Hamburg

International openness as a vector of innovation

City Portrait
July 2018

La Fabrique de la Cité

July 2018

Hamburg

City Portrait

Table of Contents

Intro duction

“Gate to the World”

(“*Tor zur Welt*”)

Though Hamburg is better known today as the “growing city” (“*wachsende Stadt*”), its original moniker remains a powerful description of the city that still applies today.

Hamburg typically conjures up notions of its lively port, full of merchants and mariners, and all its associated imagery. In fact, the expression “*Tor zur Welt*” originally referred to the “*Unterwelt*”, the underworld of St. Pauli, the infamous sailors’ quarter and red-light district situated on the right bank of the Elbe river… As a Hanseatic city, openness to foreign and faraway lands has always formed an integral aspect of Hamburg’s identity, while its port remains synonymous with travel and adventure to this day. As an axis of international trade, a nexus of rail (freight and passenger) and road (A5/A7) infrastructure, and home to Germany’s fifth-largest airport, Hamburg is a hub that has sealed its place at the heart of a reunified Europe and, by extension, the world.

In addition to infrastructure, this openness to the world also refers to the city’s mindset: Hamburg is known for its long-standing tradition of hospitality, 28.9% of its population is of foreign origin, a rate much higher than the German average of 20.5%. The city-state has earned a reputation for its particularly innovative policy of accommodating, housing and integrating the mass influx of asylum-seekers arriving since fall 2015. Its cosmopolitanism attracts and nourishes its dynamic and widely-renowned art scene. Hamburg is also the capital of German media, home to the Axel Springer Group, the weekly news publications *Bild* and *Der Spiegel* and the public radio and television broadcaster NDR.

For Hamburg, this attitude of openness to the world drives the city’s innovation: staying connected to the world operates as a vector of continuous modernization for the Port of Hamburg, which leveraged the power of digital technology to optimize port-related logistics and reduce its environmental impact; the effort to become a top-tier metro area and accommodate new residents across a territory limited heavily by its administrative borders as a city-state has pushed Hamburg to innovate in order to free up attractive new land assets and reveal the potential of dormant assets; its openness to the economy enables Hamburg to invent new forms of public-private cooperation that benefit regional projects; finally, coping with the demographic shock of welcoming asylum-seekers in fall 2015 also forced Hamburg to rethink its housing and integration policy for the long term.

Hamburg is without question a city of contrasts: a city connected to sea and land, one of the richest cities in Germany that also has an unemployment rate at the national average (7.6%), a city with a rich history of which little trace remains in its contemporary urban planning, a city marked by a high level of cooperation between local stakeholders as well as a vibrant spirit of protest… And yet, from these contrasts there emerges one common trait: in the face of all the transformations impacting the city, the city-state and all its stakeholders have always shown a firm determination to take action and innovate.

Historical buildings and recreational places

Hamburg City Hall - seat of Parliament and Senate.

St. Michael church - Lutheran church built to the glory of the Archange Saint Michael, now a symbol of this city.

Speicherstadt - former warehouse area of the port of Hamburg.

Jungfertnstieg Street - first paved street of Germany in 1838 and central axis of Hamburg near the inner lake Alster.

Deichstrasse - Hamburg's oldest street in the heart of the Speicherstadt.

Miniatur Wonderland - attraction reproducing a large network of transport miniature.

Reeperbahn - large avenue and main axis of the "red" district of the city.

Notable districts

Neustadt - cultural district housing the opera, the Saint Michael church, the inner lake Alster and the Elbpromenade.

Alstadt - old town and historical heart of Hamburg.

HafenCity - made up of ten different neighborhoods, the result of an ambitious urban development project.

Rotherbaum - where beautiful white villas sit next to the University of Hamburg, one of the largest in Germany.

Karolinenviertel - quiet neighborhood home to countless designers.

Sternschanze - trendy area.

St. Pauli - known for its nightlife and Reeperbahn.

Hamburg in 15 key dates

832 First mention of the name "*Hammaburg*", composed of "*Hamm*", the name of a village with a baptistry built by Charlemagne, and "*Burg*", a small fortress erected to protect the baptistry.

1161 Beginnings of the Hanse, a guild of North German merchants, who formed an alliance to develop regional sea trade and provide mutual protection against North Sea pirates and nearby competitors. In 1241, the cities of Lübeck and Hamburg signed a commercial treaty, or "*Hansa*", which became a pivotal step in developing trade and allowing colonists to settle in the eastern part of the country. Its status as a crossroads led to its exceptionally fast development and formed its strategic position along trade routes of the era.

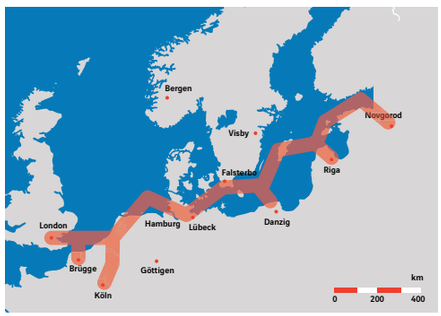


fig. 1

Primary trade routes of the North German Hanseatic League.

17th and 18th centuries Hamburg enjoys beneficial trade with Spain and Portugal and expands demographically, culturally, and economically.

fig. 2

The Great Fire of Hamburg in 1842.

1842 From May 5-8, 1842, a massive fire (*Großer Brand* or Great Fire) destroys 25% of the city, including many warehouses. In all, nearly 20% of the city's buildings burned down. English architect William Lindley oversaw the rebuilding efforts and took the opportunity to modernize the city, notably by redesigning the entirety of its sewer system.

1952 Ratification by the city-state's Parliament of the Constitution of the Free and Hanseatic City of Hamburg on 6 June 1952.

1962 The North Sea flood causes a water surge along the Elbe River in Hamburg. Water levels rise to six meters, destroying nearly 20% of the city and causing several hundred deaths. Helmut Schmidt, the city's Senator of the Interior at the time, is later applauded for his management of the crisis and rapid action in the face of extensive damages.

fig. 3

Flooding of Hamburg in 1962.

1991 Creation of a new regional structure called *Metropolregion* Hamburg, composed of 17 districts spread across three *Länder* (Lower Saxony, Mecklenburg-West Pomerania and Schleswig-Holstein), ushering in a new form of regional cooperation in the metropolitan region.

fig. 4

Perimeter of the *Metropolregion*.

1996 A new masterplan for the city-state of Hamburg is enacted, that departs from the historic plans developed in 1921 by Fritz Schumacher, which guided the city's development along axes extending outward from downtown. The new plan privileges two new development priorities: densification of the city center core and expansion of the city onto its river island.

fig. 5

Model of the HafenCity project in Hamburg with the Elbphilharmonie in the foreground.

2000 Approval of the HafenCity masterplan (157 hectares), one of the world's most ambitious urban redevelopment projects, with the aim of transforming the former harbor into an innovative urban district featuring high-quality construction and a strong connection to the rest of the world.

2011 Hamburg is named a European Green Capital. This annual award recognizes cities for their commitment to urban and social policies that improve the environment and quality of life.

2013 Two major events take place in the same year on Hamburg's island of Wilhelmsburg, Europe's largest inhabited river island, whose vulnerability and specific urban development needs were revealed by the 1962 flood:

- Inauguration of the International Building Exhibition or IBA (*Internationale Bauaustellung Hamburg-Wilhelmsburg*), which caps off the regional development project begun in 2006 by the City of Hamburg to promote the development of innovative and inspiring urban projects led by international private stakeholders. In 2013, more than 420,000 visitors came to see 70 projects completed for the exhibition.

- The International Garden Show or IGA (*Internationale Gartenbauaustellung*), which, together with the Floriades in the Netherlands, is one of the largest gatherings of international landscape experts since the mid-19th century. In 2013, the Hamburg show (*Internationale Gartenschau Hamburg – IGS*) brought together some 400 exhibitors but attracted fewer visitors than expected. The temporary gardens were transformed into a park called the Wilhelmsburger Inselpark. Wilhelmsburger Inselpark.

2013-2020 Encouraged by the success of the Hamburg IBA, the city decided to continue its urban development strategy focused on its southern districts, known as the "leap across the Elbe" (*Sprung über die Elbe*).

fig. 6

Speicherstadt district listed as a UNESCO world heritage site.

2015 Two harbor districts, spanning 370,000 m², join the list of UNESCO world heritage sites for their status as exceptional examples of the city's transformation into an international metropolis: Speicherstadt, one of the world's largest coherent ensembles of port warehouses, and the Kontorhaus ("trade counter") district, an area built to house port-related business transactions and now seen as Europe's first business district.

2017 Completion of the Elbphilharmonie on the far west end of HafenCity. Designed by Swiss architects Herzog & de Meuron, this cultural monument and emblem of Hamburg stands on a former warehouse (*Kaispeicher A*). The remarkable glass facade built on top of the concrete base gives the building the appearance of a ship at sea. Construction required ten years and cost ten times the initial budget (865 million euros).

fig. 8

The Elbphilharmonie, connecting the city to its port and the Elbe with its "plaza", an intermediary public space creating a transition between the original warehouse structure and its extension.

fig. 7

Chilehaus, an iconic building in the Kontorhaus district, built by Fritz Höger for Henry B. Sloman.

2017 12th G20 summit organized in Hamburg on July 7-8. Riots and violence accompany the event.

fig. 9

G20 summit in Hamburg.

City fact sheet

fig. 10 View of Hamburg at the start of the 20th century (postcard).

1st German commercial port.

11,000 ships/year
9 million containers/year

1st German *Land* by per-capita GDP in 2015 with €61,729 per capita.

Neighboring *Länder*:
Schleswig-Holstein €30,134 per capita.
Lower Saxony €32,890 per capita.
Mecklenburg-Vorpommern €24,910 per capita.

Richest *Länder*:
Bremen €47,603 per capita.
Bavaria and Hesse ± €43,000 per capita.
Baden-Württemberg €42,750 per capita.
Berlin €35,627 per capita.

The national average in Germany in 2016 was €41,267 per capita.

2nd most populous city in Germany after Berlin with 1.8 million inhabitants in 2017.

Berlin 3.6 million
Munich 1.5 million
Cologne 1 million

3rd **European container port in 2015 with 8.8 million containers, after**

Rotterdam 12.2 million containers
Antwerp 9.6 million containers[3]

7th **most populous city in Europe.**

9th richest *Land* in Germany with GDP of 109 billion euros in 2015, or 3.6% of total German GDP.
For reference:

Schleswig-Holstein 85 billion euros
Lower Saxony 258 billion euros

Richest *Länder*.

North Rhine-Westphalia 645 billion euros
Bavaria 550 billion euros
Baden-Württemberg 460 billion euros
Berlin 124 billion euros

Germany's total GDP in 2015:

3,479 billion euros[4].

10th **least stressful and most livable city in the world[5].**

17th **global container port in 2016[6] with 8.9 million containers.**

These ports are on top of the list:
Shanghai - China - 37 million containers
Singapore - City-state – 30 million containers
Shenzhen - China - 20 million containers

5.2 **million residents in 2017 in the *Metropolregion* of Hamburg.**

16.2 **million passengers/year at the Hamburg-Fuhlsbüttel international airport in 2015.**

130 destinations
65 airlines

Capacities across two terminals:
8 million passengers.

For reference in 2015:
London-Heathrow airport 75 million passengers
Roissy Charles-de-Gaulle airport 67.7 million passengers
Istanbul-Atatürk airport 62 million passengers
Frankfurt airport 61 million passengers[7]

755 **km² of surface area.**

2,366 **residents/km².**

+ 18,000 foreign nationals:

positive net migration to Hamburg through the end of 2015[8]
(44,000 immigrants and 26,000 emigrants).

Germany's strategic interface

Germany's strategic interface

The *Land* of Hamburg (cf. figure 10) is now Germany's richest federal state in terms of per-capita GDP and the 9th richest state in terms of total GDP. The city-state is the country's second most populous city (1.8 million residents in 2017). Its current position as a demographic and economic leader of Germany should be understood in the context of its position as a hub and its legacy as a Hanseatic and commercial city.

A Hanseatic legacy of openness and trade

The Hanse, or merchants' guild, was formed in the 13th century to enable merchants to coordinate trade in the North and Baltic Seas, which allowed them to access new markets and provide mutual protection against pirates.

In this way, the German Hanse was founded in 1241 between the cities of Hamburg and Lübeck. Hamburg capitalized on its connection to the Baltic Sea and the North Sea via Lübeck, located at a distance of 70 km, as well as its position as the seat of the Hanse to expand its economic activities and solidify its policy of openness and accommodation that would continue throughout its history. Both cities were thus able to control a strategic regional corridor, which included the isthmus of Holstein, and to dominate trade in Northern Europe.

This association of merchants, or commercial interest union, rapidly expanded to become a Hanse spanning several cities across Northern Europe, uniting Cologne, Bremen, Brunswick, and Danzig to form the Hanseatic League. At its peak in the 15th century, nearly 200 cities had joined the commercial network, foreshadowing the eventual formation of the European Economic Union.

