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Landscape Planning an Green in the City

Hamburg: Booming trade and service metropolis

- City and federal state
- Hamburg 1.8 million, growing population
- Second largest german city
- second largest port of Europe (74 km² port)
- 12 000 new flats per year until 2020
- 755 km²
- Metropolitan region of Hamburg 4.3 million people
- Nearly half the area of the city is made up of green spaces, waters, woodlands and agriculture
- varied economy – maritime and aviation industries, media companies, service sector

Hamburg Sustainable Policy – Main action points
Green Euopean City 2011

Hamburg

- Energy transition and climate protection
- Hamburg´s Economy and Ecology go hand-in-hand
- High quality of life / Environmental Protection and Mobility
- Sustainable and socially balanced urban development, affordable housing

Climate Protection Goals

Hamburg

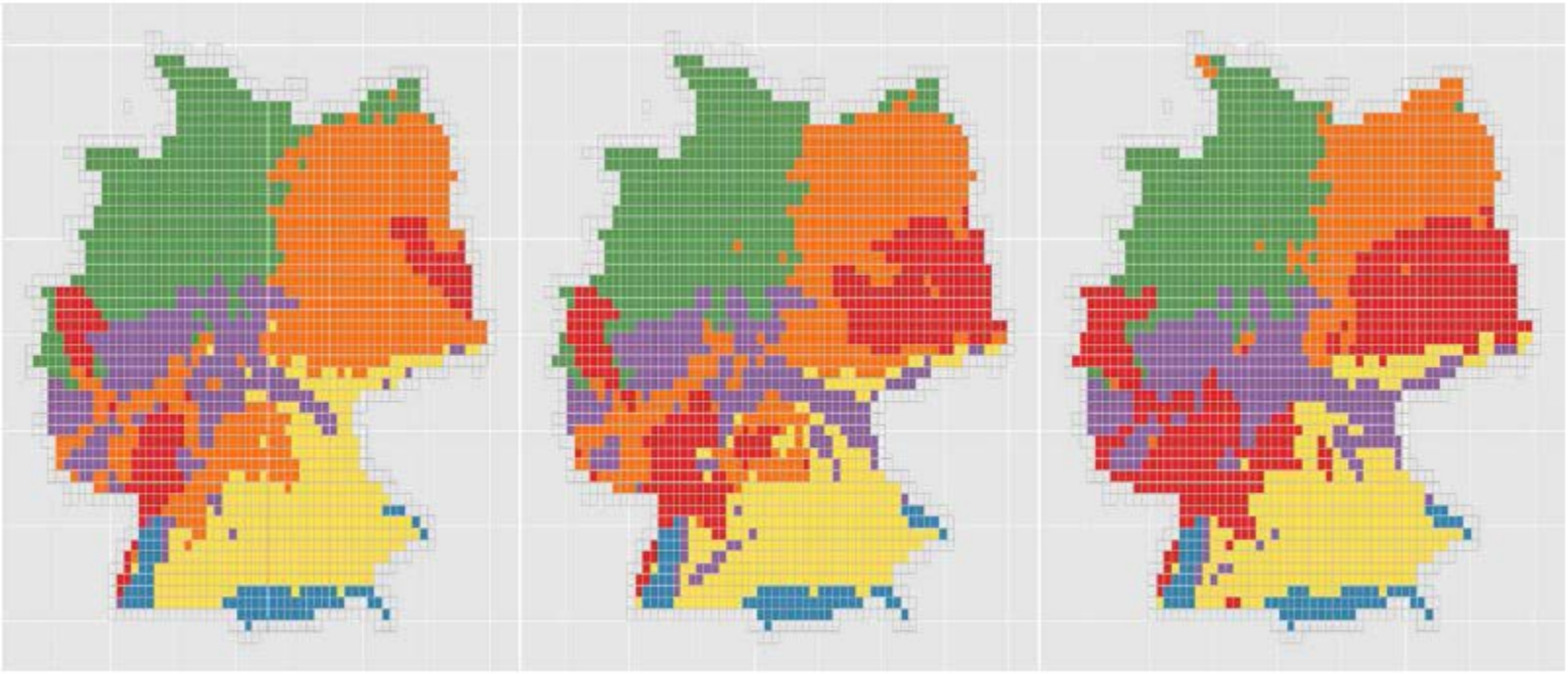
Masterplan Climate 2016
Climate protection
Climate adaption

Key points:

- Reduction of 2 mio tons CO_2 until 2020 in comparison to 2012
- Reduction of the carbon emissions to the half until 2030
- Reduction of the carbon emissions by 80 % until 2050 in comparison to 1990
- 25 % bicyle share in total traffic (now: 12 %)
- effort in youth education
- Promote resilience: adaption to climate change (green roofs, new tree species, climate adaption aims for planners, e.g.)

