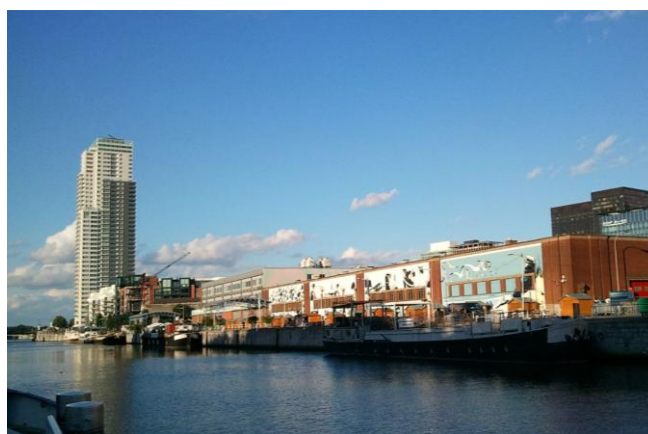


ABSTRACT

Along the riverbanks, port-city interfaces offer many different types of landscapes. The succession of uses around the waterway according to the dominant forms of economic and social organization has shaped the current organization of these spaces. Over time, they have been transformed by economic, political, social, or environmental needs related to urban growth, industrial port developments, and water management, leading periodically to their abandon or mutation. Today, the complexity of the port-city relationship is the result of the gradual disconnection between a city and its port over time. This paper aims to deepen the knowledge of these morphological changes through the prism of economic, political, and social factors. For this, two case studies, Lille and Brussels, are used. Through a geohistorical approach, the sequencing of the disconnection which has gradually separated the cities, their waterways and their ports is defined. The results show us several continuities and ruptures such as port-city disconnection, depletion of the hydrological network in cities or the enhancement and decline of water-related practices. To open the discussions, a new phase of the port-city relationship, opening the way to reconnection, is proposed. This reconnection is based on the contemporary issues of inland ports in their city; as it promotes waterway transport, which is less environmentally damaging than road freight; as a key cog in the foundational economy; as an alternative to peripheral business parks.



The evolution of the relationship between inland ports and cities: the cases of Brussels and Lille

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KEYWORDS

Port-city; Inland ports; Geohistorical approach; Brussels; Lille

The evolution of the relationship between inland ports and cities: the cases of Brussels and Lille

Introduction

“The Canal, soon the newest district of Brussels”¹

“Port of Brussels: a historic record for Brussels' own traffic”²

“Between Bois Blancs, in Lille, and Lomme, life reinvented on the banks of Deûle”³

“With the 2nd best year in its history, Ports de Lille is walking on water”⁴

These translated newspaper titles show a tension between the desires of urban and port redevelopment schemes. These port-city interfaces are at the same time considered as poles to be densified by public stakeholders in charge of urban development and real estate developers, intermodal freight hubs to be intensified by port authorities and transport operators, and watersheds to be preserved by public stakeholders in charge of water management and environmental associations.

How do these different approaches confront each other? How do they arise on territories marked by the close relationship between the economic and industrial history of the city and its waterway, itself influencing the relationship between the city and its port? This influence still marks the configuration of territories today. Port areas stand out from the rest of the urban fabric by their large land areas, which are organised in a linear but diffracted way in distinct sites, and by the functional and morphological variety of port facilities.

Along the water, different landscapes emerge. For example, in Brussels, the relationship between cities and ports presents very different situations:

- the Central districts, recently redeveloped (Figures 1-2);
- the outer harbour, to the north of the Brussels Region (Figure 3);
- the Anderlecht neighbourhoods to the south, sometimes residential, sometimes industrial, where some *Senne* river branches appear (Figure 4).

The situation in Lille presents as many diverse landscapes, between:

- the Ports of Lille site, inserted into the urban fabric (Figure 5);
- the urban project *Euratechnologies* focused on the rehabilitation of the Leblan-Lafont factory (Figure 6);
- Santes and its large warehouses and industrial silos;
- the more vegetal landscape of Wambrechies or Houplin-Ancoisne (Figure 7).

¹ Florence Thibaut, “Le Canal, bientôt le quartier le plus neuf de Bruxelles”, in *La Libre*, March 25, 2020.

² “Port de Bruxelles: un record historique pour le trafic propre bruxellois”, in *RTBF Info*, January 25, 2019.

³ Sébastien Bergès, “Entre les Bois Blancs, à Lille, et Lomme, la vie réinventée des bords de Deûle” in *Voix du Nord*, January 30, 2020.

⁴ Fk. L, “Avec la 2e meilleure année de son histoire, Ports de Lille marche sur l’eau”, in *Voix du Nord*, March 7, 2020.

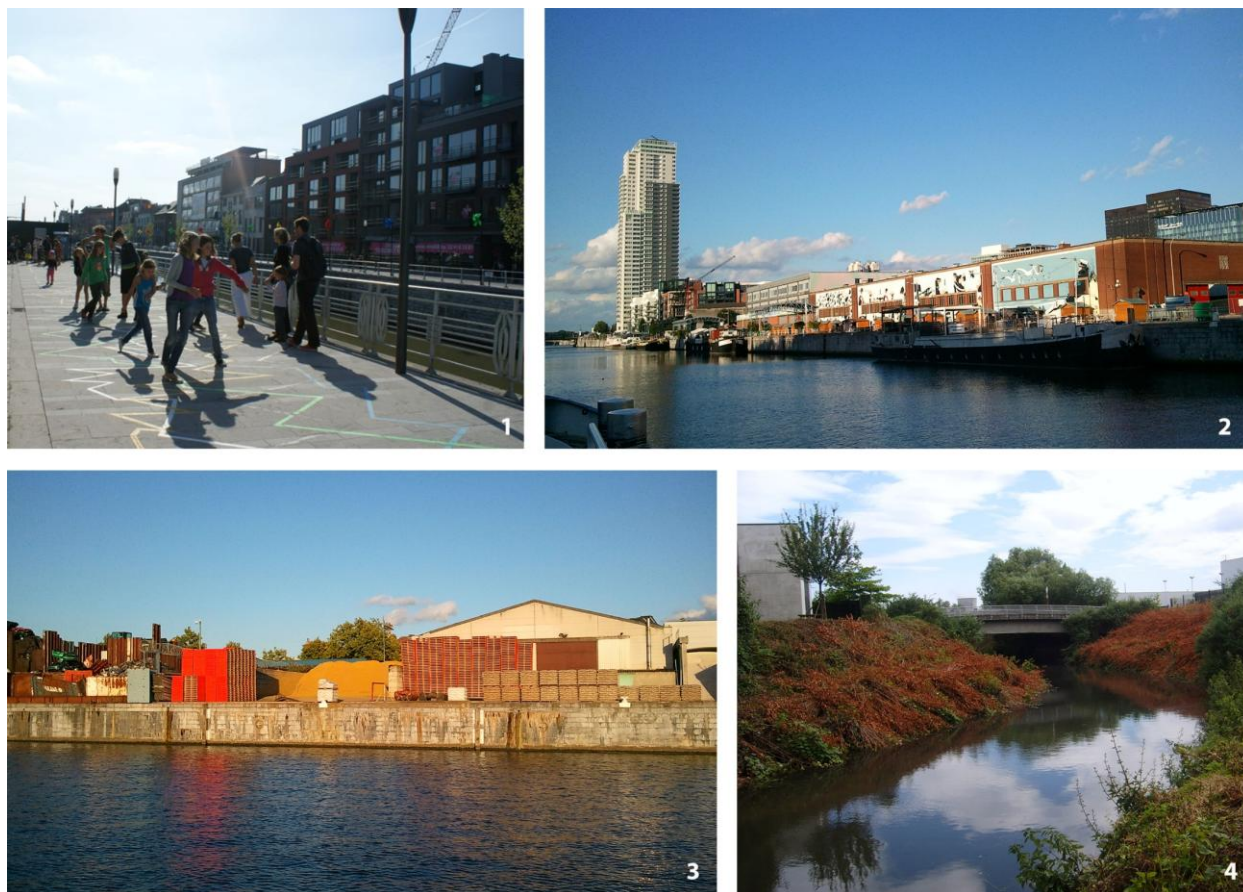


Figure 1-4. Landscapes along the water, in Brussels. (Sources: Kristel Mazy).