Affirming its position as a crossroads

The free and Hanseatic city of Hamburg, another name it inherited from the 19th century, also owes its success to its location **on the Lower Elbe estuary.** One of the major rivers in Central Europe and Germany, the Elbe draws its source in the Czech Republic and flows into the North Sea via an estuary spanning 100 kilometers.

Together, the Elbe and the Rhine, as the largest rivers in the country, account for the majority of German maritime traffic and thus constitute two major transport routes that have played a crucial role in the country's growth. Serving a large portion of Eastern and Northern Europe across 615 kilometers of navigable waters (not including the estuary), the Elbe thus enabled Hamburg to become **an interface between Europe and Asia and a major commercial crossroads.**

fig. 11 Germany's 16 *Länder* and their capitals.

Water: a constraint and an advantage

As a city of confluences – the Elbe, Alster and Bille converge in this region – Hamburg is a city marked by water and its simultaneously beneficial and detrimental presence. Its location within a flood zone has imposed topographical constraints which, over the years, have served to shape the city and its architecture (cf. figure 12).

fig. 12 Elbe drainage basin.

Managing flood risk: a key priority

Due to its position within an estuary, Hamburg regularly experiences floods that temporarily paralyze its activities and port. Since the devastating flood of 1962, which caused extensive damages and hundreds of deaths (cf. figure 13), the city has withstood eight storm surges with waters rising above the level reached in 1962. However, the city managed to contain these surges by installing an efficient flood protection system.

Since 1962, **the city-state has made flood protection a key priority managed under its direct responsibility. To that end, it unified several stakeholders,** such as the National Authority for Roads, Bridges and Waterways (*LSBG - Landesbetrieb Straßen, Brücken und Gewässer*), the Hamburg Port Authority (HPA), the Federal Maritime and Hydrographic Agency (*BSH – Bundesamt für Seeschifffahrt und Hydrographie*) and the Department for Urban Development and the Environment (*BSU - Behörde für Stadtentwicklung und Umwelt*)[9].

Through this cooperation, the city has built 103 kilometers of reinforced dykes, averaging 2.5 meters in height, as well as additional flood protection structures, commonly referred to as the "main protection line" ("*Hauptdeichlinie*"). Following an inspection by the National Authority for Roads, Bridges and Waterways (*LSBG*), conducted between July 2015 and November 2016, the city identified ten new floodplains (raising the total to fifteen) enabling it to protect against severe high waters along the Elbe. These floodplains serve to contain the high waters generated by storm surges, as well as inland floods. The city informed locals residing in the flood zones of the risk through a consultation process[10].

Also in connection with its flood protection plan, Hamburg has implemented accurate and reliable services for communicating with its residents and port. All residents have access to a transnational flood warning portal[11], as well as a map of the city's flood control areas. The city also set up televised warnings, loud-speaker alerts, and a system for sending emergency notifications to mobile phones called *Katwarn*[12].

However, the line of dykes erected by the city does not protect all of Hamburg's residential areas, such as the new districts of HafenCity and the Wilhelmsburg island. Furthermore, despite these protective measures and the commitment of all the relevant authorities, some floods may still overwhelm the city's containment capacity. For example, the flood of October 2017, triggered by Cyclone Herwart which raged across Central Europe, flooded the low-lying areas around the banks of the Elbe and caused extensive damages.

fig. 13 Hamburg flood of 1962.

Water as an element of architectural and urban design

Hamburg developed over the centuries with the presence of water and its associated risks, while always seeking to transform its waterways into a vector of its identity through a blend of pragmatism and aesthetics, as well as engineering and architectural talent. In addition to the flood protection they provide, the city designed its 64 kilometers of canals, dykes, and 2,300 bridges (more than Venice and Amsterdam), as well as the area around the Binnenalster and Aussenalster lakes, to function as urban and landscape design elements offering intrinsic aesthetic value and embellishing the surrounding buildings (cf. figure 14).

In this way, these waterways still contribute to the city's charming and lively atmosphere. The Elbphilharmonie was designed to fit snugly within this tradition. Its architecture pays tribute to the city's waterways, while also recognizing that it can never fully master this element.

The historic port warehouse district of Speicherstadt attests to the exemplary and ingenious communication network put in place between streets, bridges, and canals to encourage the expansion of trade in Hamburg. Developed between 1885 and 1927 across a network of short canals, this former commercial zone of 300,000 m² specialized in the transshipment and storage of merchandise arriving from the port. The city's network of bridges and waterways connected 15 major warehouses up to seven stories tall, as well as six secondary warehouses. Built parallel to a canal on one side and a street on the other, the warehouses included facades on both sides to facilitate their two activities of offloading wares and selling merchandise directly on site (cf. figure 15).

The customs canal separates the Speicherstadt district from downtown, while bridges of various size span the area's subsidiary canals. This remarkable and unified architectural ensemble displayed a bold and modern style for the era, pairing the red brick of the warehouses with the steel arches of bridges, and was listed as a UNESCO World Heritage Site in 2015.

Today, the city's architecture and planning continue this tradition of urban composition that offers a blend of flood protection and vibrant urban design. The newly built river promenade on top of the city's flood protection structures (renovated since the flood of 1962) in Hamburg's inner port, or Niederhafen ("lower port"), stands as one example of this tradition.

Between 2006 and 2012, Zaha Hadid Architects designed an urban walkway spanning 750 meters between the Speicherstadt[13] warehouses and the Landungsbrücken piers in the northwest corner of HafenCity, a new district developed in the former port and adjacent to downtown, with the aim of densifying the city and improving quality of life for Hamburg residents. This urban promenade, recognizable by its distinct stairways which connect the city to the banks of the Elbe, stimulated the renewal of this previously underutilized area, while enhancing the district's flood protection (cf. figure 16).

fig. 15 Cross-section of the urban customs canal and the free port zone in the Speicherstadt district.

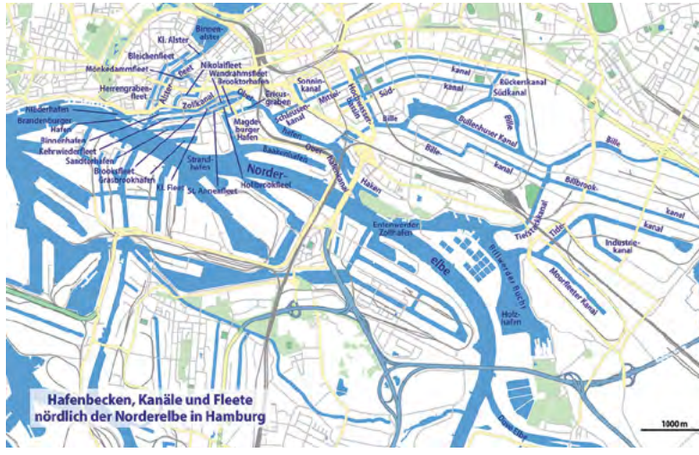


fig. 14 Network of canals in Hamburg.

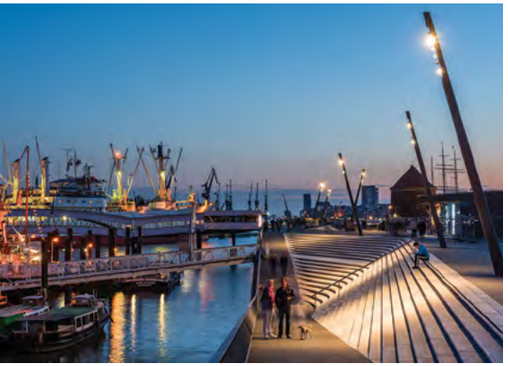


fig. 16 Stairs along the urban promenade in Hamburg's inner port, built into flood protection walls.

fig. 19 View of the Elbphilharmonie's foundation, which provides flood protection.

Buildings in these newly created neighborhoods display an architecture that seamlessly integrates flood protection while forging a unique identity, successfully combining resilience and sustainability with respect to the risks of climate change (cf. figure 17). Exemplifying this is the group of commercial buildings, offices and residences along the outer quays of Am Sandtorkai and Dalmannkai, both remarkable for their resilient architecture.

Equally representative of this style of architecture is the headquarters of Germany's leading newspaper, *Der Spiegel*, situated in the heart of HafenCity (cf. figure 18). Built on a foundation rising eight meters above sea level, the ground floor features metal doors strong enough to hold back surging waters, further reinforcing the building's flood protection. Other buildings in the neighborhood display a mixed-use blend of commercial and residential space. However, for safety reasons, residences are not authorized on the first level.

Another figure of Hamburg's resilient urban planning is the Elbphilharmonie, situated on the western point of HafenCity. Built atop a former port warehouse, it consists in a majestic concrete addition raised eight meters above sea level and distinguished by its magnificent glass facades. The building's impressive height protects it from potential flooding (cf. figure 19).

fig. 18 The headquarters of newspaper *Der Spiegel*, resilient to high waters on the Elbe.

fig. 17 Bridge in the Speicherstadt district.

The Elbphilharmonie: an architectural icon and a symbol of openness

Designed by the Swiss architects Herzog & de Meuron, the Elbphilharmonie (cf. figure 20) was inaugurated on January 11th, 2017 after 10 years of work. With a surface area of 120,000 m^2, the monument has become an emblem of the city by virtue of its architecture and its position at the point of the Speicherstadt district, or "Warehouse City", on the west end of HafenCity. By opening onto the port, the Elbphilharmonie symbolizes a bold form of modern and resilient construction that remains exposed to winds, the risk of collision with container ships and floods.

fig. 20 Construction of the Elbphilharmonie.

In 1875, the building's current location was home to Kaispeicher A (cf. figure 21), Hamburg's largest port warehouse and the only port warehouse offering access to commercial ships at the time.

Demolished in 1963 due to damages sustained during the Second World War, the new Kaispeicher A warehouse, more modern and dedicated to storing merchandise like tea, cocoa, and coffee, was built in 1966. Rendered obsolete by the arrival of containers in commercial shipping and changes to the Port of Hamburg, the warehouse remained vacant until the early 2000s, when it was acquired by Alexander Gérard, German architect in charge of Hamburg Plan Planner and Engineers GmbH, a group of urban planners, architects, and engineering companies dedicated to complex urban planning projects in Germany and abroad. Under its direction, Herzog & de Meuron Architects proposed their first model of the Elbphilharmonie in 2003.

Resembling a massive ocean liner, it comprises two prestige concert halls, one hotel, and luxury apartments with views of the Elbe, the city, and its port. The building's panoramic plaza, situated 37 meters above ground at the juncture between the former warehouse and the new glass facade, offers the public a unique view of the city and port. Freely accessible to all visitors, the terrace greatly contributed to the building's current reputation and appeal.

fig. 21 The Kaispeicher A in 1875, largest port warehouse in Hamburg at the time.

Key figures of the Elbphilharmonie

Original budget	77 million euros
Final budget	865 million euros
Financing: city-state of Hamburg	789 million euros
Donations	76 million euros
Architects	Herzog & de Meuron (Switzerland)
First sketches	2003
Start of construction	2 April 2007
Inauguration	11 January 2017
Surface area	120,000 m^2
Weight	200,000 metric tons
Number of glass panels	1,100
Number of floors	25
Maximum height	110 meters
Plaza height	37 meters
Number of luxury apartments	25 (from €21,000/m^2 to €154,000/m^2)
Number of luxury hotel rooms and suite	244

City of exchange and media

As a prosperous city, Hamburg has for centuries maintained a tradition of trade and openness. It was once an essential part of the Hanseatic League, which dominated Europe's principal trade corridor from the 13th to 15th centuries. It is a city of passage, through which populations and merchandise make their way to other European cities.

The *Hansestadt* (or Hanseatic city) is now home to nearly 3,000 import/export companies. **Its commercial port**, one of the largest in Germany, connects the city to South America and Asia. **It accounts for 15% of the city's jobs and 20% of its GDP. Nearly 57% of goods transiting through the port continue onward to inland Europe,** with the rest going to international trade.

Another hub of the country's economy, Hamburg's Helmut Schmidt airport claimed the 27th spot in the 2017 ranking of the world's 100 best airports,

compiled by the Skytrax World Airport Awards (or Passengers Choice Awards)[14].

The ranking is based on a customer satisfaction survey conducted between 2016 and 2017 among 13.8 million travelers at 550 airports worldwide. With 16.2 million passengers in 2016 and 4% growth in passenger traffic between 2015 and 2016, the Hamburg Helmut Schmidt airport is Germany's fifth busiest airport, topped only by Frankfurt, Munich, Düsseldorf, and Berlin. Fully renovated between 2007 and 2008, it is now seen as one of Europe's most modern airports.

Furthermore, the city has for decades played host to a bustling cultural life tied to the media. 15 of Germany's top 20 newspapers are published in Hamburg. Germany's most widely read weekly newspaper, *Die Zeit*, counted nearly 2,340,000 readers in 2017 and sold 504,000 copies a week. Another major German newspaper, *Der Spiegel*, launched in 1947 (with a digital edition *Spiegel Online* since 1994), sold 768,500 paper copies in the third quarter 2017, representing a slight dip from 2015 due to competition with the web editions. By comparison, sales of the weekly newspaper *Stern*, a rival of *Der Spiegel* and one of the major European news magazines published in the city, sold 590,634 copies over the same period (third quarter 2017), showing a sharp decline since 2015.

