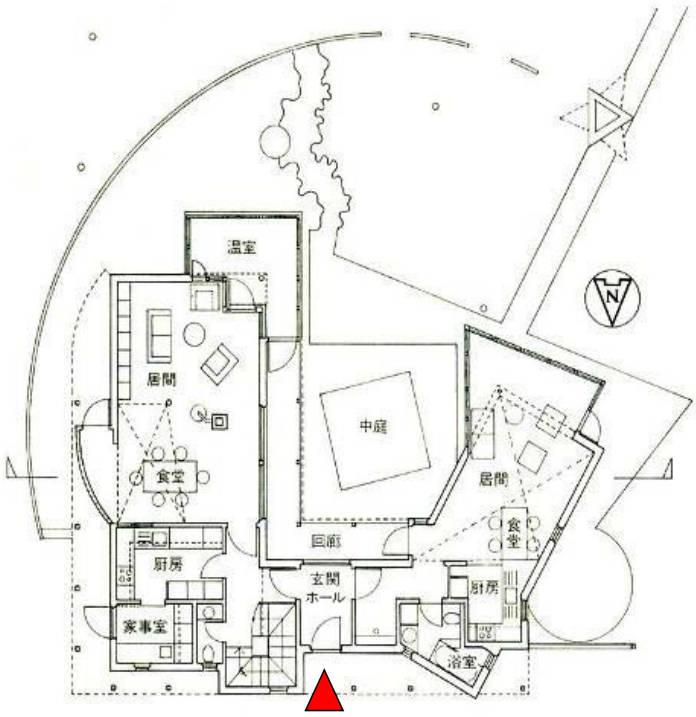
■Hall

■Hall

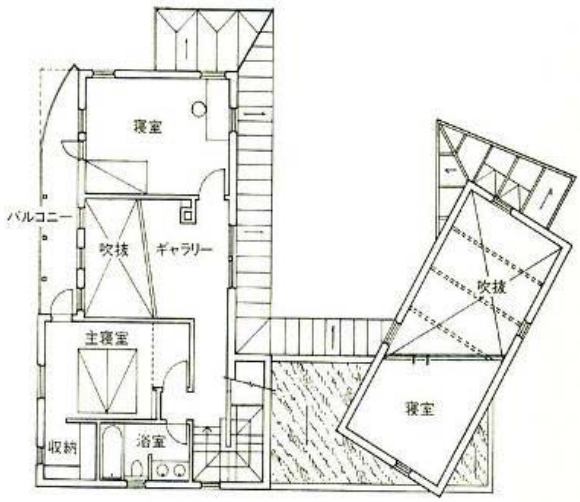
Ökologische Siedlung Kassel：Haus WAMURA

Approach

Ökologische Siedlung Kassel：Haus WAMURA



■Ground floor plan

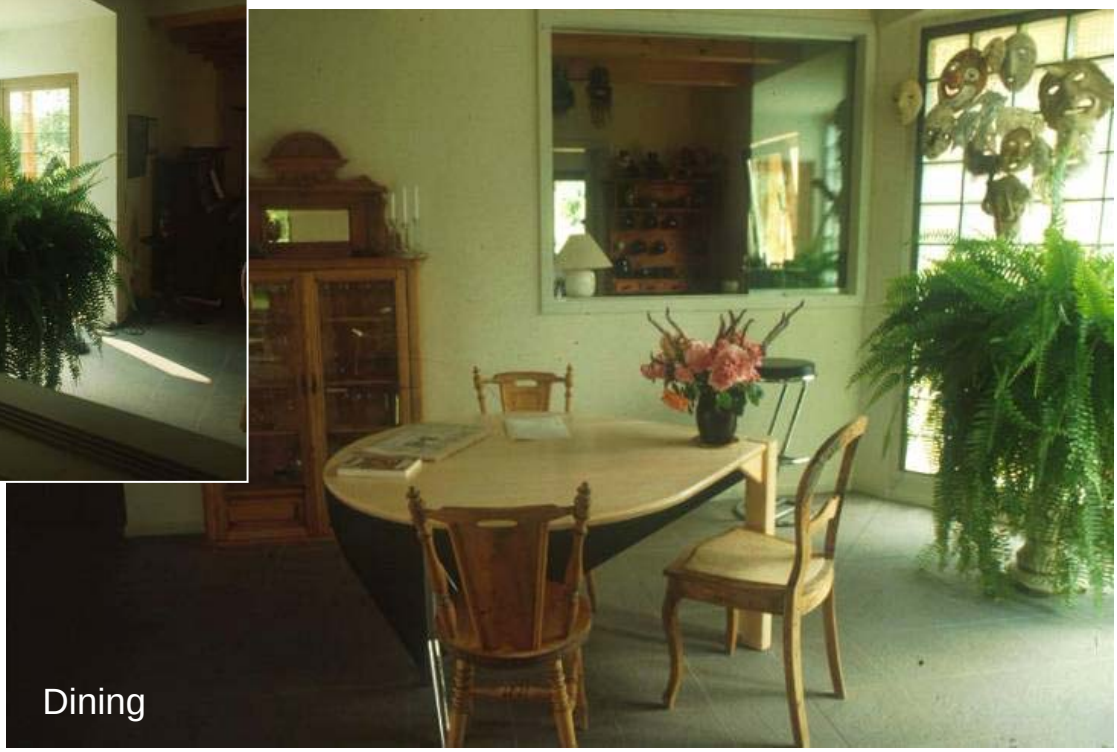


■First floor plan

Ökologische Siedlung Kassel : Haus WAMURA

Court

Ökologische Siedlung Kassel : Haus WAMURA



Dining

Ökologische Siedlung Kassel：Haus IWAMURA

Studio

At Haus IWAMURA, 2007

4.2 IBA Emscherpark

Monumental rehabilitation of towns and region along the Emscher river, NRW, Germany

IBA: Internationale Bauaustellung (International Building Exhibition)

History of urban innovations through IBA

IBA is a time-limited public corporation that initiates innovative development projects in designated areas.

