From Good City Form to Urban Transformation

Jürgen Bruns-Berentelg

CEO, HafenCity Hamburg GmbH
Germany

From Good City Form to Urban Transformation – Co-development of Urbanity, Sustainability and Resilience Inspirations from HafenCity Hamburg, Germany

Professor Jürgen Bruns-Berentelg, CEO HafenCity Hamburg GmbH

Climate Adaptation Forum Boston / June 8, 2018

HafenCity

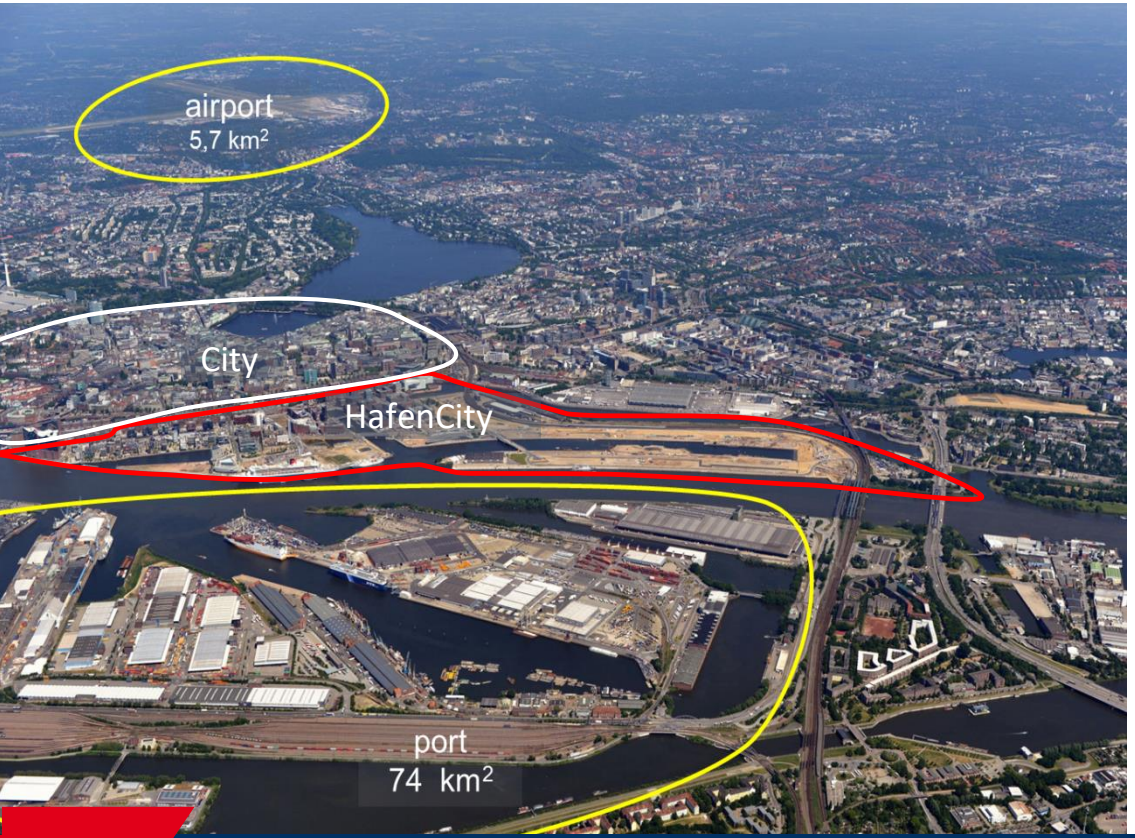
Hamburg

Content / Topics

- The key features of inner-city waterfront transformation in Hamburg
- The urbanistic and economic effects of HafenCity's flood protection system
- The ambidextrous sustainability solutions in HafenCity
- The importance of integrated thinking, beyond localism
- The institutional setting and processes of HafenCity Hamburg GmbH

Hamburg: The Local Situation / Large-Scale Inner-City Transformation of Underused Harbor and Industrial Space (HafenCity Development Frame: 2000 – 2025)

HafenCity



Hamburg: GDP / Economic Drivers

GDP 118 bill. EUR (2017)

GDP per capita 63.000 EUR

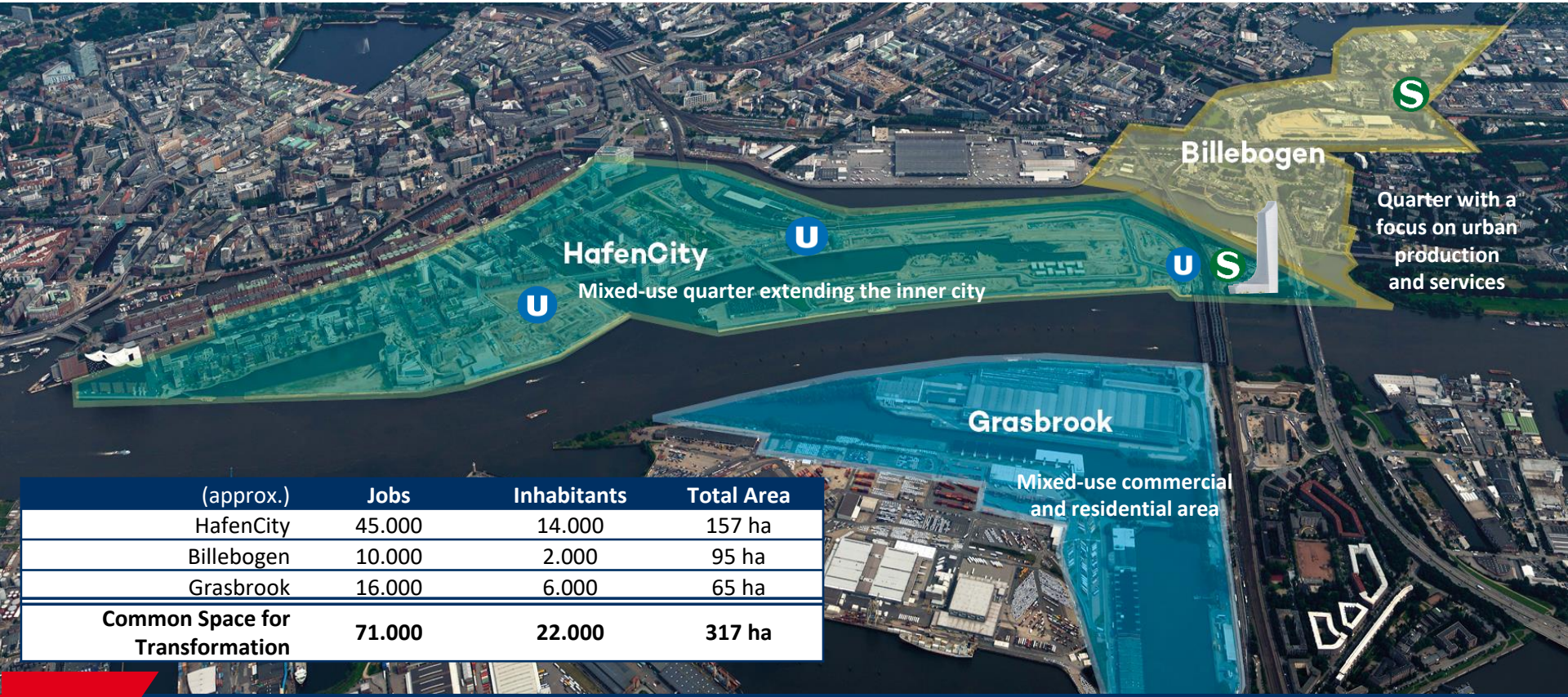
Port (third most important in Europe)

Civil aviation industry (third largest plant in the world)

Strong mixed economy with emphasis on trading, media

Hamburg: The Local Situation / Development Progress – Newly Differentiated Opportunities for Waterfront Transformation Areas HafenCity, Billebogen and Grasbrook

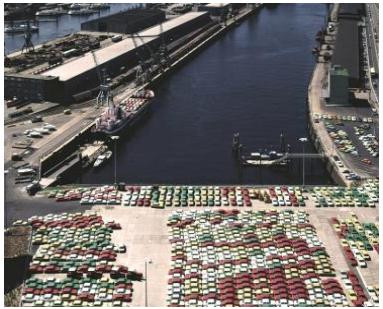
HafenCity



(approx.)	Jobs	Inhabitants	Total Area
HafenCity	45.000	14.000	157 ha
Billebogen	10.000	2.000	95 ha
Grasbrook	16.000	6.000	65 ha
Common Space for Transformation	**71.000**	**22.000**	**317 ha**

Hamburg: The Local Situation / The Starting Point – Inner-city Brownfield Development
Radical Transformation of Underused Harbor and Industrial Space / The Picture of the Nineties

HafenCity



HafenCity: Hamburgs Urban Waterfront Transformation / 3.1 km New Waterfront Development at River Elbe (Composed Almost Exclusively via Private Real Estate Development)

HafenCity

Elbphilharmonie

Strandkai Quarter

Überseequartier with cruise terminal, hotel, office, residential, retail and leisure uses

Baakenhafen Quarter

Elbbrücken Quarter with high-rise buildings outside the view corridor of the inner city

HafenCity: Hamburgs Urban Waterfront Transformation / Creating Diversity, Complexity and Site-based Solutions on a Micro Level / Elbphilharmonie Dalmannkai

HafenCity

Hamburg

HafenCity: Hamburgs Urban Waterfront Transformation
Creating Diversity, Complexity and Site-based Solutions on a Micro Level / Sandtor Harbor

HafenCity

HafenCity: Hamburgs Urban Waterfront Transformation
Creating Diversity, Complexity and Site-based Solutions on a Micro Level / Grasbrookpark

HafenCity

HafenCity: Hamburgs Urban Waterfront Transformation
Creating Diversity, Complexity and Site-based Solutions on a Micro Level / Baakenpark

HafenCity

Hamburg

HafenCity: Hamburgs Urban Waterfront Transformation
Creating Diversity, Complexity and Site-based Solutions on a Micro Level / Magdeburg Harbor