Tagesschau, the national television news show broadcast on Germany's first public station ARD[16] (consortium of German broadcasting companies), is produced in the city on a daily basis. Hamburg is also home to many regional radio stations, such as RTL Nord, Radio Hamburg, and Sat 1 Regional[17].

Printing and publishing also represent a significant share of Hamburg's activity, with more than 2,000 companies present in the city. Advertising also thrives in Hamburg, which numbers more than 8,500 marketing companies. The music industry also has a foothold in the city with the presence of the Warner Music Group Germany and EMI Music Publishing Germany.

fig. 22 The tower radio, one of Hamburg's symbols.

fig. 23 Helmut Schmidt airport, driver of the metropolitan economy.

The port of Hamburg: between modernity and saturation

The port of Hamburg: between modernity and saturation

A central hub for European and international trade

Since the 13th century and the formation of the first German Hanse, Hamburg has capitalized on its location within an estuary to earn its title as the country's "Gateway to the World". The Port of Hamburg rapidly established itself as the leading port of entry for trade and exchange between Central Europe, Eastern Europe, the Baltic and Nordic countries, as well as overseas territories.

Connecting the city to America and Asia (northeast zone, China, and Hong Kong), its biggest partner in terms of container traffic, the Port of Hamburg is now ranked as the 17th largest container port worldwide (cf. figure 24). As Europe's third busiest port after Rotterdam and Antwerp and North Germany's busiest commercial port, **it has emerged as a crucial hub of European trade due to its strong multimodal offering and its close connection to inland Europe.**

Hamburg's port covers nearly 10% of the city's total area. In 2016, some 138 million metric tons of merchandise passed through the port (fruit, spices, coffee, timber, metal, vehicles, raw materials, miscellaneous goods, etc.): 42.7% of this merchandise was intended for export and international trade, with the remaining 57% intended for inland Europe[18].

Altogether, Hamburg's port traffic represents nearly 5,000 metric tons of merchandise per day transferred from ship to train, plane, or truck and requiring state-of-the-art logistics.

Today, the Port of Hamburg concentrates the majority of the city's economic activities and represents a significant employment hub. Its influence stretches well beyond the city's administrative limits to benefit the greater metropolitan region (which includes certain portions of the three *Länder* of Lower Saxony, Schleswig-Holstein, and Mecklenburg-Vorpommern), as well as the rest of the country.

fig. 24 A container ship near the Port of Hamburg.

Multimodal benefits favoring the port's expansion

The Port of Hamburg benefits from facilitated access to the sea and inland areas via its connection to a network of maritime, road, rail, and airport infrastructure.

Maritime connections

The Elbe-SeitenKanal (ESK) is a strategic federal waterway for the Port of Hamburg, spanning 115 kilometers and situated in Lower Saxony, near the city of Artlenburg (cf. figure 25). The canal **connects the port to Germany's river network** and also provides access to the Mittellandkanal (326 km), which cuts across the country from east to west by way of Hanover.

fig. 25 The Elbe SeitenKanal.

Rail connections

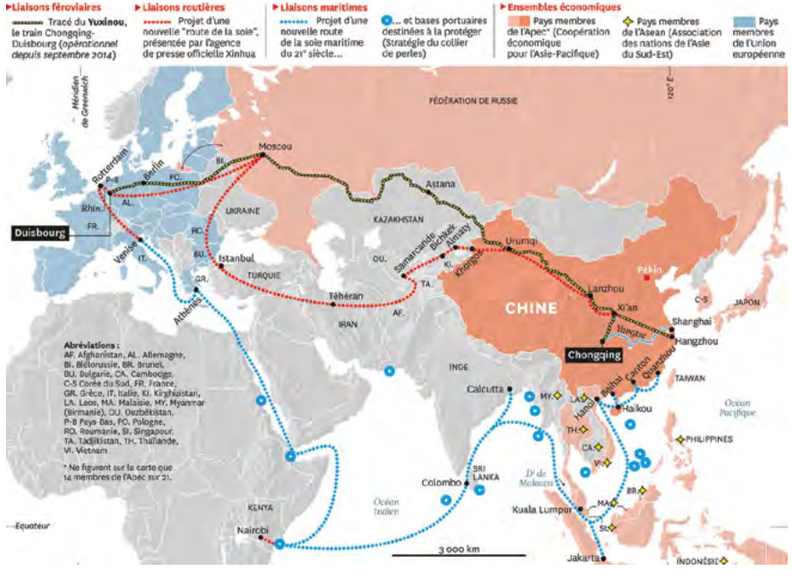
Twice as fast as transporting containers by inland waterways, **global rail freight has experienced booming growth since 2010** (cf. figure 26).

China, Germany's biggest trading partner, invested heavily to stimulate freight transport for containers and merchandise to **Hamburg, Europe's largest rail port.** China can now boost its export volumes via this commercial port open to the rest of the world.

On the initiative of the Chinese government, an initial rail link was set up in 2011 between the cities of Chongqing and Duisburg in the North Rhine. Starting in 2013, a second link of over 11,000 km has connected the ports of Zhengzhou and Hamburg. The new rail infrastructure, called the Belt and Road Initiative, cuts through Germany, Poland, Belarus, Russia, Kazakhstan, and continues to China. Its development required unprecedented transnational collaboration, as well as a loosening of customs inspections at Eurasian border crossings (cf. figure 27).

fig. 26 Transporting containers by rail freight.

fig. 27 Plans for new "silk roads".



Shippers can now transport containers and merchandise between Germany and China within 12 to 18 days, compared with 40 days required for transport by boat. In 2016, nearly 40,000 containers moved between the two countries by rail freight. Between now and 2020, Deutsche Bahn intends to transport up to 100,000 containers via this connection[20].

In addition to its role as an international hub of rail freight for containers, **the Port of Hamburg is Germany's second-largest inland port** thus benefitting from a strong connection to the country's inner regions. 300 kilometers of railways owned by Hamburg Hafenbahn enable more than 200 trains and 5,000 railroad cars per day to depart from its port infrastructure towards destinations throughout Germany and Europe, which represents 1,300 merchandise trains departing every week for a total volume of 46.4 million metric tons of goods transported in 2016.

Transporting goods by rail freight from the Port of Hamburg to inland Germany represented more than 46% of the total modal share in 2016, compared with 11.5% for inland waterways and 41.8% for trucks.

Transporting goods by rail freight from the Port of Hamburg

In the same year, container transport to inland regions occurred at a rate of 42.3% by rail freight, 2.1% by inland waterways and 55.6% by truck.

However, this strengthened position as a **nexus of global trade** has led to an increase in traffic to the port, forcing it to carry out renovations to avoid saturation and keep pace with global competition among commercial ports, particularly in the face of increased competition from Chinese infrastructure.

Road network

With nearly 130 km of roads stretching into inland areas, road transport of merchandise and containers from the Port of Hamburg represents nearly half of the modal share of traffic towards inland Germany (cf. figure 28).

40,000 trucks travel every day along the port's main highway, crossing 62 road bridges and increasing traffic congestion.

Traffic jams created by this increased volume of merchandise managed by the port and transported by road have repercussions on quality of life for Hamburg residents, an issue the port authorities have attempted to solve using the Internet of Things (IoT)[22].

A looming risk of saturation

Given its central position within Europe and the rise in global trade volumes it receives, notably with China, **the Port of Hamburg will likely exceed capacity by 2025.** At that point, the port authorities expect to receive between 14 and 17 million containers per year, compared with 9 million today, well above the port's estimated logistics capacity of 10-11 million containers[23].

Lacking the option of expanding into the dense surrounding areas or creating polders like Rotterdam, the port must find a way to contend with a steady rise in the movement of goods, notably by road, leading to severe traffic congestion problems – as well as tension with locals forced to cope with the situation.

The Hamburg Port Authority (HPA) wholly owned by the city, **is therefore investing efforts to renovate and digitize its infrastructures.** It hopes to coordinate the various players and vehicles that interact and circulate in the port, while developing optimization strategies to ease intra-port traffic and substantially reduce the congestion seen today.

fig. 28 Transporting containers by road.

Hamburg Port Autority: a crucial interface between the port and the outside world

A public institution, the Hamburg Port Authority (HPA) is the communication interface between the port, international shipping companies, and all other stakeholders: customs authorities, road and rail transport companies, warehouse managers, terminals managed independently by private companies.

Its primary missions include:

- Carrying out permanent, sustainable, and innovative infrastructure projects on the port
- Ensuring maritime traffic safety and security, as well as the efficiency of existing port infrastructure, such as quays, bridges, and roads
- Managing road and rail traffic to enable rapid transshipment and limiting congestion at the port's exit and its impact on congestion in the city
- In charge of the economic management of port areas owned by the city, outlining the economic conditions in force
- Serving as a hub of essential information about the port's activities and driving the long-term strategy based on the Internet of Things, called smartPort, a system launched in 2009 that showcases the future of ports.

fig. 29 The Altenwerder Terminal at the Port of Hamburg and its self-driving vehicles.

Internet of Things: a lever for modernizing the port

The issues of congestion and saturation confronting the Port of Hamburg led the port authorities to reflect on an adequate adaptation strategy in 2005. In 2009, the HPA kicked off a vast program to modernize its infrastructure and optimize flows (maritime, rail, and road), based on the Internet of Things. The innovative nature of this program compelled us to examine it in greater detail in our study on urban logistics, Feeding and Fueling the City[24].

Through this large-scale program dubbed **smartPORT**[25], the HPA has focused its efforts on two key priorities: **smartPORT Logistics**, a group of 20 projects centered on managing traffic flows, port-related infrastructure, and merchandise transfers, and **smartPORT Energy**, whose projects center on sustainable energies, reducing consumption, and green mobility. The program received the support of the Ministry of Urban Development and the Environment of Hamburg, as well as the Ministry of Transport, Innovation and Technology[26].

To reach its goal of maintaining, modernizing, and perfecting infrastructure and logistics at the Port of Hamburg, **the HPA began a collaboration in 2014 with American tech giant CISCO Systems, with the aim of harnessing the power of data**[27].

IoT was selected as the backbone of the port's strategy for collecting data in real time from the maritime, road and rail traffic management systems, in order to plug any communication gaps.

Connected road infrastructure

To optimize travel for the 40,000 trucks that leave the port of Hamburg every day, sensors installed on road infrastructure analyze traffic speed, slow-downs, available parking spots, and vehicle weight to anticipate bridge maintenance and traffic jams.

Using Bluetooth technologies and video detection, road movement is examined at all times using EVE (Effective depiction of the traffic situation) and DIVA (Dynamic information on traffic volumes) systems[28]. For parking needs, the location of parking lots and number of available spots for trucks is listed on display panels at the port entry and exit routes.

Self-driving vehicles in the terminals

The HPA will employ self-driving vehicles to improve the operation of its logistics infrastructure. The new Altenwerder terminal is entirely automated (cf. figure 29): 84 self-driving trucks drive 24 hours a day, seven days a week. These computer-driven vehicles rapidly load and offload containers from ships to trucks. Whereas a conventional terminal can process 20-30 containers an hour, the Altenwerder terminal can move 50-60 in the same amount of time. The terminal has thus sped up the movement of goods and boosted efficiency by 30%. The Port of Hamburg now plans to modernize every terminal to continue optimizing its flow management.

Conflicting ties between the city and its port

Despite the efforts of HPA and Cisco Systems to anticipate and regulate traffic on road and rail networks as well as waterways, the port's activity generates tensions within the city, including the following main areas of conflict:

Regulation of maritime flows

Regulating maritime flows, an operation overseen by Nautical Bureau Hamburg using radars and automated detection systems, makes it possible to inform drivers about potential delays on container ships. With this information, they can choose to wait at external parking lots to limit congestion in the port. The HPA also works in partnership with other ports on inter-port travel to regulate ship cruising speeds in advance and issue congestion alerts. To that end, sharing data with ships (cargo, size, location, itinerary, departure time) is essential. Currently, the HPA is working on this project in partnership with the Port of Shanghai.

The goal is to relay this information to the IoT rail system in order to boost its productivity.

Optimized rail transloading

The HPA also plans to maximize traffic by modernizing port access for rail. The port has begun optimizing train entry and exit using a computer platform, **transPORT,** which collects various data like arrival times, delays, cargoes, available space in train cars, itineraries, etc. The Port of Hamburg thus operates a modern computer system enabling it to manage rail traffic with precision.

Congestion that increases traffic throughout the city

In September 2017, the ports of Hamburg and Bremerhaven were declared "congested ports"[29] by their port authorities. This is no new phenomenon and, from year to year, the Port of Hamburg has maintained its top spot in terms of traffic jams.

According to data provided by the Tom-Tom traffic app[30], travel times around the port have increased by one third in recent years. In 2015, the average delay caused by road traffic increased by 30%. As a result, **25% of the city's highways were congested in 2015.**

On top of the increased traffic from containers and goods moving through the port, the passage of large container ships can temporarily close road and rail traffic along raised bridges, such as the bridge on the Rethe in the Port of Hamburg.

Since local road traffic and trucks carrying containers to inland regions share these bridges, each temporary closure triggers backups that punish commercial traffic and Hamburg residents alike, while also increasing pollution.