Figure 5-7. Landscapes along the water, in Lille. (Sources: Kristel Mazy).

The evolution of the port-city relationship that is currently being questioned in Brussels and Lille, by academics and public authorities, depends on understanding its complexity. However, this results from the gradual port-city disconnection throughout history. The succession of uses around the waterway, according to the dominant forms of economic and social organisation, has shaped the current configuration of these spaces. The aim of this paper is to analyse the mechanisms of this disconnection and its impacts. Indeed, this disconnection has gradually led to shaping these run-of-river landscapes, which have been fragmented both morphologically and institutionally. From the Brussels and Lille cases, we establish the sequencing of the evolution of the city-river port relationship, according to a diachronic approach. This study is approached from the angle of the morphological transformation of the city under the impulse of the progressive relocation of the port, closely linked to the transformation of the hydrographic network.

Evolution of port-city relationship, from waterfronts to riverfronts?

For maritime port-cities, spatial sequencing, established by Hoyle (1989), shows how the port function gradually abandons the urban core for larger coastal sites. At the same time, port industries relocate to sites on the outskirts of the city. Indeed, they no longer depend on the valuation of bulk breaking around which the port was once organised, through the transshipment, warehousing, and trading functions. Sites are then made vacant and wasteland appears. This is considered to be the result of the port-city disconnection (Bird, 1963; Boubacha et al., 1997; Ducruet, 2008; Hoyle, 1989). The interface freed up by the port represents a means of renewal in the heart of the territory and potential land development for the city. “The presence of water represents an interesting potential because it induces highly recoverable spaces in a contemporary logic of market forces, with obvious capital gains effects on the price of land bordering water” (Chaline & Rodrigues Malta, 1994). In a complementary way, the organisational model of the port-city interface aims to include not only chronological sequences and spatial relationships but also economic and technological influences. Political and environmental factors are integrated, as well as a legal framework. At the core of the sequence, the concept of the modern port is gradually relocating to the sea and abandoning, in its wake, the traditional waterfront equipment, making it available for potential redevelopment. Generated by this process of change, the area of conflict and / or cooperation at the port-city interface emerges as an extremely sensitive area requiring a detailed prior assessment of its redevelopment (Hoyle, 1989).

Is the evolution of an inland port-city relationship characterised by a progressive disconnection, like for sea-port cities? As a corollary, how did the river infrastructures, the constantly evolving hydrographic network participate in the transformation of the territories? Which political, social, economic, or environmental factors influence these territorial transformations? Previously explored in cities like Vancouver, Strasbourg, and Paris (Beyer & Debrie, 2011; Hall, 2012; Paffoni, 2013), this article aims to answer these questions by studying the cases of Lille (France) and Brussels (Belgium).

Choice of Lille and Brussels

There are several reasons for the choice of the Lille (France) and Brussels (Belgium) cases which are detailed below.

The current evolution of their port-city relationships is under question. The spaces bordered by their waterways, and by extension the port areas near the centre, have awakened a new appetite among public authorities and private stakeholders.

In addition, their respective ports, the Ports of Lille and Port of Brussels are part of the densest hydrographical network in Europe, and are well connected to the seaports which form the so-called Northern European Range (Rotterdam, Antwerp, Zeebrugge, Dunkirk, etc.) (Figure 8).

Finally, these two cities have common features which make the crossed analysis opportune, such as their demographic weight, their history, and their socio-economic difficulties. Metropolitan areas with more than a million inhabitants today, they both experienced the Burgundian and Habsburg periods, before being unbound during the French conquest in the 17th century. Currently, they are both facing the processes of peri-urbanisation and social dualisation.

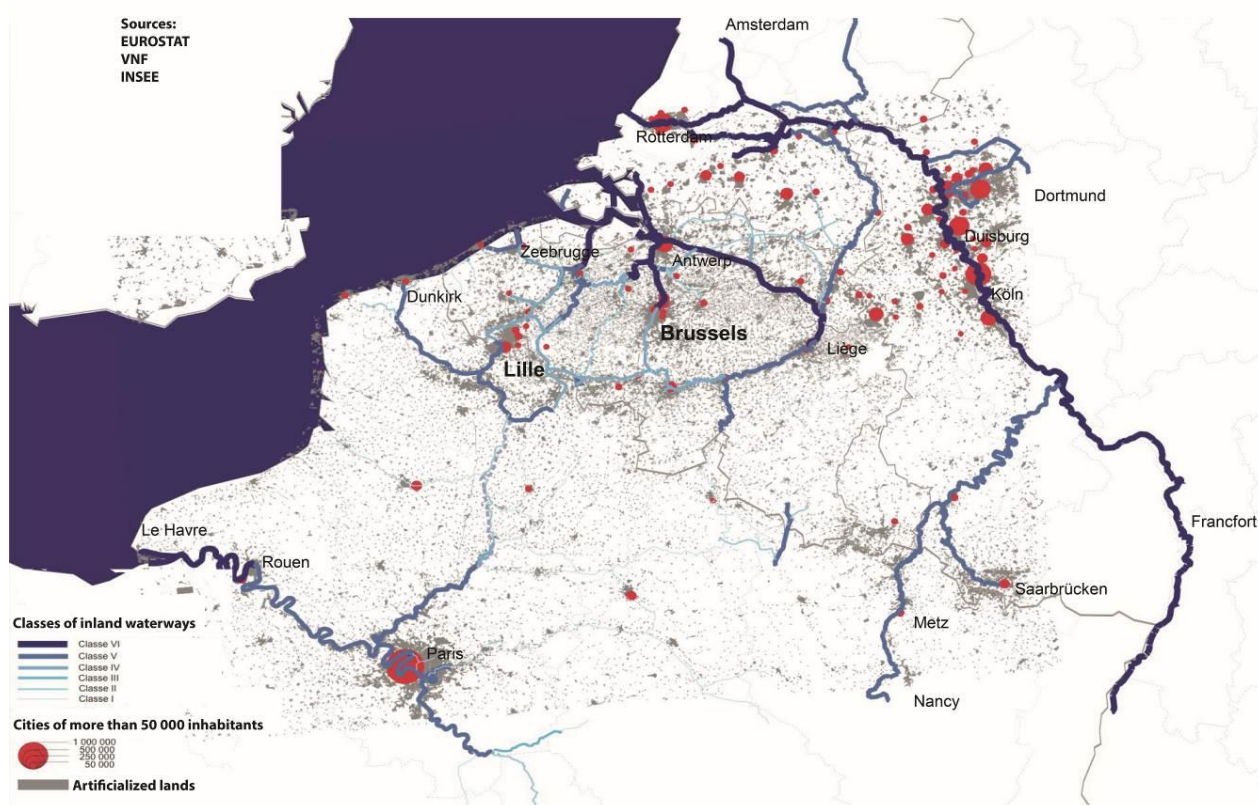


Figure 8. Brussels and Lille within the densest hydrographic network in Europe.

