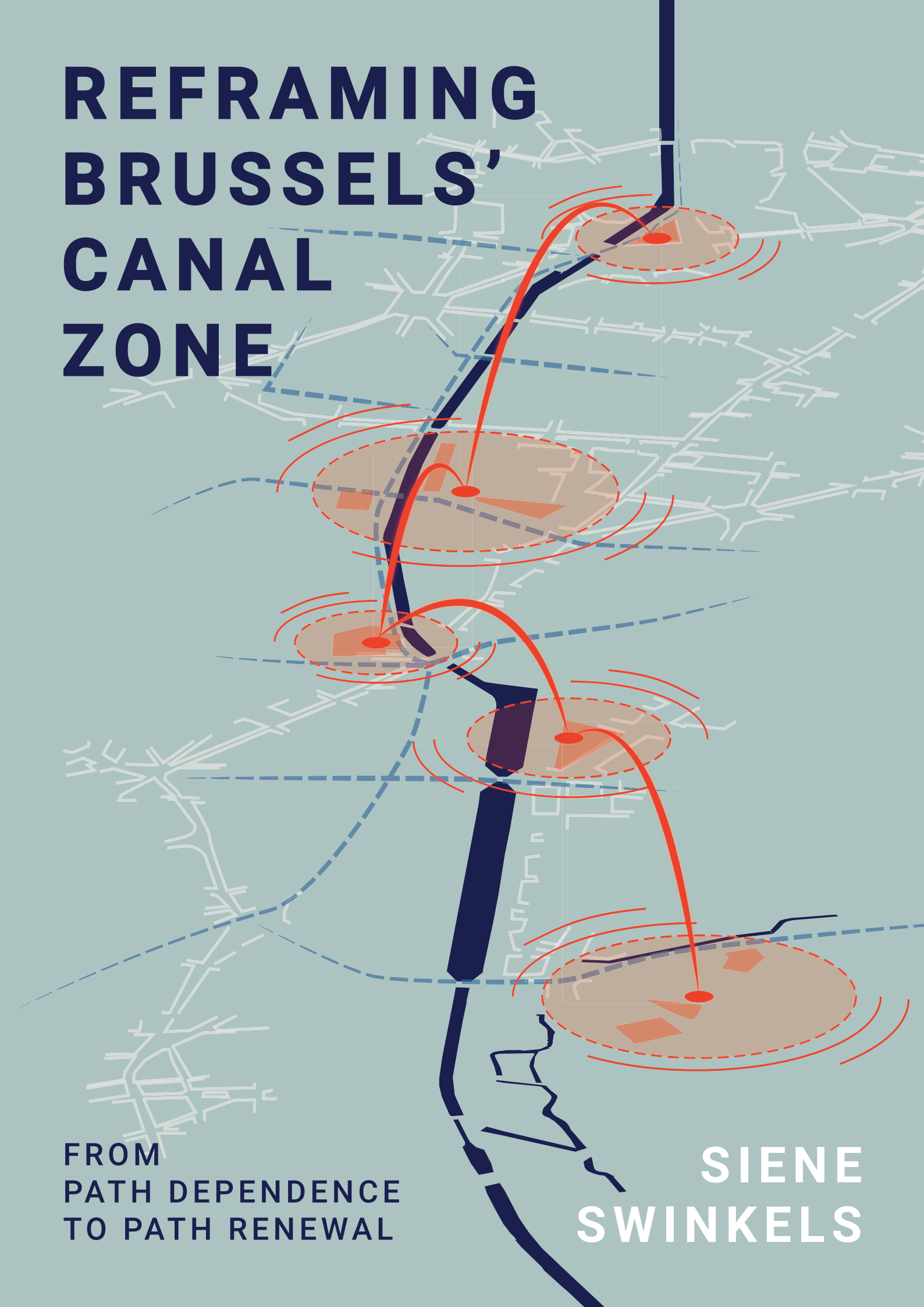
REFRAMING BRUSSELS' CANAL ZONE



FROM
PATH DEPENDENCE
TO PATH RENEWAL

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Over the past three years I took three seperate trips to Brussels. In 2021, I went with friends from secundary school. This trip sparked the idea of exploring this fascinating city for my thesis.

My dad joined me on my second trip, in 2022. It was during this visit that I discovered the canal, which I had somehow missed in my previous trip. This led me to want to further ivestigate this area.

And finally in 2023, for my fieldwork I went with Jan-Willem. It was during this trip that I visited the market of Abattoir. An experience that really altered the way I saw the city.

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ABSTRACT

Many western European countries have undergone the process of deindustrialisation. The has resulted in a changed economy focused on knowledge. This went hand in hand with urbanisation, resulting in explosive population growth in many cities. In combination with the rise of neoliberal planning made cities an attractive investment object. All three of these trends have caused many industrial areas to be transformed in often glamorous projects to revamp cities images. While aesthetically improving cities, it has also often started or intensified processes of gentrification.

The canal zone of Brussels however seems to be very stable in this regard, and has not undergone any big transformation. My hypothesis is that this could be attributed to strong path dependencies within the area, which expresses itself in three ways: the segregated social profile, the industrial land use and its governance fragmentation. Often neoliberal planning treats these types of path dependent location as a sort of 'tabula rasa' that can be used to maximise profits and thus deals with these path dependencies by path breaking: demolishing urban fabric and displacing people and/or economic functions.

Due to the fact that these path dependencies seem quite strong in Brussels and have not yet undergone such a transformation, makes it a unique opportunity to look at a different approach of urban development. Approaching these path dependencies from the perspective of path renewal, these could be starting points for a just, productive and place-based development. **How can a just, productive and place-based development be achieved in the Canal zone of Brussels, utilizing the area's path dependencies through path renewal?**

First the past, present and future for the canal zone will be analysed to see how these dependencies have and possibly will develop. After that a synthesis will be made from which values are derived. Based on these values a vision and strategic framework will be constructed, which will be tested on case study sites. This strategy is underpinned by a pattern language which is used to explore pathways to path renewal.

Ultimately this strategy aims to intensify the local economy, empower local communities and preserve spatial identity.

Image on the front: education level in Brussels (AWB, 2016, adjusted by author)

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'If we characterise these neighbourhoods as a ghetto, it means that there is nothing left to do with them. It's over and done with, a lost cause. It would be better to tear everything down and build something new (…) Often the debate in Brussels becomes completely caricatured: you're either for gentrification or for a ghetto neighbourhood. The right question would be 'who do we want to redevelop the neighbourhood for?' Are we making it attractive for new residents and investors, or do we want to improve the living conditions of the current residents?'(…) ***We could shift from a transformation logic to an improvement logic, starting with what already exists.'***

- Mathieu van Criekingen (2021) (Ten strijde tegen gentrificatie: "De centrale volkswijken zijn net een troef", 2021)

01 INTRODUCTION

1.1 PROBLEM FIELD

A neoliberal paradigm shift

Following the recessions in the seventies, many countries responded with a restructuring of their policies based on a more liberal ideology, ultimately causing the rise of neoliberalism. This change was geared towards cutting down government spending and increasing competition, which would make the economy more efficient. Neoliberalism has two foundational components (Ostry, Loungani, & Furceri, 2016):

- The first one is increased competition, which is on paper accomplished through deregulation and the opening up of domestic commodity and financial markets to not just national but global competition.
- The second one is a reduced role for the state as a supplier and regulator of services, which is accomplished through privatization of government services and austerity measures that limits the ability of governments to run fiscal deficits and accumulate debt towards infrastructural development (Ostry et al., 2016).

This new ideology found its way in all sectors of society, including urban development. “as a restructuring of the relationship between private capital owners and the state, which rationalises and promotes a growth-first approach to urban development” (Sager, 2011). In the 1990s, neoliberal planning became the norm and the idea of comprehensive planning was left behind, increasing an opportunity-led approach to planning. The main motivations for development plans became competition, consumerism and profit maximisation. This led to a contradiction of the role of the planner, a struggle between social-equity ideology and reality of capitalist urban development (Ta¸san-Kok & Baeten, 2012). This restructuring had enormous effects on how cities evolved in the last decades.

Changing cities

The recessions of the seventies also started the process of deindustrialisation in the Western world, which went hand in hand with the rise of neoliberalism and the increased globalisation. Deindustrialization refers to the contraction and decline of the weight of manufacturing industry within an economy. The main factors driving deindustrialisation were the increasing cost of labour, competition from newly industrialised countries, and the shift of manufacturing activities to overseas locations (Pike, 2009). This led to a decrease in jobs in manufacturing in many European countries, as shown in figure 1.

At first the loss of industry jobs resulted in urban shrinkage and suburbanisation in many cities in western Europe (Martinez-Fernandez, Audirac, Fol, & Cunningham-Sabot, 2012).. Though many larger cities have been able to rebound and develop their knowledge industry, and this way have undergone the process of increased urbanisation, as seen figure 2. Large investments have been made to make cities more attractive and cities have become the hart of economic activity in their regions. This lures more and more people towards cities, especially young and highly educated people (Nijskens, Lohuis, Hilbers, & Heeringa, 2019).

To accommodate population growth and to make their cities more attractive, municipalities have been looking to their industrial areas to develop. Production activity has moved from our city centres to the outskirts (Borret, 2018). Examples of these brownfield developments are countless. Think of Kop van Zuid in Rotterdam, HafenCity in Hamburg, The Guggenheim museum in Bilbao, or the Battersea powerstation in London. Urban megaprojects are seen as opportunities to give these cities a facelift, establish a marketable image, and stregthen its economy. By definition, these projects seek to renew, regenerate, or upgrade the area where they are built. Simultaneously, they often foster touristification, segregation, or gentrification that, once unleashed, are difficult to tame (Hübscher, 2021).

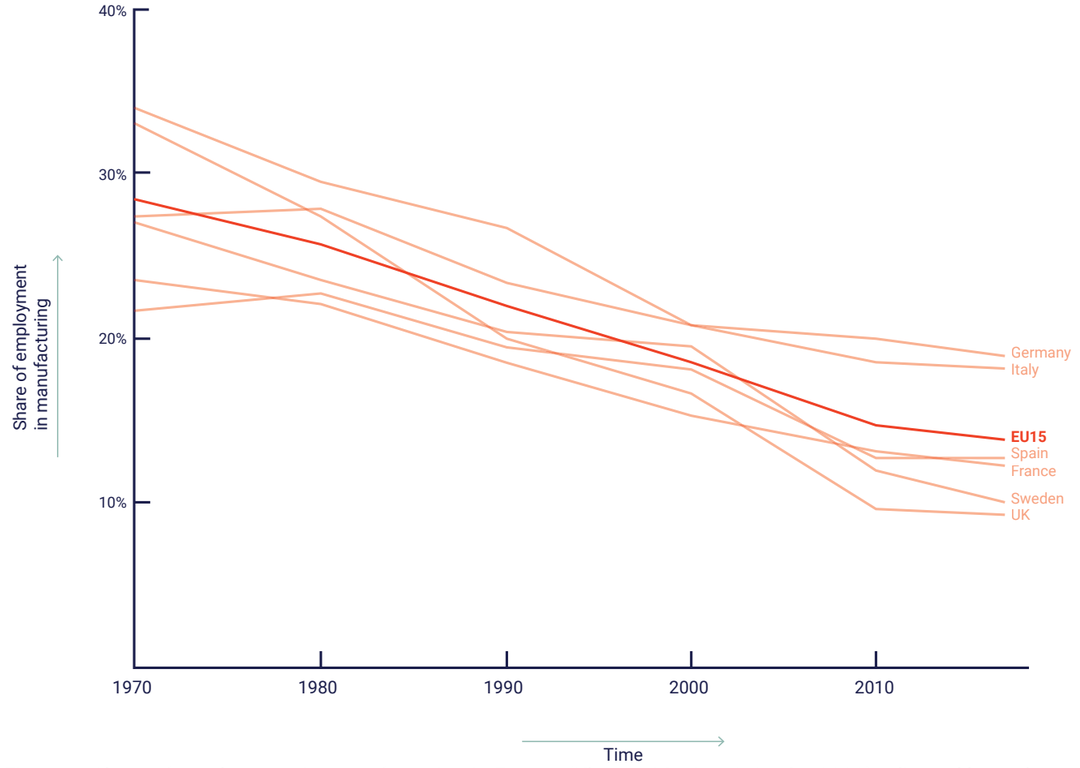


Figure 1: Share of employment in manufacturing in Europe (Klenert, Macias, & Antón, 2020) adjusted by author

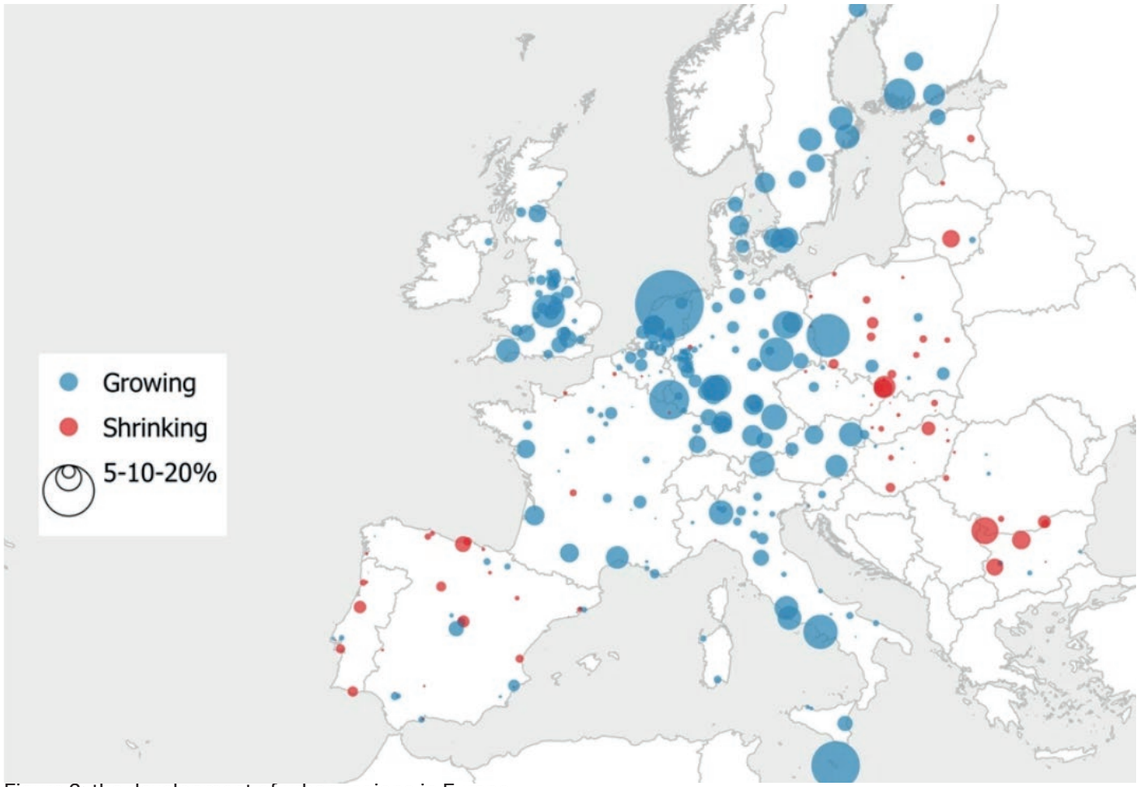


Figure 2: the development of urban regions in Europe (Cortinovis, Geneletti, & Haase, 2022)

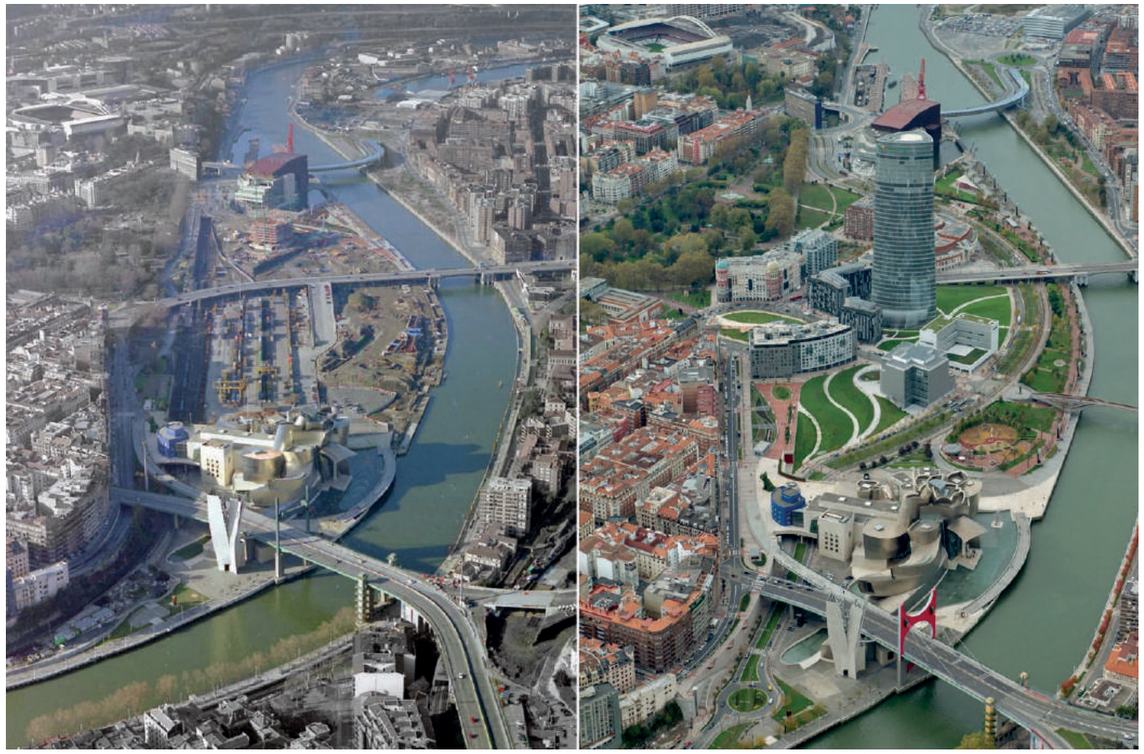


Figure 3: the Guggenheim museum and its suroundings in Bilbao, Spain, before and after development (Balmori, 2012).



Figure 4: Kop van Zuid, Rotterdam, the Netherlands (ANP, 2013)



Figure 3: Battersea power station, London, UK (Hawkes, 2022)



Figure 4: Hafencity, Hamburg, Germany (Fotofrizz, HafenCity Hamburg GmbH, n.d.)

Consequences of Neoliberal planning

This neoliberalist turn that planning took over the past decades has not been without consequences. While maybe aesthetically cities have improved, many cities in the western world face a housing crisis and increasing inequality (Wetzstein, 2017).

In many European countries the housing prcies have increased massively, as can be seen in figure 5. This rise of housing prices is especially prevelant in bigger cities, putting affordability at risk, as seen in figure 6 (Ferrer, 2020; Read, 2022). Both these problems come together in the concept of gentrification, which refers to the replacement of lower class residents with people of a higher socio-economic status. From the seventies on inner cities have been restoring their run-down 18th and 19th century housing, and often converting factories and warehouses, making these neighbourhoods attractive again to higher income population, but in the process alienate and push out its original residents (Shaw, 2008).

Gentrification has evolved from its original definition of the effects of individual household decisions, to being part of a much larger class transformation of the inner city, and a tool for urban redevelopment and regeneration. This process involves not only improving existing housing, but also new-build housing and megaprojects (Doucet, van Kempen, & van Weesep, 2011).

A similar process happens with industrial functions in cities. In the competition for scarce land, low value uses like industry have a vulnerable position compared to more profitable use, like housing and offices (de Broeck & Ryckewaert, 2020). This process is called industrial gentrification. This is problematic, because many of these industrial functions are essential in supporting cities and also often result in job loss and economic disruption for the local community (A. Hill, 2020).

Furthermore neoliberal development also often does not comply with democratic values. Government has been replaced by governance and property-led development is often leading

Besides this, planning is being replaced by project-based development and municipalities have increasingly a negotiating role instead of a leading role. Practice shows that the current approach lead to an undemocratic and finance-based reality (Tasan-Kok & Baeten, 2012). Growing economic instability bought forth by deregulation, digitization, financialization, globalization as part of the neoliberal agenda has led to crises again and again resulting in a damaged reputation of democracy and increasing polarisation (Diamond, 2020)

The government can however be directly involved in a process called state-led gentrification. In Rotterdam, for example, the gentrification of inner-city neighbourhoods has been made a priority by policy makers due to the belief that a shortage of middle-class households exists in the city. This is mainly due to the city's past, which was historically grounded in industrial and maritime activities, resulting in a high percentage of lower income households and few affluent ones. To counteract this, policies were created to attract knowledge workers in order to create a post-industrial Rotterdam. The housing aim of Kop van Zuid is to create an affluent neighbourhood that would be attractive to the sorts of households Rotterdam is attempting to bring in and retain. This is a deliberate policy and is a part of the gentrification process, designed to address the challenge of Rotterdam being a 'rich city with poor people' (Doucet et al., 2011).

A similar case is the city of Bilbao in Spain, once an industrial city, which has regenerated its urban core by using its industrial sites for an ambitious revitalisation process whose ultimate aim is to turn Bilbao into a flourishing international hub of culture, tourism and business activity. With the construction of the internationally known Guggenheim museum, it can be said that this goal has been achieved. But these development did not stop here. The city looked for new spaces for undertaking more projects and furthering the regeneration process. Some of these are deprived inner-city neighbourhoods which, once so identified, became obvious candidates for gentrification (Vicario & Martinez Monje, 2016).

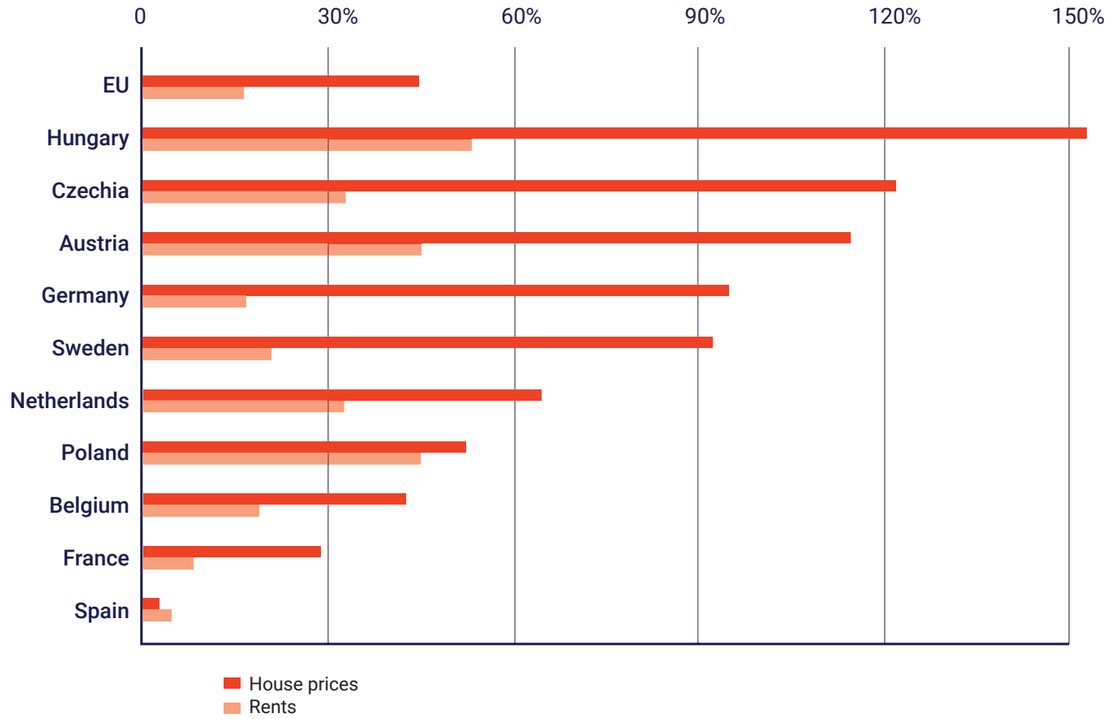


Figure 5: Changes in housing prices between 2010 and 2022 (Eurostat, 2022) adjusted by author.

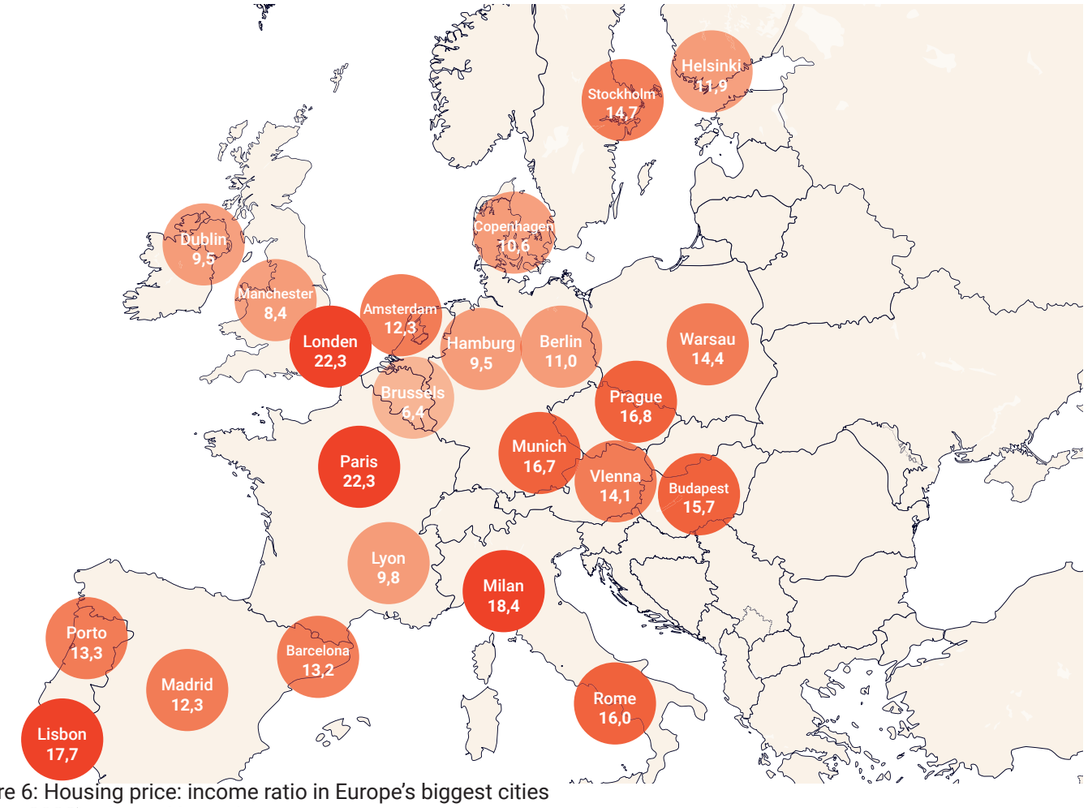


Figure 6: Housing price: income ratio in Europe's biggest cities (Ferrer, 2020) adjusted by author

1.2 PROJECT LOCATION

The case of Brussels

Brussels capital region is also very much a ‘rich city with poor people’, which is known as the Brussels paradox. The region is characterized by a very high Gross National Product per capita, but is also characterized by shocking statistics concerning poverty and unemployment (Corijn & Vloeberghs, 2009). Once it was one of the most industrialised cities in Europe, nowadays this sector makes up only 4 percent of the total economy. The economy has largely been overtaken by the knowledge sector, mainly due to the fact that Brussels has become the capital of the European Union and houses many of its institutions (A. V. Hill & Warden, 2018).

The Brussels-Capital Region is situated in the centre of Belgium, adjacent to the Senne River. It holds a distinct position in the country’s governance structure, as both the French Community and the Flemish Community are active, while being separate from the other regions of the country. The Brussels-Capital Region encompasses 19 municipalities, including the city of Brussels, which serves as the capital of Belgium.Looking at a map of median income per neighbourhood of Brussels, gives a bit more insight in this so called ‘Brussels paradox’. It can be seen that the poorer part of the population is concentrated in what is called the ‘croissant pauvre’, which is a series of adjacent neighbourhoods surrounding the urban core of Brussels, along the canal (Van Hamme, Grippa, & Van Criekingen, 2016).

Also when looking at a map of industrial functions it is clear that these are also centred along this canal. This is quite the opposite pattern of many other European cities, which have pushed their industries (Borret, 2018) and poorer population (Ham, Tammaru, Ubarevičienė, & Janssen, 2021) out of the city, in its gentrification processes. The area does not seem to adhere to neoliberal logic as can also be seen in the difference in increase in housing prices in Brussels, as shown in figure 10.

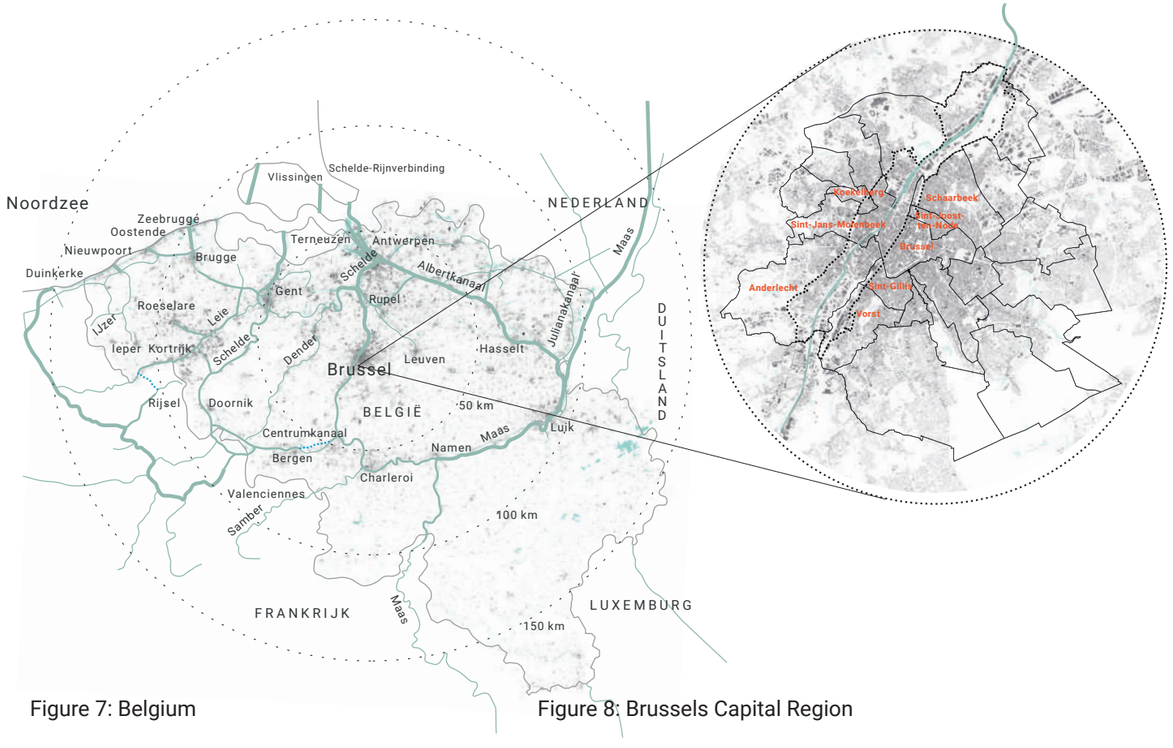


Figure 7: Belgium

Figure 8: Brussels Capital Region

The canal zone in Brussels is the area around the canal Charleroi-Brussels, formerly the river Senne. It has an axis of 14 kilometres and crosses 7 municipalities. It runs centrally through the city, splitting it in east and west. It houses the port of Brussels and connects Brussels with the outside world via waterways. The area is split into three parts: an industrial northern part, a more urban middle part and an industrial southern part (Nakhlé & Raynaud, 2019).

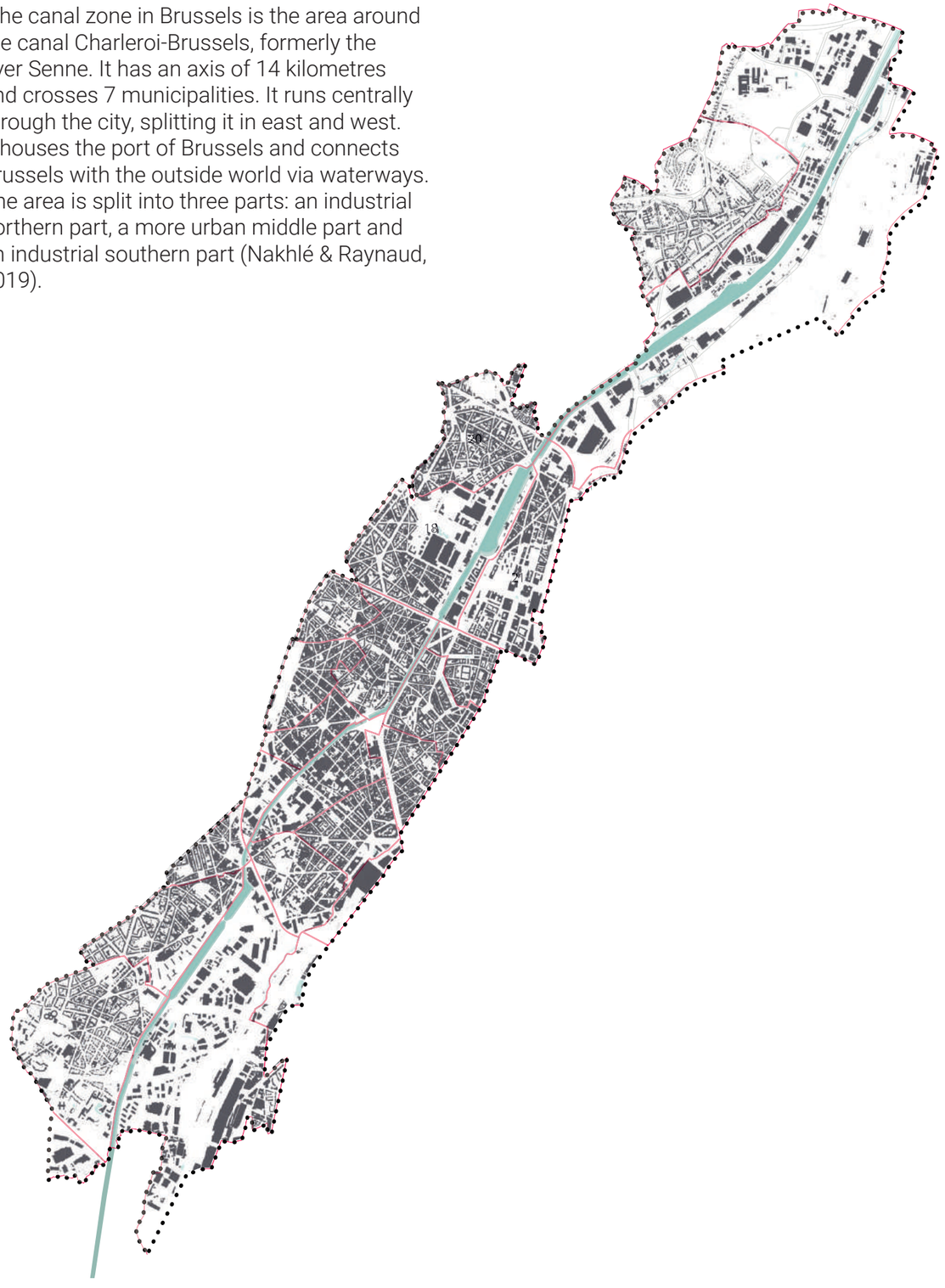


Figure 9: Brussels’ Canal zone

A path dependent context?

As established, this area has not seen the same development as many other cities in Europe. Why this is the case, can maybe be hypothesised by the concept of path dependency. This term is used in economics and the social sciences, referring to processes where past events or decisions constrain later events or decisions. This concept can be used to analyse the persistence of institutions (Mahoney & Schensul, 2009).

My hypothesis is that this path dependency in Brussels expresses itself in three ways, which all have not seemed to change in a long time while it would be expected that they would have, following neoliberalist logic. Firstly, it is expressed in the heavy industry and port activities, as well as many other (semi) industrial functions that are still located relatively close to the city centre, as seen in figure 12, even though the economic importance of these sectors for Brussels has steadily decreased over the years (Strale, 2017).

Secondly, the canal area crosses the 'croissant pauvre', shown in figure 11, which is a series low income neighbourhoods with a diverse population. These neighbourhoods are very segregated from the higher income neighbourhoods in Brussels (Ham et al., 2021). While segregation is common in many European cities, they often follow an opposite pattern, with having a richer inner-city and a poorer periphery (Ham et al., 2021).

Lastly, it is prevalent in the fragmented governance system in Brussels, the canal runs through 14 different municipalities, which is just an example of one the difficulties and bureaucracies in the Belgian system, causing decision making to be a slow process (A. V. Hill & Warden, 2018). Many cities choose to fuse their municipalities, because this would make the system more efficient and there position more competitive (George, 2019).

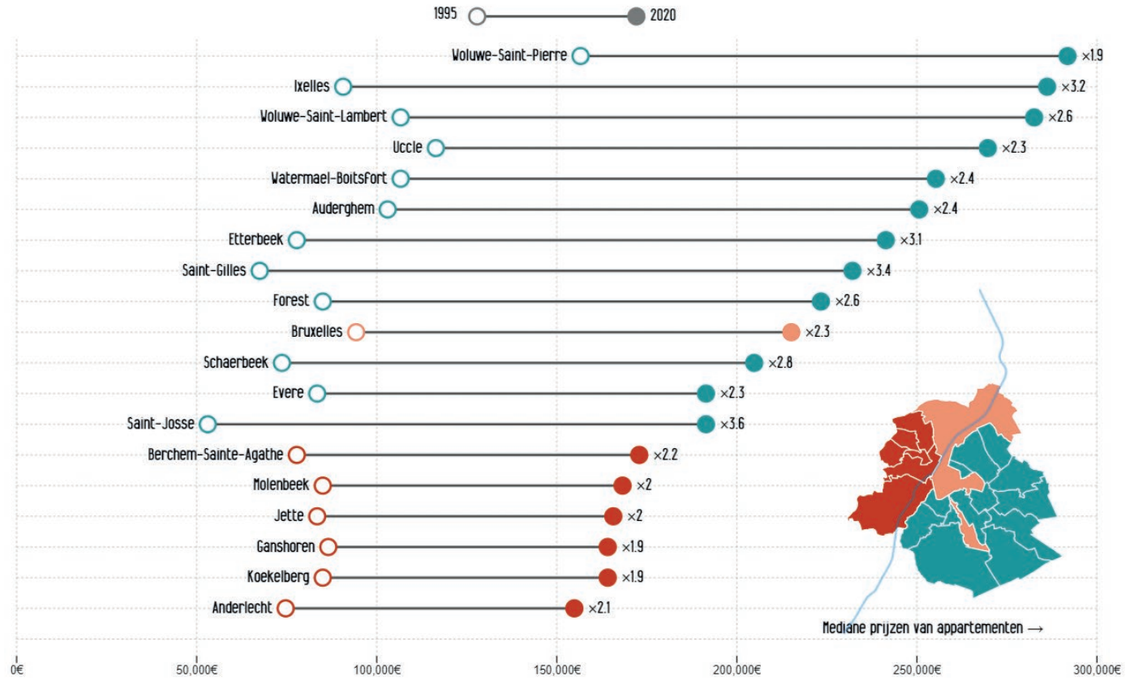


Figure 10: Increase in housing prices between 1995 and 2020 in the municipalities of Brussels (Joie et al., 2021)
This data clearly shows a divided between east and west, with the Canal marking the divide

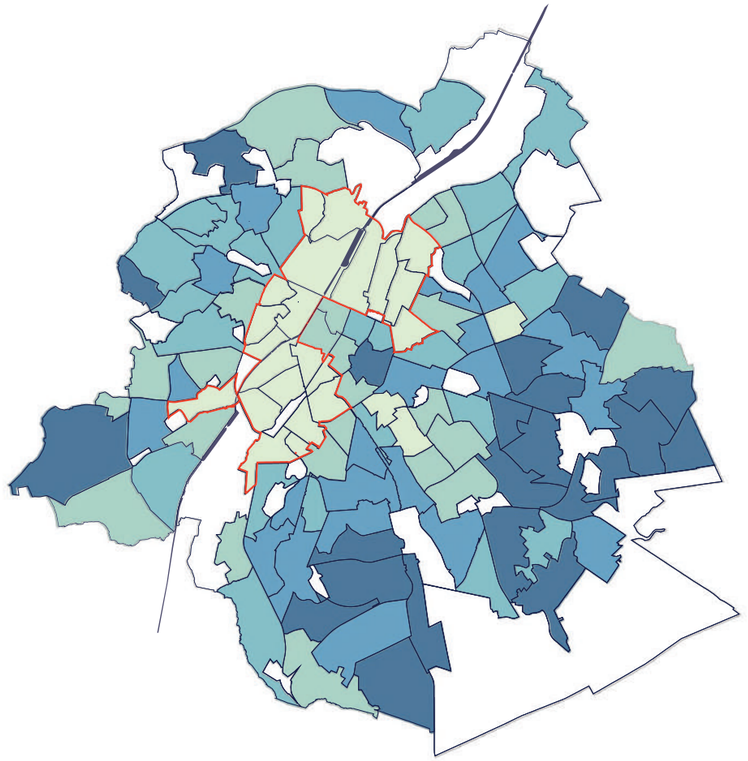


Figure 11: Average income per municpality (bisa.brussels, 2018)

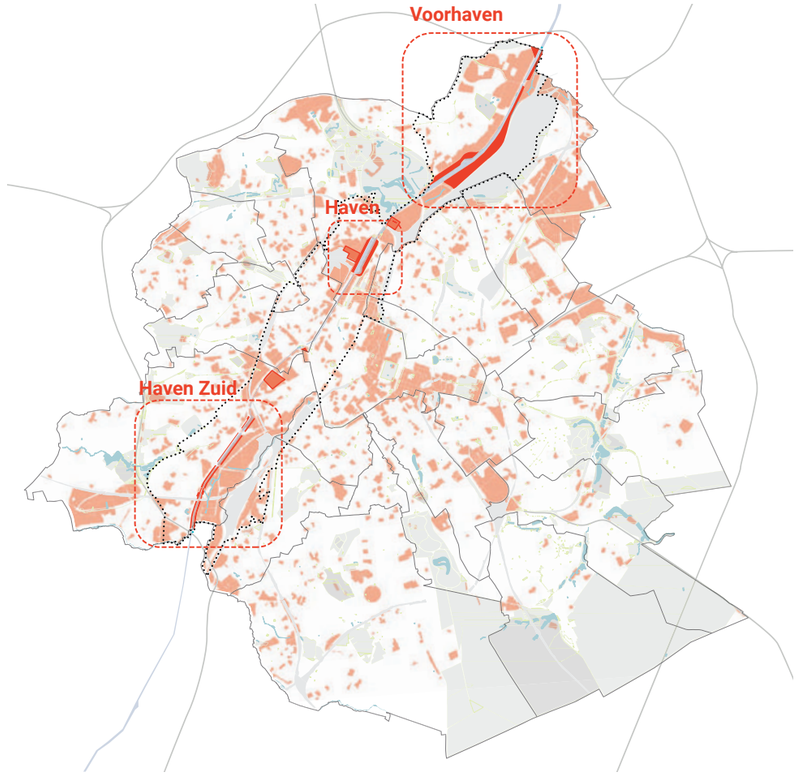


Figure 12: Industrial and commercial landuse, as well as land owned by the port of Brussels made by author based on (port Brussel, 2020 and Urban atlas, 2018)



Figure 13: the Buda bridge in the north of the Canal zone (Lalmand, 2023)



Figure 14: where Le croissant pauvre and the canal zone intersect (perspective.brussels, n.d.)



Figure 15: Harbour activities right next to urban functions (be.brussels, n.d.)



Figure 16: industrial functions in residential areas (van Tour, n.d.)

1.3 PROBLEM FOCUS

Path dependency theory

There are different models of looking at path dependencies, which was a term first coined in the 1980s and early-1990s, particularly through the work of Paul David on the economic history of technology and that of Brian Arthur on nonlinear, self-reinforcing economic processes. It has further established itself as an evolutionary concept not only in economics itself, but across a wide range of social, organisational, technological and managerial sciences. The traditional model of path dependency by David and Arthur consists of four stages: preformation, path creation, path lock-in, and path dissolution(Martin & Sunley, 2010).

In this model, a new technology or industry begins with a pre-formation phase where there is a wide variety of opportunities for exploration and development. A critical juncture then occurs, often seen as a random event, that leads to one opportunity being selected over others. This opportunity then attracts more actors and a critical mass begins to build up, leading to a lock-in phase where the path is established and self-reinforcing. In this first conception of path dependency, the break-up and dissolution of a technological, industrial or institutional trajectory is brought about by an 'external shock' of some sort, which then destabilises the system and opens up opportunities for a new path to emerge (Martin & Sunley, 2010).

Path breaking

Due to its focus on quick returns, in neoliberal planning these path dependencies are usually dealt with by breaking them. Neoliberal urban development is a clear example of how development is disregarded as deeply historical, place-specific, and embedded within specific settings. This view was adopted and implemented in many cities, particularly large ones, in the 1980s and 1990s. While there were some positive outcomes, such as increased visibility and aesthetic improvement, many cases revealed further fragmentation of the spatial urban structure, social fabric, and economic interdependencies within the urban territory (Moulaert, Martinelli, González, & Swyngedouw, 2007).

Peck, Theodore and Brenner (2009) applied the notion of creative destruction, first coined by economist Joseph Schumpeter, to neoliberal planning of cities. This theory analyses processes with destructive and creative moments: first, the (partial) destruction of systems through market-oriented reform initiatives; and second, the creation of a new infrastructure for market-oriented economic growth. They argue that neoliberalisation operates through trial-and-error experimentation, more often than not under conditions of crisis, leading to deep regulatory failures and dysfunctional, disruptive consequences. Neoliberalisation of planning may be seen as a process of creative destruction that results in a complex institutional environment where newly created and unstable spatial dynamics contradict established arrangements(Peck, Theodore, & Brenner, 2009). Ta¸san-Kok (2012) gives the following example of how the consequences of this:

'In short, the dynamics of property-led urban development prevail in a city where a comprehensive planning system has been well established; but the destructive moment arises when a new large-scale commercial property appears at a crucial spot in the centre of a traditionally social-democratic city where some other service functions were foreseen in the zoning plans. The local government allows a change in the zoning plan, convinced that a large commercial facility in the centre would enhance the city's competitive advantage. The expected outcome of the land transaction includes a new image for the city, besides rent (and tax) revenue for the local government. Thus, despite opposition from surrounding neighbourhoods seeking to avert high-density development and gentrification, the local government revises the zoning plan. Allowing this new type of large-scale mixed-use project requires not only altering the zoning plans, but also reversing the chain of command. Though contested, a new space of neoliberalisation is thereby created on the basis of property-led dynamics.(Ta¸san-Kok & Baeten, 2012).

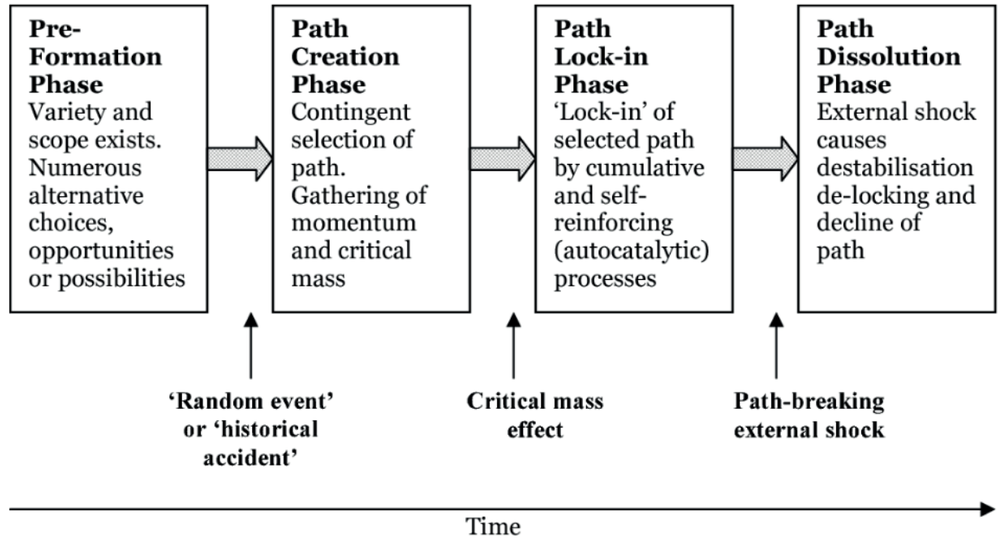


Figure 17: Phases of path development (Martin & Sunley, 2010)

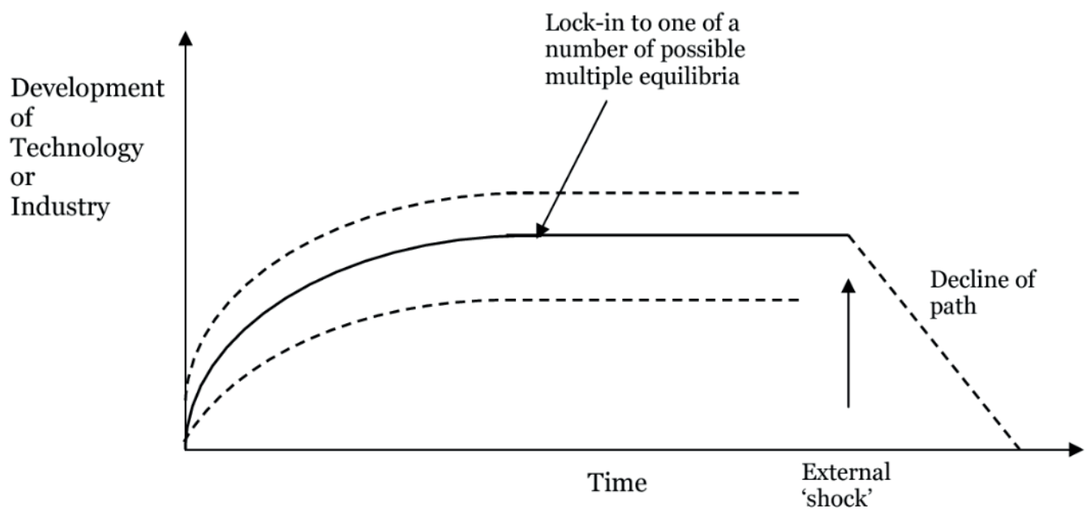


Figure 18: Development of path dependencies according the the David model (Martin & Sunley, 2010)

Is the canal zone next?

Although the Canal zone has not seen the same development and gentrification as other cities, this slowly seems to change. Brussels has been experiencing population growth, but has a hard time accommodating this growth. A brownfield development in the Canal area is a very logical location to develop homes. This canal area has therefore been appointed as an area of development by the city in 2012. Alexandre Chemetoff won the competition and worked out a Canal Plan that responds to: the explosive population growth, the lack of productive urban economy and a poor social cohesion between the neighbourhoods (perspective.brussels, n.d.) Though the Canal Plan on first glans seems to answer to these trends, concerns of gentrification have been voiced (Criekingen, 2020).

The area of Tour & Taxis, a former industrial area, which was the first to be developed, seems to confirm this concern. The area is clearly marketed to people with higher income and the proposed 300 social housing units will not be built, despite the fact that the adjacent neighbourhoods are mainly lower income (Vankersschaever, 2016). Also, even though there is policy in place in Brussels to maintain and increase urban production. Industry within the city has been declining due to industrial gentrification (De Boeck, Bassens, & Ryckewaert, 2019).

Another way

Even though these developments are alarming, it is not yet too late. The fact that these path dependencies are still so prevalent in the Canal zone in Brussels shows that these are deeply ingrained and hard to change. The case of the Canal zone could be a unique opportunity to investigate a different way of developing, instead of taking a neoliberal approach of path breaking. There is a second type of model of path dependencies, namely the Setterfield-model, which used the concept of 'temporary equilibrium', where path dependence leads to a sequence of temporary equilibria that can give rise to a subsequent endogenous process of 'innovating out' of equilibrium, this than leads to path renewal. Path renewal refers to the process of rejuvenating or revitalizing an existing path or trajectory. This can involve making changes or improvements to an existing path in order to make it more adaptive or resilient, rather than breaking out of the path entirely and establishing a new one (Martin & Sunley, 2010).

Looking from the perspective of path renewal towards the hypothesised path dependencies of a segregated social profile, industrial land use and governance fragmentation. Instead of seeing these as weak points of the area, these could maybe be starting points for another way of development. Because people with a lower socio-economic status have not been yet pushed out of the city, this could be a starting point for implementing ideas of the just city. The same goes for the industry still present, this could be a starting point for a productive city. Furthermore, because the municipalities have not yet fused and remain local, this could a basis for place-based development.

The productive city

The idea of "productive cities" as such is not entirely new but until fairly recently the term was more commonly used for "productivity" in the sense of efficiency, output and value creation than for the production of material goods. It was only in the last decade that a different meaning of the term began to take hold, which focused on the latter (Novy, 2022). The "Cities of Making" project (A. Hill, 2020) has shown the numerous and varied potential benefits that can be gained from strengthening manufacturing in cities. These benefits include diversifying urban economies, building economic resilience, promoting social cohesion and providing jobs for a wide range of workers. It also highlights the opportunities that the manufacturing sector can offer for economically disadvantaged urban communities, by enabling workers with lower levels of education and experience to acquire skills and climb the economic ladder. According to them implementing urban manufacturing can help with four needs:

- Sustaining a thriving economy
- Fostering social and economic inclusion
- Stimulate innovation
- Addressing climate change and environmental impact

The just city

One of the most influential voice in the discourse surrounding the concept of the just city has been Fainstein, who defines a Just City as "a city that has struck a balance between equity, diversity, and democracy," (Fainstein, 2013). The concept of the just city refers to the idea of creating urban spaces that are fair and equitable in terms of the distribution of resources and opportunities and where the needs of the disadvantaged and marginalized are considered in urban planning and policy-making. It is a city that prioritizes social justice, and that strives to create an environment in which all residents have equal access to resources and opportunities, regardless of their socio-economic status, race, gender, or other demographic characteristics (Soja, 2009).

Place-based development

Place-based development is a holistic approach to planning and development that emphasizes the unique characteristics and potentials of a specific location. It is a reaction to conventional forms of development, which often focus on single-sector, large-scale projects and disregard local contexts and their historical contingencies. Place-based development adopts a territorial approach that encourages the integration of contextual endowments and potentials, such as the environmental, economic, social, and cultural characteristics of a locality. It is commonly associated with "bottom-up" or grassroots modes of governance, promoting the leadership, participation, and agency of local actors within development. (Daniels, Baldacchino, & Vodden, 2015).

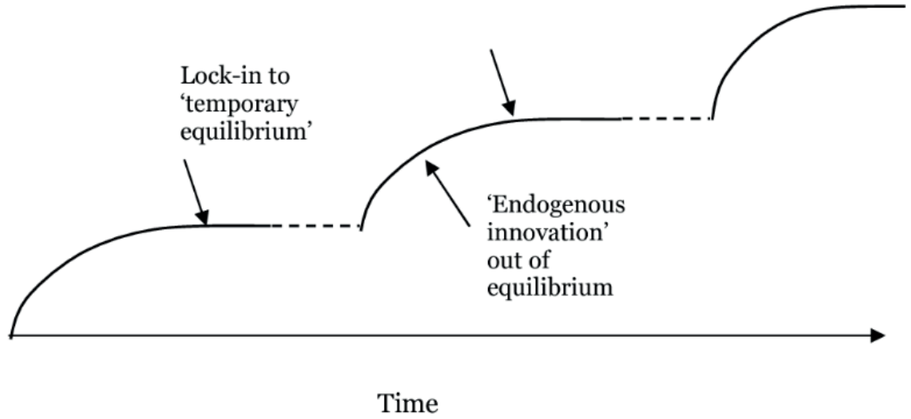


Figure 19: Development of path dependencies according to the Setterfield model (Martin & Sunley, 2010)

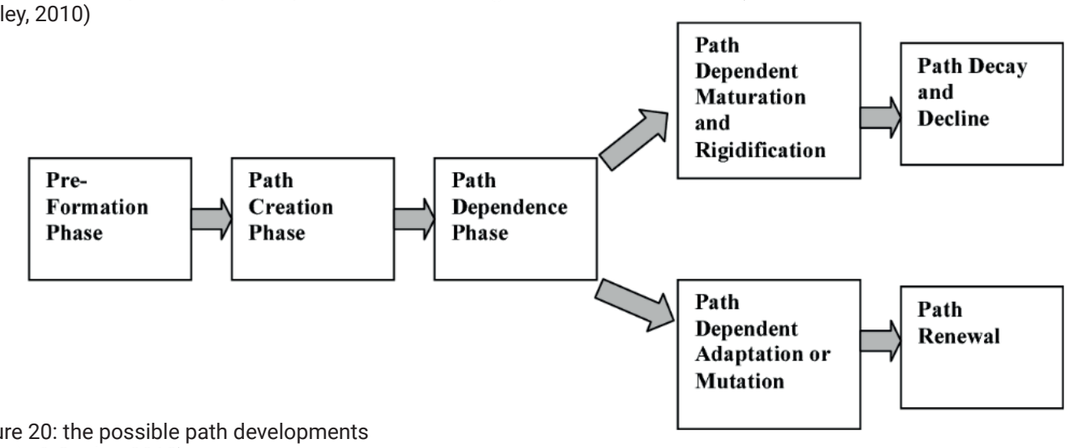


Figure 20: the possible path developments (Martin & Sunley, 2010)



Figure 20: the Upsite tower, next to the harbour



Figure 21: Taxis et Tours (Tour & Taxis, 2023)



Figure 22: an impression for the Key West project (Henning Larsen Architects, 2018)



Figure 23: the canal plan by Alexndre Chemetoff (2012)



02 PROBLEM DEFINTION

2.1 PROBLEM STATEMENT

Problem statement

Many western European cities have undergone a process of deindustrialisation. The has resulted in a changed economy focused on knowledge. This went hand in hand with urbanisation, which resulted in explosive population growth in many cities. This in combination with the rise of neoliberal planning has made cities an attractive investment object. All three of these trends have caused many industrial areas to be transformed in often glamorous projects to revamp cities images. While aesthetically improving cities, it has also often started or intensified processes of gentrification.

The canal zone of Brussels however seems to be very stable in this regard, and has not undergone any big transformation. My hypothesis is that this could be attributed to strong path dependencies within the area, which expresses itself in three ways: the segregated social profile, the industrial land use and its governance fragmentation. Often neoliberal planning treats these types of path dependent location as a sort of 'tabula rasa' that can be used to maximise profits and thus deals with these path dependencies by path breaking: demolishing urban fabric and displacing people and/or economic functions.

Due to the fact that these path dependencies seem quite strong in Brussels and have not yet undergone such a transformation, makes it a unique opportunity to look at a different approach of urban development. Looking at these path dependencies from the perspective of path renewal, These could be starting points for a just, productive and place-based development, that addresses gentrification and the challenges the area faces.