Klimaräume aus der Deutschen Anpassungsstrategie (DAS, 2015), Ministry for the Environment, Nature, building and nuclear safety of Germany

Hamburg



Gegenwart Nahe Zukunft Ferne Zukunft

rot: warme Regionen; orange: trockeneres Klima; kühleres Klima; violett: Mittelgebirgsklima; gelb:Gebirgsvorlandklima; blau: Gebirgsklima

German Adaption Strategie DAS (Deutsche Anpassungsstrategie)

Nothgerman deep plain

green: high damage potential because of industrial an settled areas due to strong wind and floods

Changes in climate datas until 2050 for Hamburg
DWD German Wether Service (2015)

Hamburg

Temperature

- **measured an increasing of the long-term annual air temperature of 1.4°C,** especially in spring (1881 until 2012)
- **until 2050 is predicted an increase of the temperature (**1.3 °C per 100 years especially in autaumn (+1.2) and summer (+0.6°C), **of summerdays, very hot days (> 30° C) and very hot nights (> 20° C) in the dense inner city**
- **until 2050 no great differences between land and city in the metropolitan region**

Rainfall

- **measured an increasing of the long-term annual precipitation,** especially in winter (+ 60 %) and spring (+ 30 %) (1881 until 2012)
- **more increase of precipitation in Hamburg than througout Germany**
- **until 2050 is predicted an increase of the average monthly precipitation (**especially in spring and autaumn, Juli/August gets dryer) **and of strong rain days (> 17 l/m2 in 1 h)**

Wind (wind)

- **No change in the average wind speed**

1. The new structures in our cities (example HafenCity) should be adapted to urban heat and strong rainfall, they have to be adapted to changing climate conditions for the next 50-100 years
2. Planning law continues these aspects since 2011
3. The citys green is important for shadows, to keep the moisture to cool down urban heat and to hold back the rainwater