1901**: Darmstadt**

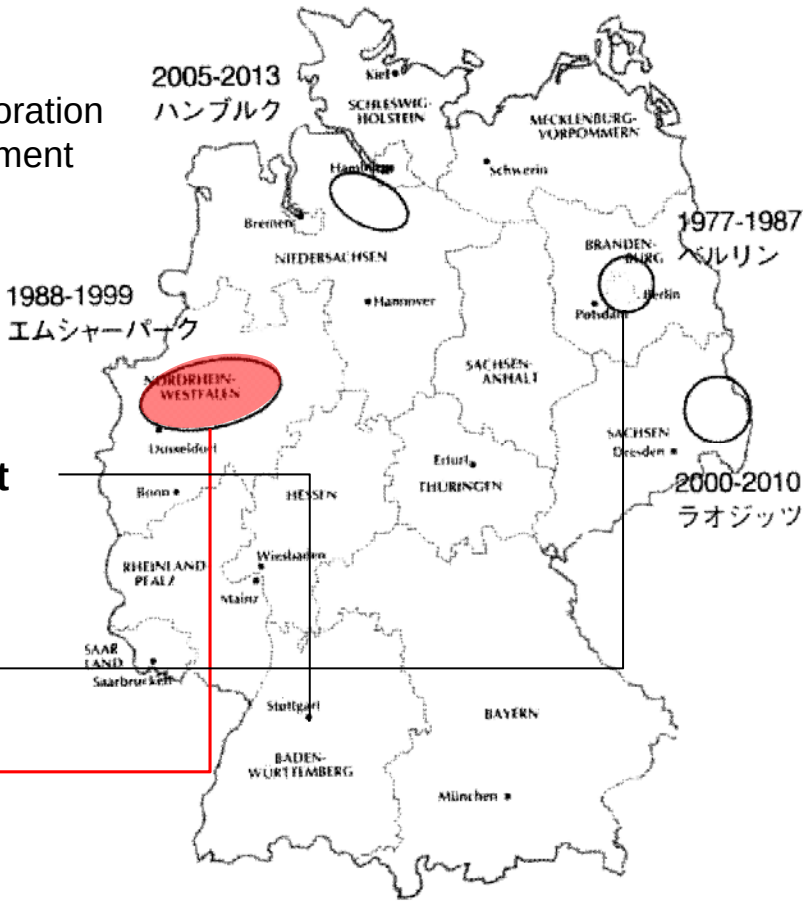
1909: **Great Berlin**

1927: **Weissenhof, Stüttgart**

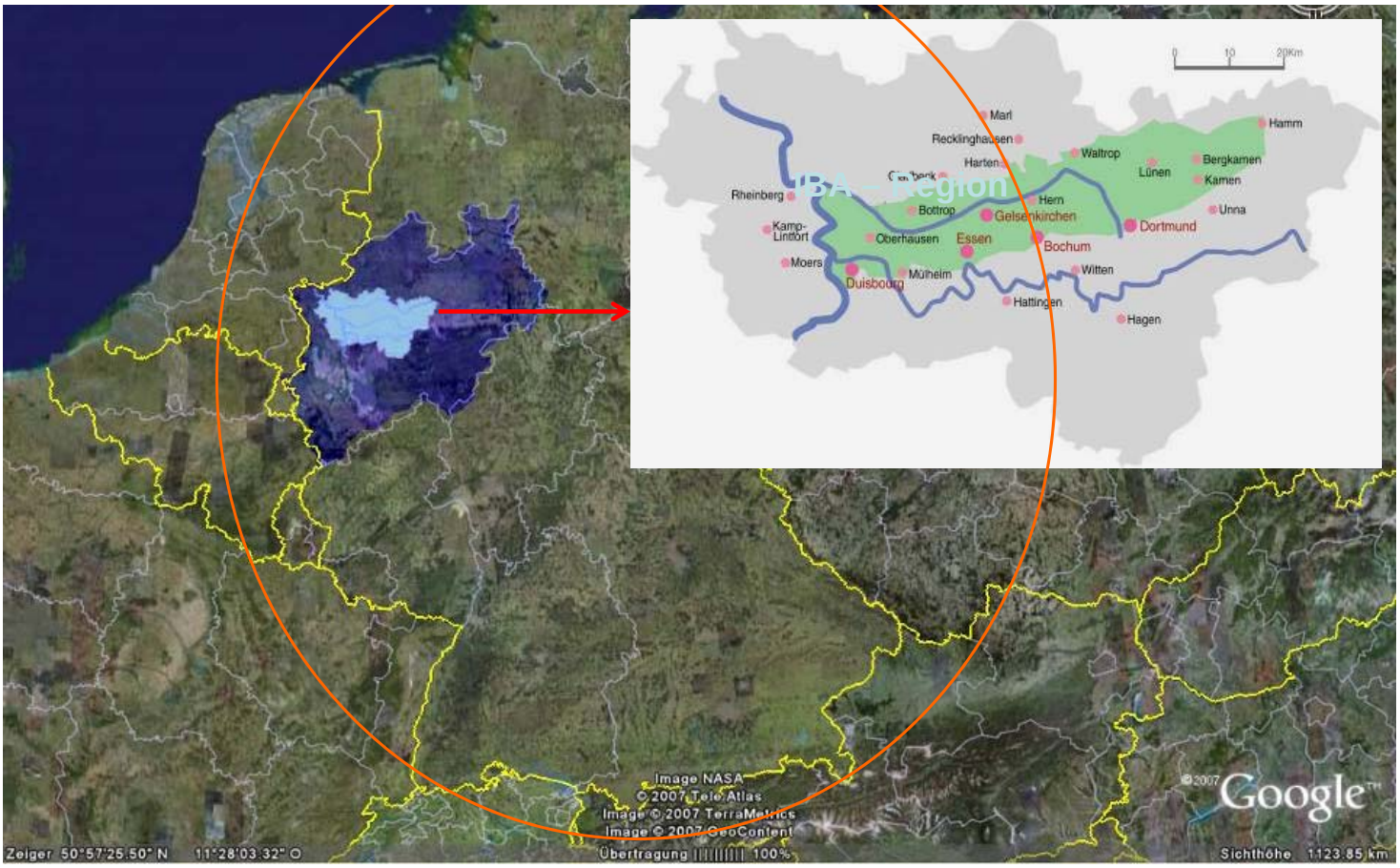
1957: **Interbau, Hansestadt**

1980: **Berlin**

1988: Emscherpark



Project area of the IBA Emscherpark



Route der Industriekultur. Strukturwandel als Attraktion

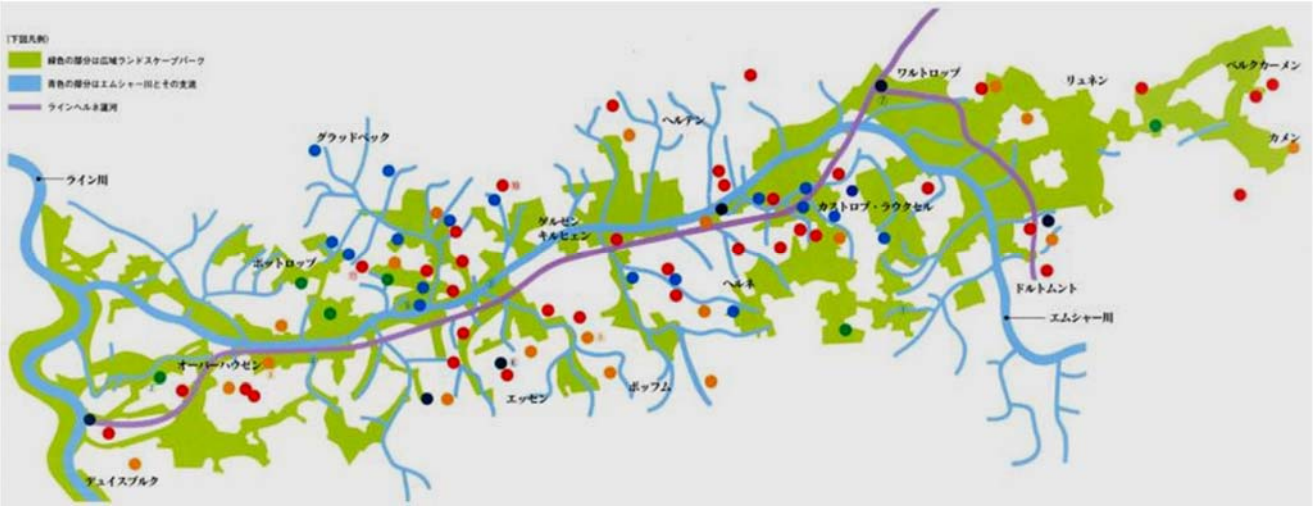
Ministerium für Bauen und Verkehr des Landes Nordrhein-Westfalen

Rehabilitation of the Ruhr industrial region as a joint initiative of EU and Germany

1）Rehabilitation of the Emscher and its green zones

2）Invitation of new industries of the 21st Century

3）Provision of comfortable housing

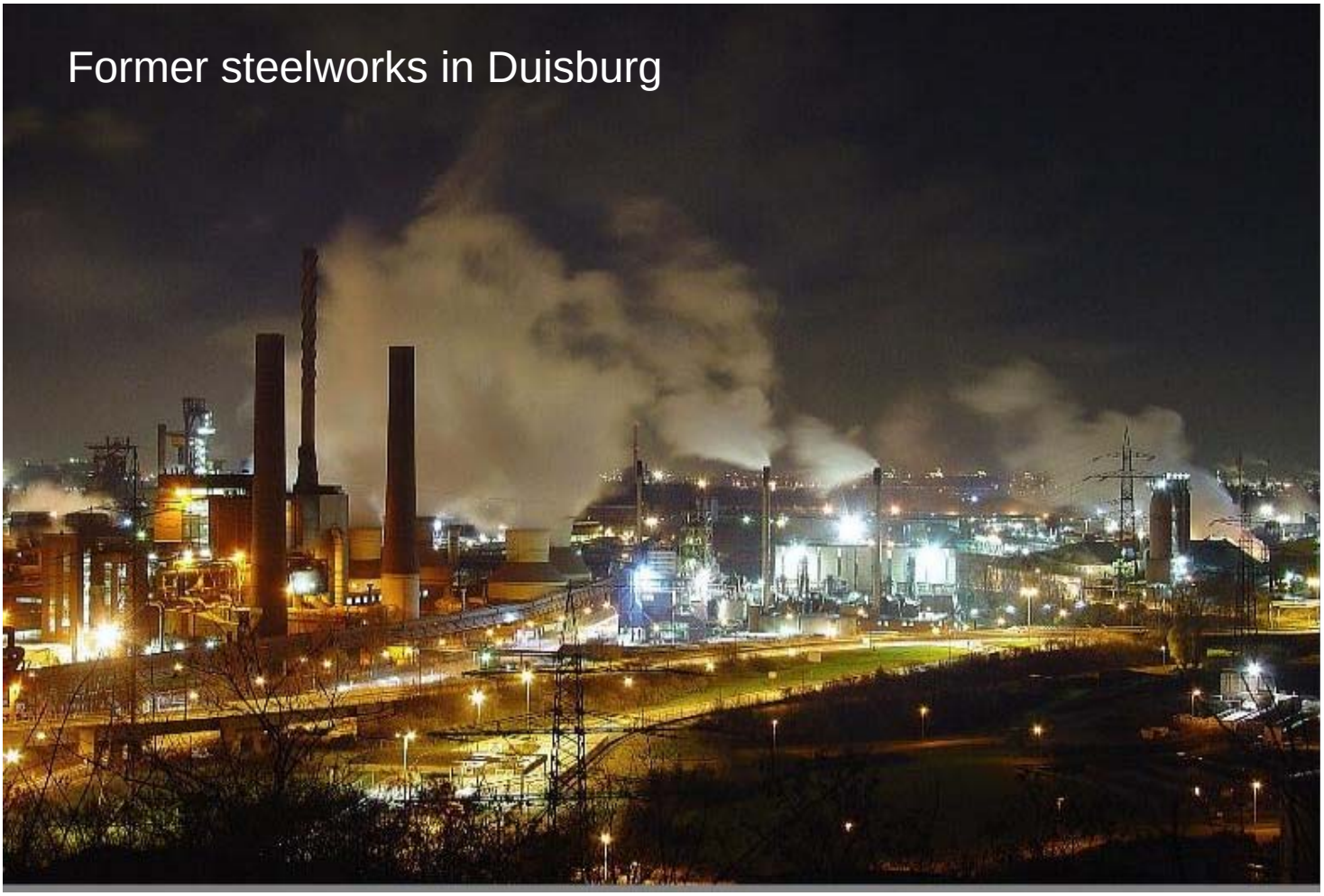


Outline of the IBA Emscherpark projects

	Theme	Project target	Number of projects
1	Landscape park: Improvement of land structure and landscape	Wide range provision of greenery and parks	15
2	Rehabilitation of eco-system of the Emscher water system	Provision of sewer system Rehabilitation of nature around the river	07
3	Creation of the regional cultural media using industrial heritage of modernization	Preservation and utilization of coal mines and steelworks	12
4	Reutilization of industrial idle sites as work places	Soil purification and redevelopment of industrial idle sites in urban areas	20
5	Provision of housing as contemporary Garden City	Rehabilitation and new construction of housing settlements	21
6	Introduction of new social systems associated with community development	Provision of public service facilities Town management through residents' participatory programs	14

Project data:
Designated area: ca.800km^2, Population: 2,5million p., Number of cities: 17
Amount of investment: 3500 millionUS$（Public sector:2/3, Private sector:1/3）

Former steelworks in Duisburg



Ministerium für
Bauen und Verkehr
des Landes Nordrhein-Westfalen

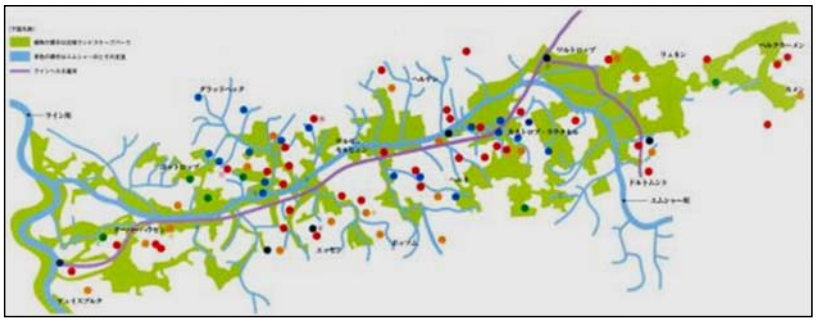
Emscher Landscape Park

Steelworks in Meiderich, Duisburg

Conversion of the former industrial site to a cultural site

Open-air stage built on the site of former steelworks

Rehabilitation of the Emscher



Rehabilitated Mühlenbach river

Teutoburgia-Siedlung, Herne

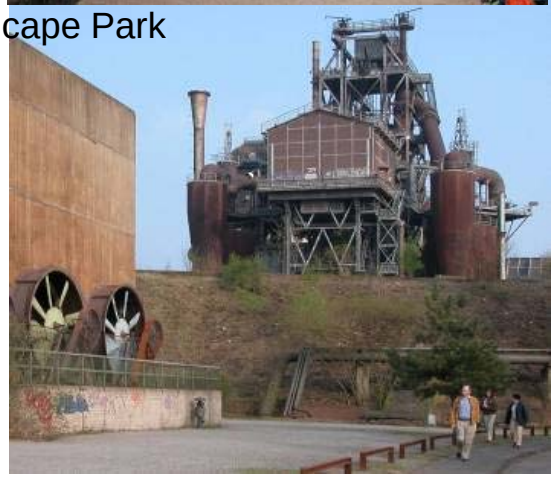
Originally built for coal-miners in 1909-1923