HafenCity

Hamburg

HafenCity: Hamburgs Urban Waterfront Transformation
Relating HafenCity, City and World Heritage Site Speicherstadt (Late 19th Century)

HafenCity

Hamburg

HafenCity: Hamburgs Urban Waterfront Transformation
Creating Diversity, Complexity and Site-based Large-scale Solutions / Überseequartier

HafenCity

Hamburg

HafenCity: Hamburgs Urban Waterfront Transformation
Creating Diversity, Complexity and Site-based Large-scale Solutions / Überseequartier

HafenCity

HafenCity: Überseequartier – Mix of Uses and Jobs / Dense Cluster of Residential, Retail, Culture and Entertainment Uses and Integrating a Vertical Cruise Terminal

HafenCity

Uses	ÜSQ Total (Further development plan HafenCity 15 2016/2017) Northern. ÜSQ completed or under construction 2016 * + southern. ÜSQ, amendment 1 incl. revisions in m² GFA	Share in percentage	ÜSQ Total number of jobs	Jobs "export-oriented"
Office	approx. 97.000	24 %	3.245	1.000 – 3.000
Residential	approx. 123.600	30 %		
Hotel	approx. 55.300	14 %	550	550
Culture / Entertainment	approx. 13.600	3 %	151	50
Gastronomy	approx. 18.200	4 %	300	100
Retail	approx. 92.800 (thereof southern ÜSQ 80.500)	23 %	1.871	At least 600
Cruise Terminal (Boarding/Deboarding)	approx. 7.600	2 %	20	20
Total	**approx. 408.100**	**100 %**	**6.137**	**2.320 – 4.320**

* inkl. BF 34-15/16

HafenCity: Hamburgs Urban Waterfront Transformation
Creating Diversity, Complexity and Site-based Large-scale Solutions / Highrise Elbtower

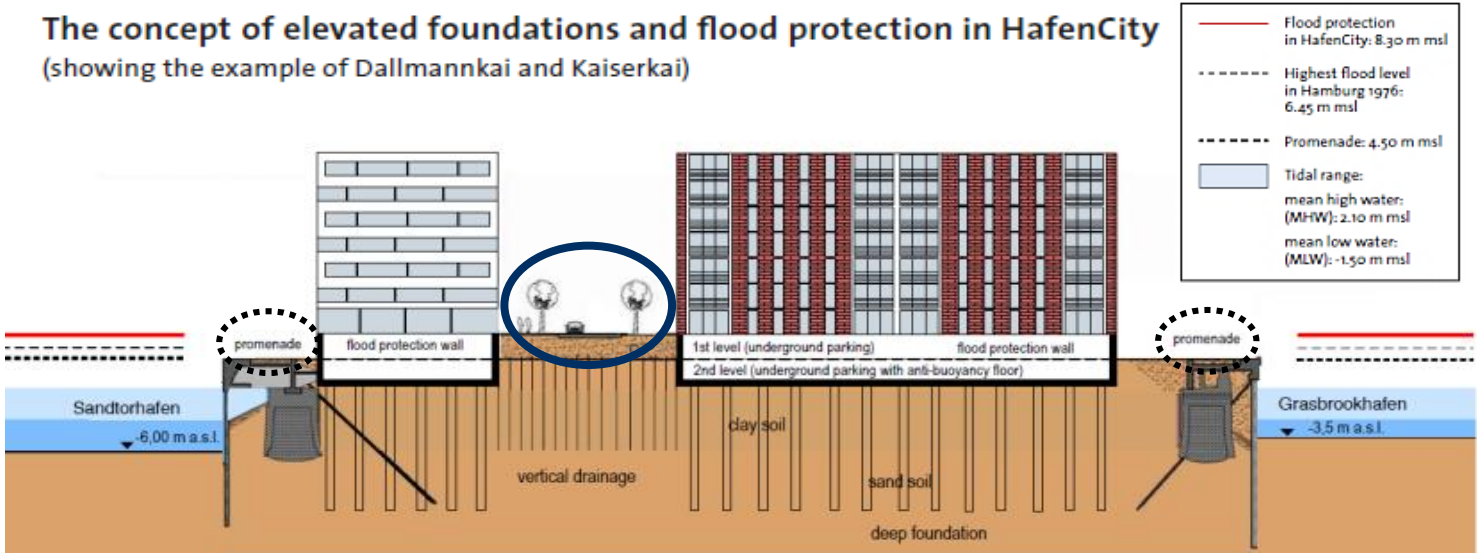
HafenCity

Hamburg

HafenCity: Generating a New Waterfront (3.1 km) in the Center of Hamburg
Island Situation and Flood Protection Concept Considering Climate Adaptation

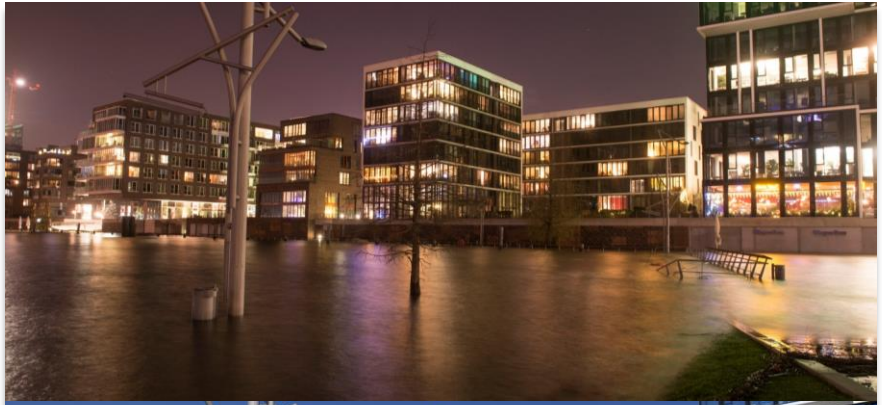
HafenCity

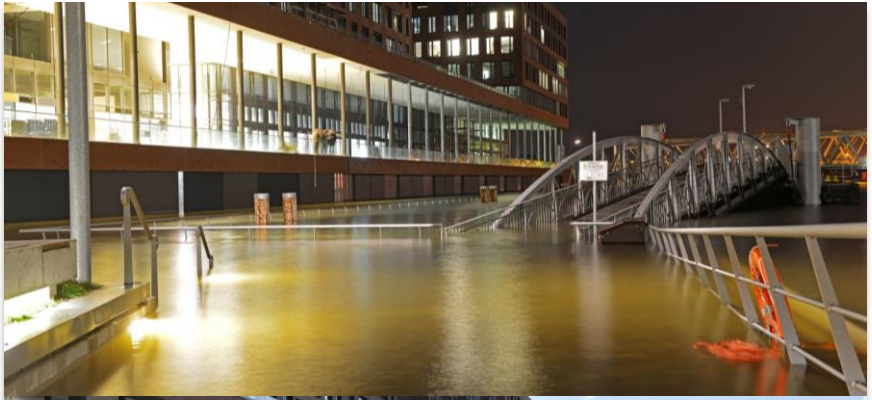
HafenCity: Generating a New Waterfront (3.1 km) in the Center of Hamburg
Island Situation and Flood Protection Concept Considering Climate Adaptation



HafenCity: Generating a New Waterfront (3.1 km) in the Center of Hamburg
Flood Protection / Flood Resilience and “Controlled Flooding” Considering Climate Adaptation

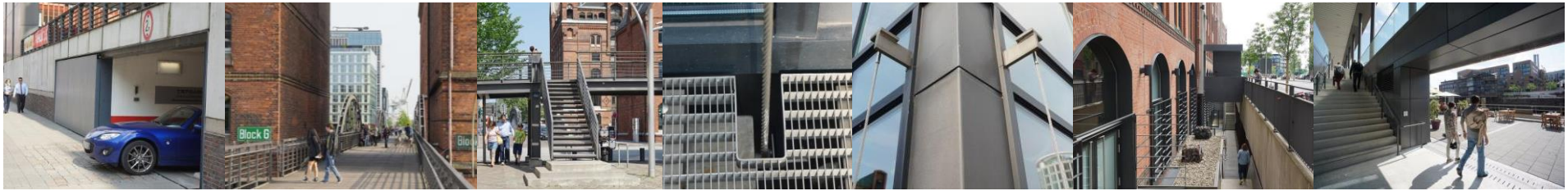
HafenCity





HafenCity: Generating a New Waterfront (3.1 km) in the Center of Hamburg
Flood Protection / Place-specific Solutions Considering Climate Adaptation

HafenCity



HafenCity: Generating a New Topography Considering Climate Adaptation
Creating Urban Street Scapes and Waterscapes (Example Dalmannkai quater)

HafenCity

Waterscape

Streetscape
(Example Am Kaiserkai)

Waterscape

HafenCity: Generating a New Topography Considering Climate Adaptation Integrating Flood Protection and “Blue” and “Green” Open Spaces

HafenCity

HafenCity: Generating a New Topography Considering Climate Adaptation
Creating a Broad Range of Open Spaces (Example Sandtor Habor)

HafenCity

Hamburg

HafenCity: Generating a New Topography Considering Climate Adaptation
Open Spaces as Urban Encounter Spaces (Inclusive Spaces)