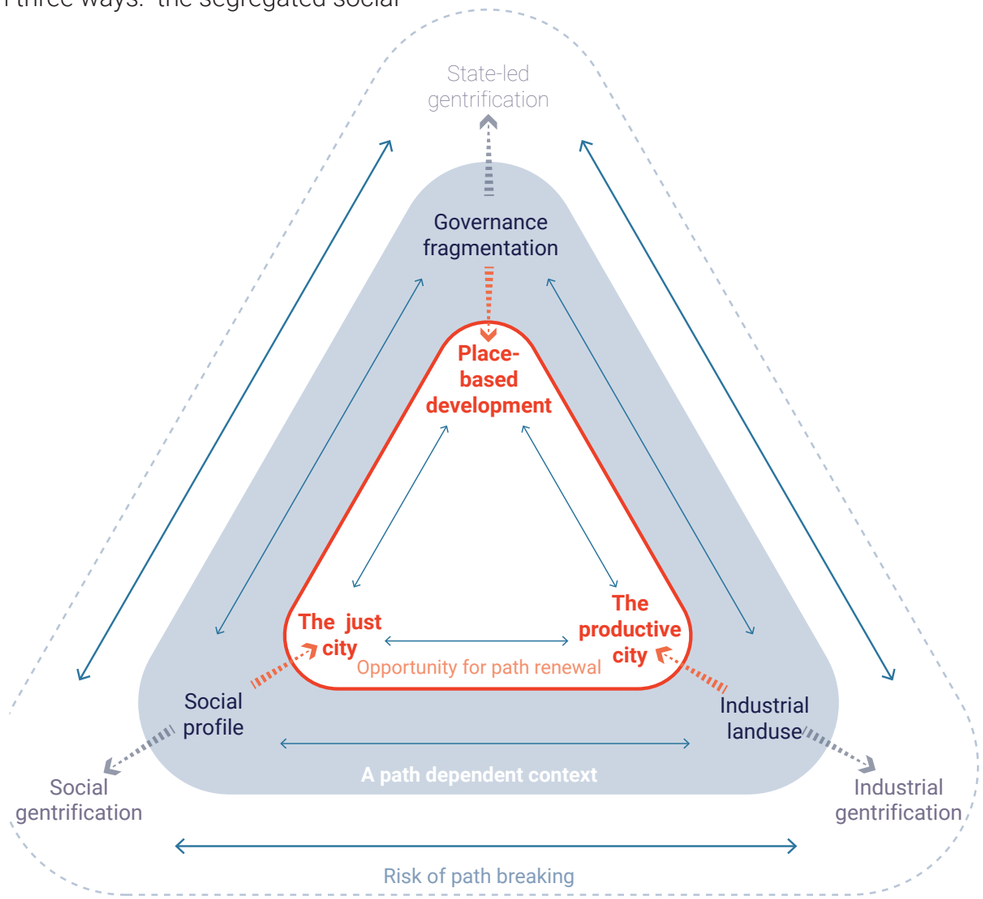


Figure 24: The problem statement (made by author)

Project aim

The aim of the project is twofold. It aims to investigate the prevalence of path dependencies in the area and research alternatives ways of dealing with path dependencies, in the form of path renewal. This approach will show a different perspective on urban development in heavily path dependent context and thus, could potentially be an example.

Secondly it aims to utilise these path dependencies to enable this alternative development guided by the concepts of the just city, the productive city and place-based development. Overlapping these theories more concrete objectives can be established: Firstly, intensifying the local economy and thus creating employment, educational and economic opportunities for the local communities. This connect to the second goal of empowering local communities and incentivising participation. Preserving and empowering these local communities links to the third objective, namely preserving spatial identity and embedding the development within the context of the Canal. This objective again links back to first objective due to the industrial heritage of the Canal.

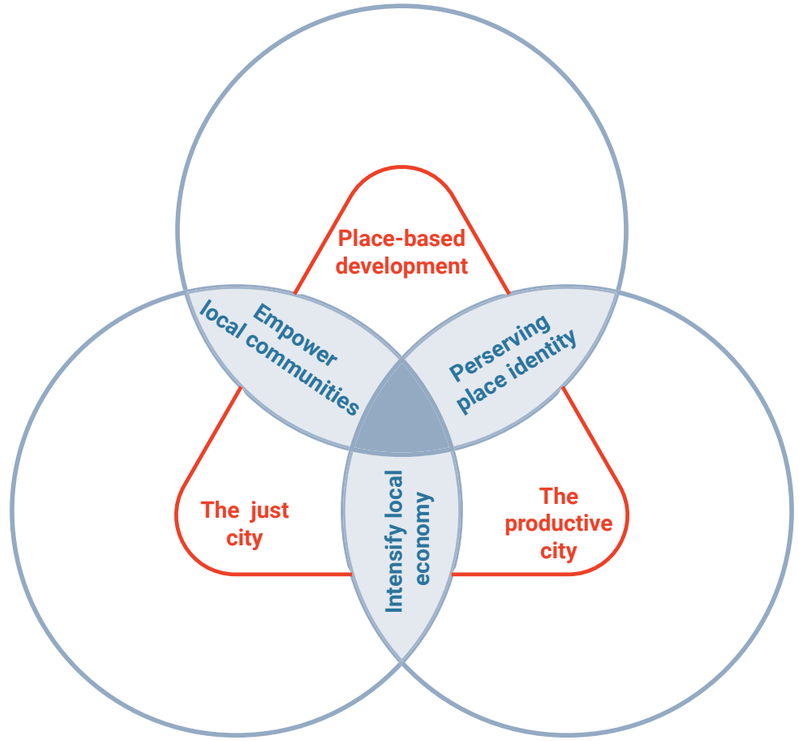


Figure 25: the project aim (made by author)

2.2 RESEARCH QUESTIONS

Main question: How can a just, productive and place-based development be achieved in the Canal zone of Brussels, utilizing the area's path dependencies through path renewal?

SQ1: How did the path dependencies in the Canal area develop and how do they manifest themselves in the current urban landscape and urban policy?
1a. How did the prevalent path dependencies develop overtime?
1b. How do these path dependencies shape and manifest themselves in the current urban landscape?
1c. How does policy in Brussels deal with these path dependencies?
1d. Based in these analysis, what can we say about the future of the canal area?

SQ2: What values can be synthesised from these path dependencies and how could these be integrated in an alternative vision for the Canal area?
2a. What are the challenges and risks related to these path dependencies?
2b. What are the opportunities and strengths related to these path dependencies?
2c. What values can be extracted, that should be preserved, based on this synthesis?
2d. What would the canal area look like if it would be developed, based on these values?

SQ3: How can this vision be operationalised, through a strategic framework, utilising the path dependencies?
3a. What conflicts arise when implementing the vision?
3b. Which spatial- and planning principles derive from these analysis and vision, in the form of a pattern language?
3c. How can this pattern language be implemented spatially and strategically?

SQ4: How can the implementation of this strategic framework be spatialised on a smaller scale?

2.3 RELEVANCE

In most western European countries urban developments have become increasingly profit driven, which has had enormous effects on cities, such as increased inequality, a housing crisis and (industrial) gentrification. Therefore there is need to find a different approach towards urban development. This study will explore the theories of the just city, the productive city and place-based development as a starting point for urban development. This will provide further insight in how these theory could operate in practice and how they could be implemented. Furthermore, on a more local scale this research could potentially establish a different narrative for the canal area and showing its different possibilities, instead of the current approach that is taken

Also, although quite a few studies have been done on how path dependencies have shaped our institutions and economics, the built environment remains fairly unexplored, though of course linked with these sectors. These studies focus on the 'unlocking' of path dependencies and establishing new paths, instead of finding ways to renew certain paths. Therefore this thesis could provide an opportunity for a different perspective on this and to see how to utilize path dependencies to shape future developments. This could be a new way to study developments with complex contexts that are heavily influenced by path dependencies and find more nuanced context-specific solutions for this.

2.6 RESEARCH APPROACH

Research framework

The research framework shows the set-up of this research. It is divided into two phases: a more research focused phase and a more design focused phase. In the first phase there is focus on an extensive research. Information will be gained about the past, present and future of Brussels and the trajectories of the path dependencies. This will contain a historical analysis, shedding light on how the path dependencies have developed in the past. Furthermore it will contain a spatial analysis, which shows how these path dependencies currently manifest themselves. Also it contains a policy analysis, which shows what mainstream position is on dealing with these path dependencies and speculate how they will evolve in the future.

The output of this phase will be a synthesis, which provides an overview of challenges, risks, strengths and opportunities related to the canal zone and the prevalence of path dependencies. From this synthesis, filtered by literature review on the theories of the just city, the productive city and place-based development, values will derived.

These values will be the base for the next phase. This phase will be more design focused, starting with an alternative vision for the area. To operationalise this in a strategy, a more detailed spatial analysis will be made in a zoomed in area. Based on this a strategy will be made that addresses the path dependencies, consisting of a pattern language and a strategy map. Than lastly this strategy will be tested and showcased on three key locations.

In the last phase, a reflection will be given on the research process. The research will be concluded and the research questions will be answered. Also, a reflection will be given on the results and limitations will be explained, giving an advice on further research.

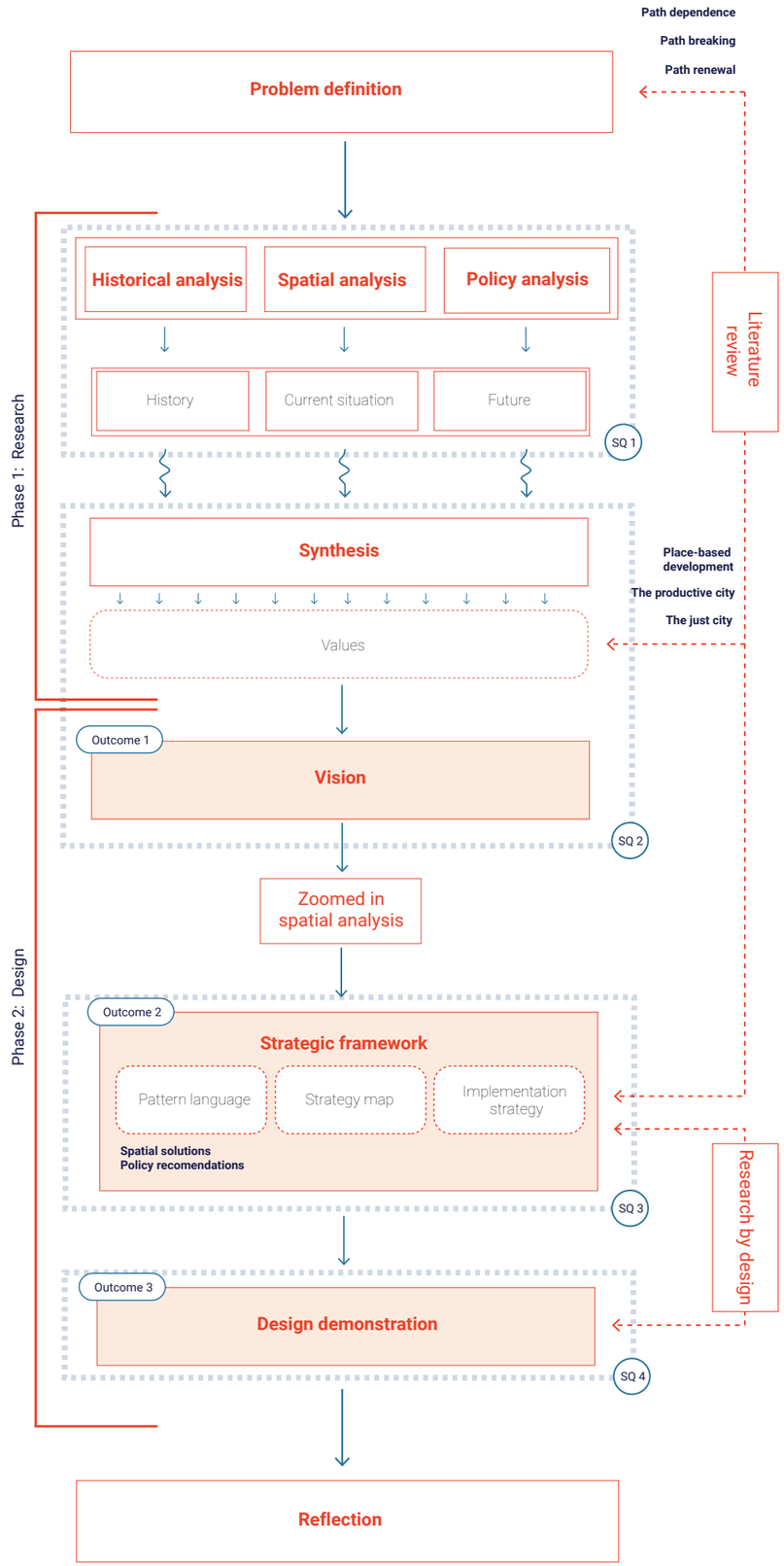


Figure 30: research framework (made by author)

Expected outcome

The first output is a vision map. This map will show an opposing vision for the canal zone and thus providing an alternative narrative towards dealing with its path dependencies, which uses values derived from the analysis as a base for the vision. The main objectives of this vision map are:

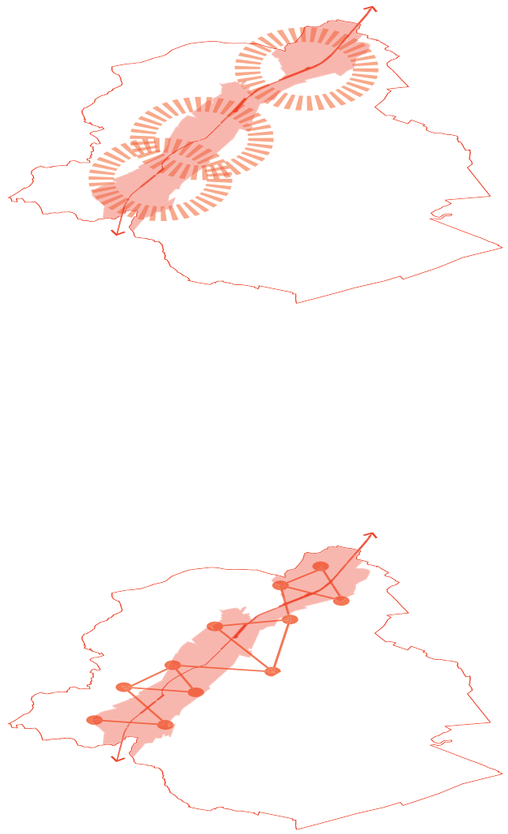
- Highlighting the strengths of the canal zone and altering the narrative, based on this.
- Showcasing what designing with the values, derived from the research phase, would look like.

In order to make this vision more concrete the second output of this project is a strategic framework. This strategic framework will consist of three components. Firstly, a pattern language, containing both spatial solution as well as policy recommendations, that are organised in a pattern field. I will further elaborate on what a pattern language is and why it is used in the method section. Secondly, a strategy map will be made, which will operationalise this pattern language. The main objectives of this strategy are:

- Deriving a set of easy to understand design solutions and policy recommendation, that can be used to communicate with different types of stakeholders and actors. And that while specific to the canal zone, can be used as reference for other projects.
- Spatialising this pattern language and operationalise the vision in a strategy map and implementation strategy, illustrating how it would be applied in practice.

The last output are three case study designs, in three locations along the canal, show casing and testing the strategic framework in practice.

- Illustrating how the strategy would be applied in practice
- Testing if the strategy would give satisfactory results in accordance to the vision and values.



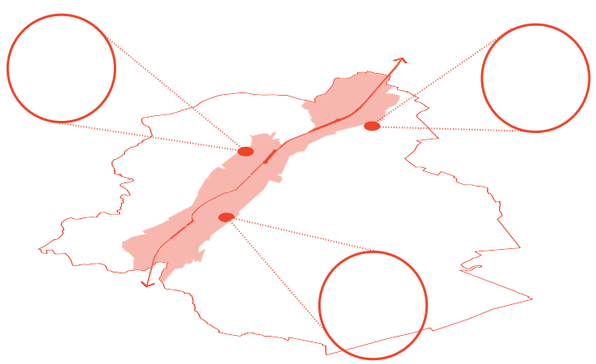


Figure 31: expected outcomes (made by author)

2.7 Ethical considerations

Because this research will touch upon different and also vulnerable demographic groups, there is a danger of biases. Especially the groups that hold less power and have less of a voice, need to be well represented. The project should be reflective and inclusive from all sides. Consequentely, especially the issue of segregation which part of this thesis will deal with is very sensitive.

Furthermore I think it is important to reflect upon the Belgian context. Even though Belgium is close by, it is a different culture and context, which is important to keep in mind when analysing and purposing solutions. They should be well adjusted to this context and tradition of planning.

Also the topic of language is important. Even though Brussels is officially a bilingual city, the main spoken language is French. Therefore the sources that I will consult will be mainly Dutch and English, possibly excluding narratives. I should therefore be aware if I am not missing perspectives that are only accessible in French.

2.7 METHODS

Literature review
Literature review is used to identify the main theories related to this thesis and shed light on the current discourse. It is used to establish the conceptual framework, which not only actively informs the problem statement and research approach, but will also inform in a later stage of the thesis. Namely this conceptual framework will filter the derived values from the synthesis, will guide design decisions and inform patterns.

Aim: Establishing a conceptual framework and identify main theory related to the thesis

Historical analysis
Historical analysis is used to understand the urbanizations patterns of Brussels and the canal area. More specifically, a timeline and series of historical maps explores the relation between the social, economic and governance development over time and what role the canal and its geography played in this.
Aim: Identify path dependencies and how they evolved over time.

Spatial analysis
The spatial analysis aims to track down the spatial factors and characteristics of the path dependencies within the city, The analysis reveals general structures in the region, next to a more specific analysis of the Canal area. Fieldwork will also be part of the spatial analysis, to collect data through photography, mapping, drawing and observing.

Aim: Identify path dependencies and how they manifest spatially in the current urban landscape.

Policy analysis
A policy analysis is a tool for understanding the direction of urban development in a specific area. By reviewing strategic frameworks, environmental visions, area plans, and policy documents, it is possible to examine the municipality's priorities and intentions regarding mixed-use development, live-work environments, support for existing businesses in transformation areas, safeguarding of industrial space, and affordability. The review process can also highlight any existing limitations, restrictions, or conflicts that may impact the area's development.

Aim: Identify most influential policies in the area and how they are influencing and will influence the area in the future.

Synthesis
The synthesis seeks explanations for the proposed observations and to explore possibilities. this stage, the collected data is conceptualised in order to create a "diagnosis" for the region, containing the most important challenge, risks, but also establishing strengths and opportunities in the area From this synthesis, values can be extracted, that will guide the design process.

Aim: A 'diagnosis' of the area, from which values can be derived.

Vision-making
A vision tells a story about the future of an area and is thus an important tool in guiding the development of an area. Visions in planning processes serve as an orientation point. They have a guiding functions, they steer actions, and help to focus (Vermeulen, 2015). In this thesis it will be used to show an alternative narrative for the canal area that is based on path renewal instead of path breaking.

Aim: Establishing an alternative narrative for the canal area, based on the earlier derived values.

Research by design
The design process is characterised by "exploring, deciding and experimenting" (van Dooren et al., 2013). During this stage, multiple alternatives and concepts are developed and tested against the previously defined spatial principles and diagnosis of the area.

Aim: understanding of ways to implement design interventions and exploring synergies between different design interventions and the existing context. These explorations help to formulate new insights and visualise the desired result.

Pattern language
A pattern language is a tool that helps to systemically understand how different (design) interventions are related. The concept was first introduced by Christopher Alexander (1977). He described the pattern language as an archetypical language that describes universal problems in the built environment. The main contribution of this systemic approach is that it 'breaks down complexity into easily understood bodies of knowledge' (Hill, 2020). These solutions form a network that is hierarchically structured: the pattern field.

A pattern language consists of a pattern field, a hierarchically organised set of solutions. The hierarchical structure helps to understand how solutions on a lower scale translate to goals at a higher scale. This makes it a suitable method to answer to the question path renewal. Instead of larger top-down design, it allows for smaller adjustments on different scales that can have a more bottom-up approach.

Aim: Providing several interlinked design solutions on different scales that allow for an easier understanding of the complexity of the project.

03 HISTORY



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

3.1 THE ORIGINS OF BRUSSELS

The Brussels Canal Zone reflects its rich past, with some traces preserved and others lost over time. In the present urban area, a fascinating mix of historical and contemporary elements can be found, creating a layered and symbolic landscape. It can be seen as a palimpsest, where history has been written, erased, and rewritte. (Corijn & Vermeulen, 2013). This next chapter will give more insight into this past.

The Origins of Brussels

The origins of Brussels are closely connected to its geographical environment. The city of Brussels is believed to have emerged around the 10th century in the marshy area at the end of the navigable part of the Zenne river, on the Sint-Gorik island. Giving it its name “Bruocsella,” meaning “seat of the marsh.” A series of watermills were built in this area. This location became the center of important medieval connections: the east-west road connecting Bruges, Ghent, Liege and Cologne, and the water connection between Brussels and the Schelde. This is how the first religious, military and commercial settlements formed. Traders and craftsmen established their activities there, while the city urbanized towards the west (Nakhlé & Raynaud, 2019)

This asymmetrical development is due to the fact that the eastern side of the valley is relatively steep. The sandy soil in this area were used for agricultural activities, which levelled its rugged terrain. The steep slope on this bank was quickly occupied by the upper class, as it offered protection from flooding. The west bank had a less steep slope and consisted mostly of clay soils, and was therefore more prone to flooding. The development and urbanization of this area took place further away from the river and occurred later. The configuration of the Zenne valley explains the asymmetrical growth of the city and the metropolitan area, as well as the geographical and societal differentiation of the population, as the working class was often relegated to areas with a higher risk of flooding (Nakhlé & Raynaud, 2019).

During the 13th century, Brussels emerged as a significant industrial hub. The Senne River played a vital role in this development, as it provided essential primary energy that fueled numerous mills constructed along its shores. Hydraulic projects were implemented to manage floods, establish fish ponds, and facilitate irrigation in areas beyond the flood-prone zones. The Senne served as a lifeline, connecting Brussels to the economic center of Antwerp and providing a crucial trade route to the North Sea through the Scheldt River. This river system was instrumental in the growth of Brussels’ textile and food industries.(Nakhlé & Raynaud, 2019).

It provided raw materials for the textile and food industries, and served as the means of disposing household and industrial waste, which was significant in volume due to the intensive craft activities in the city. This earned the river the name of “open sewer” as a proper and modern sewage system did not appear until the second half of the 19th century (E. Corijn & Vermeulen, 2013).

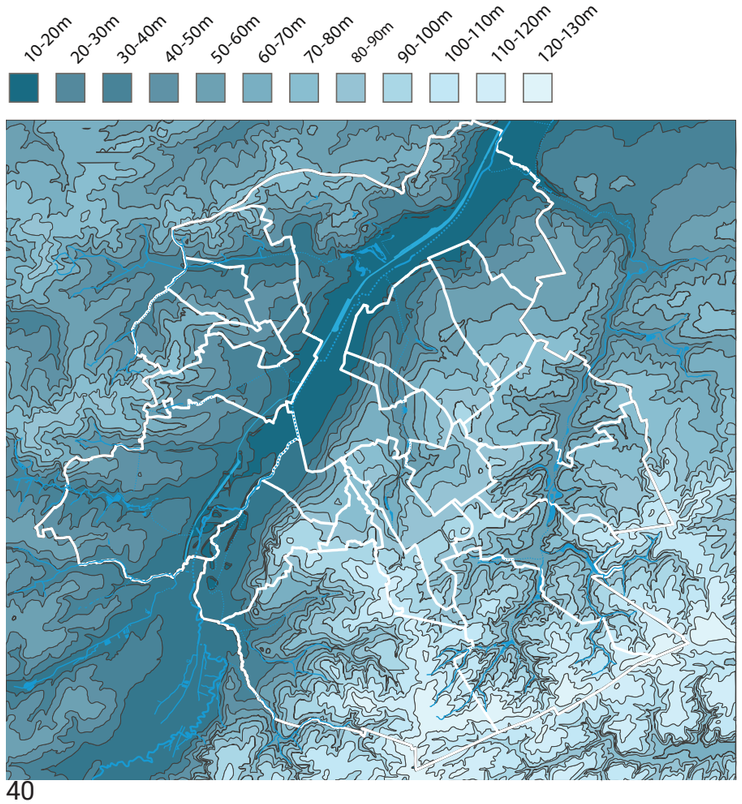


Figure 31: Height map of Brussels
Derived from (Nakhlé & Raynaud, 2019).



Figure 32: Historic map by Jacob van Deventer, 1550-1554
Derived from (Nakhlé & Raynaud, 2019).

3.2 BRUSSELS URBAN DEVELOPMENT

Canalisation

Brussels experienced an initial economic boom based on the production of drapery, tapestries, lace, and similar goods. The port, which is now known as Place Sainte-Catherine, was developed in that area. Trade primarily took place through waterways, although it faced challenges due to the unpredictable path of the Senne River and the various usage rights held by towns and cities along its course. To overcome these obstacles, the Willebroeck Canal was constructed between 1551 and 1561. This canal connected Brussels to Antwerp, reducing the distance to 30 km (one to two days of travel by boat) compared to the winding 120 km of the Senne (which took eight or more days to navigate). Consequently, warehouses, shops, factories, hotels, and other buildings were established along the quays of the new canal in Brussels. (Nakhlé & Raynaud, 2019).The canal, however did not provide any solution to the unhygienic 'open sewage' situation.(E. Corijn & Vermeulen, 2013)

Within the city walls of Brussels, warehouses, storage buildings, industrial structures, commercial buildings, and inns quickly emerged along the newly constructed quays. However, the canal disrupted the balance that the old Brussels industry relied on from the Zenne: the diversion of a portion of the river's water upstream from the city and the lack of maintenance led to the economic decline of that industry. Due to the construction of the canal, Brussels was able to solidify its status as the capital of the Spanish Netherlands and its economic significance, but it also marked the beginning of the disappearance of the river from the city (Nakhlé & Raynaud, 2019). In the 18th century, Brussels witnessed the rise of new industries like earthenware production, carriage-making, and printing. While some factories were constructed within the city center, others flourished along the central axis of the Senne valley, in areas such as Anderlecht and Molenbeek. As the urban and commercial development gained momentum, the timely arrival of raw materials, particularly coal, became vital for sustaining these industries (Nakhlé & Raynaud, 2019).

The opening of the Charleroi Canal in 1832, connecting the city by waterway also in south direction, allowed for the large-scale import of coal, which contributed to an industrial, demographic, and urban boom in Brussels.



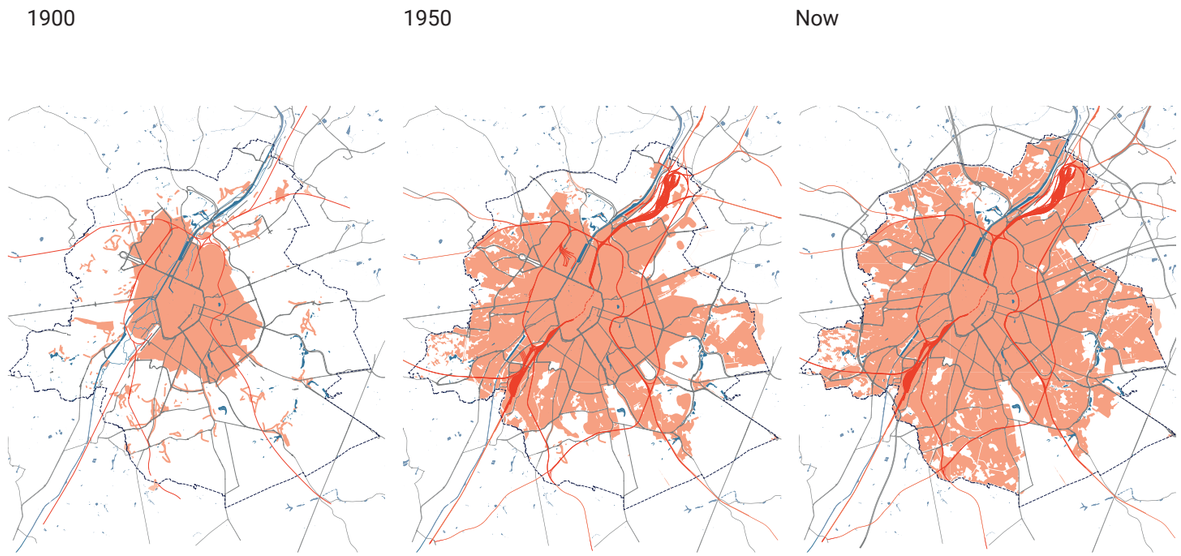
Figure 33: development of Brussels over the years
(made by author, based on historic maps derived from (KBR, n.d.)

The city became the leading region for industrial employment in the country, and the mechanization of industry led to the emergence of foundries and engineering and metalworking companies (A. V. Hill & Warden, 2018). These transformations occurred in a specific context: the city became the only capital housing the main public and private institutions of a rapidly growing country, with the rise of an industrial bourgeoisie who required ample and inexpensive labor, fast transportation, and affordable raw materials (Nakhlé & Raynaud, 2019).

As urbanization and transportation methods advanced, the structural importance of the valleys gradually decreased. This led to the expansion of new traffic routes and railway infrastructure. Large land leveling projects altered the existing valley structure. The most notable intervention was the covering of the Zenne river, which disappeared from the Brussels landscape. The development of the metal industry also accelerated the expansion of the railway network. The valley floor of the Zenne became the ideal location for the construction of railways, starting 1835, solidifying the area's industrial character in the 19th century(Nakhlé & Raynaud, 2019). This new mode of transportation played a major role in the establishment of factories and warehouses, but it also created new divisions in the city. The western railway line, built around 1870, defined the western boundary of the current Canal Zone(Nakhlé & Raynaud, 2019).

Meanwhile by the middle of the 19th century, several epidemics decimated parts of the population living in the city centre, and some politicians attributed this to the unsanitary conditions caused by the Senne river. While this was a contributing factor, these politicians also used the epidemics as an opportunity to call for a major makeover and beautification of the city centre. Many of the city's elites, with higher purchasing power, had moved to the peripheral suburbs, such as the Leopold Quarter and the Louise District. In order to maintain the city's tax base, the government aimed to attract these elites back to the city centre through significant investments in urban renewal. The unhygienic state of the Senne, in combination with its constant flooding eventually also led to the covering of the river. This sanitization led to the disappearance or replacement of the old industrial fabric and pushed the areas of economic activity more to the west compared to the original situation. Due to development of the canals, the river Senne has been degraded to a drainage system throughtout the city, and is in many parts not even visible (E. Corijn & Vermeulen, 2013).

The port



3.3 THE INDUSTRIAL BACKBONE OF THE CITY

In the late 19th century, as the rail network in Brussels reached its capacity, the concept of transforming the city into a sea port emerged. The idea involved constructing larger and deeper port facilities to accommodate both river barges and seagoing vessels.The construction of the three main docks, took place in 1922, while the outer harbor downstream was completed in 1939 (Nakhlé & Raynaud, 2019). The establishment of this sea port had a profound impact on Brussels' development. The old docks in the Sainte-Catherine area were gradually filled in, making way for a vast industrial complex at the Tour & Taxis site. This complex included a freight yard, a customs area, and warehouses.

As a result, new industries emerged to the north and south of the canal axis, spanning chemicals, petrochemicals, construction materials, gas works, coking works, and cement works. These industries occupied larger spaces compared to the small and medium-sized family businesses that previously existed along the central section of the axis (Nakhlé & Raynaud, 2019).The modernization efforts encompassed various aspects, such as the relocation of the intra-muros port to the outer-pentagon, the straightening of the canal trajectory, the reorganization of water drainage between the Senne River and the canal, and the development of the Tour & Taxis site. These initiatives led to the Brussels port evolving into an inland seaport and transformed a conventional coal canal into a Sea Canal. This expansion of the port ultimately led to the extension of Brussels municipality's borders to include the port (E. Corijn & Vermeulen, 2013).

The hydraulic works - especially the covering of the river and the construction of a sewage network - promoted the urbanization and industrialization of the southwestern part of the Pentagon and more generally of the valley on either side of the city. The industrial companies were spread throughout the area, as was still visible at the end of the 20th century, but the largest of them, with the most employees and a greater density, concentrated in the "factory axis," that is, the original valley, along the docks that lie outside the center, wihch can also be seen figure 34 (A. V. Hill & Warden, 2018).Brussels industry was characterized by the development of small and medium-sized, often family-run businesses. These were usually integrated into the urban fabric that gradually emerged inside street blocks and whose streets were bounded by buildings with a dual function: retail on the ground floor (café, baker, grocer) and housing on the upper floors. In this way, various economic activities, housing and public amenities (stations, schools, etc.) were inextricably mixed (Nakhlé & Raynaud, 2019).

After WW2

Despite the destructive impact of World War II, the northward expansion of the port continued. In the second half of the 20th century, significant modernization efforts were undertaken, including the construction of quays, the establishment of the TIR Center, the widening of the canal, and the construction of new bridges. However, during the 1950s, the Walloon coke industry experienced a substantial decline. This decline had a ripple effect on the iron and steel sector, resulting in the relocation of steel production to Ghent and Dunkirk. Consequently, the significance of the inward port of Brussels diminished, accompanied by a decrease in industrial activity in the surrounding area.The rapid growth of the service sector in the 1970s further contributed to the decline of Brussels' industry. This post-industrial restructuring was similar to that of many other European and US cities and led to increased economic differences between regions. The increased investment in the Belgian road network and the development of the airport in Zaventem made road and air transportation more competitive than shipping, further declining the role of the Brussels canal as a key passage for traffic. (E. Corijn & Vermeulen, 2013).

In the 1970s, Brussels, like many other large cities, saw its population decline as the middle and upper classes moved to the suburbs. Additionally, as the main region for manual labor in the country until the late 1960s, Brussels was particularly affected by deindustrialization. In just 40 years, the number of industrial jobs in the city dropped from 160,000 to less than 30,000. Along the Canal axis, logistics gradually replaced industry (A. V. Hill & Warden, 2018).

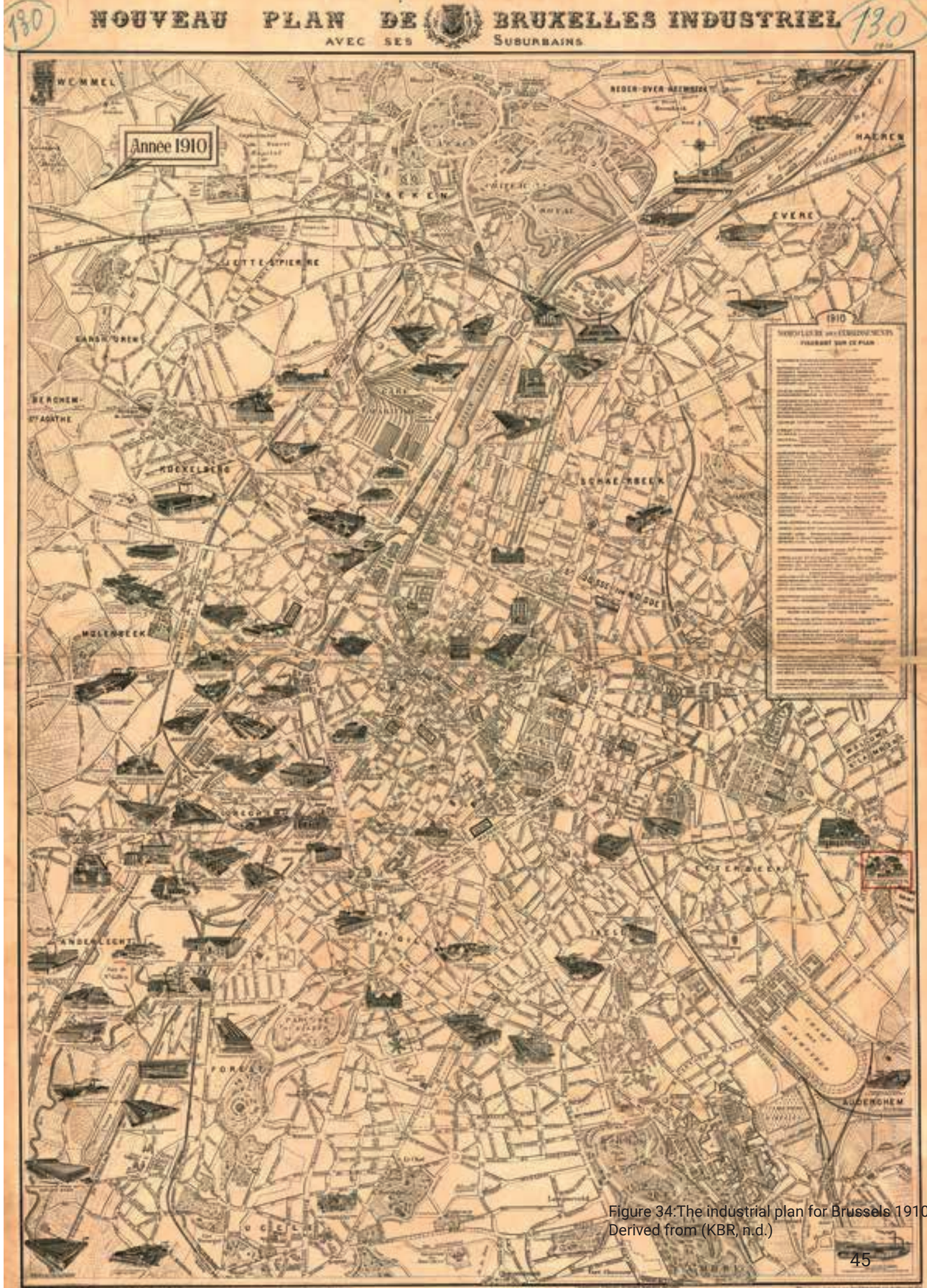


Figure 34:The industrial plan for Brussels 1910
Derived from (KBR, n.d.)

3.4 HERITAGE

The industrial past of the canal area resulted in many industrial heritage along the canal that is still present today. These images give an impression of the kinds of buildings that are present.

Looking at the map of monuments in Brussels, it seems that most of it is located in the city centre. Much of the industrial heritage does not seem to have a protected status.







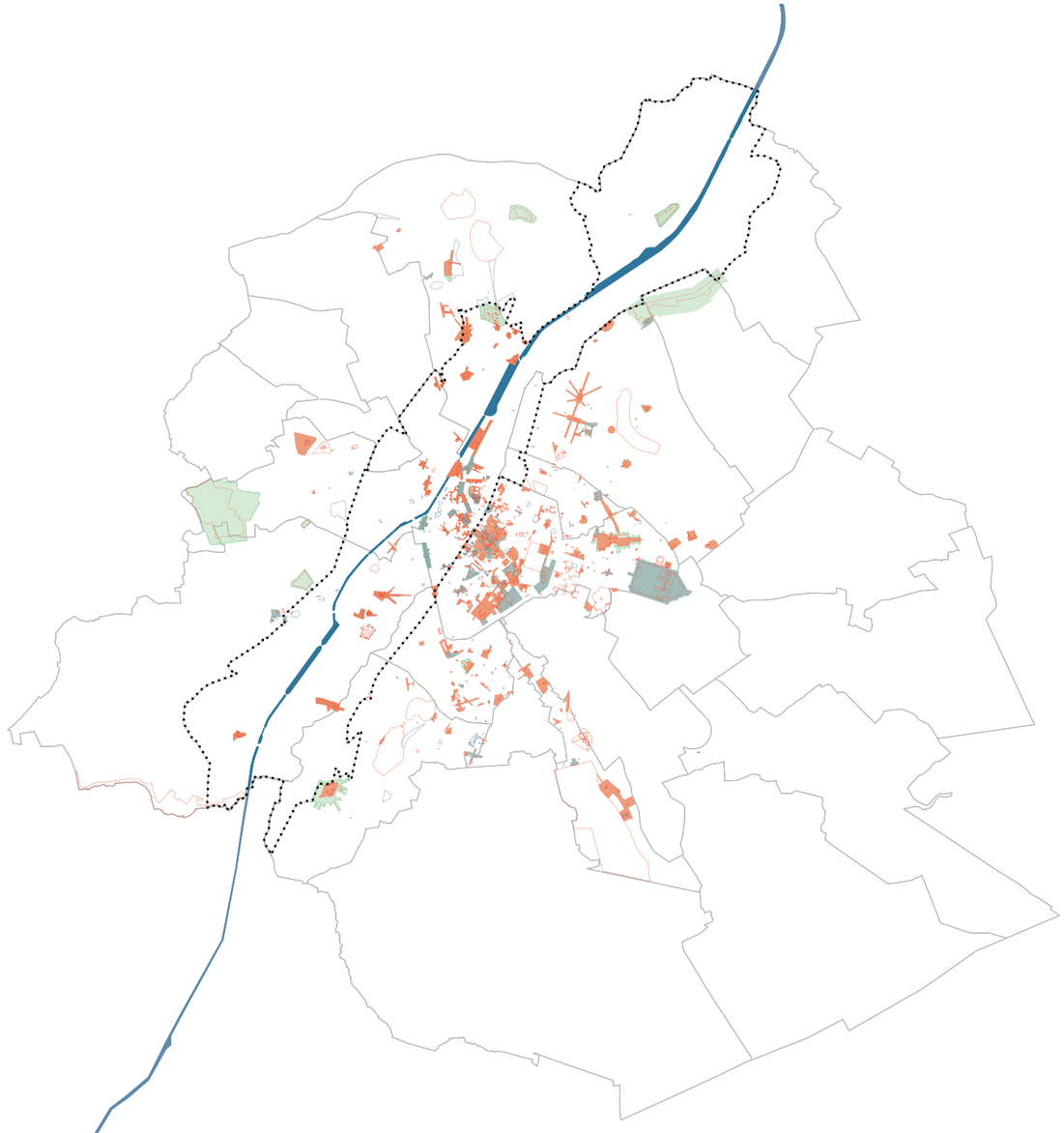








Figures 35-41: examples of industrial heritage in the Canal zone (All images derived from Google maps)



Figures 42: Protectedritage in Brussel, derived from (Nakhlé & Raynaud, 2019) adjusted by author

- Architectural whole
- Monument
- Classified
- Protected
- Natural site

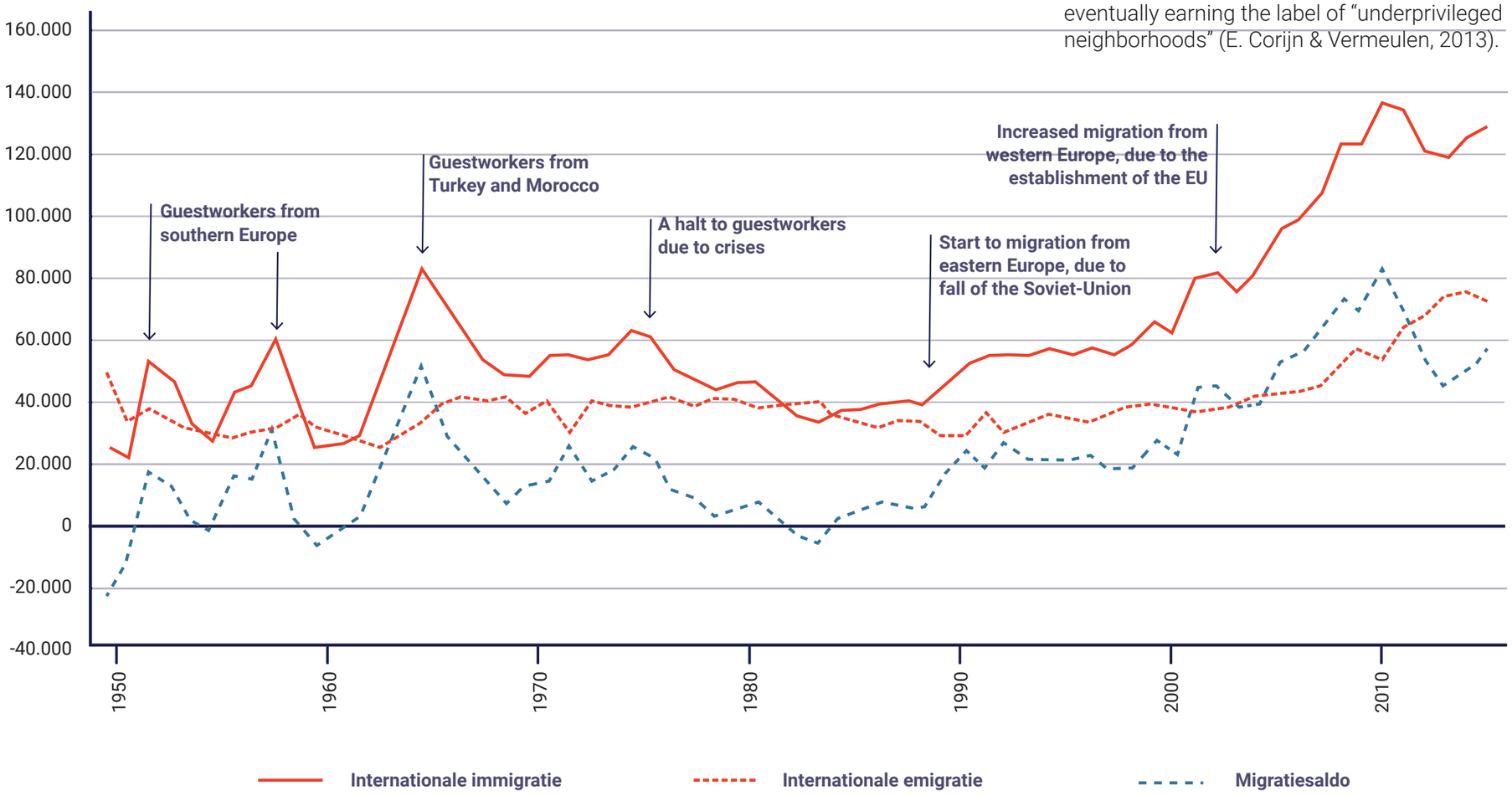
3.5 NEIGHBOURHOODS OF ARRIVAL

The central Canal Zone in Brussels comprises several neighborhoods that historically served as "neighborhoods of arrival" for migrants. During the industrial revolution, these districts experienced an influx of Flemish and Walloon migrants, with factories surrounded by housing for the workers, often of modest quality. In the early 20th century, social and political struggles, along with improving living standards, sparked the first wave of suburbanization. This period witnessed the emergence of social housing and garden cities, forming the second residential belt of Brussels. However, within the working-class neighborhoods of the Canal Zone, there continued to be space for renovation and new residents, and these areas remained as places of arrival for newcomers seeking affordable housing (E. Corijn & Vermeulen, 2013).

Following World War II, during the economic boom of the 1960s, the working-class neighborhoods underwent significant changes due to an influx of international workers. This period of post-war prosperity and increasing living standards resulted in homeownership, often in the more affordable suburbs, and car ownership for commuting purposes becoming symbols of economic success. As a consequence, there was a rapid process of suburbanization, leading to the abandonment of former industrial neighborhoods like the Canal Zone. The available low-wage jobs in these areas, along with the relatively cheaper housing units, were occupied by newcomers, guest workers, and immigrants (E. Corijn & Vermeulen, 2013).

These newcomers arrived in successive waves. In the 1950s, guest workers primarily came from Southern Europe, followed by individuals from Morocco and Turkey. The migration flows slowed during the economic crises of the 1970s but increased with the collapse of the Soviet Union, leading to immigration from Eastern Europe. Additionally, the establishment of the European Union facilitated migration from across the continent (Geldof, 2019).

However, these newcomers in the Canal Zone aspired to upward social mobility and sought to move to more desirable residential districts. Unfortunately, their aspirations were impeded by the economic crisis of the 1980s, which resulted in widespread unemployment. As a consequence, the working-class neighborhoods in the Canal Zone became predominantly migrant neighborhoods, characterized by concentrated unemployment, discrimination, and neglect, eventually earning the label of "underprivileged neighborhoods" (E. Corijn & Vermeulen, 2013).



Figures 43: influx of immigrants over the years in Brussels
Made by author, based on (Geldof, 2019)

3.6 GOVERNANCE

As we saw in former chapters, contemporary Brussels consists of several former village which have grown together. These villages formed individual municipalities.

Belgium underwent a process of federalization in the 1970s, resulting in its division into three regions and three communities, with each region having jurisdiction over matters pertaining to its territory, and each community having authority over matters related to individuals, such as education, health, culture, and welfare.

In this process Brussels became a bottleneck, because of its unique cultural, linguistical and political position. In 1971, the law called for the creation of agglomerations with an elected representative body in Brussels. However, the Brussels executive, consisting of federal ministers, largely influenced urban policy in the city for almost two decades, as it was never re-elected. The political deadlock stemmed from disagreements between Flemish and French-speaking parties on the autonomy of the Brussels region, the organization of public institutions, and the city's future development visions. Despite efforts to establish an organizational structure for public institutions in Brussels, the case remained unresolved for an undefined period. As a result, the 70s and 80s were regarded as a political vacuum in Brussels (Nakhlé & Raynaud, 2019)..

This era was characterized not only by the erosion of public revenues and reduced city budget but also by significant urban exodus and deindustrialization, leading to a decline in tax revenue. Some local policymakers formed questionable coalitions with business partners to develop office spaces in the city center and European quarters, which was known as "Brusselisation." This led to a rise in the local urban movement, prompting the formalization of participative planning (Nakhlé & Raynaud, 2019).

During the period between 1977 and 1983, a national process of merging municipalities took place, which resulted in a significant reduction in the number of municipalities in Belgium from 2359 to 589. However, the case of Brussels was a sensitive topic in the national state reform discussions, and due to the lack of agreement on the regional status of Brussels, the possibility of a merger was never seriously considered. This led to the establishment of a dual-layered system of public institutions in the Brussels-Capital Region (BCR) (Nakhlé & Raynaud, 2019)..

At the regional level, four public governments operate within the BCR, each with its own parliament and administrative system: the government of the Brussels-Capital Region, the Flemish Community Commission, the French Community Commission, and the Common Community Commission. Additionally, the BCR includes 19 municipalities, which enjoy extensive autonomy. Local public administrations are primarily responsible for assessing and granting planning permissions, implementing detailed land use changes, and coordinating local urban renewal efforts (Nakhlé & Raynaud, 2019)..

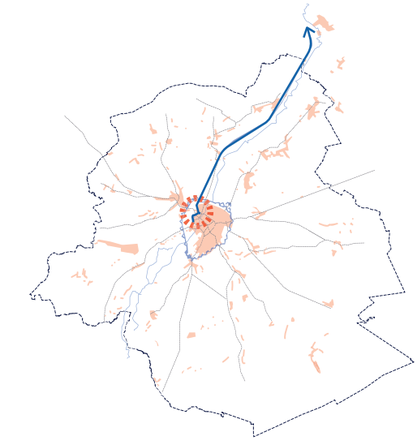
3.7 CONCLUSIONS

Analysing Brussels history from a spatial, institutional and socio-economic perspective it can be established that all these historic paths have largely influenced and perpetuated one another. Ultimately resulting in the peculiar path dependent nature of the area today: a segregated social profile, persistent industrial land use and governance fragmentation.

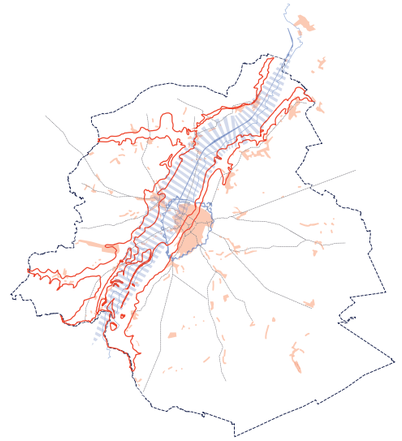
The river, and later, the canal has always had an industrial character, which accelerated after the industrial revolution. This has largely formed the urban fabric in the area, with the construction of a seaport and the railway. It also partially formed the administrative borders of Brussels. The municipality borders within the region were based on the original villages that surrounded medieval Brussel. Brussels eventually annexed the northern municipalities, because it made the investments for the harbour. After the sixties the knowledge sector in Brussels started to increase, resulting in a decrease in industry. Leaving this area in decay.

This industrial and geographic character of the canal zone has also heavily influenced its demographic development. The area was always the lowest lying land in the city, which resulted in a risk of flooding. It also for a large portion of Brussels functioned as an open sewage. Therefore this was the designated area for the less privileged class of Brussels population, already from the Middle ages. Later, during the rapid industrialisation of the city, the Canal zone functioned as neighbourhoods of arrival. People from outside the city would move here, in the hope of upward social mobility. Once this was achieved they would move out. This resulted in perpetual state of a poorer population.

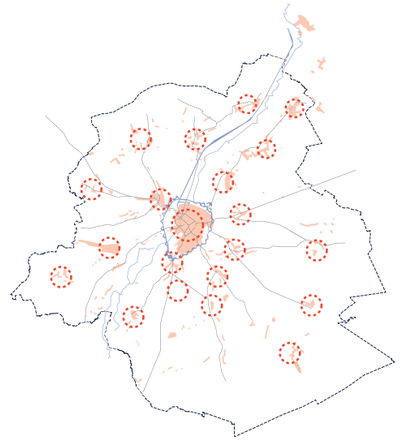
After the second world war this resulted in an increase in migrant workers in the area, while the native population moved to the suburbs. The decrease in industry after the sixties left these migrant workers without many economic opportunities, which ultimately resulted in the demographic make up of the area nowadays.
This influx of migrants throughout the centuries also resulted in the francisation of Brussels. This bilingual nature complicated the federalisation of Belgium, eventually resulting a separate Capital Region, where both the Flemish, as well as the French community, would be active. Due to the institutional complexity of Brussels, the borders of the municipalities have remained largely untouched, while many other municipalities in Belgium did fuse.



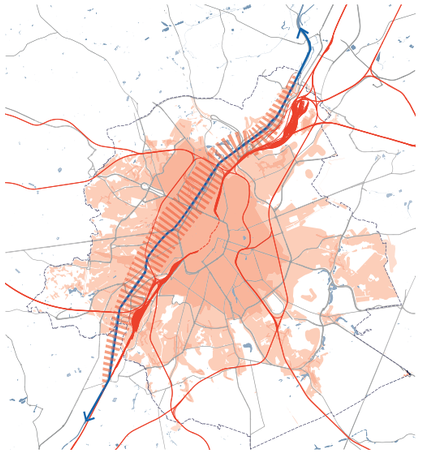
First industrial activities around the canal



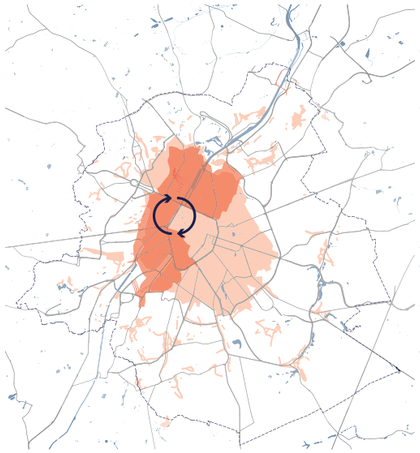
Area prone to flooding, resulted in inhabitants of lower socio-economic status



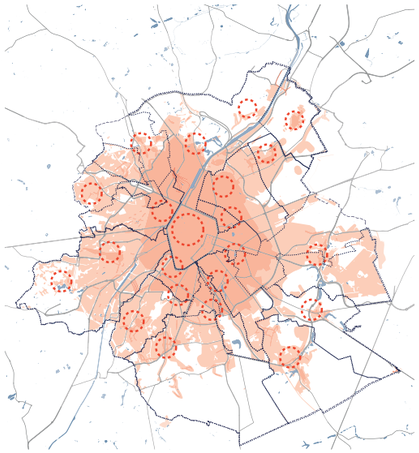
Several villages around Brussels



Canal as an industrial axis



Neighbourhoods of arrival



Municipality boundaries never updated

04 PRESENT



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

4.1 INFRASTRUCTURE

To further examine the presence of path dependencies it is important to examine the current status of the area and its role within Brussels.

Infrastructure

The first infrastructure that is important to examine is obviously the canal and how it is used today. Even though the current industrial sector is only 6 percent of Brussels economy, the canal still plays a key role in the logistics of the city. Logistics and transport of goods are crucial for a city, as they ensure the availability of goods for various needs such as shops, population, industries, and worksites. Logistics and goods transport are essential for a city, ensuring the supply of goods for shops, the population, worksites and industries, as well as the evacuation of rubble and waste and the marketing of economic production. In the north the canal is wider and therefore most of the port activities remain here. However there is also some activity in the south. Both the north and south have a good access to the high way (Strale, 2017).

The presence of these infrastructures means that a lot of logistics take place here. Many of the main logistical nodes are related to wholesale trade, such as the morning market, abattoirs, and the Port of Brussels(Voghel, Strale, Boswell, & Coekelberghs, 2017):

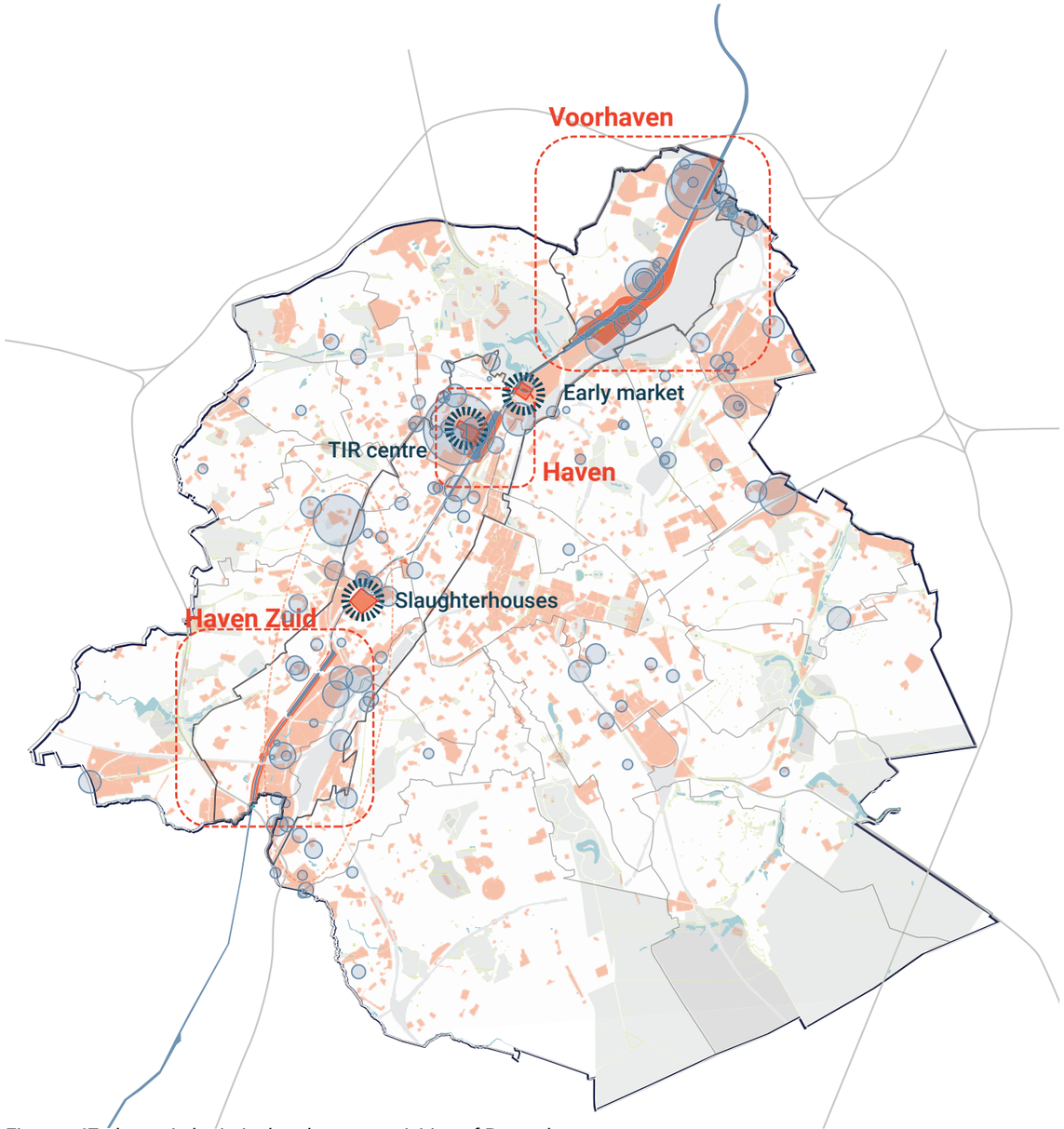
- The early morning market, which is the largest wholesale market in the country, with 40,000m² of warehouses that accommodate 120 wholesalers specializing in food products. It is open six days a week and employs around 400 people.
- The Port of Brussels, which has 85 hectares of industrial space that is home to many companies, representing about 6,000 direct jobs. It has a container terminal and the TIR Centre, a 160,000m² warehouse, and focuses on heavy goods, building materials, cement, fuel, construction rubble and waste.
- The Anderlecht slaughterhouses, which is an old facility dating back to the late 19th century that still represents 2-3% of the Belgian slaughter market and 100% of the Brussels market.