After the refurbishment

Teutoburgia-Siedlung, Herne

Landscape Park in Duisburg, NRW

Duisburg, Landschaftspark Nord | North Landscape Park

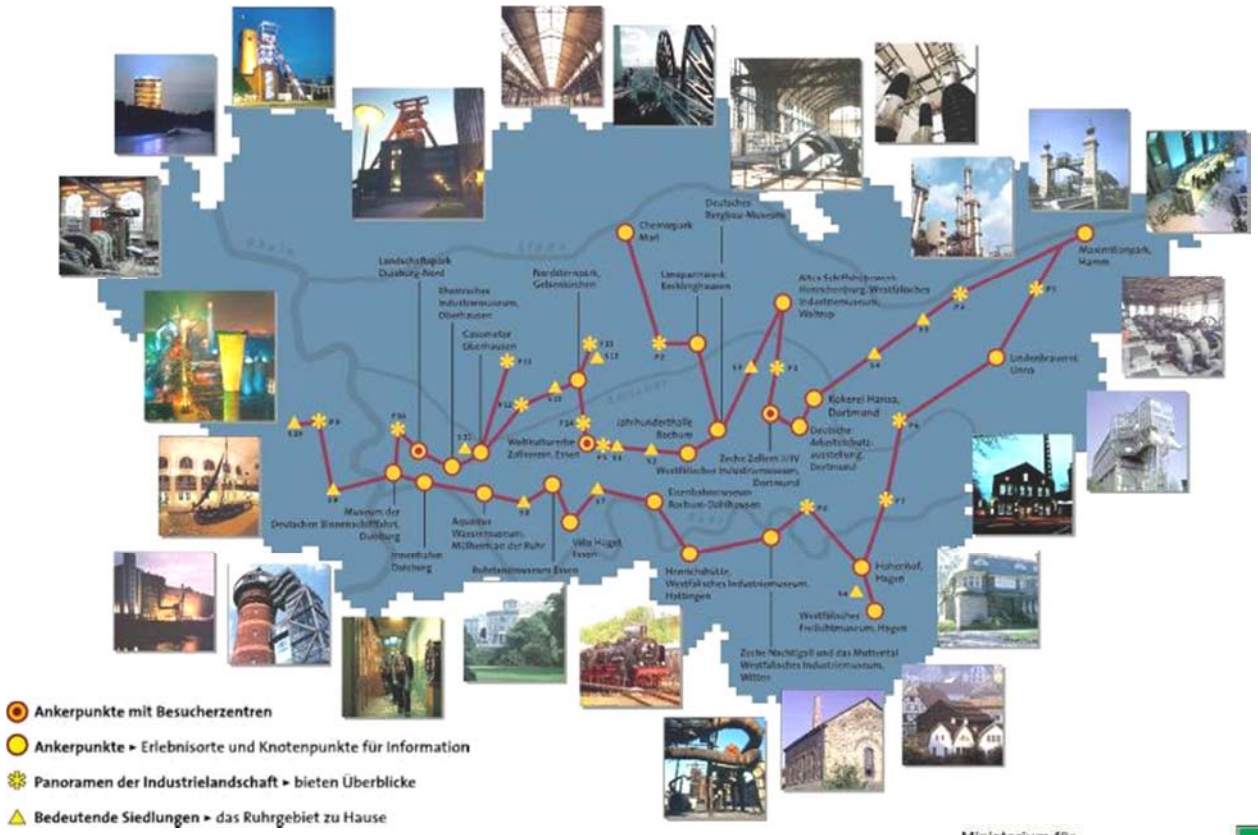


Route der Industriekultur. Strukturwandel als Attraktion

Ministerium für Bauen und Verkehr des Landes Nordrhein-Westfalen

Inner Harbor of Duisburg, NRW

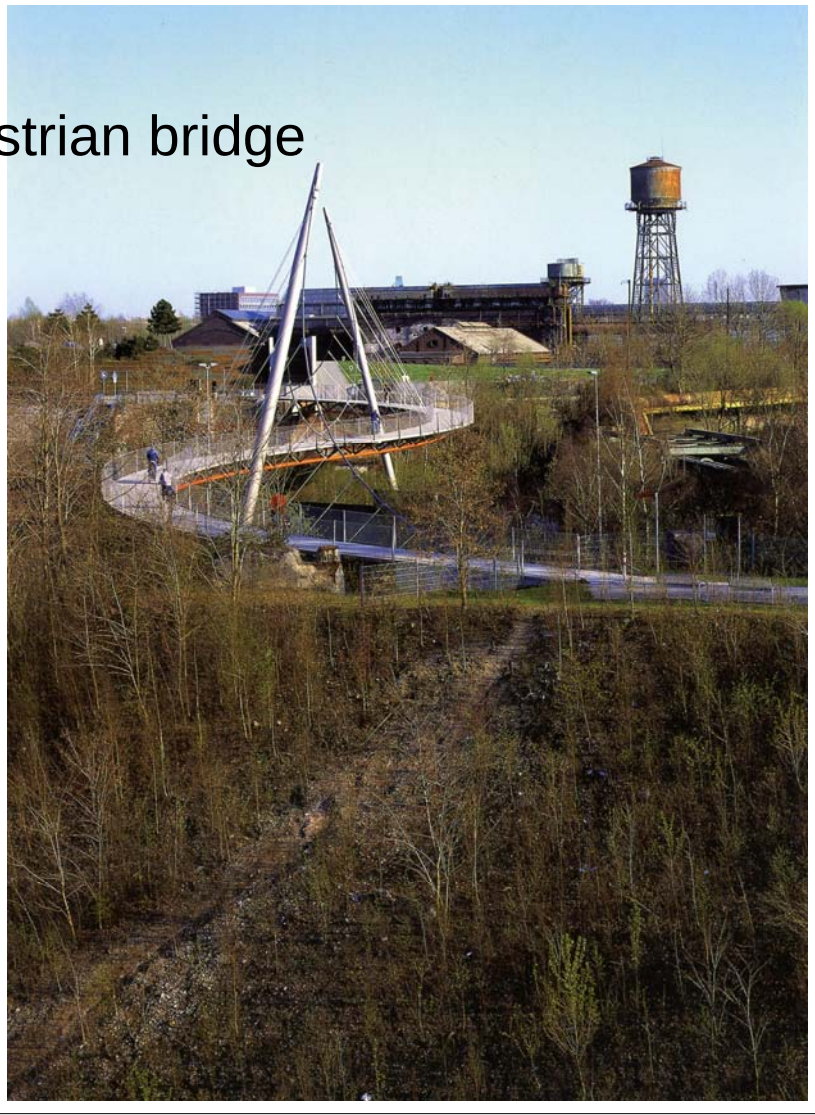
Visiting route of the industrial culture spots