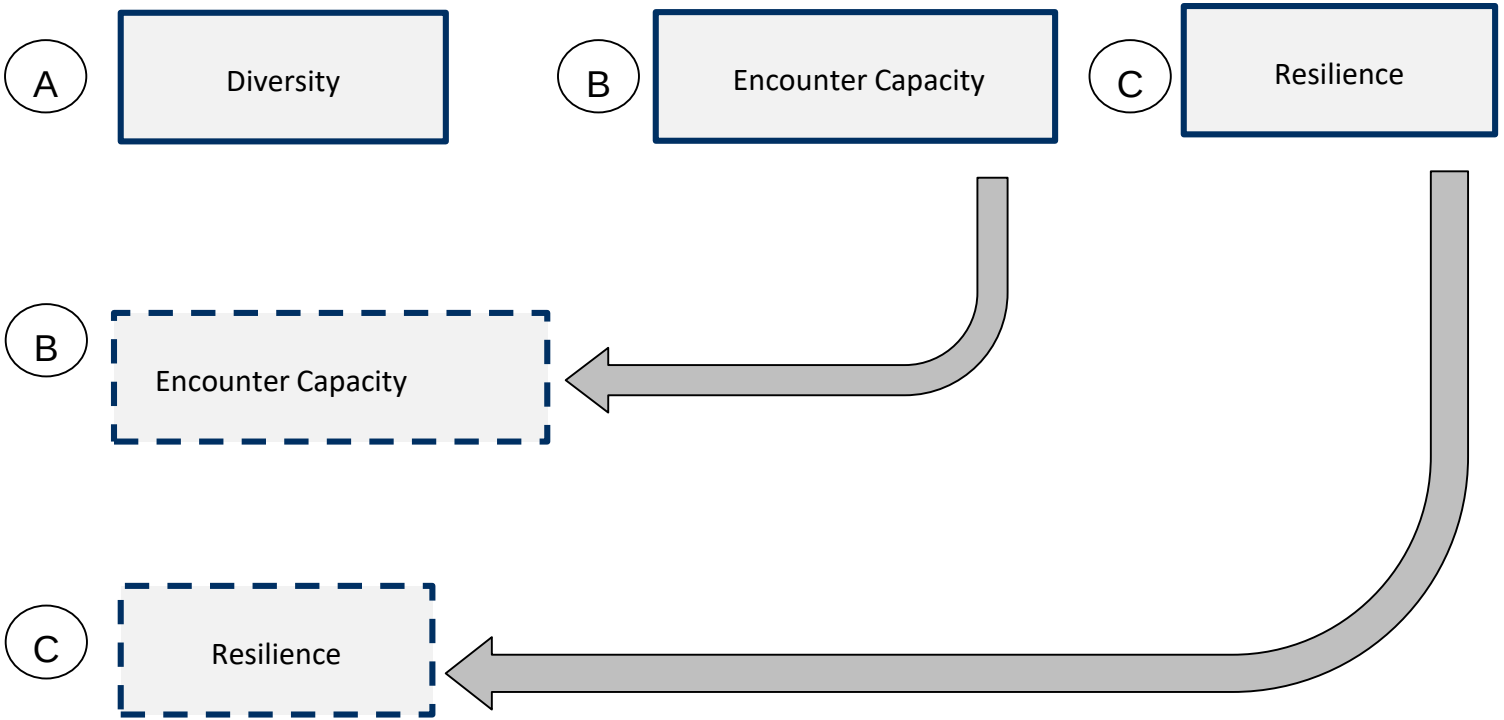
HafenCity

HafenCity: The Composition at the Meso-Level (Example Baakenhafen)
Social Diversity and Cohesion in an Integrated Urban Neighbourhood

HafenCity

Hamburg

HafenCity: The “Presentation” of Social Capital and its Adaption



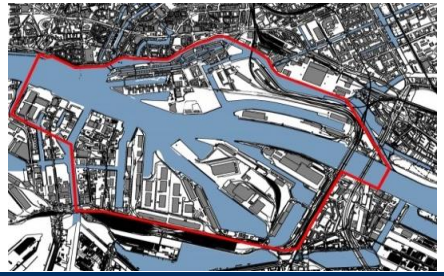
HafenCity: Generating a New Waterfront (3.1 km) in the Center of Hamburg
Public Space Concept / Density and Public Space (380 jobs and 95 inhabitants per ha)

HafenCity

Water area*:	28,2 ha	
Public spaces on the water	1,4 ha	- 5 %
Land area*:	109,8 ha	
Traffic areas	25,6 ha	- 23 %
Built up area	35,2 ha	- 32 %
Public spaces (places/promenades/parks/playgrounds)	26,5 ha	- 24 %
Private open spaces: publicly accessible (at least way-leave)	15,2 ha	- 14 %
Private spaces: not publicly accessible	7,3 ha	- 7 %
* without Quarter Oberhafen		
Quarter Oberhafen	8,6 ha	

HafenCity: Generating a New Waterfront (3.1 km) in the Center of Hamburg
HafenCity and Harbor Compatibility: Establishing a Liveable Relationship

Harbour Area	HafenCity		
Public Law	**Public Law**	**Technical Innovation**	**Private Law**
Noise Cap (regulated)	• (Soft) Agreement with Federal Agency for Environmental Protection (2003) • Regulatory framework in development plan enables residential use without double glasing • Land use plan & building permit with special terms for noise measurement and protection (location of bedroom) and buildings with specific windows („HafenCity window“)	• HafenCity Window instead double fascade (required via building permit in specific noise prone locations)	• Property purchase agreement: excepting harbour noise (secured by easement) • Transfer and Acceptance in lease contracts



HafenCity: Urban Transformation and Sustainability / The Basic Concept of (Environmental) Sustainability in a Dense, Mixed-used New Downtown

HafenCity

"Behavioural change"

- communication of sustainable issues
- experimenting with new solutions (e.g. cooperations)

City Structure

- urbanistically integrated flood protection system
- fine grained mixture of urban uses
- high urban density
- high percentage of networks of open spaces
- high degree of urban encounter capacity

Material Environment

- maritime, industrial built environment
- flood prone urban land
- harbour noise affected environment

Sustainable Construction

- certification: 5 levels of resource efficiency
- benchmark based
- technology open

(Heating) Energy Supply

- CO_2 benchmark
- regenerative energy sources
- decentralized systems, technology open

Urban Mobility

- modal split: close to 20% MPT
- walkable and bikeable city network quality
- public transport network of high density and quality (subway, fuel cell busses)
- car parking integrated in flood protection concept
- carsharing; transformation to electrical mobility

HafenCity: Urban Transformation and Sustainability / HafenCity Eco Label
Mandatory Certification of Buildings at Platinum Category

Eco Label HafenCity Platinum for all Buildings in the eastern part of HafenCity

General Features

- First certificate in January 2007
- Certificate became mandatory for all developers in 2010
- Major adjustments in 2010 and 2017

Eco Label Categories (benchmarking system)

1. Sustainable use of energy resources (required Platinum standard for every building)
2. Sustainable use of public goods **(including mobility requirements such as integration of electric mobility and carsharing system)**
3. Use of environmentally friendly building materials (elements of cradle-to-cradle)
4. Special consideration for environment, comfort and health protection
5. Sustainable Facility Management

Certification requirements:

- platinum standard in three categories (sustainable use of energy mandatory)
- gold standard in the other two categories

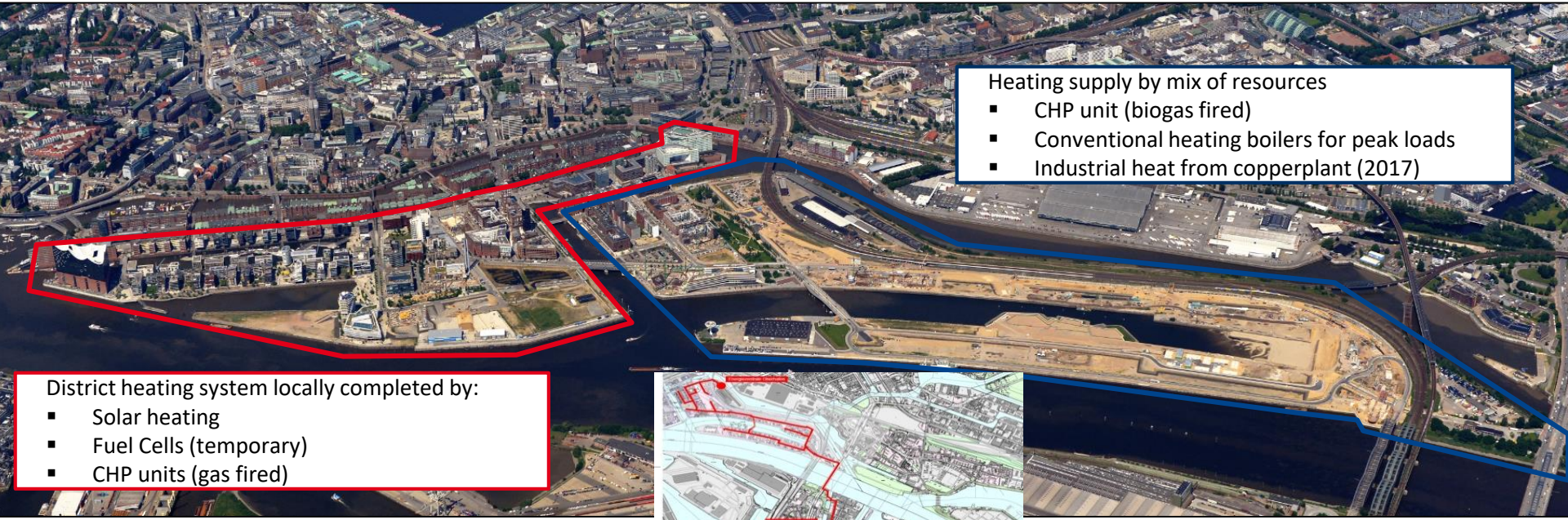
New: Platinum certification (new benchmarks and requirements)

- No further demand on heat loss prevention via fascade
- Instead energy generation of solar energy (30% of roof top area)
- Integration of electric mobility as minimum standard (40% of spaces fitout, 60% prepared)
- Very low primary energy factor (approx. 0.11), industrial waste heat of Aurubis copper melting plant
- Monitoring process of energy consumption after two years of operation

HafenCity: Urban Transformation and Sustainability
New Standards for (Decentralised) Heating Energy Supply

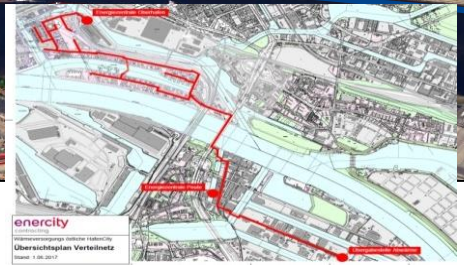
Western HafenCity supplied by Vattenfall
CO2-Benchmark: 175 g / kWh (Contract 2003)
Technology open tendering