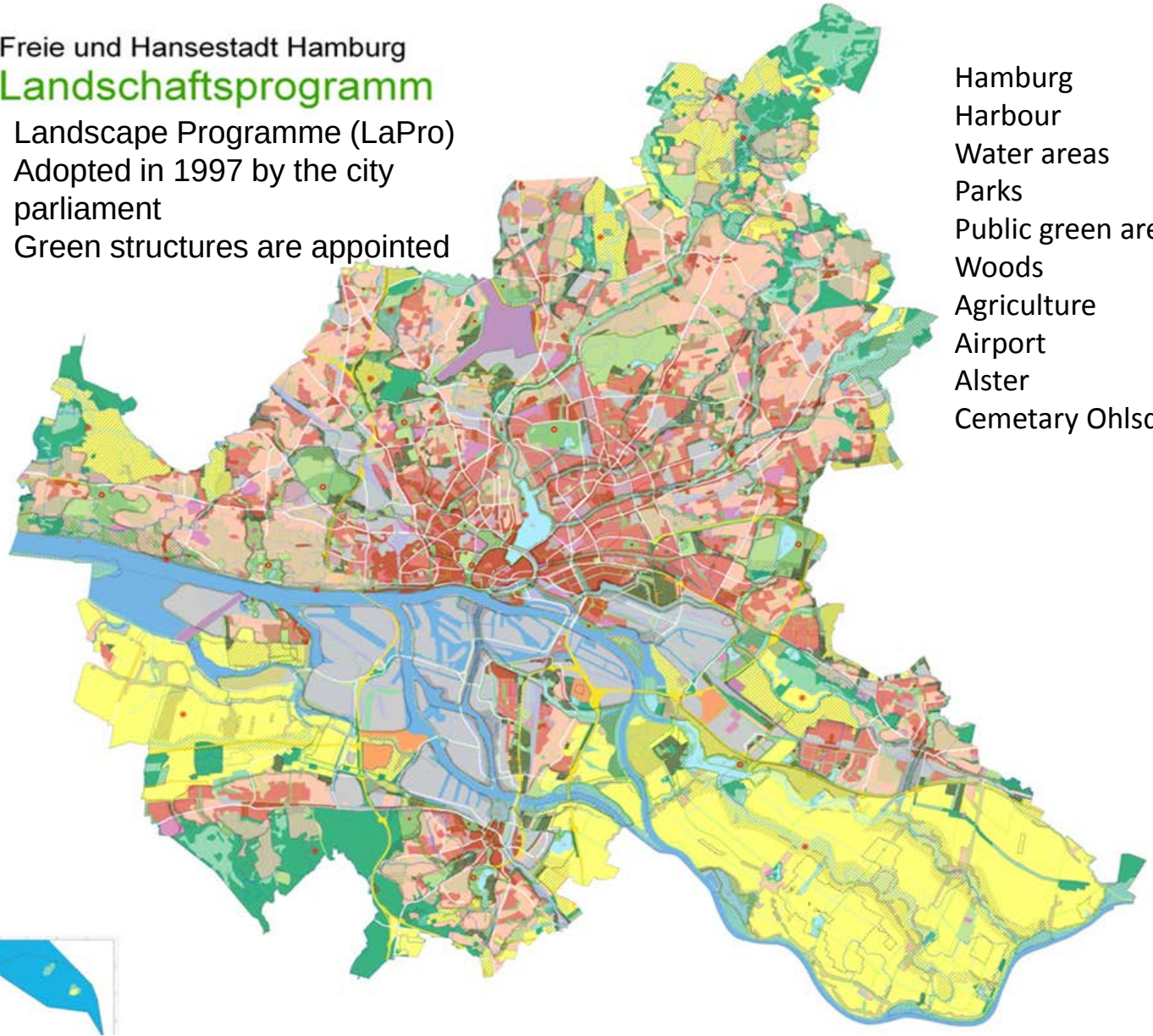
Landscape Programme Hamburg

Hamburg

Freie und Hansestadt Hamburg

Landschaftsprogramm

Landscape Programme (LaPro)
Adopted in 1997 by the city parliament
Green structures are appointed



Hamburg	755.3 km²
Harbour	74.0 km²
Water areas	61.2 km²
Parks	27.0 km²
Public green areas	65.0 km²
Woods	48.3 km²
Agriculture	181.3 km²
Airport	5.7 km²
Alster	1.8 km²
Cemetary Ohlsdorf	4.0 km²

city development / landscape planning and climate change

Hamburg

Challenges for city development in context with climate change and climate adaption:

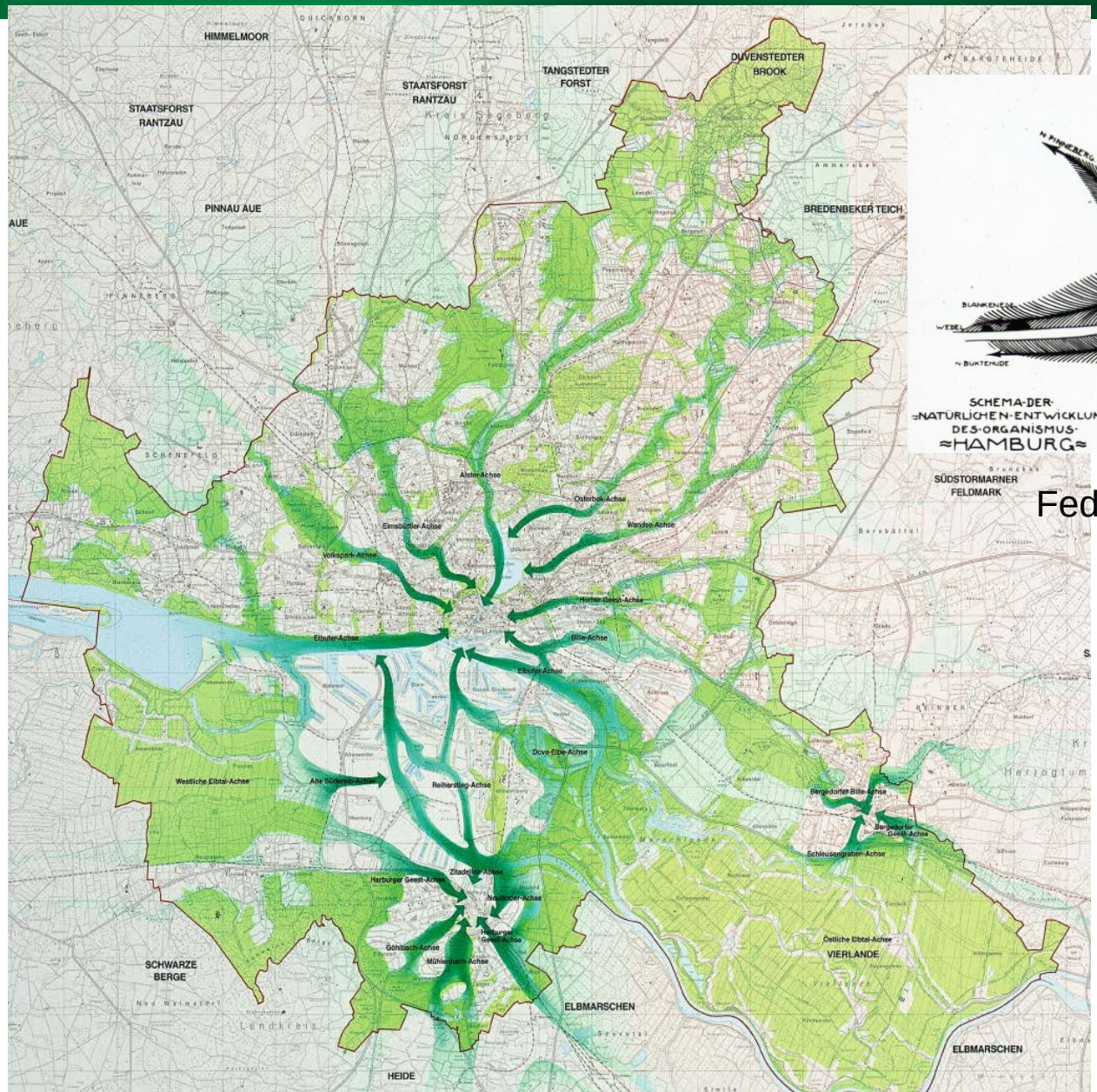
1. **urban heat in dense parts of the city**
2. **management of rainwater and intense / strong rainfall**