Although not all logistical nodes are directly related to the use of the waterway, but the semi-industrial structure of the area, the main roads along it and the available space explain why they are located in the area (Strale, 2017). Due to the presence of these infrastructures and the economic structure of Brussels, jobs and companies related to goods transport are also concentrated around the canal. Furthermore, their clients, the retailers, are concentrated near the centre [Wayens, 2006]. Due to the lack of integration of this activity, the proximity to this clientele is fundamental [Strale & Wayens, 2014]. In the neighbourhoods along the canal, wholesalers find suitable spaces and semi-industrial buildings, which are accessible to heavy vehicles and where they are able to store goods. These companies provide approximately 10 000 jobs in the neighbourhoods along the canal [Strale et al., 2015].

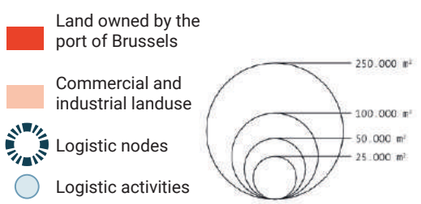
Likewise, small carriers and logistics service providers specialised in urban service and messaging or the storage of small volumes, represent a significant share of the industries along the canal, benefiting from the same advantages as the wholesalers. They represent approximately 5 000 jobs [Strale et al., 2015].

However, large-scale storage and logistics activities tend to favour the immediate surroundings, in particular along the ring road and highways. These operators need large areas for parking and storing goods. Furthermore, they often operate on a larger scale than just Brussels and must have easy access to the highway (Voghel et al., 2017).

The logistics sector in Brussels is experiencing a shift from the city center to the periphery. This is evident in both the supply of modern real estate, which is increasing on the outskirts and decreasing in the city, and in employment in the logistics and wholesale sectors, which is decreasing in the Brussels-Capital Region but growing on the periphery. The areas closest to the Brussels Ring and the motorway routes, as well as the municipalities between Brussels and Antwerp, are seeing the greatest employment gains (Voghel et al., 2017).



Figures 47: the main logistical nodes ann activities of Brussels, made by author based (port of Brussels, 2020; Urban atlas, 2018; Voghel et al., 2017)



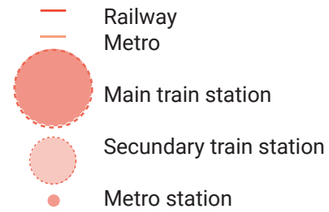
For these logistics activity also the road network is very important. Brussels is very centrally located in Belgium and the north and south part of the Canal zone have direct access to the highway. However, Brussels is known to be a very congested city when it comes to traffic. This mainly due to the fact that many people working in Brussels live outside of the city, and that Belgium has a fairly car dependent culture (Vermeersch, 2014).

Another important infrastructure in the area is the railway network. The main north-south access runs along side the canal, with both the north and south station of Brussels in close proximity of the canal as well as many other smaller stations. However the railway so not only connect, but also act as a barrier, cutting the urban fabric in half, therefore the middle part was tunneled. Further north and south there are big marshalling yard, taking up a big area. Historically the railway network, port and surrounding industries were intertwined, but nowadays, only one access point to from the harbour to the railway network remains, but is also under pressure (Sloover, 2022)

The third major infrastructure is the road network. Brussels is known to be a very congested city.Both the north and south part of the canal have a direct link to the highway and are therefore popular locations for industrial and logistical functions.



Figures 45: Road connections, derived from (openstreetmap, 2022)





Figures 46: Train and metro connections derived from (openstreetmap, 2022)

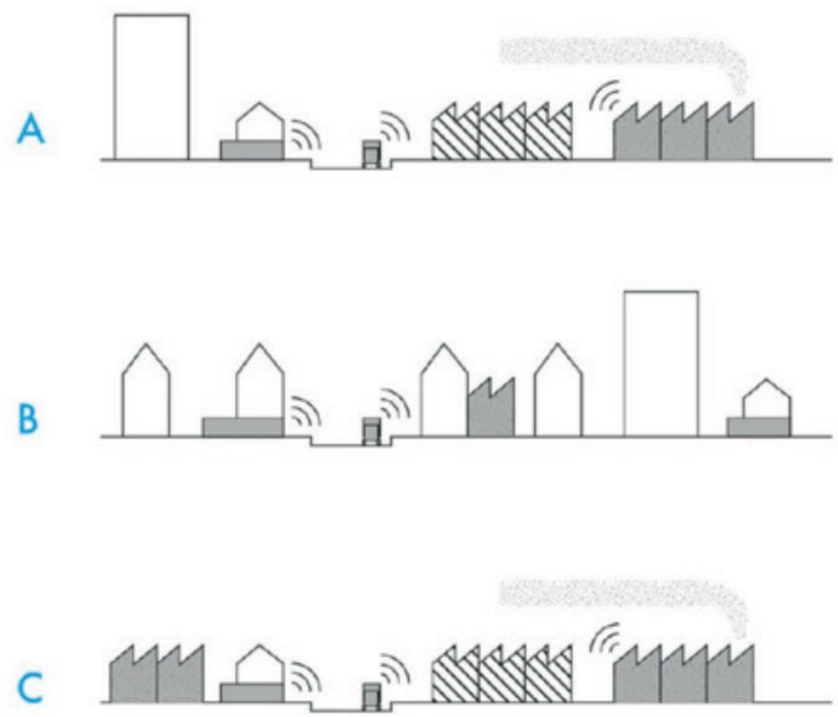
4.2 INDUSTRY

Due to the logistical nature of the canal many industries still remain here.. Cities of making identified three different typologies for industrial land use (Hill & Warden, 2018):

A) Pockets of manufacturing adjoining other land uses, such as the Audi and SABCA factories, are located in industrial areas separated from residential areas by merely a road. These zones are neither at risk or entirely safe from redevelopment.

B) Highly mixed zones, such as the central 19th century neighborhoods of Heyvaert, Molenbeek, and Masui, contain an incredibly rich mix of housing, schools, garages, small factories, market spaces for informal dealings, and some remarkable examples of early 20th century art nouveau architecture. These areas are under the gaze of developers seeking to transform the charming industrial space into housing opportunities.

C) Industrial zones, such as the Gobert, Béco, Vergote docks, and large industrial complexes like Tour & Taxis, have been created following the widening of the canal zone as sea harbour in the early 20th century. Due to the deindustrialization process since the 1960s along the Canal area, logistics have gradually replaced industry. These zones perform some of the most basic metabolic work for the city, such as bringing in sand and building material, processing wastewater, and recycling building material. These zones are to be find in the more north and south part. The biggest question for liveability is dealing with noise and dust issues.



Figures 48: three typologies of industry (Hill & Warden, 2018)

The main sectors, besides logistics, which is already talked about, are: mechanical engineering, construction, networks, printing and food Processing.The metal manufacturing and mechanical engineering sector is a major contributor to the economy of Brussels, with the presence of companies such as Audi Brussels and SABCA being the most significant elements. Audi Brussels, which occupies 530,000 square meters of buildings, is one of the largest industrial companies in the region, having been established in 1948. SABCA, established in 1921, occupies 57,000 square meters of buildings (Voghel et al., 2017). Both these companies employ middle to low killed labour, Audi employing 3.000 and SABCA 1.000 (A. V. Hill & Warden, 2018).

Additionally, the presence of numerous car repair workshops and garages integrated in the urban fabric also contribute to the sector.(Voghel et al., 2017). The debate on the future of Brussels' large-scale urban industry centers around the largest industrial plants in the region, as well as the additional functions necessary to facilitate the design and production process, such as customer support, logistics and procurement. The complexity of the larger ecosystem raises several questions, including the ability to expand, sourcing personnel, training, and mobility for both goods and workers. Additionally, in 2017 only 11% of Audi employees were residents of Brussels. These issues need to be considered when discussing the future of the industry in the region (A. V. Hill & Warden, 2018).

Related to this sector is the trade in second-hand cars to Africa, particularly in the Heyvaert district. This area has become a hub for this industry due to several factors, including the presence of a large number of immigrant communities with connections to their home countries, proximity to the airport with regular flights to Africa and to the port of Antwerp which is a major export hub.
Additionally, the district has a number of former meat processing facilities, which no longer met modern standards and were purchased at low prices by Lebanese families fleeing conflict, who then established themselves in the used car export business. As a result, hundreds of thousands of used cars pass through Brussels annually(Voghel et al., 2017).

The network sector includes all activities related to the distribution of essential services such as water, gas, electricity, telecommunications, public transport and recycling in the city. The

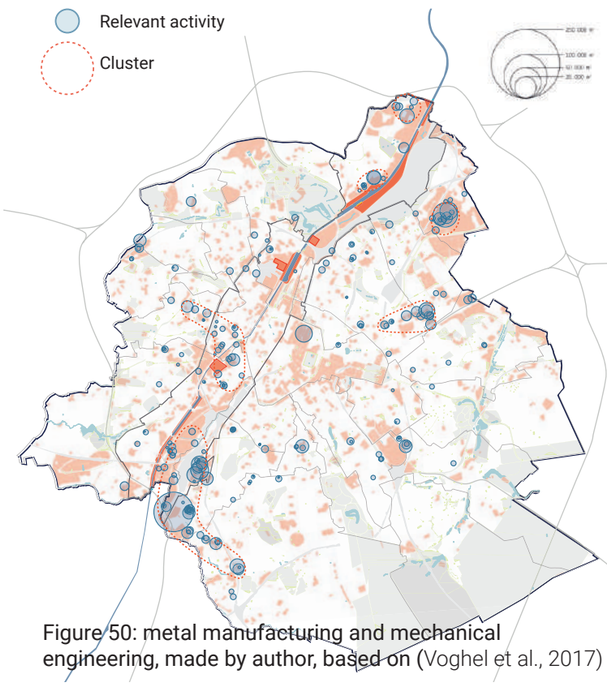
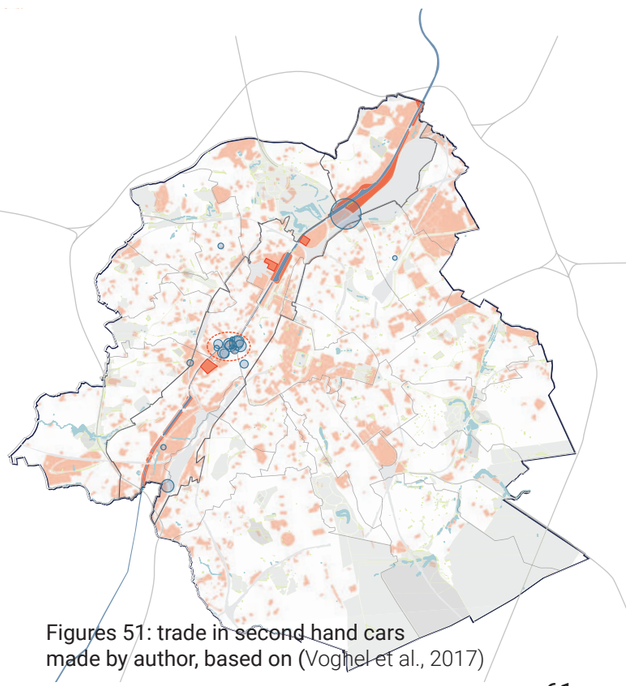


Figure 50: metal manufacturing and mechanical engineering, made by author, based on (Voghel et al., 2017)



Figures 51: trade in second hand cars made by author, based on (Voghel et al., 2017)

Brussels region's public transport company, STIB/MIVB is the capital's largest employer, with about 8200 employees in 2016, and covers the maintenance and upgrade of a wide range of vehicles from trams, metro carriages, and buses (A. V. Hill & Warden, 2018). These activities tend to be concentrated in the main industrial areas of Brussels, with some notable exceptions (Voghel et al., 2017).

The food processing sector is mainly located on the city's historical industrial axis, particularly around the slaughterhouses of Anderlecht, which have been in operation since the 19th century. The meat industry is the predominant part of this sector, occupying more than 68,000 square meters, or over a quarter of the space. Other notable companies include Leonidas and Godiva, which together occupy 41,000 square meters, and the Ceres mill facilities, which occupy almost 40,000 square meters. The sector also includes various bakery workshops, catering workshops, and kitchens for the City of Brussels and the European Commission, as well as breweries and drinks depots. This sector requires buildings that are recent or have been reconfigured to meet the necessary hygiene requirements (Voghel et al., 2017). It's interesting to note that 95.1% of this sector is occupied by middle and small companies (under 50 workers) with 76.4% being very small companies (<10 workers), especially in the bakery industry. This raises the question of where to draw the line between industrial scale and neighborhood scale production. Furthermore, 64% of the jobs involve manual work, indicating that the food sector still requires skilled labor(A. V. Hill & Warden, 2018).

The construction sector includes a variety of wholesale businesses that sell materials such as timber, plumbing supplies, roofing materials, tools, tiles, and flooring, as well as the materials depots of construction companies. These businesses are located in the city due to the proximity to the construction sites. Some of the larger companies have taken steps to improve their integration into the urban fabric, such as Inter-Béton concrete plant which has been present in the Vergote Dock since 1962. The company plans to minimize the nuisances caused by the operations, such as noise and dust, re-organize its heavy goods vehicle traffic and redesign its tower as a local landmark (Voghel et al., 2017).

The paper processing and printing/publishing sector occupies 154,119 square meters of space and includes private companies as well as the printing presses of public institutions such as the Ministry of Finance in Forest and the European Commission in Haren. One example of a company in this sector is Imprepack, located in Molenbeek, which specializes in the production of packaging for chocolate(Voghel et al., 2017). The printing industry has a long history in Brussels, as a result of its location as an administrative center, its long history in painting and weaving and possibly even due to laxed copyright rules in the past that allowed for a large number of counterfeits in the 19th century. The printing industry represents a niche with around 3500 employees and an average company size of 15 workers. (A. V. Hill & Warden, 2018).

Small scale industrial functions around the centre are slowly being displaced. In Brussels, local businesses often lack representation of their interests, making them vulnerable to changes in land use or complaints from residential areas as public authorities enforce stricter regulations on noise, dust, deliveries, and other nuisances. Many companies do not own their land or are not content with their current location. Intra-Brussels relocations have been on the rise. The primary reason cited is accessibility, as Brussels is known for its traffic congestion and limited parking options in areas where businesses want to be located. (A. V. Hill & Warden, 2018).

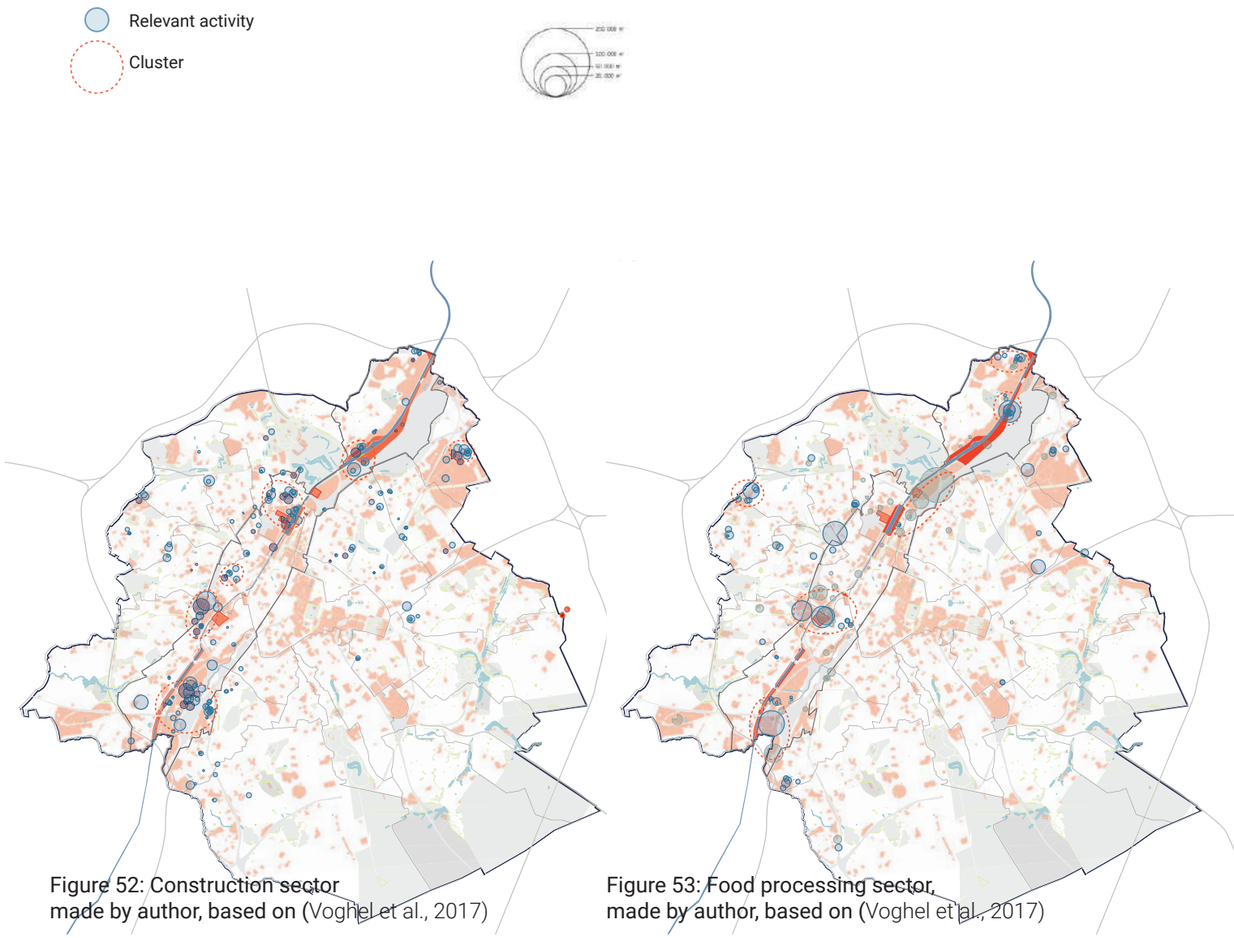


Figure 52: Construction sector
made by author, based on (Voghel et al., 2017)

Figure 53: Food processing sector,
made by author, based on (Voghel et al., 2017)

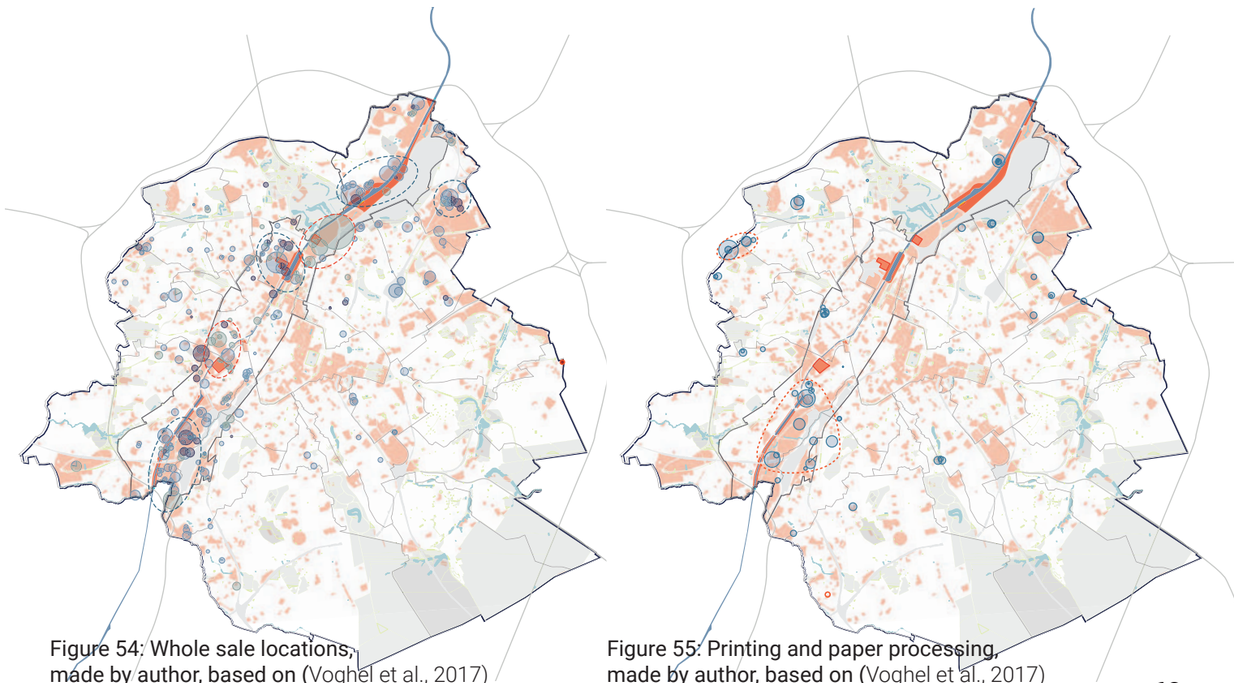


Figure 54: Whole sale locations,
made by author, based on (Voghel et al., 2017)

Figure 55: Printing and paper processing,
made by author, based on (Voghel et al., 2017)

4.4 DEMOGRAPHICS

According to the World migration report 2015 (IOM, 2015), Brussels was the city, out of the top 20 global cities, with the most foreign born residents, after Dubai, around 60 percent. In Brussels 184 nationalities are represented, making it one of the most diverse cities in the world. Most foreign-born residents come from other European countries, with France being the main contributor. The share of eastern Europeans is also big, with Romanians making up 9 percent of immigrants. Besides European countries, Moroccan, Congolese and Turkish communities are the biggest. Eventhough the city might be one of the most diverse, when looking at these communities separately it becomes clear that they live fairly segregated, with the Turkish and African communities concentrated in the area the overlaps with the 'croissant pauvre', while western Europeans live more towards the east-south of the city as can be seen on the maps.

In an analysis made by Belgian newspaper de Tijd (ROELENS & BERVOET, 2021), it becomes clear that Brussels became a lot more diverse over the last 20 years. The proportion of residents of classical Belgian origin was 44% in 2000 compared to 19% in 2020. The African community was then much more strongly concentrated around Molenbeek and the Turkish neighbourhoods in Schaarbeek were not yet as strongly mixed with Eastern Europeans. Also striking: the well-known expat neighbourhood full of Eurocrats in the south of Brussels is only recent, in 2000 it was not yet visible in the figures.

Historically these neighbourhoods have always been neighbourhoods of arrival, and are to extend still to this day. Migrants with increasing economic success also move to better neighbourhoods in the country. At the same time, a less successful or more rooted part of that community continues to live in the neighbourhood. This community expands and new migrants from other regions continuously join it. The result is the creation of a larger mix, even though older generations still dominate (ROELENS & BERVOET, 2021). In Brussels the croissant pauvre has the biggest migratory movement in the region (Van Hamme, Grippa, & Van Criekingen, 2016). However this article could not conclude that only migrants with higher economic success move to other areas.

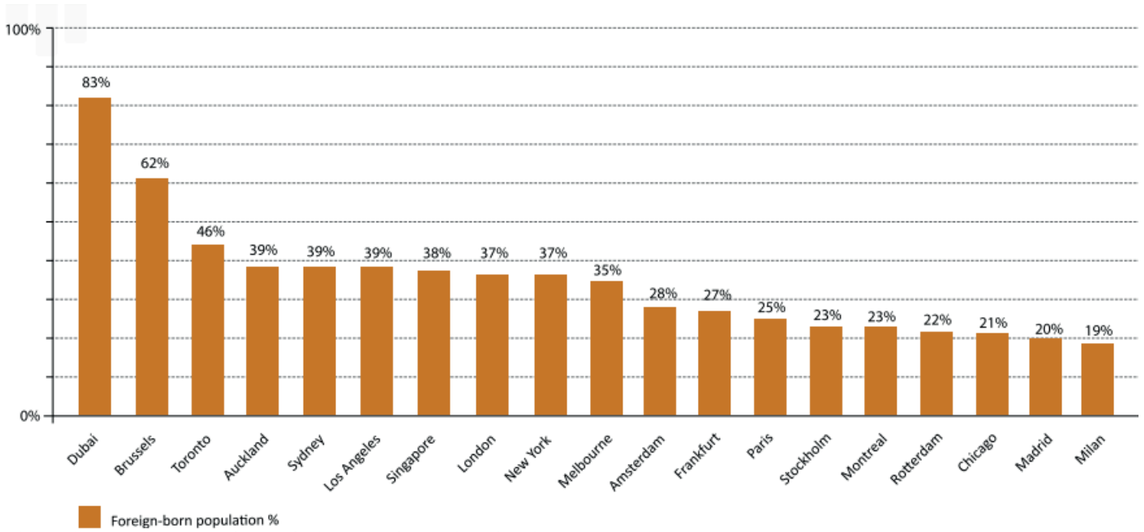


Figure 56: percentage of population was bown in a foreign counrty (IOM, 2015)

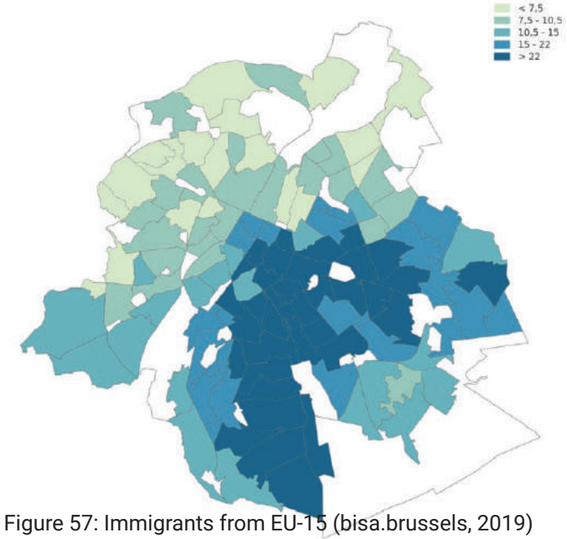


Figure 57: Immigrants from EU-15 (bisa.brussels, 2019)

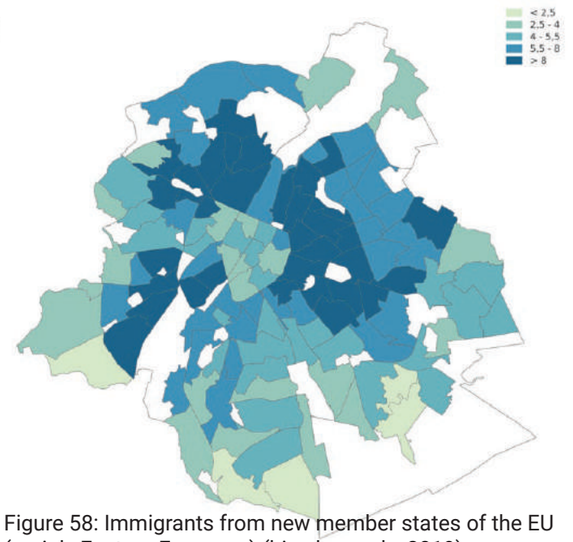


Figure 58: Immigrants from new member states of the EU (mainly Eastern European) (bisa.brussels, 2019)

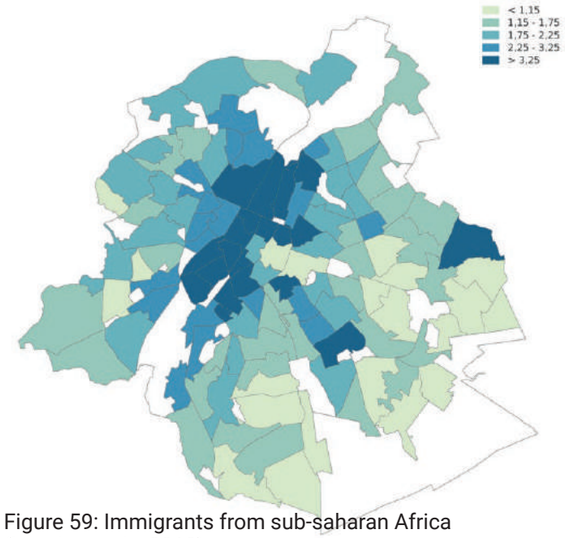


Figure 59: Immigrants from sub-saharan Africa (bisa.brussels, 2019)

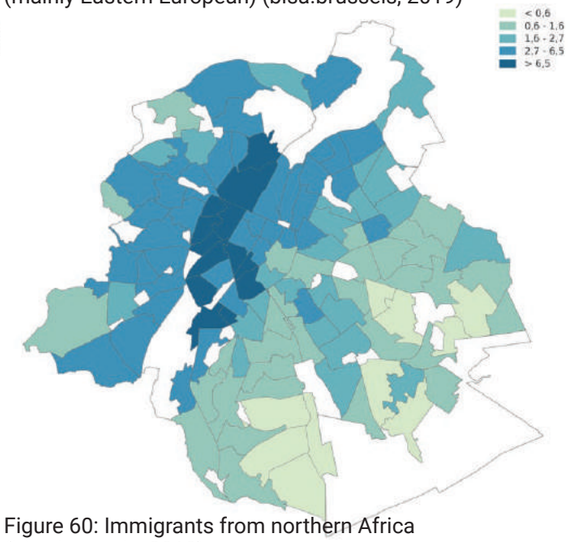


Figure 60: Immigrants from northern Africa (bisa.brussels, 2019)

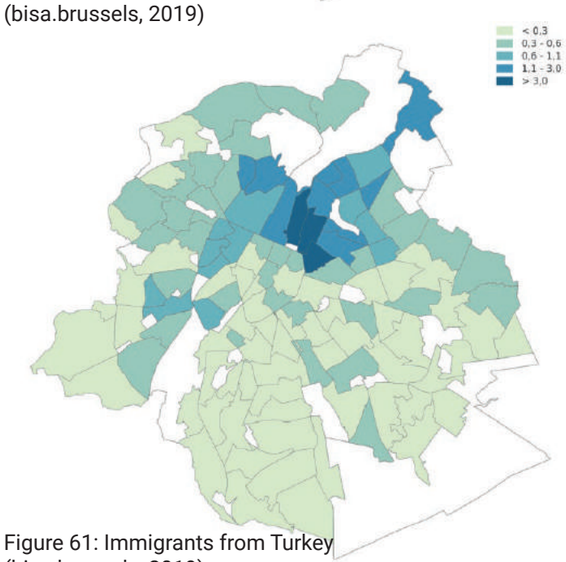


Figure 61: Immigrants from Turkey (bisa.brussels, 2019)

4.5 LE CROISSANT PAUVRE

Brussels is not only segregated when it comes to nationalities, but also when it comes to wealth. In 2019, 35,3% of Brussels population lived at a risk of poverty in 2021, compared to 12,4% in Flanders and 24,9% in Wallonia (STATBEL, 2021). This poverty is mainly concentrated in the north-west quadrant of the city, in what is nicknamed the «croissant pauvre», in which 22,5% of Brussels' population live. Densely populated and precarious, the poor crescent comprises the majority of Brussels neighbourhoods that have an EHR rate of more than 40%. EHR stands for Entitlement to Higher Reimbursements. These are people who receive a higher reimbursement from their health insurance funds for their healthcare, due to their low income (less than €20,300 gross taxable income per annum) or their personal situation (disability, single-parent family, unaccompanied foreign minor, etc.). (Joie, Douieb, Noirfalisse, Sanchez, & Herda, 2021).

When looking at age in relation to EHR rate it can be observed that the inhabitants of wealthy neighbourhoods are on average six years older than the inhabitants of poorer neighbourhoods (Joie et al., 2021). Also the households tend to be bigger in the croissant pauvre as can be seen in figure 66. In the wealthy neighbourhoods, each inhabitant enjoys an average of 43m² of housing, which is 17m² more than each inhabitant in the neighbourhoods with the highest rates of EHR, with an average of 26 m² per inhabitant (Joie et al., 2021). The area is also the densest of Brussels

Another maybe more alarming statistic is the one of unemployment in these areas. In 2018 some of the neighbourhoods along the canal had unemployment rates of well over 30 percent (wijkmonitoring). This is mainly due to a mismatch on the labour market. Brussels has a high supply of jobs, however, it also has high unemployment, creating a paradoxical labour market. This is partly due to the fact that many jobs in Brussels are linked to the city's status as a regional, national, and European capital and are filled mainly by highly-skilled workers, while a significant proportion of the region's population is low- or medium-skilled. Additionally, the foreign-born population in Brussels may not meet the nationality or language skill criteria for available positions and may face discrimination in the recruitment process. These factors contribute to a significant mismatch between labour supply and demand in Brussel (Zimmer, 2012).

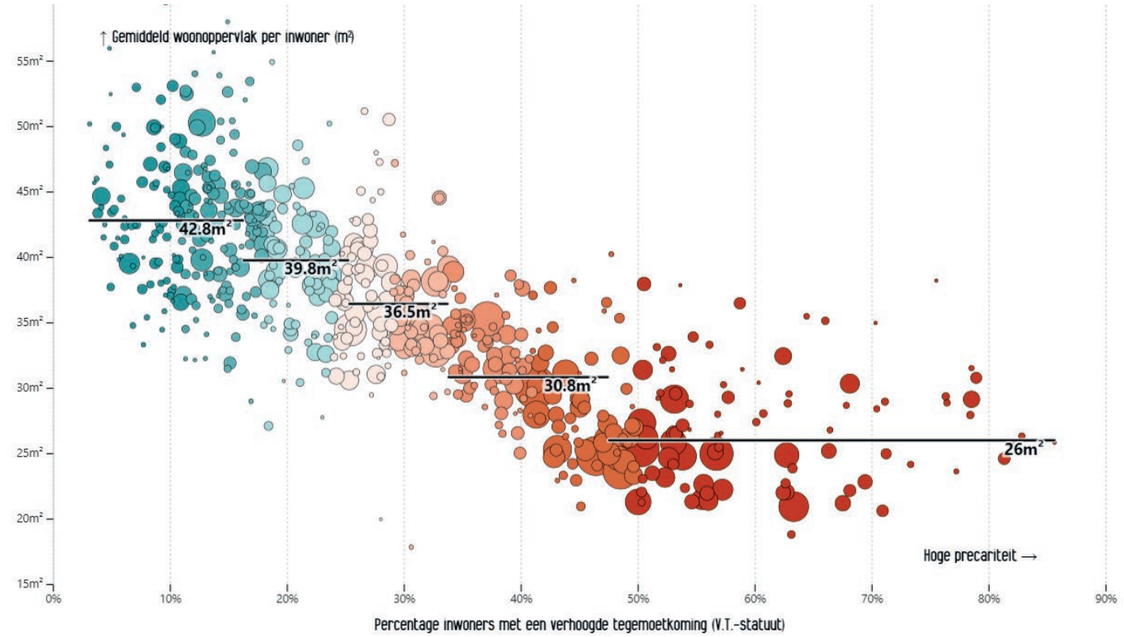


Figure 62: Average living space per person compared to percentage of people who recieve subsidies (Joie et al., 2021)

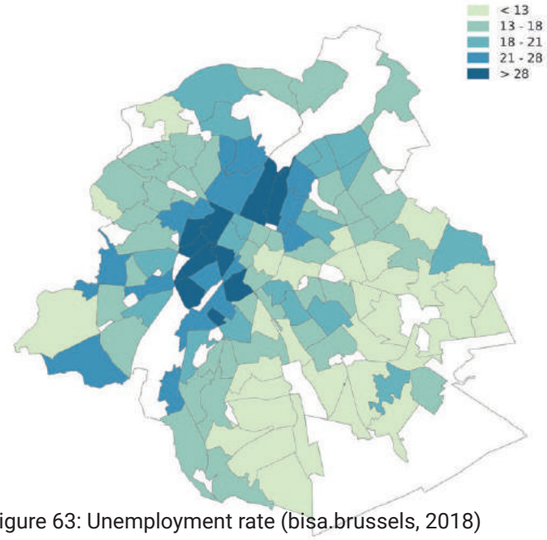


Figure 63: Unemployment rate (bisa.brussels, 2018)

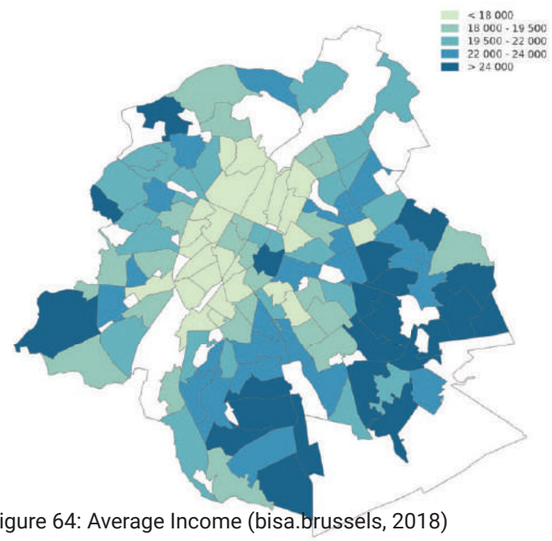


Figure 64: Average Income (bisa.brussels, 2018)

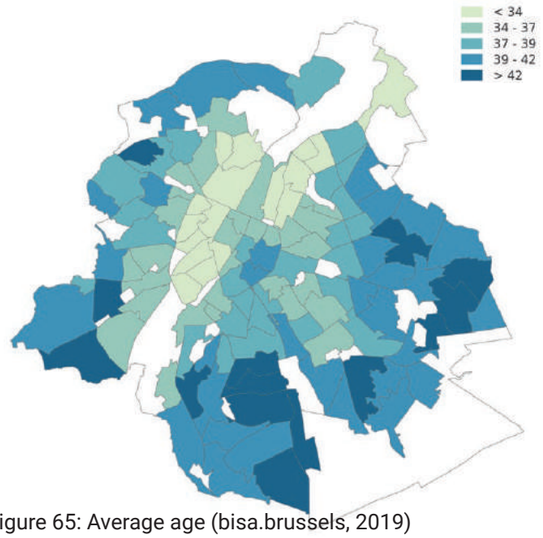


Figure 65: Average age (bisa.brussels, 2019)

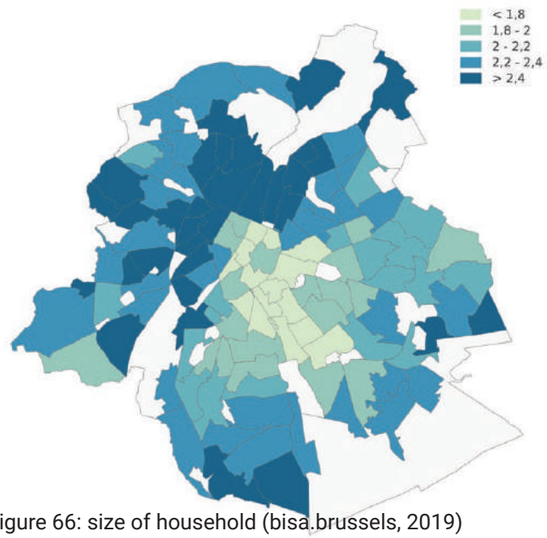


Figure 66: size of household (bisa.brussels, 2019)

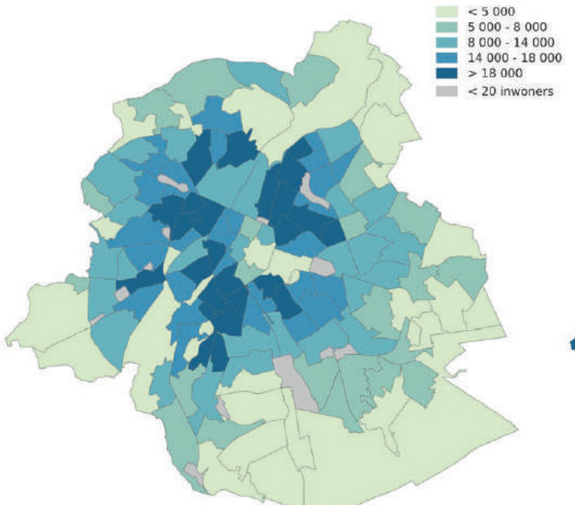


Figure 67: population density (bisa.brussels, 2019)

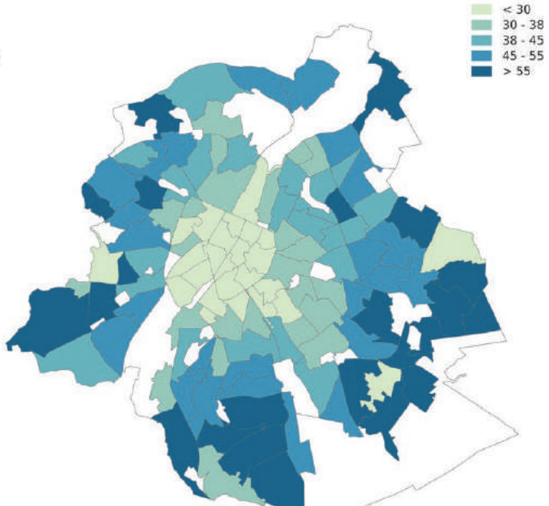


Figure 68: ownership of own house (bisa.brussels, 2001)

4.6 LIVEABILITY

Spatially segregation and the industrial nature of the canal zone becomes clear when looking at greenery in Brussels. Although satellite images confirm the presence of vegetation on about 50% of the territory, the green spaces are unevenly distributed between the communes. Private gardens represent 30% of the green spaces. They are almost totally absent from the city center, which is nearly completely paved (Joie et al., 2021). It also needs to be noted that the largest green body in the Canal zone is the Royal Domain of Laken, and is not accessible by public.
When it comes to air pollution, across almost all of Brussels, the concentrations of fine particulate matter (PM 2.5 µg/m³) exceed the maximum values set by the World Health Organization (10µ g/m³).

However, the center suffers from a dual environmental penalty: fine particulate matter and little greenery. The Nord-East is in an intermediate situation: a lot of fine particulate matter but enough green spaces. The South has the best scenario: low levels of fine particulate matter and many green spaces, thanks to the Sonian Forest, the Bois de la Cambre and private gardens in the wealthy neighbourhoods (Joie et al., 2021).

Noise pollution in Brussels is strongly related to road traffic and the airport in the North-East. 72% of the population of Brussels suffers from noise nuisance (>55 dB (A)). At night, 81% of the city's inhabitants experience noise pollution (>45 dB (A)). The north and south part of the canal zone have the highest levels of noise pollution (Joie et al., 2021).

Looking at the averages of these three indicators in relation to the EHR-rate of the neighbourhood, it becomes clear that all neighbourhoods experience similar levels of noise pollution, but there does seem to be a correlation between the lack of greenery and air pollution in relation to the wealth of a neighbourhood. Furthermore due to its industrial past and present, lots of the ground is polluted(Nakhlé & Raynaud, 2019)..

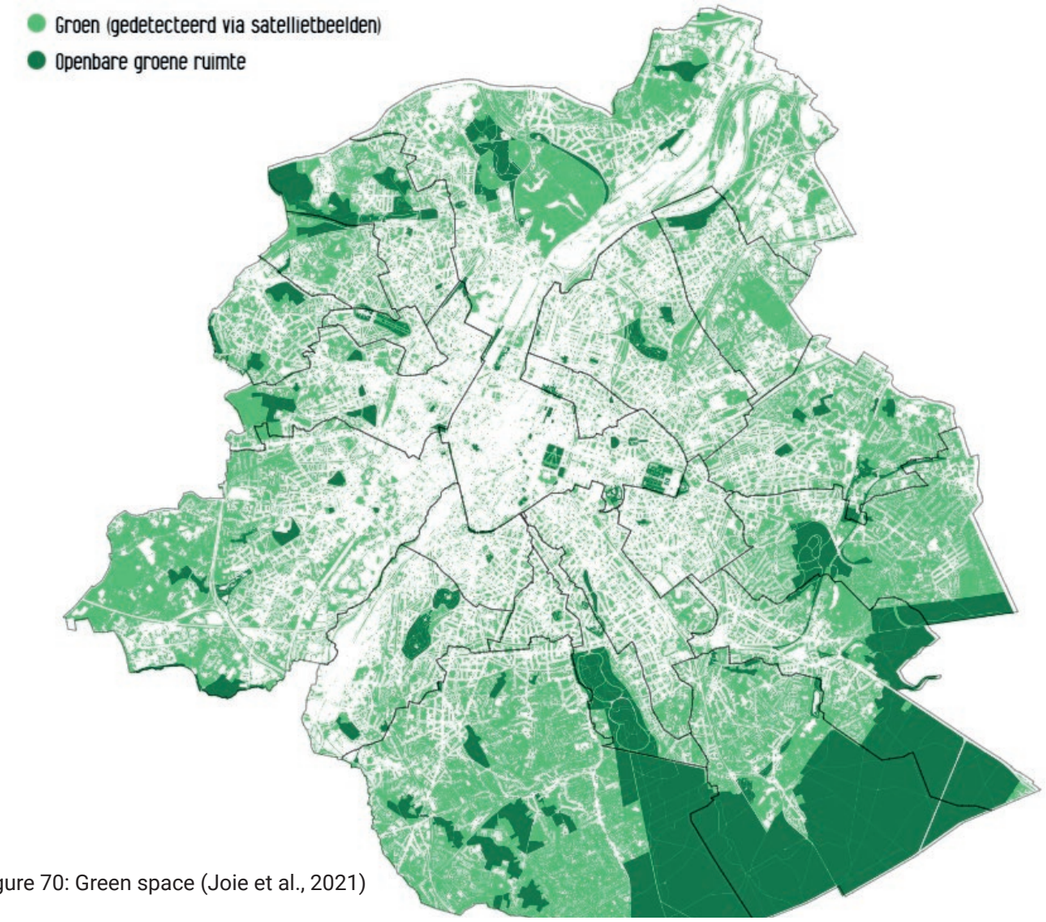


Figure 70: Green space (Joie et al., 2021)

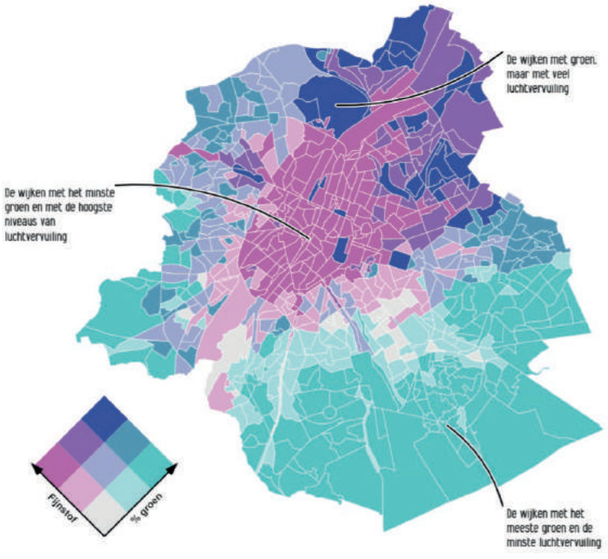


Figure 68: Air pollution overlaped with greenery (Joie et al., 2021)

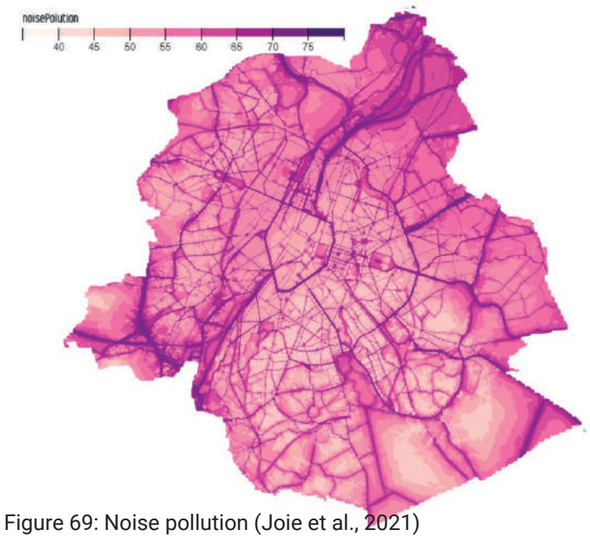


Figure 69: Noise pollution (Joie et al., 2021)

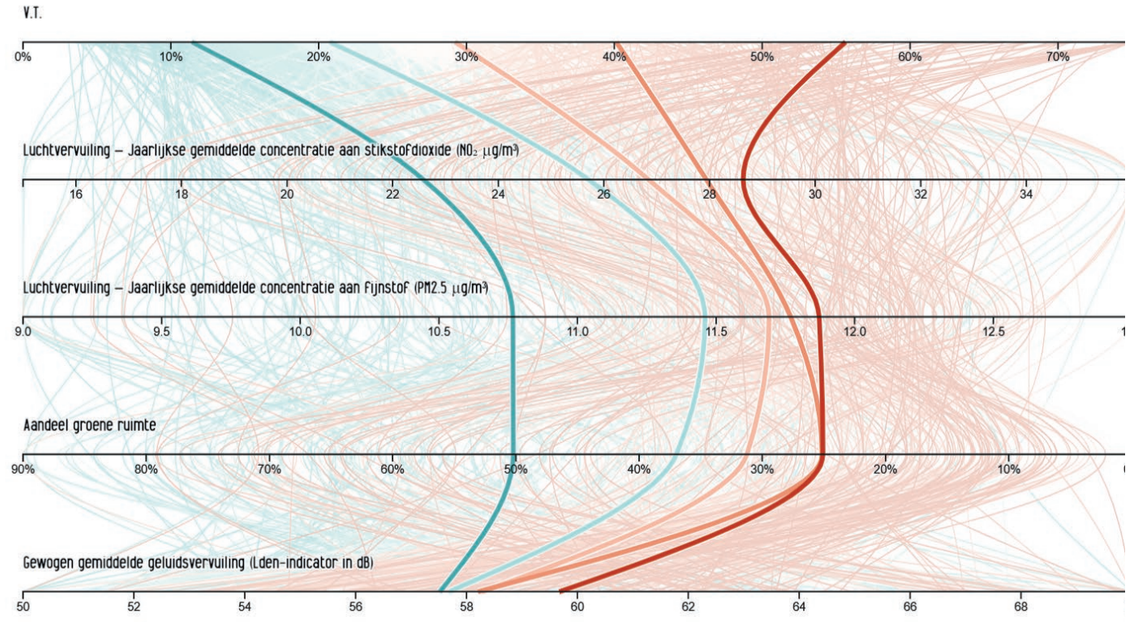


Figure 71: comparison between income level of neighbourhood and the rate of different types of polutions (Joie et al., 2021)

4.7 QUALITY OF SPACE

The following images give an impression of the quality of space in the Canal zone. The area seems quite car oriented and spatial quality seems poor in many areas. There are many fances, or empty plinths and decaying buildings. Though there is definitely also potential, such as the waterfront, and some of the pre-war architecture.































Figure 72-88: impression of quality of space in the Canal zone
(All images derived from Google maps)

4.8 CENTRALITIES

In the collective perception of Brussels, the canal continues to serve as a dividing line, creating a sense of "rupture" between the historic city center, known as the "pentagon," and the 19th-century working-class districts of Anderlecht, Molenbeek, and Schaerbeek. Within this mental map, the pentagon is defined by several prominent features, including the arched course of the Senne River, the central boulevards, and the railway connection linking Brussels-North and Brussels-South stations. (E. Corijn & Vermeulen, 2013). As already established the canal serves a logistical and industrial function serving retailers in the centre. It has more of a supporting role instead of being a centre itself. However there are many centralities around the canal, often corresponding with historical centres of the different municipalities.

These centralities attract a lot of visitors even from outside the region or even Belgium, which can be explained explained by the relatively cheap, but mainly international and specialist offerings that are on sale here. However many visitors are local, around 30 percent of visits daily. The commercial diversity is partially dependent on the identity of the neighbourhood. For example, the Brabantwijk has an assortment of textiles from the Middle East and the Maghreb, supplemented with furniture stores; the Zuidwijk receives the Europeans visiting the capital; the Dansaertwijk attracts lovers of creative designs and prestigious fashion stores; Kuregem has all food from around the world on offer. Furthermore, the Canal area has the most visited markets. The Zuidmarkt attracts 50,000 visitors on Sundays, the market of the Slaughterhouses 106,000 people spread over three days. These two markets are among the largest in Europe (Nakhlé & Raynaud, 2019).

The main centralities along the canal are: Helmet, Bockstael, Brabant, Vismet, Dansaert, Simonis, Molenbeek centrum, Zuid Lemonnier, Zuid, Kuregem, Ninoofsesteenweg, Sint-Guido, Sint Denijs. All have very different specificities and targetgroups. Some, like Sint-Guido, Sint- Denijs and Helmet serve the local neighbourhood, others like Kuregem, Brabant and Molenbeek have a larger reach, mainly due to the reasons listed below. Also the profile of visitors is different across various centralities. According to a study in 2014, by Atrium, 6 percent of visitors in Vismet were unemployed, but this number would jump to 21 percent in Bockstael. This area was also popular with student, together with Dansaert and Vismet (Brussel, 2014).

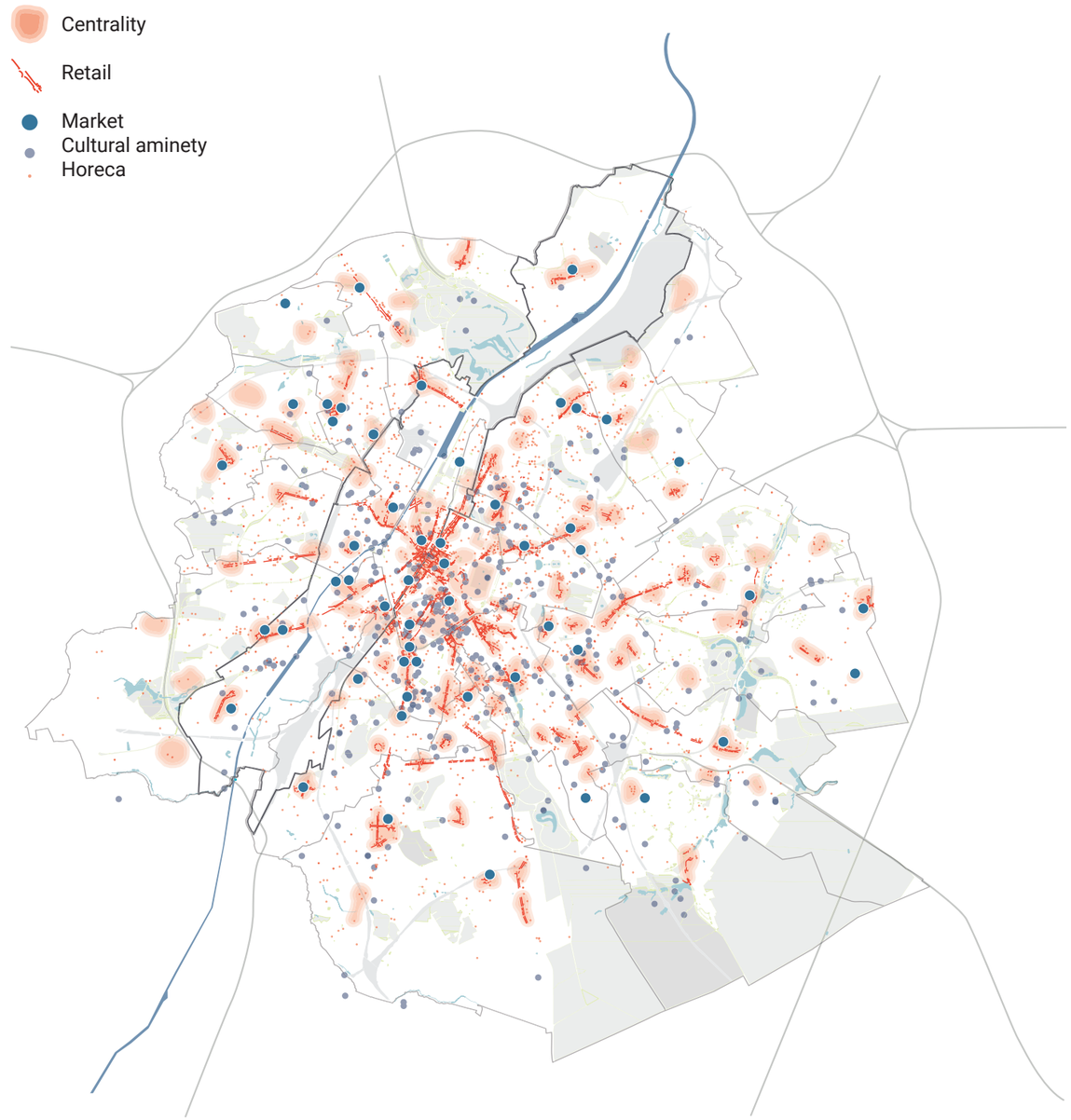


Figure 89: centralities and amenities in Brussels,
made by author based on (hemels.brussel, 2022; BHG, 2018; Nakhlé & Raynaud, 2019).

1.1 CONCLUSION

Analysing the current status of Brussels, it can be concluded that the historic developments, which led to the three path dependencies, have left their mark in the current urban landscape, with both negative and positive consequences. Due to the decrease of the importance of industry in the economy of Brussels, the canal now mainly performs a logistical function. In this logistics the most important connection is by road, slowly decreasing the importance of the railway and waterway in the transportation of goods. These infrastructures still have a large impact on the urban fabric and act as a barrier between different area. The shift towards road transport also has led to congestion issues. The most important logistical location are: the early market, the port of Brussels, the TIR centre and the Abattoir. Even though nowadays logistics is the most important role of the canal. Industry also has a fairly stable role in the area. The most important sectors are: mechanical engineering, construction, printing and food processing.

Spatially these industrial and logistical functions, manifests themselves differently in different area. In the northern and southern area it is mainly located in monofunctional areas, which are highly car dependent, in large volumes. These areas do not have many people living in them. In the central part these industries are more smaller scale and integrated in the urban fabric. This industrial character has influenced the liveability of the Canal zone. There is a lack of green, as well as high prevalence of ground, noise and air pollution. Also the quality of public space is lacking and is very car oriented, even though, at least the central part of the Canal zone, has a very central location and is relatively well accessible by public transport.

This central part is also the most densely populated part of Brussels and is part of the infamous ‘pauvre croissant’. Demographically this area is characterised by high prevalence of immigrants, high rate of poverty and unemployment, making the population fairly vulnerable. These factors have stigmatised the area. Also, the households here are bigger and the population is younger compared to the Regions average.

Due to Brussels municipality structure, poorer municipalities have a lower tax revenue and therefore are less able to invest in its neighbourhoods, which has likely contributed to the lack of green and quality in public space and the perpetuation of poverty in these municipalities. These municipalities has also made citizens more focused on the neighbourhood centralities, often located in the historic core of the municipality, instead of Brussels as a whole. While some centralities are located close to the canal, they rarely cross it, and the canal is more perceived as ‘the back’ of the centres.

All these factors have contributed to a negative perception of the Canal zone and it is seen by many as a barrier, both spatially and symbolical. However on the flip side, the demography and industrial nature of these areas has enabled a very specific economy. The commercial diversity is partially dependent on the identity of the neighbourhood, filling several niches and attracting many visitors. Also the population has largely organised themselves in social and/or religious associations. This way many migrant groups have establish themselves in the economic and social fabric of the area. Furthermore the municipalities due ensure local representation and makes the distance between citizen and government smaller, thus easing participation.