Eastern HafenCity supplied by enercity (formerly Dalkia)
CO2-Benchmark: 70 g / kWh
Technology open tendering



Heating supply by mix of resources
- CHP unit (biogas fired)
- Conventional heating boilers for peak loads
- Industrial heat from copperplant (2017)

District heating system locally completed by:
- Solar heating
- Fuel Cells (temporary)
- CHP units (gas fired)



HafenCity: Urban Transformation and Sustainability
Mobility Transformation

Goals of the Smart Mobility project in the eastern HafenCity:

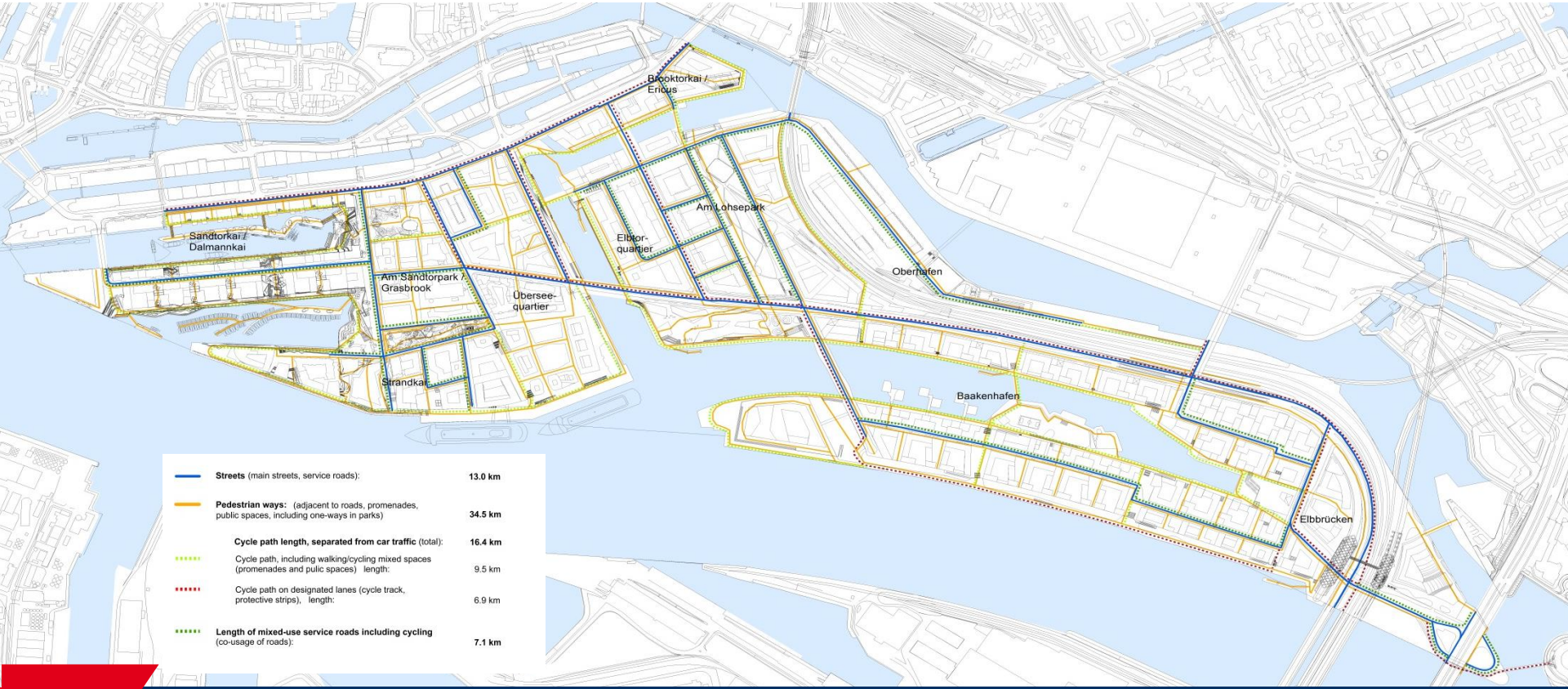
- Reduction of construction costs by omitting a large part of the parking spaces (at least one level)
- Partial replacement of private car ownership / transformation of MIV mobility culture
- Integration of a station-based car sharing concept with approx. 300 to 400 vehicles for both quarters
- Promotion of electromobility through the development of private and public charging infrastructure and increasing electrification of the
- car-sharing fleet (start with at least 40% in 2019)
- Building a multimodal and cost-saving mobility offer for residents
- Marketing as the largest district-related innovation project for car sharing / electromobility in Europe

HafenCity: Urban Mobility / Subway and City Railway Station Elbbrücken (2018/2019)
Future Linkage between HafenCity and Neighborhood Rothenburgsort

HafenCity

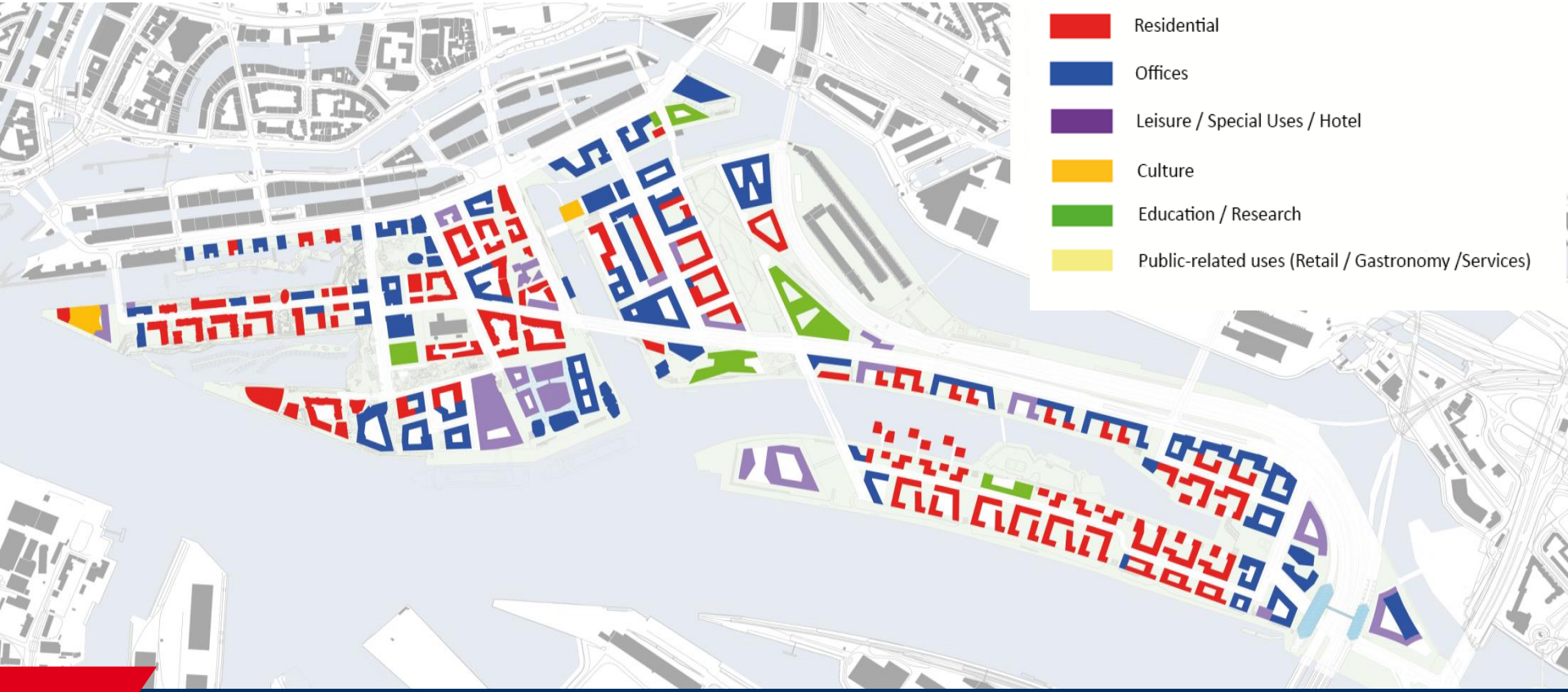
Hamburg

HafenCity: Urban Transformation and Sustainability
Mobility Infrastructure / Creating a Walkable and Bikealbe City With Short Distances