Methodology

To study the evolution of the port-city relationship in Brussels and Lille, we adopted a methodology based on historical geo-spatial mapping. This qualitative approach shares similarities with other studies which explored the port-city relationships from a focus on cities and landside development (Meyer, 2003; Charlier, 2007; Kokot et al., 2009; Desfor et al., 2010; Hein, 2011; Hall, 2012; Hein, 2012, 2016; Porfyriou and Sepe, 2016; Schubert, 2018). More particularly, the methodology is inspired by spatial models turned to the understanding of the evolving port-city relationships (Bird, 1963; Hoyle, 1989; Ducruet, 2008). As (Beyer and Debie, 2011; Frémont, 2011; Paffoni, 2013; Vandenberghe, 2016), we attempted to link Hoyle's model with abstract historical-morphological maps of inland port-city, such as Lille and Brussels, first based on a detailed work of their specific patterns.

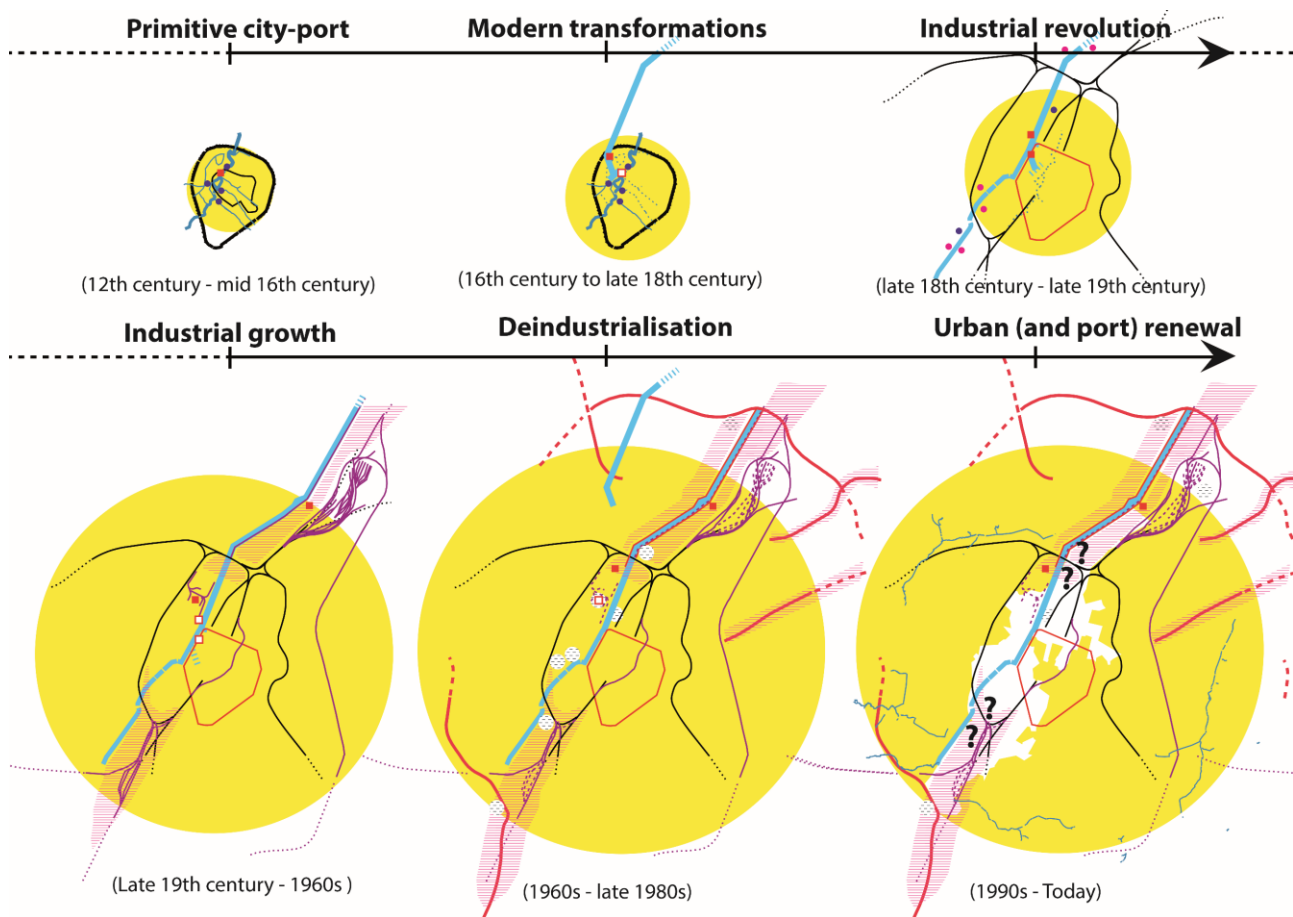
The methodological development is based on three steps. First, through observations of historical maps, we identified successive developments that changed both the relationship between the city and its port, as well as between the city and its waterway. For this purpose, we first established, for the cases of Brussels and Lille, a timeline according to the major morphological changes of the two cities and according to the existing maps (Table 1). On this basis, we produced synthetic maps (see

Supplementary files in a final note). They show, for each period, the extension of urbanisation and the main urban changes affecting the waterway and associated practices (establishment of craft trades, port facilities, etc.). Through schematic sequences, these synthetic maps enabled us to draw the sequences of the port-city relationship in Brussels and Lille (Figures 9-10). Capturing similarities from these synthetic maps, we propose a global pattern (Figure 11) with the use of abstract forms, inspired by the “*choremes*” defined by (Brunet, 1986).

Sequences	Cartographies
Primitive port-city (12 th century – mid 16 th century)	Brussels City Plan of Brussels, by Jacques de Deventer from 1550 to 1565, integrated to the Atlas of Belgian cities, spearheaded by Charles V and Philip II) Lille Plan of the City of Lille and surroundings, by Brun Lavainne, 1504
Modern transformations (16 th century to late 18 th century)	Brussels Topographical and surroundings plan, engraved in 1777 by L.A. Dupuis, attached to the Chorographical Map of Plan of the City of Brussels Austrian Netherlands, spearheaded by the general count de Ferraris Lille Plan of the City of Lille and surroundings, by Brun Lavainne, 1792-1796
Industrial revolution (Late 18 th century – late 19 th century)	Brussels Plan of the City of Brussels, 1894 (J. Malvaux Establishments) Lille Plan of the City of Lille and surroundings, according to the official plan established by the Directorate of municipal works department, under the Administration, 1878
Industrial growth (Late 19 th century – 1960s)	Brussels Topographical maps 1:10 000: 23/7, Vilvoorde, 1961; 31/1, Anderlecht, 1953 c 58; 31/3, Brussels, 1953 c 58; 31/6 Halle, 1953 c 58; 31/7, Uccle, 1954 (military cartographic Institute) Lille Maps of France 1:25 000: Lille 1-2;3-4; 5-6; 7-8, 1958
Deindustrialisation (1960s – late 1980s)	Brussels Topographical maps 1:10 000, 1993-1994: 23/7, Vilvoorde; 31/1, Anderlecht; 31/3, Brussels; 31/6 Halle; 31/7, Uccle (National Geographic Institute) Lille Topographical maps 1:25 000: Lille Roubaix Tourcoing, 1998 (National Geographic Institute)
Urban (and port) renewal (1990s – 2010s)	Brussels Topographical maps 1 :10 000, 2011 (National Geographic Institute) and background maps Urbis, 2009 (CIRB) Lille SCoT of Lille Metropole, 2010 (ADULM)

Table 1. Cartographic sources for each sequence of the evolution of the port-city relationship in Brussels and Lille.