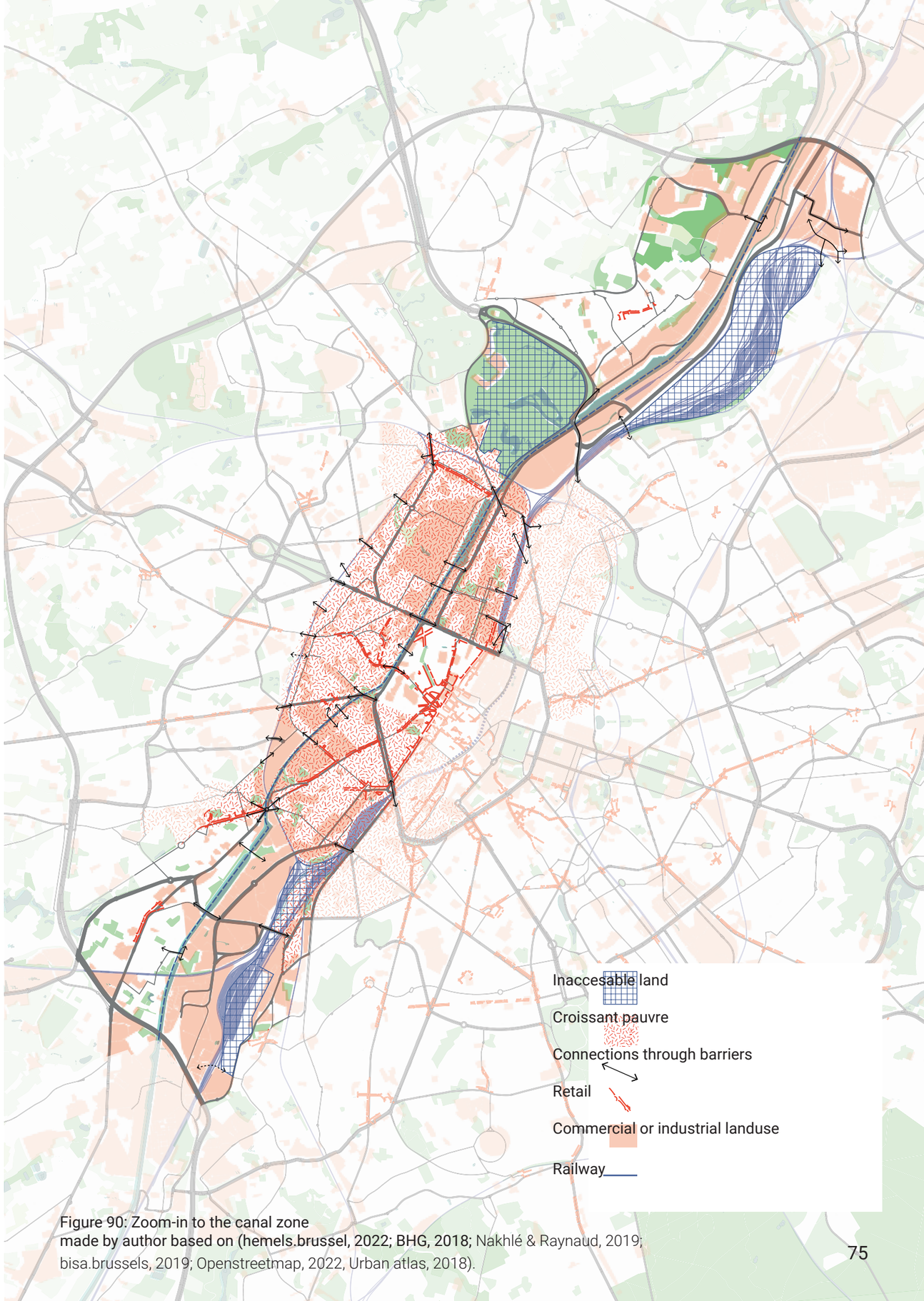
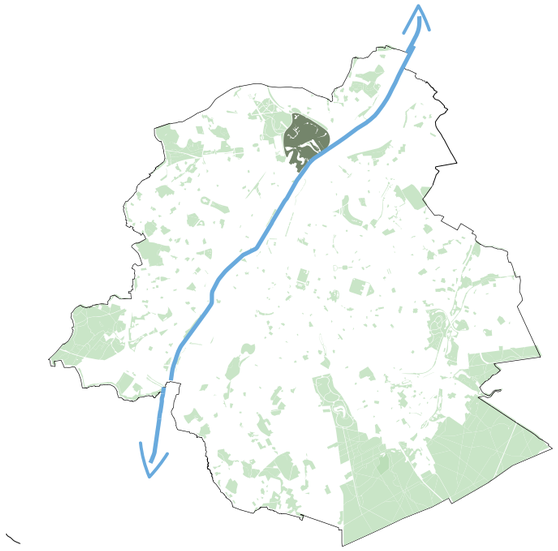
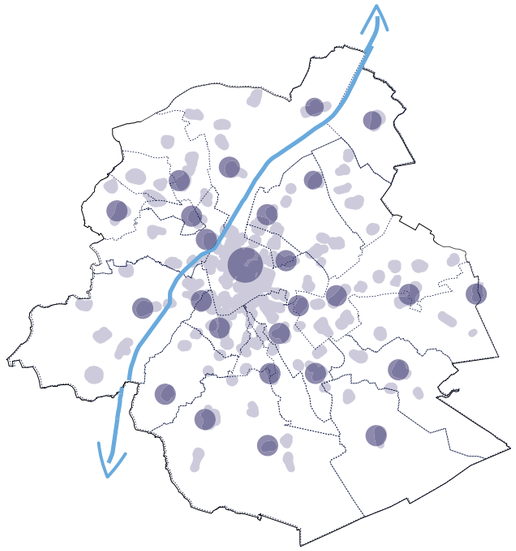


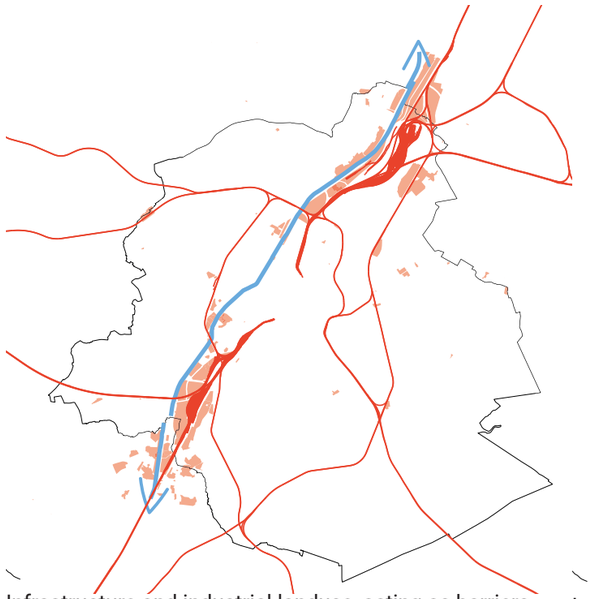
Figure 90: Zoom-in to the canal zone
made by author based on (hemels.brussel, 2022; BHG, 2018; Nakhlé & Raynaud, 2019; bisa.brussels, 2019; Openstreetmap, 2022, Urban atlas, 2018).



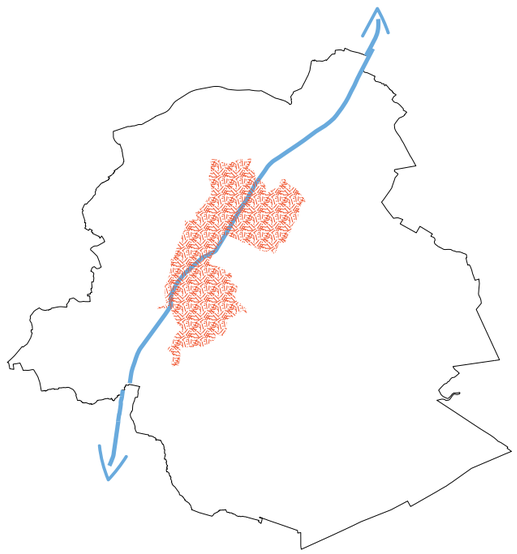
Lack of green



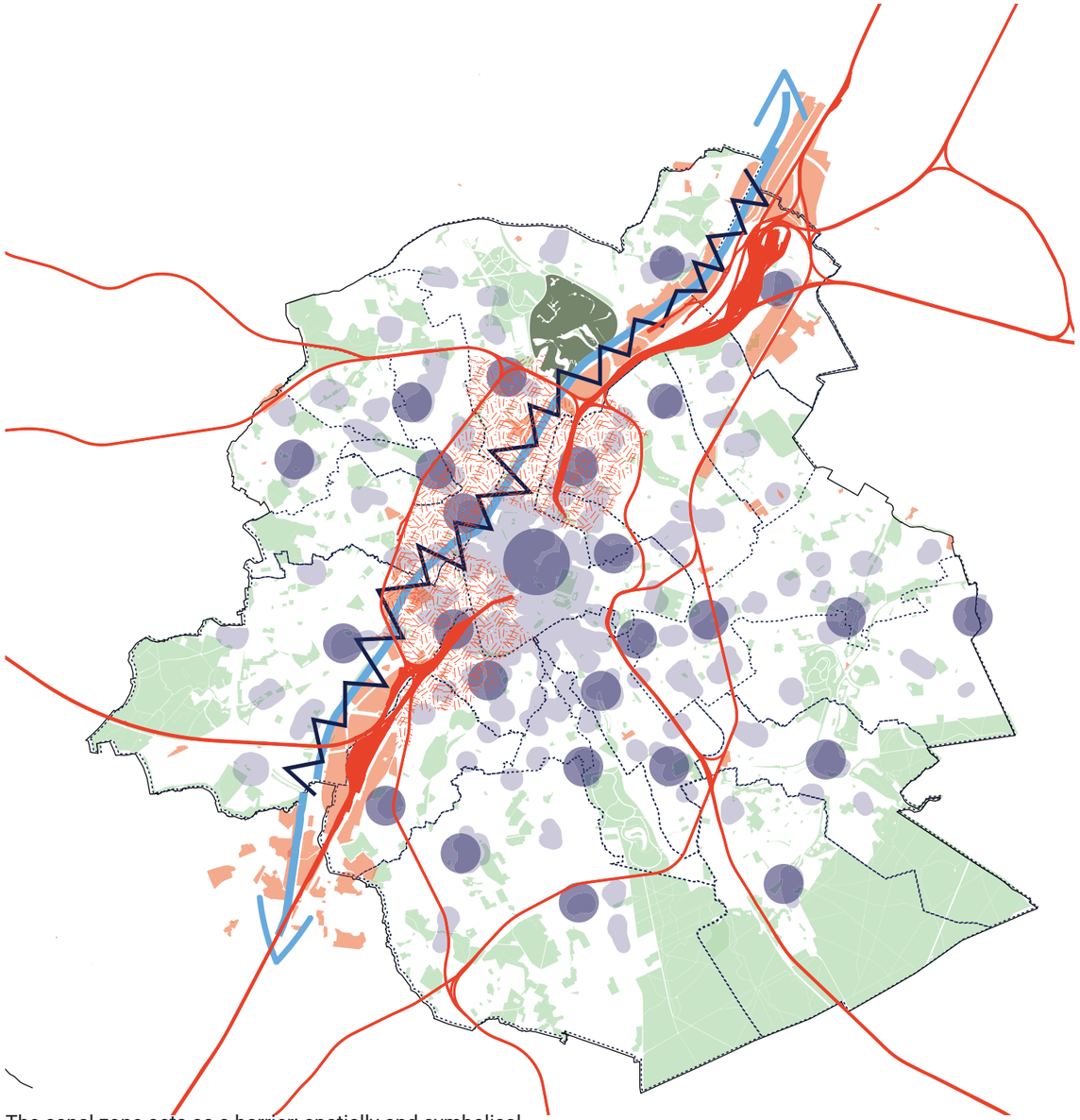
Different centrality



Infrastructure and industrial landuse, acting as barriers



Le croissant pauvre



The canal zone acts as a barrier: spatially and symbolical

Figure 91: conclusion drawings

05 FUTURE



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

5.1 VISION OF THE REGION

The Gewestelijk Ontwikkelingsplan (GewOP) is the main plan in the hierarchy of plans that outlines the development of the Gewest and spatial planning. According to Article 16 of the Brussels Act on Spatial Planning, the GewOP is the overarching planning tool for regional development in the context of sustainable development. The GewOP is indicative and not prescriptive, and subordinate plans or municipal plans must align with it.

In 2009, new challenges faced the Brussels Region such as population growth, education and employment, environment and sustainable development, internationalization, and a dualization within the city. The government decided to revise the GewOP in its entirety in 2009, and aimed for the city to continue developing considering the three pillars of sustainable development: social, economic, and environmental. A second "D" for "Duurzaam" (sustainable) was added to the name of the Gewestelijk Ontwikkelingsplan. The goal of this planning tool is to plan, promote and think about the sustainable development of the Region with horizons 2025 and 2040. This is achieved through projects that integrate in the context of strong population growth and social, economic and cultural diversity (perspective.brussels, n.d.-a).

The canal zone is an important structure within these plans. Firstly it aims to break the perceived barriere of the canal and establish a 'hyper city centre', to include a part of Molenbeek. It states the following vision: The canal and its neighbourhoods (Zennevallei) are serving as the backbone of the Region, rather than just a boundary between the city center and the working-class neighbourhoods. It is becoming a place where different population groups living on both sides of the canal come together and mix, and no longer serves as a barrier as it currently does. Other poles are also forming, which require well-thought-out planning: in the north, the redevelopment of the Noordwijk in connection with the station, the Vergotedok and Thurn & Taxis through the Masuiwijk; in the south, the axis Zuidstation-Slachthuizen via Kuregem. These existing dynamics should serve as levers for the economic redevelopment of the poor crescent of Brussels. However, they must be controlled and targeted to avoid gentrification. This requires a transversal vision and close cooperation between the various involved institutions (BHG, 2018).

Secondly it wishes to further develop the canal zone to increase the housing stock in the area, while preserving its economic functions. To do this the Region has drawn up a Canal Plan in which the development principles of this area are included, worked out by the architect-urban planner Alexandre Chemetoff. These principles aim to give coherence to the canal area as a whole and create connections between the many initiatives (BHG, 2018). These principles are:

- to keep economic activity in the city and strengthen its urban integration;
- to create housing that meets the needs associated with population growth for all household profiles;
- to create pleasant, unifying public spaces (in particular by promoting the Canal axis and its crossings);
- to create the conditions for an open city by promoting a mix of functions, a diverse

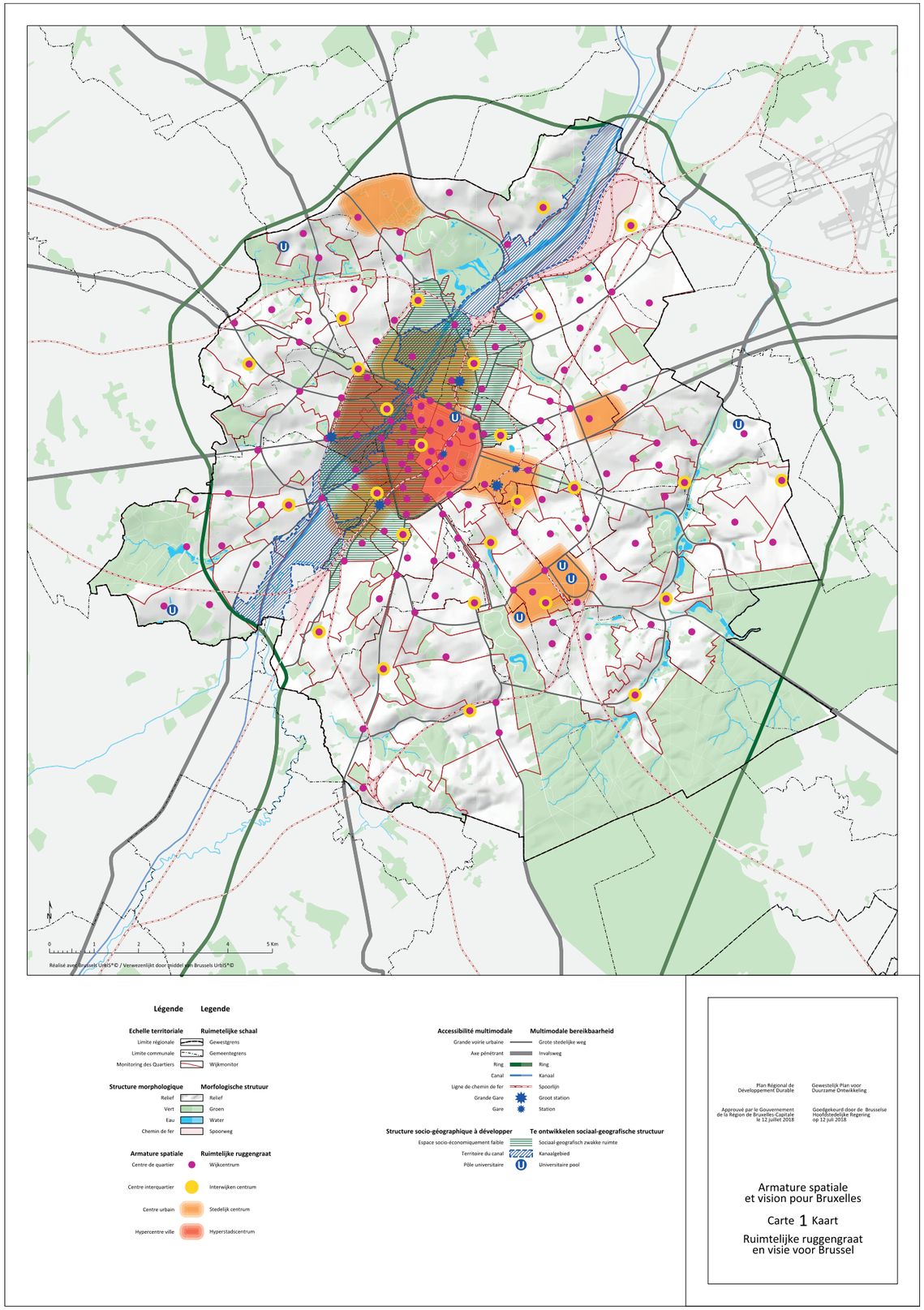


Figure 92: GDOP (BHG, 2019)

5.2 POLICIES

To guide the development of the canal and its functional mix several policies have been established. The most important being:

ZEUS
ZEUS, or the "Economic Expansion Zone in the City," is a designated area within the Brussels-Capital Region that aims to encourage businesses within its perimeter to hire employees. The ZEUS zone, defined in 2013, is based on statistical analysis of three socio-economic criteria, whose value is compared to the regional average. The Brussels-Capital Region offers three types of financial support to SMEs in ZEUS: support for general investments, assistance in hiring, and support for maintaining employment. To qualify for the subsidy, the employee must be at least six months resident in the Stimulated Urban Economic Zone (NKVK, n.d.).

ZEMU
Due to the expected demographic growth in Brussels and the corresponding housing crisis, it was decided to also provide housing in urban industrial areas. The chosen areas are now called 'enterprise zones in an urban environment' (ZEMU). In those areas, both housing and businesses can coexist (hub.brussels, 2017).

ZRU
The Urban Renovation Zone (ZRU) brings together neighbourhoods that are struggling. The Brussels-Capital Region is increasing its investments in this zone to improve the quality of life and socio-economic participation of residents. The Region wants to give the local economy a new boost. In the ZRU, multiple regional tools are applied: Sustainable neighbourhood contracts, Urban renewal contracts, Grants for renovation and beautification of facades (perspective.brussels, n.d.-b).

CDQD
A Sustainable Neighborhood Contract is implemented over a specific and short period of time. It is the result of a partnership between various individuals and multiple consultation rounds with residents. They are a series of actions in five different domains: housing, community facilities, public space, social-economic actions and providing space for commercial or productive enterprises (urban. brussels, n.d.-b)

CRU
The Urban Renewal Contracts (CRU) are programs for improving cities based on past successful projects, particularly the Sustainable Neighbourhood Contracts (CDQD). While CDQDs focus on individual neighbourhoods on the initiative of a municipality, the CRUs focus on the urban fabric and primarily aim to cross municipal borders, which were often ignored. These programs can include real estate developments, such as social housing and public spaces, as well as socio-economic and environmental improvements (urban.brussels, n.d.-a).

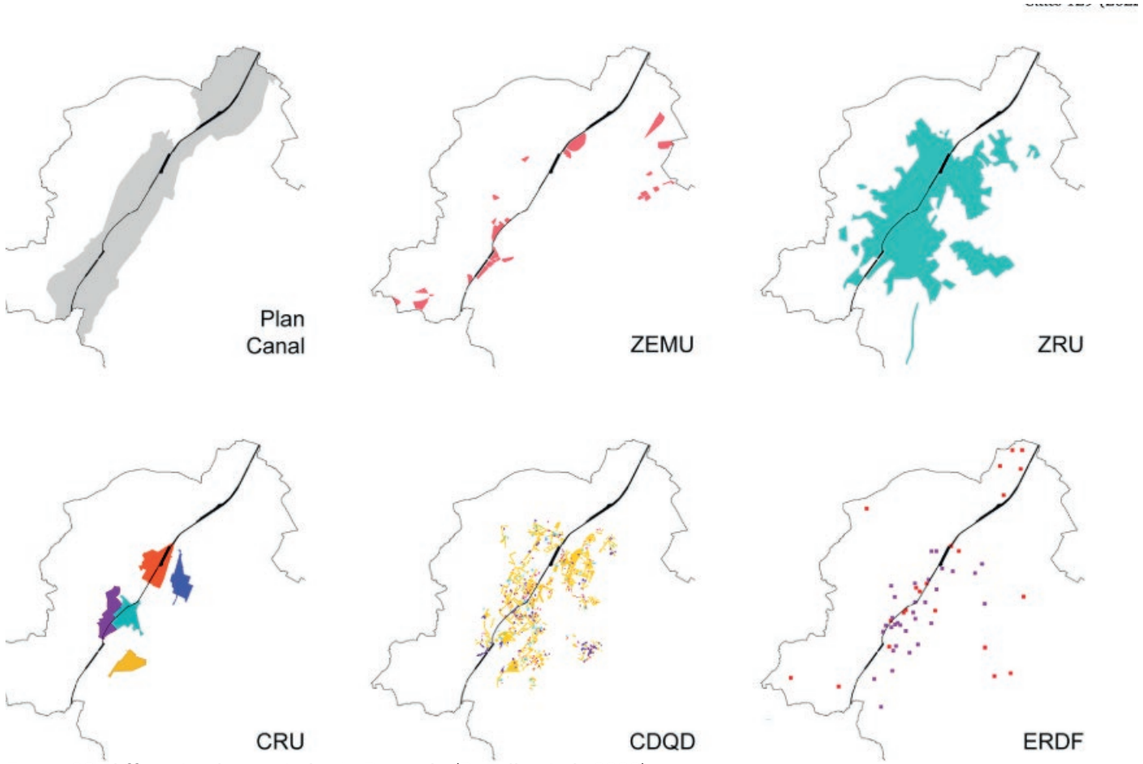


Figure 93: different policies at play in Brussels (Bonello et al., 2022)

5.3 EFFECTS

Although on paper all intentions seem great, some criticism has been made. There is a significant amount of real estate speculation in Brussels facilitated by legislation and spatial planning. The PRAS (Regional Land Use Plan) gives too much power to developers and not enough to the public sector. Some regional development programs may appear to support manufacturing but actually work against it, such as the ZEMU zoning, which puts the burden on private developers to integrate productive spaces into their residential projects.

The neighbourhood contracts also invest in renovating inner-city neighbourhoods, which can lead to increased land value and displacement of manufacturing tenants. Urban masterplans also tend to focus on public space and housing rather than supporting business networks. The Region's sustainable development plan, the PRDD, also primarily focuses on the tertiary sector instead of urban production (Hill & Warden, 2018).

ZEMU areas are being implemented as a solution to make more efficient use of land, but in practice, they may be problematic for the future of industrial space as there are no delivered test cases or precedents to learn from, and the developers primarily interested in these projects are those focused on housing and commercial real estate with no experience in industrial sites.(A. V. Hill & Warden, 2018).

Also these policies, by focusing on innovative and environmentally friendly activities, may fail to acknowledge that local and inclusive urban manufacturing still play a role in enhancing social inclusion and increasing resilience of urban economies (Bonello, Faraone, Leoncini, Nicoletto, & Pedrini, 2022).

Another study found that re-zoning of land-use plans from monofunctional production areas to mixed-use areas by public authorities contribute to the decline of affordable production spaces in cities. The risks of this re-zoning strategy are that financial reasons and reasons related to the compatibility of uses might prioritize immaterial production and retail over material production. Additionally, the rigid building prescriptions of vertical mix can increase conflicts between housing and production uses. The study suggests that monofunctional areas remain the best strategy to preserve affordable production spaces in cities(de Broeck & Ryckewaert, 2020).

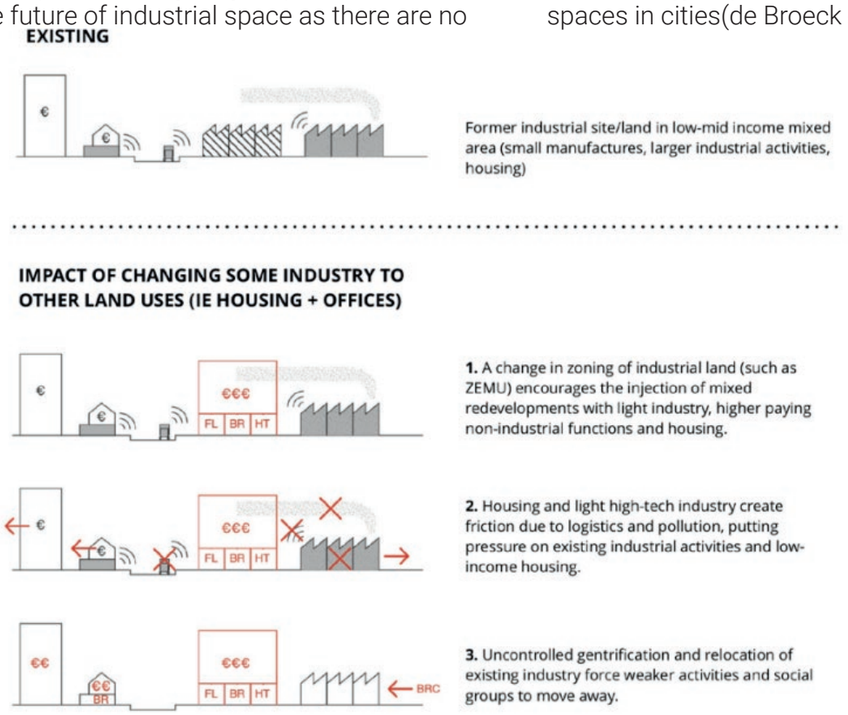


Figure 94: how industrial gentrification happens (Hill & Warden, 2018)

These pictures give a first impression into the kind of newly built projects in the Canal zone. They seem to have a very distinctive architectural style which is very different from the rest of the canal zone. Also they seem quite monofunctional and make use of fencing to seperate the common courtyards from others.







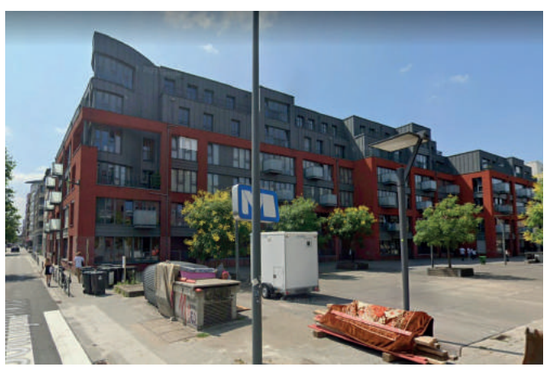


Figure 95-102: New projects in the Canal zone (All images derived from Google maps)

5.4 CONCLUSION

By analysing the current plans and policies for the Canal area, we can get a glimpse into the future. The area has been the topic of hot debate over the years and already several projects have been initiated. The main goal of the region is to involve the canal into the city centre, establishing a 'hyper centre' which will make the area a new central axis for the region. This view makes sense from the perspective of the region. The reality of Brussels however, is that it consists of many municipalities, which ultimately hold most of the power in urban development. Because of this friction, much room has been left for developers. This has made the operationalisation of the Canal plan very speculative.

Many policies have been implemented to guide urban renewal and the mixing of industry with other functions. While yielding some positive results, it has also shown signs of (industrial) gentrification, mainly when it comes to industrial functions.

Some of the results of the plans that have been built, mainly the taxis and tour area have mainly confirmed these concerns. The area has not been developed with the local community in mind, but instead competitive status of Brussels. No social housing will be built, but instead there is room for a luxury shopping mall.

If these developments are not adjusted it is very likely that the area will be gentrified and Brussels will follow the footsteps of many other cities with similar projects. This will endanger the local communities and economy. This is not only detrimental to these local neighbourhoods but also to Brussels as a whole. If the areas are not planned well, this might worsen segregation and social issues, as well as put more pressure on amenities and the urban fabric. Furthermore the projects so far seem to be fairly monofunctional and detached from the surrounding urban fabric, some even closing themselves of with gates.

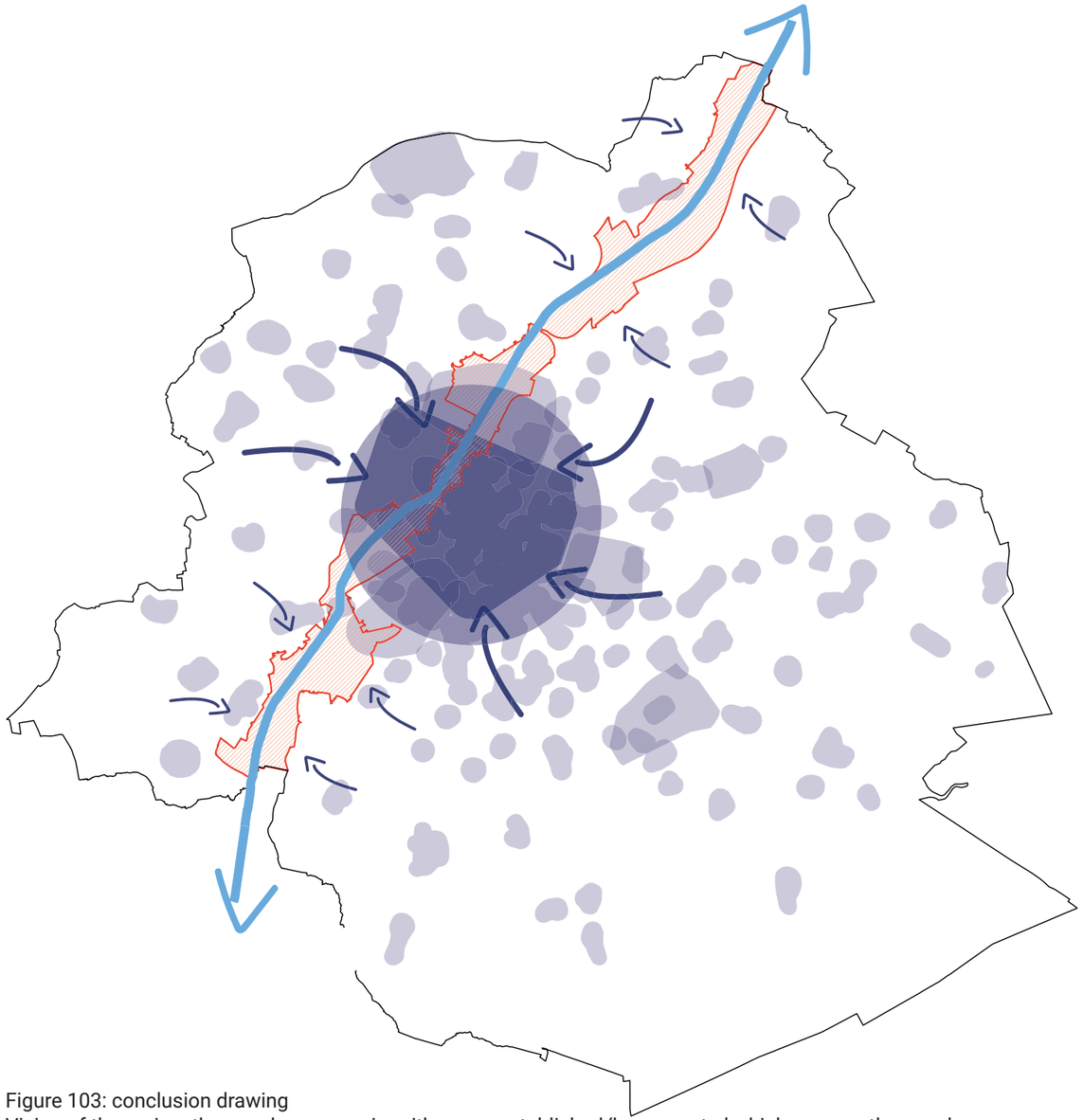


Figure 103: conclusion drawing
Vision of the region: the canal as new axis, with a new established 'hyper centre' which crosses the canal

06 SYNTHESIS



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

6.1 BRUSSELS CAPITAL REGION

Strengths

Local representation
Due to Brussels municipality structure, different social groups are fairly well presented and there is a close proximity between citizens and there governance.

Strong service economy
Brussels role as a the de facto capital of the EU has established a strong service related economy.

Well-connected nationally and internationally
Brussels has a central location in western Europe, and is well connected by plane, road and train.

Diverse population
Brussels population is extremely diverse, with 62 percent of its population has been born in another country, making the city a very distinctive and interesting place.

Weaknesses

Bureaucratic
Brussels governance fragmentation makes processes complex and bureaucratic.

Congestion
Brussels is one of the most car congested cities in Europe. This is mainly caused by a relatively car dependent and suburbanised culture, with many people working in the city while living around it.

Relatively poor population
While Brussels has a strong economy, a big part of population does not benefit from this and is relatively impoverished, with high levels of unemployment.

Opportunities

Participation
The close proximity between citizens and governance could be an opportunity for increased participation.

Public transport
The improvement of public transport routes could help with the Brussels congestion issues

Heterogenity
Due to the different municipalities and diverse population the city is characterised by heterogeneity. This could be an opportunity for each area to focus on their strengths and establish a vibrant social life and economy.

Risks

Lack of coordination between municipalities and the region
The region and different municipalities have different interests and sometimes the roles are not very clear, this can lead to unclear visions and haphazard development.

Prolonging of neoliberal planning
Neoliberal ideas evident in politics and planning in recent decades seem to aggravate segregation and social exclusion. The power dynamics have shifted more towards private parties, and many of these shifts are seemingly irreversible. If those parties are unwilling to collaborate or make efforts for the public good, it will be very tough for the municipalities to counter current spirals of decline in.

State-led gentrification
The state could also incentivise gentrification, which has happened in many other European cities. This could excelerate the gentrification process.



Figure 104: SWOT-analysis of Brussels Capital Region (made by author)

6.2 CANAL ZONE: CENTRE

Strengths

Diverse and specific local economy
Due to the diverse population the economy is also very diverse and specific to each neighbourhood.
Industries integrated in urban fabric
There are already many industrial spaces interwoven in the urban fabric.
Old urban fabric and architecture
The area is characterised by 19th century industrial architecture, giving it a sense of identity
Central location
The location is very close to the city centre and well connected by public transport
Strong community life
There are many different communities within the area, which are supported by organisations and associations.

Weaknesses

Lack of economic opportunities for local population
The local population has been somewhat excluded from participating in much of the economic sector of Brussels, leaving a relatively large portion unemployed
Lack of green
There are almost no larger green space within the area, and also streets are mainly paved.
Poor quality of housing
Many of the houses are overcrowded or in poor condition.
Car oriented public space
The quality of the public space is poor and is mainly used for the parking of cars. Cycling routes are also lacking.
Vulnerable population
The population is both socially and economically vulnerable, with around 35 percent at risk of poverty.
Segregated by infrastructure
Train tracks create barriers to other neighbourhoods, thus segregating both spatially and socially.

Opportunities

Vacant and underused sites
Many sites are vacant or underused, leaving room for possible development in this already dense area.
Waterfront
The waterfront at the moment is mainly a traffic corridor, but has potential for an ecological corridor and/or recreational functions.
Young and diverse population
The population is relatively young and very diverse. This gives lots of opportunities for education and upward mobility.

Risks

(industrial) gentrification
If this area is not developed carefully. There is a risk of gentrification. This mainly due to its architectural qualities and central location.
Poorly planned developments
If there is not coherent vision for the area, the developments might occur hapahazardly and poorly planned. Which could potentially accelerate gentrification, but also on the other hand leave the area with poorly designed projects.
Further impoverishment and exclusion
If nothing is done there is also a risk of further impoverishment. The area has serious social problems, which need to be dealt with.



Figure 105: SWOT-analysis of Canal zone: centre (made by author)

6.3 CANAL ZONE: NORTH AND SOUTH

Strengths

Industrial economy
Industrial economy is essential in the economy of a city and provides diverse jobs.
Green spaces
Between many industrial areas, there are large green spaces
Industrial heritage
Although less than in the central part, glimpses of industrial heritage are still prevalent in the area.

Weaknesses

Car dependent
The area is hard to reach by public transport and also does not seem to support other transportation than cars
Monofunctional
The areas are fairly monofunctional, with either only commercial or industrial functions.
Large inaccessible land claims
Large parts of the land are claimed by infrastructure, such as the port or the railway service. Also a large space is claimed by the royal family. These spaces create barriers between this area and other areas.
Nuisance and pollution
The heavy industry produces dust, noise and air pollution. Also much of the ground is polluted

Opportunities

Open space
There is much open space that have room for new developments. At the moment the land is relatively inefficiently used. There is an opportunity for densification and the integration of smaller business and other functions.
Waterfront
The waterfront at the moment is mainly a traffic corridor, but has potential for an ecological corridor and/or recreational functions.
Better connections
Improving public transport as well as the connections with surrounding areas could make the area more accessible, also by other modes of transport than the car. Furthermore in terms of goods water and railway connections could be re-established and intensified, relieving some of congestion that Brussels is known for.
Densification
At the moment the land is relatively inefficiently used. There is an opportunity for the integration of smaller business and other functions.
Providing economic opportunities for population
Intensifying the local economy and connecting these areas, could provide needed economic opportunities.

Risks

Industrial gentrification
Mixed-use development that is not done carefully can result in the displacement of industry.
Further congestion and car dependence
If these areas would be densified without establishing better connections, this could result in increased car use and congestion.
Further pollution and unsustainable business practice
If more industry is added in this area it could increase pollution and decrease liveability of the area.
Vacant business parks
Monofunctional business parks have decreased in popularity and use, leaving many empty. The area should therefore have a diverse set of functions and again, needs to be well connected, not just by car.



Figure 106: SWOT-analysis of Canal zone: north and south (made by author)

6.4 EXTRACTING VALUES

Based on this synthesis values can be extracted, which the vision will be built upon. These values are informed on the literature on the just and productive city and on place-based development. The Harvard graduate school on design developed a just city index, with several value indicators(Griffin, 2018). I have picked values most applicable to the case of Brussel canal zone, based on the synthesis. I picked two values in three categories: spatial, socio-economic and governance. One that is already well represented in the area, based on the strengths, and could be further elevated. And one that is not yet well adjusted in the area, but where there is an opportunity.

Economic

Need for elevation:
Diversity
Definition in the just city index: An intentional state of mixed people, institutions, and cultural norms
I would add to this definition the need for a mix of functions.The canal zone of Brussels is fairly diverse socially and economical. The central part supports both residential, commercial as well as industrial functions and is culturally very diverse. This diversity could be further improved and elevated. This mix of functions should be further supported and could maybe even be increased. At the moment, the northern and southern part are still quite monofunctional and could be diversified. While industrial spaces are more and more puched outside of the city centre.

Need for implementation:
Connectivity
Definition in the just city index: The physical and social networks that tie places and people together, providing contact and opportunity necessary for social wellbeing.
At the moment Brussels is very congested city and quite car oriented. This situation need to be improved if the economy is intensified. Also walkability and public transport network needs improvement, this could increase the well being of local residents and could connect them to more jobs and services.

End goal:
Prosperity
Definition in the just city index: The condition of being successful or thriving in terms of social, economic, civic, cultural, and health indicators

Social

Need for elevation:
Community
Definition in the just city index: A group of individuals or collective groups having shared or common interests
There is a strong sence of different types of communities in Brussels. People of similar (immigrant) backgrounds have moved to the same neighbourhoods and organise themselves in associations, organisations and religious institutions. However these communities are the most vulnerable and often lack representation and financial mean, making them very vulnerable to gentrification.

Need for implementation:
Inclusion
Definition in the just city index: The acceptance of difference and the intention to involve diverse opinions, attitudes, and behaviours.
I would broaden this definition of the just city index and say that there should not only be involvement of diverse opinions, attitudes and behaviours, but also involvement of diverse people, from different cultural, educational and economic backgrounds. This is a value that is not yet very well presented in the area. At the moment a large part of the population seems to be excluded socially and economically. While the area is diverse, if a large portion is excluded, this diversity is lost. Providing these people with opportunities will increase the economic and social vitality of the area, to eventually reach the following value:

End goal:
Empowerment
To give formal authority or power to a person or collective group by promoting action or influence.

Spatial

Need for elevation:
Authenticity
Definition in the just city index: The recognition of physical and social characteristics that are genuine to a particular place or culture and promote this recognition within communities
The canal area is full of physical traces of the past.This give this place a certain identity and character, mainly shaped by its industrial past. This value should be highlighted, because at the moment lots of buildings are not well maintained and fall in decay. Also the quality of space is relatively poor and features like the waterfront are not utilised.

Need for implementation:
Liveability
Veenhoven (2000) defines livability as the quality of life, welfare, 'level of living,' or habitability of the environment. This value is not in the just city index, but I think, in the case of the canal zone, this is essential. At the moment the spatial quality of the area is poor, car-oriented and green space is lacking, while the area suffers from ground, noise and air pollution. Therefore liveability needs to be improved. This can however be linked to some of just city index' values:
Beauty: Everyone's right to well-made, well-designed environments
Healthiness: A state of complete physical, mental and social well-being that supports the absence of disease or infirmity
Ultimately improving this will contribute to the following value:

End goal:
Belonging
Definition in the just city index:
To feel accepted and comfortable in a setting despite age, gender, race, sexuality, or income
I would add to this value the definition that the just city index gives to pride: A respect and admiration arising from feeling good and confi dent about some act, space, place, or relationship. These two values are very connected.

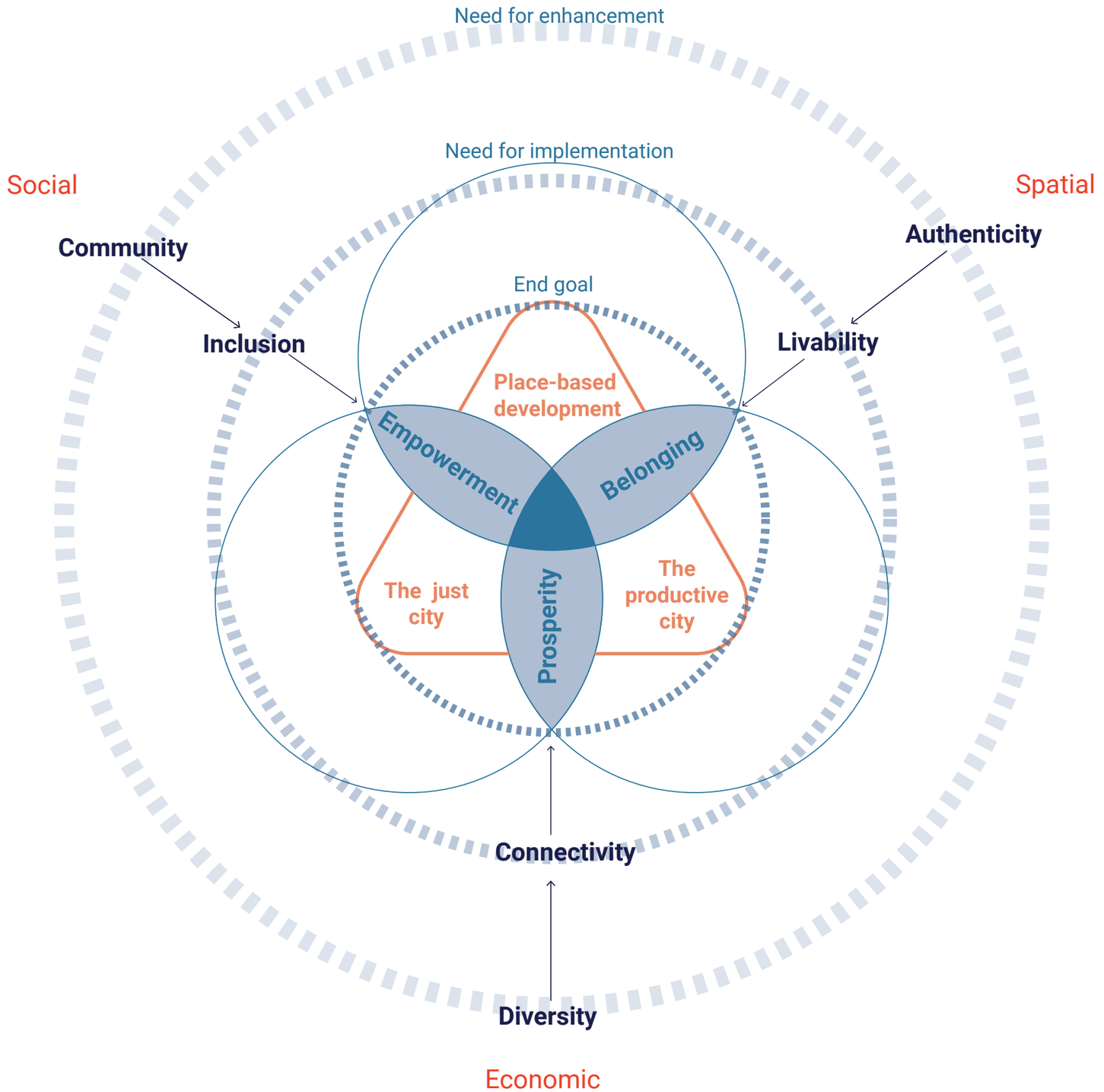
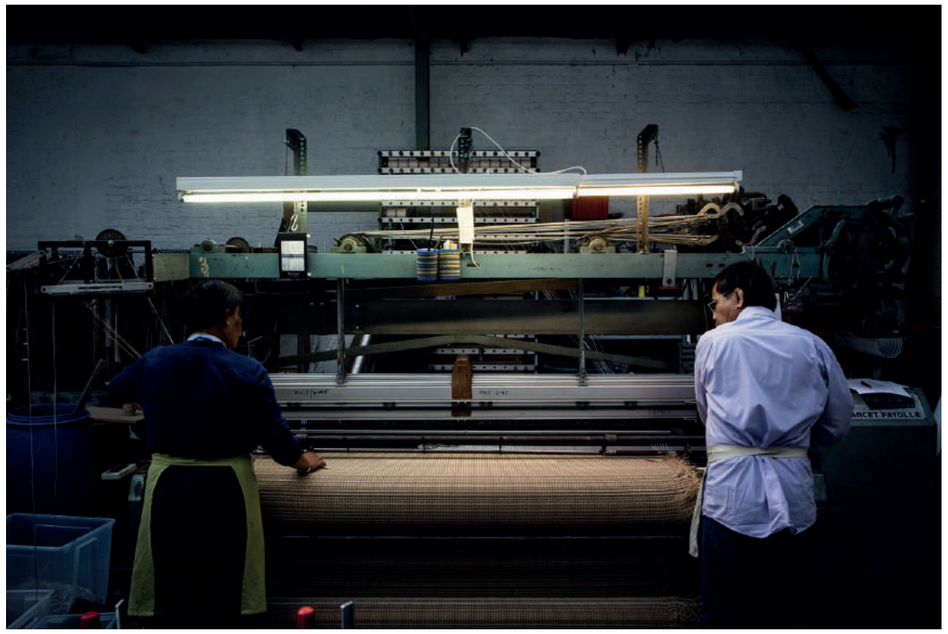


Figure 106: Extracting values (made by author)

07 VISION



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

7.1 CONSTRUCTING THE VISION

After establishing the most important values, a vision statement can be formulated. A vision in the context of urban planning refers to a future-oriented statement or idea of what a city or urban area should be like in the future. When constructing this vision I tried to connect the outcome of the analysis with the aim of the project as well as the values that were extracted.

Connecting the analysis with the goals that were formulated in the beginning of this project, industrial urban integration could be the missing piece that connects all aims of this project. According to Cities of Making (2018) urban manufacturing centres fulfils four key needs in cities. Firstly, urban manufacturing helps sustain a thriving economy by creating local employment opportunities, developing export products, and serving as a foundation for service-based industries. By keeping manufacturing within the city, it contributes to the economic vitality of the local community (Hill & Warden, 2018).

Secondly, urban manufacturing stimulates innovation by leveraging technical skills and ideas. The proximity of manufacturing facilities to research institutions, universities, and other industries facilitates collaboration and innovation (Hill & Warden, 2018).

Thirdly, urban manufacturing plays a crucial role in addressing climate change and environmental impacts. It enables the adoption of more efficient technologies, facilitates the repair and improvement of existing technology, and supports the transformation of local waste into new products through recycling and upcycling processes (Hill & Warden, 2018).

Finally, manufacturing fosters economic and social inclusion by providing job opportunities with low barriers to entry. It offers a diverse range of work conditions, from skilled labour to entry-level positions, and provides accessible pathways for entrepreneurship and economic mobility. By promoting inclusive hiring practices and offering training and skill development programs, urban manufacturing can contribute to the social and economic well-being of the local community (Hill & Warden, 2018).

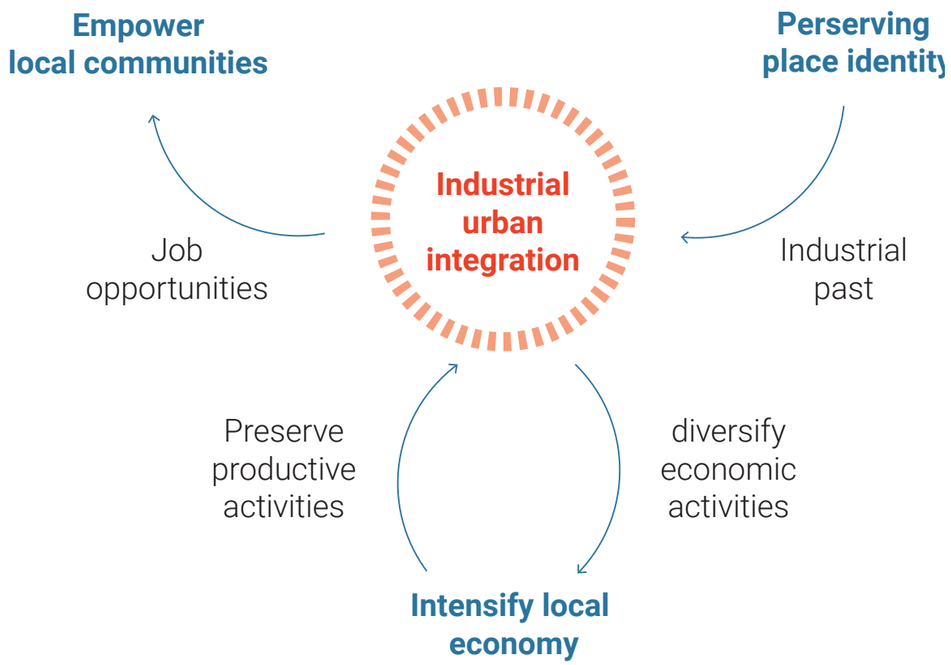
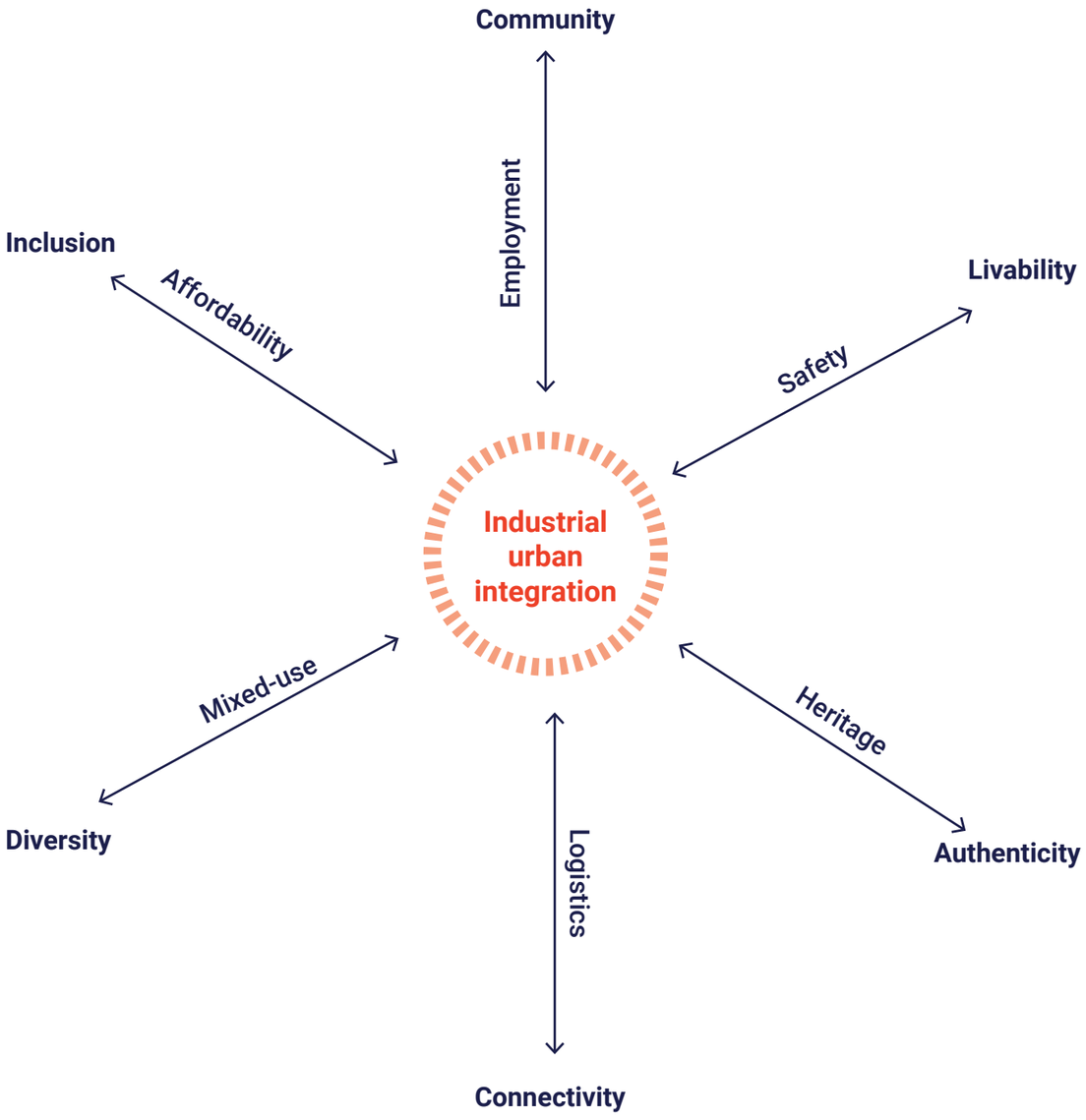


Figure 107: Industrial Urban Integration (made by author)

In this thesis I focus on a broader definition of industry: productive activities and also related sectors, such as construction and logistics. Industrial urban integration could preserve spatial identity, by elevating the Brussels industrial past and repurposing heritage. It could provide employment as well as economic mobility to the local community. It could renew and diversify the local economy, preserving both existing activities as well as finding new collaboration, innovation towards a more sustainable future.

Connecting this missing piece to the values established in last chapter It becomes clear that the it connects well to the values that need enhancement, such as diversity, community and authenticity, as seen on the next page.These connections are similar to the connections to the goal. relating to the industrial past and heritage, providing opportunities for the local community, as well as diversifying the local economy in a mixed use environment.
Connecting industrial urban integration to the values that need implementation, it becomes clear that for a succesfull development these values should be kept in check. There is a real concern of Safety and nuisance in connection to liveability. Furthermore logistics of industry should be well thought out. As well as the inclusion of the local community in these developments. Affordability of both housing as well as spaces for businesses should be kept in check.
These values also establish synergies with one another and are interconnected. For example community is connected to both liveability as well as diversity with need for access to amenities. It is also connected authenticity, because there is a need for an identity in this area.



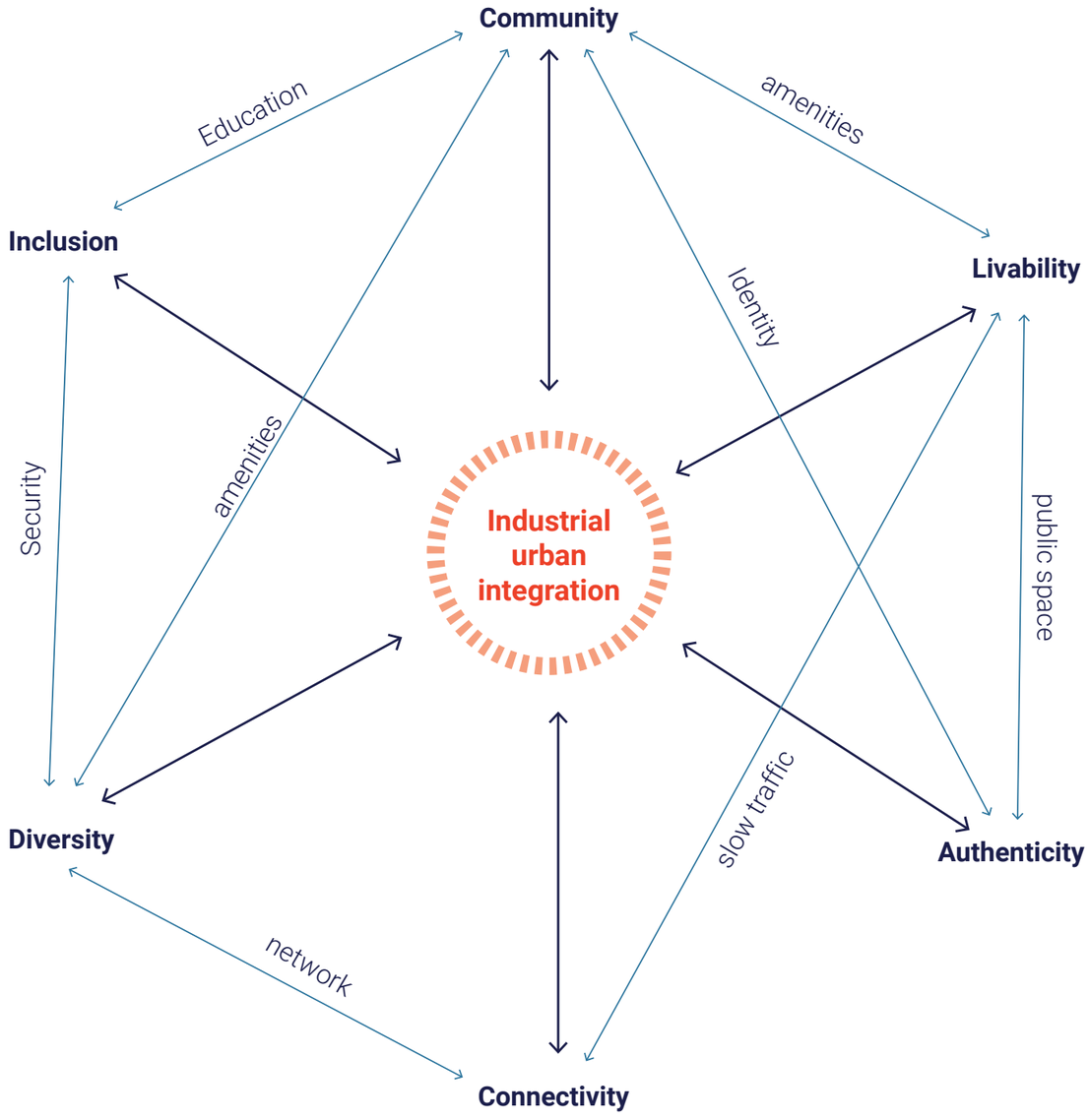


Figure 108 & 109: Connection with values (made by author)

7.2 VISION STATEMENT

Now that it is established how industrial urban integration is connected to the extracted values a vision statement can be formulated:

By 2050, the canal area of Brussels will once again become an integrated part of the social and economic fabric of the city, leveraging its historical significance and spatial identity to shape a new vision rooted in industrial urban integration. This transformation will establish the canal and its infrastructure as a crucial foundation for a diverse and collaborative economic ecosystem, empowering the local community through the creation of employment, educational, and entrepreneurial opportunities.

To reinforce community and foster a sense of belonging and collective identity, the transformation of the canal area will strengthen centralities as focal points for social interaction. Inclusivity will be prioritized throughout the process, ensuring the availability of affordable housing and workspaces that provide long-term security. Educational opportunities will be connected to the economic ecosystem, allowing individuals to develop themselves and contribute to innovation and collaboration.

The revitalization of the canal area will be characterized by diversity, achieved through mixed-use development that integrates industrial, residential, commercial, and cultural functions. This inclusive approach will enable businesses of all types and sizes to thrive, nurturing a diverse and vibrant economy. Diverse amenities will cater to the varied needs and desires of the community.

Preserving authenticity will be central to the vision for the canal area. Priority will be given to small-scale transformations and the renovation of existing structures, especially those with significant architectural value. The industrial heritage of the area will be harnessed, repurposing vacant spaces to create a harmonious blend of old and new that respects the area's identity.