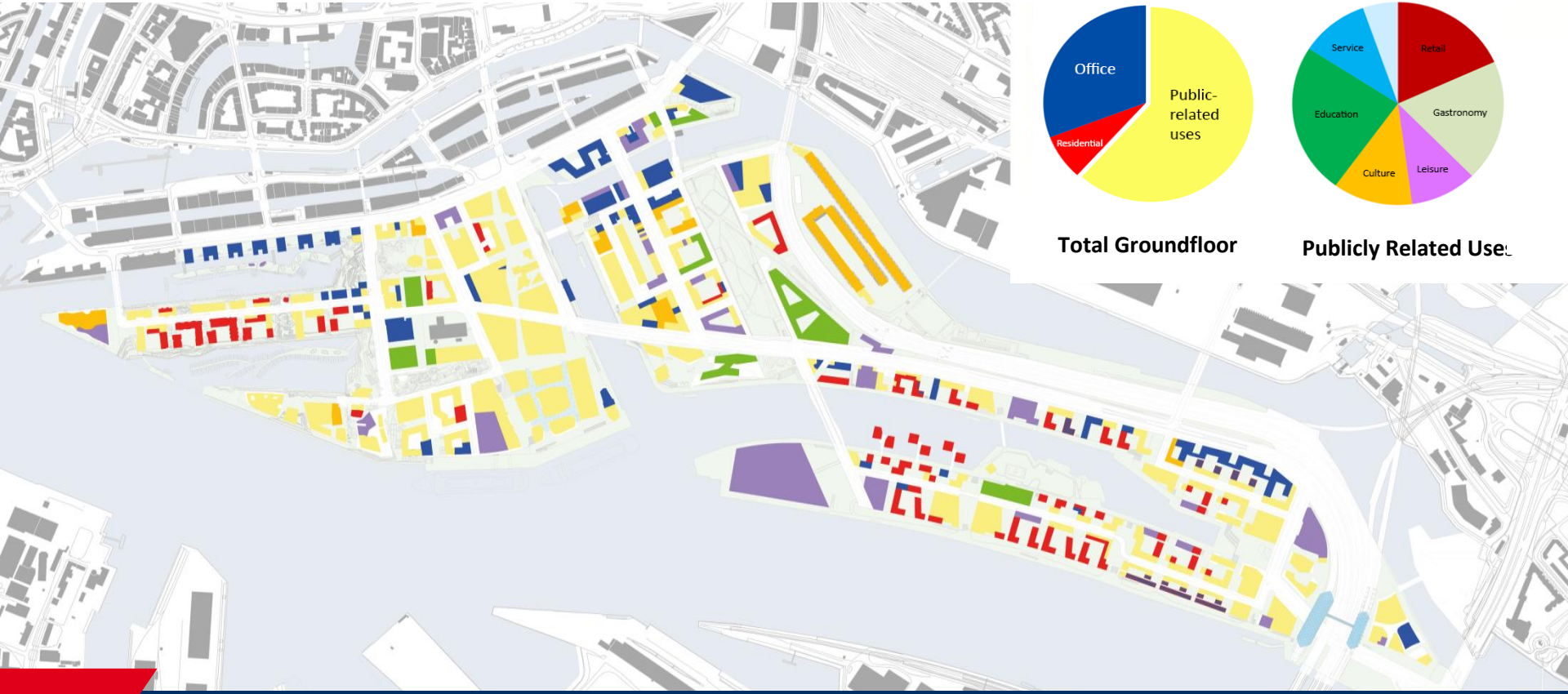
HafenCity: Urban Transformation and Sustainability / Fine-Grained Mixture and Differentiation of Concepts and Uses (2nd Floor with Focus on Residential and Office Uses)

HafenCity



HafenCity: Urban Transformation and Sustainability / Fine-Grained Mixture and Differentiation of Concepts and Uses (Ground Floor with Publicly Related Uses)

HafenCity



HafenCity: Urban Transformation and Sustainability
Mobility Transformation

HafenCity

Strong sharing strategy

Effciency and social justice generation in spite of reduced spaces

- By introduction of carsharing (30 % of parking spaces; for 100 households: 12 sharing places)
- Customized availability of the "right" car (broadening range of available cars)
- High substitution effect for private car ownership for households using a car for less than 10.000 km p.a.
- Carsharing spaces free of parking costs

Benefits:

- Efficiency gain in resource use
- Social benefit high (car use on demand, no socio-economic exclusion)
- Strong social learning effects

Reducing parking spaces

Significant cost and grey energy savings
(no above ground parking available on sites)

- 0.4 parking spaces per residential unit in eastern HafenCity (and selected other locations)
- Reduction to approx. 25-30 % for non-residential buildings (in quarter Elbbrücken)

Benefits:

- Investment costs in housing construction and for commercial buildings are falling significantly (in general one underground parking level not necessary)
- Consumption of grey energy decreases by an average of approx. 8-10% (per building)
- Pressure for efficient use of space

Outcome

Transformation of the car-based mobility system

Strong E-mobility strategy

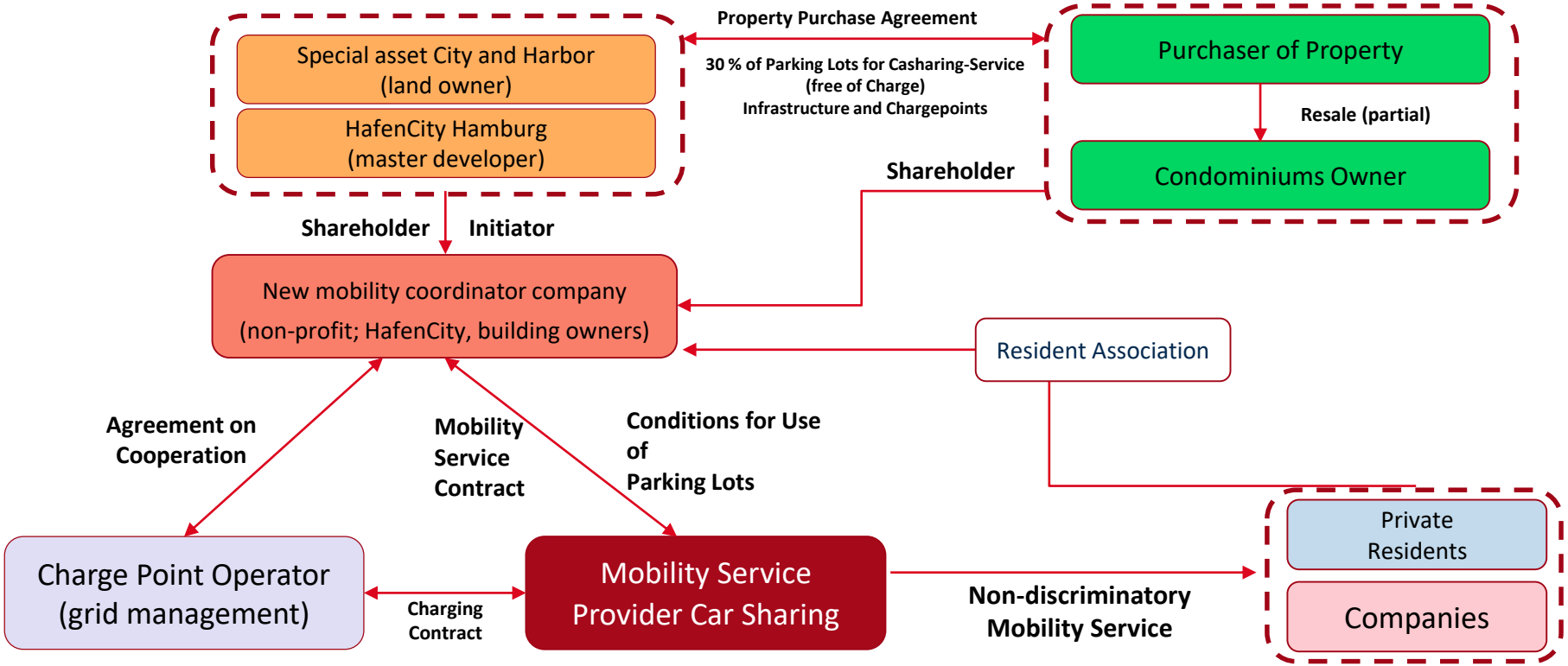
Transformation into electrical mobility

- Electrical mobility fitout for at least 40 % of parking spaces (residential and office use) are equipped with a wallbox 11kW)
- All carsharing spaces are equipped with electrical mobility fitout (wallbox)
- 40 % electric cars in the first phase, 90% by 2025
- 100 % of parking spaces prepared for electrical mobility fitout
- Central access system; wireless network coverage

Benefits:

- Dramatic increase in e-mobility diffusion
- Strong environmental impact
- Strong social learning effects

HafenCity: Urban Transformation and Sustainability
Institutional Frame for Sustainable Mobility: Carsharing, E-Mobility, Transformation



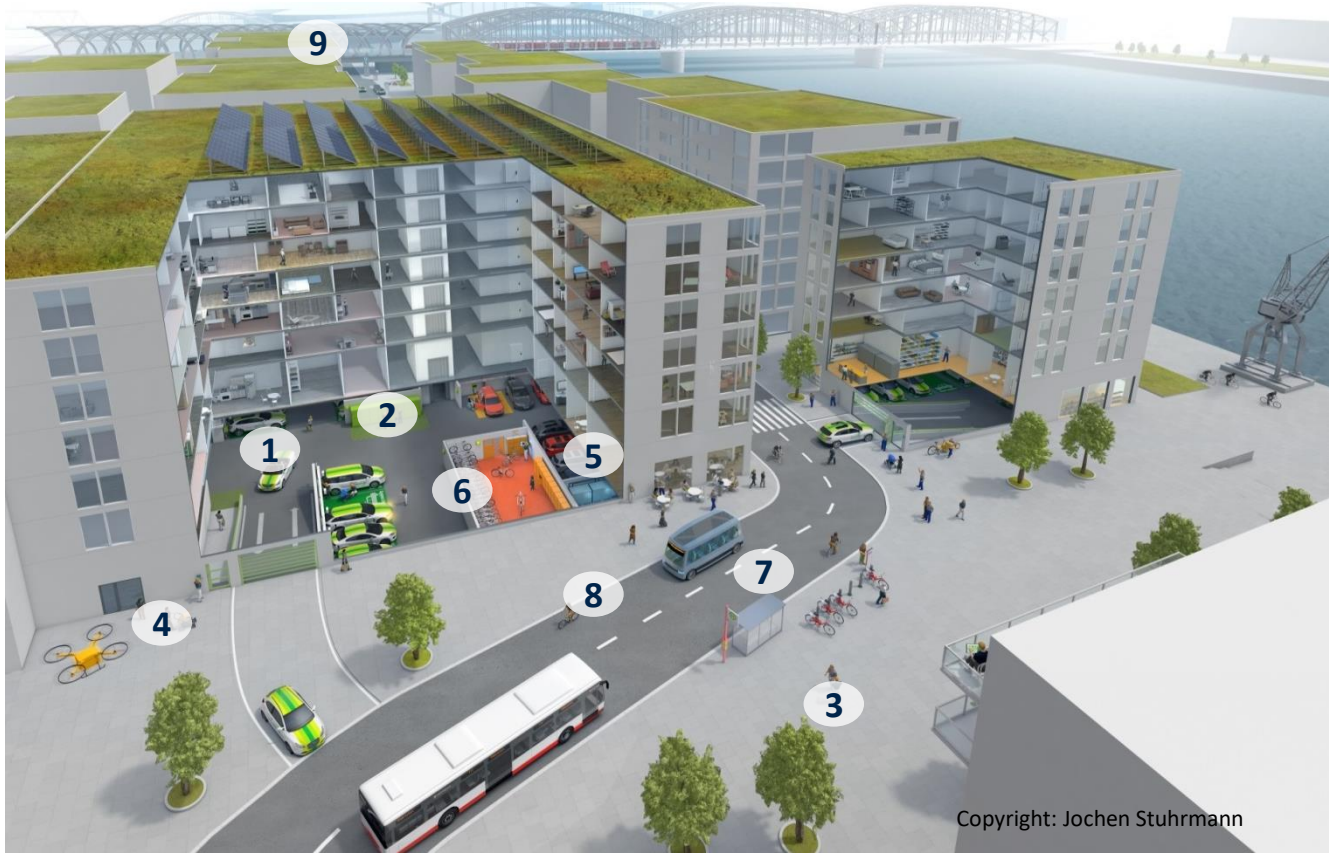
Quelle: Becker Büttner Held (2017)