In a second step, monographs on the urbanisation of Lille and Brussels helped us identify the political, social, economic, or environmental factors of these territorial transformations observed through historical geo-spatial mapping. For each period, they are completed by publications focused on the historical, economic, geographical, political, and social specificities linked to a particular sequence. Some of these are referenced below in the development of the sequences. Finally, the last step is dedicated to analysing the influences of these actions on the natural and material properties of the territory, by cross referencing the analysis of cartographies and specific publications.



Caption	Spaces	Networks	Activities
<ul style="list-style-type: none"> Urbanization Walled enclosures Brownfields Urban renewal Tensions between urban et port renewal 	<ul style="list-style-type: none"> Original river Channel Vaulted/ backfilled river Railway line Extension of the railway network Road Highway 	<ul style="list-style-type: none"> New port facility Former port facility Transformed port facility Craft/ small-scale industry Industrial fabric 	

Figure 9. Evolution of the port-city relationship in Brussels.

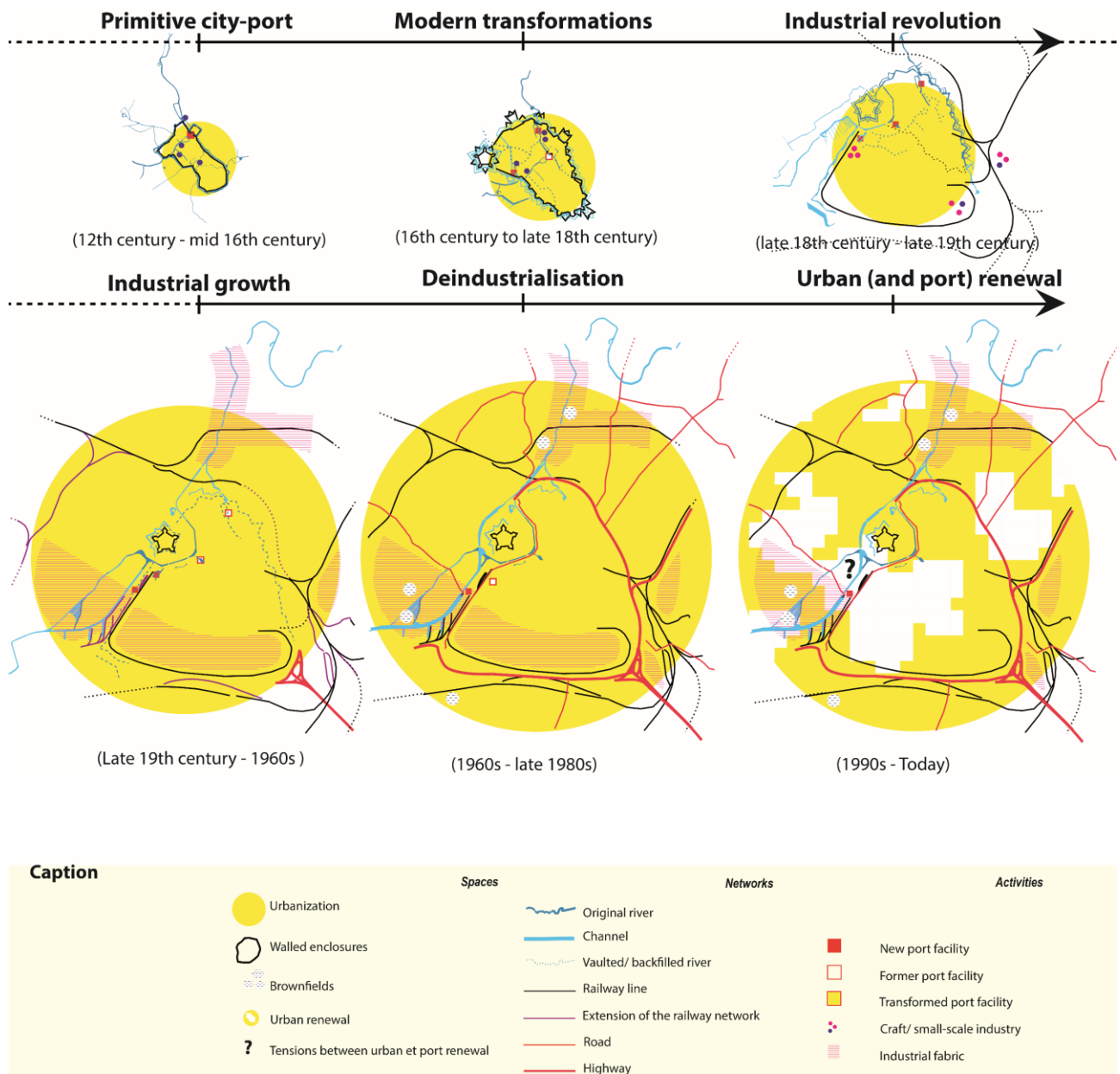


Figure 10. Evolution of the port-city relationship in Lille.

For each sequence, the article shows the main territorial changes, linked to the port-city relationship. Through specific publications referenced, it highlights political, social, economic, or environmental factors, which have influenced these territorial transformations.

First sequence: Primitive port-city (12th to mid-16th century)

The mills and the port, drivers of urban development

In Brussels and Lille, the existence of bulk breaking (between land and river transport) promoted the emergence and the development of these cities. This modal shift could have been caused by the relief. In Lille, for example, it was due to the four-metre difference in level between the *Haute Deûle* and the *Basse Deûle*. Bulk breaking offered a configuration conducive to the development of an agglomeration, by promoting the establishment of two types of facilities: the mills and a port. The mills used hydraulic energy for craft activities (flour mills, forges, sawmills). The first port facilities (portus) offered merchants and boatmen a docking place. The first water-related practices, activities associated with mills and navigation, constituted major drivers of development. These first forms of development were initiated by the Counts of Louvain (for Brussels) and Flanders (for Lille). From the 15th century, the craft and industrial sectors diversified around the activity of the water mill. The trades (tanners, brewers, butchers, etc.) colonised the intra-urban streams. In addition to their economic role, the canalisations and water diversions contributed to urban development. Indeed, land drainage caused the draining of the marshes on which the two cities were built.

Appropriation of the watershed at the heart of political strategies

The installation of the first mills was closely linked to the development of agricultural activities made necessary by population growth. For example, in Lille, the population increased from 1,000 to 4,500 between the year 1000 and 1100 (Paris & Stevens, 2000). The construction of the ducal mills could also be compared with the interest of the counts in these economic infrastructures and the gains they could generate. In Brussels, the Count of Louvain installed several mills in Vilvoorde and Brussels. In this way, he ensured the centralisation of income from cereal production, and by extension from the brewing industry, by linking the collection of fees from beer production. More generally, all the interventions were aimed at fixing a terminus for navigation in the two cities. This terminus helped to establish their economic development by making the peripheral cities dependent on this berthing place (Deligne, 2003).