Route der Industriekultur. Strukturwandel als Attraktion

Ministerium für
Bauen und Verkehr
des Landes Nordrhein-Westfalen

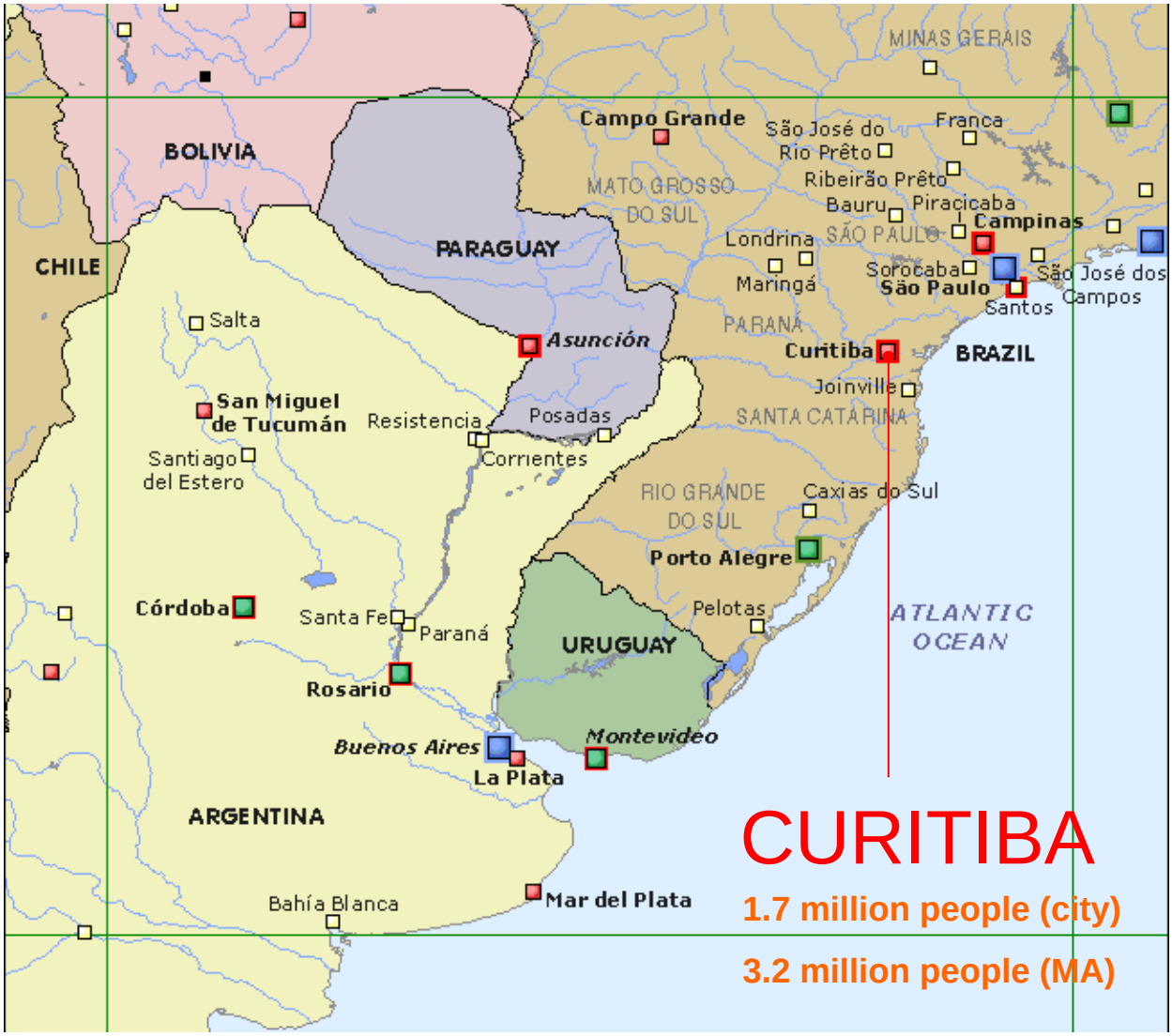
Serpentine pedestrian bridge



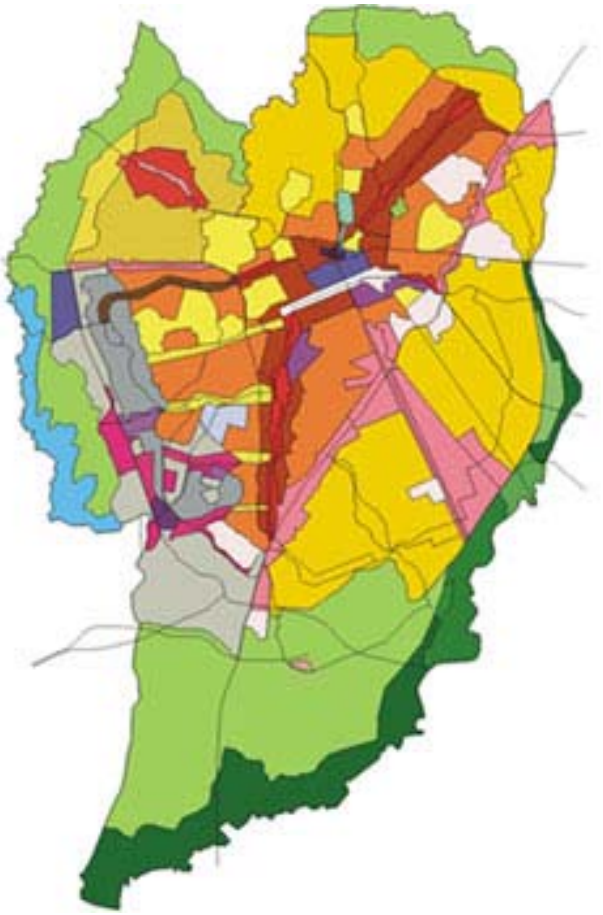
4.3 CURITIBA

One of the most successful urban developments for sustainability

Past Mayor: Jaime Lerner



The Zoning and Land Use Act, 1975



PHYSICAL STRUCTURE

Organized land use was implemented as an urban planning mechanism. Zoning for specific purposes and occupation parameters guided investments and organized public and private activities.

Law 5.234/75 defined land use in Curitiba. It created residential areas, with different population density rates; recovery areas; special zoning for services, manufacturing, and rural activities.

It defined structural sectors; pedestrian areas; natural preservation areas, riverside preservation areas; parks; and the Historical District.

Three key words of
the environmental urban development of
CURITIBA:

1) Mobility

2) Sustainability

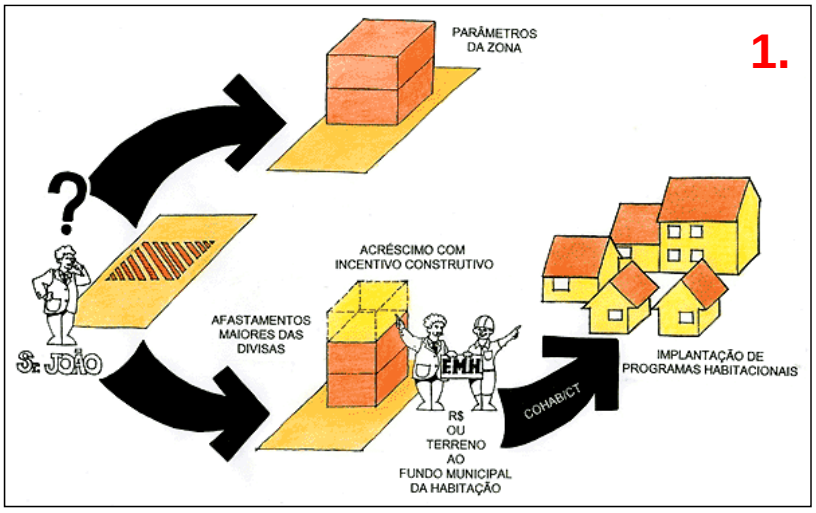
3) Identity

Building Rights Transfer Act

The country's democratization process also provided conditions for increasing artistic and cultural activities during that decade which, in turn, led to a greater demand for cultural facilities.

1982 witnesses the creation of one of the most important incentive instruments for city development: the Building Rights Transfer Act.

This law gave a new impetus to the city's process of preservation of its historic, cultural, and architectural heritage.

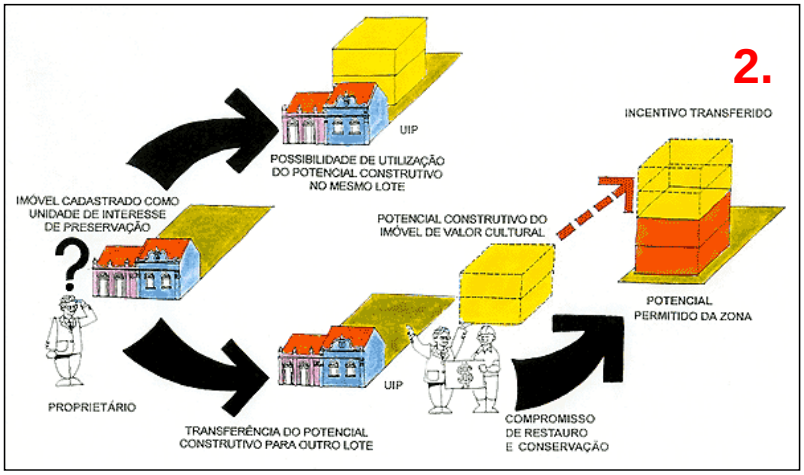


1.

Fund provision for social housing

***Building Rights Transfer Act-1**:*

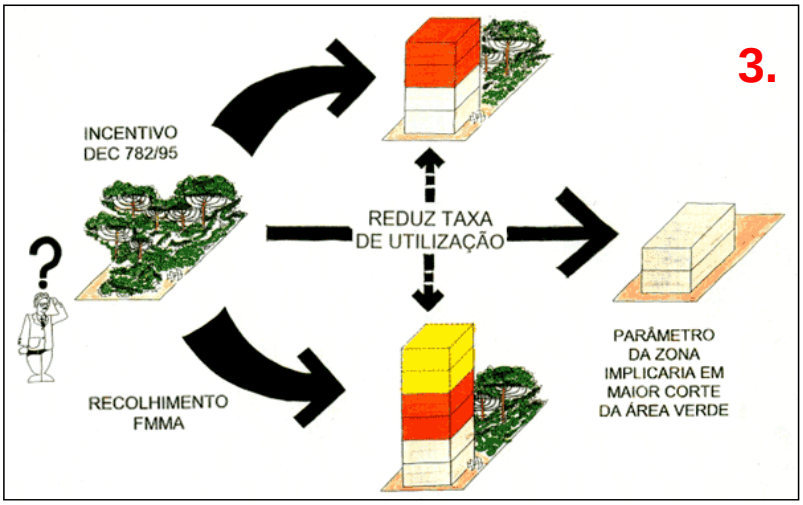
an incentive for implementing Social Interest Housing Programs



Preservation of cultural heritage

Building Rights Transfer Act-2,

designed to preserve the city's historical, cultural, and architectural heritage

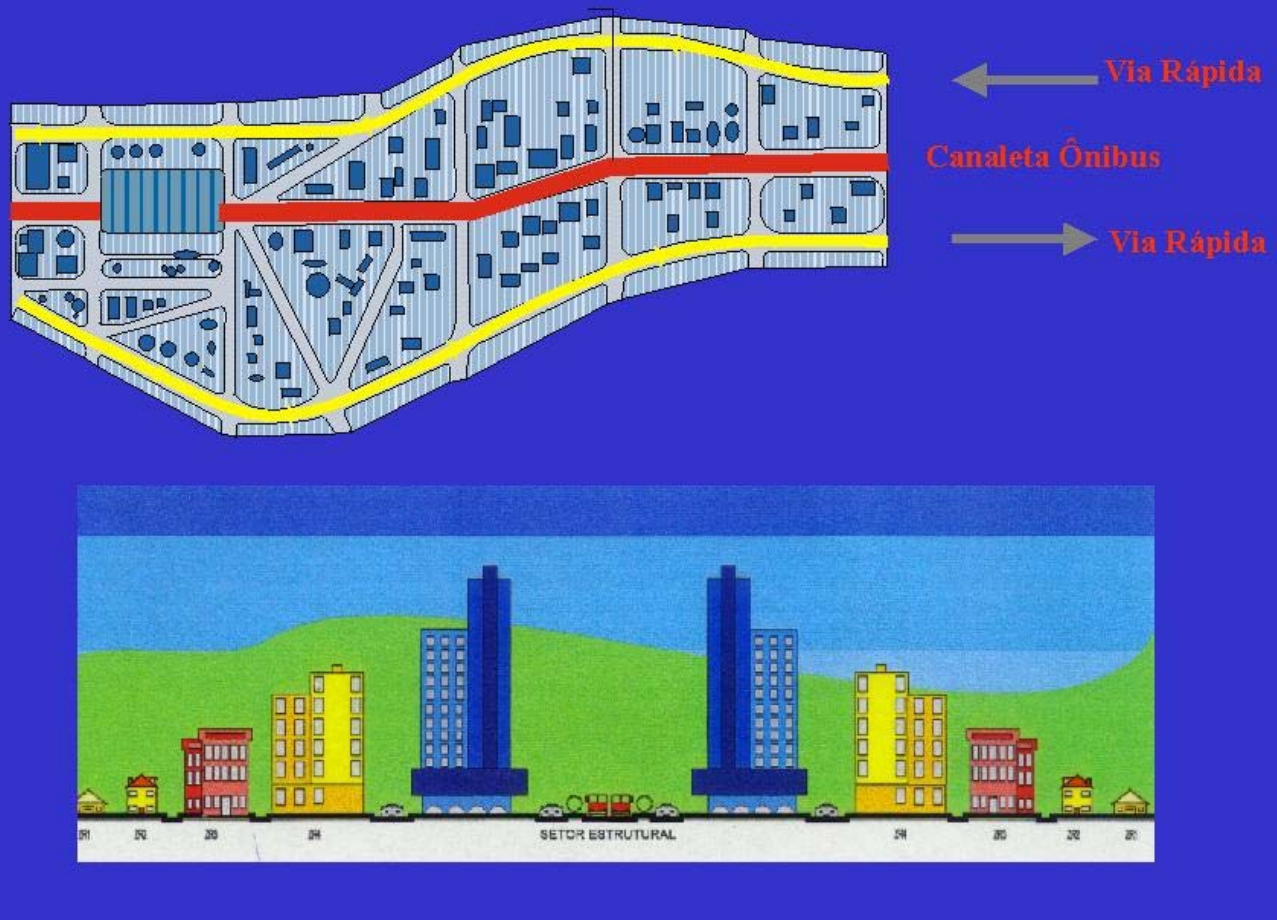


Preservation of urban greenery

Building Rights Transfer Act-3,

designed for the preservation of the city's green areas.