Connectivity will serve as a cornerstone of the canal area's revival, repurposing existing infrastructure into an efficient network that facilitates logistics. Well-planned and walkable paths and streets will encourage active mobility and foster human interaction. Public transportation will be enhanced, ensuring efficiency and accessibility.

At the core of this transformative vision is the concept of liveability, as the canal area will be designed with walkable networks that foster a strong sense of community and connection. High-quality public spaces will be created, offering opportunities for recreationand interaction. Safety and limited disturbance will be prioritized to ensure a secure and peaceful environment.

The integration of green spaces will promote sustainability and enhance the overall well-being of the community.

In summary, by 2050, the canal area will be seamlessly integrated into Brussels' social and economic fabric through industrial urban integration. This transformative vision embraces the area's historical significance and spatial identity, establishing a diverse and collaborative economic ecosystem supported by improved connectivity, enhanced liveability, and a strong emphasis on social inclusion. By repurposing the canal infrastructure and celebrating authenticity, the canal area will be reinvented as an economic backbone, empowering the local community while preserving its unique character



Figure 110: Vision [illegible]

7.2 POINTS OF CONFLICT

While implementing this vision there are several conflicts that could arise. All of the goals are somewhat interlinked and support one another, but when implemented them spatially not all of them will be easily compatible. How can liveability be ensured, while increasing connectivity and intensifying economy? How can the economy be intensified and the area be densified while benefitting the local community? How can identity be preserved while densifying? These conflicting goals could be simplified to the following two groups: community, liveability and authenticity vs industrial urban integration, connectivity and diversity. Between these two groups there needs to a delicate balance to mitigate between the different goals and conflicts.

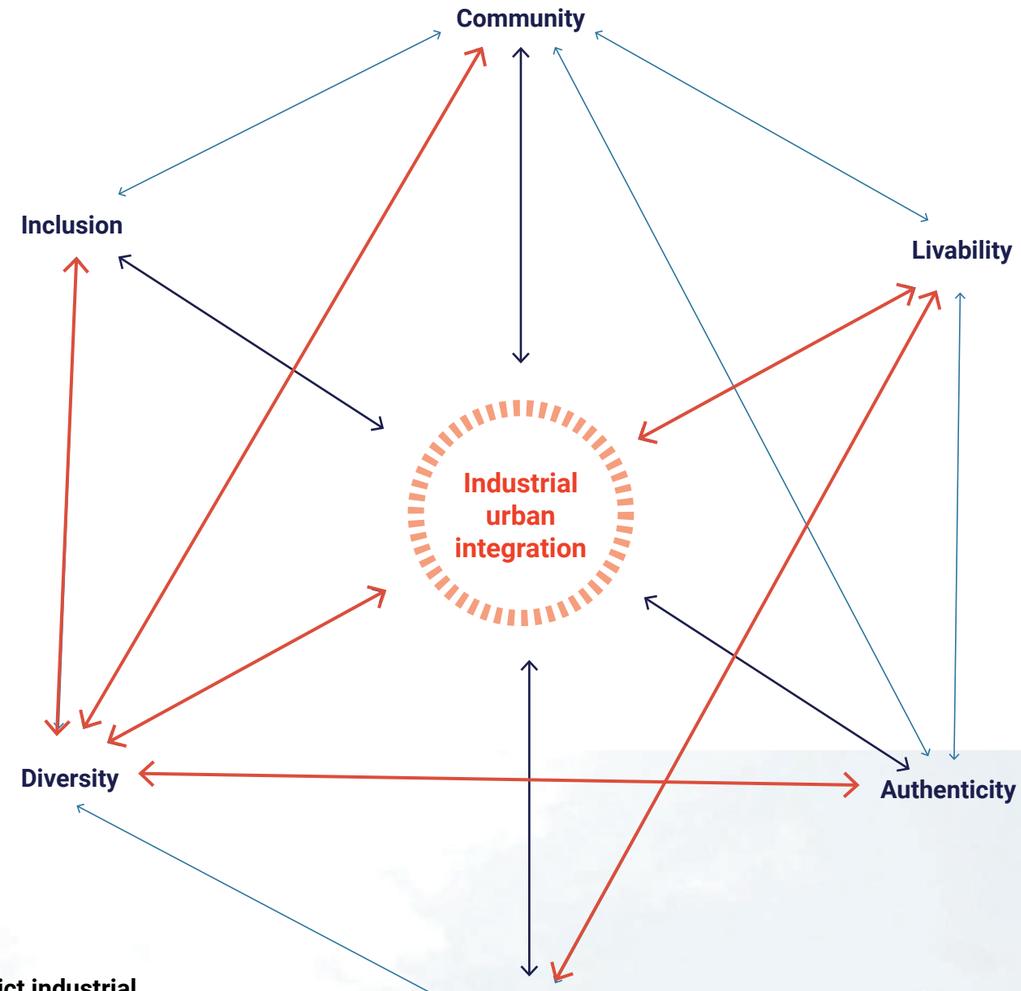
- Conflict between preserving spatial identity and diversifying: As the area is densified and diversified, there is a risk of losing the area's historical and cultural identity, which is an important part of the community's identity. It could create an influx of new people, that might not integrate in the area and put it at risk for gentrification.

- Conflict between diversifying functions and community/inclusion: Economic development and diversification can bring jobs and growth, but it can also lead to gentrification and displacement of the existing community. This could lead to tensions between those who want to attract outside investment and those who want to ensure that the benefits of development are shared equitably with the existing community.

- Conflict between industrial urban integration and liveability: The canal area has a significant industrial presence, which can bring jobs and economic opportunities, but it can also create nuisances such as air pollution and noise.

- Conflict between increasing connectivity and liveability: An intensified economy needs improved connectivity, which can also lead to increased traffic and noise pollution, which can negatively impact the quality of life for residents.

Figure 110 &111: Conflicting values (made by author)





08 EXPLORATION



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

8.1 APPROACH

To further explore how this vision could be implemented and to further investigate the spatiality of these conflicts I will zoom in on case study area. While I have already done spatial analysis, this analysis will be more zoomed in on a specific area and will be concretely targeted to find opportunities and urgencies that correlate with the vision and values

For this area I chose the southern part of the canal area, spanning from the lock of Molenbeek to the lock of Anderlecht. I chose this area because of the large presence of industrial heritage, the presence of different types of neighbourhoods with different characteristics, as well as the large presence of industry interwoven in the urban fabric. At its heart lies the market of Abattoir, a historic market and slaughterhouse complex that has been a fixture of the area for over a century. This site has played a key role in the economic and social life of the community, and is an important part of the area's cultural heritage. Furthermore there is a harbour area and a large ZEMU development area, which is being targeted for redevelopment and intensification in the coming years. This mix of functions and neighbourhoods, makes this place a good case study to further explore.

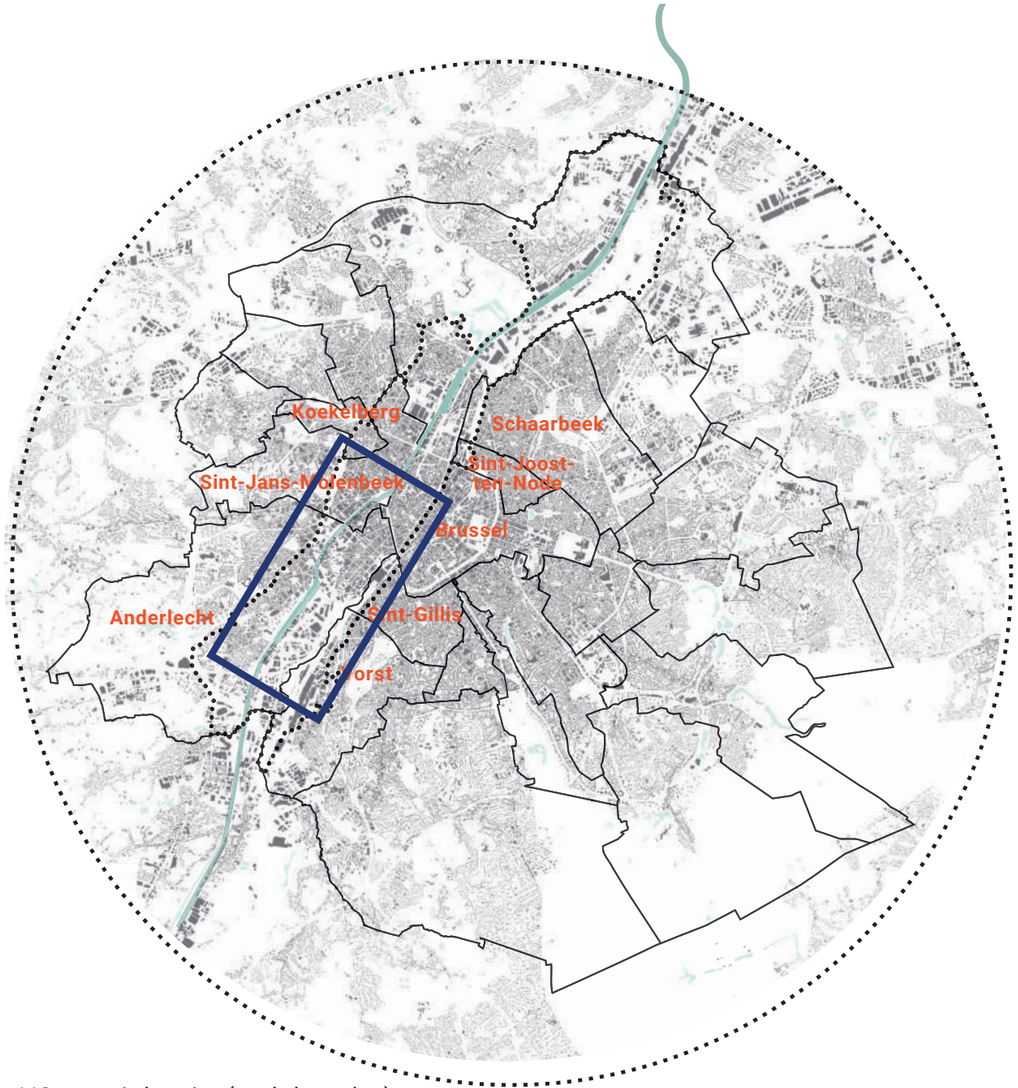


Figure 112: zoom in location (made by author)

To investigate this area further I will do a layered spatial analysis, existing of the following layers: function, built form, public space and relations.

- Functions: In this layer I will pinpoint the different functions present in the area. I will conclude by characterising different areas.

- Built form: In this layer different mixed use typologies will be characterised as well as empty or messy lots that might have an opportunity to develop.

- Public space: In this layer the green and public space structure will be analysed. It will be established if there are areas to increase green and/or update public space.

- Relations: In this layer I will look at relations between these functions, their accessibility and the relation to the network.

Each layer will be concluded with an urgencies and opportunities map. After the this layered analysis the layers will be compared with one another to see if there are overlapping urgencies and/or opportunities and what are the spaces of possibility. Than a layered analysis of smaller scale follows, divided in the different typologies.

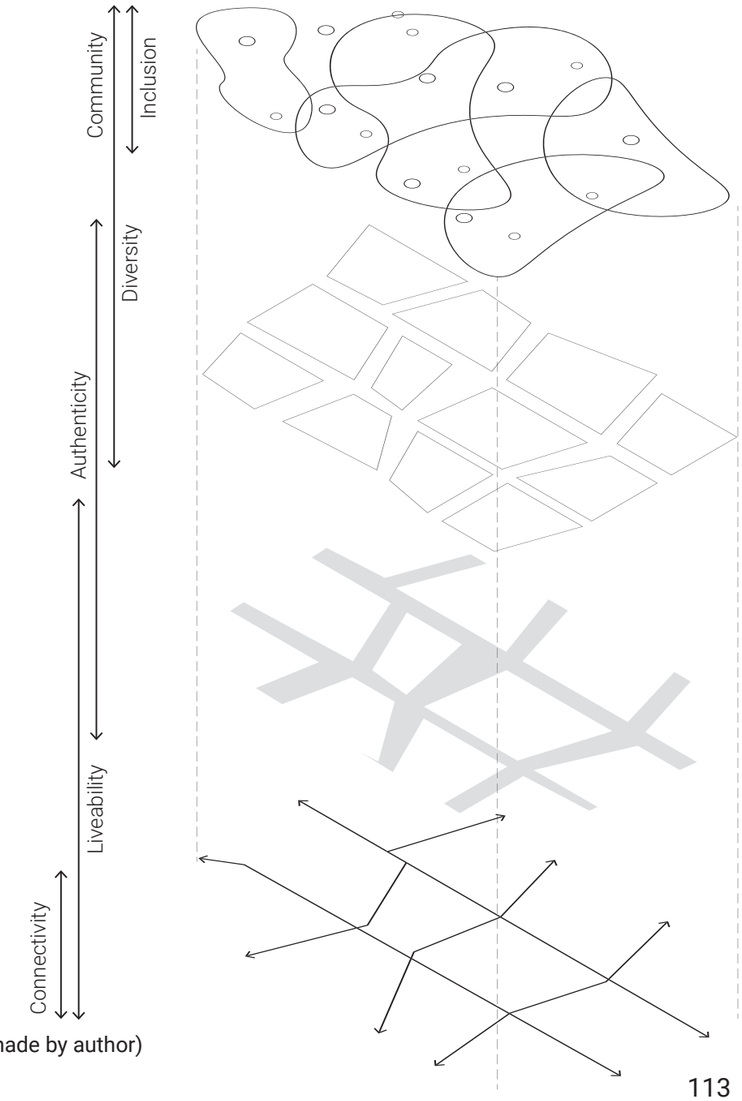
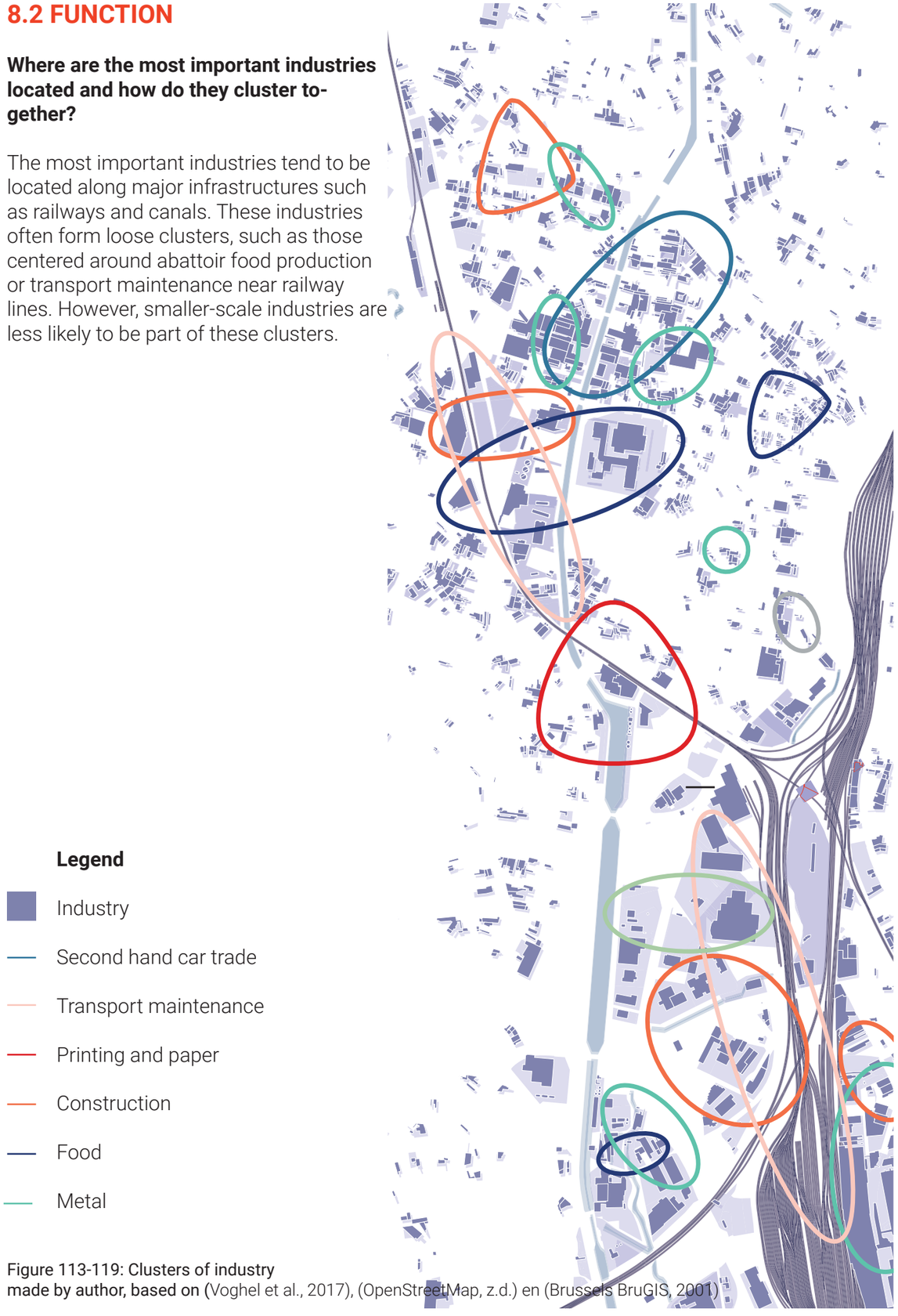


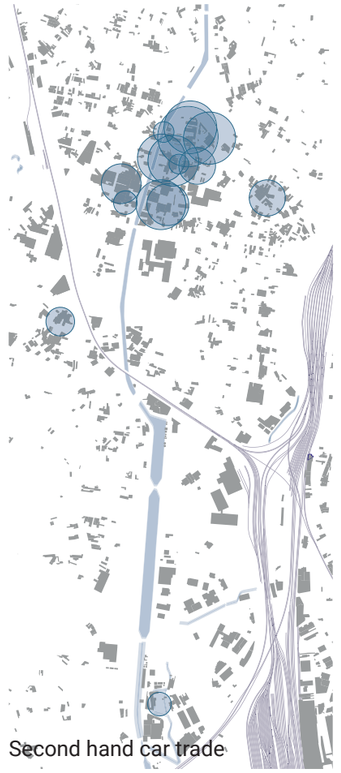
Figure 113: layers connecting to values (made by author)

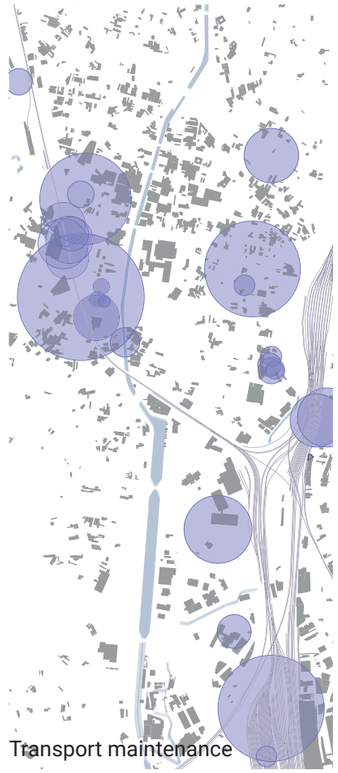
8.2 FUNCTION

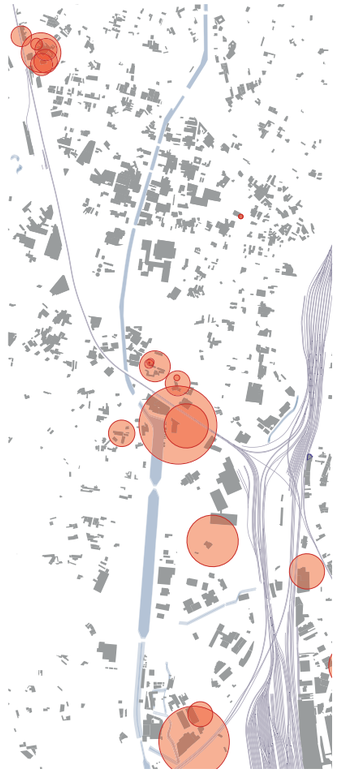
Where are the most important industries located and how do they cluster together?

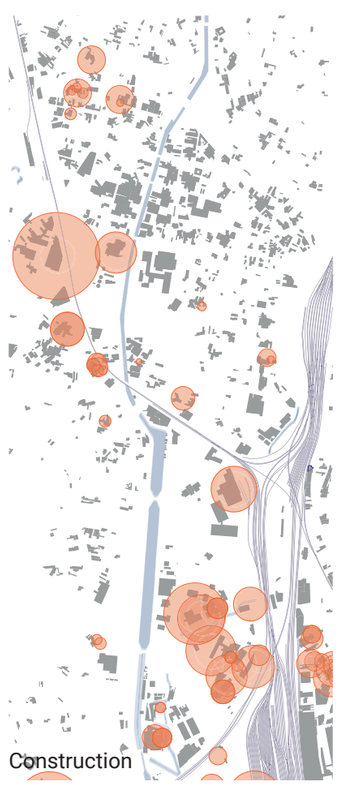
The most important industries tend to be located along major infrastructures such as railways and canals. These industries often form loose clusters, such as those centered around abattoir food production or transport maintenance near railway lines. However, smaller-scale industries are less likely to be part of these clusters.

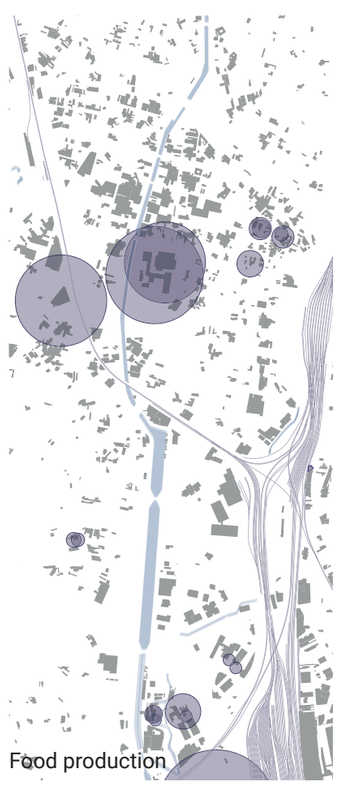



Second hand car trade


Transport maintenance




Construction


Food production

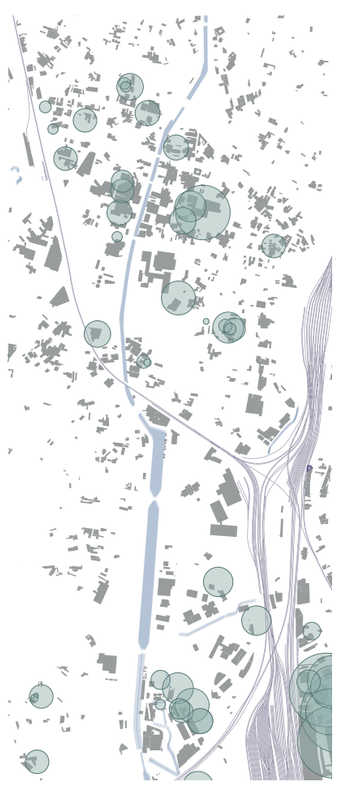


Figure 113-119: Clusters of industry
made by author, based on (Voghel et al., 2017), (OpenStreetMap, z.d.) en (Brussels BruGIS, 2001)

Where are the most important social functions located and how do they cluster together?

The most significant social functions, including retail, are predominantly located around or near retail lints. These social functions tend to cluster together in centralities, which are concentrated hubs of activity.

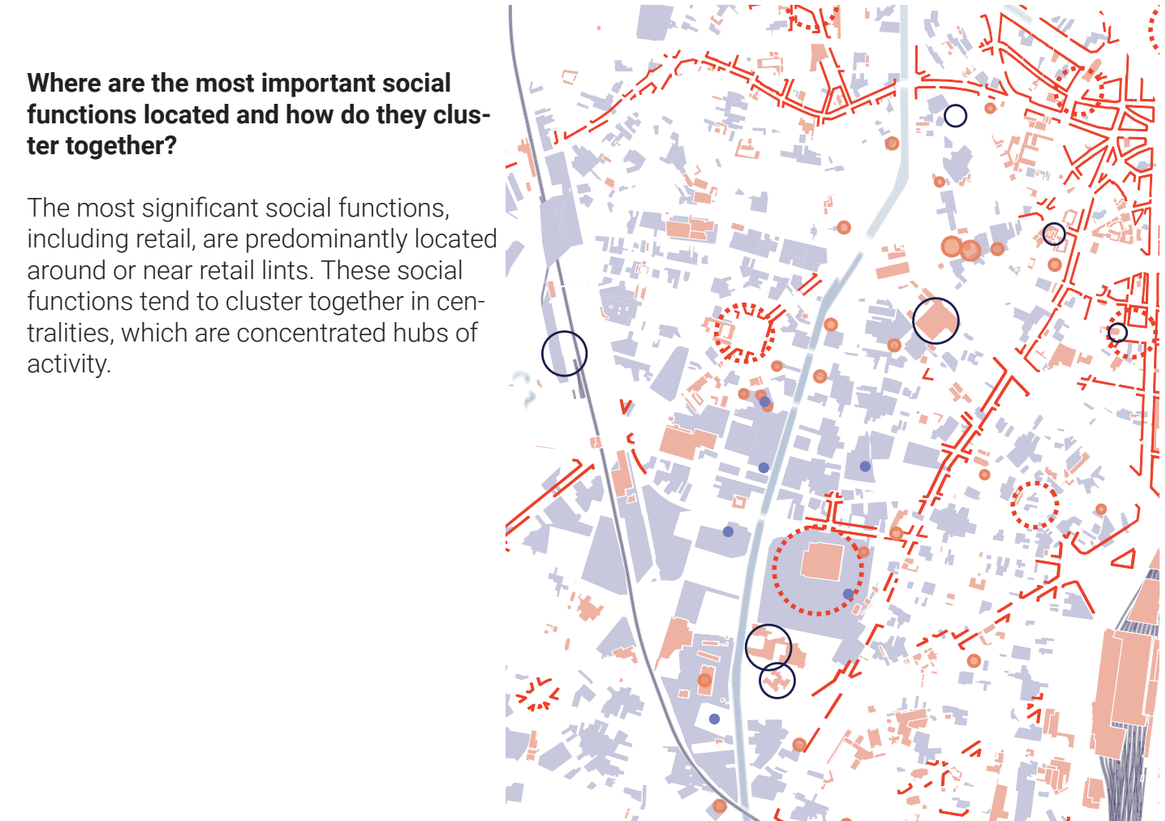


Figure 120: Social functions
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

How are these two functions related?

The relationship between these two functions varies depending on the specific context. In areas closer to the center, there tends to be a higher concentration of retail activities and a more limited presence of fine-grained industries. For instance, areas like Cureghem exhibit a mix of various functions located adjacent to one another. In contrast, as you move further south, there is more segregation between the industry and retail functions.

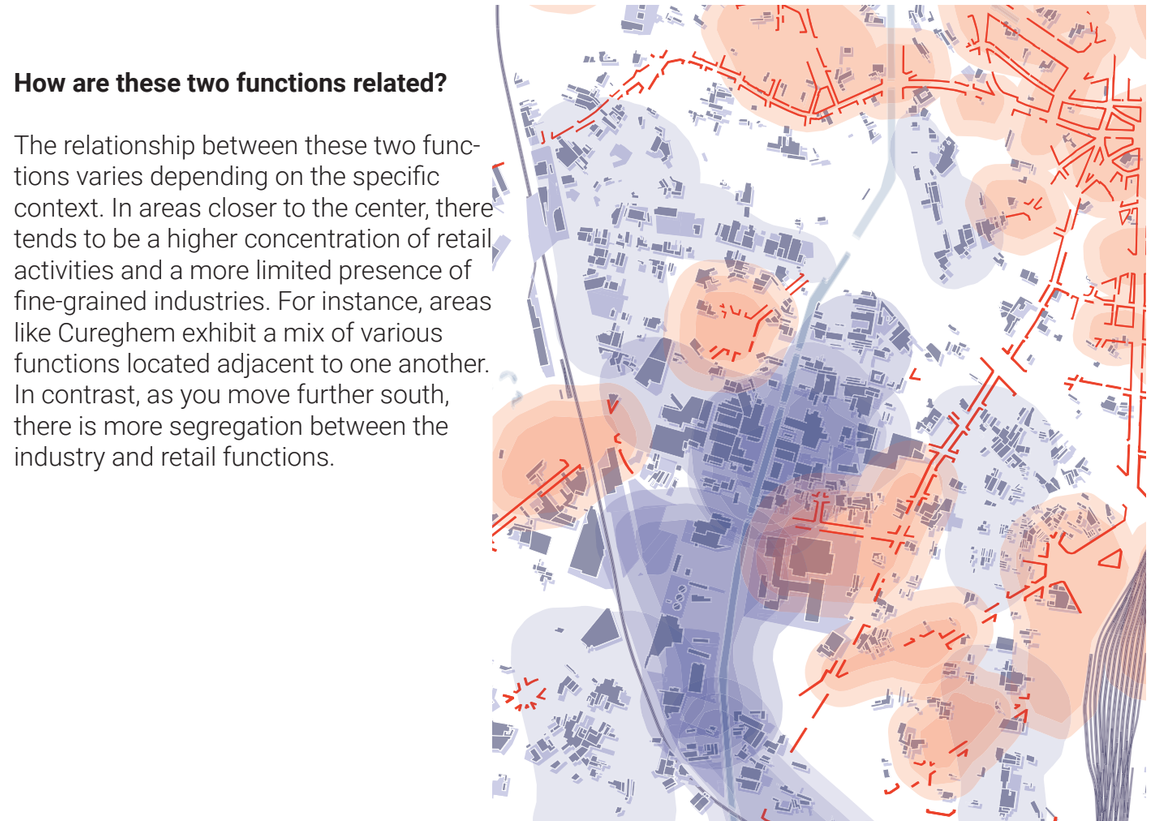


Figure 121: Characterising areas
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

Where could industry be maximised and where are opportunities for a new centrality?

To intensify these functions, it is possible to focus on certain areas. Along the infrastructure axis, industry can be intensified, leveraging the existing transportation networks. Additionally, the existing centralities can be strengthened to enhance their role as social and retail hubs. Moreover, it may be beneficial to establish new mixed-use centralities in areas where industry or retail presence is currently limited.

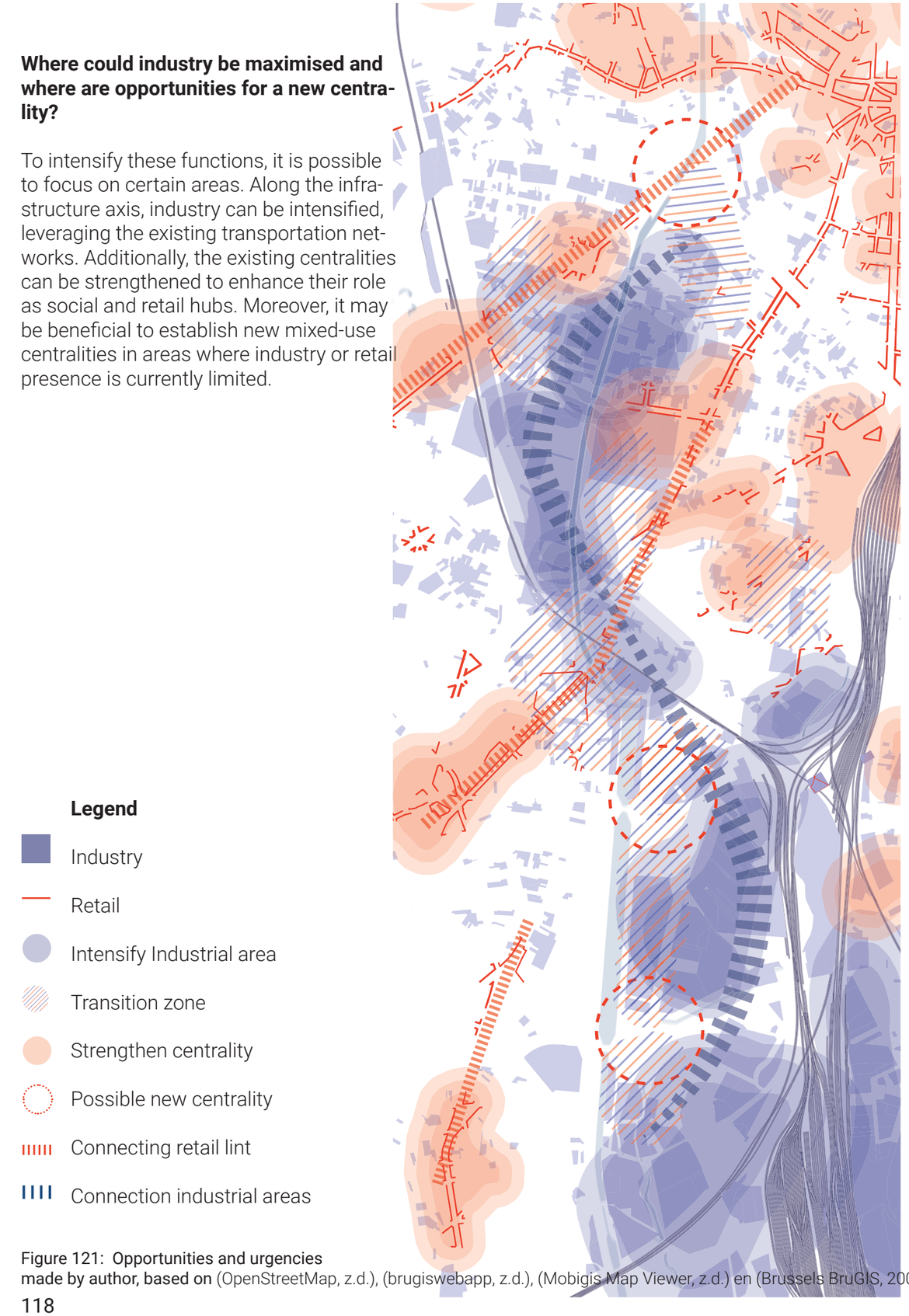


Figure 121: Opportunities and urgencies
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

What are important exisitng fucntions to connect with

Throughout the area many promising projects and functions are established that the development could either strengthen or collaborate with. Example of this are the existing markets, makers spaces and education institutes.



8.3 BUILT FORM

Which different typologies can be found in mixed use areas?

Different mixed-use typologies can be identified within the study area. These typologies include fine-grained, mainly observed in Molenbeek; medium-grained, predominantly found in Cureghem; and large-grained, primarily located in monofunctional industrial areas. Along the canal, there are numerous industrial heritage sites, some of which are abandoned. Moreover, the entire region features buildings of architectural quality, particularly towards the center.

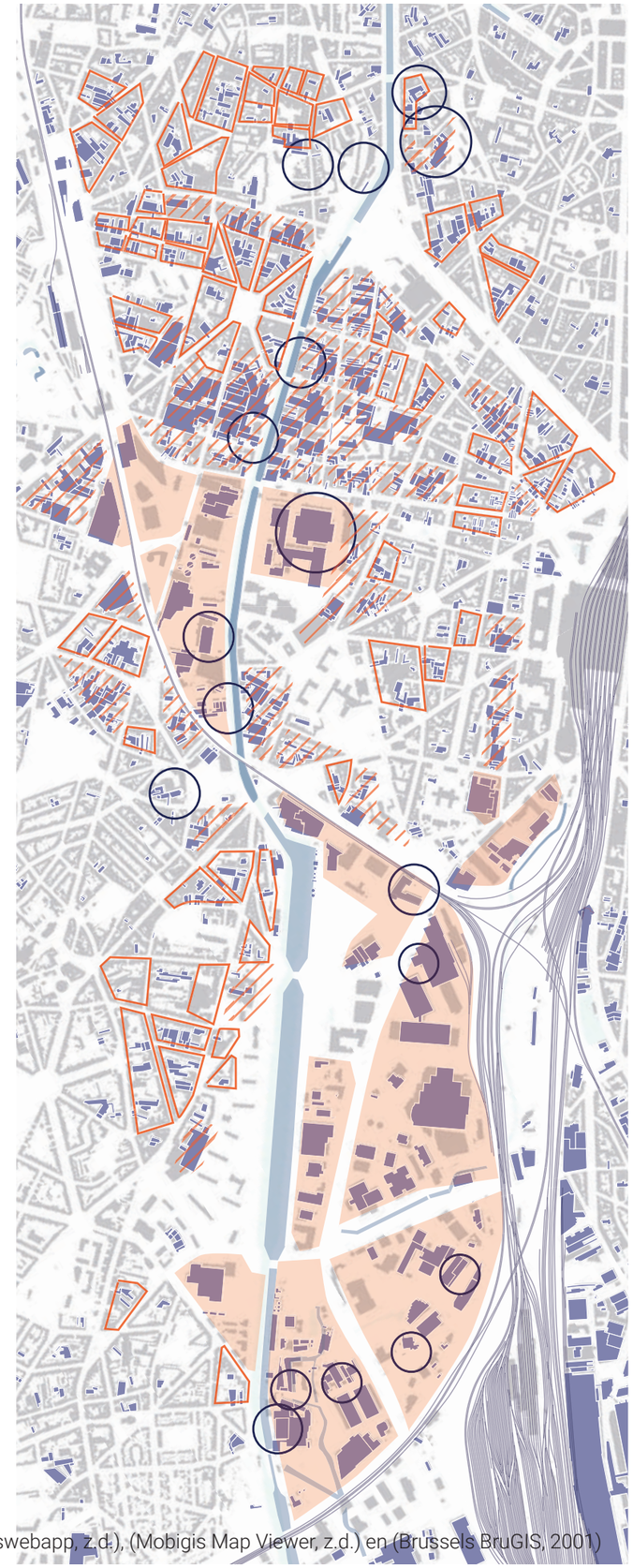


Figure 122: Typologies
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

Where are vacant spaces located?

Vacant spaces within the study area are varied and can be categorized into different types, including abandoned spaces, messy terrains, large underused parking lots, and abandoned buildings. Larger vacant spaces are predominantly found in the large-grained industrial areas, while abandoned buildings are more commonly encountered in the denser urban fabrics**.**

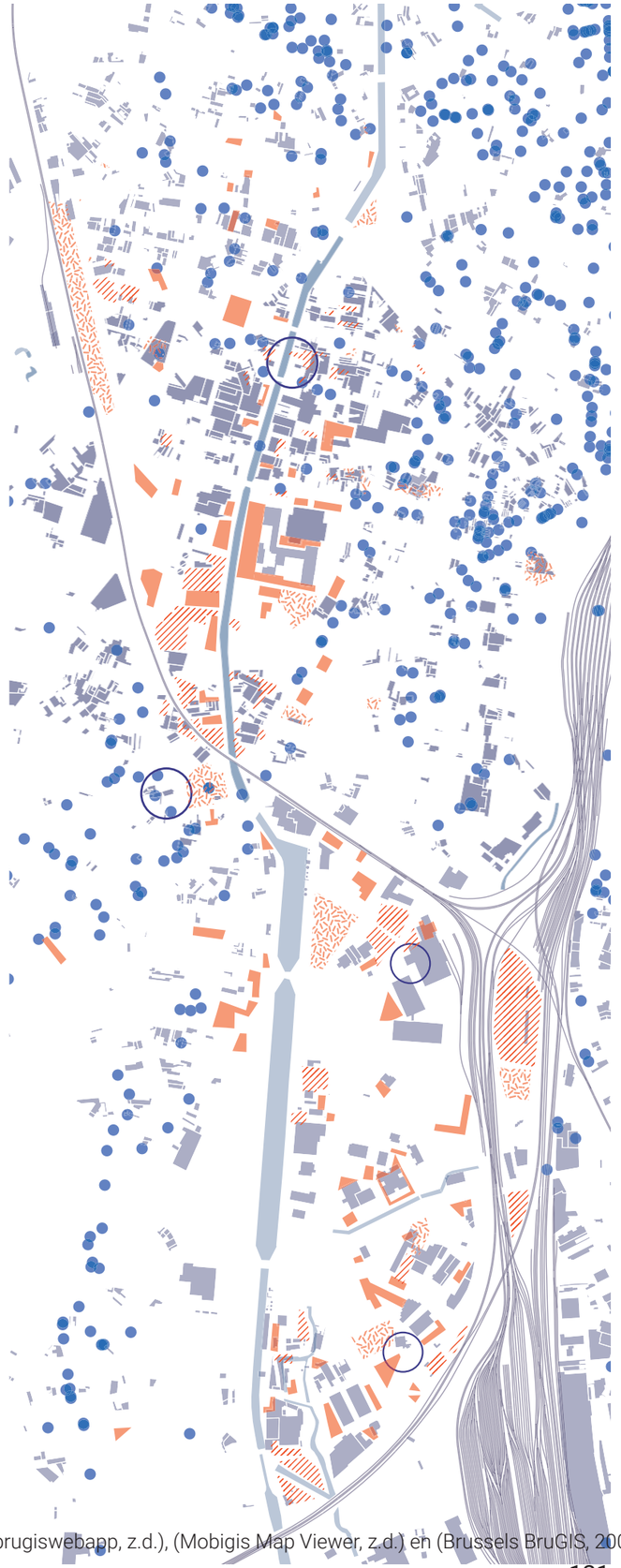


Figure 123: vacant space
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

What are possibilities to develop?

Numerous development opportunities exist within the study area. Some vacant spaces cluster together, while others are strategically located along the canal, presenting potential areas for development. Additionally, different types of urban fabrics necessitate distinct development strategies. Fine-grained areas can be improved, medium-grained areas can be intensified, and large-grained areas can be densified. Abandoned buildings, on the other hand, need to be repurposed to maximise their potential.

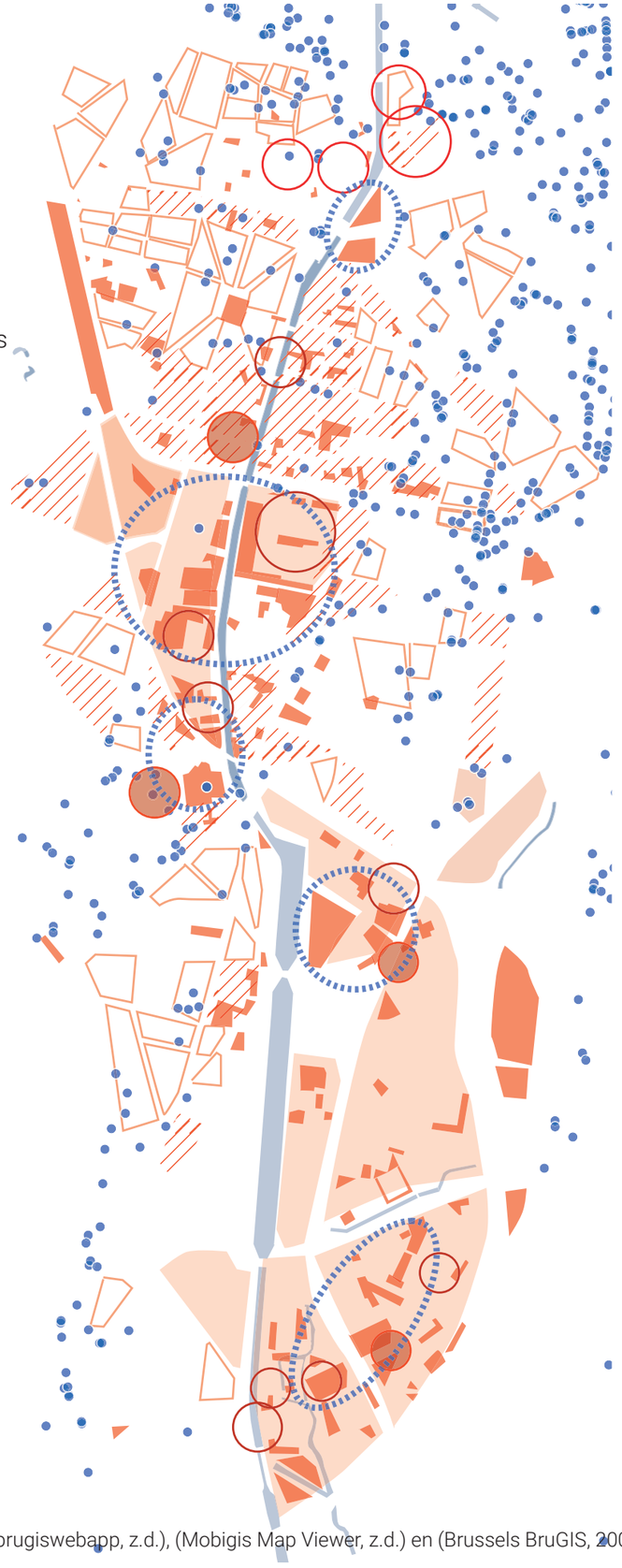


Figure 123: Urgencies and opportunities
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

How does the opportunities to develop relate to intensifed functions?

These development opportunities align with the concept of intensified functions. It can be observed that certain clusters of vacant spaces overlay with options for intensification. By promoting mixed-use development and intensifying industrial activities, these areas can become vibrant economic and social centers. The integration of intensified functions, such as diverse commercial and residential uses, within these spaces can contribute to their revitalization and enhance the overall livability of the region.

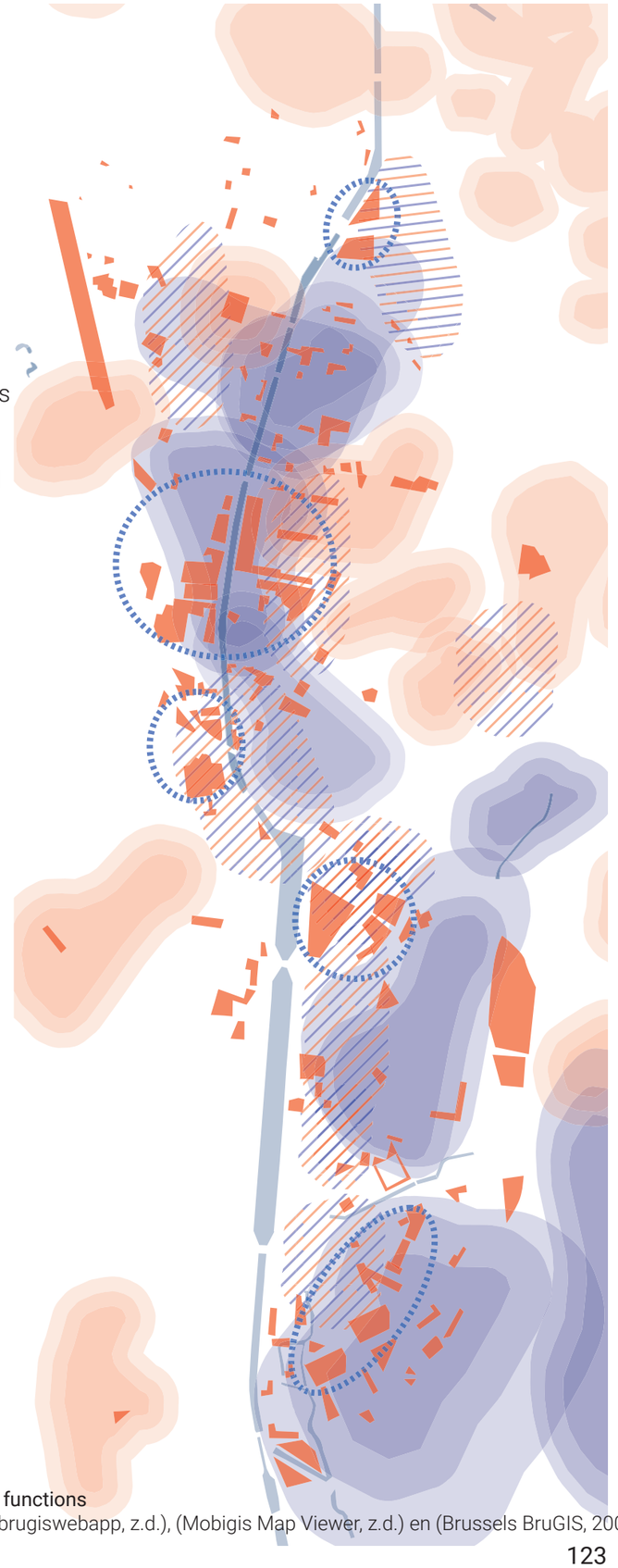


Figure 123: Opportunities in regards to intensified functions
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

What important functions are located near the development sites?

Numerous important functions are located near the possible development sites. The sites could react to these, strengtheing them, placing similar or related function, or collaborating with them.



Legend

- Vacant space
- Market
- Community
- Shared industrial concepts
- Schools
- Higher education

8.4 PUBLIC SPACE

What green structure and public space is located in the area?

Green and public spaces in the study area are distributed unevenly. Green spaces are primarily located in the southern part of the region, especially within the industrial area, but their quality is generally low. Towards the center, there is a scarcity of green spaces. On the other hand, public spaces are dispersed throughout the entire area.

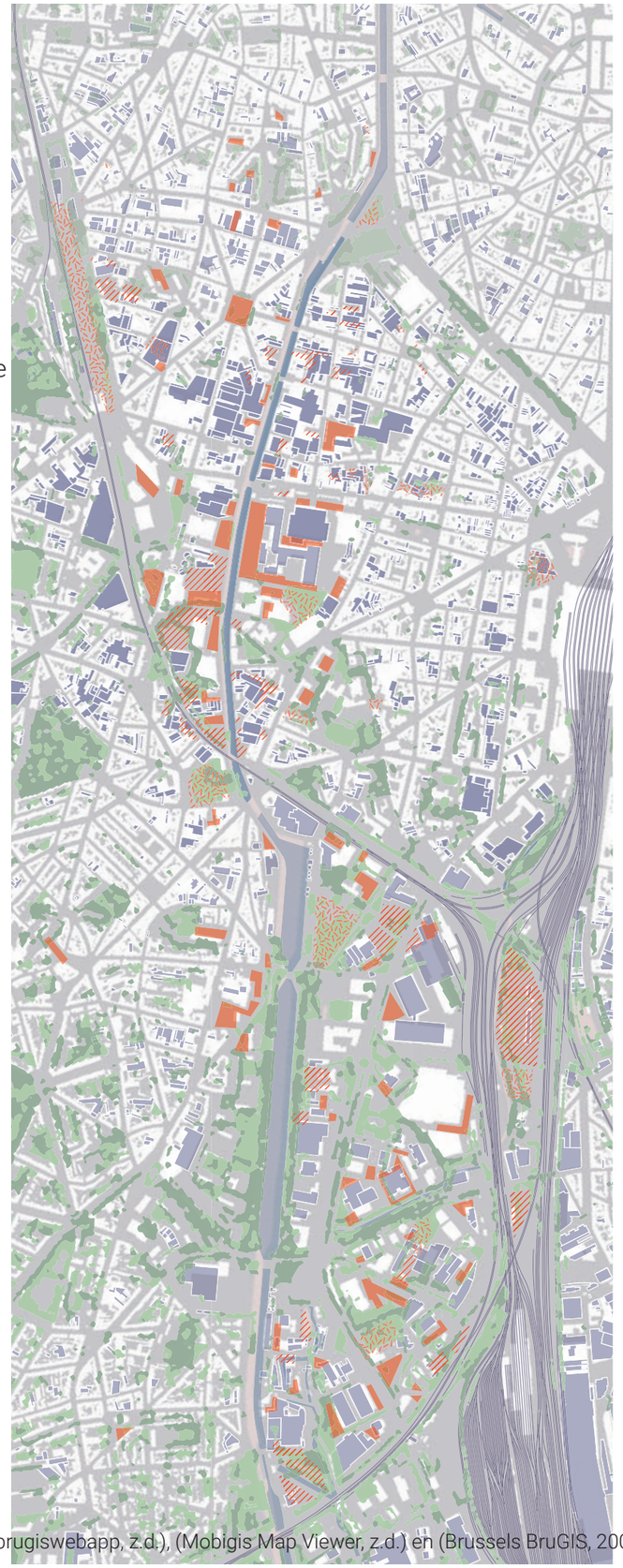


Figure 124: Public space and green
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

Where could public space be enhanced?

There are opportunities to improve public spaces within the study area. Establishing green corridors, upgrading and greening existing public spaces, as well as transforming underutilized parking lots into more inviting and functional areas, are some potential strategies for improvement.

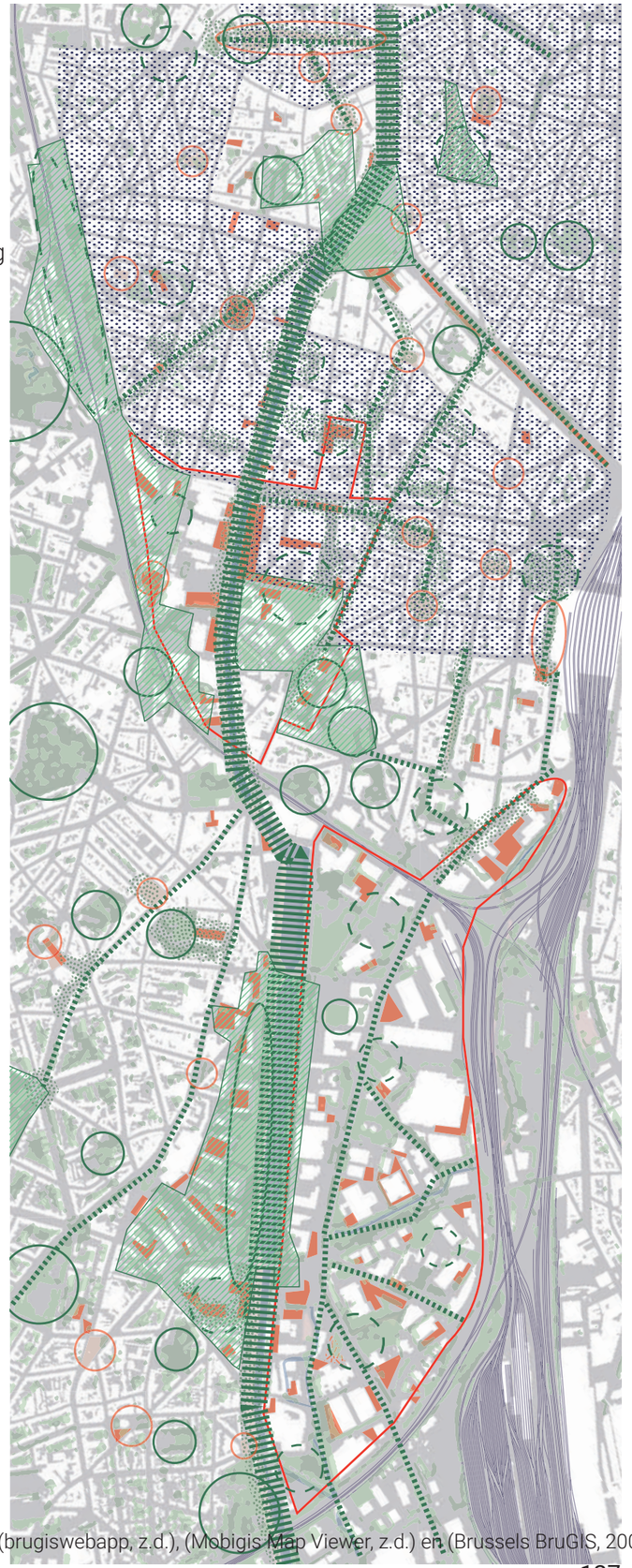


Figure 125: opportunities and urgencies
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

8.5 RELATIONS

What is the road network between functions? and what are the consequences?

The hierarchy of roads within the study area is currently unstructured. The main roads also serve as high streets with retail activities, leading to congestion, dangerous points, and noise issues along these routes.



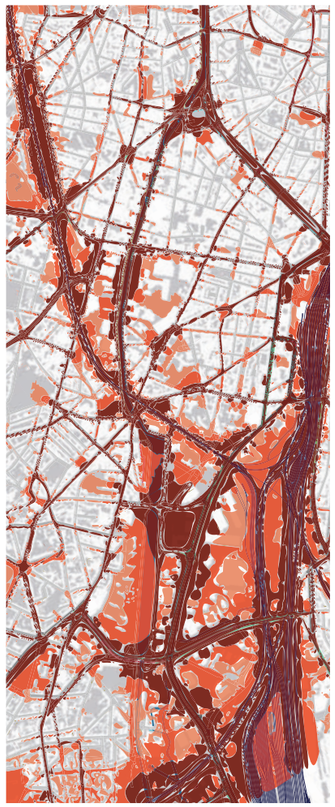
Legend

- Industry
- Logistics
- Retail
- Regional road
- main road
- Secundary road
- Local road

Roads



Noise



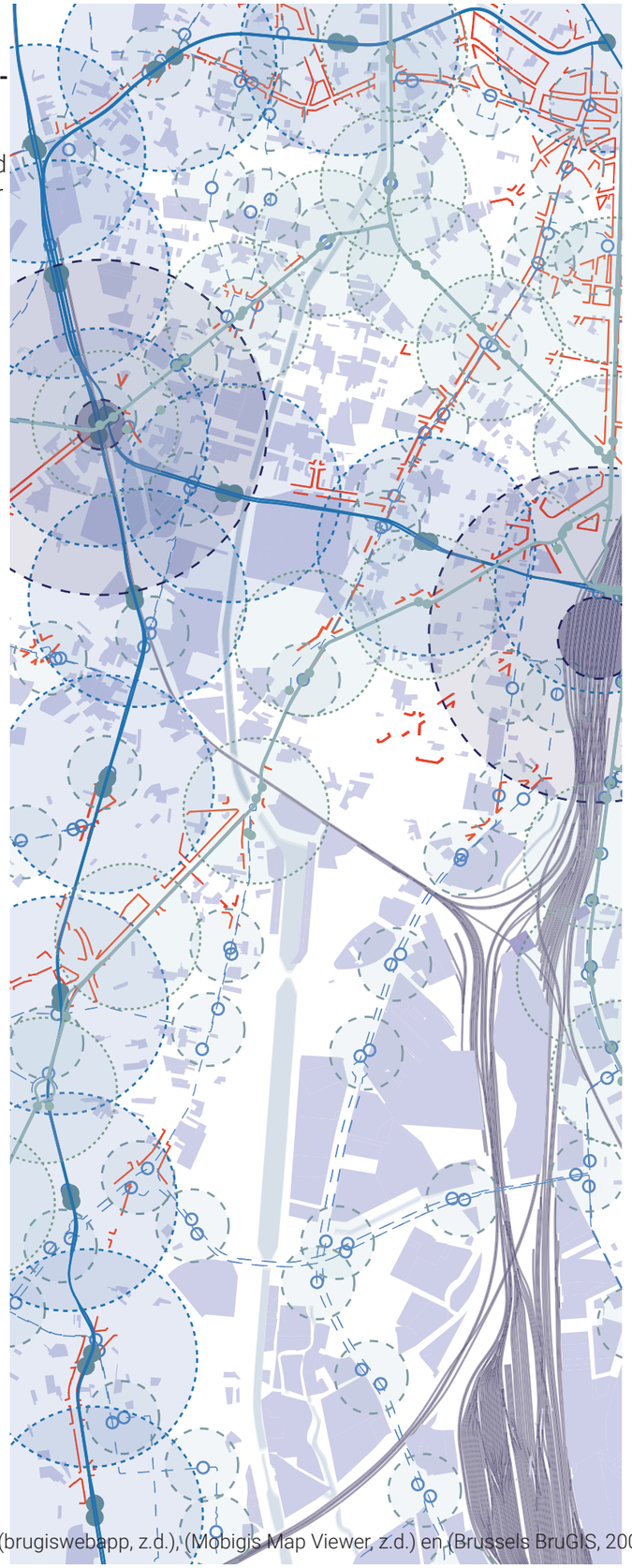
Congestion spots



Figure 125- 128: Road network and consequences made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

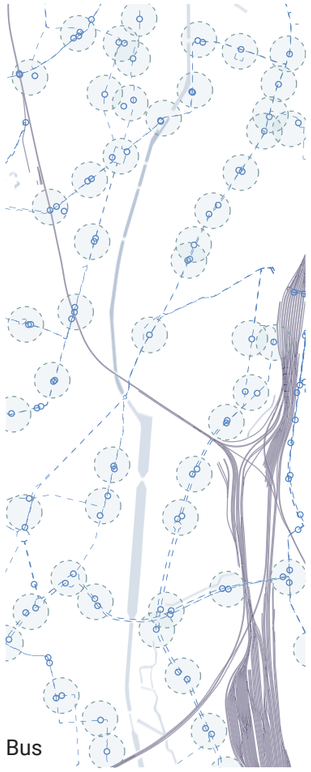
What is the public transport network between functions?