This first sequence shows that the waterway, at that time, was a driver for economic development (transport and energy), and for wastewater disposal. The appropriation of the watershed was already an important geopolitical issue.

Second sequence: Modern transformations (16th century to late-18th century)

Canals projects, a factor of change in urban landscapes and the hydrographic network

In Europe, the digging of canals brought important changes for urban landscapes inside the walled enclosures. In Brussels, the *Willebroek Canal*, inaugurated in 1561, modified the Brussels landscape by the progressive digging of the basins inside the second enclosure. In Lille, a canal was dug between the *Haute Deûle* and *Basse Deûle* to eliminate the bulk breaking and transshipments between the two shores. This canal constituted the first diversion of the *Deûle* to bypass the city.

Water capture from pre-existing rivers and tributaries to feed the canals caused a dysfunction of the hydrological network (drying up, flooding). This dysfunction led to an imbalance between the practices linked to navigation and to the water-related craft professions which coexisted until then (Deligne, 2003).

The European competitive context for the control of inland waterways

From the 16th century to late 18th century, there was a competitive context for European cities (for the collection of fees and rights of way). The control of the waterways was a major issue in this competitive context. In Brussels, the city suffered from obstacles caused by its main artery, the *Senne*: a winding, narrow river, which was often full of silt. To strengthen its place in 16th century commercial networks, the project of a fast waterway between Antwerp and Brussels became necessary. In Lille, until the French conquest, activity was geared towards the north, following the natural course of the waterway, via the *Deûle*, the Lys and the Scheldt (Paris & Stevens, 2000). But, in 1667, the destiny of Lille shifted to the south. On the one hand, the water was used for defensive purposes, to protect the stronghold, recently conquered by France. The construction of the Vauban Citadel is testimony to this. On the other hand, water was also used for commercial purposes with the creation of a fluvial network, promoting economic exchanges orientated towards the border, the agricultural south, and the French maritime west.

This second sequence shows that the control of waterways constituted a pivotal role within the geopolitical context. Water was used for commercial purposes with the creation of a river network, promoting economic exchanges and allowing cities to expand their area of influence. It was also used for defensive purposes. The development of trade and commerce, and then of production, is the key factor that explains the origin and development of European cities (Le Galès, 2003). This control of waterways implies major changes within the hydrographic network, creating an imbalance between water-related craft professions and navigation practices (Deligne, 2003).

Third sequence: The industrial revolution (late-18th century – late-19th century)

Extension of the waterway network

The existing navigable network was improved and extended. Brussels already had accessibility to the sea, to Antwerp, via the *Willebroeck Canal*. Three centuries later, the water artery was extended from Brussels, to the coal basin, located to the south (Charleroi, Hainaut). The Charleroi Canal was dug between 1827 and 1832. "Much more than a channel for the transit of goods from south to north, it is rather a coal channel which has just been put in place" (Demey, 2008). This time lag of three centuries between the Brussels-Antwerp Canal (sea) and the Brussels-Charleroi Canal (coal basin) can be explained by geopolitical factors and interests. The Belgian territory was under the regime of the Austrian Netherlands until 1794 (former Southern Netherlands). In this context, since their independence in 1648, the United Provinces (former Northern Netherlands) maintained the closure of the Scheldt to ensure their monopoly over the transport of goods. It was not until 1815, corresponding to the fall of the French Empire and the creation of the United Kingdom of the Netherlands (including former Southern and Northern Netherlands), that this project for the waterway's extension materialised. Indeed, pressure from industrialists from Hainaut's coal basin converged with the political will of the new King, William I, to offer a cheaper way to supply his country. In Lille, an improvement programme for the *Haute Deûle* was initiated by the government due to the difficulties of navigation on the course of the *Deûle*. While waterway transport was already in competition with the development of the railway

network, this decision can also be explained by geopolitical and economic reasons. The triggering factor for this French State position is probably the fact there was a preference for coal boats to go through Ghent and Veurne, located in Belgium which had been independent from the Netherlands since 1831, rather than through the French city of Lille (Caniot, 2005). The diversion of *the Moyenne Deûle* was extended. The waterway was extended to bypass the city through the fortifications to the north.

Relocation of port activities to the wider river network and rail

The enlargement of the river connections and the rise of the rail network led to the relocation of port and industrial activities to the enlarged river and rail network, outside the ramparts. The nerve centre of the port of Brussels moved north of the city, in the direction of the port of Antwerp. In Lille, the diversion of the *Moyenne Deûle* and the enlargement of the city contributed to the opportunity for a new port to be established (Port Vauban). Existing ports became more specialised (military, supply). Both in Brussels and Lille, the construction of new port infrastructures was decided at the instigation of:

- Land opportunities
The demolition of the ramparts freed up new space for port development.
- Intermodal concerns
This relocation made it possible to reach the large ship canals and the rail network, as well as any developments outside the city.
- Technical issues
For example, in Brussels, the lowering of the water level of the canal required the digging of new basins to allow the evacuation of the flood waters of the *Senne*.

The city's industrial expansion

In Brussels, the almost simultaneous development of the railway network and the new channel conditioned the installation of industries and manufacturing employment along the new north-south line. From the origin of the city, the old hydrographic network and the east-west road had structured the establishment of shops and crafts. Near Lille, the nearby suburbs and the villages of Roubaix and Tourcoing experienced spontaneous urban explosion, starting from a rural fabric, in relation to new industrial establishments. Flemish peasants, affected by rural crises, flocked to the French side and fuelled industrial and urban development, particularly in the Roubaix and Tourcoing regions (Paris & Stevens, 2000).

The disappearance of branches of rivers and small tributaries

The nineteenth century marked the start of a vast project to reshape cities, leading to the gradual disappearance of the central canals, rivers, and basins, which were vaulted or backfilled. Hygiene, functional, and aesthetic arguments led to the disappearance of stagnant and dried-up branches of rivers and small tributaries. In Brussels, the so-called sanitation works of the *Senne* led to its radical underground confinement. First, this choice was motivated by hygiene concerns. The increase in rubbish dumps, combined with the low dilution capacity of the *Senne*, caused regular flooding in the lower part of the city. However, these negative externalities were no longer balanced by the economic role of the *Senne*. *"The Canal signified the first erasure of the river. It allowed Brussels to consolidate its rank and place it on the urban chessboard, giving it a new economic and territorial basis"* (Deligne, 2005). Secondly, the concern of the design and improvement of the road network also came into play. Indeed, the need for an appropriate road network was necessary to connect the two new stations. Thirdly, this concern for reshaping the city was motivated by a desire to make the poor districts of the

city disappear. This reinforced the decision to bury the river by creating a wide boulevard with three branches (a Y-shaped boulevard) over the river.

In Lille, the loss of the economic role of interior canals, associated with the concern of improving urban sanitation, led to the decision to gradually conceal them by vaulting or filling. In fact, from the middle of the 19th century, the landscape was seriously affected by the arrival of the railway and, at the same time, the diversion of the *Moyenne Deûle* which now bypassed the city. These factors led to the loss of the economic role of the *Basse Deûle*. Abandoned by the artisanal industries, it became a disused branch of the waterway network.