Furthermore, the stress caused by thousands of trucks circulating along the bridges and highways serving Hamburg's port area takes a physical toll on port and road infrastructure. Extensive maintenance needs lead to long-term construction. Repairs on highway A7, which runs through the port, are notably scheduled to carry on through 2022. These works partially block traffic along main roads.
A cluster of related factors (increased maritime traffic, detours, truck delays, etc.) contributes to the congestion currently seen on the edge of the port. This traffic then reverberates into Hamburg.

Urban expansion vs. port expansion

To absorb the growth in its population and activities, Hamburg and its port are now seeking new space available for expansion projects – even as Hamburg's status as a city-state prohibits any development beyond its administrative limits, at the risk of losing its special rights[33].

The port has gradually expanded along the Elbe banks to cover nearly 10% of the city's area. Historically, the land owned and allocated to the port by the City of Hamburg changed continuously over time depending on the need for port infrastructure. Due to silting along the Elbe, the emergence of new types of ships and the development of trade in the country's inland areas, requiring privileged access to rail and road infrastructure, the port was forced to modernize or expand elsewhere, running the risk of further conflict with locals due to land scarcity.

Regarding the city, **Hamburg opened an important new front in urban planning** with its project to redevelop a former port platform into an upscale residential district, HafenCity.

However, tensions arise less from competition for land than from the increasing proximity of the port and city, as well as Hamburg's productive and residential functions. The two spaces respond to separate demands that are difficult to reconcile: for the port, constant activity continuing day and night coupled with heavy infrastructure and substantial environmental impacts; for the city, high ambitions in terms of quality of life and the environment, notably in Hamburg's new showcase in HafenCity.

In this way, the city and port have long maintained an ambivalent relationship built equally out of close cooperation (both need each other) and tensions resulting from their frequently opposed stakes and challenges.

The challenge of creating a dense urban area[35]

While Hamburg is widely known for the international reach of its modernized port, as a central hub of exchange and commerce, the city also encourages local initiatives aiming to improve last-kilometer logistics throughout the old city. Consisting largely in narrow streets, **central Hamburg is now congested** due to steady road traffic originating from the port, as well as **commercial vehicles** parking in disorderly fashion due to a lack of available spaces[36].

fig. 30 UPS delivery tricycle parked in a German street.

For almost a year, the City of Hamburg has worked in partnership with logistics company UPS to develop small-scale distribution centers at several locations throughout the historic city center in order to provide sustainable last-kilometer service to locals. With this system, 300 to 400 packages are dropped off every day in the early hours of the morning. Next, the packages are delivered on foot or by bike within a radius of 2 to 2.5 km (cf. figure 30). According to Frithjof Büttner, director of the Business Improvement District program with Hamburg's department of urban planning and development, whom *La Fabrique de la Cité* interviewed for our work on urban logistics Feeding and Fueling the City, one container per neighborhood suffices to ensure sustainable last-kilometer delivery.

Initial feedback has shown that the system has eased traffic, freed up parking spaces, and reduced polluting emissions. However, UPS is redesigning the style of the infrastructure so that the centers blend more seamlessly into their urban surroundings. The company is notably planning to develop a platform that can conceal the container underground overnight. Other cities have expressed an interest in the project, including Dublin, Essen, and Cologne.

fig. 31 Skyview of Hamburg port in 2005.

fig. 32 Skyview of Hamburg docks in 2017.

An ambitious policy of cooperation to support an urban renewal policy

An ambitious policy of cooperation to support an urban renewal policy

Hamburg, a city-state divided between broad powers and heavy spatial constraints

Hamburg benefits from its special status as a city-state, a status it shares with only two other cities: Bremen and Berlin. This status dates back to the 12th century, with the first mention in historical texts of a free city charter granted by the Emperor Frederick Barbarossa to Hamburg in order to allow the unencumbered expansion of its mercantile activities across both land and sea[38]. Today, this status continues to grant the city its own governance body and expanded prerogatives, by enabling it to **exercise the powers of a *Land*, urban district, and municipality across the extent of its territory.** Like other municipalities, the city-state manages municipal streets, granting driver's licenses, waste management, sewage removal and cultural sites; like other Länder, it determines its own policy in terms of schools, culture, transportation, higher education, internal security, regional development, and environmental matters. Still more importantly, as a Land, Hamburg holds **seats in the German Parliament[39] (*Bundestag*).**

City-state status constitutes a major advantage for Hamburg, just as it imposes heavy constraints.

First, one major benefit: this status gives the city complete control over its destiny through a robust governance system, while also granting it the right to intervene in federal laws and weigh in during international negotiations. The latter point notably played a major role in managing the city's migrant crisis in fall 2015.

Next, a constraint: as a city and a Land, Hamburg can only exercise its authority over the strictly defined limits of its territory. However, the city's greater urban area extends well beyond these boundaries. **For this reason, it must densify, build vertically, and develop a shrewd land and real estate management policy to avoid losing any of its activities or residents to neighboring *Länder* (HafenCity); next, it must develop new forms of regional cooperation with not one but three other *Länder*, in order to continue benefiting from all the resources available within its metropolitan area (*Metropolregion*).**

Metropolregion Hamburg: a governance scale suited to a prosperous metropolitan area

Germany first created its *Europäische Metropolregionen* (EMR) in 1995 with the aim of forming major hubs with international reach that would drive the country's economic, social, and cultural development, strengthen its productivity and competitiveness and ensure its role and rank in Europe. 11 such regions currently exist, including the metropolitan region of Hamburg (cf. figure 33).

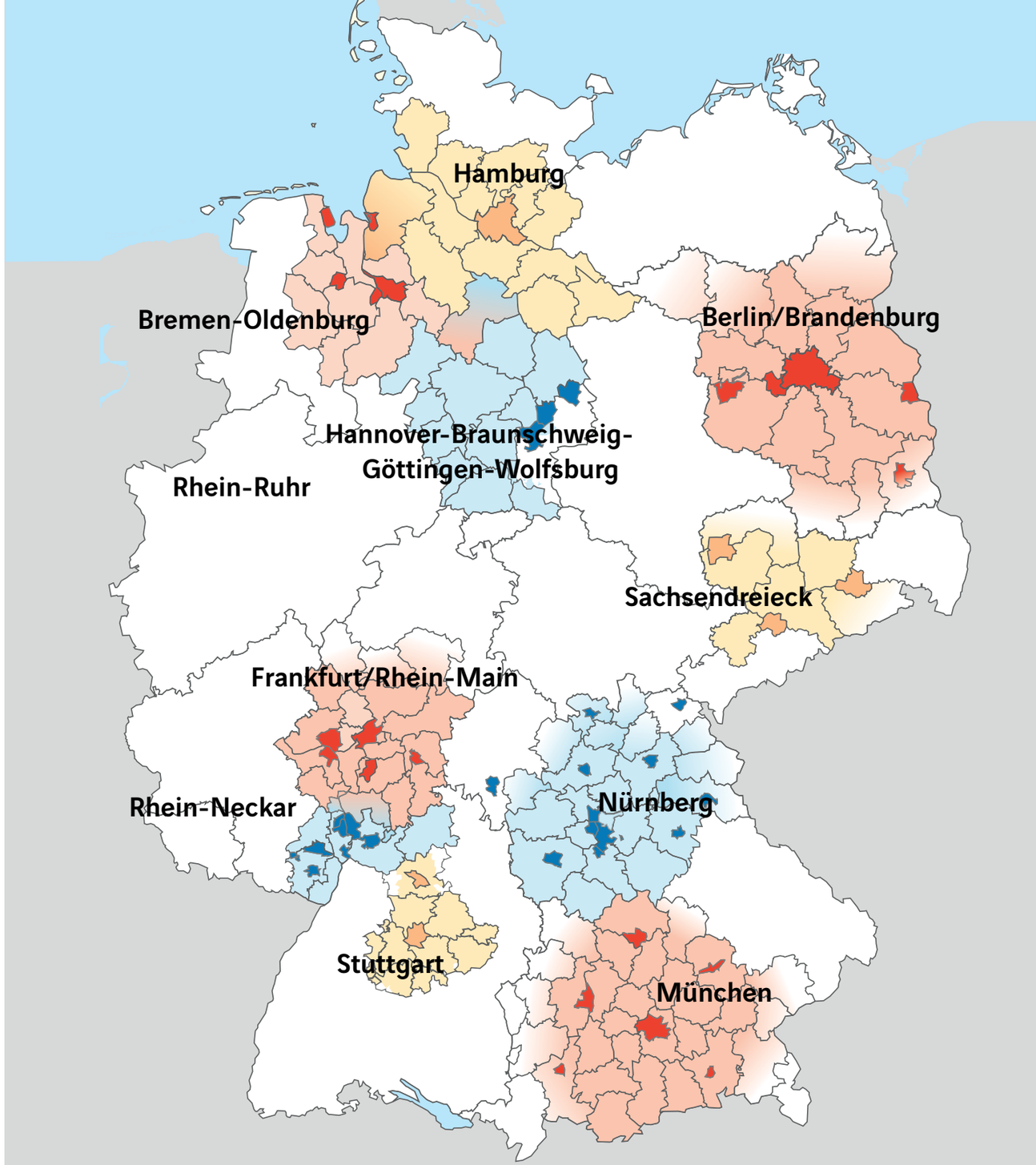


fig. 33 German metropolitan areas.

Hamburg claims a metropolitan area that extends well beyond its administrative boundaries.

The *Metropolregion* stands as an attempt to better reflect the unified nature of this metropolitan area. In addition to the city-state, it also comprises eight rural districts of Lower Saxony and six districts of Schleswig-Holstein, spanning a territory of 19,800 km², 800 municipalities and a population of 4.3 million residents (+2.7% demographic growth since 2000). This flexible style of regional cooperation enables the three *Länder* to align and **pool their actions in terms of investments, economic development and regional marketing, in order to assert their role as powerful engines of growth on the national level.**

This cooperation primarily concerns the following priority areas: housing, public services, transport and, especially, building ultra-efficient infrastructure, developing high levels of expertise, innovative businesses and internationally recognized universities – as well as combating climate change.

To achieve its goals, the *Metropolregion* set up two development funds in 1962 to improve its structure and development: 1) the **Hamburg/Lower Saxony fund,** and 2) the **Hamburg/Schleswig-Holstein fund.** The first fund receives 1.2 million euros from the city-state and Lower Saxony every year, while the second fund benefits from an annual grant of 1.7 million euros from the associated *Länder.*

In total, the two funds have invested 54 million euros into the *Metropolregion* since 1992. On their own, these government bodies faced mounting difficulties in terms of funding projects and supporting growth. The development funds thus serve as an example of financial innovation and cooperation based on a proactive approach and consensus among the *Länder,* associations, and chambers of commerce, industry and trade in carrying out a development strategy.

A Regional Council (the highest decision-making body for this type of governance structure), a Management Committee, groups of experts, regional conferences, and an administration were established to guide debate, enable the optimal management of Hamburg's metropolitan region, and communicate decisions.

An example of a project developed within the *Metropolregion* of Hamburg

Klimzug-Nord: adapting to climate change

Research team: six universities, six research institutes, ten ministries, ten companies

Planned duration:
5 years

Total budget:
29 million euros

Subsidies received:

German state:
15 million euros

Hamburg :
1.2 million euros

Metropolitan region development fund:
330,000 euros

HafenCity, or how to reveal and develop hidden assets

How can cities reckon with rising demand when their resources remain scarce? This question posed by researchers Bruce Katz and Luise Noring in their report[41] published recently by *La Fabrique de la Cité* is particularly relevant in Hamburg, whose urban expansion is impeded by three factors: its status as a city-state, the expansion of its port, and the flood risk that it faces. Like Copenhagen, Helsinki, and Lyon, Hamburg has successfully found innovative ways not only to free up land assets and optimize its use of real estate, but also to plan and finance a large-scale urban renewal project, HafenCity.

The HafenCity project stands out for its proactive policy carried out independently of short-term policy or economic considerations, with a focus on the urban development project's long-term benefits. This project is expected to yield public gains and benefit the entire city through its sustainability characteristics, as well as its mixed-use and socially diverse nature. Prof. Jürgen Bruns-Berentelg, Chairman and CEO of HafenCity Hamburg, thus admits to

"not considering the processes of HafenCity development as a finance mechanism primarily. We consider it as a socio-technical system creating 'a common public good inside the private good' as far as private investment is concerned"[42].

Aggregating assets to regain control

The Port of Hamburg has played a central role in the city's urban and economic landscape since the 19th century. Owned by the city since its creation, **its perimeter has fluctuated at many points** with each successive wave of innovation in the maritime sector, such as the arrival of containers, increased ship volumes, **and adaptation of the port** to stay globally competitive. Vast swathes of the port's land on the edge of downtown were thus left vacant or occupied solely by small mercantile affairs connected to the port.

Like most port cities, Hamburg long turned its back on its industrial banks to pursue its development in the northern quarters of the city, along the Alster river. However, in the early 1990s, Hamburg confronted a need to densify its urban spaces and improve quality of life for residents, as it witnessed its strategic position within Europe transform following the fall of the Berlin Wall: from a peripheral city in Western Europe, it returned to its central position within a reunified Europe. **At this stage, the city-state recognized its underutilized port lands as dormant assets packing a vast potential for urban and property development.** It thus decided to develop Europe's largest intra-urban renewal program and transform it into an example for urban planning in the 21st century.