The public transport network is dense and most areas are well connected, except for the industrial areas. This network plays a crucial role in facilitating transportation and connectivity within the region.

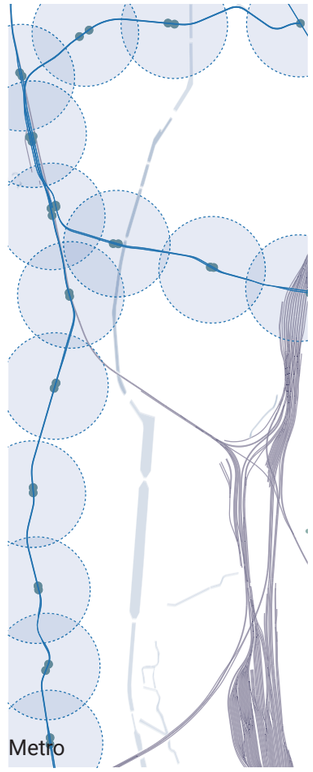


Legend

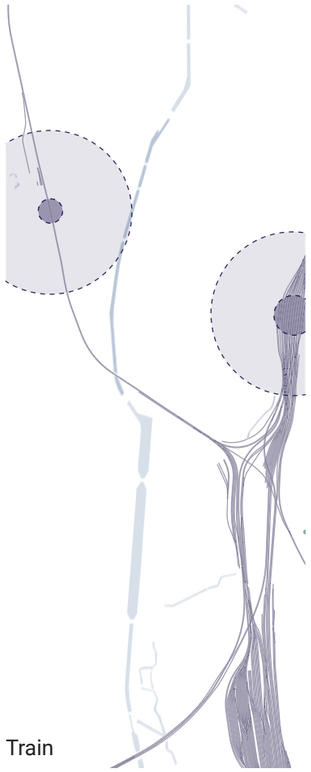
- Industry
- Retail
- train
- metro
- tram
- bus



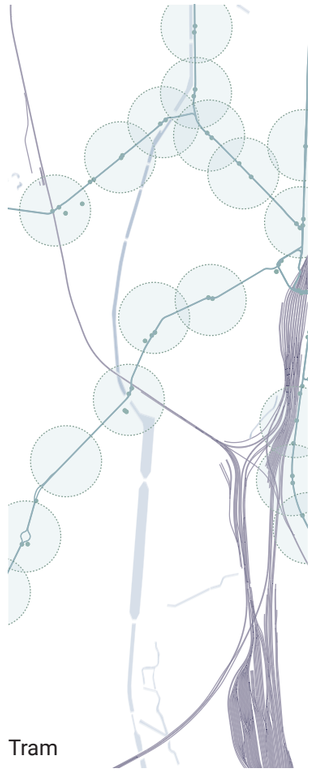
Bus



Metro



Train

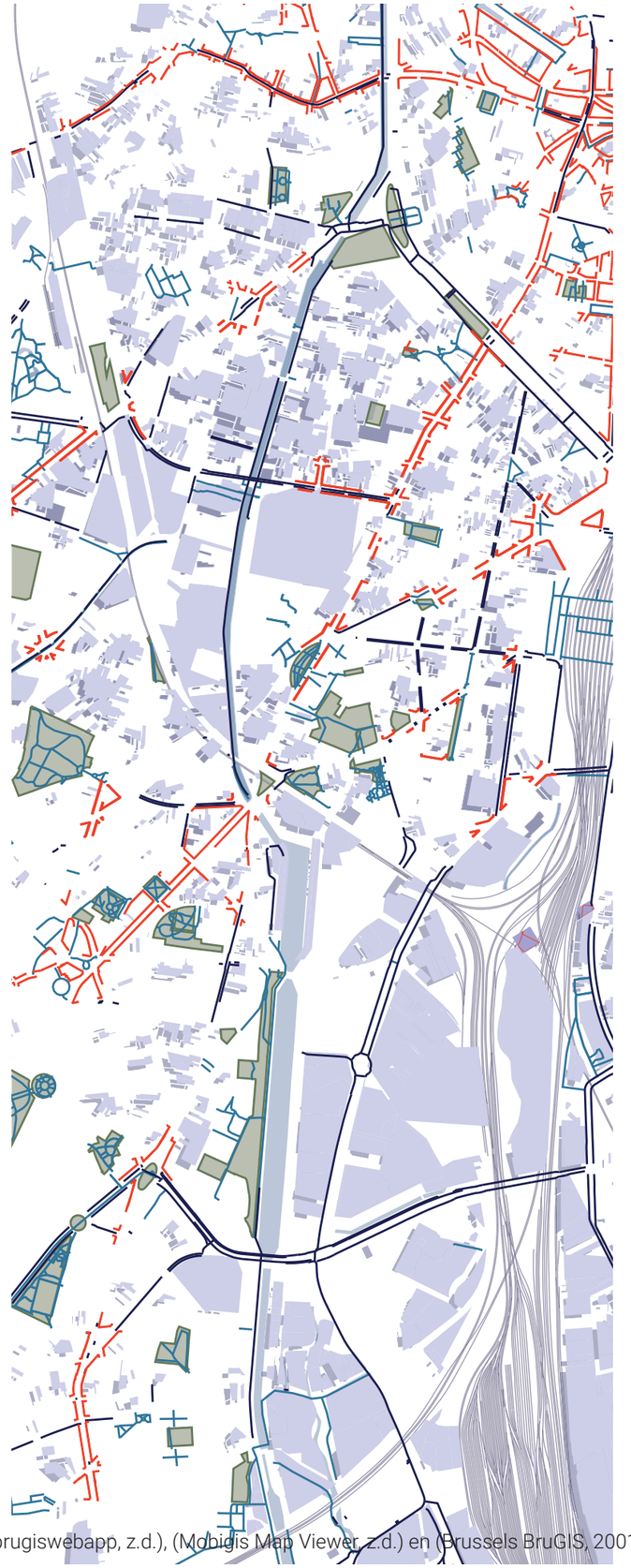


Tram

Figure 129-133: Public transport network
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

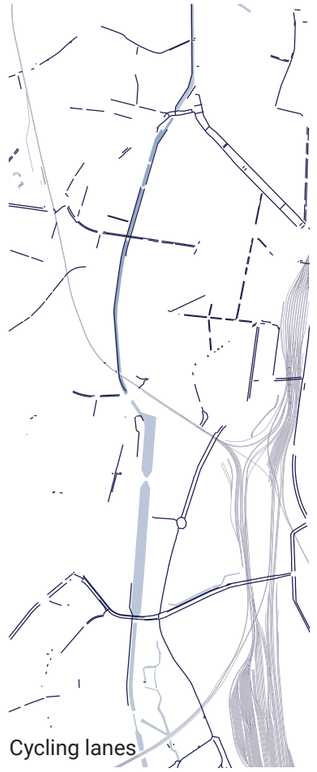
What is the slow traffic network between functions?

The slow traffic network, which caters to pedestrians and cyclists, is dispersed throughout the area. It is primarily located in parks and along some major roads. This network plays a vital role in promoting active transportation and enhancing connectivity within the region**.**

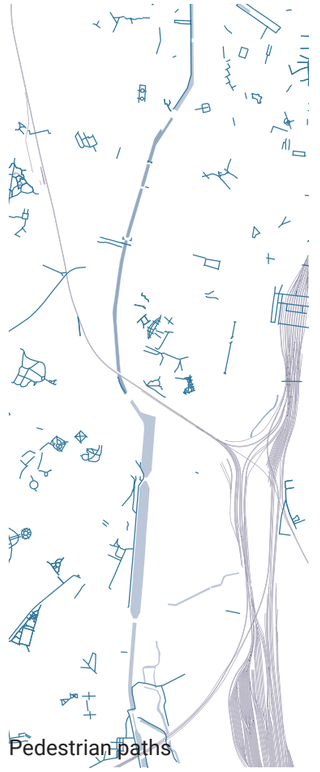


Legend

- Industry
- Retail
- park
- cycling
- pedestrian paths



Cycling lanes



Pedestrian paths

Figure 134-135: Slow traffic
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

How can these networks be navigated?

The main opportunities and urgencies regarding connectivity include making high streets more walkable and establishing a clearer hierarchy for logistics, which could potentially be along the canal. These improvements would contribute to creating more accessible and efficient transportation networks.



Figure 136: Opportunities and urgencies
made by author, based on (OpenStreetMap, z.d.), (brugis[illegible]happ, z.d.), (Mobigis Map Viewer [illegible] Brussels BruG[illegible]001)

How does does this connect towards the opportunities for function?

These opportunities for connectivity align with the development and intensification of functions. Making high streets more walkable would enhance the centralities, and also improve the local economy in these streets. Additionally, establishing a clear logistical route along the canal would effectively connect hubs and industrial areas, facilitating the movement of goods and services.

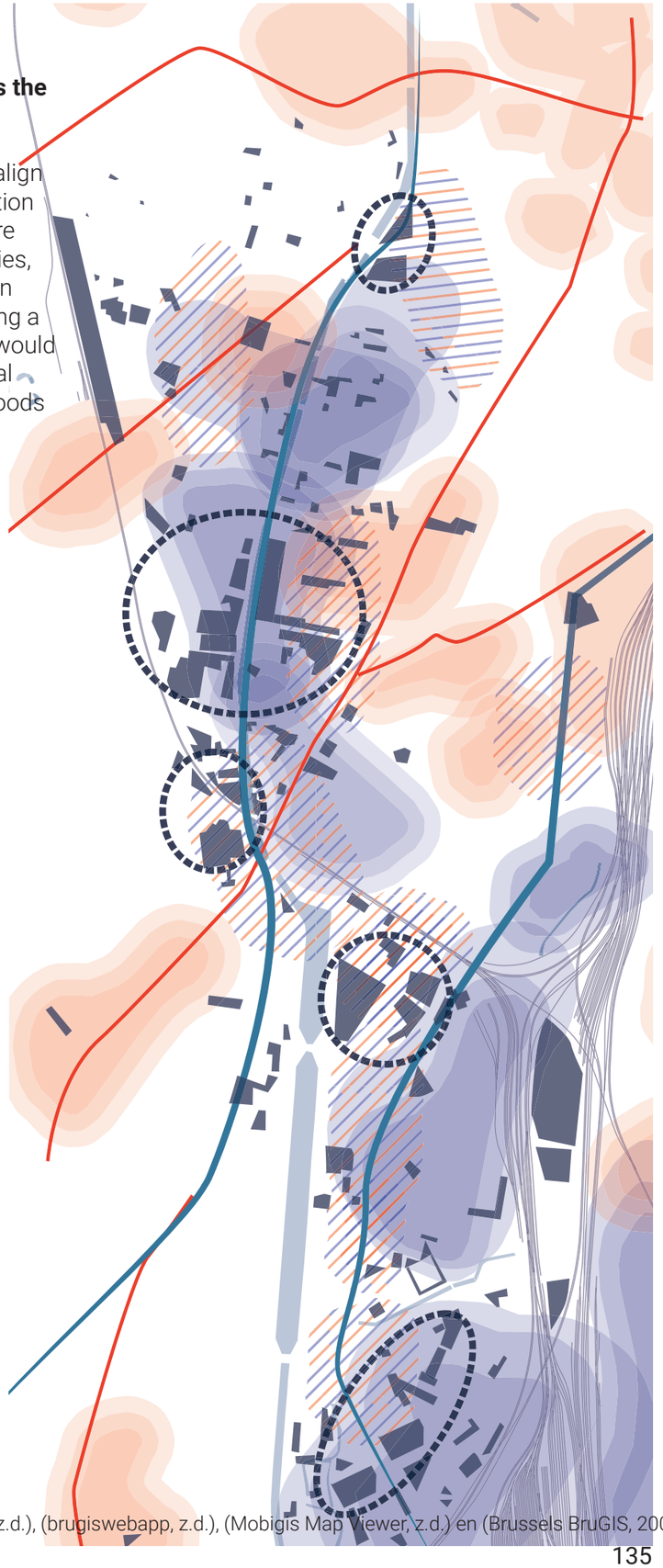
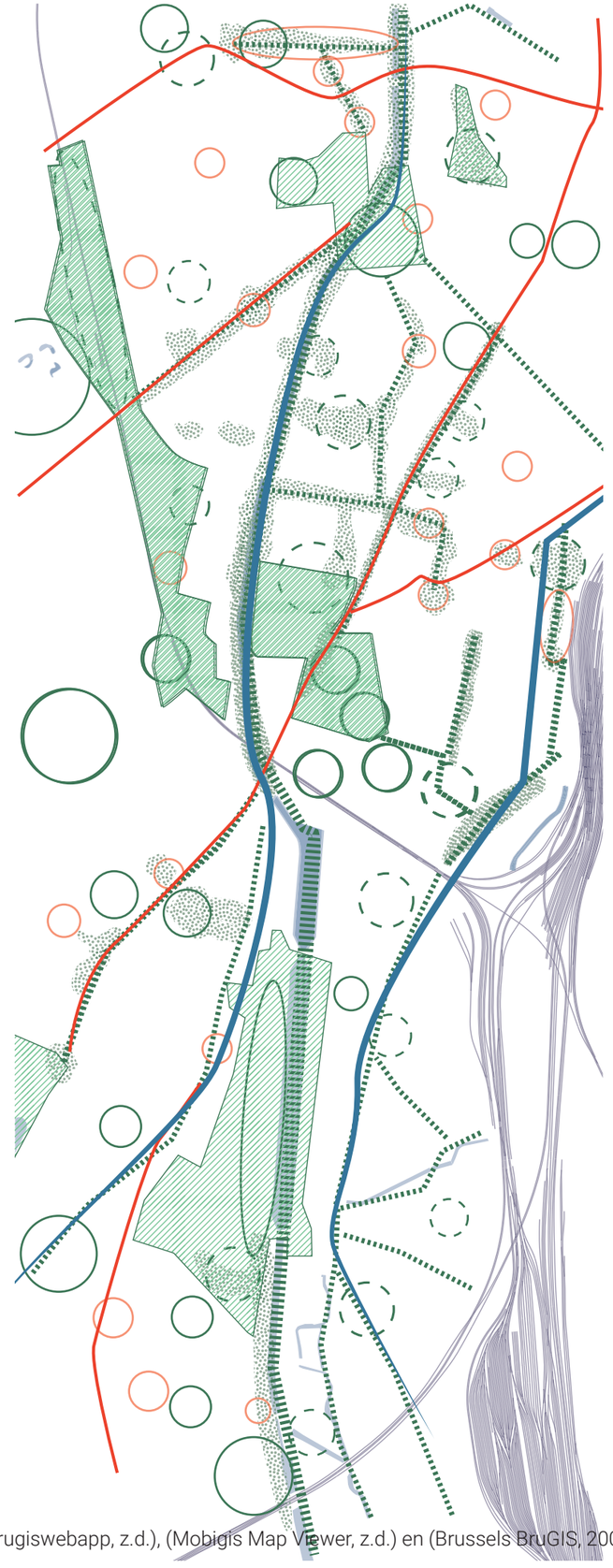


Figure 137: Connection to functions
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

How does this overlay with opportunites for public space?

The improvement of public space is closely related to the opportunities for connectivity. Many green and improvement options align with the routes targeted for network improvements. By addressing these improvements together, there is a synergistic effect, enhancing both connectivity and the quality of public spaces.



Legend

- green corridor
- green area
- Exisitng green area
- Possibility for green
- Updated public space
- Rethink parking lot
- Upgrade logistical route
- Need for walkable high street

Figure 138: Connection to green network
made by author, based on (OpenStreetMap, z.d.), (brugiswebapp, z.d.), (Mobigis Map Viewer, z.d.) en (Brussels BruGIS, 2001)

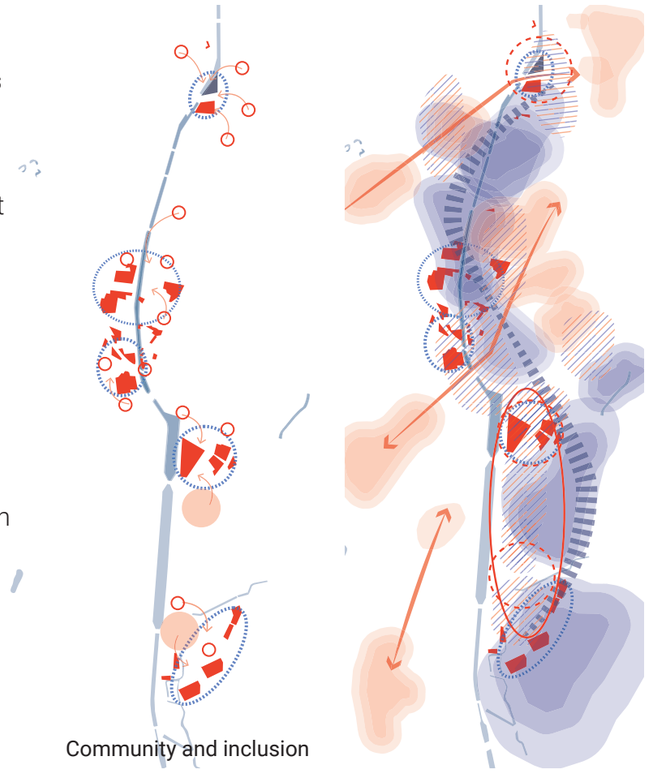
Main take-aways connecting to the values
Inclusion and community: several exisiting function around the possible development locations could be strengthened and collaborated with, strengthening the current social infrastructure

Diversity: Different types of areas that server different types of functions could be established and connected with one another.

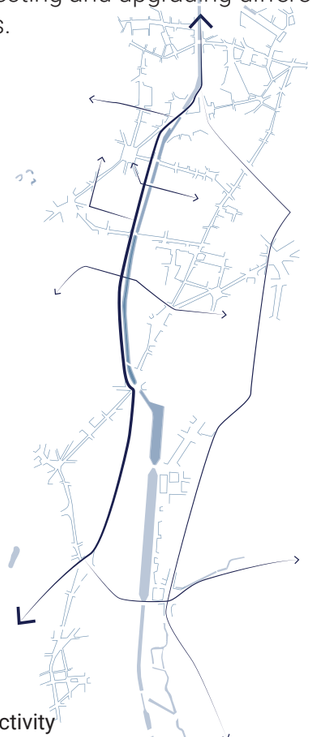
Authenticity: Development location are limited to vacant spaces, clustering together in five locations. The existing urban fabric can be modified with small scale interventions, based on its typology.

Connectivity: Two different connecting networks could be established: one for logistics and one walkable public space network strenghtening the different functions

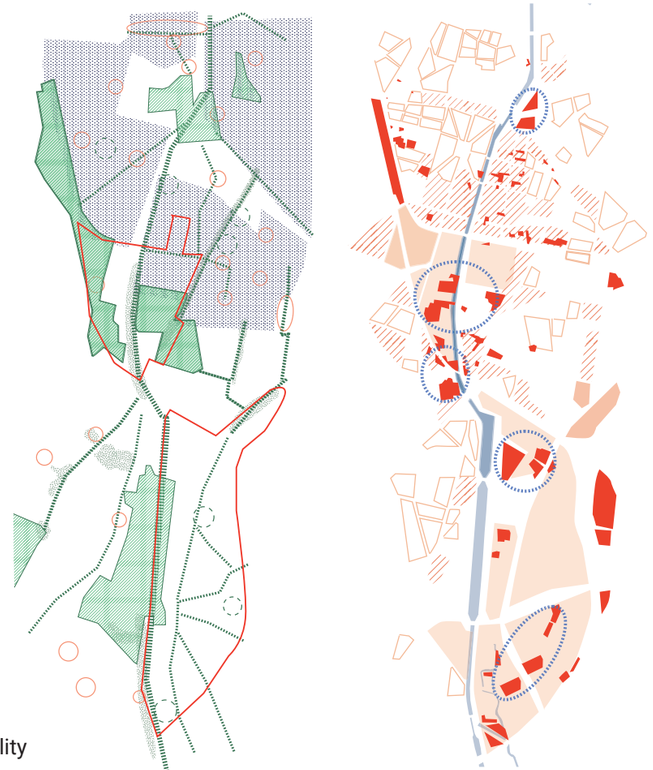
Liveability: This network could be strengthened with a green network, connecting and upgrading different green zones.



Community and inclusion



Connectivity

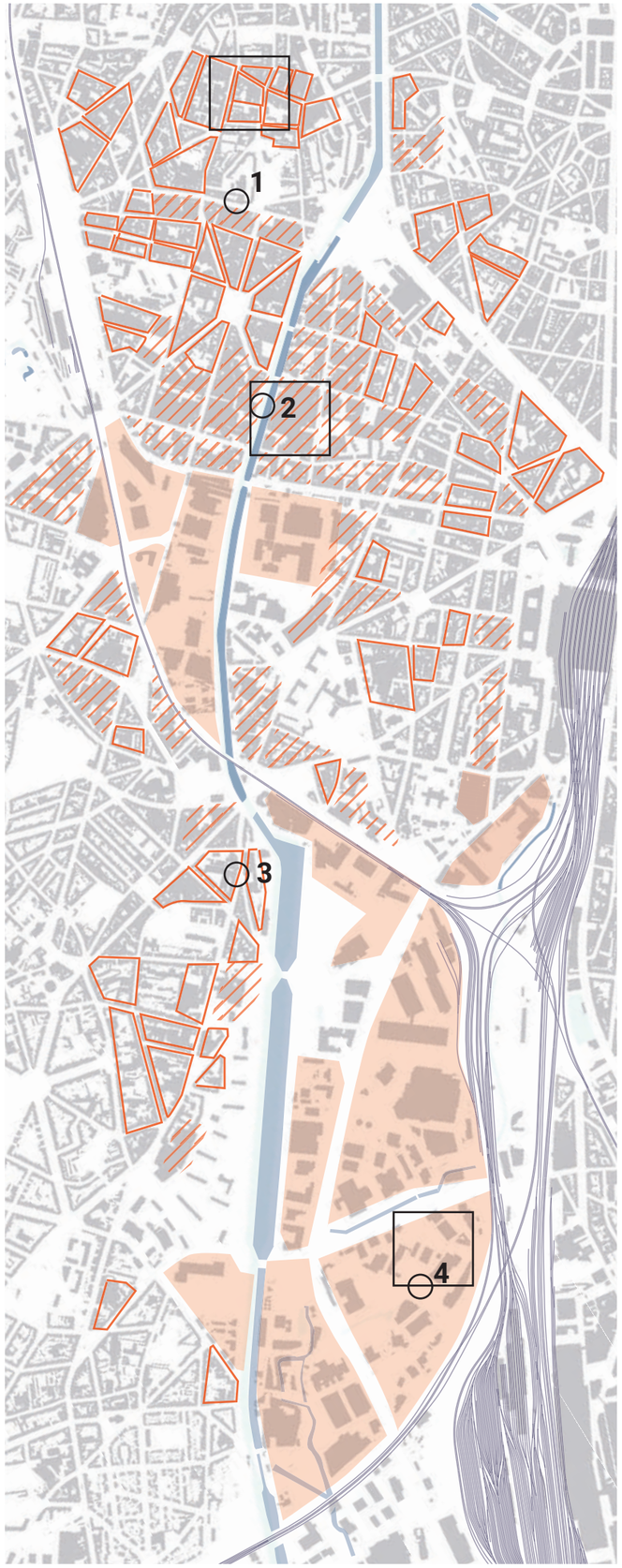


Liveability

Figure 139-143: Main takeways,made by author

8.6 SMALL SCALE

In order to further understand the area, three zoom-ins were made. On three typologically different fabrics: small grained, medium grained and large grained. As well as on four different street typologies



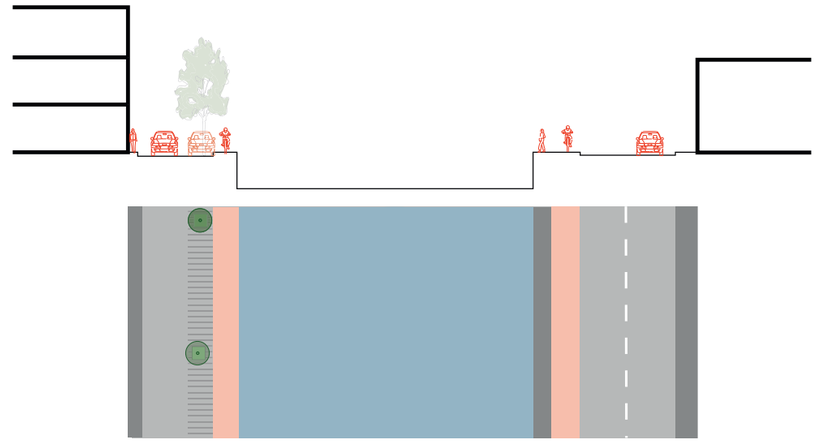
Legend

- Large grain typology
- Medium grain typology
- Small grain typology

1. Logistical street in dense area
2. Route along canal
3. High street
4. Logistical street in industrial area

144: Zoom-in locations, made by author

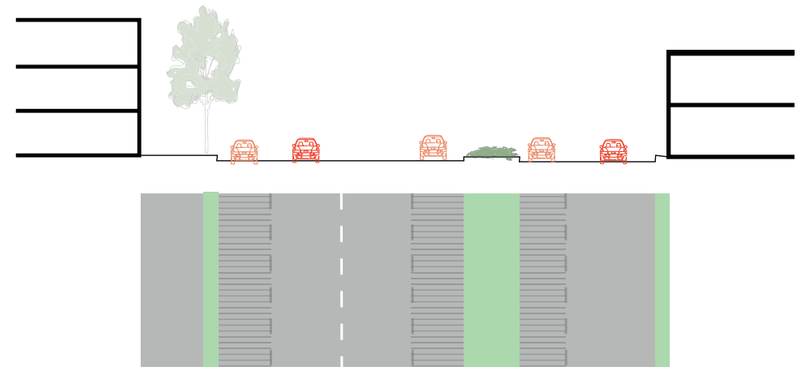
Street typologies
Four street profiles were investigated. What can be noted is that much of the street space is reserved for parking, with little space for green or sidewalks. Cycle lanes were sometimes seperate. In the industrial area there is not even a sidewalk.



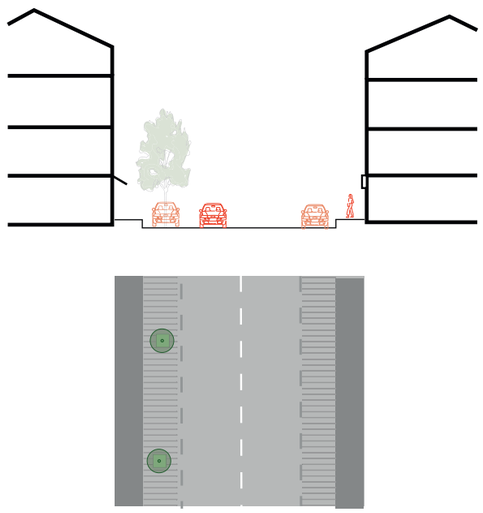
section canal

Legend

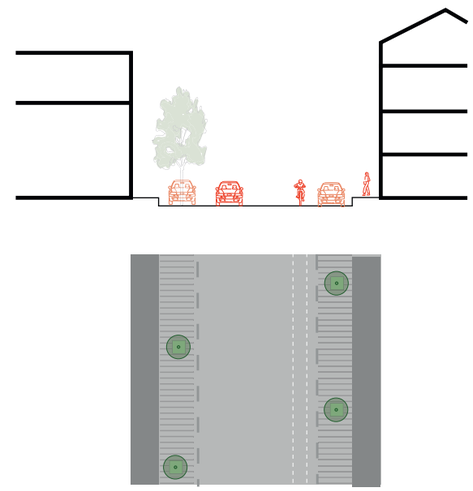
- Sidewalk
- Green space
- Cycling lane
- Parking



logistical route industrial area



High street



Logistical street in dense area

Small grained urban fabric

In the small grained fabric, two blocks are situated along Dansaert Street, a bustling shopping street. The ground floors of these blocks predominantly house various shops, but some spaces remain abandoned. Additionally, there is one vacant empty lot in the area.
The small grained fabric exhibits a high level of density, with limited green spaces. The courtyard, currently used for parking, could be transformed into a more vibrant communal area. Notably, numerous closed-off plinths exist, and the functions they serve are not always clear.
The streets in this fabric are primarily one-directional, and Dansaert Street, being the main access and has plenty of pedestrian traffic, has narrow sidewalks.

The primary priorities for this fabric type revolve around improving livability, reducing car dependency, addressing vacant spaces, and increasing greenery. Due to its high density, large-scale development opportunities are limited. Therefore, the strategy should focus on upgrading and renovating existing structures while implementing small-scale interventions. One potential area for improvement is the utilization of the courtyard.



Figure 145: Zoom-in dansaert
made by author, based on (OpenStreetMap, z.d.) en (Mobigis Map Viewer, z.d.)

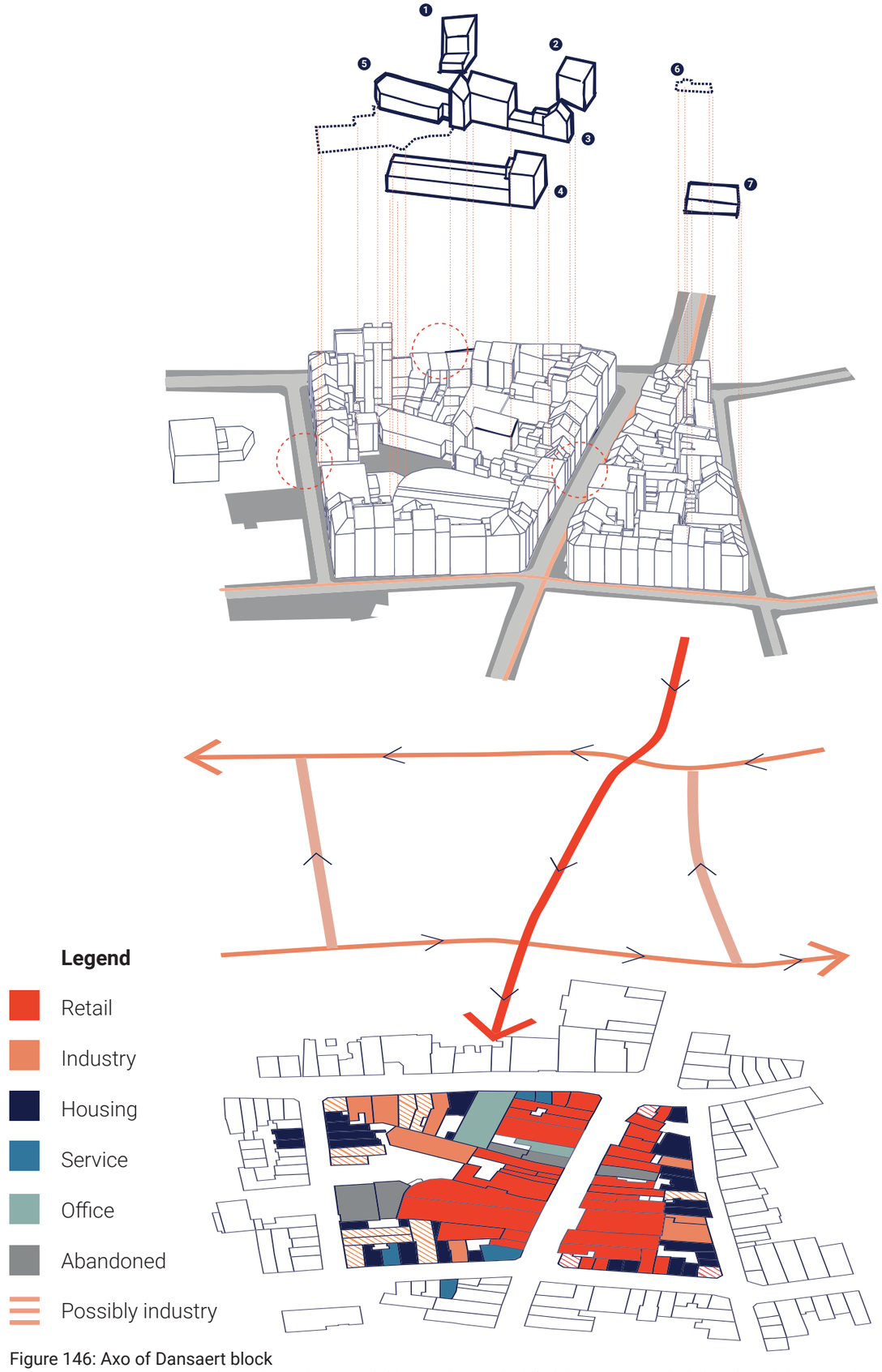


Figure 146: Axo of Dansaert block
made by author, based on (OpenStreetMap, z.d.) (Google Maps, 2023), (cibg.brussels, 2023)en (Mobigis Map Viewer, z.d.)

Medium grained urban fabric
Moving to the medium grained fabric, it encompasses a block along the canal and Cureghem. This area is predominantly dedicated to second-hand car trading, with some other industrial functions. Additional functions are located at the corners of the blocks. As one approaches the canal, industrial activities become more prevalent. The medium grained fabric features dense construction, mainly comprising warehouse structures with public facades and residential units on upper floors. Unlike the small grained fabric, there are no apparent abandoned spaces in this fabric. The remaining outdoor spaces primarily serve as parking areas, with a few patches of greenery. Streets in this fabric are narrow and one-directional, with the main access street being on the other side of the canal.

The primary urgencies in this area relate to the logistics of industrial and car trade activities. The narrow streets pose a challenge in terms of efficient movement. Additionally, the car trade industry has been associated with questionable practices, prompting a discussion on exploring alternative uses for the warehouses. Given their flexible nature, these warehouses can be easily repurposed for other industrial functions. Some structures may be of poor quality and could be considered for demolition if it would contribute to overall improvement.

However, it is crucial to approach these changes with caution to prevent gentrification and maintain a balanced fabric. The focus should be on creating truly mixed-use spaces that encompass both housing and various industrial functions. By ensuring a diverse range of activities, the fabric can retain its character and accommodate the needs of different stakeholders.



Figure 147: Zoom-in Cureghem
made by author, based on (OpenStreetMap, z.d.) en (Mobigis Map Viewer, z.d.)

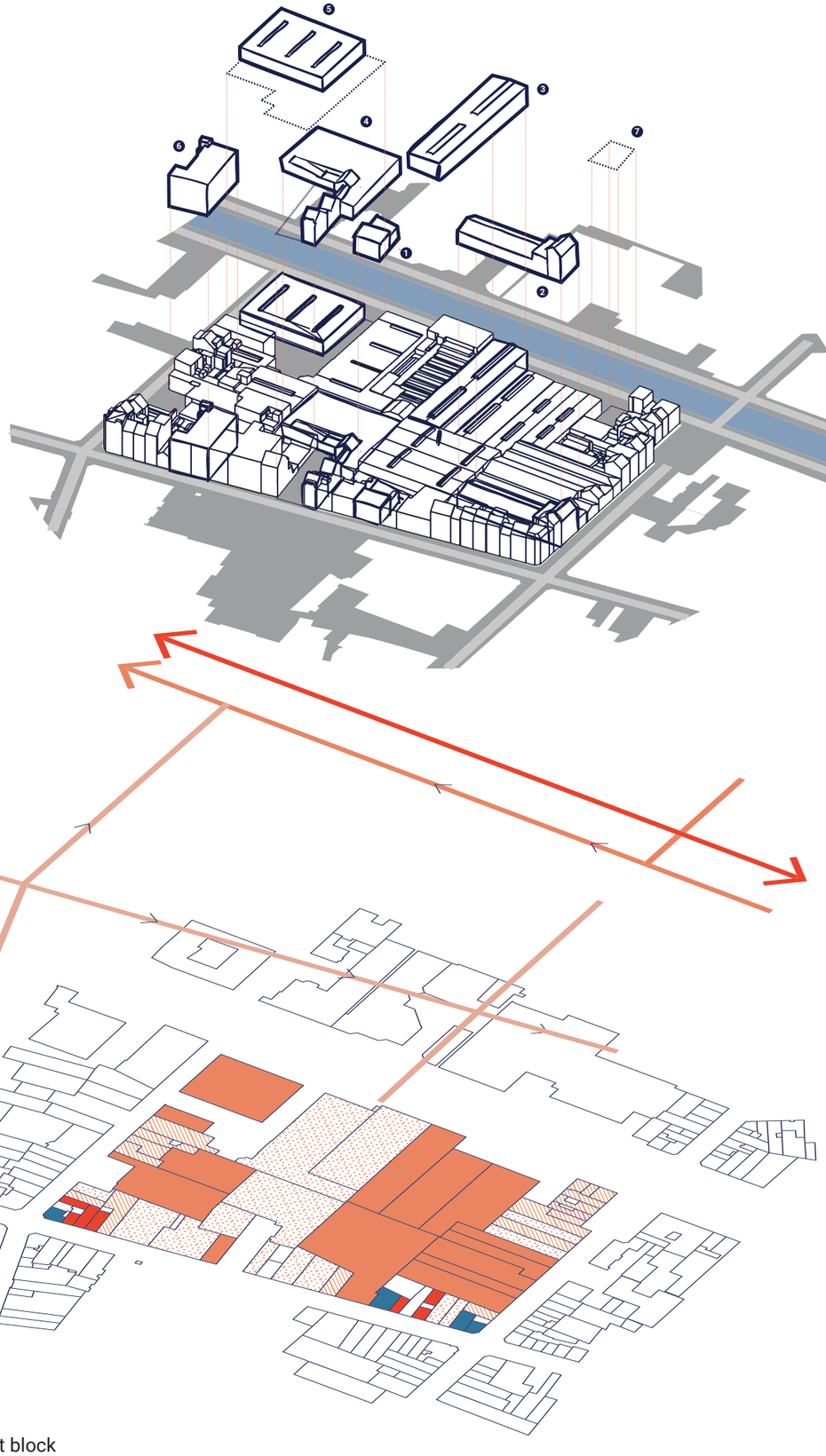


Figure 148: Axo of Cureghemt block
made by author, based on (OpenStreetMap, z.d.) (Google Maps, 2023), (cibg.brussels, 2023)en (Mobigis Map Viewer, z.d.)

Large grained urban fabric

Lastly, the large grained fabric is situated near the railways within the industrial area. The buildings in this fabric consist mostly of large warehouses or office buildings with significant spacing between them. There is a vacant, sizable lot within this fabric, offering potential for development. Despite the presence of abundant green spaces, the quality of public areas is relatively low. Parking facilities occupy a considerable amount of space. Some buildings within this fabric house multiple industrial companies, and there is a small block of housing. Access to this fabric is facilitated by large, wide roads with separated lanes.

There is plenty of space in this area and therefore the main development strategy could be densification. The main urgencies in these areas is the lack of walkability and quality in public space. Also it is fairly monofunctional and does not provide many amenities. More diversification could be considered, especially towards the large road on the canal side, since a housing project has been built a cross the road. Further densification with housing could be considered but should be approach with caution. Housing might not be mixable with existing industrial function and further intensification of these functions.



Figure 149: Zoom-in Industrial area
made by author, based on (OpenStreetMap, z.d.) en (Mobigis Map Viewer, z.d.)

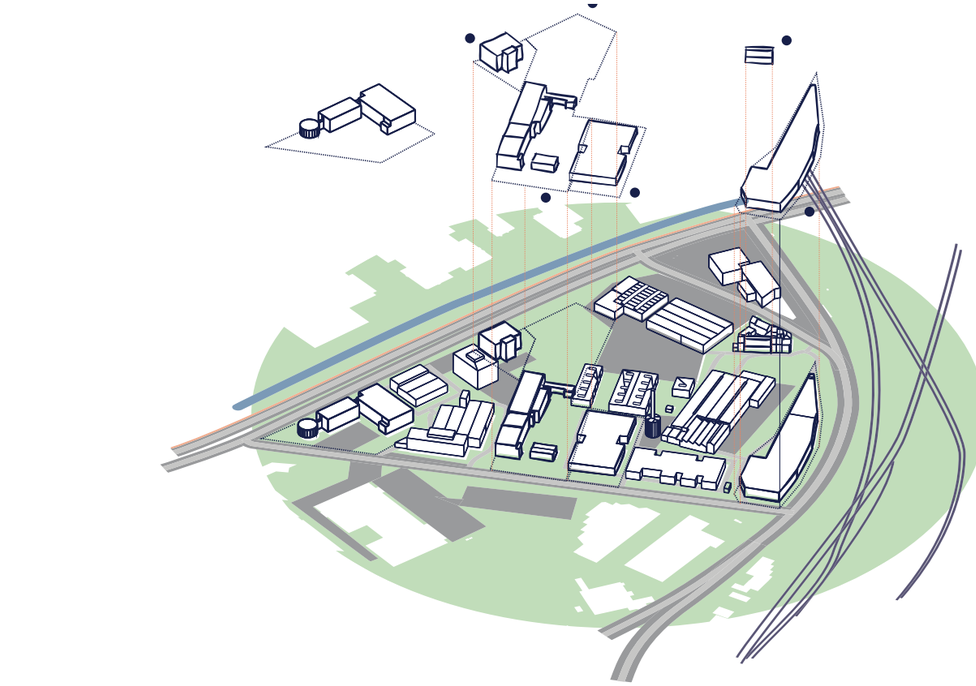
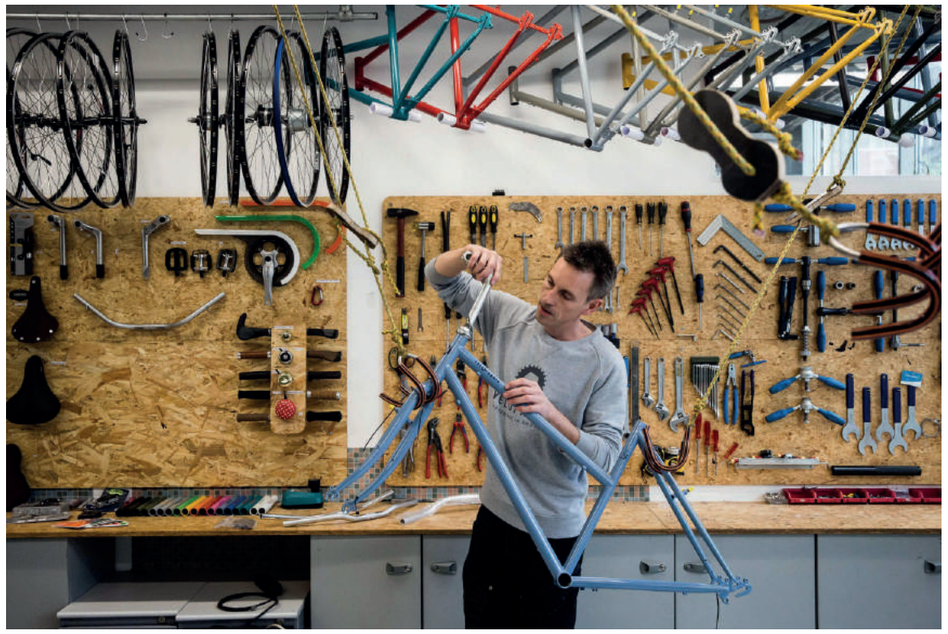




Figure 150: Axo of Industrial area
made by author, based on (OpenStreetMap, z.d.) (Google Maps, 2023), (cibg.brussels, 2023)en (Mobigis Map Viewer, z.d.)

09 STRATEGY



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

9.1 NEEDS OF INDUSTRY

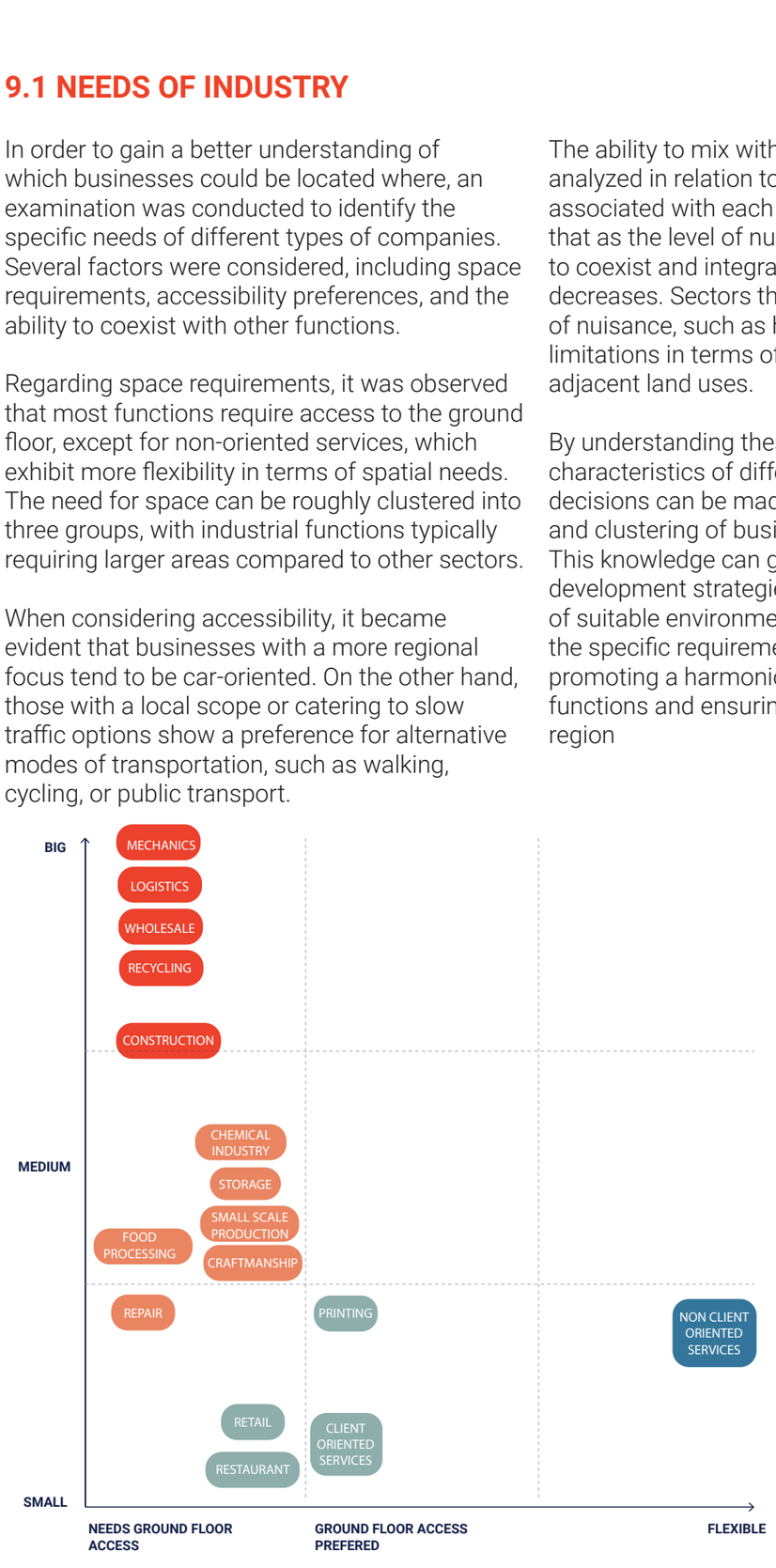
In order to gain a better understanding of which businesses could be located where, an examination was conducted to identify the specific needs of different types of companies. Several factors were considered, including space requirements, accessibility preferences, and the ability to coexist with other functions.

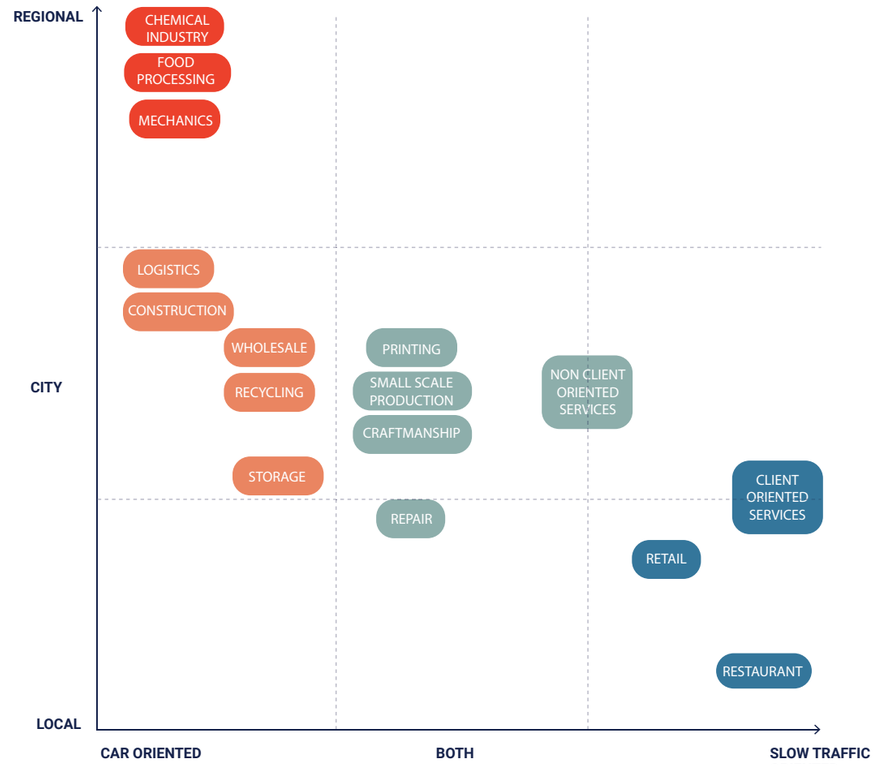
Regarding space requirements, it was observed that most functions require access to the ground floor, except for non-oriented services, which exhibit more flexibility in terms of spatial needs. The need for space can be roughly clustered into three groups, with industrial functions typically requiring larger areas compared to other sectors.

When considering accessibility, it became evident that businesses with a more regional focus tend to be car-oriented. On the other hand, those with a local scope or catering to slow traffic options show a preference for alternative modes of transportation, such as walking, cycling, or public transport.

The ability to mix with other functions was analyzed in relation to the level of nuisance associated with each sector. It was observed that as the level of nuisance increases, the ability to coexist and integrate with other functions decreases. Sectors that generate higher levels of nuisance, such as heavy industries, may face limitations in terms of their compatibility with adjacent land uses.

By understanding these distinct needs and characteristics of different sectors, informed decisions can be made regarding the allocation and clustering of businesses within the area. This knowledge can guide urban planning and development strategies, allowing for the creation of suitable environments that accommodate the specific requirements of industries while promoting a harmonious coexistence with other functions and ensuring the overall livability of the region





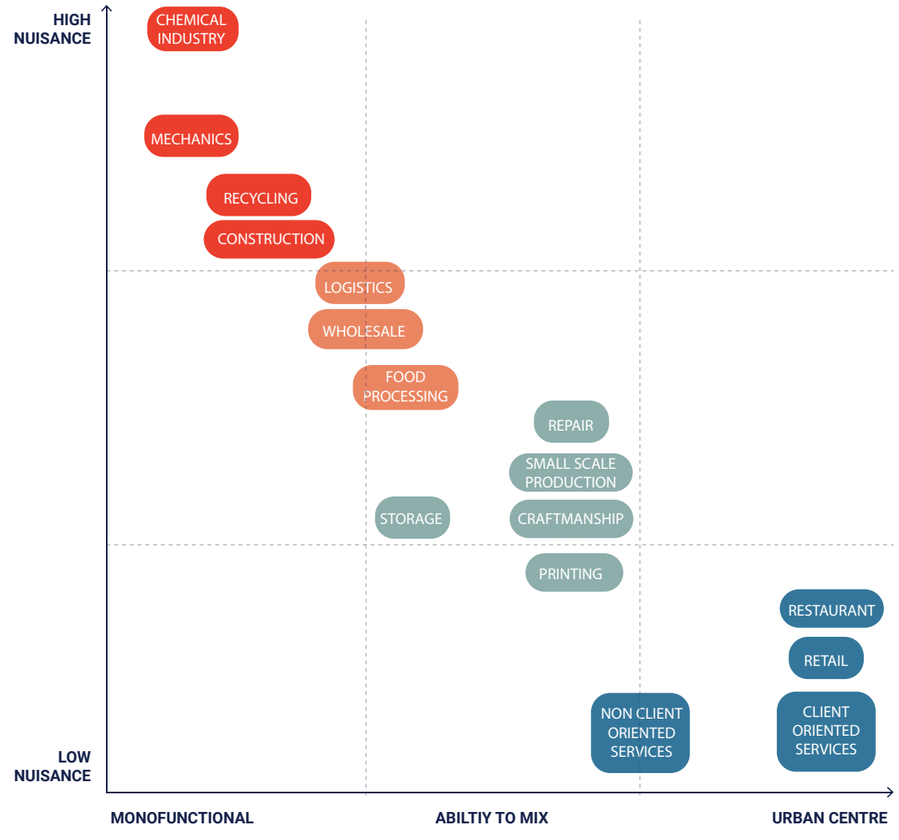


Figure 151-153: needs of industries, made by author

9.2 STRATEGIC OVERVIEW

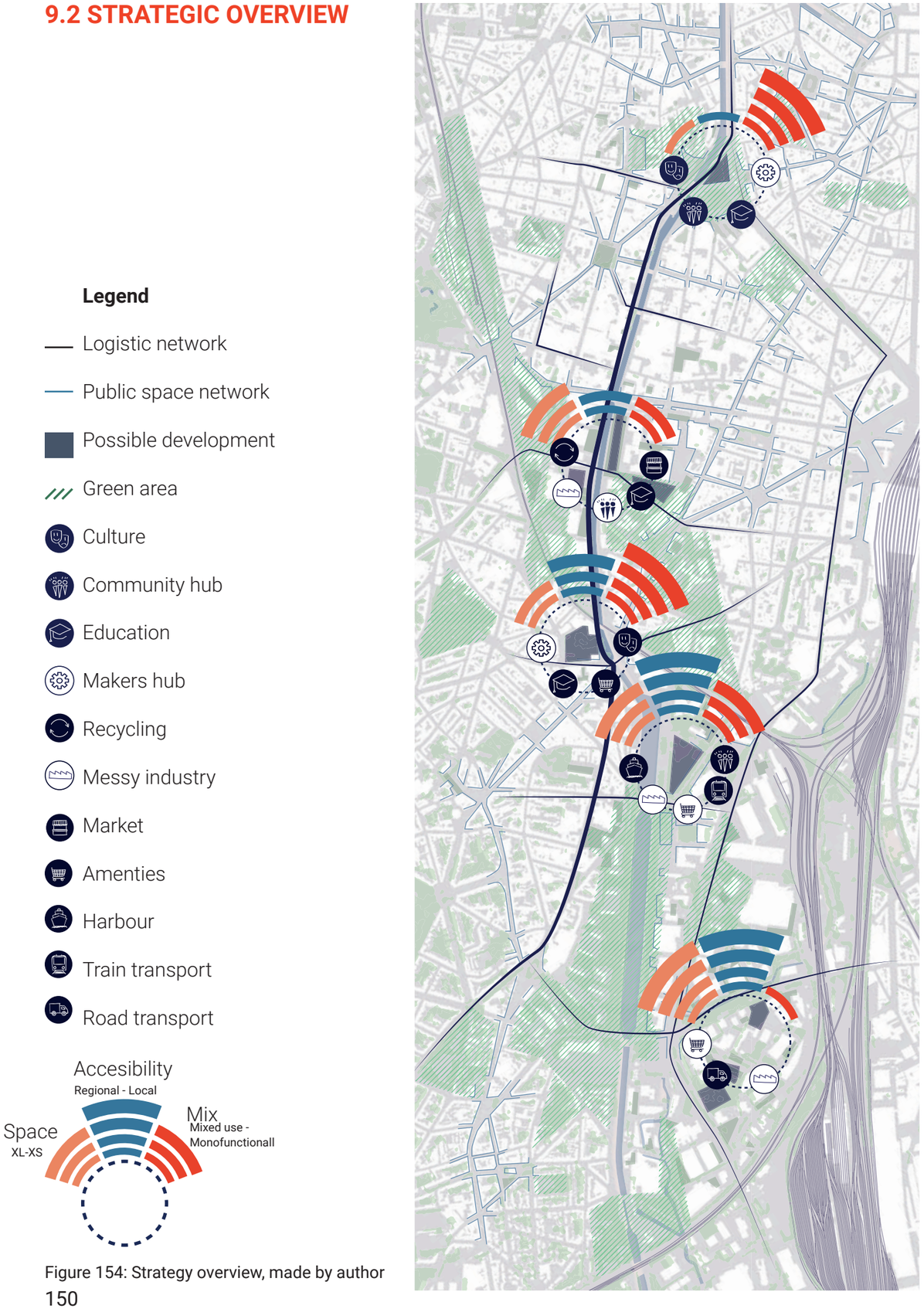


Figure 154: Strategy overview, made by author

A new economic ecosystem is being developed through the establishment of five hubs, each with its unique characteristics in terms of space, connectivity, and mixed use. These hubs are strategically located within clusters of vacant spaces and offer a wide range of amenities tailored to their specific areas.

To connect these hubs effectively, two networks have been established. The first is a logistical network running along the canal, primarily serving the industrial sector and accommodating heavy traffic. This network includes a main route that intersects with secondary routes, ensuring accessibility to all industries within the area. The second network is a walkable network designed to support slow traffic, featuring dedicated cycling lanes and spacious sidewalks. Car accessibility may be limited within this network, which focuses on connecting centralities and public spaces.

In order to enhance liveability, existing parks are being upgraded and new green spaces are being created. Streets are also being transformed into greener corridors, benefiting both the logistical and walkable networks. This emphasis on green spaces aims to improve the overall quality of life for residents in the area.

To support the implementation of this strategy, a pattern language has been developed, encompassing patterns applicable to every scale. These patterns are derived from theories, fieldwork, and/or research by design. They are organized into three categories: program and policy, built form, and network and public space. This pattern language provides a framework for guiding the development process and ensuring coherence and effectiveness in achieving the desired outcomes.

9.3 SYSTEMIC SECTION

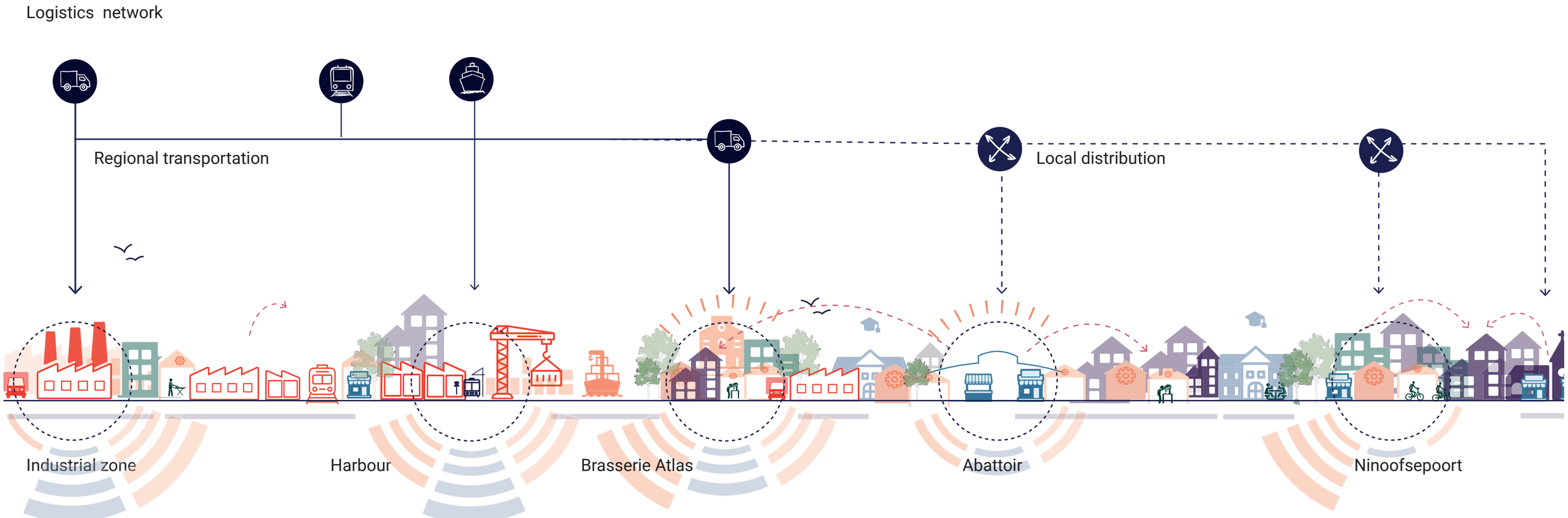


Figure 155: systemic section, made by author

9.4 STAKEHOLDERS

Governance encompasses a broad range of processes involved in governing, extending beyond the scope of government institutions. It involves various actors such as market participants and networks, and operates through a combination of laws, norms, power dynamics, and language. Unlike traditional government-focused approaches, governance emphasizes social practices and activities that shape decision-making and resource allocation (Bevir, 2012, p. 2-3).