Major transformations of the hydrographic basin by the industrial, political, and financial bourgeoisie

These transformations covered the digging of canals but also implied hydrological dysfunctions (Deligne, 2003):

- A reduction in the number of hydraulic annexes (ponds, marshes, reservoirs).
- The use of water in industrial processes and their waste disposal solutions.
- Significant urbanisation, which led to an increased waterproofing of the soils and to the development of the road network and contributed to the modification of the runoff and flow of the watershed.

This third sequence shows that the waterway and the port were at the service of an unprecedented industrial boom and urbanisation. Through the industrial revolution, these economic and demographic changes directly served the construction of nation-states. Major infrastructure works, such as extensions and improvements of the waterway networks and port infrastructures, were the signs of the state's actions, acting as an essential regulatory instrument producing long-term benefits. This industrial urbanisation was spectacular in Northwest Europe. These major works took advantage of the space left by the demolition of the ramparts, which had become useless in the context of the growing political weight of European states. This third sequence was also marked by urban changes through planning influenced by health concerns. This led to the complete disappearance of branches of rivers and small tributaries, to an increasing waterproofing of soils, and hydrological dysfunctions.

Fourth sequence: Industrial growth (late-19th century until the 1960s)

Spatial configurations of the industrial boom

Industrial development took the form of an axis in Brussels and a pole in Lille. In Brussels, an industrial axis had been developed along the Canal and the parallel rail network since the 19th century (Beyaert, 2006). The widening of the waterway and the opening of new port facilities caused an influx of industrial establishments. They covered a variety of fields (building materials, iron and steel, flour milling, chemical industry, petroleum sector, etc.). In Lille, a textile centre of global importance had been developed in the wool (Roubaix-Tourcoing) and linen/cotton sectors (Lille, Armentières, etc.). From the interwar period, there was less innovation. The structures were frozen in an industrial apparatus that was certainly powerful, but which was no longer as responsive. The system had reached maturity (Paris & Stevens, 2000). After World War II, Belgium, unlike France, pursued '*une politique d'abondance*' (a policy of abundance) that sought to stimulate the economy, refusing to adopt the austerity measures enforced in Britain, France, or Holland. Consequently, the Belgian economy appeared to recover faster in the early post-war years (Ryckewaert, 2011).

Growing urbanisation and socio-spatial polarisation

The urbanisation process, which accompanied industrial development, took the form of an intense movement of urban sprawl. In Brussels, the suburbs continued to develop, to the detriment of the centre, the Pentagon, which had lost many of its inhabitants. Two causes explain this exodus: the major infrastructure works in the Capital due to the junction of the north and south stations (North-South Junction) and the mobility of workers in combination with the development of two-wheeled vehicles, railways, and trams. In Lille, the urbanisation process created an urban, complex, and polycentric system. From the main urban cores, urbanisation spread to the outlying municipalities to gradually form, according to the British model, a conurbation.

The industrial boom and increasing urbanisation contributed to marking social disparities in the urban landscape. A class society was visible in the urban space. In Lille, the accumulation of workers' housing in the districts of Moulins and Wazemmes contrasted with the bourgeois districts around the Barbieux park. In Brussels, the Canal axis already drew the socio-spatial divide between the east and the west of the agglomeration. Facing this issue, significant social housing construction was undertaken.

This fourth sequence shows that a set of infrastructure works were started during the industrial revolution and were developed in the context of a still growing political weight of the states, particularly after the two World Wars. The efficient transport network and the new port centres proved to be tremendous incentives to industrial growth, ensuring the ease of an exchange of goods between production and consumption centres. However, industrial boom and increasing urbanisation contributed to marking social disparities in the urban landscape.

Fifth sequence: Deindustrialisation (1960s to late 1980s)

Road development, deindustrialisation, and emergence of brownfield sites

The navigable network and the port infrastructures were adapted to the new economic requirements. The latter required minimisation of bulk breaking between maritime and land transport by increasing the transshipment speed. In this context, containerisation, installation of multimodal platforms and road modes were developed. In Brussels, the Canal was widened between the outer harbour and Vilvoorde. The TIR Centre (International Road Transport) was created in 1959. The Ring road appeared in 1970. In Lille, the *Deûle* bypass canal at the Citadel was inaugurated in 1977. Later, the LCT container terminal was created (1990). The construction of the peripheral boulevard occurred in 1970.

In the 1970s, the construction of motorway ring roads disrupted urban landscapes. These infrastructures transformed urban morphologies. Above all, the highway network allowed a wider choice of implantations, resulting in a residential and economic sprawl. In Brussels, in the 1950s, the first industrial relocations were due to the impossibility of an on-site extension; this benefited Flanders (Hal-Vilvoorde). This process reinforced deindustrialisation. Indeed, in the early 1970s, the industrial recession also affected the other two Belgian regions. Consequently, the movement of industrial deconcentration, through the transfer of activities towards the periphery, continued in the form of pure deindustrialisation (Vandermotten, 2005). The Nord Pas de Calais region also experienced the decline of key sectors of its economy: the mining and textile sectors and the steel and metallurgy sectors.

During this period, economic development policies impacted urban planning by the creation of peripheral business parks. In Brussels, from the 1960s, the creation of peripheral parks had an impact on the relocation of Brussels firms from the 1970s. They were concentrated around the motorway network and expressways, and preferably in the north-east of the city (towards Liège, Antwerp, and the national airport) (Merenne-Schoumaker, 1983). In addition to industrial production facilities, these parks

combined logistics and maintenance activities, and even large retail areas and offices. In Lille, the creation of large peripheral industrial zones from the 1960s, and especially in the 1970s and 1980s, near expressways and highways, resulted in the same process of relocation of production activities. By the end of 1996, almost one in every two jobs was located within such areas (Paris & Stevens, 2000).

In the two cities, the competition of peripheral sites and industrial decline led to the creation of many industrial brownfield sites within the dense urban fabric. In Lille, this was the case for many textile factories whose activities were linked to the use of water from the Deûle or the Roubaix Canal. In Brussels, the Canal area experienced many closures and abandonments, such as the *Marly* coke plant, *la Gare Maritime de Tour & Taxis* in 1993 and the *Renault* factory in 1997.

Desertion from city centres and first revitalisation operations

From the end of the 1970s, the rehabilitation policy responded to the desertion of central neighbourhoods whose socioeconomic and urban fabric had been undermined (brownfields, wastelands) by urban sprawl and deindustrialisation. These actions concerned renovations of blocks and isolated buildings. In Brussels, these public actions responded at the same time to the urban development model referred to as “Bruxellisation”, supported by a policy which was very open to the promotion of office buildings and road improvements, supported by the national state. At the beginning of the 1990s, at the dawn of regional autonomy in the context of the federalisation of the Belgian state, the rehabilitation policy was extended to a revitalisation policy. Urban renewal actions and local social actions were associated with operations to renovate and protect the existing environment to tackle insecurity and strengthen social cohesion (Noël, 2009). In Lille, the first urban renewal operations, in the 1970s, began in the Vieux Lille district, which had been abandoned by the bourgeoisie.

Reindustrialisation versus urban redevelopment?