The city based its urban renewal project on the following key priority: regaining control of its key assets inside the city, which were previously underestimated and underutilized, while aggregating these assets to improve their management. Maritime transport and logistics companies rented plots situated in the HafenCity port area through long-term lease agreements with the city (30 years). The companies owned the buildings and warehouses built on the plots and retained control over how their plot was used. For its part, the municipality remained the proprietor of each plot. To avoid the effects of land speculation as the city reacquired the plots from the long-term leases signed with port operators and recovered the property rights of these plots, **the reason for these acquisitions** – a large-scale redevelopment project not connected to the port – **remained secret from 1993 to 1997.** Acquisitions were carried out by a company owned wholly by the city, *Hamburger Hafen und Lagerhausgesellschaft GmbH* (now *Hafen und Logistik AG*) and its subsidiary, *Gesellschaft für Hafen- und Standortentwicklung* (GHS), created in 1995 (now *HafenCity Hamburg GmbH*).

The urban renewal financing mechanism, as explained by Bruce Katz and Luise Noring[43]

1

HCH uses the legal guarantee put in place for the SAC by the city-state to contract loans on the private financial market.

2

HCH invests the capital in the basic infrastructure and equipment for HafenCity.

3

These investments increase the value of public assets.

4

Individual plots are sold to developers and private entrepreneurs.

5

The revenue covers HCH's investments and operating costs and repays loans and interest.

6

Assets are then gradually transferred to the authorities of the city-state and city at no charge (the SAC received the public plots from the HafenCity region at no charge).

The city unveiled its project to reclaim the Elbe riverbanks and expand downtown Hamburg in May 1997. In that same year, the city neutralized potential opposition from stakeholders in the port by creating a special asset category called the Special Fund for City and Port Assets (Sonder Vermögen Stadt und Hafen), aiming to sell plots to finance not only the expansion of downtown Hamburg and its infrastructure, but also the modernization of the Altenwerder container terminal, which lacked funding (the city was released from this commitment in 2013).

The special fund constitutes the city's main system for regrouping public assets: all property rights for public assets situated on HafenCity plots (plots and buildings) were transferred to the fund. Creating the fund made it possible to reconvert industrial land managed by the port into buildable land managed by the Ministry of Urban Development for commercial and residential purposes. However, since it is only a legal entity and not a company, the fund does not carry out any urban development operations. GHS, which was entrusted with the fund's administration and became in 2004 the *HafenCity Hamburg GmbH* (HCH) by decision of the City of Hamburg (sole owner of the property), oversees the management of the HafenCity redevelopment project. **Indeed, the complexity of funding this urban renewal program, due to the blend of public and private financing sources, requires detailed monitoring of all operations and transactions.** This separation between the operating company and the fund aims to guarantee a long-term strategy, by sheltering the fund from any potential changes in political vision.

As a public company managed entirely by the private sector (the city of Hamburg), **HafenCity Hamburg GmbH demonstrates** – through the Special Fund for City and Port Assets it operates – **the essential attributes of a company operating public assets:**

"by concentrating non-official functions in a dedicated development company of its own, Hamburg can ensure the efficiency and quality of the urban development project, yet through intensive division of labor and control also retain a high degree of public accountability"[44].

Funding for the HafenCity project includes 8.5 billion euros from private investments, 1.5 billion euros from the sale of land owned by the city and approximately 1 billion euros from miscellaneous public investments.

Quality above all: a new approach to calls for offers to create "*a common public good inside the private good*"

What makes the HafenCity redevelopment project unique is the drive to create "*a common public good inside the private good*" (J. Bruns-Berentelg[45]). This common public good results from the transformation of HafenCity into an attractive neighborhood marked by a high level of functional and social diversity, tackling the challenge of sustainable and environmentally-responsible construction, and embodying the objective set by the city to become "a green, inclusive and growing city by the water" ("*Grüne, gerechte, wachsende Stadt am Wasser*"[46]).

To achieve this objective, the HafenCity site was made a "priority area". **Decisions must now be taken by the City of Hamburg** instead of the district accommodating the project, Hamburg-Mitte. HafenCity is the object of an urban development plan prepared by the Authority for Urban Development and Housing (BSW – also in charge of issuing the construction permits) and discussed within the Commission for Urban Development. **Quality is the primary goal.** For this reason, the main challenge is to create the conditions for quality to emerge. **The project does not operate based on the usual principle of offering more, instead the choice was made to offer better, with two thirds of decisions based on this concept and only one third on price.**

HafenCity Hamburg GmbH (HCH) missions:

HafenCity project

- Management and total control of the project,
- Funding management,
- Land preparation,
- Design and construction of public spaces and infrastructures,
- Contracting with land developers and future residents,
- Communication management and public relations,
- Management of the green certificlabel for new built buildings.

Billebogen project

- 72 hectares area located northeast of the new HafenCity neighborhood and to be redeveloped,
- Neighborhood development supervisor

Kleiner Grasbrook project

- 95 hectares area located in the current port of Hamburg and to become the Olympia City with 8,000 new houses, sports facilities, economic activity area or public spaces,
- Public tender management at a master plan level,
- Olympia City building process management.

Criteria for winning a public procurement contract in HafenCity: quality before all else

A developer wishing to buy land in HafenCity will have not just the financial characteristics of his development project analyzed, but also its creative and qualitative characteristics. 70% of the final appraisal rewards the quality of the submitted real estate project: 50% depends on the assessment of the proposal's "pure" concept, and 5% on compliance with a minimum standard of sustainable development and the development of skills in this area (HCH Platinum standard certification, higher than LEED Platinum certification, is mandatory for any project submitted, the 5% awarded therefore implies a very high building performance, beyond the LEED reference); and 15% on the proposal's realization potential.

The remaining 30% reward compliance with financial criteria or concern the sale of construction rights on a parcel of land. The price of these rights varies based on the location (ground floor, community services sector, etc.) and the type of occupation (residential, offices, affordable housing, subsidized housing for people with reduced mobility etc.).[47]

The second challenge is to successfully mobilize stakeholders capable of contributing to the project's quality standards and to offer innovative proposals to transform the neighborhood into a laboratory for European urban planning in the 21st century. Extensive cooperation with the private sector was implemented for this purpose. Calls for bids pertain only to residential buildings, while the committee selects only those developers who respond most attentively to the needs of future users. Private initiatives account for the other projects: a company seeking to occupy 60-70% of a building can propose a project to HCH. If the commission for land development grants its approval, the company receives an exclusive option for the parcel. **However, this option does not guarantee the sale of the land or the acquisition of the construction permit. It only opens a window of 18 months of collaboration with the city,** during which the investor can, on one hand, order an architectural design competition and preliminary studies, develop their project, secure funding, and potentially find other co-users, while on the other hand, the city can ensure that quality standards are met throughout the project and its processes. Only after this period of 18 months has ended and it has verified that its quality criteria are sufficiently accounted for does the city grant the building permit and sell the land.

This process enables Hamburg to retain control over the neighborhood's development, while establishing a new form of cooperation between the public and private sectors, rooted less in audits and oversight than in mutual trust and shared objectives. The City of Hamburg argues that:

"this encourages cooperative, exacting and reliable developer behavior – with both city and developer reducing risks and costs, optimizing quality. For Hamburg, HafenCity is not first and foremost a major real estate project in which individual projects need to be realized as quickly and efficiently as possible – instead it is the vehicle for achieving exemplary urban quality and defining the city anew for the 21st century".[48]

Developing an extension of downtown: the ambitions for Hamburg's new waterfront

Conceived in the 1990s by Kees Christiaanse, who designed the first masterplan announced in 1997 and approved by the Hamburg Senate in 2000, the HafenCity project spans 157 hectares between the Elbe and downtown Hamburg, including 127 hectares of buildable land (cf. figure 34). Upon its completion, HafenCity will comprise ten new neighborhoods developed along an east-west axis. The ambition is for the neighborhood to accommodate over 14,000 new residents, with 6,000-7,000 new homes, as well as some 45,000 new jobs. More than a regular neighborhood, HafenCity is intended to become an extension of downtown Hamburg, a goal further reinforced by the arrival of the city's U-Bahn subway system.

fig. 34 Location of the HafenCity project within Hamburg.

The project draws on two levers to achieve this goal.

1. The first lever pertains to landscape.

Developing the extension involved thorough efforts to ensure a consistent use of landscape from the historic downtown through HafenCity to the banks of the Elbe, primarily by accenting the presence of water. The project planners opted to develop a promenade highlighting the Elbe and its port, rather than integrating flood protections that would have severed the neighborhood's connection to this landscape element. Moreover, the project rehabilitated and integrated Speicherstadt's industrial legacy into the city by featuring subtle references throughout HafenCity, notably apparent in the use of brick.

2. The second lever consists in promoting social and functional diversity, both horizontally (on the scale of the neighborhood and island) and vertically (on the level of each plot of land).

From its inception, the project was intended to accommodate all essential functions of the city: housing, retail, public facilities, jobs, recreation, culture, etc. The first development phase played a crucial role in this process, as it conveyed the first image that people would associate with HafenCity in the future. It should come as no surprise, then, that the flagship project of the first phase is the Elbphilharmonie: it fully encapsulates the project's goal of functional diversity by integrating a cultural venue, housing, a public space and a hotel into Speicher A – just as it also illustrates one of the project's limitations through its current lack of social diversity.

The goal for each of these ten neighborhoods is to meet the needs and expectations of a diverse population: extending downtown should not come at the cost of social inclusion,

since the key challenge is to create a vibrant social fabric that represents the full spectrum of Hamburg's population. For this reason, additional attention was also paid to public space, which is both ample (38% of the total surface area) and developed specifically to blend in with ground floor amenities (cf. figure 35). Though each neighborhood has its own personality and a diversified range of housing types, it is nonetheless true that HafenCity lies within a segment of the real estate market impacted by land speculation. However, the city of Hamburg has taken proactive measures on this issue, notably by introducing a minimum share of social housing in 2010. First set at a rate of 20%, the city raised this share to 33% the following year.

fig. 35
Land use distribution in HafenCity.

Distribution

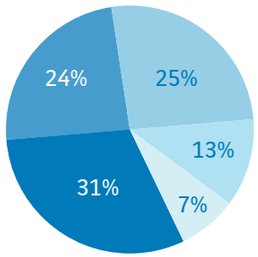
Land use in HafenCity

Total: 127ha

24%
Traffic areas
26.3 ha

31%
Building areas
33.9 ha

7%
Private open spaces
7.8 ha
Non publicly accessible



25%
Public open spaces
28.1 ha
public square, parks, promenade

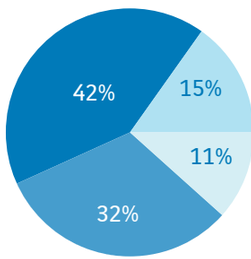
13%
Private open spaces
13.8 ha
publicly accessible

Built surfaces distribution

Total: 2,4 million m²
Gross Floor Area (GFA)

42%
Offices
1,040,000m²

32%
Residential
800,000m² GFA



15%
Academia, education, culture, leisure and hotel
380,000m² GFA

11%
Retail, gastronomy, (ground floor) services
275,000m² GFA

Internationale Bauaustellungen (IBA): a new kind of cooperation to generate urban innovation

The phrase "*Internationale Bauaustellung*" is deceiving since, translated literally, it means "International Building Exhibition". However, if IBAs attract millions of visitors – even after the "exhibition" period has ended – it is because they are regional development projects that successfully combine the long-term scale of urban metamorphosis with the exceptional nature of innovative and inspiring works developed by international players – and which therefore merit a special trip.

IBAs are a type of urban project created in Germany that are supported through financing systems other than public-private partnerships. Only two IBAs have taken place outside Germany's borders (*IBA Parkstad* in the Netherlands from 2013-2020; *IBA Wien* 2016-2022 in Austria) and there is only one cross-border IBA (*IBA Basel* 2010-2010 in Switzerland, France and Germany). The first IBA kicked off in Darmstadt in 1901 and was succeeded by others organized in cities like Stuttgart, Berlin, and Hamburg, as well as regions like the Ruhr (*IBA Emscher Park*) and Saxony-Anhalt.

A project structure with a long history, IBAs retain all their innovative force today, because even though their basic goals remain the same (to unite stakeholders through a regional project giving rise to urban and architectural innovation), the organization and terms of each project have evolved by adapting to the specific nature of each region.

IBAs are local initiatives that aim to develop innovative and exemplary solutions to global problems (urban, social, economic, environmental, etc.), where traditional processes have failed to produce an adequate response.

In this way, IBAs always take a dual perspective that is at once local and international. An IBA can only be organized if the challenges raised in the IBA's region apply on a broader level and the intended solutions are apt to have a global impact.