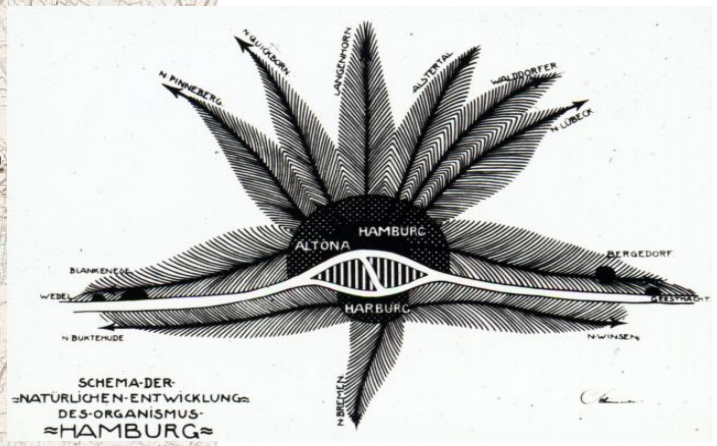
climate of the city / household of the nature for the Landscape Programme (LaPro)

- **aim: support of planners with climate relevant informations**
- **support and development of the citys green despite more inhabitants and higher density in Hamburg in the future**
- **climate adapted management of areas with Area Utilization Plan (FNP) and Landscape Programme (LaPro)**