During the beginning of this post-Fordist era, the hesitations of the public authorities regarding the orientations to be given to these urban territories, marked by industrial heritage and pollution, contributed to their paralysis. In Brussels, decisions on the future of the Canal zone languished due to the uncertainty linked to port and/or urban development choices. For example, at the end of the 1980s, strong real estate pressure was exerted on the port land. In 1990, the Brussels region imposed a moratorium on investments from companies of the port community. Effectively, this moratorium froze any extension of port activities to rethink the development of the area. Real estate development projects emerged, such as the “*Etangs du Nord*”, inspired by the London Docklands. However, most port areas were maintained in the first regional planning document, which included several elements:

- Mobilization of port companies
- Institutional restructuring of the port
- Upward revival of freight transport
- Decrease in real estate pressure

Only, the Beco basin, near the city centre, was subjected to an urban reconversion. It started the debate over the urban transformation of port areas.

Cities and ports finalised their disconnection during this period under the effect, on the one hand, of the relocation of economic and port activities and, on the other hand, of the reinvestment of the centres in urban renewal operations. During this post-Fordist mutation, the dithering of public authorities regarding the directions to be given to these territories, which were marked in their spatial or social organisation by their industrial heritage, contributed to their paralysis.

Sixth sequence: The reinvestment in industrial spaces (from the 1980s to the present day)

First act of urban renewal

In response to the social and spatial consequences of the transformation of the economy, public policies focused their actions mainly on degraded centres (see above). These policies were part of a wider movement to refocus public action on the city, from the mid-1970s. Several factors, identified by G. Pinson, contributed to the origin of this transformation:

- Globalization and transformation of capitalism
- Recomposition of national states
- Slowing of spatial Keynesianism
- Development of regional and urban policies by the European Union

In Brussels, the autonomy acquired by the Region (1989) reinforced the concern for attractiveness vis-à-vis other European cities, but also - and above all - vis-à-vis the other two regions. Indeed, the Flemish and Walloon regions continued to receive flows from urban sprawl. Since 1989, the action of the Brussels region had focused on the most degraded districts. Concentrated initially around the central districts, it gradually stretched along the axis of the Canal. The objectives of the public actions related to the attractiveness of the central city and to the redistribution towards lower socio-economic groups, who mainly occupied these neighbourhoods (Noël, 2009). The operations used were, in particular, “neighbourhood contracts” and actions within the framework of European programmes. In Lille, from the 1970s, and even more so in the 1980s, the first urban revitalisation actions took the form of “neighbourhood plans” to tackle demographic drain and reintroduce attractiveness. However, despite the requalification efforts, the socio-economic gaps were widening between districts, particularly in the sectors of Roubaix and Tourcoing, which continued to be derelict. Lille’s Community strategy for urban renewal, initiated in 1991, introduced the concept of “*Ville Renouvelée*”, and became the basis of planning documents. At this period, the districts “*Ville Renouvelée*” concerned nearly a third of the urban fabric, mainly mixed housing-work districts resulting from the industrial tradition, often located along waterways. This concept anticipated national policies known as “Urban Renewal” (Paris & Mons, 2009).

Second act: Renewal, urban projects, and tensions in port-city areas

This contemporary phase of the port-city relationship reveals the tensions in port areas close to centres (Mazy, 2014). It emerged within a shift in the planning approach. This shift relates to the transition towards urban planning with a general scope, focused on the renewal of central districts, geared towards the multipolar development of strategic sites through urban projects. In Brussels, these two approaches were already present in the Regional Development Plan of the Brussels Region, adopted in 2002, through urban renewal operations (“neighbourhood contracts”) and urban projects (“areas of regional interest”). At the same time, the Lille Metropolitan Council implemented these two sequences in its planning document, named “*Schéma Directeur*”, approved in 2002. Urban renewal operations were developed through the “*Politique de ville renouvelée*” and urban projects were implemented by the inscription of “*Pôles d’excellence*” on the periphery of the centre. Their vocation was to become the strengths of metropolitan influence.

These two concomitant approaches tended to stimulate an expansion of urban centres. This expansion created a land tension exerted on the industrial-port zones. In the early 2010s, the need to open a dialogue between urban and port authorities arose through specific planning documents.

Are we facing a new time in the port-city relationship which opens the way to reconnection?

In Lille, the programming study on the renewal and integration of the port into Lille's urban fabric, initiated in 2011, was intended to refine, balance, and bring together urban and port wishes. However, it was suspended in 2012. Divergences in terms of methodologies, distribution of programming (housing / port activities), and choice of partners for real estate development, did not allow for mutual agreement. For its part, Ports de Lille - CCI Grand Lille was also engaging in a new investment programme, which led to the need to renew the concessions of the historical port site until 2038. In addition, the *Métropole européenne de Lille* (MEL) and the City of Lille continued to expand urban development around port sites. The extension and continuation of operations for the urban renewal project "*Rives de la Haute Deûle*" were then decided in 2016. A new meeting point could take place at the initiative of the "*Territoire de Projets*" approach, resulting from the work of the planning document "*Schéma de cohérence territoriale*" (SCoT).

In Brussels, 2011 marked the starting point for the elaboration of a public vision for territorial development centred around the Canal with the "Canal Plan", produced by Alexandre Chemetoff & associés, author of the *Plan-Guide de l'Île de Nantes*. This evolution of the port-city dialogue was accomplished through a change in the political context, accompanied by operational tools set up a few years later for the implementation of this planning document. The "*Research by design*" team, within the "*Canal Team*", negotiated a common vision between public authorities and project leaders based on different spatial variants, by applying the principles of densification, functional and social mix and urban integration defended by the "Canal Plan". The exercise required the understanding of different land logics. "While the real estate developer's objective of optimal profitability is to achieve the largest volume from the smallest possible plot of land, the industrial stakeholder envisages their economic expansion only in parallel with their land expansion" (Lacasse & Collet, 2016). Finally, the urban integration of productive activities was also stimulated by the team of the Brussels Master Architect, through the promotion of the "productive city" and the organisation of architectural competitions around objects, such as the redevelopment of a concrete plant or a company specialising in sorting waste. In addition, the preparation of the Masterplan for the Port of Brussels started with a very broad consultation of public, private and association stakeholders concerned with territorial development, logistics and the environment.

Between the cases of Lille and Brussels, the difference in openness to dialogue between the city and port can be explained by different governance structures (Mazy and Debie, 2020). The governance of the Ports de Lille, indirectly influenced by the State (through Chamber of Commerce), impacts the port-city dialogue, marked by an institutional disconnection (a secondary role of communities in port governance) between the port authority and the administered territory. Brussels offers a completely different model, close to the municipal status of northern European ports. Indeed, after the federalisation of the Belgian state, the port jurisdiction was regionalised in 1993. The port-city organisational system is based on a direct representation of the port function by a supervising Minister within the executive of the Brussels-Capital Region, through the municipal and regional representatives on the Board of the Port of Brussels, and finally through the development of a four-year management contract between the Brussels-Capital Region and the Port of Brussels.

This sixth sequence shows that recent developments, in the trajectory of the port-city disconnection, concerned the relocation of port land, coupled with an urban renewal of abandoned sites. These urban renewal operations are the signs of policies and public actions refocused on the city from the mid-1970s. Many metropolitan urban projects of the last twenty years have relied on this process of *docklandisation* (Charlier & Malézieux, 1997), contributing to a new geography of the port-city relationship (port relocation / urban reconversion of interfaces). Today, the progression of concepts of circular economy, reflection on the functional mix of public spaces, and the recent theme of the productive city, have enhanced waterways and their ports. Indeed, these are all the tools available to meet the current objectives in terms of sustainable development ("soft" modes of transport, short circuits of materials, waste and recycling of

construction materials, urban logistics, job maintenance for the less qualified in urban centres, etc.) (Mazy and Debie, 2018). The goal of sustainability in planning exercises promotes a new interpretation of the place of the port and the river in the city.