In order to ensure fairness and inclusivity in the governing process, it is vital to incorporate diverse voices and provide avenues for their expression. Recognizing the importance of different stakeholders is particularly crucial in the context of planning, as it involves coordinating various parties with distinct objectives. One effective method for understanding stakeholders is by employing a power-interest matrix (Rocco, 2021a).

Stakeholders in this project can generally be categorized into four primary groups. The first group consists of public organizations and semi-public institutions, such as ports, which hold significant power. Investors and developers also fall into this category, although their level of interest may initially be low.

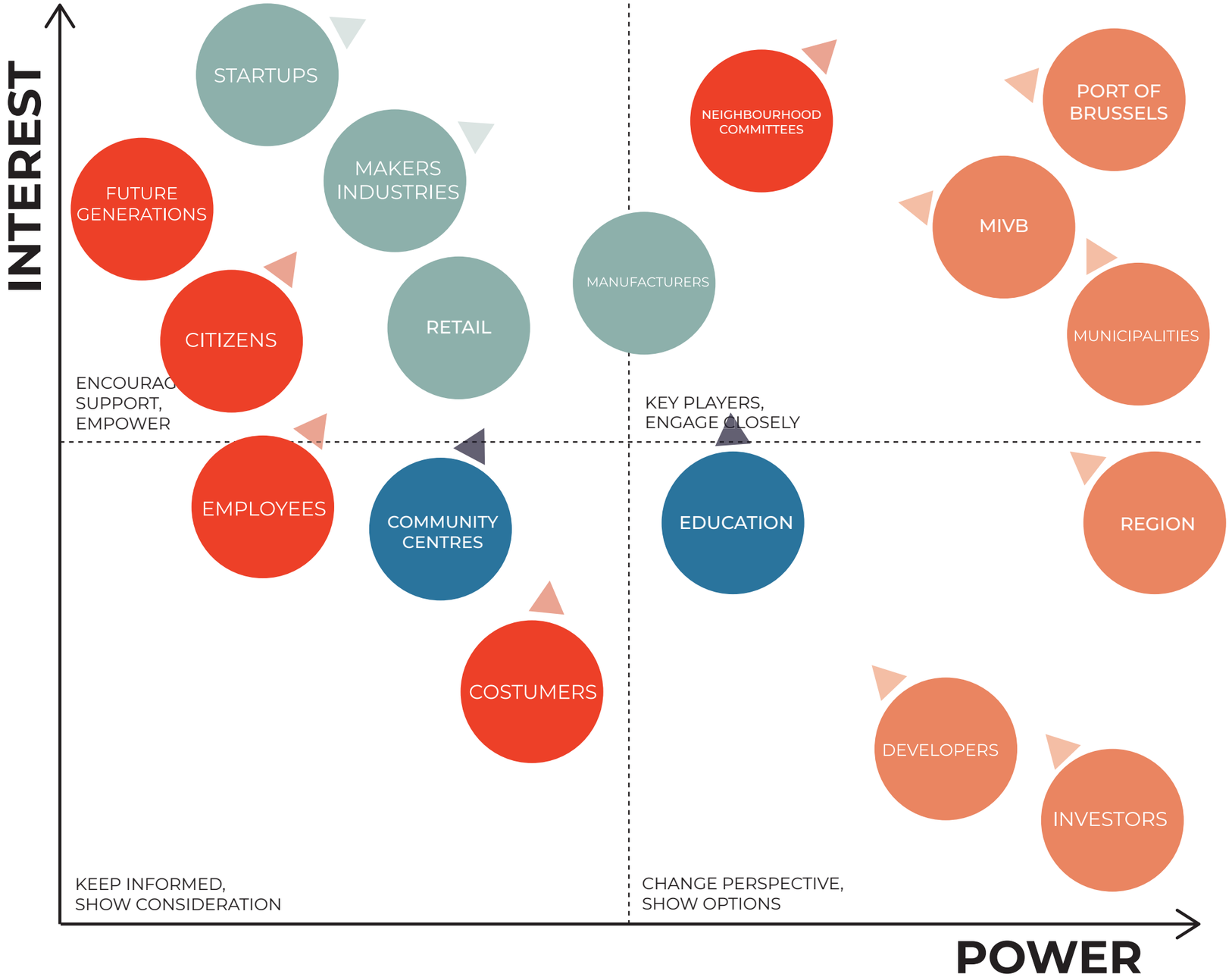
The second sector comprises society as a whole, which includes ordinary citizens, small business owners, and employees. While these stakeholders may possess limited power individually, they can be effectively engaged through mechanisms such as neighborhood committees, where collective voices can be heard.

The third category encompasses public facilities, such as educational institutes, community centers, and associations. These entities hold more power than individual citizens and serve as important collaborative partners in governance initiatives. Their involvement can enhance the inclusivity and effectiveness of the decision-making process.

Lastly, businesses form the fourth category, and their power levels can vary based on their size and influence. Businesses are highly interested stakeholders and engaging with them is critical.

Legend

- Society
- Governance
- Public facilities
- Bussinesses



9.5 PROCESS

The strategy employs three different stakeholder engagement approaches for various elements within its framework. These approaches are built upon the existing model of neighborhood committees and neighbourhood contracts
For each neighbourhood contract, the establishment of a neighborhood commission is required. The commission plays a vital role in defining the objectives of each contract, encompassing both program development and implementation.
The neighborhood commission is formed during the initial general meeting of the neighborhood. It consists of residents within the specified perimeter, representatives from local associations, traders operating within the neighborhood, and representatives from various government entities such as the region and municipality.
To effectively define the contract's objectives, the commission can be divided into specialized working groups. Additionally, the commission is responsible for closely monitoring the operations of the district contract throughout its entire operational phase (Duurzame Wijkcontracten, z.d.)
.
The municipality convenes the neighborhood commission at least four times during the program's development phase, a minimum of twice per year during the implementation phase, and no fewer than twelve times throughout the entire duration of the program. Furthermore, the municipality calls for the neighborhood commission to meet at least once a year during the program's implementation.

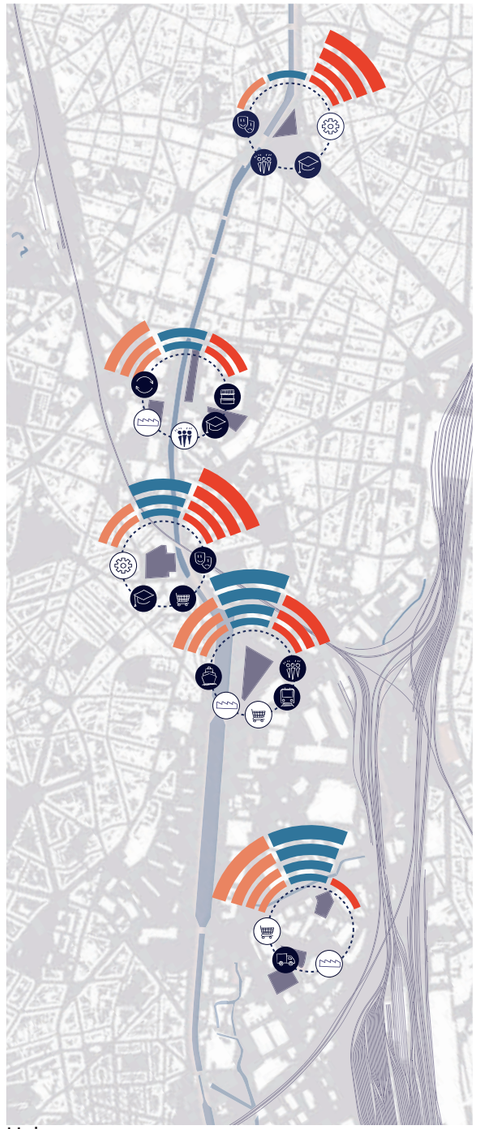
This already existing engagement strategy can be used in different forms for the different elements in this strategy, namely: small scale projects, hubs and network.

Small-scale projects are implemented using a bottom-up and co-design approach, organized by the neighbourhood committees. These committees will have a very active role in shaping these projects. These projects are mainly about already upgrading already existing spaces, like parks, squares and streets. These projects have a relatively short time span, with a maximum duration of four years.



Small scale projects

Hubs, on the other hand, involve medium-scale projects that employ a combination of both bottom-up and top-down approaches. These projects are facilitated by municipalities and encourage collaboration between different neighbourhoods and municipalities. The same principle of neighbourhood committees can be used, but on more of a munipality scale. These committees have less of an active role in organisation, but will be constantly engaged. They also involve the participation of design offices and incorporate workshops, co-design sessions, and public consultation events. Hubs have a longer time span, typically spanning around eight years.



Hubs

Lastly, the **network** is a large-scale project that connect and coordinate small-scale initiatives. The network approach involves a top-down coordination aspect while also incorporating bottom-up involvement through engagement with all neighbourhood and hub committees. Representatives of these committees can be more actively engaged. Collaboration between municipalities is crucial, and the network's facilitation is carried out at the regional level. Design offices and mobility advisors are involved on this larger scale. Public consultation events are also held within the network approach.



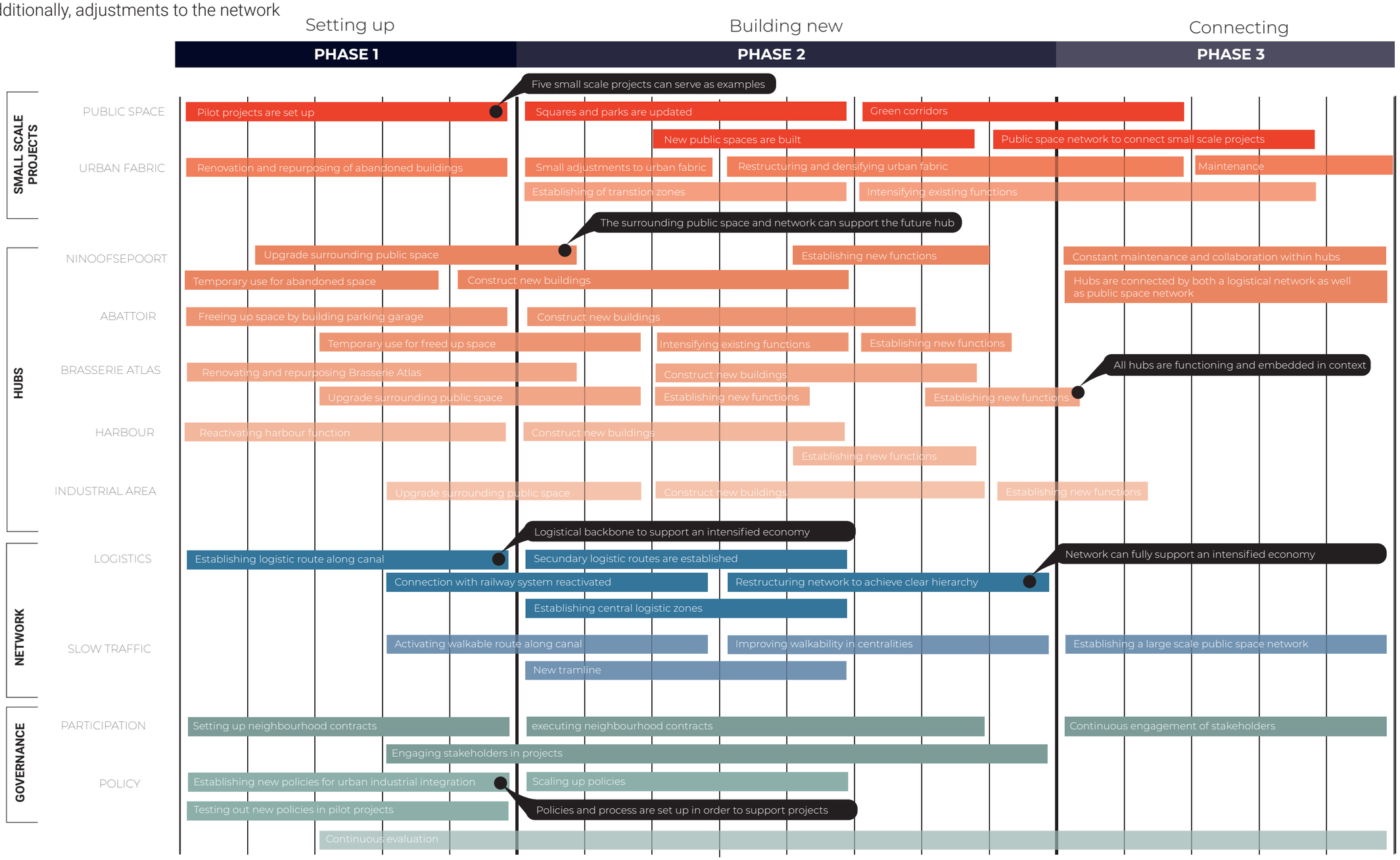
Network

9.6 PHASING

This process is also manifested in the three-phased approach adopted. The initial phase is dedicated to experimentation, establishing neighbour contracts, and formulating relevant policies. Pilot projects are initiated during this phase, providing valuable learning experiences for subsequent phases. It is crucial to address degraded or abandoned buildings in this phase, offering them temporary use to prevent further decay. Additionally, adjustments to the network are made to facilitate its smooth intensification in later stages.

The second phase focuses on constructing new elements. Hubs are established, and the network is expanded and updated. Small-scale projects are strategically implemented in key locations. Also the surrounding urban fabrics are restructured, enabling an intensified use.

Finally, in the third phase, the small-scale projects are interconnected through a comprehensive public space network. The hubs are seamlessly integrated into their surroundings, constantly seeking updates, maintenance, and new collaborations. This phase aims to fully establish the new ecosystem in Brussels.

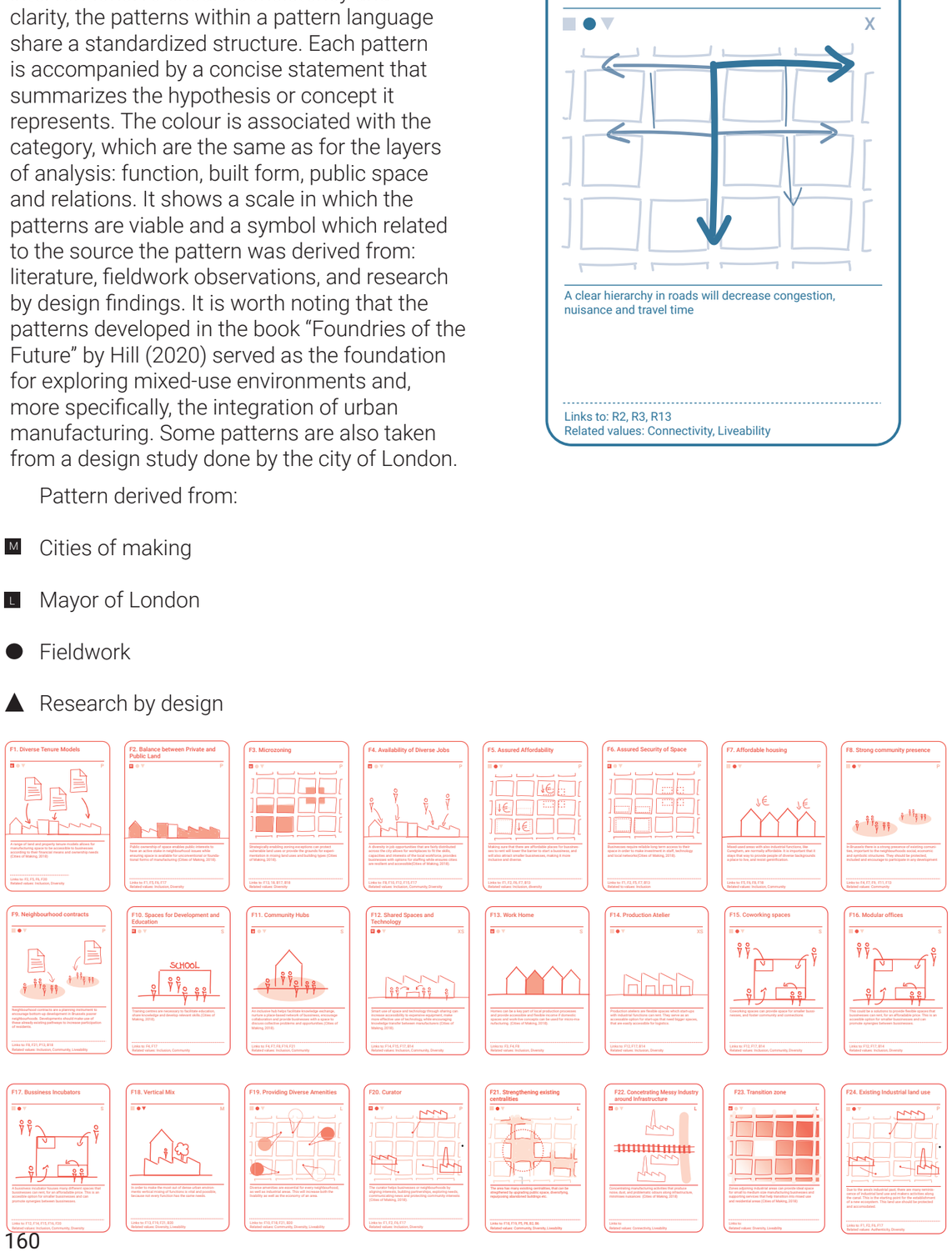


9.7 PATTERN LANGUAGE

A pattern language is a valuable tool for comprehensively understanding the relationships between different design interventions.To ensure consistency and clarity, the patterns within a pattern language share a standardized structure. Each pattern is accompanied by a concise statement that summarizes the hypothesis or concept it represents. The colour is associated with the category, which are the same as for the layers of analysis: function, built form, public space and relations. It shows a scale in which the patterns are viable and a symbol which related to the source the pattern was derived from: literature, fieldwork observations, and research by design findings. It is worth noting that the patterns developed in the book “Foundries of the Future” by Hill (2020) served as the foundation for exploring mixed-use environments and, more specifically, the integration of urban manufacturing. Some patterns are also taken from a design study done by the city of London.

Pattern derived from:

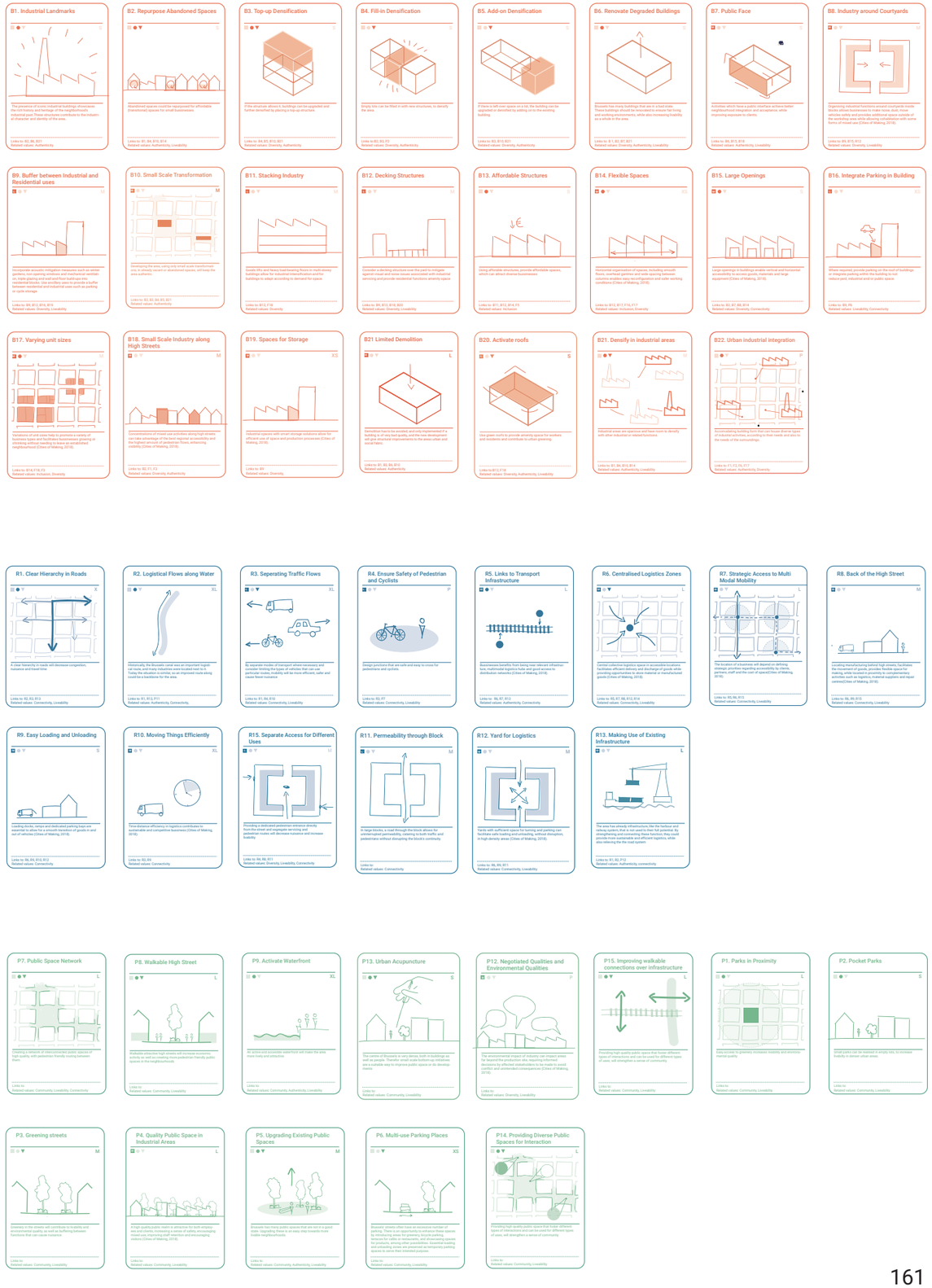
- M Cities of making
- L Mayor of London
- ● Fieldwork
- ▲ Research by design



R1. Clear Hierarchy in Roads

A clear hierarchy in roads will decrease congestion, nuisance and travel time

Links to: R2, R3, R13
Related values: Connectivity, Liveability



9.8 FUNCTION

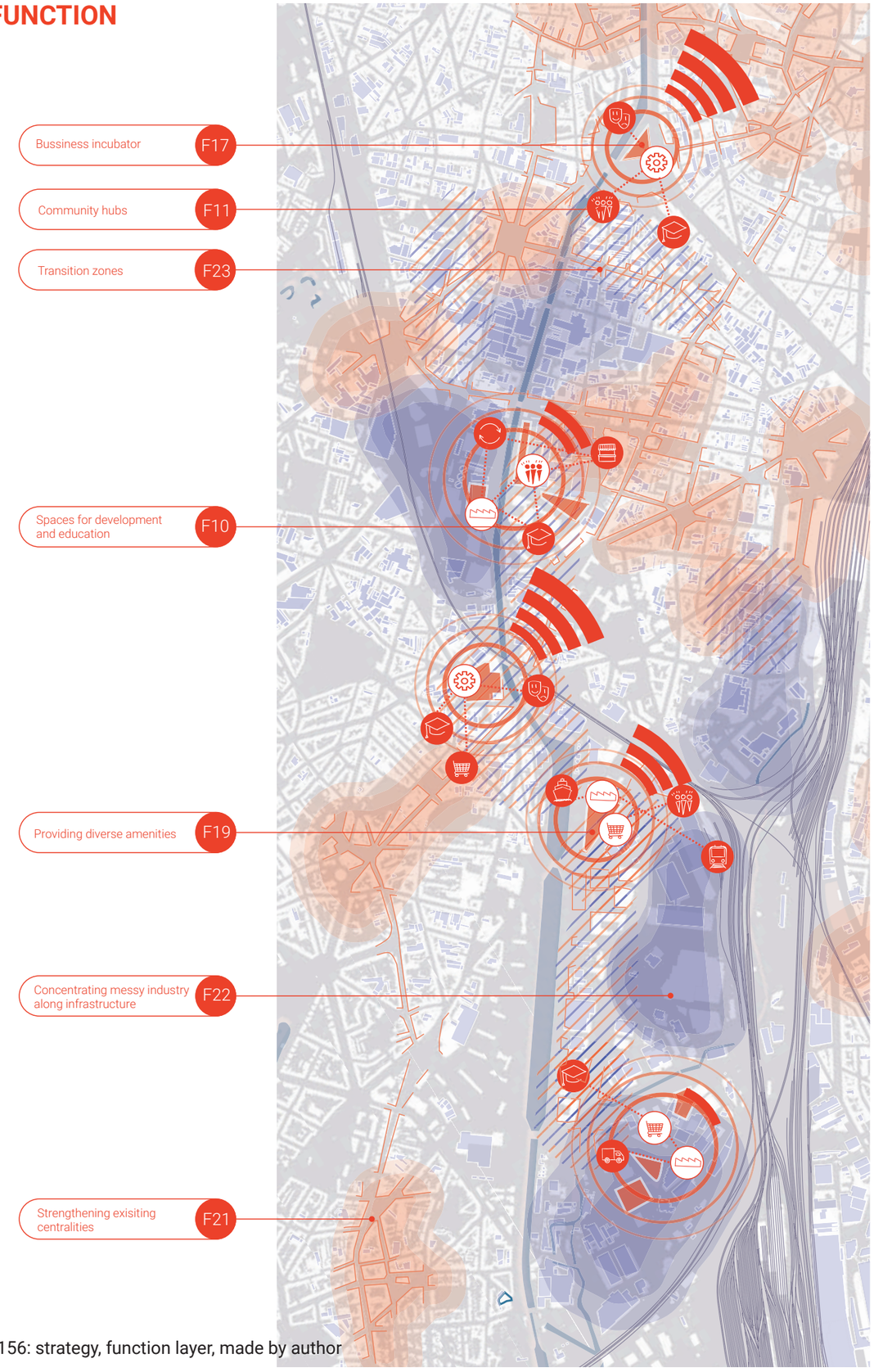


Figure 156: strategy, function layer, made by author

The development of functional hubs is crucial for the revitalization of the canal area. These hubs will serve as dynamic centres that accommodate a diverse range of activities. Each hub will have its own specific functions, tailored to meet the needs of its surrounding context.

One important hub is Ninoofsepoort, which will act as a vital link between the city centre and the canal area. This hub presents an opportunity to extend the centrality of the city into the canal zone. By connecting various community, cultural, and educational functions within Ninoofsepoort, we can foster a sense of integration and create a vibrant node.

Another significant hub is Abattoir, which already serves as a bustling market. By further enhancing the market function and incorporating surrounding industrial activities, its role can be strengthen as a key economic centre. Additionally, given its proximity to educational institutions, it presents an ideal location to introduce community and educational functions, further enriching the area and fostering a sense of collaboration.

The Brasserie Atlas hub offers an opportunity to repurpose an abandoned industrial heritage as well as a vacant lot. Situated amidst residential and industrial areas, this hub is strategically positioned to connect different industrial zones and centralities. By combining elements of the area's industrial character with cultural activities, a diverse space, that engages the surrounding area can be established.

Furthermore, the development of the Biestebroeck hub is essential for the harbour area. With several new housing projects in development, it is important to integrate these residential developments with the existing harbour function. This can be achieved by introducing new amenities and community functions, fostering a sense of community and creating a harmonious blend of living and working environments.
Lastly, the industrial area itself will predominantly cater to industrial activities. However, along the main roads leading towards the canal, it is important to provide diversification in amenities to serve the needs of the new housing projects and the workers in the area. This balanced mix of functions will contribute to the overall livaebility of the canal area.

Values in this layer:

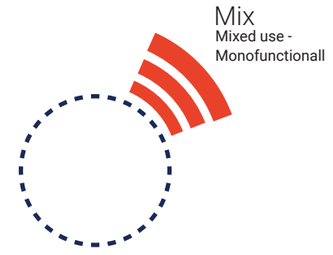
Community
- *Strengthening centralities*
- *Providing community spaces*

Inclusion
- *Providing education*
- *Providing diverse job opportunities*

Diversity
- *Providing diverse amenities*
- *Mixed-use developments*

Legend

- Intensify Industrial area
- Transition zone
- Strengthen centrality
- Market
- Amenties
- Harbour
- Train transport
- Road transport
- Culture
- Community hub
- Education
- Makers hub
- Recycling
- Messy industry



Socio-economic network

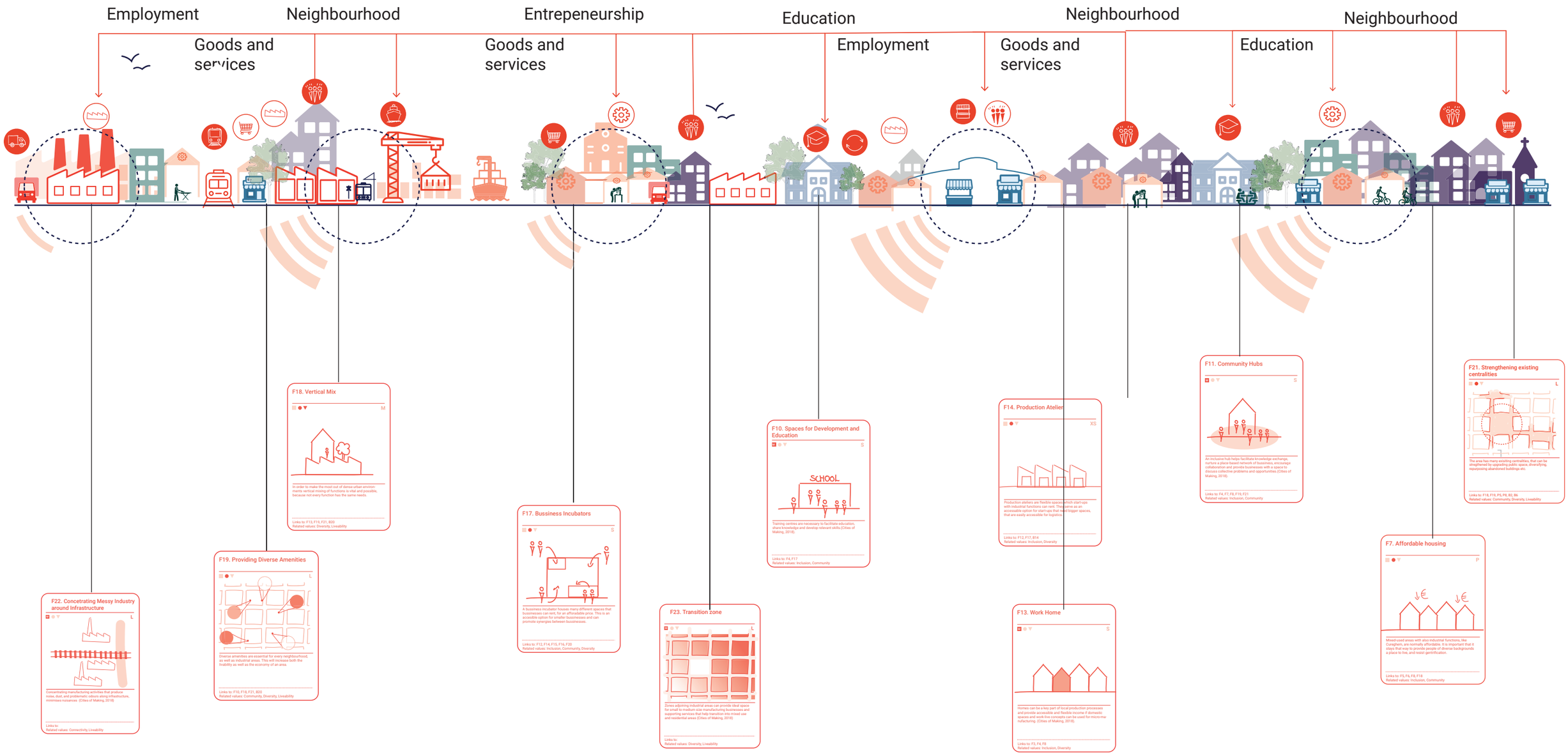


Figure 157: systemic section function layer, made by author

9.10 EXPLORING PATH RENEWAL

To explore the path form path dependence to path renewal, the pattern language can be used. Depicted in the diagram on the following is a possible path in the function layer. This path begins with patterns that represent starting point, associated with the path dependent nature of the area. It ends with patterns that connect to path renewal.

The sequence of patterns that bridge the gap from point A to point B can be established. In this layer, it is evident that the establishment of policies and neighborhood contracts should precede the introduction of new functionalities.

These policies will be a foundation in which new functions can be succesfully added. Enabling these new functions will ultimately lead to the desired end goals.

It is important to note that this function layer does not exist in isolation but is interconnected with other layers. The diagram also includes the most crucial patterns.

This diagram is complemented by a spatial exploration on path renewal underneath. These sequence of maps shows the transformation of the existing situation to the possible final outco-

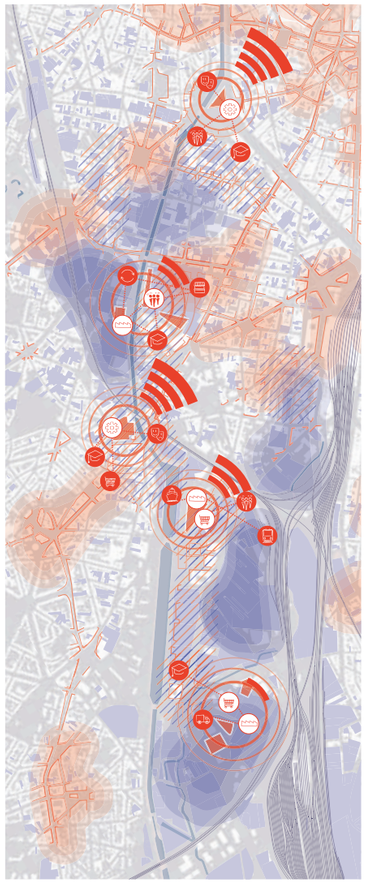
Existing situation: Current retail lints and centralities, intertwined with industrial land use. Relevant function Around hubs which need to be engaged.



Establishing of hubs: Transition zones are added and existing functions as well as new functions are connected in the hubs

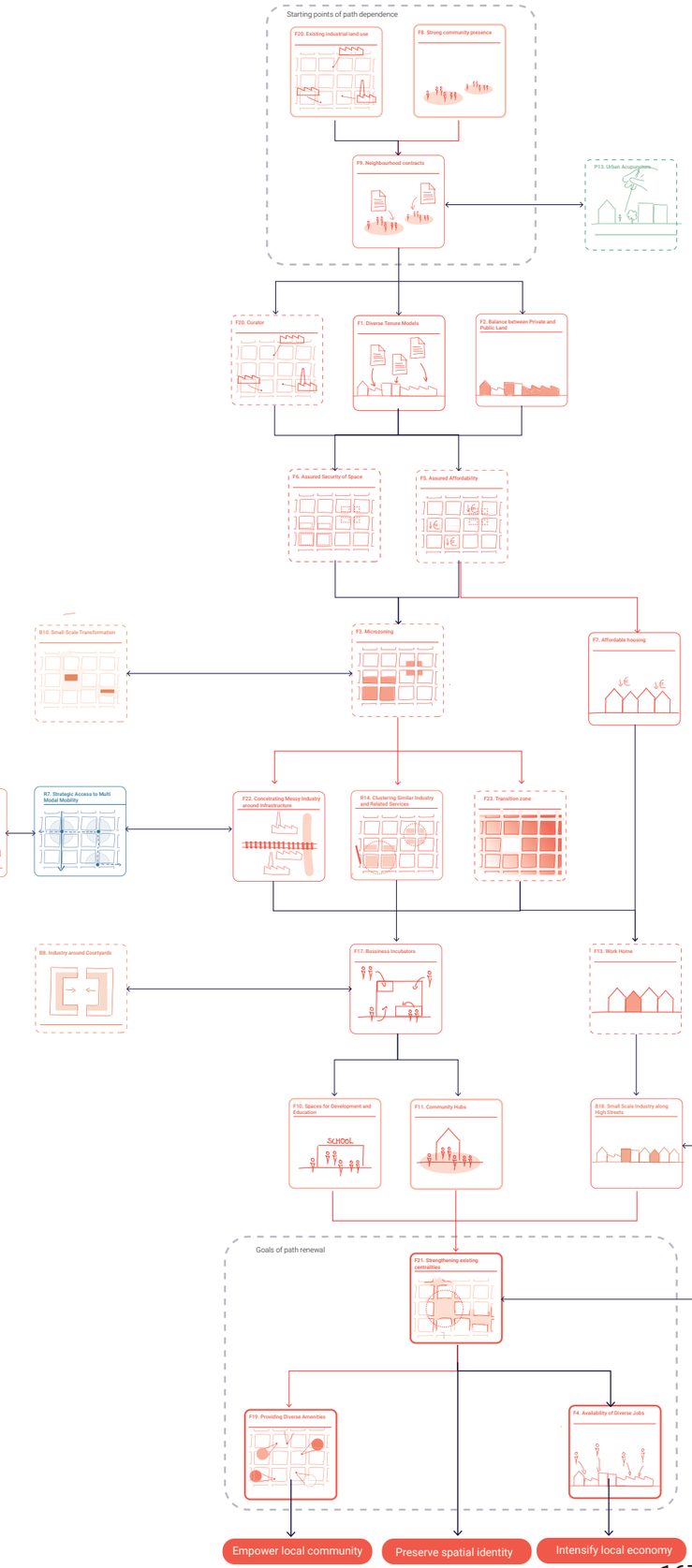


Restructuring of surroundings: the industrial area is intensified by densifying and existing centralities are strengthened by connecting them with a walkable network



Legend

- Needs to be engaged
- Needs to be upscaled
- Needs to be added
- End goal
- Follow- up
- Requirement
- Connection



9.11 BUILT FORM



Figure 158: Strategy, built form layer, made by author

The strategy is based on the existing urban fabric and will aim to improve this rather than transform. Only vacant sites and abandoned buildings we be the base for bigger developments. The design of these built forms will be influenced by the surrounding context, ensuring a harmonious integration with the existing fabric.
Different typologies will require specific strategies to achieve their transformation. In the fine-grained fabric, the focus will be on upgrading and renovating existing structures. Due to the area's high density and architectural value, there may be limited opportunities for significant changes. Therefore, the emphasis will be on enhancing and preserving the existing built environment.

In the medium-grained fabric, the goal will be to repurpose and intensify the area. By rethinking a significant portion of the car trade industry, there is potential to free up space for new developments. This opens opportunities for innovative design approaches and the creation of mixed-use environments that can cater to a variety of functions and activities.

The large-grained fabric offers more space and flexibility for interventions. Currently characterized by large blocks, there is an opportunity to densify and diversify this fabric by introducing finer-grained elements. This can involve creating smaller-scale developments and incorporating a mix of functions, adding vibrancy and variety to the area.

Overall, the built form within the canal area hubs will be guided by a careful balance between preservation, adaptation, and new construction. By considering the unique characteristics of each fabric type and implementing appropriate strategies, the built environment can be transformed to meet the needs of the community while respecting the area's existing architectural heritage

Values within this layer:

Inclusion:
- *Providing affordable spaces*

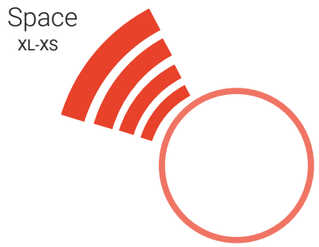
Diversity
- *Providing diverse spaces*

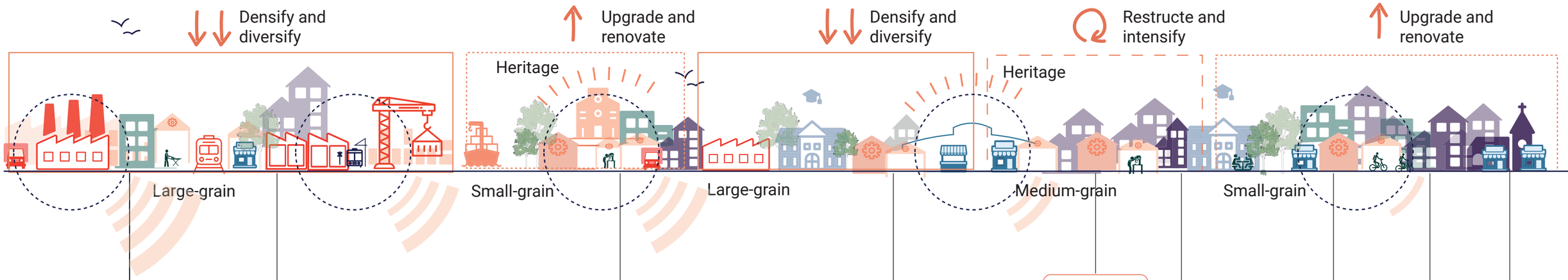
Authenticity
- *Limited demolition*
- *Heritage*
- *Small scale transformation*

Legend

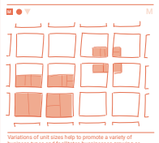
- Possible development locations
- Densify
- Rethink
- Update
- Repurpose vacancies
- Industrial heritage
- Repurpose heritage

Space
XL-XS





B17. Varying unit sizes



Variations of unit sizes help to promote a variety of business types and facilitates bussinesses growing or shrinking without needing to leave an established neighbourhood (Cities of Making, 2018).

Links to: B14, F18, F3
Related values: Inclusion, Diversity

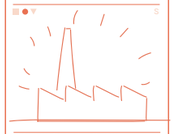
B11. Stacking Industry



Goods lifts and heavy load-bearing floors in multi-storey buildings allow for industrial intensification and for buildings to adapt according to demand for space.

Links to: B13, F18
Related values: Diversity

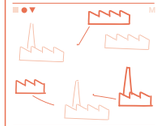
B1. Industrial Landmarks



The presence of iconic industrial buildings showcases the rich history and heritage of the neighborhood's industrial past.These structures contribute to the industrial character and identity of the area.

Links to: B2, B6, B21
Related values: Authenticity

B21. Densify in industrial areas



Industrial areas are spacious and have room to densify with other industrial or related functions.

Links to: B1, B4, B10, B14
Related values: Authenticity, Liveability

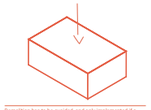
B2. Repurpose Abandoned Spaces



Abandoned spaces could be repurposed for affordable (transitional) spaces for small bussinesses

Links to: B1, B4, B10, B14
Related values: Authenticity, Liveability

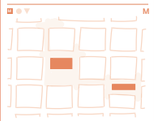
B21 Limited Demolition



Demolition has to be avoided, and only implemented if a building is of very bad quality, and the new development will give structural improvements to the areas urban and social fabric.

Links to: B1, B3, B4, B10
Related values: Authenticity

B10. Small Scale Transformation



Developing the area, using only small scale transformations, in already vacant or abandoned spaces, will keep the area authentic.

Links to: B2, B3, B4, B5, B21
Related values: Authenticity

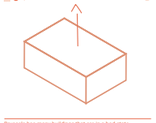
B18. Small Scale Industry along High Streets



Concentrations of mixed use activities along high streets can take advantage of the best regional accessibility and the highest amount of pedestrian flows, enhancing visibility (Cities of Making, 2018).

Links to: B2, F1, F3
Related values: Diversity, Authenticity

B6. Renovate Degraded Buildings



Brussels has many buildings that are in a bad state. These buildings should be renovated to ensure fair living and working environments, while also increasing livability as a whole in the area.

Links to: B 1, B2, B7, B21
Related values: Diversity, Authenticity, Liveability

9.12 EXPLORING PATH RENEWAL

Again we can explore path renewal through pattern language, this time in the built form layer.

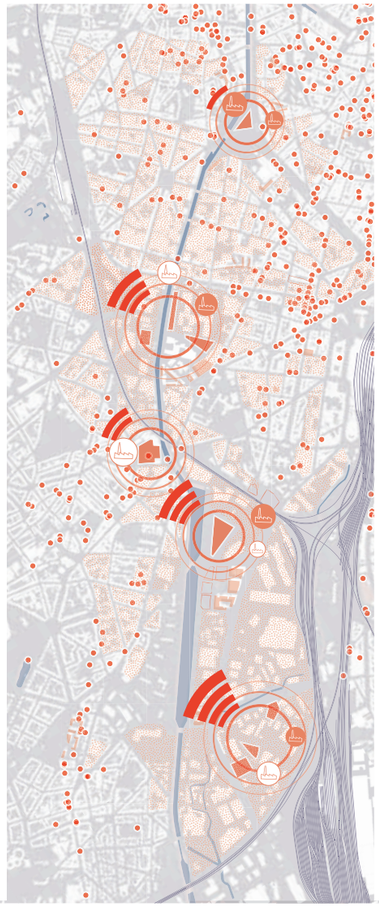
First the renovation and repurposing of already existing spaces is prioritised in order for them to not degrade further. Than through small scale transformation, bigger changes to existing buildings can be made, or new buildings can be constructed. These can make use of the patterns that concretely make industrial urban integration possible. Buildings do not stand on their own and our connected through networks, therefore the connection with relations layer is crucial. This will eventually make industrial urban integration possible.

Again this exploration is comlemented with a spatial exploration.

Existing situation: Three different urban fabric types, as well as many abandoned buildings and heritage Clusters of empty space that could be developed



Establishing of hubs: Abandoned buildings are renovated and repurposed. Empty spaces are developed. Small adjustments to existing urban fabric are made.

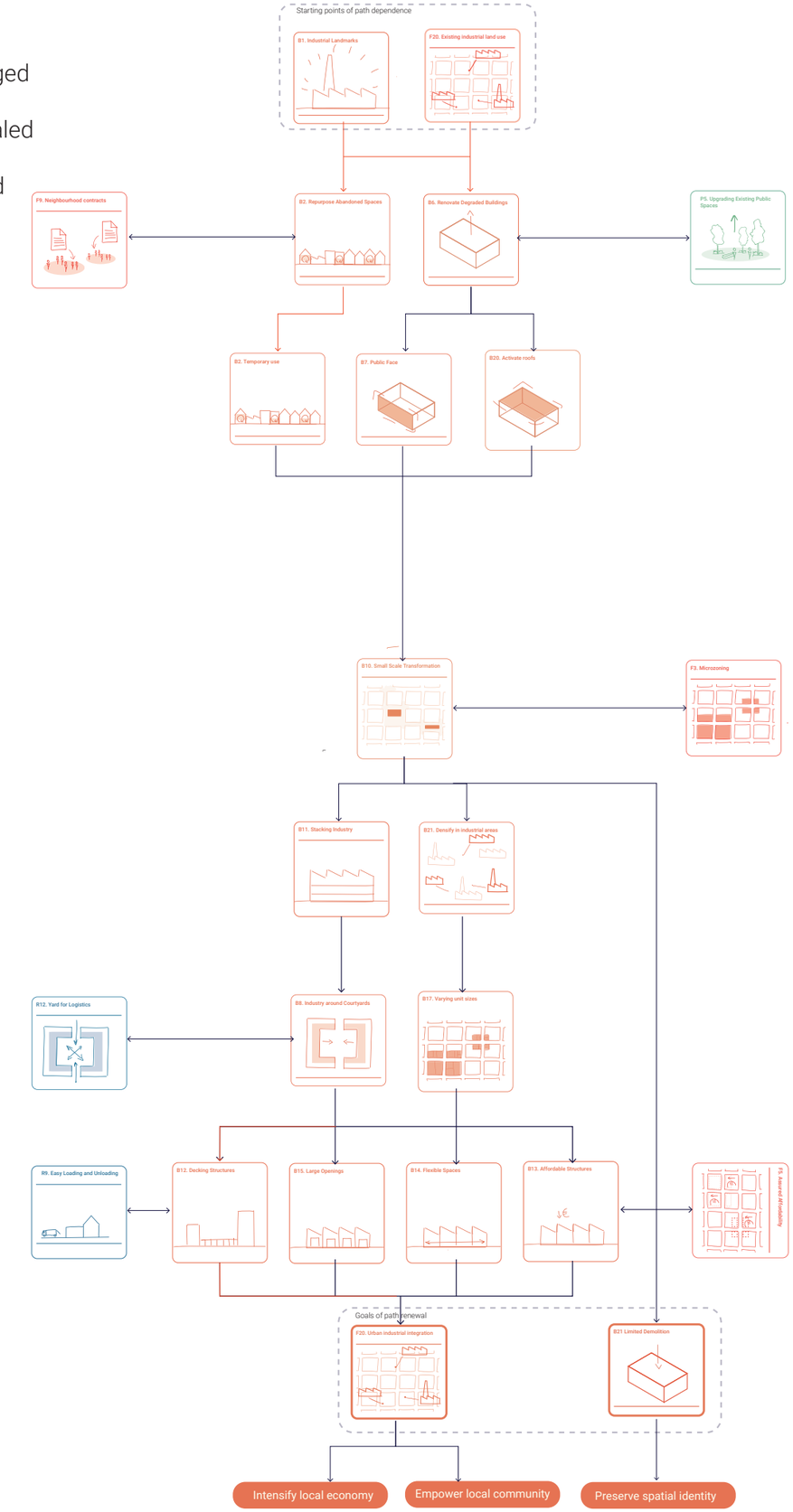


Restructuring of surroundings: The urban fabric types are dealt with in three ways: Upgrade, restructure and densify, to intensify the existing uses.



Legend

- Needs to be engaged
- Needs to be upscaled
- Needs to be added
- End goal
- Follow- up
- Requirement
- Connection



9.13 PUBLIC SPACE



Figure 160: strategy public space layer, made by author

A new economic ecosystem is being developed through the establishment of five hubs, each with its unique characteristics in terms of space, connectivity, and mixed use. These hubs are strategically located within clusters of vacant spaces and offer a wide range of amenities tailored to their specific areas.

To connect these hubs effectively, two networks have been established. The first is a logistical network running along the canal, primarily serving the industrial sector and accommodating heavy traffic. This network includes a main route that intersects with secondary routes, ensuring accessibility to all industries within the area. The second network is a walkable network designed to support slow traffic, featuring dedicated cycling lanes and spacious sidewalks. Car accessibility may be limited within this network, which focuses on connecting centralities and public spaces.

In order to enhance liveability, existing parks are being upgraded and new green spaces are being created. Streets are also being transformed into greener corridors, benefiting both the logistical and walkable networks. This emphasis on green spaces aims to improve the overall quality of life for residents in the area.

Values within this layer:

Community
- *Providing spaces to meet*

Liveability
- *High quality public space*
- *Providing green spaces*
- *Walkable public space network*

Legend

- green corridor
- green area
- Possibility for green
- Public space network
- Updated public space
- Rethink parking lot

9.14 EXPLORING PATH RENEWAL

In this layer the starting patterns are from another layer, but are preconditions for this sequence of patterns.
- ‘Existing industrial land use’, which has put pressure on the current quality of public space
- ‘Neighbourhood contracts’, which will be an integral part of upgrading public space

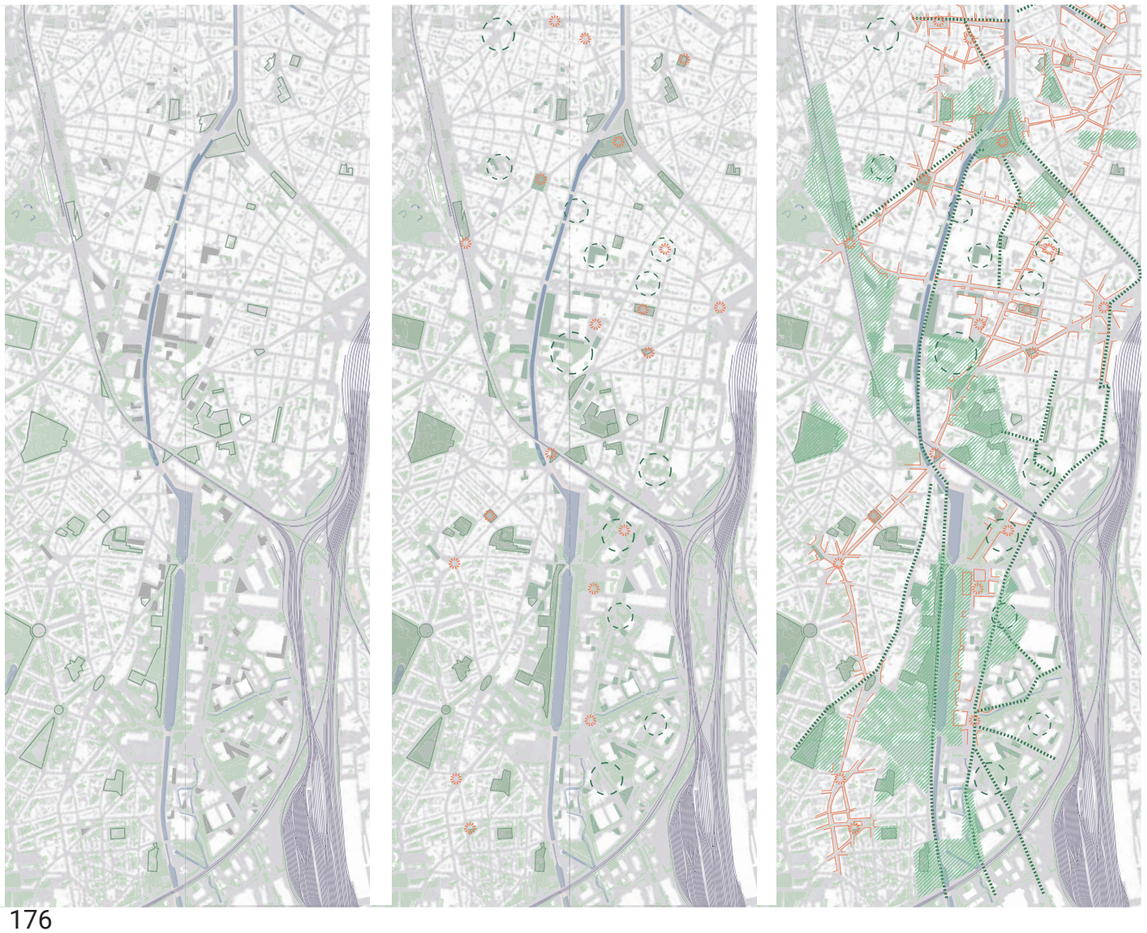
First small scale adjustments to existing spaces will be made. Than these will be strengthened by a route along the water and improved connections. Than the other connecting streets will be greened and made walkable, finally resulting in strengthening centralities and establishing a public space network of diverse spaces, as well as parks.

This layer is also closely related to the network and built form. The quality of space can only be achieved if there is an active mitigation between the values of urban industrial integration and livability.

Existing situation: Several green spaces and parks as well as parking spaces that could be repurposed and upgraded

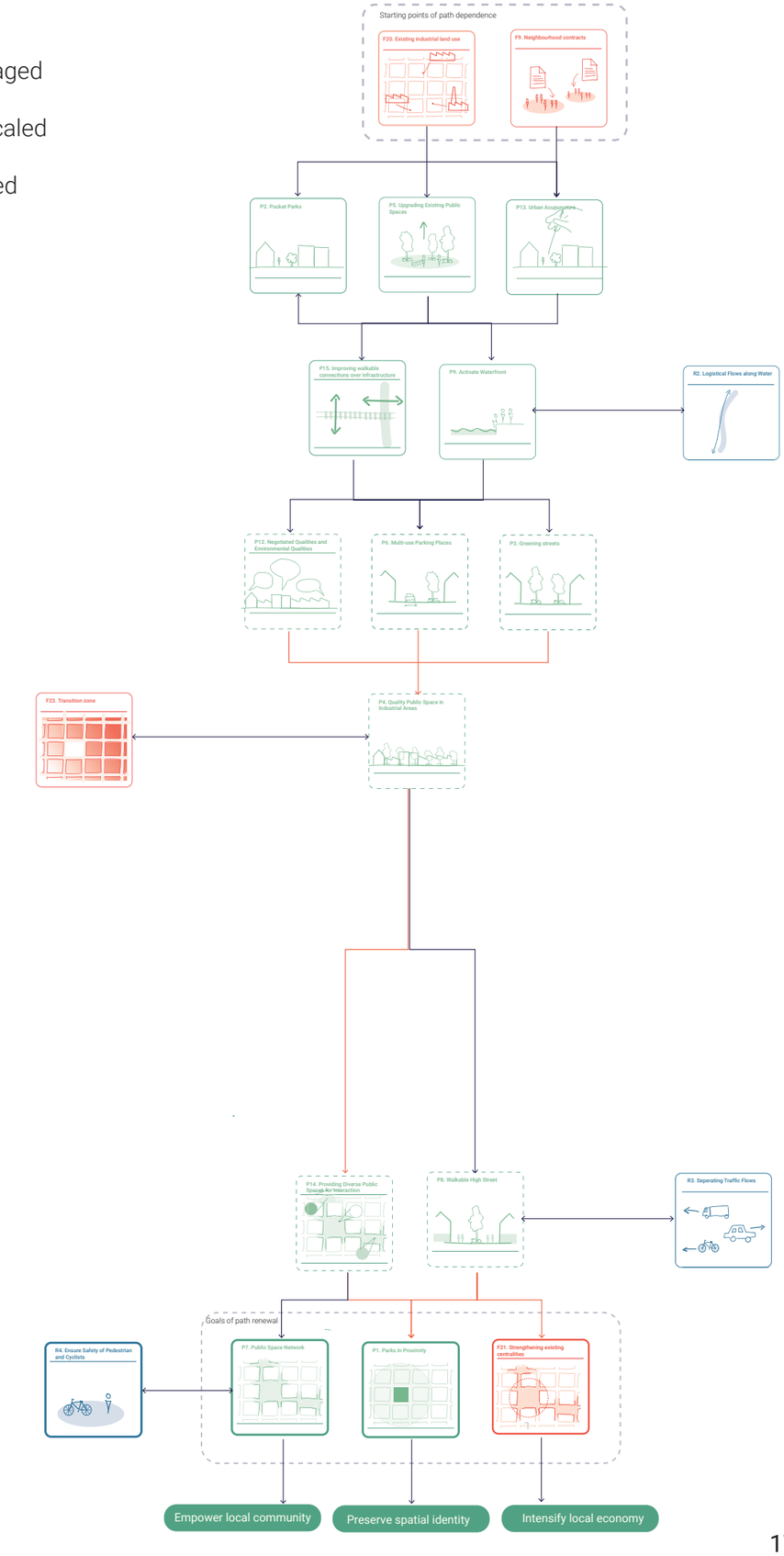
Establishing of small scale projects: On several key points existing spaces are upgraded and made more green.

Restructuring of surroundings: These small scale projects are connected to one another with green corridors and a public space network.