IBA Emscher Park (1989–1999) is certainly the most widely known of these initiatives. This IBA successfully developed tailored solutions for a region experiencing industrial decline and demonstrating a sharp dichotomy between cities that pivoted to the service economy on the one hand and cities that remained industrial on the other. In addition, it also opened potential new avenues for developing brownfields and promoting urban renewal through cultural action on a regional level, which has since provided a model for other regions to follow.

IBAs also employ a project management organization that mobilizes a broad range of local and international stakeholders, including building companies and civil society, as well as experts, researchers, and political leaders. However, mobilizing these stakeholders does not add a new layer to the complicated tangle of bureaucracy. Communities involved in the IBA simply create a single, lean structure known as the IBA bureau. It sets objectives, initiates international calls for projects, selects projects that will receive the IBA label, and supports the project leaders. But it does not finance or carry out the projects. In short, the IBA in no way replaces traditional stakeholders.

By staking a clear position as a laboratory for ideas[49], IBAs provide a platform for thought and exchange built on a new foundation: discussions begin prior to the call for projects in order to define the structure's ambition and objectives in connection with a scientific committee composed of international experts. By mobilizing all stakeholders, this discussion ensures that the region plays an active and committed leadership role. IBAs comprise a variety of time frames (short-, medium-, and long-term) and provide a framework for developing a local regional vision designed to create value for other regions, as well. Furthermore, IBAs also account for their experimental and incremental nature. **For this reason, each IBA implements partnerships and cooperative reflexes designed to last beyond the exhibition's conclusion:** it establishes a project dynamic between local stakeholders who will remain in the region and continue working together once the IBA has ended.

IBAs thus function like a catalyst of energy and financing – so much so that some have referred to them as "*an immense machine for diverting subsidies*" (K. Ganser[50]). They mobilize private sector players both domestically and internationally, drawn in by the project's visibility and clear-cut time frame (limited duration, between seven and ten years), as well as special funds (notably Europe-wide).

IBAs demonstrate how an inexpensive structure can help finance innovative projects through traditional channels.

Timeline of IBAs in Germany[50]

1901

IBA Mathildenhöhe Darmstadt (*Land* of Hesse)

Objective: Combine growth, society, industrialization and the arts within a neighborhood dedicated to an artists' colony.
An iconic building was erected to commemorate this building exhibition[51].

1927

IBA Weißenhofsiedlung Stuttgart (*Land* of Baden-Wurtemberg)

Objective: International promotion of the quality of German products through design, led by the association "*Deutsche Werkbund*". The exhibition presented 21 model homes.

1952-1957

IBA Stalinallee & Interbau (East and West Berlin, respectively)

Objective: New model neighborhood built on postwar ruins. Show an example of the "city of tomorrow". Train architects in new international precepts.

fig. 36 The Jugendstil Artists' Colony, Mathildenhöhe Darmstadt.

fig. 37 Stuttgart, Weißenhofsiedlung, Hans Scharoun house.

fig. 38 IBA Stalinallee & Interbau. Photo taken on set of "The New Apartment", a cultural film produced by DEFA featuring the major socialist buildings on Stalinallee in Berlin.

fig. 39 Building plan during *IBA Berlin Neubau / Altbau.*

fig. 40 Legacy of steel in Duisburg.

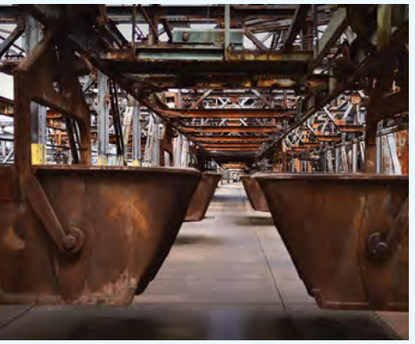


fig. 41 Steel legacy in the Lusace area.

fig. 42

Map of *IBA Stadt Umbau* in 2010.

fig. 43 Docks during *IBA Hamburg.*

1987

IBA Berlin Neubau / Altbau

Objective: Preserve, renovate and promote existing construction in the city's war-damaged historic downtown (*IBA-Altbau*). Construction of new buildings to meet urgent housing needs (*IBA-Neubau*).

1999

IBA Emscher Park (Ruhr)

Objective: Economic and environmental conversion of former brownfield left over from the region's steel and coal production activities.

2010

IBA Fürst-Pückler-Land (*Land* of Brandenburg)

Objective: Restructuring the Lusace region's landscape following the end of extraction and processing of lignite, used to generate heating and electricity.

2010

IBA Stadtumbau (*Land* of Saxony-Anhalt)

Objective: Contain urban degrowth, unemployment and city finances through a comprehensive overhaul of municipal policies. Enable urban renewal and economic recovery in the 17 cities taking part in the project, based on transferrable models.

2013

IBA Hamburg (city-state)

Objective: This IBA comprises the island of Wilhelmsburg, the Veddel neighborhood, and Hamburg's inner port. Considered to be cut off from the rest of the city, these spaces offer a venue for expressing new urban and social avenues conceived for the city of Hamburg.

IBA Hamburg Wilhelmsburg: freeing up land assets and creating a laboratory for the sustainable city

Wilhelmsburg, an island located south of downtown Hamburg and home to 55,000 residents across an area of 35 km², occupies a deceptively central position on the map of Hamburg. Since the flood of 1962, the island (the largest in Europe) has instead served as a repository for the city's unwanted activities that emit pollution or eat up space (logistics), in addition to poor members of the community who often come from foreign backgrounds (over 40 nationalities rub shoulders here). As a fractured zone that is frequently ignored by city authorities, this portion of Hamburg has long remained on the sidelines of the dynamic activity in Germany's second largest city.

Faced with a looming land shortage caused by the city's growth, a deliberate choice was made to avoid the opportunistic development of this island by instead forming an IBA.

The aim of this IBA is to spotlight the neighborhood's assets in order to counter the negative image associated with it, while establishing a framework for offers so as to meet challenges that are even more ambitious than simply creating new land assets.

Managed through a lean organization (temporary creation of a private-sector agency with the City of Hamburg as the sole shareholder[52]) composed of 30 people from various backgrounds, *IBA Hamburg,* comprising the island of Wilhelmsburg, the Veddel neighborhood, and the Harburg inner port, centers on **three main themes**[53]**:**

1. **KOSMOPOLIS** (cosmopolitan city), with 18 projects: **how to transform diversity into a strength** through projects relating to public space, new housing types, neighborhood management, and new education and work spaces suited to the needs of diverse residents? Exemplary new ideas for cooperation, notably in the field of education, have emerged within a multicultural context blending over 40 nationalities among 55,000 residents.

2. **METROZONEN** (urban fringes), with 21 projects: **how to develop and re-densify** Wilhelmsburg without sacrificing its ample public space or local economy? Casting Hamburg's urban fringes in a positive light by emphasizing the major development potential is one of the key issues tackled by this IBA.

3. **KLIMAWANDEL** (cities and climate change), with 12 projects: how to improve the resilience of Wilhemlsburg, a neighborhood facing flood risk, and work to reduce the environmental impact of its high concentration of industrial activities? The stated goal is to make this neighborhood **carbon-neutral** by 2050: energy rehabilitation in existing buildings, development of renewable energies, local energy production, etc

fig. 44 Map of the "*Sprung über die Elbe*" project.

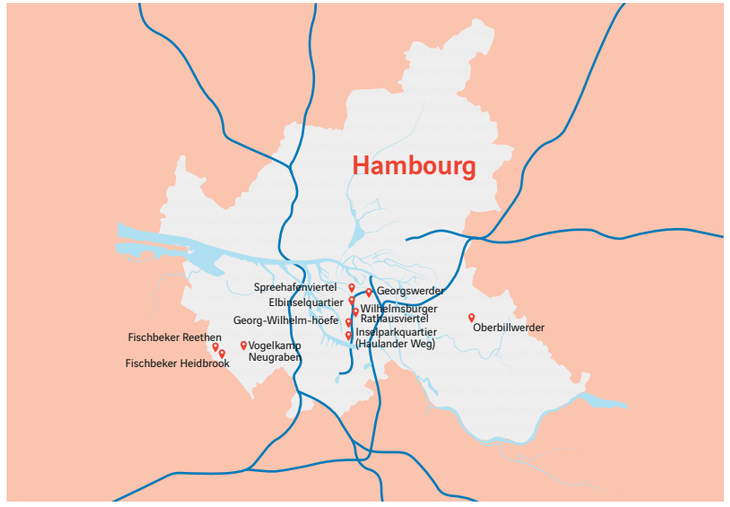


fig. 45 Distribution of the leading projects during *IBA Hamburg.*

The themes developed in these exceptional projects (cf. figure 45) focus primarily on:

Energy

One of the flagship projects involves the conversion of a former bunker from World War II into an Energiebunker, comprising a power plant with a large heat reservoir and using a broad range of renewable energies: solar, biogas, wood chips, and excess heat from a nearby industrial plant[54] (cf. figure 46).

The energy bunker thus combines renewable energy production using solar panels installed on its roof, storage of this energy in a large heat reservoir built on its area of 120 hectares and 2,000 m³, and local energy supply adjusted based on the needs of 4,000 households connected to the facility. 3,000 households receive heating from the bunker, while another 1,000 homes receive electricity.

fig. 46 *Energiebunker* in Wilhelmsburg.

Architecture/construction

IBA Hamburg's Smart Material Homes project showcases the smart materials that will build the houses of tomorrow. New components were tested during this exhibition, demonstrating their resilience, durability and their utility in resisting environmental changes. The project places additional emphasis on the buildings' exterior facades, with the aim of optimizing energy flows.

One remarkable building produced through the Smart Material Houses construction process, the BIQ building (Bio-Intelligent Quotient), completed in 2013, features novel bioreactor and passive facades composed of algae (cf. figure 47). This process renders the building energy self-sufficient through the algae's photosynthesis and the production and recycling of solar energy. Designed by the Austrian architecture firm Splitterwerk, the building captures the thermal energy generated by the algae on the facade.

fig. 48 "smart price house" as part of *IBA Hamburg.*

Another example of the project's remarkable construction concepts, the Smart Price Houses offer a model for high-quality affordable housing[55] (cf. figure 44). This low-cost construction model functions by delivering only the basic building (structural frame, floors, ceilings, main networks, common areas, elevators). Residents can then build the walls and interior of their home as they choose, with guidance from the expert architect. The project's 1,650 m² of floor area thus cost 2.2 million euros, creating apartments ranging from 30 to 130 m².

Six designs won the contest associated with the Wilhelmsberg IBA, with four of these designs ultimately implemented. All four now stand as exemplary projects for their modular nature, as well as their sustainable and low-cost approach.

fig. 47 BIQ's bioreactor facade powered by algae.

The IBA project illustrates some of the tensions surrounding the concept of the sustainable city. What factors determine a city's sustainability? Who selects these factors? What role do residents play in this process? Although the Wilhelmsburg IBA aimed to serve as an example of local involvement, it has yet to convince all the skeptics. Some notably see it as a tool to serve the policies already in place, which have produced a wide gap between the reality on the ground, the interests of Wilhelmsburg residents (notably in terms of rent), and the project developed by the working groups and approved by government bodies[56]. For example, some have referred pejoratively to the project as little more than an "*image campaign*" or "*marketing*" of cultural and social diversity[57].

Innovation and major contemporary challenges: sustainable development and housing for all

Innovation and major contemporary challenges: sustainable development and housing for all

Hamburg: a green capital?

As a major North German industrial center confronting severe pollution and congestion problems, Hamburg is a city that has for decades emphasized green growth across its region and throughout its industrial and service activities. Recognizing the quality of life offered to Hamburg residents, the European Commission distinguished the city in 2011 by naming it a European Green Capital, selected from among 34 participating cities. The contest's criteria focused on air quality, sustainable land use, waste management, combating climate change, and local governance[58].

Its efforts have targeted two themes in particular:

1. Reducing the presence of cars and developing one of Europe's largest green corridors

Reducing the presence of cars: such is Hamburg's ambition by 2030-2035. To achieve this goal, it plans to create a green corridor connecting its parks, green spaces, and recreation areas, which represent 16.7% of its area, much more than cities of similar size in Germany and Europe. With the advantage of its radial or "axial" morphology, the city holds 8.4% of its land in protected natural areas. 25% of its land is also occupied by agricultural, horticultural and fruit farming activities.

In order to showcase these lands and lower the number of vehicles circulating throughout the city, Hamburg intends to create pedestrian ways and bike paths based on the model of a green network stretching from the city's outskirts to downtown, enabling people to explore Hamburg while traveling solely by walking and/or biking. Currently, an impressive 89% of the city's population lives within 300 meters of a park.

The project's centerpiece is the "green corridor". Launched in 2015, the corridor's construction involved covering 3 km of the A7 highway, while transforming the new land into a "green roof" comprising 60 hectares of green space and over 2,000 new homes[59]. Pollution and noise should diminish substantially by 2022.

2. Reducing greenhouse gas emissions and using renewable energies

Since 1990, Hamburg has displayed an ambitious determination to protect its climate and environment. Between 1990 and 2006, the city managed to cut its CO_2 emissions by 15%. It hopes to achieve a reduction of 40% by 2020 and of 80% by 2050. To succeed in its endeavor, the city has invested nearly 22 million euros annually to run its "Climate Protection Program", created in 2007 and comprising ten areas of action and over 450 measures, such as increasing the share of electric vehicles in public transit (target of 50% by 2050), promoting biking (expected to reach 25% of all traffic), integrating low-emissions buses, and educational campaigns to protect the climate and raise awareness among younger generations.