1) Mobility: Public Transport System

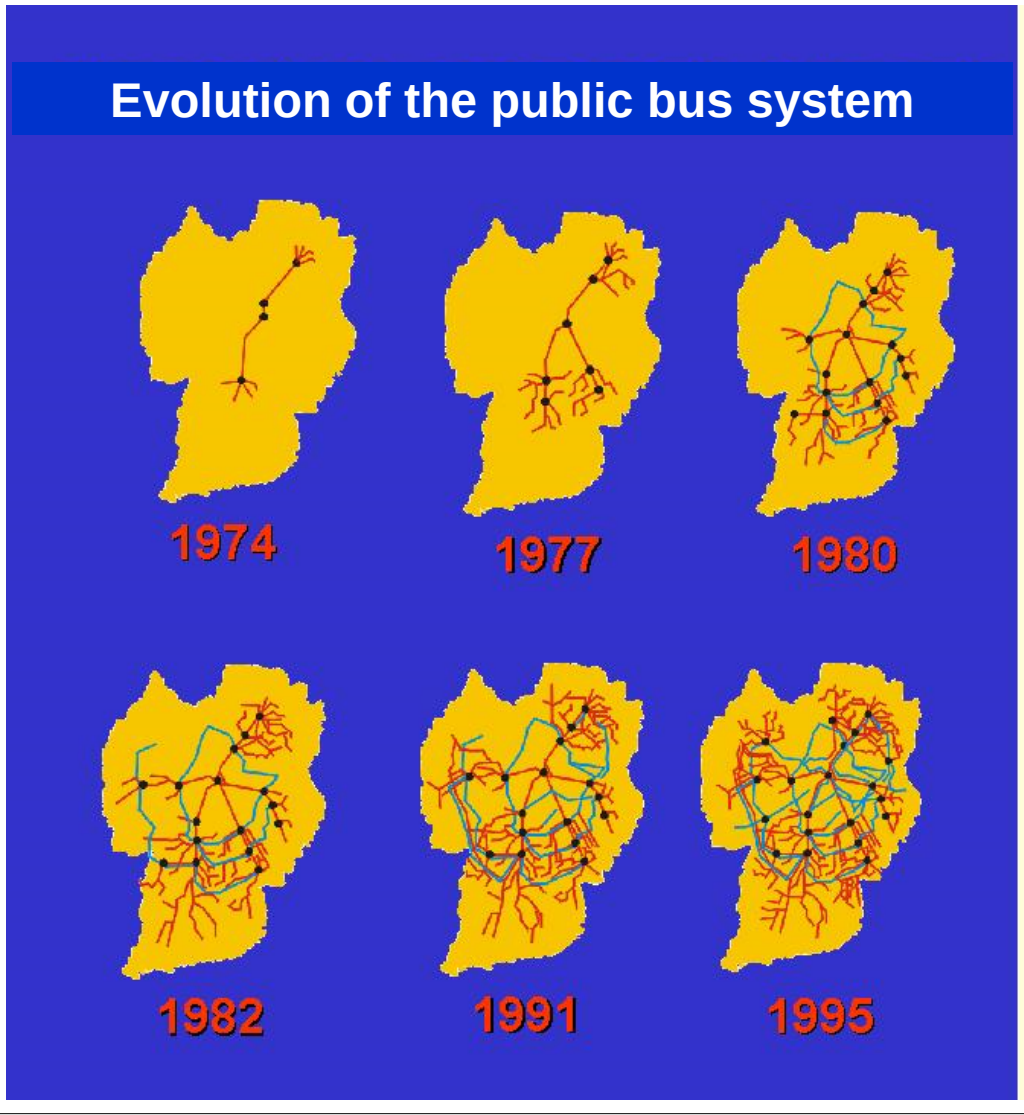


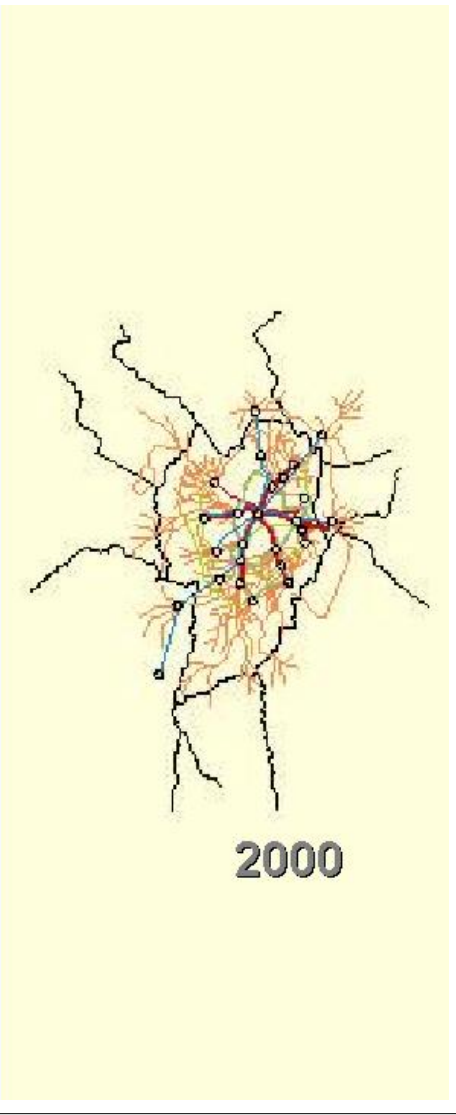
Explicit urban axis and the bus system

Central urban axe with the exclusive omnibus service lanes of both direction

Bus terminal associated with public facilities

Evolution of the public bus system






505 BOQUEIRÃO — C. CÍVICO
9241
VOLVO

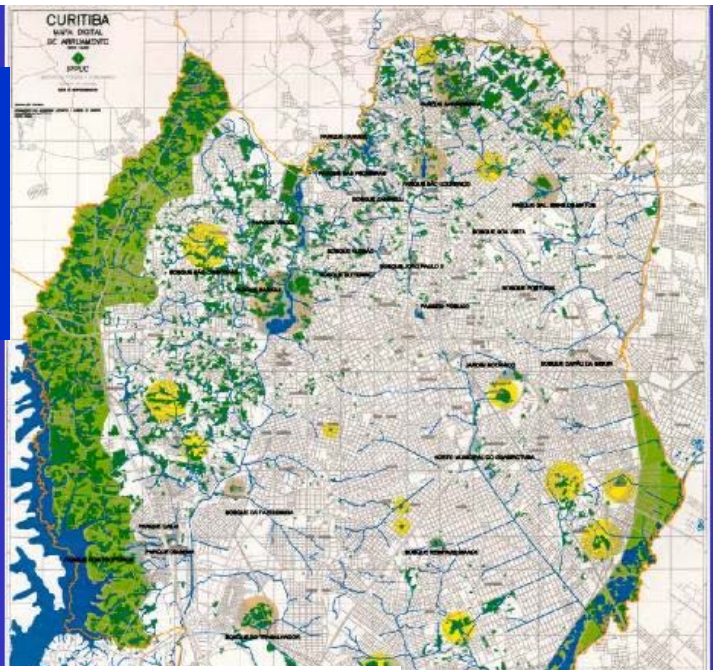
120 Km

Pedestrian and cycling roads

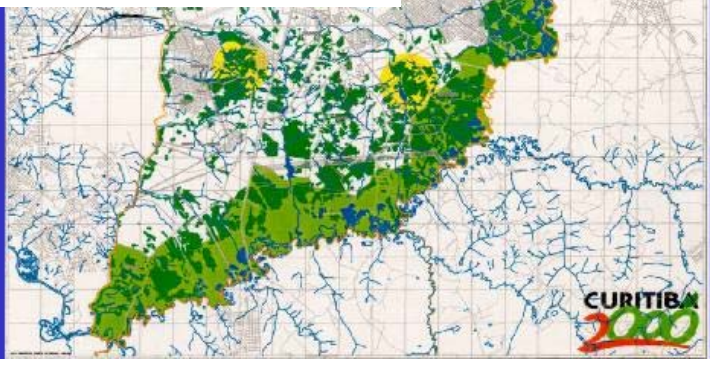
Car free mall in the down town shopping area