HafenCity: Urban Transformation and Sustainability
Mobility Transformation / Smart Mobility

HafenCity

Smart Mobility HafenCity:

1. **Maximum of 0,4 parking spaces** per residential unit; thereof a minimum of **30 % for Carsharing**
2. **Minimum of 40 % of parking spaces** for residential units and offices with a wallbox (all Carsharing-parking spaces)
3. **Booking a car** via Phone/Computer
4. **Comprehensive underground parking access system;** Underground parking with **Wi-Fi and mobile coverage**
5. Generation of **solar power for own consumption**
6. High **comfort for bicycle parking facilities**
7. **"City of short distances"** invites to **cycling**
8. **Test field** for **autonomous driving** (Start 2018)
9. **Traffic junction Elbbrücken** (U-Bahn, S-Bahn, Switchh-Station, Bike + Ride)



Copyright: Jochen Stuhrmann

HafenCity: Urban Transformation and Sustainability
Mobility Transformation / Smart MobilityPilot Area for Self-driving Buses (Start in 2018)

Project HEAT (Hamburg Electric Autonomous Transportation)

Project objectives

- Demonstrate the suitability of automatically driven buses for a use in public transport
- Increase public awareness for autonomous driving
- Gain experience and expertise in the field of autonomous driving
- Structuring high quantities of data and creating an intelligent transport strategy for the future (Hamburg will host the ITS World Congress in 2021, the largest event in the field of ITS)

Vehicle information

- Automatically driven bus with a capacity of 10-16 people (wheelchair place included)
- Vehicle with a fully electric drive
- Bus equipped with a variety of sensors, such as camera, radar, and lidar; interaction with other smart infrastructure in the street and the control center of the municipal subway

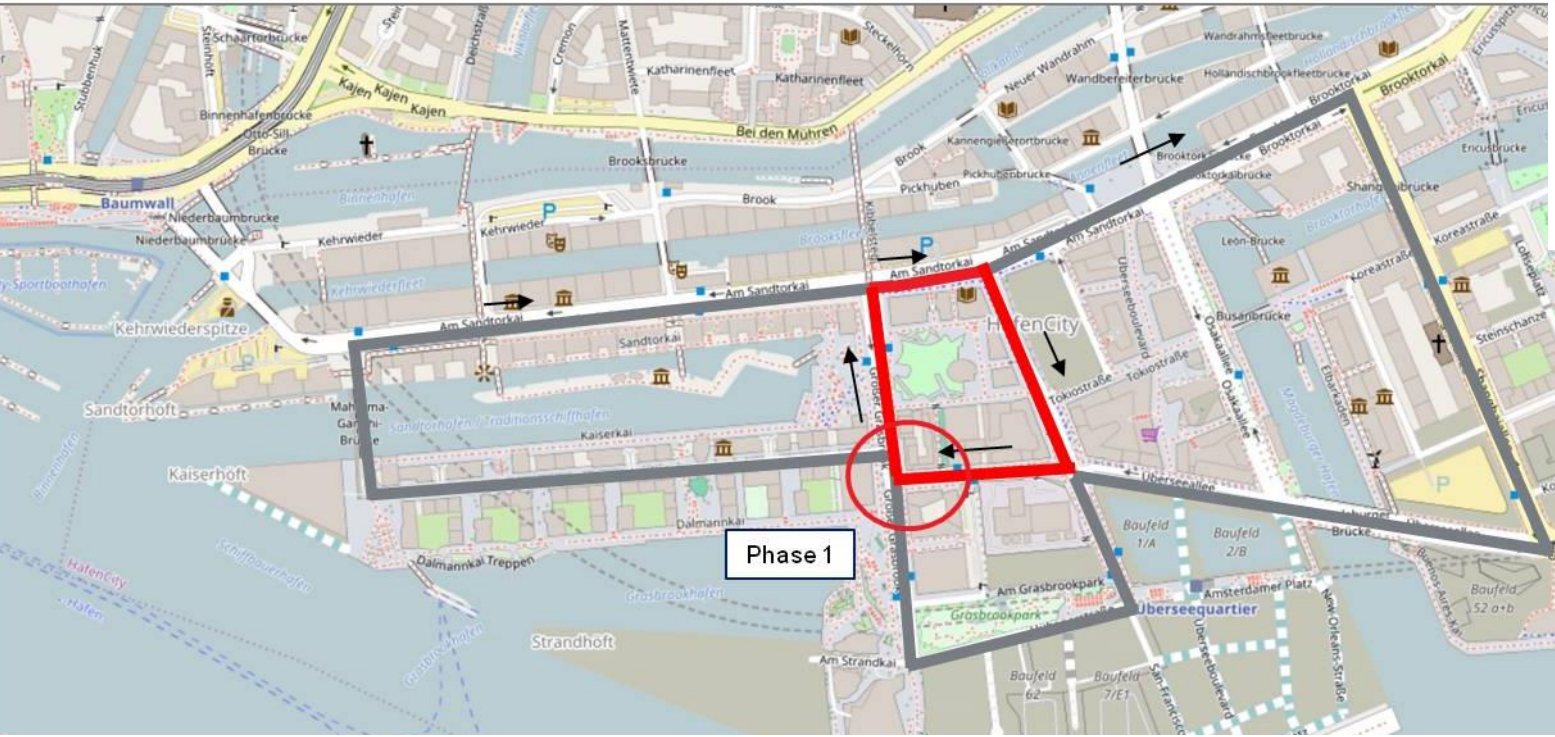
Project structure

- Experts from six companies in the field of public transport, vehicle development, smart city and the local government (project lead: Hamburger Hochbahn AG)
- Project start in 2018 (initially with a driver)

Source: Hamburger Hochbahn (2018)

HafenCity: Urban Transformation and Sustainability
Pilot area for self-driving buses (start in 2018)

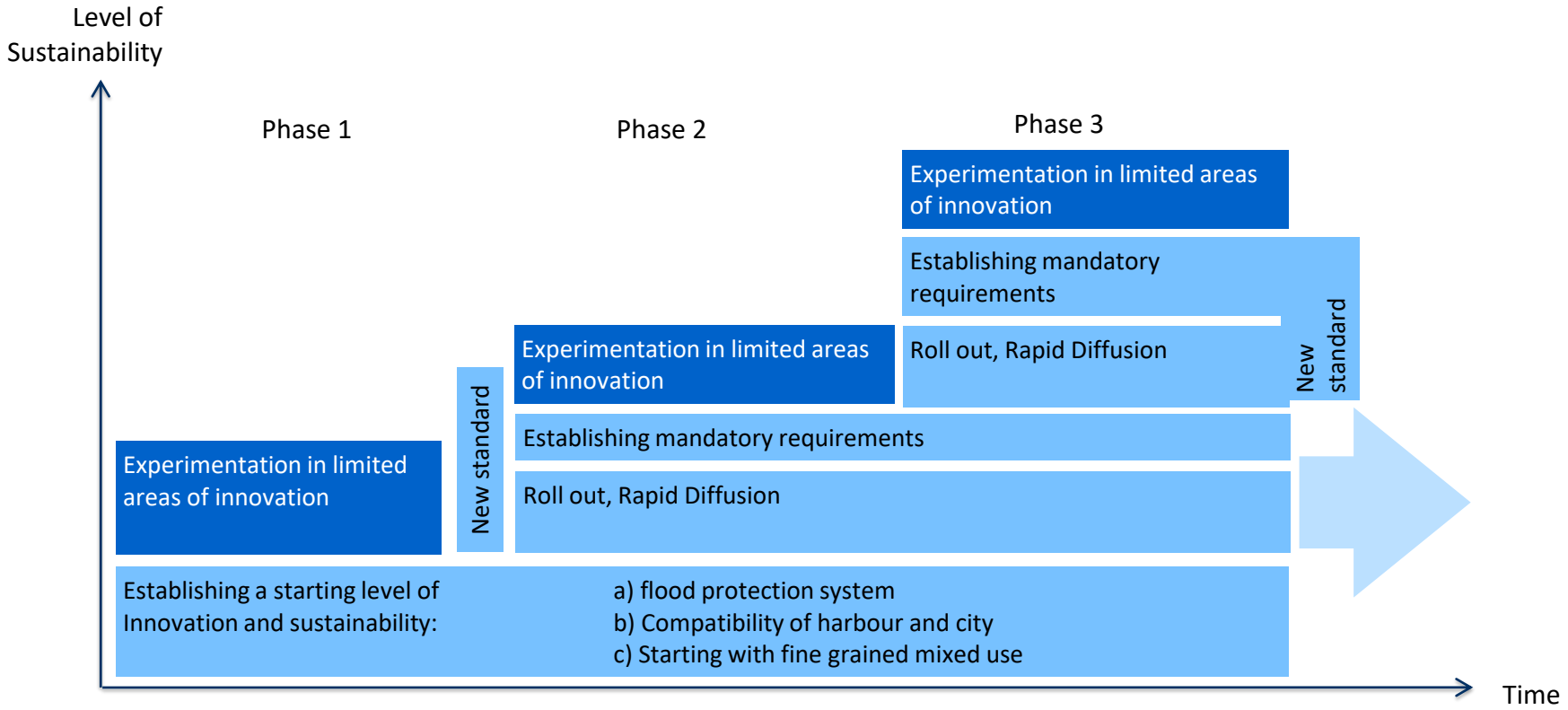
HafenCity



Total distance:	2.2 miles
Bus stops:	9
Traffic lights:	12
Driving direction:	⟶

Source: Hamburger Hochbahn (2018)