Other measures include the energy transformation of its port, recycling used raw materials from retail and industry, using ecological and modular materials in new construction, and developing wind power.

In addition, through its recent project "New 4.0" (*Norddeutsche Energiewende*), approved in 2015 by the federal government of Germany, Hamburg intends to supply 70% of North Germany with renewable energies by 2025. To make this happen, Hamburg partnered with the Land of Schleswig-Holstein and received approval for 230 million euros of funding from the SINTEG program ("Smart Energy Showcases – Digital Agenda for the Energy Transition"). This program began in late 2016 at five pilot sites in Germany and aims primarily to develop the energy mix and diversify electricity sources across the country[60].

This active policy in favor of the environment is further reinforced by the "Enterprise for Resource Protection" program, which has already launched more than 1,000 partnership projects. The program operates according to the following principle: for every euro invested into the project by the city, participating businesses will invest ten euros. This system helped raise 146 million euros from participating businesses, and 15 million from the City of Hamburg. Funded efforts aim to encourage stakeholders to go above and beyond the legal requirements in terms of cutting emissions, by enacting proactive policies. To date, member companies have generated 134,000 metric tons of CO_2.

The City of Hamburg and 300 companies invested in promoting renewable energies have earned praise since the 1990s for their efforts to develop an energy mix combining solar, wind, thermal, hydraulic and photosynthesis energy. Nationwide, green energy production now stands at 17%. Germany aims to raise that figure to 50% over the next decade[61], while Hamburg has decided to offer a substantial contribution to this effort.

The 5 projects of the SINTEG program*

1. *C/Sells* project

— **Regions:** Baden-Württemberg, Bavaria, Hesse.

— **Objectives:** optimize supply and demand for solar power.

2. *Designetz* project

— **Regions:** North Rhine-Westphalia, Rhineland-Palatinate, Saarland.

— **Objectives:** expand solar energy use in urban and industrial areas.

3. *Enera* project

— **Regions:** Lower Saxony.

— **Objectives:** consolidate energy supply service and increase the share of renewables in total energy production.

4. *New 4.0* project

— **Regions:** Hamburg, Schleswig-Holstein.

— **Objectives:** achieve 70% renewables by 2025.

5. *Windnode* project

— **Regions:** Berlin, Brandenburg, Thuringia, Saxony, Saxony-Anhalt, Mecklenburg.

— **Objectives:** supply the electric, transport and heat network sectors with renewable power.

* SINTEG : Smart Energy Showcases – Digital Agenda for the Energy Transition

A housing crisis against a background of spatial constraints and land tensions

— A spike in real estate prices

Hamburg's special status as a city-state means that it faces heavy constraints in terms of its urban sprawl, compounded by the additional constraints associated with the port. Today, one of the biggest challenges facing Hamburg (and all major German cities, such as Munich, Berlin, and Frankfurt) resides in **densifying its habitable space** to keep pace with demographic growth and an existing housing crisis, all while containing the trend of runaway rents and home prices seen in recent years.

Indeed, real estate prices across Germany rose by 31% between 2003 and 2011[62], and by 7% in 2016 alone. In Hamburg, in 2017, average real estate prices settled around 5,000 to 7,400€/m² depending on the neighborhood, compared with over 9,000€/m² in Munich and approximately 5,500 €/m² in Berlin[63]. These figures make Hamburg the second most expensive city in Germany, behind Munich and ahead of Frankfurt and Stuttgart. In Hamburg's poor neighborhoods, the average share of household revenue spent on housing reached 21.3% in 2014 (third highest nationally, after Munich and Frankfurt)[64], while home prices have climbed 47% since the early 2000s.

The main reasons put forward to explain this sudden rise in real estate prices are Hamburg's new status as a major European metro area with a thriving business district, demographic growth (the population has increased by 2.7% since 2000[65]) spurred by the city's dynamism and excellent business sectors (finance, insurance, aeronautics, service sector), its low interest rates supported by the Hamburg Senate's public policies, as well as the construction of new, high-quality neighborhoods like HafenCity.

— Difficulties accessing affordable housing?

This context has given rise to several protest movements, the most prominent of which is the "*Recht auf Stadt*" (Right to the City) network[66]. These movements decry what they see as a real estate bubble and rampant speculative investment, while calling on city authorities to address the lack of social housing, difficulties keeping the middle class from accessing the rental market, and rising rents. They raise the following key question: for whom are new homes built? The new HafenCity neighborhood is often lambasted for preferring the upscale segment over affordable housing.

With these tensions in the real estate market in mind, the Hamburg Senate has carried out a policy encouraging the construction of new rental units since 2011. Its goal is to build 6,000 additional homes every year, including 2,000 subsidized units[67]. The goal was raised in 2017 to a total of 10,000 additional homes, including 3,000 subsidized units. These figures do not include the city's efforts to house the massive influx of refugees that arrived in the city beginning in fall 2015. This influx led to a new kind of tension in the market, which Hamburg approached in an especially innovative way.

Accommodating refugees in German cities: a laboratory for affordable housing and urban resilience[68]

Germany received some 476,649 requests for asylum in 2015; in 2016, it processed 745,545 such requests. For German cities – with some like Hamburg receiving 400 new arrivals a day at the height of the crisis – the question was how to cope with such a demographic shock in a resilient manner? How could these cities, in the initial stage, supply adequate emergency housing to ensure that no asylum-seeker would have to sleep on the street and, in the second stage, quickly build high-quality temporary housing for the medium and long terms as refugees awaited processing of their requests and received education and training? Finally, what lessons did European cities, and German cities in particular, learn from the reflection and innovations arising from the rapid construction of temporary housing since 2015, which they might apply to provide affordable housing, a particularly urgent challenge in these dense and highly developed cities? These questions are the subject of the report *European Cities and Refugees: A Laboratory for Affordable Housing and Urban Resilience*, published in January 2018 by *La Fabrique de la Cité*, which focuses specifically on the cities of Hamburg, Stuttgart, Berlin, Munich, and Dresden in Germany and Stockholm in Sweden[69].

fig. 49 Geutensweg emergency housing complex (Hamburg), currently in use.

fig. 51 Hohe Sasel complex (Hamburg), within a permanent building that will accommodate refugees for 15 years, before offering social housing units for a further 30 years.

Hamburg, which is now home to some 50,000 refugees, implemented an ambitious and efficient strategy of building and opening temporary emergency housing as early as summer 2015. While reclaiming existing buildings (department stores) to accommodate new arrivals in temporary housing, the city simultaneously created an administration devoted exclusively to crisis management: the Central Coordination Unit for Refugees ("*Zentraler Koordinierungsstab Flüchtlinge*"), and started building temporary and modular structures offering fast construction, such as the Notkestrasse 2 housing complex in Altona. Built in a little over six months, this complex housed 648 asylum seekers in 2017, for a total construction cost of 25 million euros, or 35,000 euros per occupant.

In addition, the city also built permanent structures intended to offer temporary housing for refugees (cf. figures 49, 50, 51).

The Blomkamp housing complex (cf. figures 52, 53, 54) demonstrates the evolution in construction methods used to build temporary housing: the first phase of construction used containers, while the second phase (still underway) implies building several permanent and high-quality housing structures subject to temporary rental contracts. This innovative approach consisting in offering temporary housing within permanent structures has generated a surge of interest in Germany, where it has been widely adopted since the migrant crisis of 2015.

Many German cities, including Hamburg, have thus taken the need to provide temporary housing as an opportunity to reflect on the long-term future of its affordable housing; projects of this type, designed to accommodate refugees or asylum-seekers for several years before becoming social housing or housing for other groups (students, the unemployed, retirees, etc.), have grown more numerous today.

In Hamburg and many other cities throughout Europe, the mass influx of refugees has sparked reflection into low-cost housing, while also triggering a broader reflection on housing types among many urban players. This reflection process has seized on temporary housing as its life-size testing ground.

fig. 50 Notkestrasse temporary housing complex in Altona (Hamburg).

fig. 52

fig. 53

fig. 54

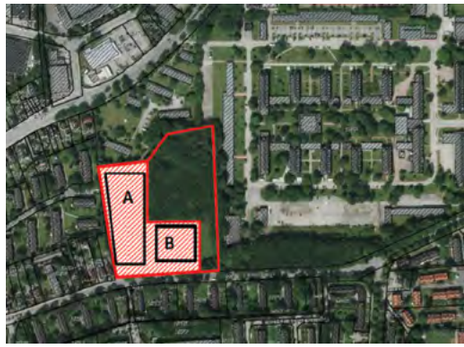


fig. 52 Blomkamp – view of housing units.

fig. 53 Blomkamp – view of housing units.

fig. 54 Blomkamp – aerial view of the site.

The “Finding Places” project[70]

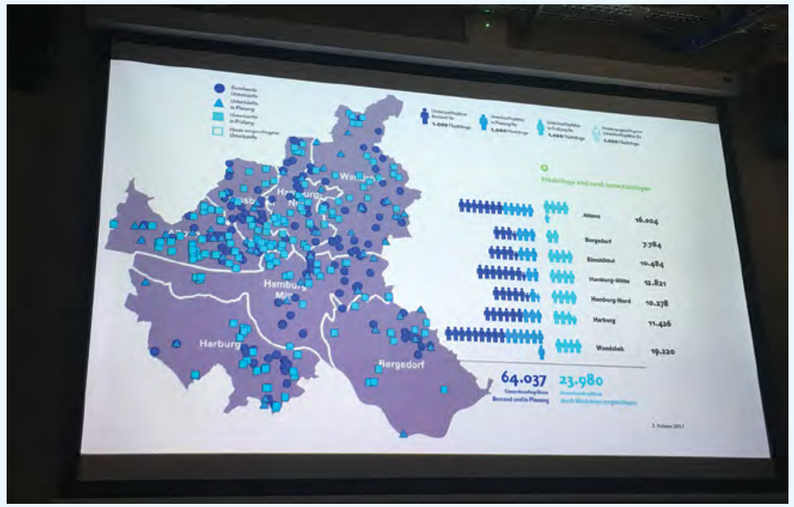


fig. 55
The “Finding Places” map of existing and planned housing for refugees in Hamburg

Located in Hamburg, *HafenCity Universität* is a new university dedicated to urban planning, civil engineering and architecture. It is also the headquarters of the CityScienceLab, an initiative launched in June 2015 by the Mayor of Hamburg, Olaf Scholz, in collaboration with the Changing Places group from the Massachusetts Institute of Technology Media Lab, with the aim of making the city a “*living laboratory for digital urban development*”.

Shortly after its creation, the CityScienceLab sought to explore the potential of CityScope, a new technology developed by Changing Places to solve complex urban planning issues. This interactive model of the city, combining digital (data visualization and algorithms) and physical elements (Lego blocks), is a multifunction open-source tool for 3D visualization of city territories. The CityScienceLab initially planned to use the tool to prepare for converting Hamburg’s Olympic village into an urban innovation area, until a referendum put an end to the city’s bid to host the 2024 Olympic Games.

In February 2016, when Olaf Scholz was visiting the CityScienceLab, members of the lab asked him to name the most urgent challenge confronted by his city. Without hesitation, the mayor mentioned housing asylum seekers. In fact, the city’s existing and planned housing for new arrivals then totaled 60,000 beds; however, Hamburg expected to receive some 80,000 additional asylum seekers over the course of the year. That meant the city would need 20,000 more beds. At the same time, new housing projects had triggered protests in certain neighborhoods, demonstrating the crucial need to involve citizens in the development of temporary housing projects. With no further delay, the CityScienceLab set to work defining the role CityScope could play in this regard. Eight weeks later, the “Finding Places” project was born, a series of 34 workshops that combined CityScope and

citizen involvement to take stock of land available to provide refugees with temporary housing.

From May to July 2016, more than 500 citizens gathered at the university to suggest plots where the city might erect temporary modular housing for refugees. Upon entering the CityScienceLab, participants were greeted by a map indicating existing and planned housing in dark blue throughout the city’s seven districts, as well as its projected needs in light blue. With these figures in mind, participants then proceeded to two interactive digital models of the city. Since each workshop was devoted to a specific district, the first model in the series gave visitors a comprehensive view of the district’s geography. Aerial views and signs indicating the location of existing housing also provided an initial overview of potential locations in the sector.

After selecting a specific zone within the district, participants were then invited to proceed to a second model on which projectors superimposed an aerial view of the neighborhood onto movable blocks. Citizens had the opportunity to suggest specific plots by removing the corresponding block and replacing it with a Lego block. Each type of Lego represented a different capacity (40, 80 or 1,000 beds, for example). Every time a new Lego was placed on the model, participants saw the number of needed housing units decrease in real time. By placing a Lego on the model, participants viewed the characteristics of the selected plot displayed on a screen: dimensions, nearby services, etc.