Hamburg - Landscape Elements III – Radiating Landscape Axes

Hamburg

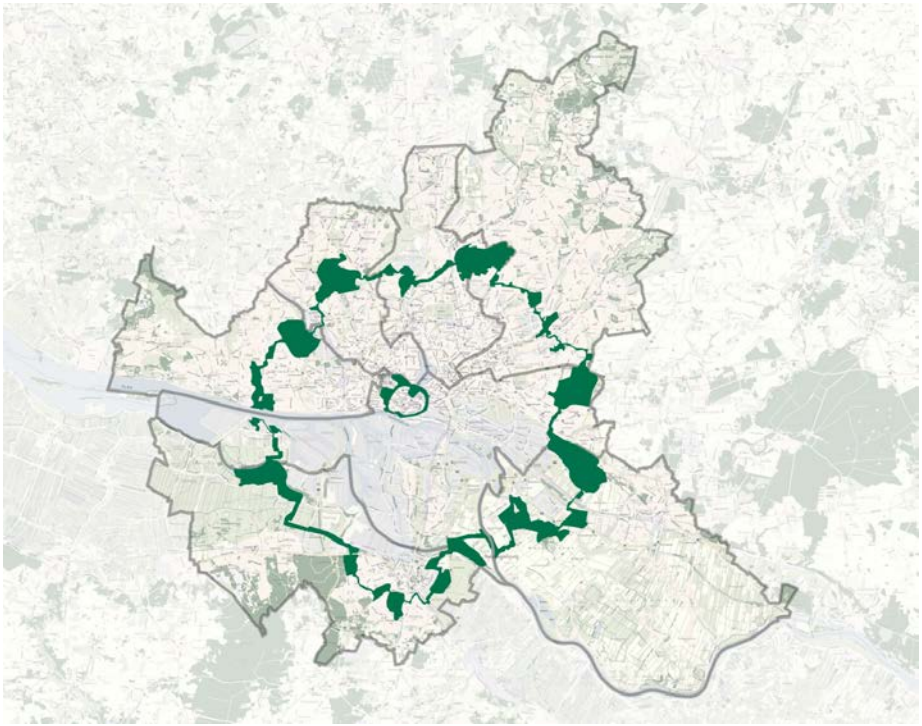


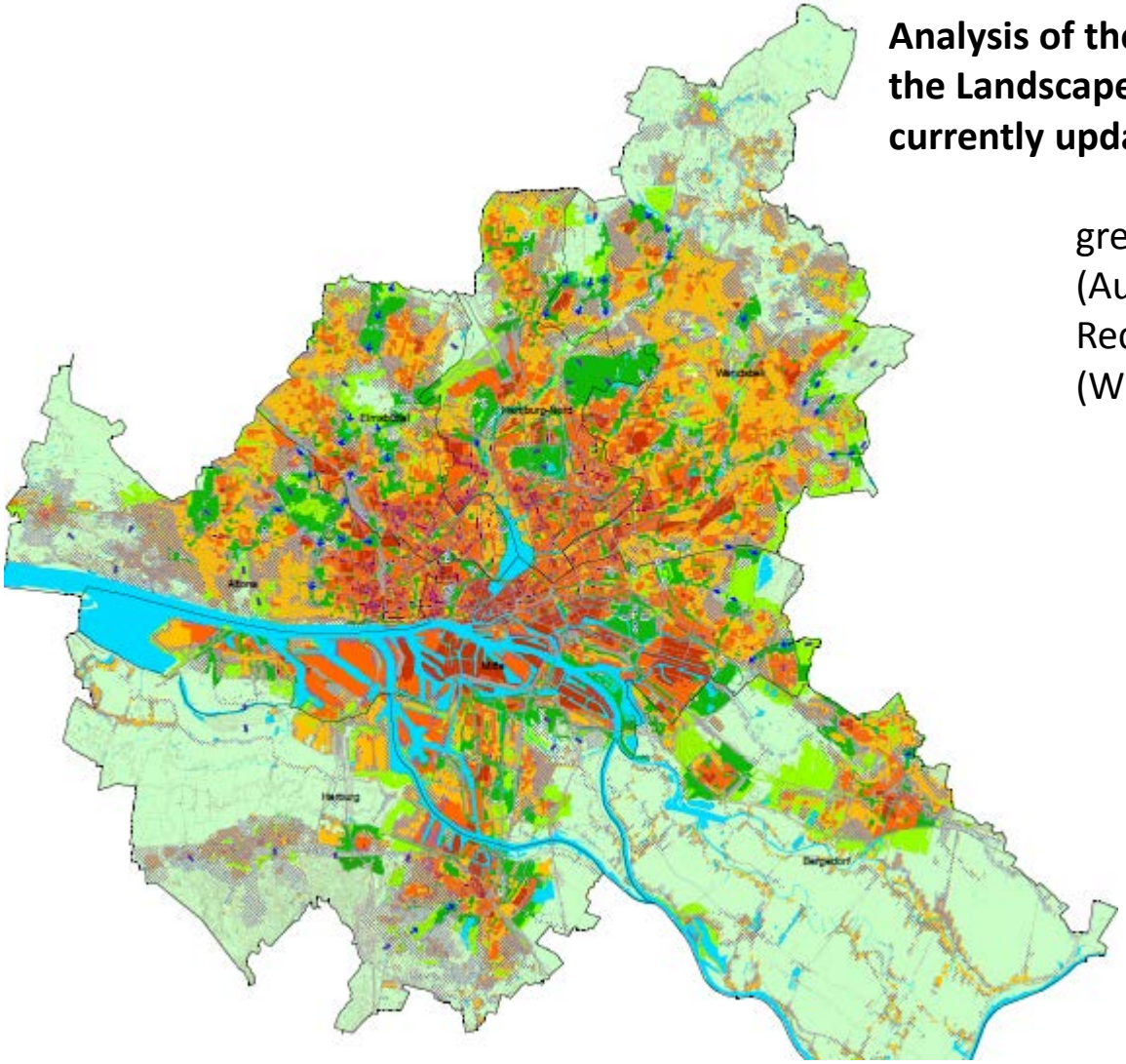


Federplan Schumacher, 1920

Walking on the 2. Green Ring

Hamburg





Analysis of the climate of the city for the Landscape Programm (LaPro, GEO-NET 2012); currently updated