HafenCity: Urban Transformation and Sustainability
Gaining Fast Traction in the Sustainability Transformation in an Urban Mega Project



HafenCity Hamburg / The Institutional Setting
City State of Hamburg, HafenCity Hamburg GmbH and Private Sector

HafenCity

City State of Hamburg
(reducing hierarchical character of planning and concentrating on the sovereign process)

Setting the political agenda

Organization
- HafenCity as special development zone (2005) for planning on state-level, not borough-level "Bezirk")
- complementary project group at Authority for Urban Planning; works horizontally and vertically (Oberbaudirektor)

Integration of decisions
- development of plans (Commission for Urban Development)
- land sales approval (Commission for Land Reallocation)

Prepares or grants
- development of plans (land-use plans, Area Development Plans; Authority for Urban Planning)
- urban design (guidelines)
- building permits

Finances and builds - partly public-private joint venture:
- Schools , public university, concert hall, subway
- external infrastructure

Receives
- Infrastructure and public spaces from HafenCity Hamburg GmbH

HafenCity Hamburg GmbH
(the city state owned "Schumpeterian public goods producing entrepreneur")

Finance

Public land owner
- trustee of Special Asset City and Port (has received state-owned land at zero costs)
- finances its activities from land sales proceeds
- financial target: no profit/no loss (break even)

Development
- acts as entrepreneurial master developer creating a new downtown to a significant degree as public good
- development planning
- plans and builds infrastructure (streets, bridges, quay walls) and
- public spaces (promenades, plazas, parks)
- sets new frameworks for quality enhancement and innovations
- acquires investors, builders and main users based on conceptual ideas,
- sells development sites,
- organizes communication, marketing

Private Sector
(refocussing and recalibration of markets as competitive, innovation and value oriented)

Private and institutional developers and users

- development of individual sites exception Überseequartier (central retail area, 20 buildings)
- Realization of buildings, private open spaces and private but publicly accessible open spaces

Mobilization of private (real estate) actors
- as conceptual urban innovators
- via conceptually based competitive processes (conceptual focus instead of profit maximization, 70:30)

HafenCity Hamburg GmbH: The Functional Embeddedness and Operation

HafenCity

Supervisory Board
- First Mayor (Chairman)
- 4-5 Senators

Ministry of Urban Development
(until 2004: Ministry of Economics & Labour)

Control

- **Real estate development companies**
- **Owner occupiers**
  70 % concept /
  30% price

Competitive Contracting

HafenCity Hamburg GmbH and „Sondervermögen Stadt und Hafen“ (Special Asset “City and Port”)

Advice

Advisory Committee (started 2005)
- Permanent members: Chamber of Commerce, Resident association, Chamber of Architects, Tourism, etc
- 10 academic members

Coordination Group Cultural Affairs
(started 2005)
- co-chaired by HCH/ Ministry of Culture
- stakeholders of various cultural disciplines

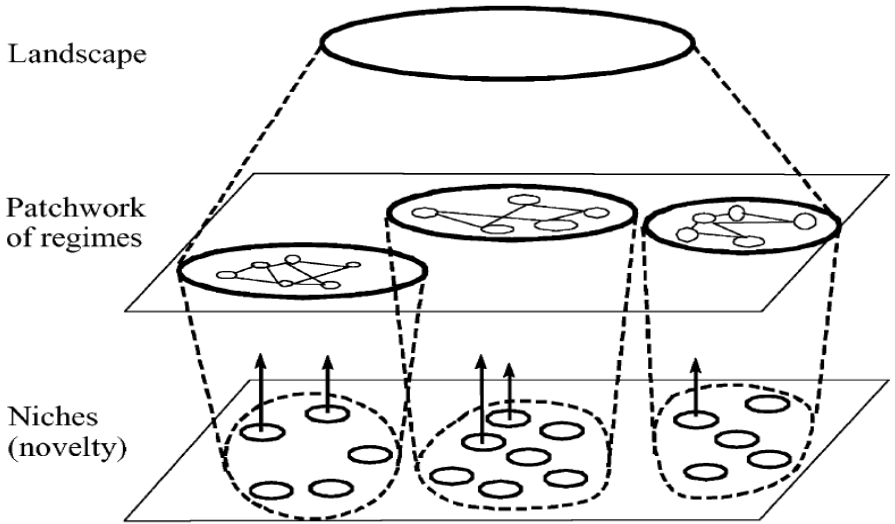
Competitive Contracting

Construction companies
(infrastructure)

Planners
- master planning / urban design
- traffic
- landscape
- infrastructure etc.

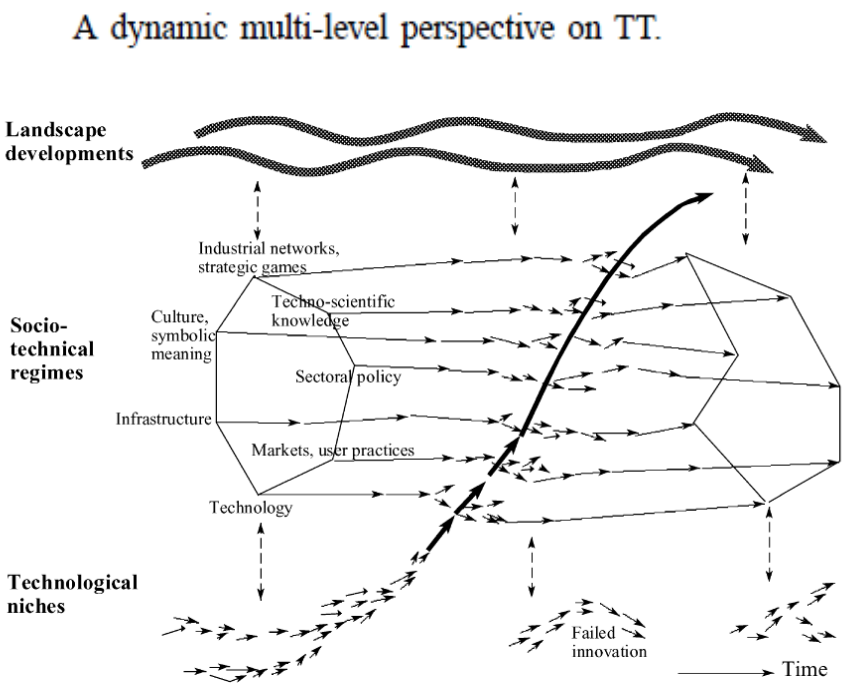
Urban Development Today: Transformation Instead of Continuity

Multiple levels as a nested hierarchy.



Source: Frank W. Geels: Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and case-study. In: Research Policy 31 (2002) 1257-1274

The Embedding of Urban Development in (Urban) Transformation Processes



Source: Frank W. Geels: Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and case-study. In: Research Policy 31 (2002) 1257-1274

HafenCity: Planning Culture / Urban Development
Levels of Design (Planning) in the Transformation Process

HafenCity

I HafenCity (community level)

Masterplan 2000
(flexible & open)
Winner Masterplan competition: Kees Christiaanse (today ETH Zurich/KCAP), draft and final version: HafenCity Hamburg GmbH / Ministry of Urban Development and Environment

Masterplan Revision 2010 Eastern HafenCity

- Masterplanner:
  KCAP / HafenCity Hamburg GmbH / Ministry of Urban Development and Environment

II Intermediate (ten city quarters)

Functional Plan for each City Quarter

detailed plan leads to the draft of the development plan („B-Plan“)

Urban Design Competitions

before the start of the development of an area, 10-12 participants

Landscape Competitions
1-3 quarters, approx. 30 participants for each competiition
Winners:
- EMBT, Barcelona
- BBGG, Barcelona
- Vogt, Zürich
- Loidl, Berlin

III Micro level (Site level)

Infrastructure (Bridges)
joint architectural / engineering competitions

Architectural Design of Individual Buildings
(100 - 150 buildings)

private buildings:
4 – 12 participants, depending on the size
of the building

Public buildings:
up to 100 participants

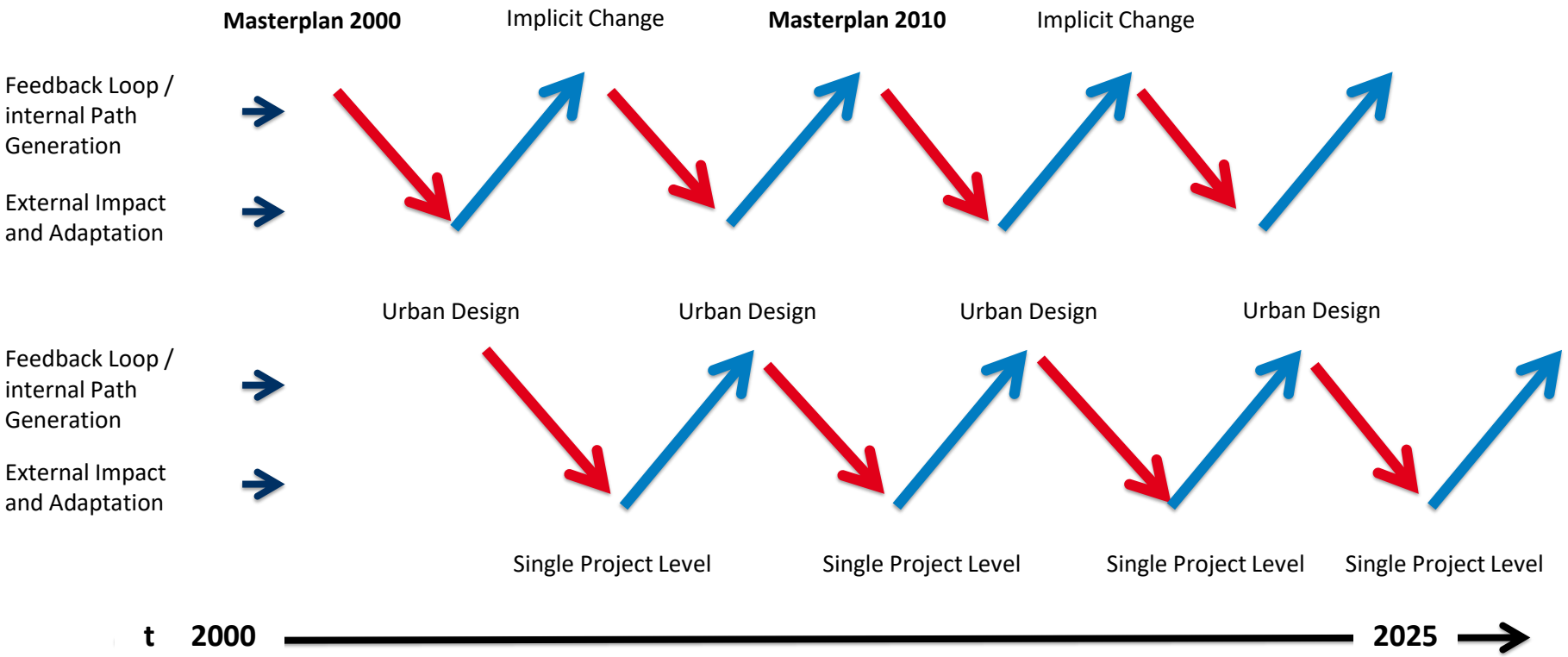
No competition for very few buildings (e.g. Elbphilharmonie)