2) Sustainability

Environmental policies regarding green and water



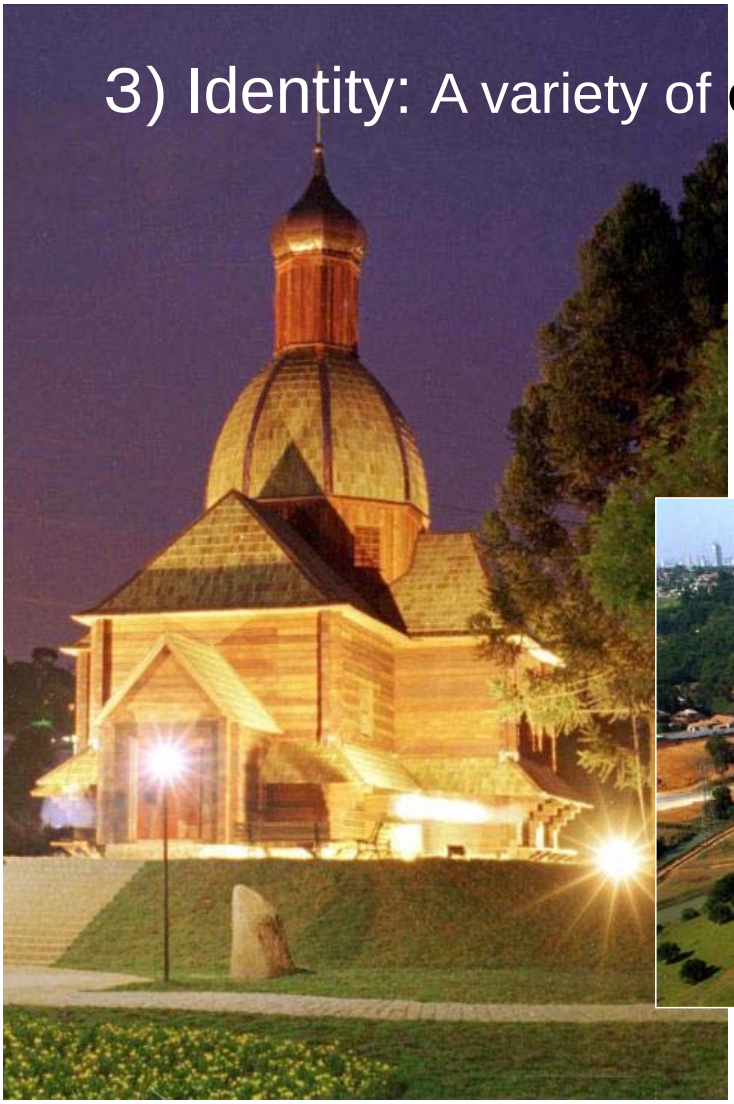
Green area per capita＝51.50㎡



Rehabilitated water front

Environment College for citizens, built with telegraph poles

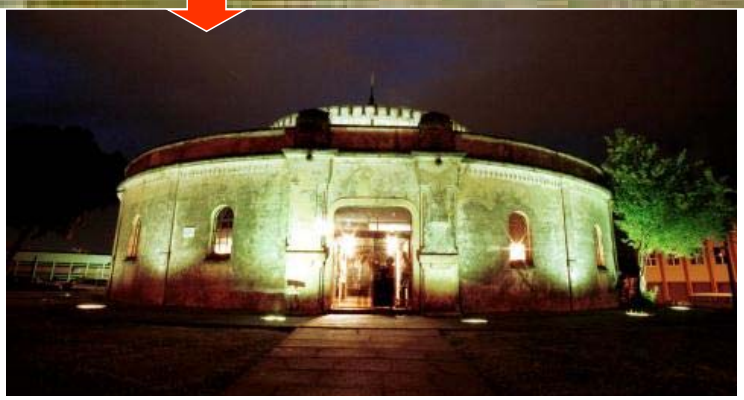
3) Identity: A variety of ethnic culture + heritages



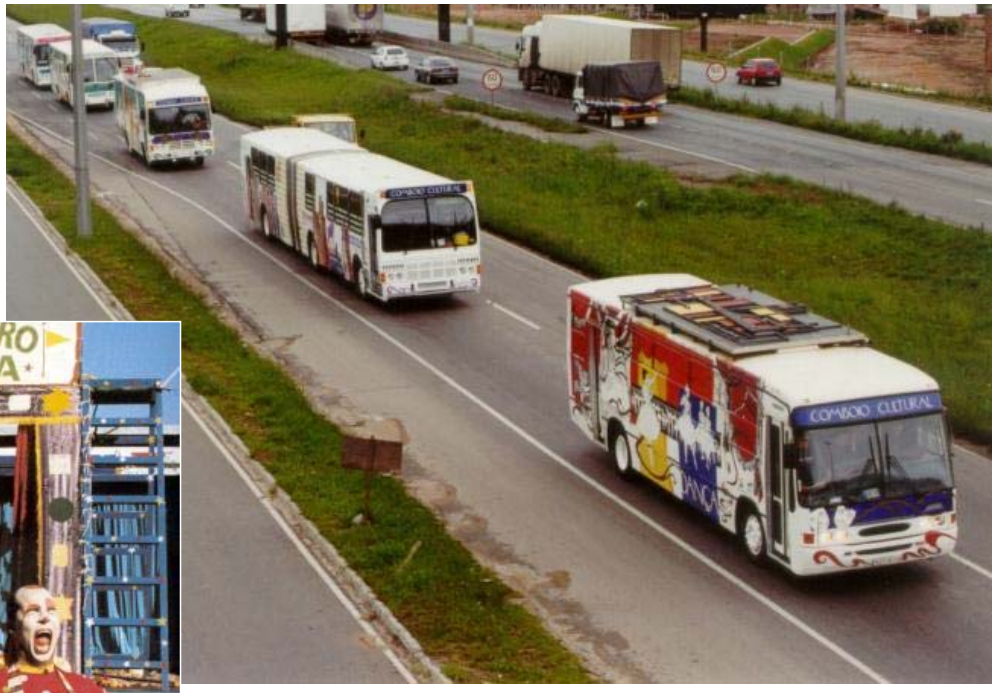
Ukrainian Garden

Japanese Garden

From the powder magazine to a theater



Exchange system of sorted wastes for vegetables



Caravan of environmental education

For children of the future

Environmental education
and practice for children

5 *Urban Morphology*

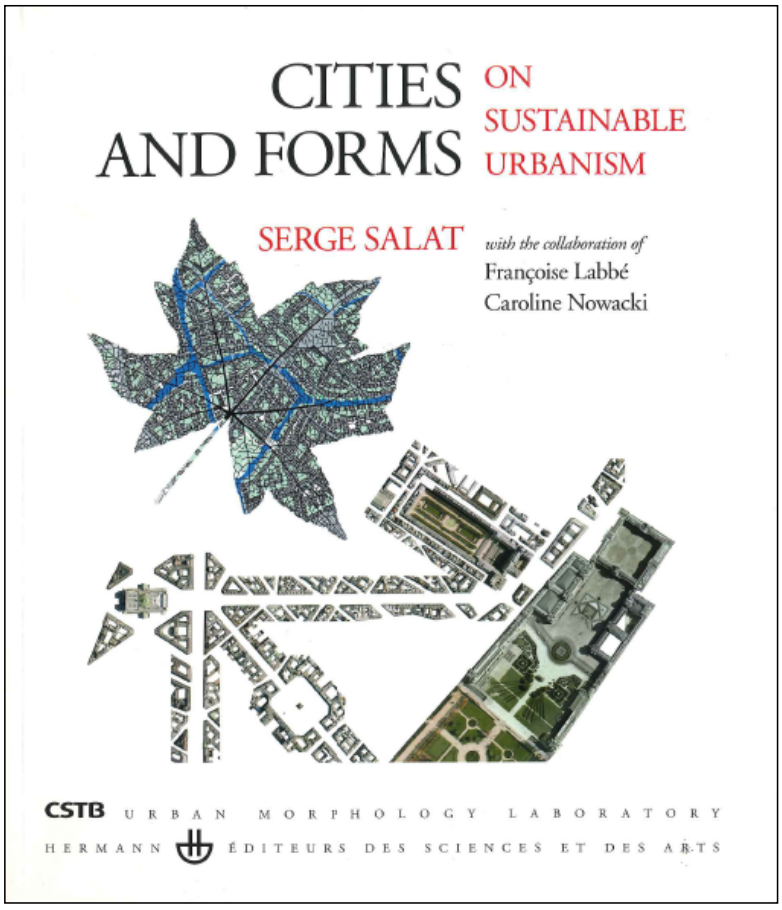
Towards Sustainable Cities

Urban Morphology and Sustainability

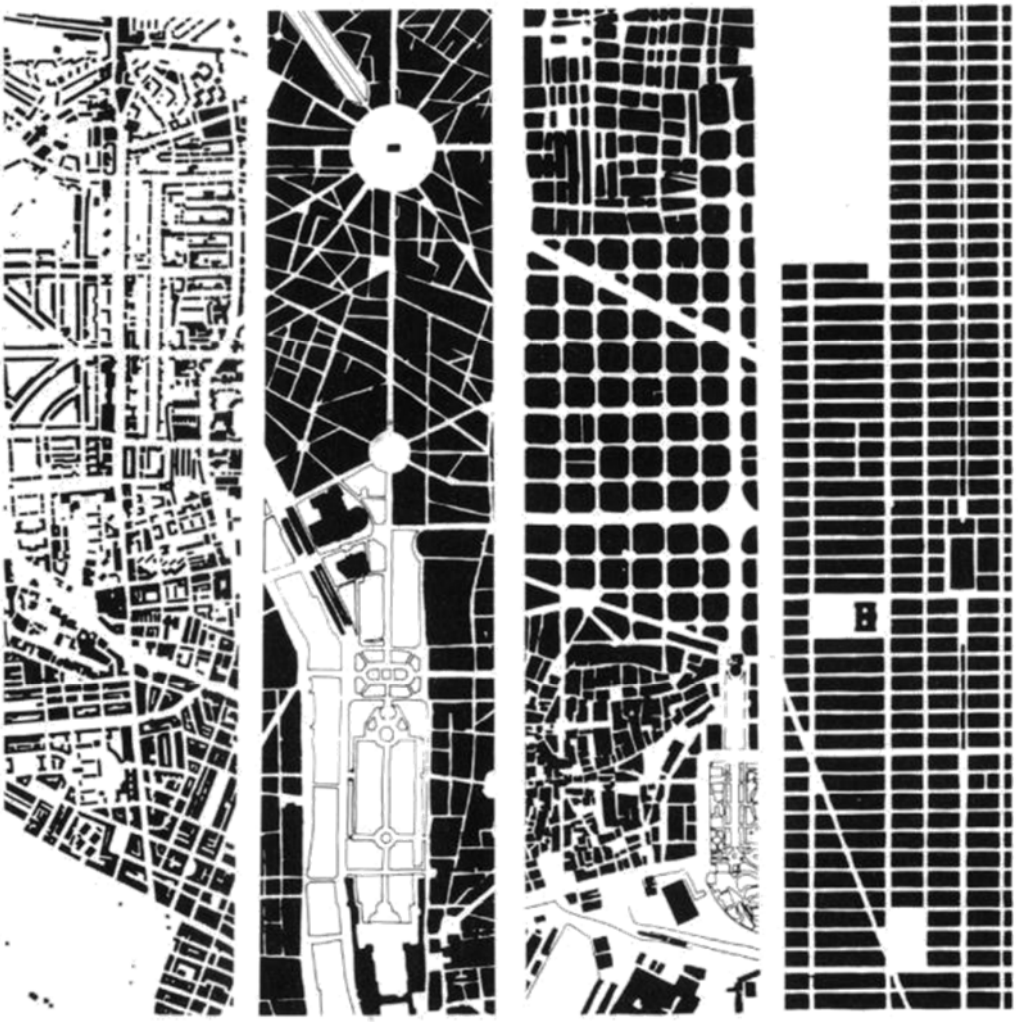
A state-of-the-art comprehensive research in depth regarding Urban Morphology and Urban Sustainability

This may provide a new breakthrough towards integrated approach of form and environmental performance in city scale.

Chinese edition is available.



Urban tissues in comparison



London Paris Barcelona Manhattan

La Ville Radieuse by Le Corbusier, 1925

Which urban model is more resource-efficient?