green coloring: compensation space (Ausgleichsraum)
Reddish coloring: effective space (Wirkungsraum)

Green Roofs (Dachbegrünung)

Hamburg

Abflussbeiwert run off (Auszug aus Richtlinie für die Planung, Ausführung und Pflege von Dachbegrünung, 2008)

Aufbaudicke thickness	Dachneigung bis 5° roof pitch	Rückhaltung hold back	Dachneigung > 5° roof pitch
größer 50 cm	0.1	90 %	-
10 bis 15 cm	0.4	60 %	0.5
6 bis 10 cm	0.5	50 %	0.6
2 – 4 cm	0.7	30 %	0.8

Funding Example – vision of green roofs

Hamburg

Aim is 10 ha green roofs (0.1 km^2) in 10 years
1 % of Hamburgs roofs are green
3 million € until 2019

advantages

- retain rainwater
- Improve micro climate via evaporation
- Create new open spaces in the city
- Lower energy costs for heating and cooling
- Create havens for bees, birds and plants
- Can be combined with solar pv
- Duplicate the life span of roof panels
- Bind pollutants
- Reduce noise
- Lower costs for rainwater sewage
- …

Donation programme „my tree – my city“

Hamburg

- since 1950 230 000 street trees are planted
- 2 Mio € for special planting programme in 2007/2008 from the city parliament
- its still going on

www.hamburg.de/mein-baum-meine-stadt/

Acticities for the industry- benefits for climate and environment

Hamburg

- **Eco-Partnership (since 2003)**

- voluntary alliance supported by the Chamber of Commerce, Chamber of Crafts and Trades, industrial association, Unternehmensverband Hafen, Ministry of Environment and Energy
- platform for information and networking
- promotion of sustainable and ressource-efficient economic activities
- combination of climate protection and adaption (green roof for rainwater retention and lower energy costs)

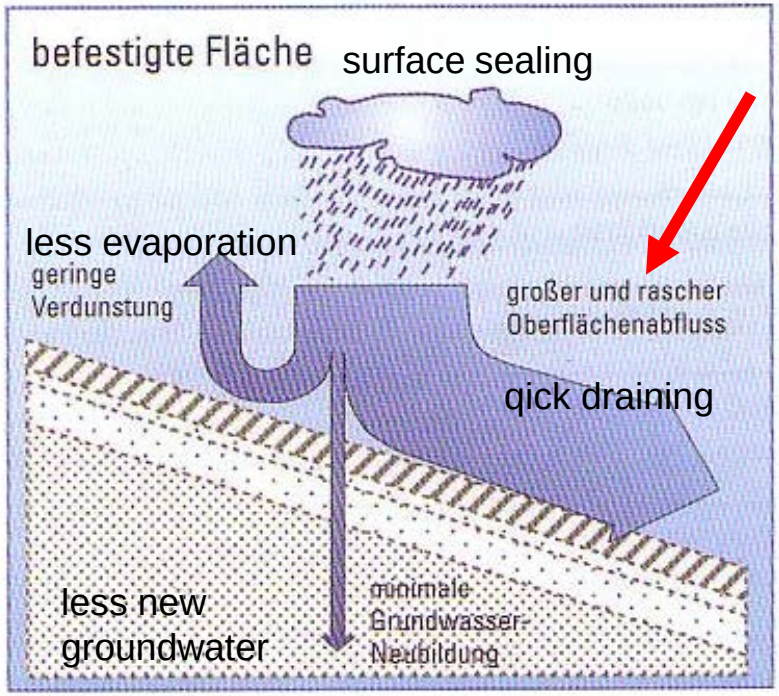
- **Companies for resource protection (since 2001)**

- the Hamburg Model offers a combination of financial, advisory and practical support
- voluntary activities are combined with customer-oriented sustainable programmes to reduce costs for energy, water, material

rain water drainage (Dürr, 1995)

Hamburg

Urban watercycle



Natural watercycle