Participants had the opportunity to explain their proposals in writing; their comments were sent directly to the city with no preliminary treatment, providing a precious aid to the city, which committed to reviewing each proposal within two weeks. Hamburg’s responses concerning the potential of each plot were made public and displayed on the project site, allowing the public to see the reasons why each proposal was adopted or abandoned. In all, 161 sites were proposed, representing a potential of 24,000 beds. The city preselected 40 sites, including six that have since undergone a planning process.

fig. 56 Movable blocks placed on the “Finding Places” urban visualization tool (left); characteristics of a plot projected onto the screen and shown to participants in a “Finding Places” workshop (right).

Notes

Identity of Hamburg

1. https://www.worldatlas.com/articles/the-richest-and-poorest-states-in-germany.html
2. https://fr.actualitix.com/pays/wld/pib-par-habitant-par-pays.php
3. https://www.hafen-hamburg.de/en/statistics/top-world-container-ports
4. http://www.statistik-portal.de/Statistik-Portal/en/en_jb27_jahrtab65.asp
5. https://fr.statista.com/infographie/5536/les-villes-les-plus-agreables-du-monde/
6. https://www.hafen-hamburg.de/en/statistics/top-20-container-ports
7. http://airinfo.org/2016/02/05/classement-les-trente-premiers-aeroports-europeens-en-2015/
8. https://www.statistik-nord.de/zahlen-fakten/bevoelkerung/dokumentenansicht/ergebnis-einer-schnellschaetzung-der-zuwanderung-von-auslaendischen-staatsangehoerigen-2015-fuer-hamburg-58663/

1 Hamburg: Germany's strategic interface

9. http://www.hamburg.de/hochwasser/3268878/hochwasser/
10. http://www.hamburg.de/pressearchiv-fhh/10023980/2017-12-05-bue-ueberschwemmungsgebiete/
11. http://www.hochwasserzentralen.de/
12. https://www.katwarn.de/
13. http://www.zaha-hadid.com/architecture/hamburg-river-promenade/
14. http://wwworldairportawards.com/awards/world_airport_rating.html
15. https://de.statista.com/statistik/daten/studie/164386/umfrage/verkaufte-auflagen-von-spiegel-stern-und-focus/
16. « Arbeitsgemeinschaft der öffentlich-rechtlichen Rundfunkanstalten der Bundesrepublik Deutschland »
17. http://www.connexion-francaise.com/votre-region/a/hambourg-ville-mediatique#.WjvFjFXiapo

2 The port of Hamburg: between modernity and saturation

18. https://www.hafen-hamburg.de/en/statistics
19. http://www.european-waterways.eu/e/info/germany/elbe_seitenkanal.php
20. https://mediarail.wordpress.com/2017/01/03/40-000-conteneurs-par-rail-entre-lallemagne-et-la-chine/
21. https://www.hafen-hamburg.de/de/europas-groesster-eisenbahnhafen
22. https://www.hamburg-port-authority.de/en/road-traffic-in-the-port/
23. https://www.latribune.fr/regions/smart-cities/20150213tribb0180d6f9/le-port-de-hambourg-vitrine-allemande-de-la-smart-city.html
24. La Fabrique de la Cité : « *Feeding and Fueling the City». Trois scénarios pour repenser la logistique urbaine.* 58p, octobre 2016
25. https://www.hamburg-port-authority.de/en/hpa-360/smartport/
26. https://www.hafen-hamburg.de/en/universal-port-hamburg
27. https://www.cisco.com/c/en/us/about/case-studies-customer-success-stories/hamburg-port.html
28. https://www.hamburg-port-authority.de/en/road-traffic-in-the-port/
29. http://www.themigroup.com/publicsite/special-alert-congestion-german-ports-impacting-shipments/
30. https://www.portofrotterdam.com/en/news-and-press-releases/congestion-in-rotterdam-in-2015-lower-than-in-hamburg-and-antwerp
31. https://structurae.info/ouvrages/pont-basculant-sur-la-rethe
32. http://www.marine-oceans.com/actualites-afp/5946-le-port-de-hambourg-freine-par-des-infrastructures-a-bout-de-souffle
33. https://www.lafabriquedelacite.com/fabrique-de-la-cite/data.nsf/C00F37AEAEB2A0CEC12576B7005EA6A3/$file/actes-hamburg-bd-fr.pdf
34. http://www.aucame.fr/web/publications/etudes/fichiers/Fiche_Hambourg.pdf
35. La Fabrique de la Cité *Feeding and Fueling the City.* Trois scenarios pour repenser la logistique urbaine. 58p, octobre 2016
36. https://longitudes.ups.com/hamburg/
37. La Fabrique de la Cité *Feeding and Fueling the City.* Trois scenarios pour repenser la logistique urbaine. 58p, octobre 2016

3 An ambitious policy of cooperation to support an urban renewal policy

38. http://www.latlon-europe.com/hamburg/fr/histoire_T06.htm
39. Hambourg détient 16 sièges, contre 28 pour Berlin, 6 pour Brême. À titre de comparaison, la Bavière en détient 108 et la Hesse 50.
40. http://english.metropolregion.hamburg.de/contentblob/2420824/6ecef6b1f04ca942a27142d644149d0e/data/facts-and-practice.pdf
41. Bruce Katz, Luise Noring, La Fabrique de la Cité, *L'innovation au service du financement de la régénération et des infrastructures urbaines.* Le modèle européen de revitalisation urbaine. Leçons de Copenhague, Hambourg, Helsinki et Lyon. 39p, janvier 2018
42. *Ibid.*, p.24
43. *Ibid.*, p.24
44. HafenCity Hamburg. Thèmes Les quartiers projets. HafenCity Hamburg GmbH, octobre 2015, 24ème édition.
45. *Ibid.*, p.25
46. *Freie und Hansestadt Hamburg, Behörde für Stadtentwicklung und Umwelt. V.i.S.d.P: Christian Landbeck, Grüne, gerechte, wachsende Stadt am Wasser : Perspektiven der Stadtentwicklung für Hamburg, 2014*
47. Bruce Katz, Luise Noring, La Fabrique de la Cité, *L'innovation au service du financement de la régénération et des infrastructures urbaines. Le modèle européen de revitalisation urbaine. Leçons de Copenhague, Hambourg, Helsinki et Lyon,* janvier 2018, p.25
48. HafenCity Hamburg. Thèmes Les quartiers projets. HafenCity Hamburg GmbH, octobre 2015, p.11
49. http://www.ihest.fr/IMG/pdf/7-allemagne2012.pdf
50. http://www.lema.ulg.ac.be/urba/Cours/Cas/0910/Emsher_simon.pdf
51. IBA meets IBA, Cent ans d'expositions internationales d'architecture. IBA Hamburg GmbH, M:AI Museum für Architektur und IngenieurKunst NRW. 2013.
52. http://www.ihest.fr/IMG/pdf/7-allemagne2012.pdf
53. http://www.iba-hamburg.de/en/story/themes-of-the-iba/metrozones.html
54. http://www.iba-hamburg.de/en/projects/energiebunker/projekt/energy-bunker.html
55. http://www.iba-hamburg.de/en/projects/the-building-exhibition-within-the-building-exhibition/smart-price-houses/projekt/smart-price-houses.html

4 Innovation and major contemporary challenges: sustainable development and housing for all

56. Clément Barbier, *Les métamorphoses du traitement spatial de la question sociale : approche croisée de deux grands projets de renouvellement urbain dans les agglomérations de Lille et de Hambourg,* thèse soutenue le 04.12.2015, université Paris 8 et *HafenCity Universität* de Hambourg, sous la direction d'Yves Sintomer et de Dieter Läpple, http://edoc.sub.uni-hamburg.de/hcu/volltexte/2016/325/pdf/Barbier_C._Les_mCotamorphoses_du_traitement_spatial_de_la_question_sociale._ThCise_2015.pdf
57. http://hh-mittendrin.de/2013/03/iba-igs-kritik-und-protest-werden-lauter/
58. http://ec.europa.eu/environment/europeangreencapital/wp-content/uploads/2011/04/Hamburg-Final-FR.pdf
59. http://info-hambourg.de/2015/01/21/couverture-de-lautoroute-cest-parti/
60. https://www.bmwi.de/Redaktion/EN/Downloads/bmwi-papier-sinteg-kernbotschaften.pdf?___blob=publicationFile&v=3
61. http://ec.europa.eu/environment/europeangreencapital/wp-content/uploads/2011/04/Hamburg-Final-FR.pdf
62. http://www.connexion-francaise.com/votre-region/a/les-prix-de-l-immobilier-s-envolent-dans-les-grandes-villes-allemandes#.WjElQlXiapo
63. https://www.courrierinternational.com/article/immobilier-les-villes-allemandes-de-plus-en-plus-cheres
64. https://www.immobilienscout24.de/immobilienbewertung/ratgeber/mietpreise-und-kaufpreise/deutschlands-teuerste-wohnstaedte.html
65. http://english.metropolregion.hamburg.de/contentblob/2420824/6ecef6b1f04ca942a27142d644149d0e/data/facts-and-practice.pdf
66. http://www.citego.org/bdf_fiche-document-772_fr.html
67. http://www.hamburg.de/bsw/wohnungsbau/4029174/wohnungspolitik/
68. *La Fabrique de la Cité Villes européennes et réfugiés : un laboratoire du logement abordable et de la résilience urbaine* 45p, janvier 2018
69. *La Fabrique de la Cité Villes européennes et réfugiés : un laboratoire du logement abordable et de la résilience urbaine* 45p, janvier 2018
70. *La Fabrique de la Cité Villes européennes et réfugiés : un laboratoire du logement abordable et de la résilience urbaine* 45p, janvier 2018

Pictures

p. 9 :
- fig. 3 courtesy of private archive of Gerhard Pietsch, Hamburg;
- fig. 4 Thomas Pusch CC BY-SA-4.0

p. 10 :
- fig. 5 MissyWegner CC-BY-3.0

p. 11 :
- fig. 6 Wolfgang Staudt CC-BY-NC-2.0
- fig. 7 Lumu CC-BY-SA-3.0-migrated
- fig. 9 Farchering CC-BY-4.0

p. 12 :
- fig. 10 NordNordWest CC-BY-SA-3.0

p. 23 :
- fig. 13 NordNordWest CC-BY-SA-2.0

p. 24 :
- fig. 16 published with kind permission of M. Martin Zitzlaff. http://www.zitzlaff.com

p. 25 :
- fig. 18 Dennis Siebert CC-BY-SA-3.0

p. 26 :
- fig. 20 Wikikay CC-BY-SA-3.0-DE

p. 29 :
- fig. 23 Flo!an CC-BY-SA-3.0

p. 33 :
-fig. 25 Les CC-BY-SA-3.0

p. 34 :
- fig. 27 published with kind permission of M. Thierry Gauthé and Courrier international. Map published on May 14th, 2017 in Courrier international. https://www.courrierinternational.com/grand-format/chine-route-de-la-soie-la-mondialisation-selon-xi-jinping

p. 37 :
- fig. 29 Heje CC-BY-3.0

p. 40 :
- fig. 30 Flor!an CC-BY-SA-4.0

p. 57 :
- fig. 36 Jean Pierre Dalbéra CC BY 2.0
- fig. 37 Andreas Praefcke CC BY 3.0
- fig. 38 Bundesarchiv, Bild 183-17346-0009, Quaschinsky, Hans-Günter CC-BY-SA 3.0

p. 58 :
- fig. 39 Steve Tiesdell Legacy Collection's photostream CC BY 2.0
- fig. 40 DerHexer CC-BY-SA-3.0,2.5,2.0,1.0
- fig. 42 Magnus Manske CC-BY-SA-2.0-DE

p. 61 :
- fig. 44 published with kind permission of Urban Catalyst. http://www.urbancatalyst-studio.de

p. 61 :
- fig. 46 Geoff Dude CC-BY-NC-ND-2.0

p. 63 :
- fig. 47 NordNordWest CC-BY-SA-3.0-D
- fig. 48 Gunnar Ries Zwo CC BY-SA-2.0

p. 70 - 71 : published with kind permission of M. Fouad Hamdan

p. 72 - 73 : report "European Cities and Refugees: a Laboratory for Affordable Housing and Urban Resilience to Future Crises", Marie Baléo, 45p, January 2018, La Fabrique de la Cité

La Fabrique de la Cité

La Fabrique de la Cité is a think tank dedicated to urban forecasting. Its interdisciplinary approach brings together French and international experts to reflect on best practices in urban development and propose new ways to build and renovate cities. Its work revolves around five key topics: mobility, urban development and construction, energy, digital revolution, and new practices. Created in 2010 by the VINCI Group, its chief sponsor, *La Fabrique de la Cité* is an endowment fund that fulfils a public service mission. Its work is available to the public through a Creative Commons license on its website, Twitter account and Medium publication.

Authors
Delphine Lacroix
Chloë Voisin-Bormuth
Introduction
Chloë Voisin-Bormuth
Editor
Marie Baléo

Communications
Matthieu Lerondeau
Laure Blanchard
Graphic design
Elsa Antoine
Printed at
Impression Jaurès

La Fabrique de la Cité
6, place du colonel Bourgoin
75012 Paris
France
contact@lafabriquedelacite.com


www.lafabriquedelacite.com


twitter.com/fabriquelacite