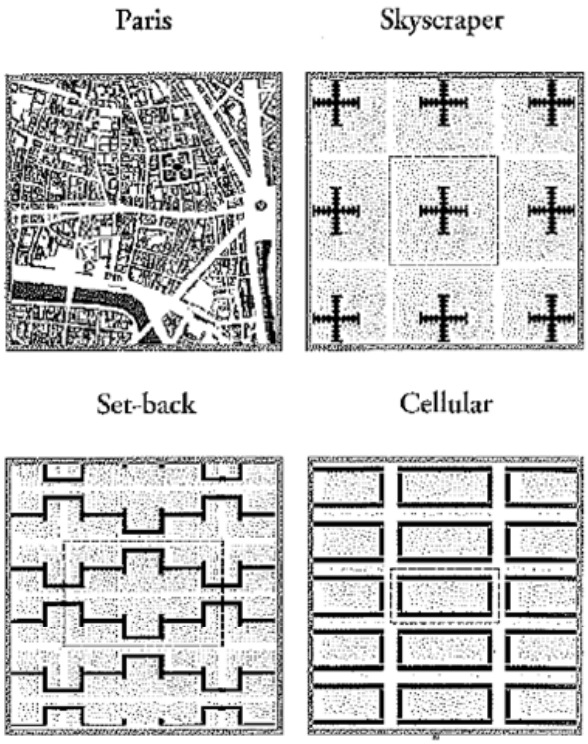
Le Corbusier's modernism of the 20th century or Hausmanian of the 19th century?

The answer is the latter!

Typical Hausmnian pattern of Paris

Metrics for comparison

1. Energy
   1.1 Heating needs
   1.2 Average U-value
2. Form coefficient
   2.1 Volumetric compactness
   2.2 Form factor
3. Density
   3.1 Population density (14m^2/inhab)
   3.2 Population density (30m^2/inhab)
   3.3 Built block density
4. Solar analysis
   4.1 Solar access coefficient
   4.2 Solar admittance
5. Passive volume
6. Street network
   6.1 Cyclomatic number
   6.2 Average distance between intersections



(Source: Serge Salat et.al “Cities and Forms”, CSTB, 2011, p198)

Indicators of Urban Sustainability-1, proposed by Serge SALAT

1. Land use	Human density, Building density, Housing density, Density of legal personalities, Job density, Coefficient of land occupancy Subdivision intensity, Diversity of subdivision size, Diversity of land use, Diversity of subdivision use
2. Mobility	Surface occupied by pedestrian and bicycle paths, Surface occupied by the road network, Proportion of the road network dedicated to public transport, Connectivity of the pedestrian/bike grid, Connectivity of the car grid, Cyclomatic complexity of the car grid, Cyclomatic complexity of the pedestrian/bike grid Average distance between intersections Proportion of the population more than 300m away from a public transport stop Number of public transport modes accessible within 300m Fractality of the street network
3. Water management	Hydrological intensity, Impermeability of land, Intensity of water treatment, Efficiency of water use, Accessibility of drinking water
4. Biodiversity	Proportion of agricultural surfaces, Proportion of green fabric Connectivity of housing Distribution of green spaces

Indicators in red are related to urban form.
Source: Serge Salat et.al “Cities and Forms”, CSTB, 2011, pp486-498

Indicators of Urban Sustainability-2, proposed by Serge SALAT

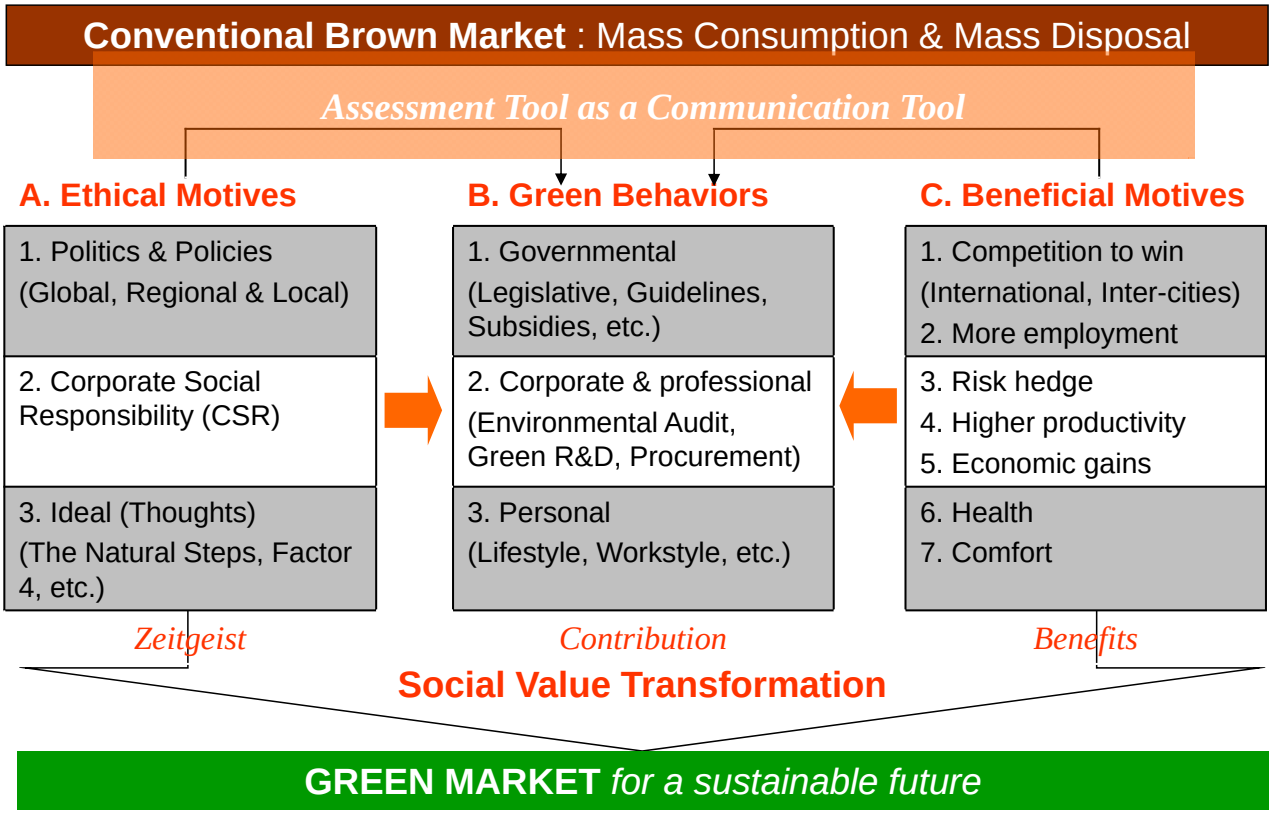
5. Energy and bio-climate	Energy intensity per resident, Surface energy intensity, Proportion of local production, Rate of renewable energy used, Rate of energy reuse Volumetric compactness, Size factor, Form factor, Rate of passive volume, Energy consumed for heating, Energy consumed for air-conditioning Complexity of buildings in relation to the energy consumed by the buildings, Comparison of the complexity of the urban network and transportation energy
6. Equity	Proportion of jobs in relation to housing, Proportion of social housing Diversity of ages, Diversity of incomes
7. Economy	Resource productivity, Intensity of learning activities, Job potential Structural diversity of jobs, Structural diversity of uses Proximity of convenient stores Distance of the distribution of each district from the global distribution of facilities Complexity of fabric of activity
8. Well-being and culture	Noise pollution, Intensity of cultural activities Proximity of leisure facilities
9. Waste and materials	Proportion of recycled materials, Productivity of urban metabolism, Intensity of GHG emissions per resident, Intensity of emissions to produce wealth

Indicators in red are related to urban form.
Source: Serge Salat et.al “Cities and Forms”, CSTB, 2011, pp486-498