Conclusions

The results show us that, through the different sections that have marked the development of these port-cities (Figure 11), we can identify several continuities and ruptures:

- **Depletion of the hydrological network in cities**

Another constant is the gradual scarcity of water in the city through the search for its control. For this purpose, works of pipes, vaults, and fillings have been undertaken, sometimes to achieve the better performance of navigable ways, sometimes for the improvement of public health. Today, a city-water reconnection is being initiated through rising environmental concerns related to the state of degradation of aquatic environments, water quality, and increased flooding.

- **Valorisation and decline of practices and territories linked to water according to economic upheavals**

Over time, water has been a major support for economic growth built on the development of successive activities: those associated with mills, transport and trade of goods, crafts, industry, logistics, leisure, etc. During economic changes, certain districts have undergone a physical transformation, in terms of infrastructure or development (the digging of a canal, the construction of a new port, or the reallocation of a disused basin). From this basis, imbalances could arise between territories according to their adaptation to the latest forms of economy. These imbalances have caused social disparities. As early as the 1980s, and still today, the question of gentrification has arisen around real estate development fuelled by "*flurbanization*" (Le Sueur, 1997).

- **The port-city disconnection**

Ports have gradually moved away from the urban centre due to two, often simultaneous forces related to the need for new spaces: technological port priorities (brought by new property needs and proximity with new, higher performance transportation infrastructures) and/or property and real estate resulting from urban development (Frémont, 2011).

Today, urban projects lead us to question the continuation of this port-city disconnection to propose a possible reconnection (Mazy, 2014, 2017). This logic of reconnection concerns several objectives:

- Environmental concerns: the port, within the city, is useful to serve the objectives of urban sustainability (Debie, 2013), since it can promote waterway transport, which is less environmentally damaging than road freight.
- Economic purpose: inland ports, through their roles in the supply chain, promote sectors of the economy necessary for the daily life of the inhabitants (construction sector, mills, oils, etc.). In this way, ports can be considered as a key cog in the foundational economy, allowing economic activities that maintain the daily functioning of the metropolis and its citizens (De Boeck, Bassens, and Ryckewaert, 2019). These areas – located between the port and the city – thus focus on bigger scale debates, such as the economic decisions regarding reindustrialisation, the pursuit of the expansion of the service sector, and the rise of the residential economy in European cities.
- Urban planning: port areas within the city offer an alternative to peripheral business parks, which cause land consumption and road transport (Merenne-Schoumaker, 2007).

However, this port-city reconnection implies a paradigm shift in many sectors. First, it questions transport and waterway support policies. Secondly, it debates the planning processes, often segmented according to uses, and thus creating competition between them. Thirdly, it implies better recognition from public authorities of the basic or foundational economy of the city, promoted by ports. And finally, this reconnection is conditioned by the acceptance of the citizens, who are rarely informed about the role, or even the very presence, of the port in the city.

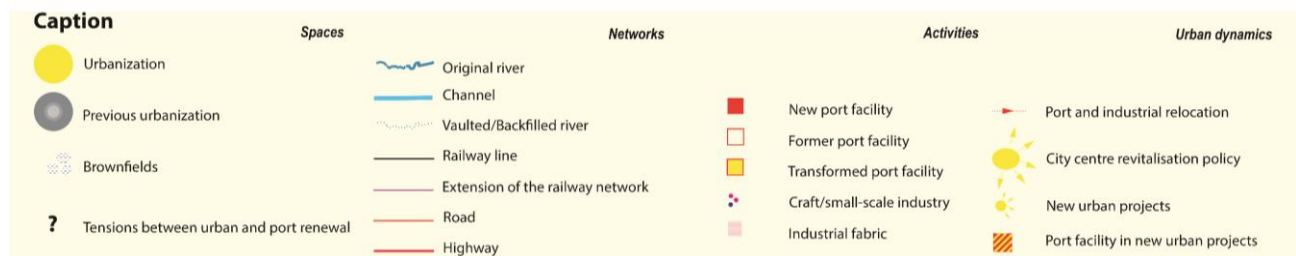
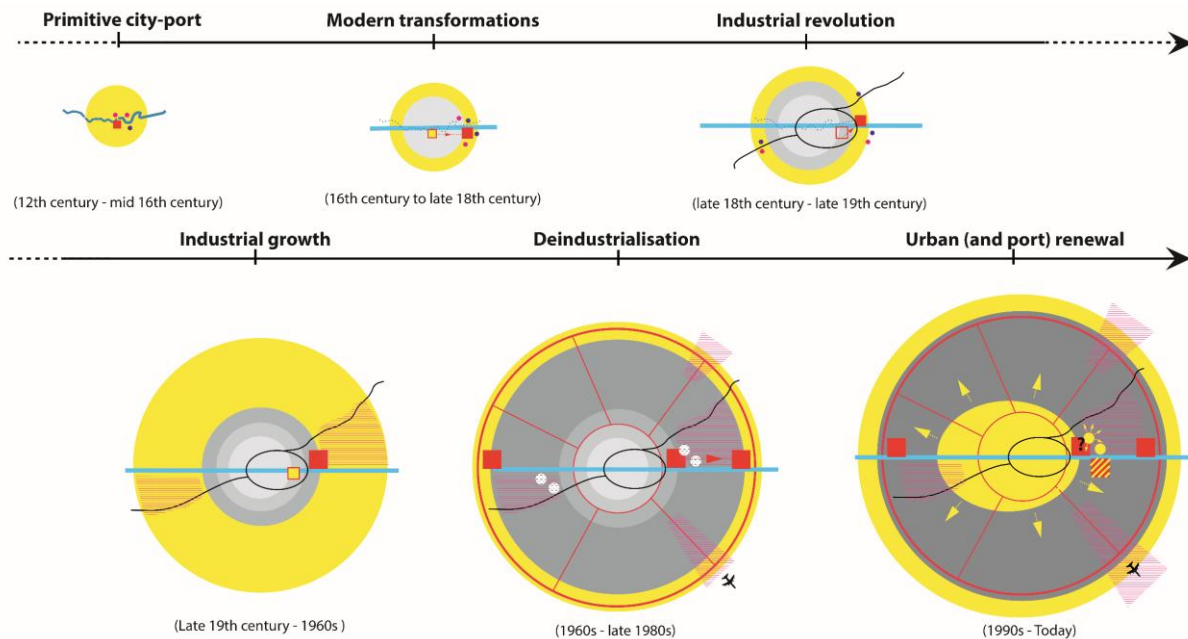


Figure 11. Schematic evolution of the relationship between inland ports and cities.

Supplementary Files

The synthetic maps, which enabled us to draw the evolution of the port-city relationship in Brussels and Lille, are available in PDF files, in Kristel Mazy's doctoral research (2014). « Villes et ports fluviaux : le projet comme dispositif de reconnexion? Regards croisés sur Bruxelles et Lille ». Bruxelles: Université Libre de Bruxelles - Université de Lille. <https://www.theses.fr/2014LIL10049>.

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