Private competitions on sites:
Diverse landscpae architects

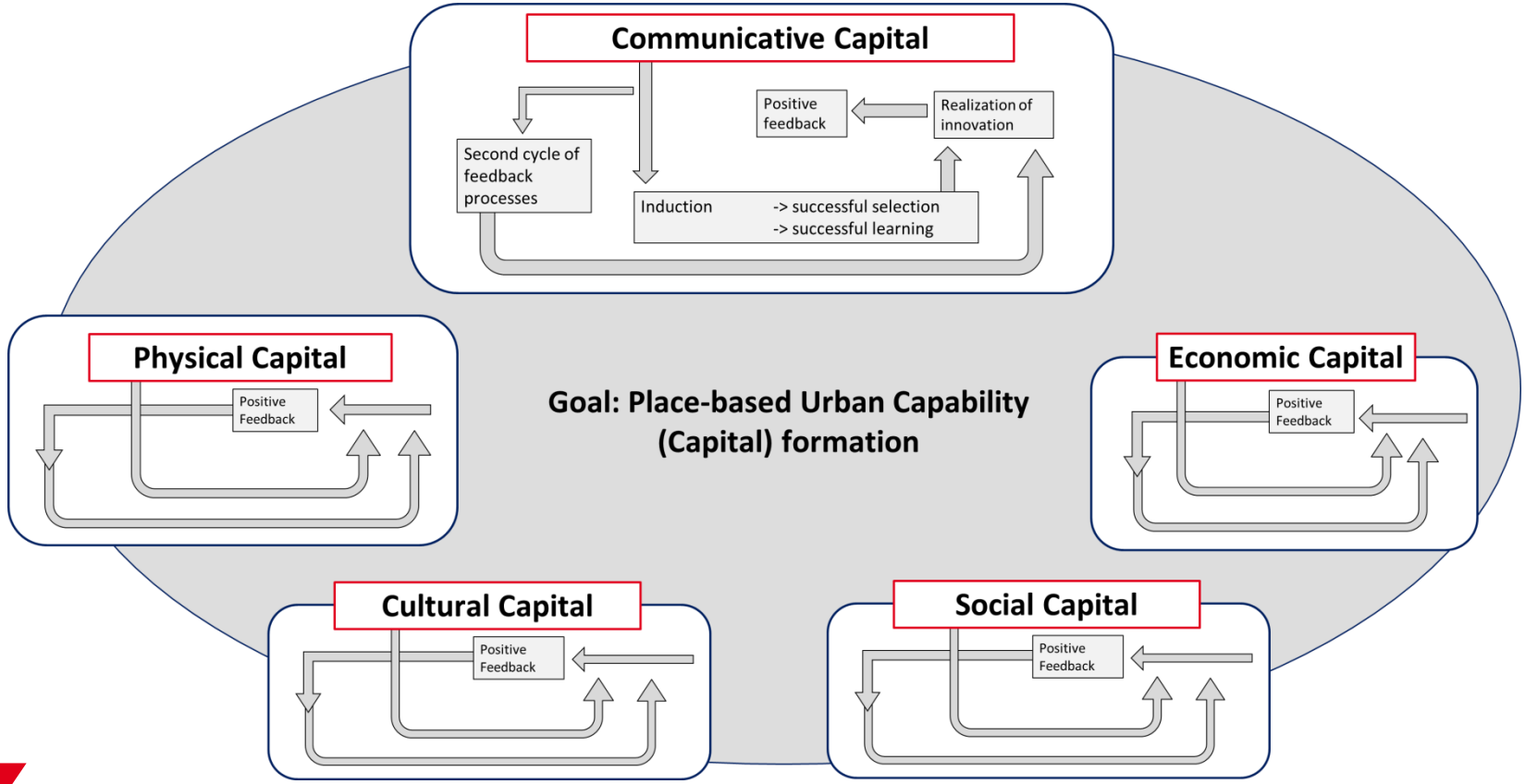
Private competitions

Public competitions

HafenCity: Planning Culture / Evolution of Material Planning through Adaptation and Path-Generation



HafenCity: Place-based Integrated Urban Capability Generation

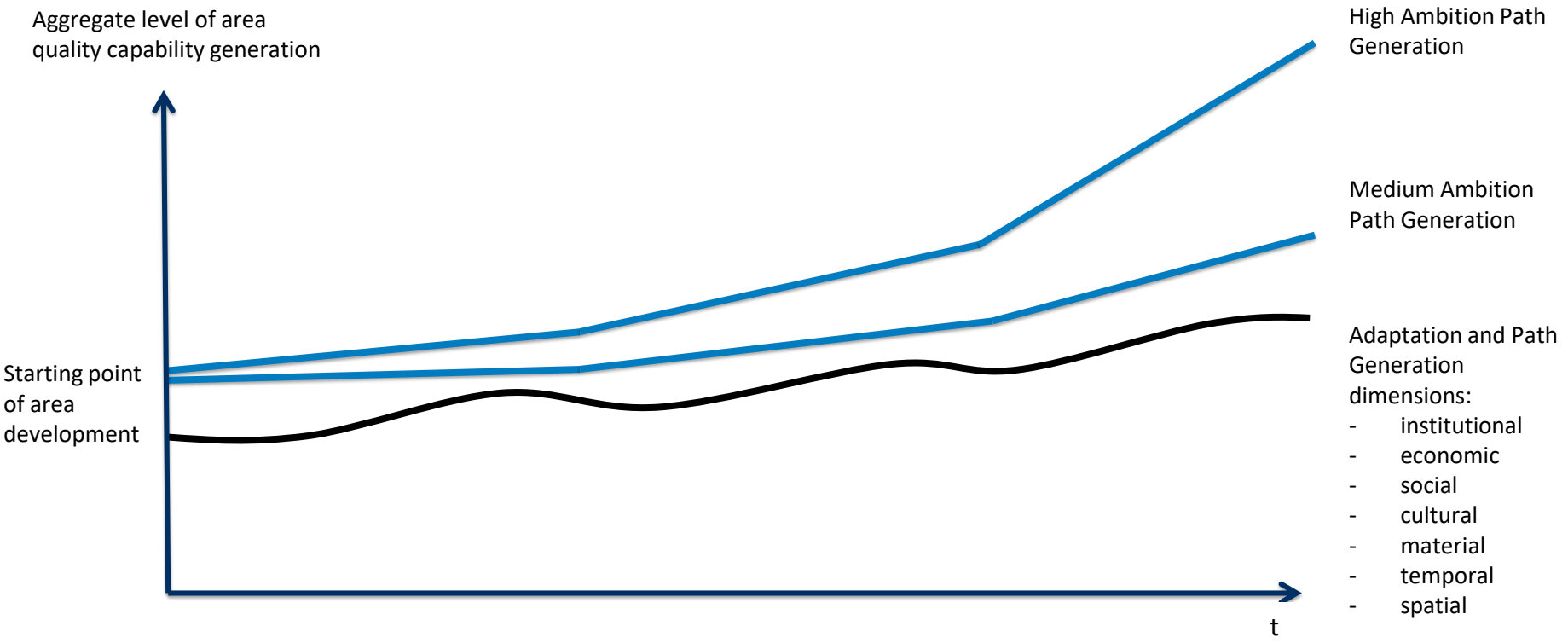


HafenCity: Planning Culture / Place-based Integrated Urban Economic Capability Generation

HafenCity

processes	instruments	values
market mobilisation based on target concept (place specific) • What makes sense strategically? • What is missing? • What could be innovative?	• Expectation management • target group presentations and information documents • public discussion of expectations • leading by example	***-> knowledge density generation*** (reducing risk and uncertainty) (matching markets / establishing future markets) • generating dense "markets" • creating matching environments (A. Roth)
tendering process • 70% concept / 30% price different prices for different uses (€ sqm GFA)	tender documents	***-> competition process*** • based on concepts • generating ideas-based offers
granting an exclusive option 18 to 24 months; developing the product quality (from architectural competition up to building permit)	exclusivity agreement (binding option)	***-> cooperation process*** • stabilizing matching environments and ideas
sale of land (freehold) • on detailed contractual basis **start of construction**	sales contracts	***-> commodification / decommodification process*** • fixing of results and creating resilience of public goods • stabilizing matching environments and ideas

HafenCity: Planning Culture / Evolution of Urban Transformation through Adaptation and Path-Generation



Thank You For Your Attention!
Professor Jürgen Bruns-Berentelg, HafenCity Hamburg GmbH

HafenCity

Hamburg