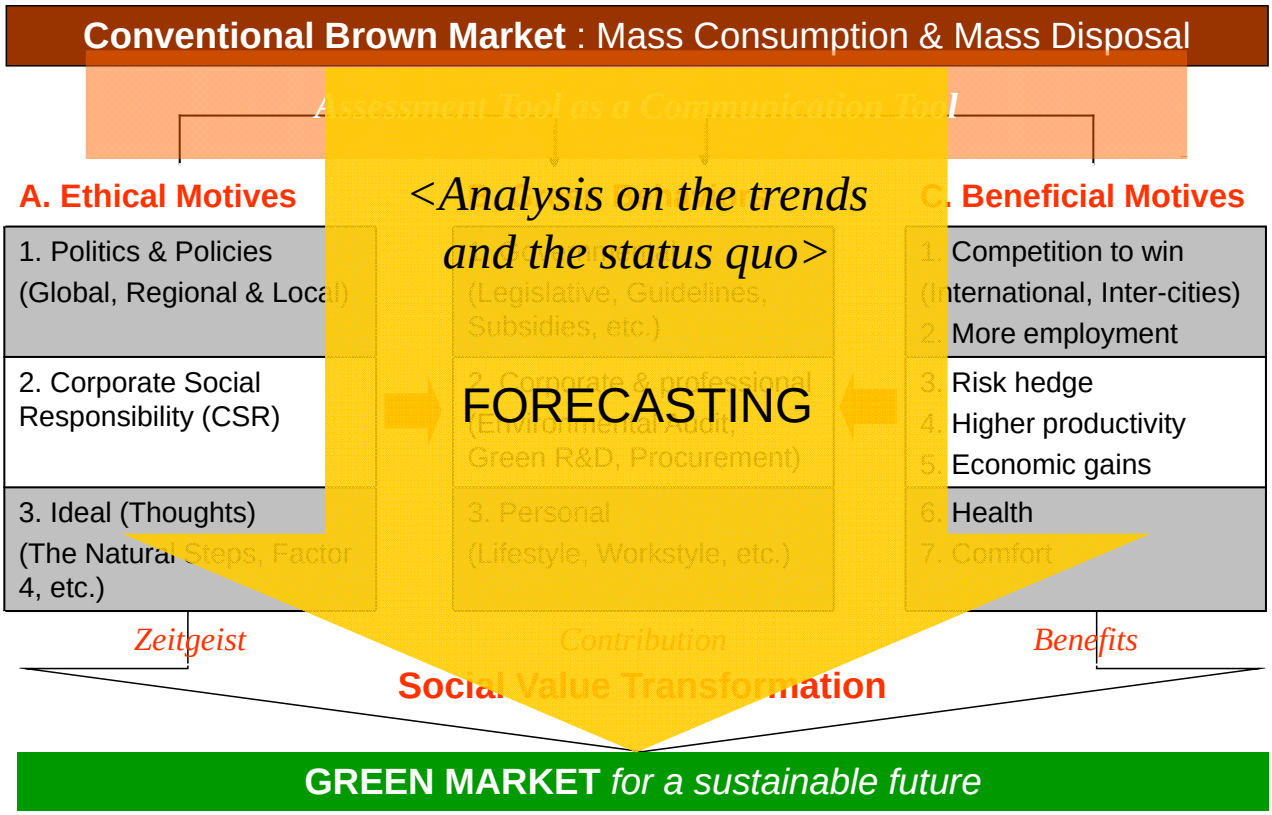
6 *Backcasting*

Back from the Future

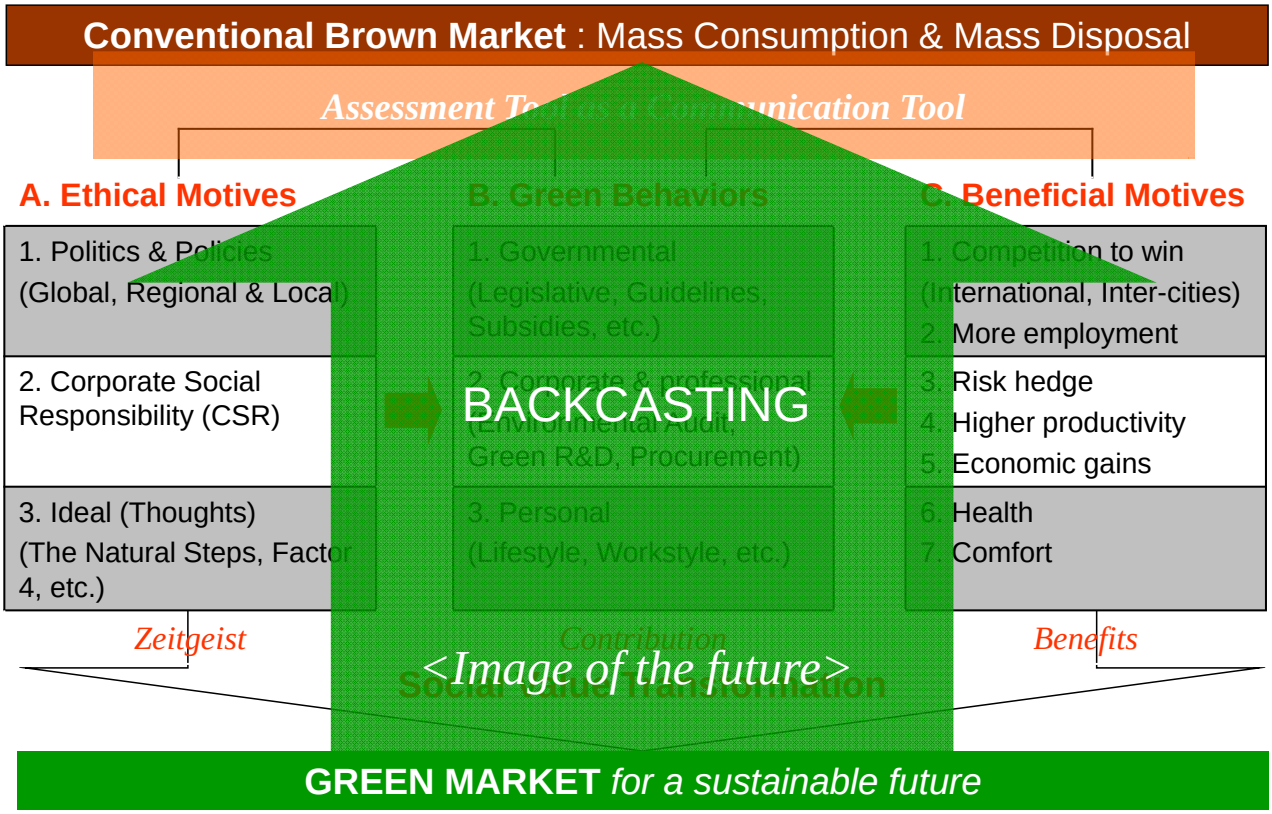
Market Transformation towards Green Market



Market Transformation towards Green Market



Market Transformation towards Green Market



Forecasting vs Backcasting

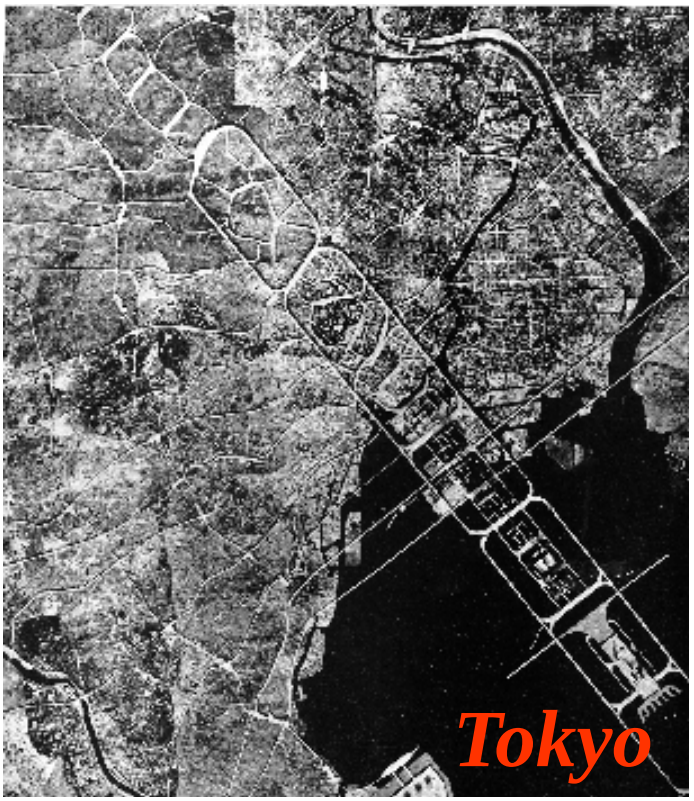
'*Backcasting*' is a technique that often is pointed out as an opposite to '*forecasting*'.
It involves identification of a particular scenario and tracing its origins and lines of development back to the present.

The activity of '*backcasting*' involves establishing the description of a very definite and very specific future situation.
It then involves an imaginary moving backwards in time, step-by-step, in as many stages as are considered necessary, from the future to the present, in order to reveal the mechanism through which that particular specified future could be attained from the present.

（Source：Wikipedia "Thought Experiments"）

Le Corbusier, 1925

Kenzo Tange, 1960



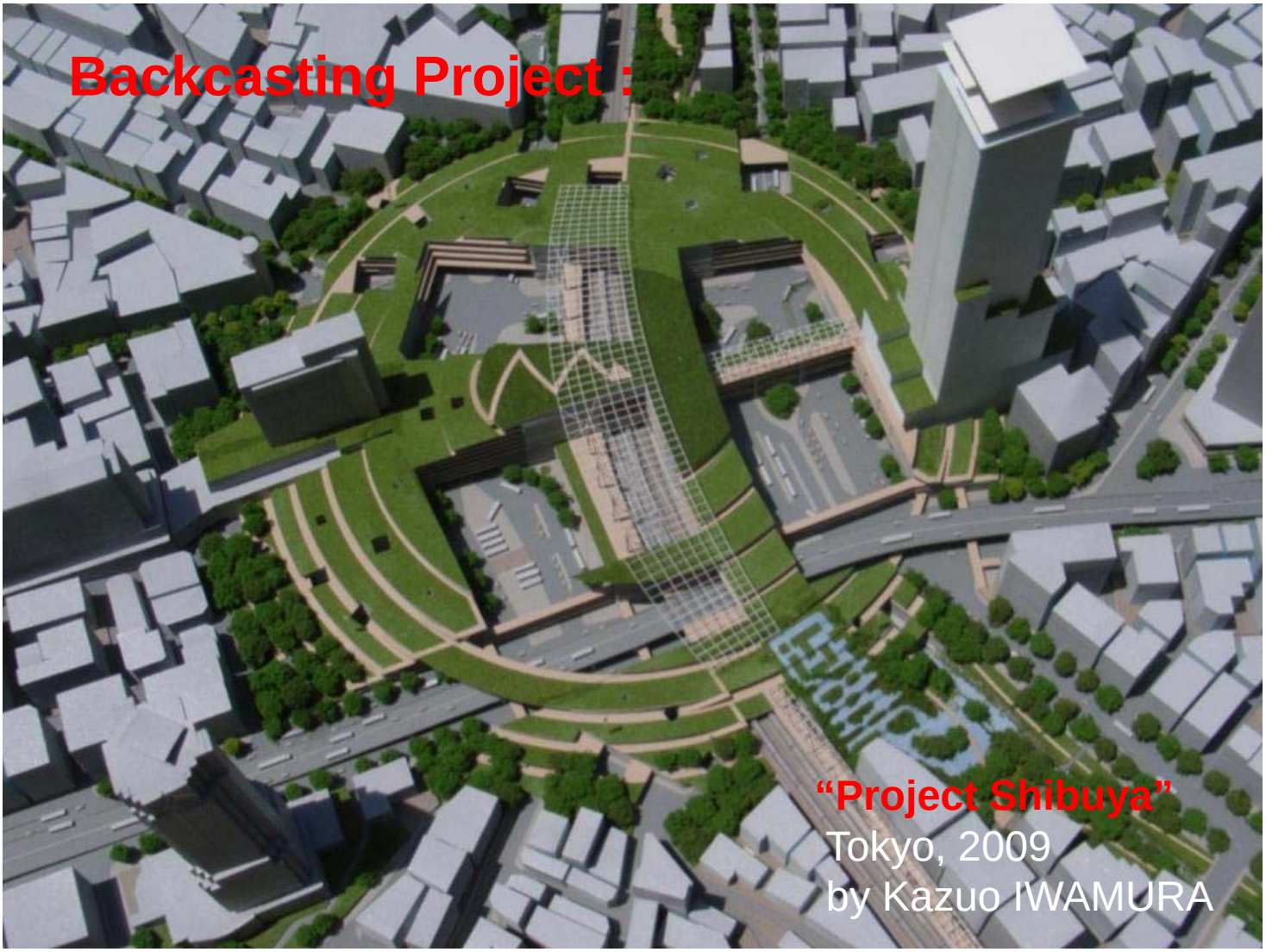
Backcasting
by great architects
of the 20th Century

What is an alternative vision for
'***backcasting***' the 21st Century?

How does it look like?

Who will make it and how?

Backcasting Project :



“Project Shibuya”
Tokyo, 2009
by Kazuo IWAMURA

Thanks for your attention.

Kazuo IWAMURA
iwamura@iwamura-at.com