Legend

- Needs to be engaged
- Needs to be upscaled
- Needs to be added
- End goal
- Follow- up
- Requirement
- Connection



9.15 RELATIONS

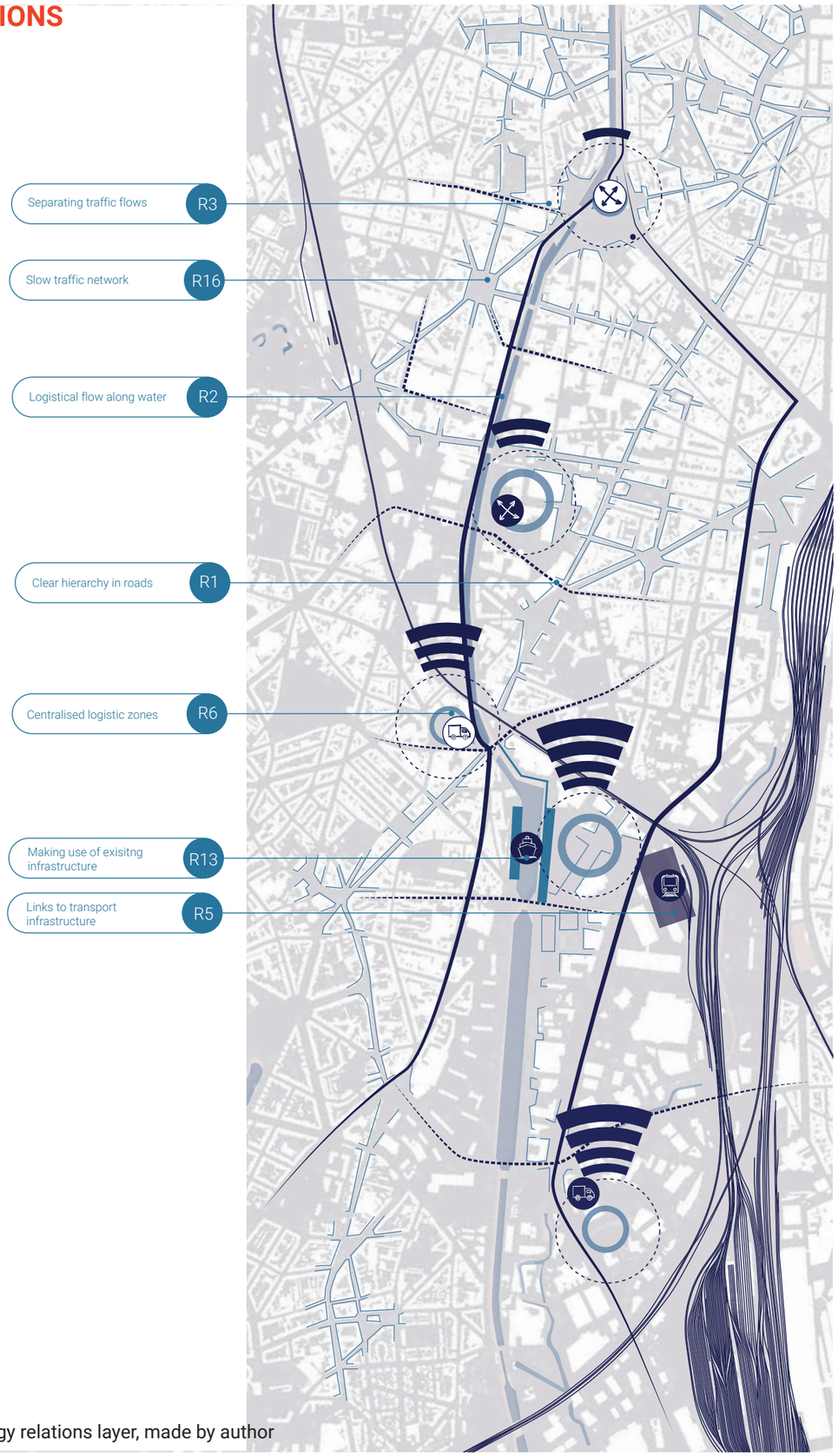


Figure 161: strategy relations layer, made by author

The improvement of public space is a crucial aspect in enhancing the overall liveability of the canal area. To achieve this, a network of high-quality public spaces will be established, mitigating nuisances that the industry might bring.

One key strategy is to connect and enhance existing retail areas, making them more walkable and reducing car access. This will not only promote pedestrian activity but also contribute to a more vibrant and engaging streetscape. Additionally, existing squares and parking lots will be upgraded and integrated into the public space network, offering opportunities for social interaction and leisure activities. Green elements will be introduced, transforming these spaces into more pleasant areas.
Moreover, existing green areas within the canal area will undergo improvements and be connected to one another through the creation of green corridors. These corridors will not only enhance the visual appeal but also provide opportunities for recreational activities and ecological connectivity. Pathways throughout the area will be carefully evaluated to identify opportunities for greening, ensuring that nature is integrated into the fabric of the canal area.

Along the canal itself, a dedicated recreational route will be established, connecting various points of interest within the area. The development and improvement of public spaces in the canal area will play a vital role in creating a vibrant and inclusive community.

Values in this layer

Liveability
- *increase walkability, by separating routes*
- *and ensuring safety of pedestrians and cyclists*

Connectivity
- *using existing infrastructure*
- *Restructuring existing road network to ensure a more efficent use*

Legend

- Main Logistical route
- Secundary logistical route
- Walkable network
- Harbour
- Train transport
- Road network
- Local logistic point

Accesibility
Regional - Local



Logistics network

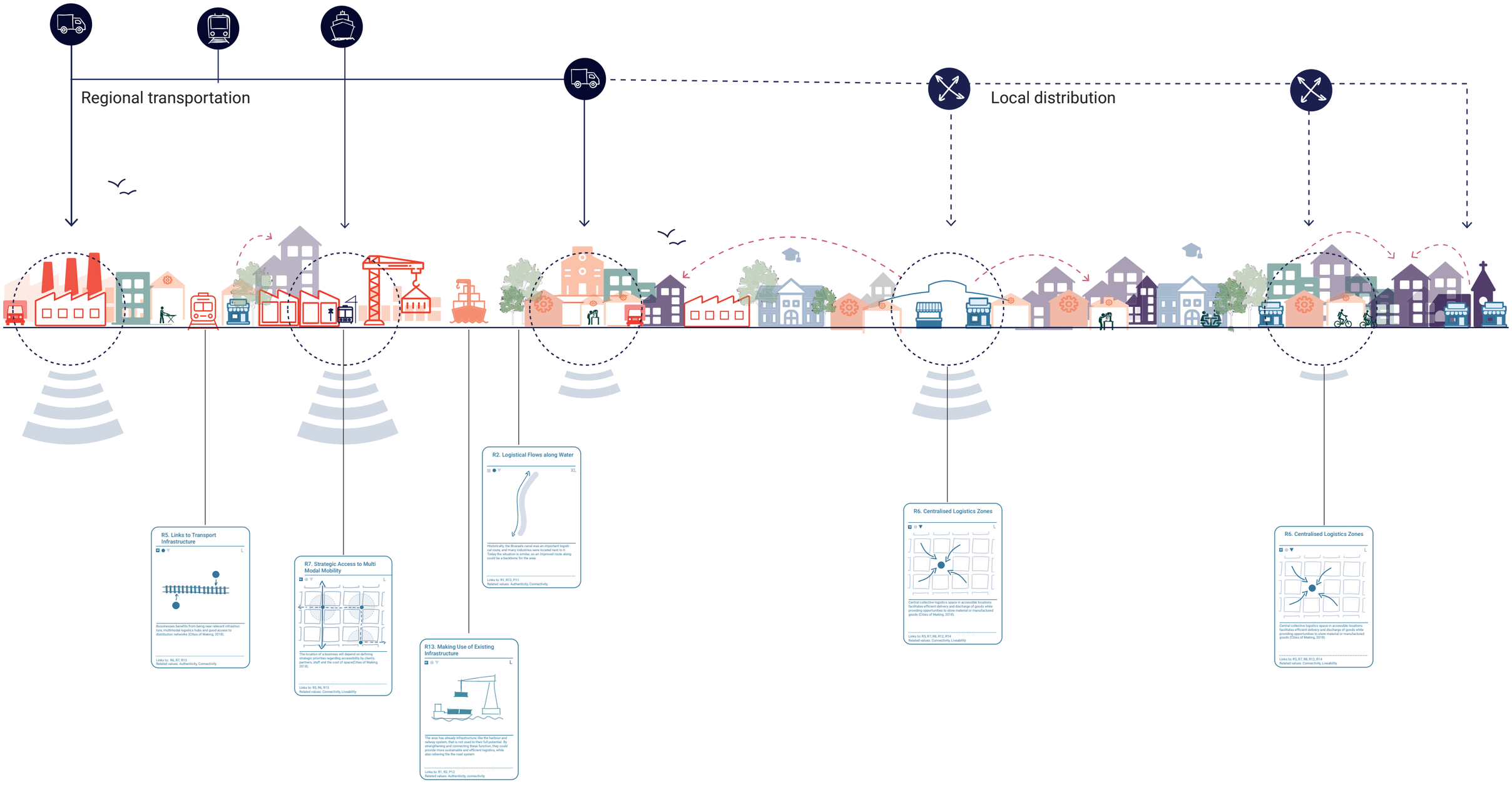


Figure 162: systemic section, relations layer, made by author

9.16 EXPLORING PATH RENEWAL

Starting points of this layer are the already existing historic infrastructures, the harbour, railway, and the logistical route along the water.

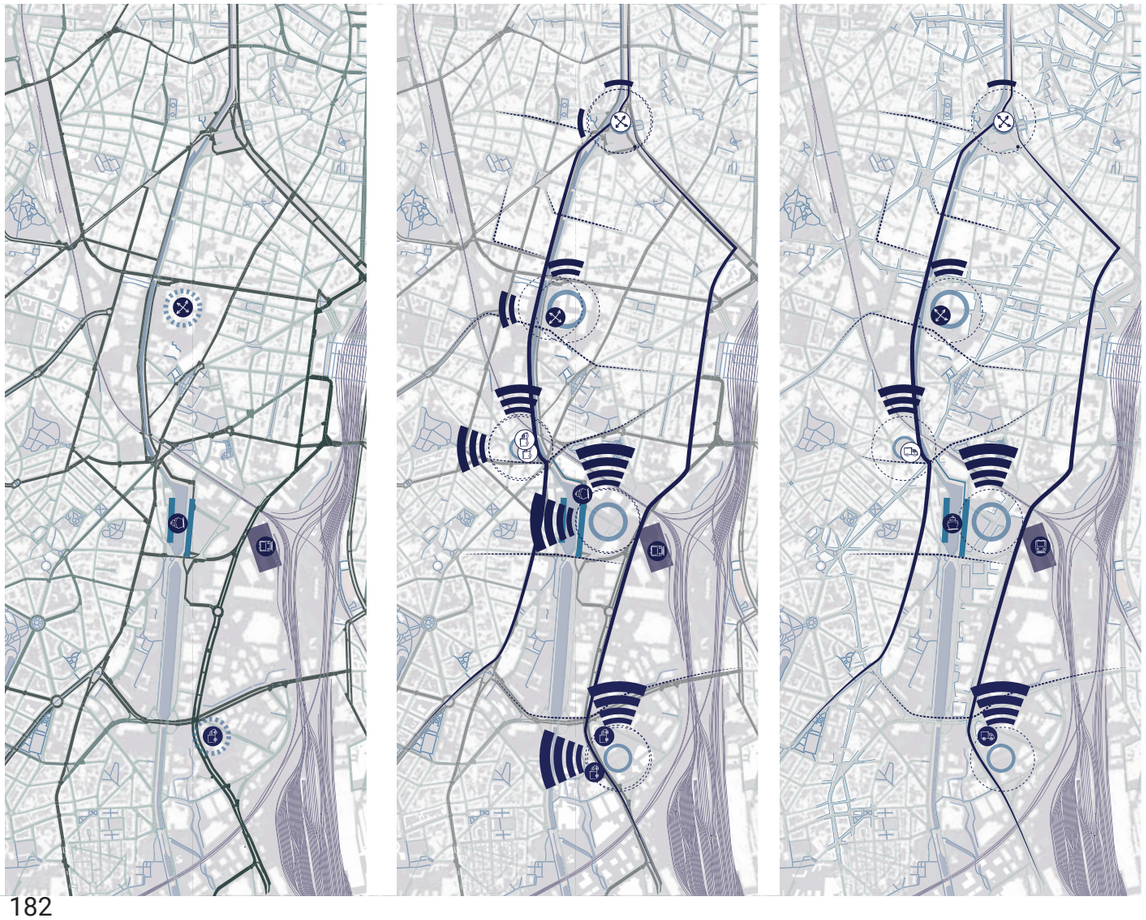
after elavating existing structure, the connection to all mobility networks should be ensured and upgraded. Than different logistical zones can be established, easing transportation. Through the separation of different traffic flows a larger as well as a block scale, transportation can be made more efficient and safe, ultimately achieving the end goals.

This layer is very much connected to both built form on a block scale, as well as public space on a larger scale.

Existing situation: Current road structure is unclear. There are several logistical function already in the area that need to be reactivated or strengthened.

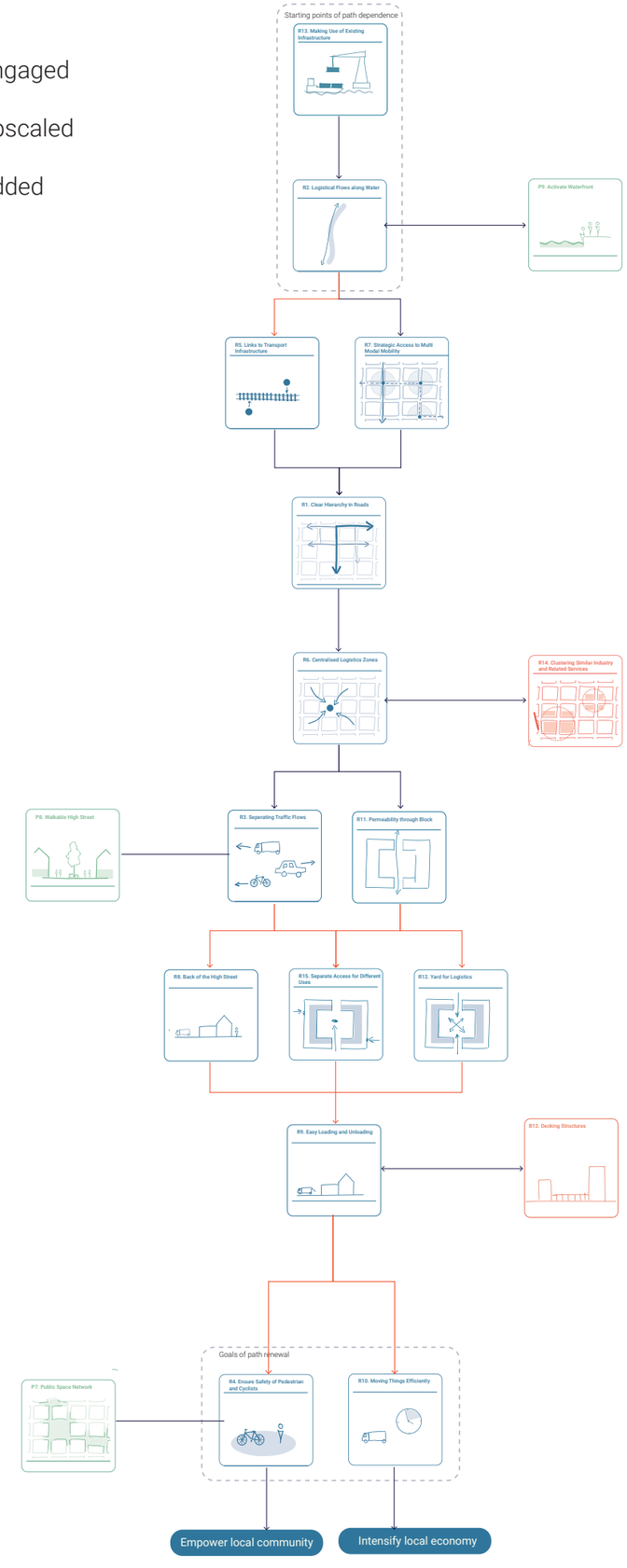
Establishing of hubs: The hubs function as central logistic zones. Connection with the harbour and rail network is reestablished. Road network is restructured

Restructuring of surroundings: A public space network is established connecting several existing pedestrian zones.



Legend

- Needs to be engaged
- Needs to be upscaled
- Needs to be added
- End goal
- Follow- up
- Requirement
- Connection



10 DESIGN TESTING



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

10.1 TYPOLOGIES OF PUBLIC SPACE

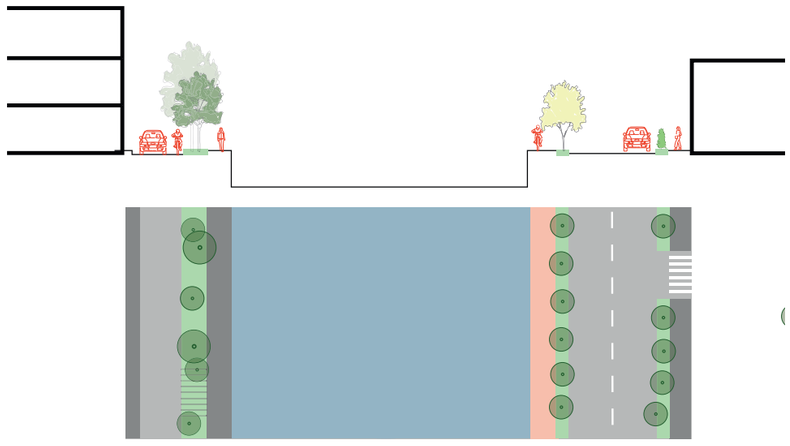
In terms of public space and network, five key typologies have been identified to guide the development process. These typologies contribute to creating a well-connected, accessible, and livable environment within the Canal zone of Brussels:

1. The logistical route along the canal serves as the primary transportation artery for industrial activities. The road on the west side of the canal, being the widest, is most suitable for logistics, while the road on the east side is transformed into a walkable path and cycle route, catering to recreational needs.

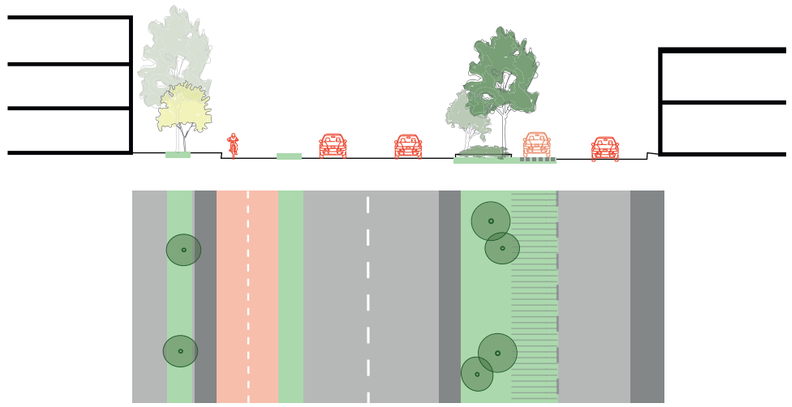
2. In areas with dense urban fabric, a secondary logistical route is essential to accommodate larger trucks. This route should provide sufficient space for loading and unloading while ensuring a clear sidewalk for pedestrian safety.

3. Industrial areas require a separate secondary logistical route with dedicated lanes, sidewalks, cycling paths, and greenery. Establishing clear boundaries between these lanes using green elements helps to create a distinct and organized transportation network.

4. Walkable high streets, which are currently dominated by car traffic, need to be transformed into pedestrian-friendly spaces. This can be achieved by reducing speed limits, narrowing car lanes, widening sidewalks, incorporating green spaces, and strategically implementing retail spaces and temporary parking areas.



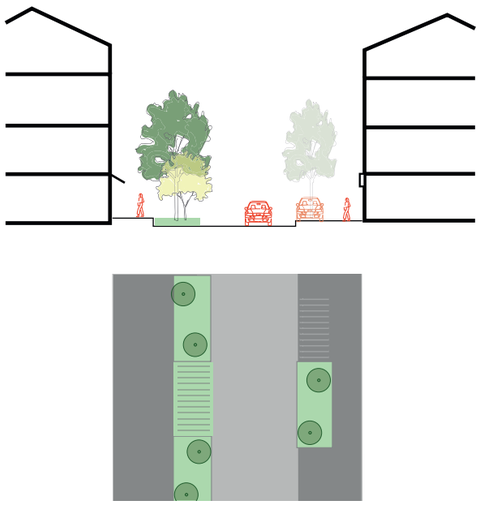
section canal



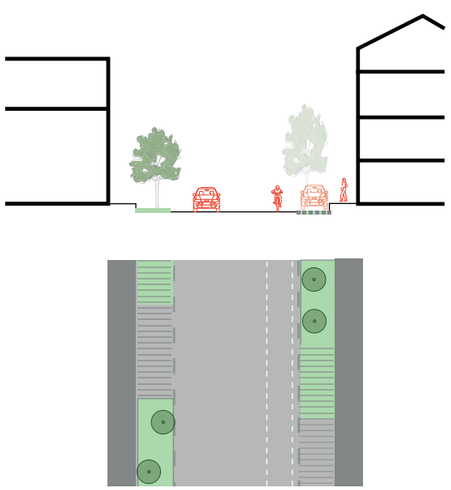
Legend

- Sidewalk
- Green space
- Cycling lane
- Parking

logistical route industrial area



High street



Logistical street in dense area

10.2 SMALL-GRAINED

The pattern language serves as a valuable tool for implementing the strategic framework in a flexible and adaptable manner, taking into account the unique characteristics of the area. Four distinct built form typologies have been identified: small grain, medium grain, large grain, and vacant blocks. Each typology requires a specific approach to maximize its potential.

In the small grain typology, the emphasis is on upgrading and revitalizing the existing built environment. Various measures will be taken to enhance the functionality and appeal of this fabric type. These include topping up existing structures, utilizing rooftops for additional purposes, renovating buildings to improve their condition, repurposing abandoned spaces, and opening up plinths to activate street-level engagement. The objective is to cater to small-scale companies that have minimal impact and require local connectivity.

One approach to address the limited green space is to transform vacant lots into pocket parks. These small green areas will provide much-needed open space and contribute to the overall livability of the neighbourhood. Additionally, the courtyards within this fabric type present opportunities for small-scale workshops or other compatible activities that can further contribute to the local economy and community engagement.

Given the mixed-use nature of the small grain typology, many homes within this fabric type can serve as work homes, where individuals have the convenience of living and working in the same space.To facilitate industrial integration, some adjustments can be made to ground floor openings. Enlarging these openings will create more accessible and flexible spaces that can accommodate industrial activities

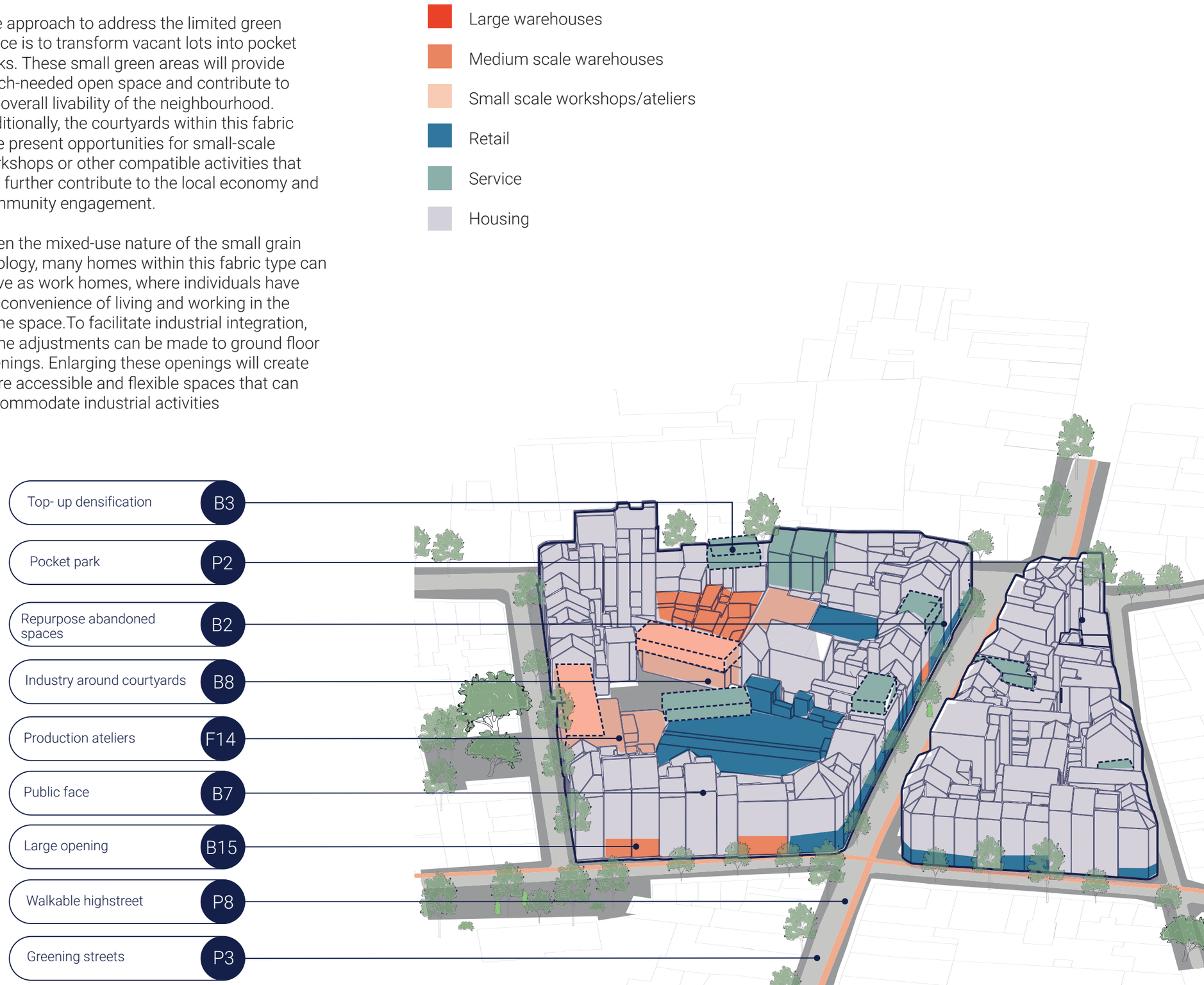


Figure 166: ijmplementation of patterns
made by author, based on (OpenStreetMap, z.d.) (Google Maps, 2023), and (cibg.brussels, 2023)

10.3 MEDIUM-GRAINED

The medium-grained fabric presents an opportunity for repurposing and intensifying the area to accommodate a range of functions. One key strategy is to reconsider the car trade industry, which could potentially free up significant space for new developments. With larger buildings and increased available space, there is room for intensified activities through shared concepts and the upgrading of the existing urban fabric. It is important to ensure that these new functions align with the overall character and objectives of the area.

To enhance the overall structural improvement of the medium-grained fabric, it may be appropriate to consider demolishing low-quality buildings. This selective demolition can contribute to the overall revitalization and create space for more desirable structures that align with the envisioned goals of the area.

Similar to the small-grained fabric, modifying ground floor openings can enhance industrial integration within the medium-grained fabric. Enlarging these openings can create more accessible and adaptable spaces, better suited to accommodate industrial activities. This flexibility promotes the integration of various functions and encourages economic growth within the area.

The corners of the medium-grained fabric offer smaller spaces that are particularly suitable for retail or service-oriented functions. These areas can be utilized to create vibrant and active corners that contribute to the overall liveability and diversity of the fabric.

Legend

- Large warehouses
- Medium scale warehouses
- Small scale workshops/ateliers
- Retail
- Service
- Housing

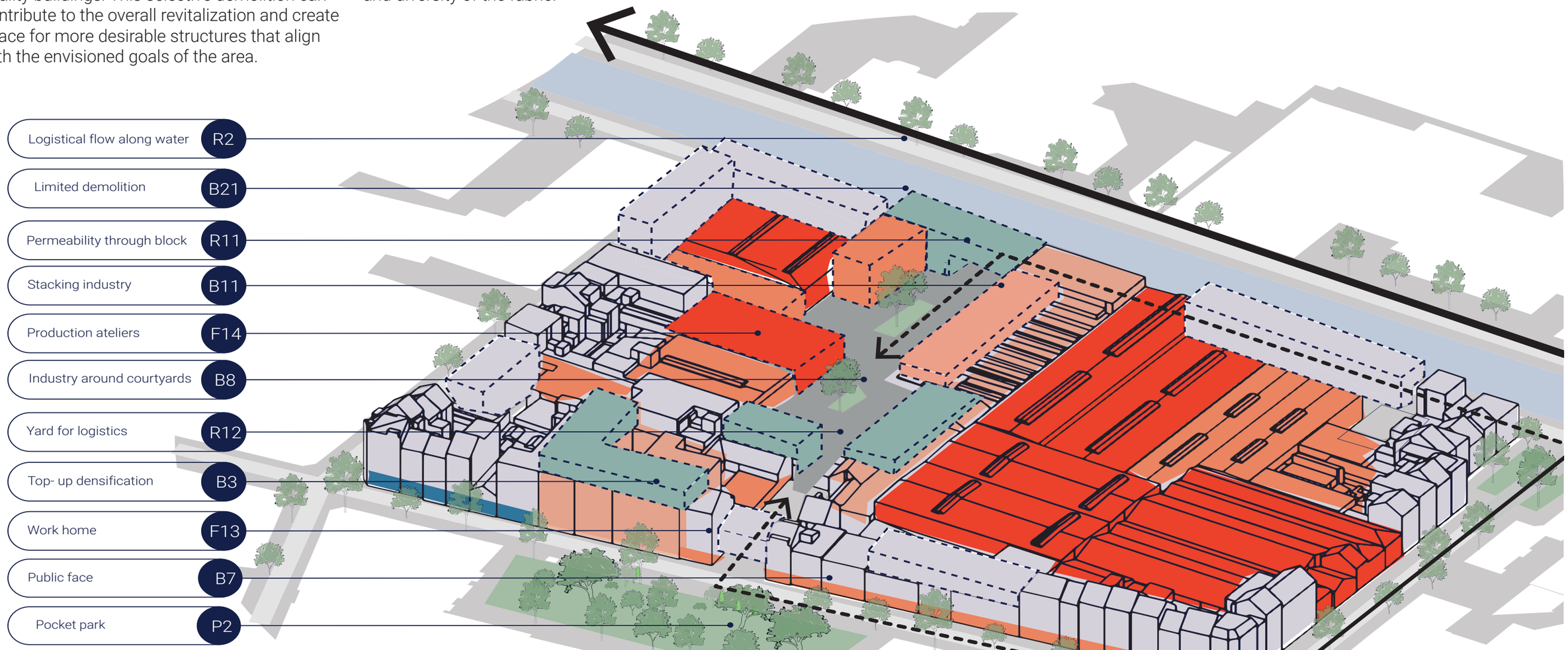


Figure 166: ijmplementation of patterns
made by author, based on (OpenStreetMap, z.d.) (Google Maps, 2023), and (cibg.brussels, 2023)

10.4 LARGE-GRAINED

In the large grain typology, the focus is on densification to make efficient use of the expansive spaces between buildings. This approach entails constructing new buildings and structures that effectively utilize the available land. The primary objective is to accommodate industries that require larger spaces and may generate a certain level of nuisance within this typology.

The vacant lot within the large grain fabric presents a perfect opportunity to establish a business incubator. This facility can cater to companies that require larger lots for their operations. By providing a supportive environment and necessary resources, the business incubator can foster innovation and economic growth within the area.

On the corners of the fabric, there is potential to incorporate retail or other service-oriented functions. These spaces can serve as vibrant hubs where people can access essential goods and services, further enhancing the overall livability and functionality of the area.

By embracing densification and strategically utilizing available spaces, the large grain typology can create a dynamic and diverse urban environment. The incorporation of business incubators and retail/service functions contributes to the vitality and economic potential of the fabric, supporting the growth and development of industries within the area.

Legend

- Large warehouses
- Medium scale warehouses
- Small scale workshops/ateliers
- Retail
- Service
- Housing



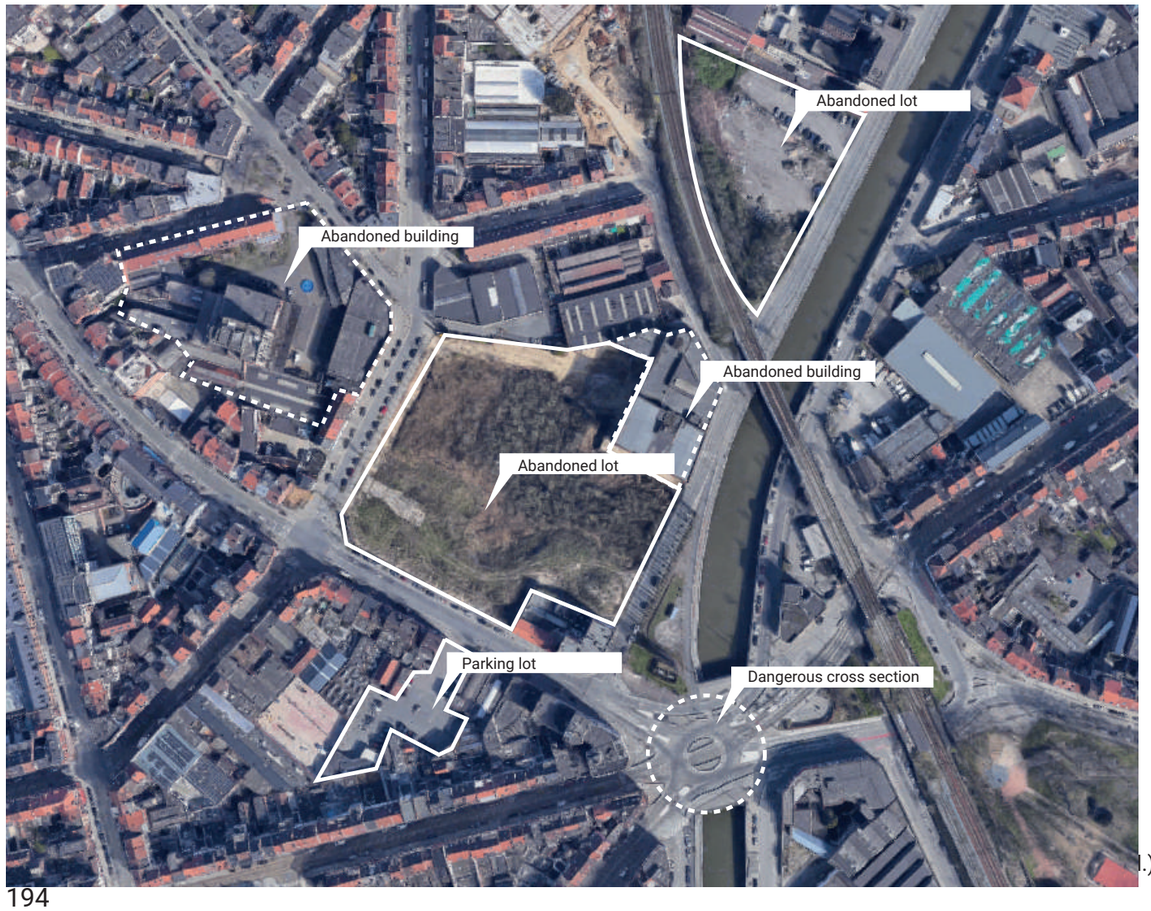
Figure 166: implementation of patterns made by author, based on (OpenStreetMap, z.d.) (Google Maps, 2023), and (cibg.brussels, 2023)

10.5 BRASSERIE ATLAS

The development of vacant blocks plays a big role within the strategic framework, offering a unique opportunity for transformation. In these areas, the focus lies on designing new mixed-use typologies that are tailored to the specific context of each location. The precise combination of functions, types of spaces, and connectivity will be determined by factors such as proximity to the city center, regional connections, and the desired level of diversification.

Within the Brasserie Atlas hub, there exists the potential to repurpose both an abandoned industrial heritage site and a vacant lot. This hub is strategically positioned amidst residential and industrial areas, making it an ideal location to connect various industrial zones and centralities. The development in this area will feature medium-sized spaces with excellent accessibility at a city scale, accommodating a diverse mix of housing, commercial, service, and industrial functions.

The abandoned buildings within the hub can be repurposed to accommodate workshops and offices of various sizes, catering to different types of functions. Meanwhile, the vacant lot will be developed with larger spaces on the ground floor to facilitate logistics and industrial activities, while housing will be integrated on the upper floors. Additionally, the retail lint along the canal will be connected, providing dedicated spaces for retail establishments.



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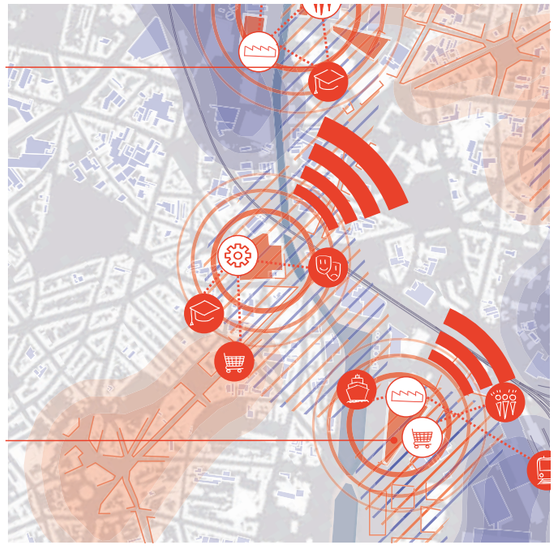


Functionally, the area will be a transition zone, connecting both centralities as well as the industrial area. The functions should be able to mix. This hub will be a logistical centre and connect several functions in surroundings as well as providing amenities.



The area is surrounded by different types of fabric and can therefore be medium grained. There are several abandoned structures in the surroudings, with the most notable being the former brewery Brasserie Atlas. These need to be renovated and repurposed urgently.



In terms of network, the area will be a logistic centre for road traffic and connect both regionally and locally. It is on a cross road of the logistics network and the walkable network, resulting in a restructuring of the crossection

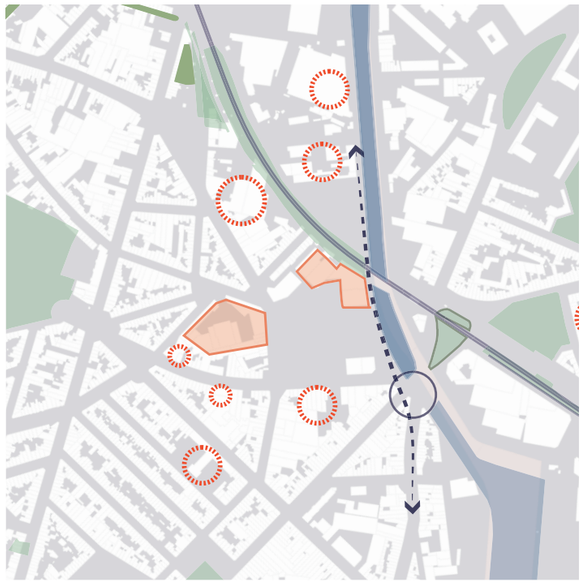


This cross section will also be an upgraded public space. Furthermore in the surroundings there are several opportunities to add green spaces.

Phasing
During the first phase, the focus is on updating the route along the canal and making alterations to its cross-section. This serves as the initial project in establishing the neighborhood contract. To create this contract, engagement with the most relevant stakeholders in the surrounding area is crucial. Additionally, it is imperative to find new uses for abandoned buildings and renovate them to prevent further decay.

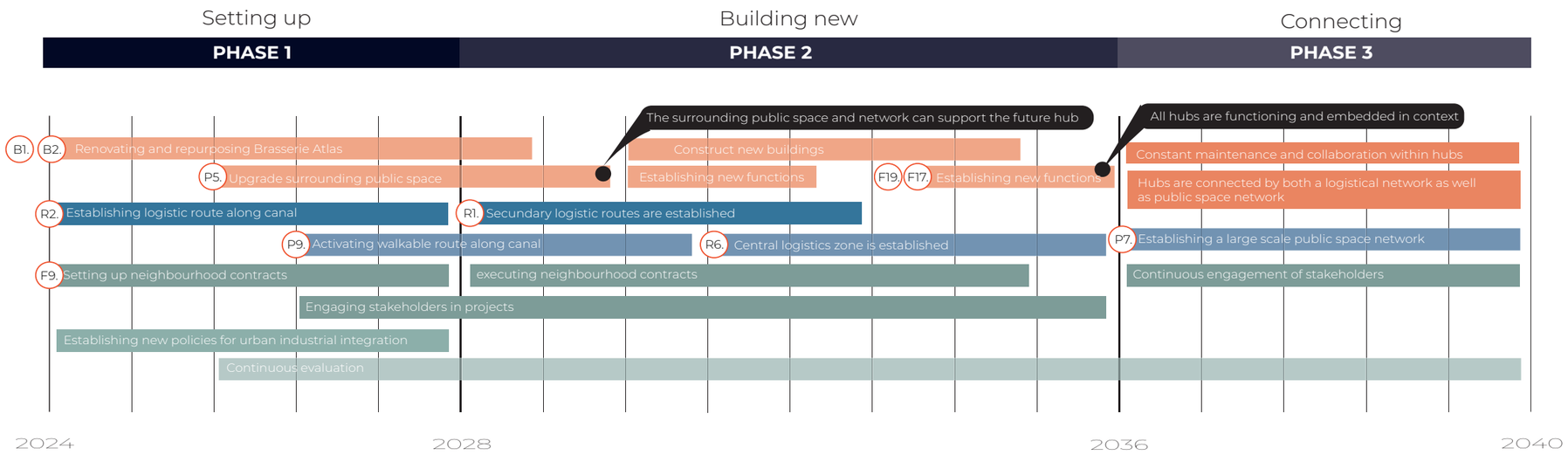
Moving into the second phase, a co-design process is undertaken to establish a hub. This involves constructing the secondary route of the logistical network to improve transportation efficiency. The creation of new green zones and the upgrading of the park are also important components of this phase.

In the third and final phase, the public space network is extended, and the hub is fully integrated into the area. This integration includes providing amenities, entrepreneurial and job opportunities, as well as affordable housing. The focus is on ensuring the hub becomes an integral part of the community, offering a wide range of benefits and opportunities for its residents and visitors.









Legend

Renovation

Built new



Legend

Large warehouses

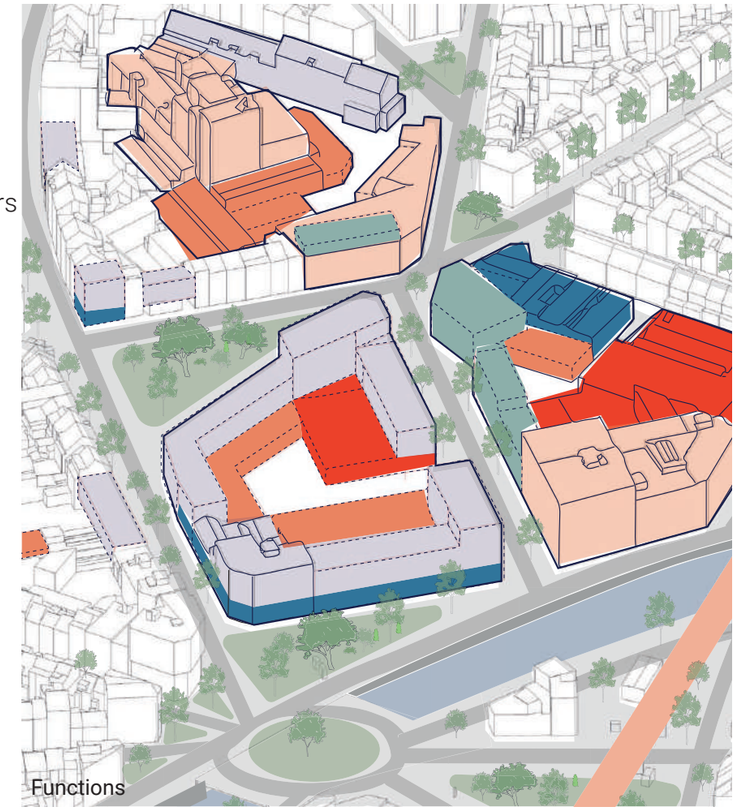
Medium scale warehouses

Small scale workshops/ateliers

Retail

Service

Housing



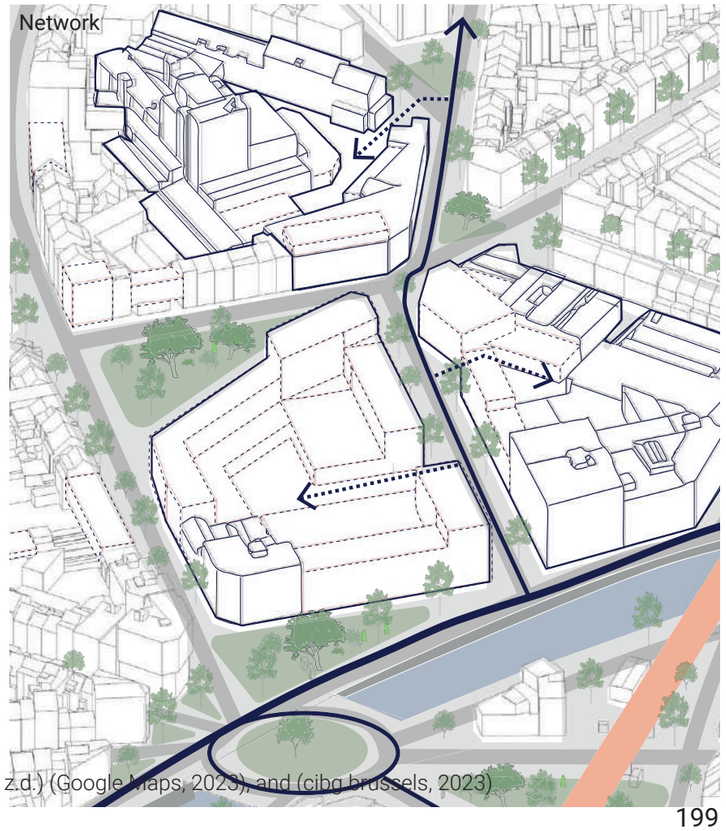
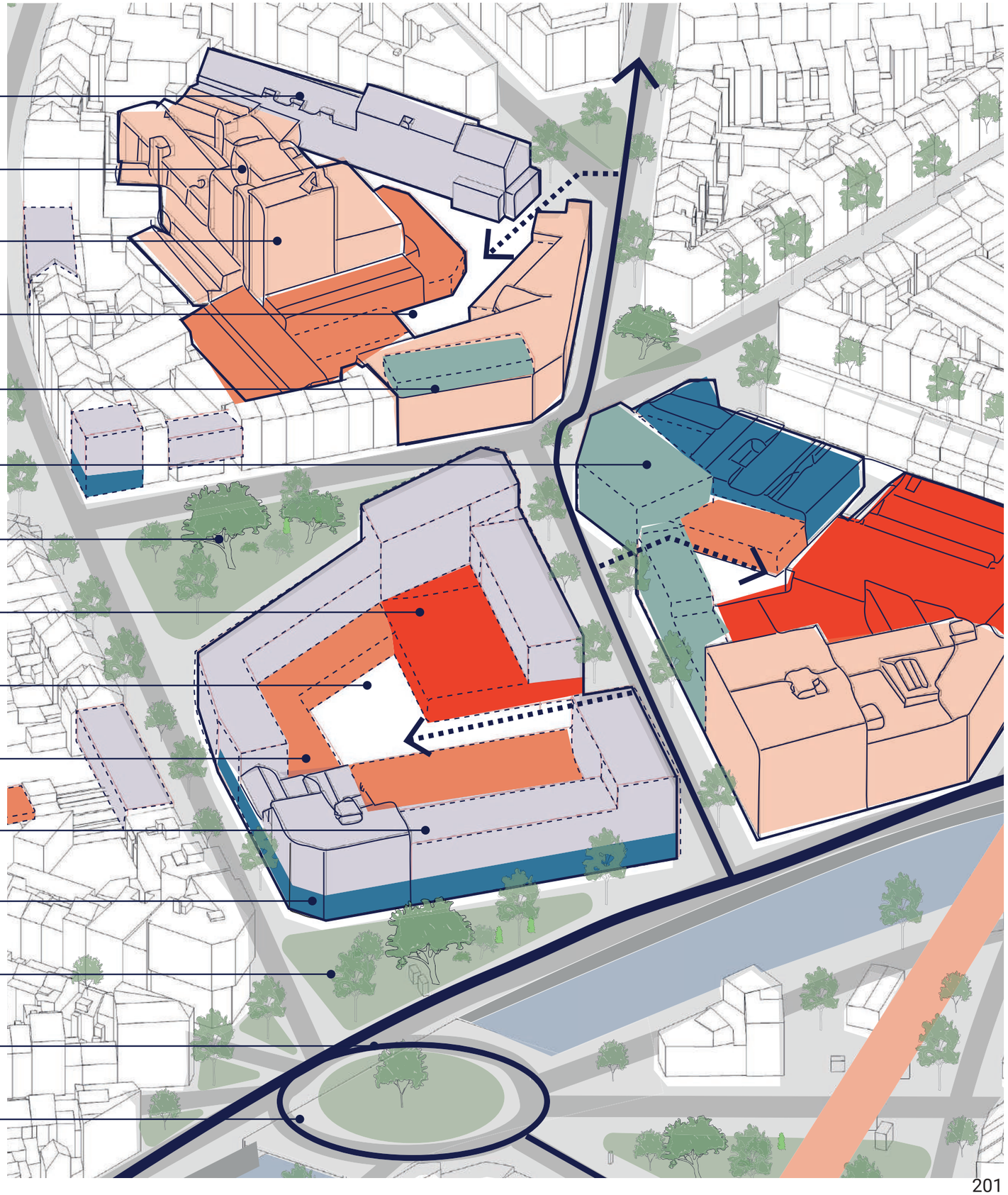


Figure 164-165: Axo of hub
made by author, based on (OpenStreetMap, z.d.) (Google Maps, 2023), and (cibg brussels, 2023)

- Repurpose abandoned spaces — B2
- Industrial landmark — B1
- Bussiness incubator — F17
- Yard for logistics — R12
- Top- up densification — B3
- Modular offices — F16
- Greening streets — P3
- Activate roofs — B20
- Production ateliers — F14
- Industry around courtyards — B8
- Affordable housing — F7
- Strentgthening exisitng centralities — F21
- Seperate access for different uses — R15
- Upgrading existing public spaces — P5
- Separating traffic flows — R3



11 CONCLUSION



Picture series ‘Atelier Brussels’, 2016, Brussels. Photo: Bas Bogaerts

11.1 SUMMARY

This last chapter will first give a summary of this thesis guided by answering the sub question. Than it will give a conclusion to the main question:

Main question: How can a just, productive and place-based development be achieved in the Canal zone of Brussels, utilizing the area's path dependencies through path renewal?

SQ1: How did the path dependencies in the Canal area develop and how do they manifest themselves in the current urban landscape and urban policy?

The past
The history of Brussels has created a path-dependent nature in the area, with a segregated social profile, persistent industrial land use, and governance fragmentation. The area always had a industrial charater, and traces of this can be seen throughout the area. This has also nfluenced its demographic development, resulting in a perpetual state of a poorer population. After World War II, an increase in migrant workers in the area and a decrease in industry left these workers without many economic opportunities, shaping the area's current demographic makeup. The influx of migrants throughout the centuries also resulted in the francisation of Brussels, which complicated the federalisation of Belgium and led to a separate Capital Region. The institutional complexity of Brussels has kept the borders of the municipalities largely unchanged.

The present
The historic developments of Brussels have left their mark on the current urban landscape, resulting in both negative and positive consequences. Industry has decreased in importance, leaving the canal to mainly perform a logistical function. The most important logistical locations are highly car-dependent and act as a barrier between areas. Industries such as mechanical engineering, construction, printing, and food processing are still stable in the area, with a spatial manifestation that varies between monofunctional and integrated. Demographically, the central part of the Canal zone is characterised by high rates of poverty and unemployment, a high prevalence of immigrants, and a younger population. Due to the municipality structure, poorer municipalities have lower tax revenue, contributing to a lack of green and quality public space, perpetuating poverty. The demography and industrial nature of these areas have enabled a specific economy and commercial diversity, attracting many visitors.

The future
Current plans and policies for the Canal area aim to establish it as a new central axis for the region. However, because of the power held by individual municipalities and lack of coordination, the operationalisation of the Canal plan is speculative. While policies have been implemented to guide urban renewal and the mixing of industry with other functions, there are concerns about (industrial) gentrification. Recent developments, such as the Taxis and Tour area, have confirmed these concerns as they do not prioritize the local community and instead prioritize the competitive status of Brussels. Without adjustments, gentrification of the area is likely, which will endanger local communities and the economy, worsen segregation and social issues, and put more pressure on amenities and the urban fabric. Additionally, the current projects seem to be monofunctional and detached from the surrounding urban fabric.

SQ2: What values can be synthesised from these path dependencies and how could these be integrated in an alternative vision for the Canal area?

Values
From the three established path dependencies different values were derived, based on the just city index, which were than translated into a vision. The values already present but in need for enhancement were: diversity, authenticity and community. The values that are in need of implementation are: inclusion, connectivity and liveability. This will than lead to the end goal of empowerment, belonging and prosperity.

Vision
To make these values more concrete they were integrated in a vision. The vision presents the idea that the Canal zone in Brussels will become an inherent part of Brussels social and economic fabric again, integrating the area's historical significance and spatial identity into a new vision for the future.

Industrial urban integration is a core concept in this vision and connects to the aims of this thesis: Industrial urban integration could preserve spatial identity, by elevating the Brussels industrial past and repurposing heritage. It could provide employment as well as economic mobility to the local community. It could renew and diversify the local economy, preserving both existing activities as well as finding new collaboration, innovation towards a more sustainable future.

The vision states that the canal and its infrastructure will become a vital foundation for a diverse and collaborative economic ecosystem that supports diverse local businesses and thus empowers the local community. To achieve this vision, the canal area is composed of diverse spaces that support different functions and qualities, connected by supported infrastructure with the canal as a backbone. The values that were derived are integrated into the vision.

SQ3: How can this vision be operationalised, through a strategic framework, utilising the path dependencies?

Conflicts
To implement this vision it is important to recognise the different conflicts that could arise:
- Conflict between preserving spatial identity and densifying/diversifying: A-
Conflict between intensifying the economy and empowering the local community:.
- Conflict between intensifying the economy and liveability:
- Conflict between increasing connectivity and liveability:

Analysis
To address conflicts in the caste study area, a spatial analysis was conducted using four layers: function, relation, built form, and public space. The function layer identified areas where industry could be intensified, areas that required amenities, and clusters of industries that could be intensified. The relation layer highlighted the need for separate networks for logistics and slow traffic, the intensification of public transport, and the upgrading of the current harbour and railway connection. The space layer identified three types of mixed-use urban fabrics that needed enhancing, the potential of abandoned buildings to get a new life, several clusters of empty space along the canal that could be utilized, and a lack of green space in the northern area. The industrial area south also lacked quality in public space, which needed enhancement.

By overlaying these layers, it was found that the clusters of empty space could become hubs in the new economic ecosystem, offering amenities and community functions. Small-scale interventions could maintain the spatial identity of the area while connecting these hubs with two overlaying networks - one for logistics and one for a walkable network. Upgrading public space to include green areas was essential in all areas to increase liveability.

To further explore possibilities on a small scale, three zoom ins in typology different areas have been made. The small grain area is dense, with limited public space and suitable only for small scale industry or retail. The medium grain area has mixed-use functions, narrow streets, and abundant parking, while the large grain area is dominated by industry, logistics, and office buildings, with little pedestrian-friendly space or amenities.

Strategy
A new economic ecosystem is being developed through the establishment of five hubs, each with its unique characteristics in terms of space, connectivity, and mixed use. These hubs are strategically located within clusters of vacant spaces and offer a wide range of amenities tailored to their specific areas.

To connect these hubs effectively, two networks have been established. The first is a logistical network running along the canal, primarily serving the industrial sector and accommodating heavy traffic. This network

includes a main route that intersects with secondary routes, ensuring accessibility to all industries within the area. The second network is a walkable network designed to support slow traffic, featuring dedicated cycling lanes and spacious sidewalks. Car accessibility may be limited within this network, which focuses on connecting centralities and public spaces.
In order to enhance liveability, existing parks are being upgraded and new green spaces are being created. Streets are also being transformed into greener corridors, benefiting both the logistical and walkable networks. This emphasis on green spaces aims to improve the overall quality of life for residents in the area.

Stakeholder engagement
The stakeholders of the area are engaged in three ways:
Small scale projects: bottom-up and co-design approach, organized by the neighbourhood committees. These projects have a relatively short time span, with a maximum duration of four years.

Hubs: involve medium-scale projects that employ a combination of both bottom-up and top-down approaches. These projects are facilitated by municipalities and encourage collaboration between different neighbourhoods and municipalities. Hubs have a longer time span, typically spanning around eight years.

Network: a large-scale project that connect and coordinate small-scale initiatives. The network approach involves a top-down coordination facilitated by the region while also incorporating bottom-up involvement through engagement with all neighbourhood and hub committees.

Within the phasing is room for experimentation and trial and error in the first phase. Than best practices will be scaled up and used within the establishing of larger projects like the hubs. Finally the network will be fully established connecting all projcts.

Pattern language
To support the implementation of this strategy, a pattern language has been developed, encompassing patterns applicable to every scale. These patterns are derived from theories, fieldwork, and/or research by design. They are organized into three categories: program and policy, built form, and network and public space. This pattern language provides a framework for guiding the development process and ensuring coherence and effectiveness in achieving the desired outcomes. It can also be a tool to show a sequence of actions to enable this path renewal.

SQ4: How can the implementation of this strategic framework be spatialised on a smaller scale?

Built form
The pattern language serves as a valuable tool for implementing the strategic framework in a flexible and adaptable manner, taking into account the unique characteristics of the area. Four distinct built form typologies have been identified: small grain, medium grain, large grain, and vacant blocks. Each typology requires a specific approach to maximize its potential.
1. In the small grain typology, the focus lies on upgrading the existing built environment. This involves measures such as topping up structures, utilizing rooftops, renovating buildings, repurposing abandoned spaces, and opening up plinths. This typology primarily accommodates small-scale companies with low levels of nuisance and a need for local connectivity.
2. Moving to the medium grain typology, the emphasis shifts towards intensification and rethinking the structure. With more available space and larger buildings, functions can be intensified through the implementation of shared concepts and the upgrading of existing urban fabric. Also space could become available if the car industry is rethought. Companies within this typology can be larger in scale but should still be compatible with other functions within the area.
3. The large grain typology calls for densification as a means of effectively utilizing the spacious areas between buildings. This involves constructing new buildings and structures to maximize the use of available land. Industries that require more space and may generate some level of nuisance can be accommodated within this typology.
4. Vacant blocks present a unique opportunity for development and play a crucial role as hub locations in the strategic framework. Here, the approach involves designing new mixed-use typologies tailored to the specific context of each location. The exact mix of functions, types of spaces, and connectivity will vary based on factors such as distance from the city center, regional connections, and the degree of mono-functionality desired.

Public space
In terms of public space and network, five key typologies have been identified to guide the development process. These typologies contribute to creating a well-connected, accessible, and livable environment within the Canal zone of Brussels:

1. The logistical route along the canal serves as the primary transportation artery for industrial activities. The road on the west side of the canal, being the widest, is most suitable for logistics, while the road on the east side is transformed into a walkable path and cycle route, catering to recreational needs.
2. In areas with dense urban fabric, a secondary logistical route is essential to accommodate larger trucks. This route should provide sufficient space for loading and unloading while ensuring a clear sidewalk for pedestrian safety.
3. Industrial areas require a separate secondary logistical route with dedicated lanes, sidewalks, cycling paths, and greenery. Establishing clear boundaries between these lanes using green elements helps to create a distinct and organized transportation network.
4. Walkable high streets, which are currently dominated by car traffic, need to be transformed into pedestrian-friendly spaces. This can be achieved by reducing speed limits, narrowing car lanes, widening sidewalks, incorporating green spaces, and strategically implementing retail spaces and temporary parking areas.
connected, livable, and sustainable environment within the Canal zone of Brussels.

11.2 CONCLUSION

Now that the sub questions have been answered, the main question can be answered.

Main question: How can a just, productive and place-based development be achieved in the Canal zone of Brussels, utilizing the area's path dependencies through path renewal?

To achieve a just, productive, and place-based development in the Canal zone of Brussels, leveraging the area's path dependencies through path renewal, several key approaches can be adopted.

One crucial approach is industrial urban integration, which allows for the renewal of existing path dependencies. This strategy aligns with the principles of place-based development and spatial identity, acknowledging the unique historical context of Brussels and the presence of industrial remnants. Moreover, it connects with the concept of a just city, promoting the well-being of the local community by generating employment opportunities and fostering accessible entrepreneurship. Additionally, it supports the idea of a productive city and local economy by preserving existing businesses while creating new ones, leading to economic diversification.

In implementing industrial urban integration within the canal zone of Brussels, we can derive four key findings:

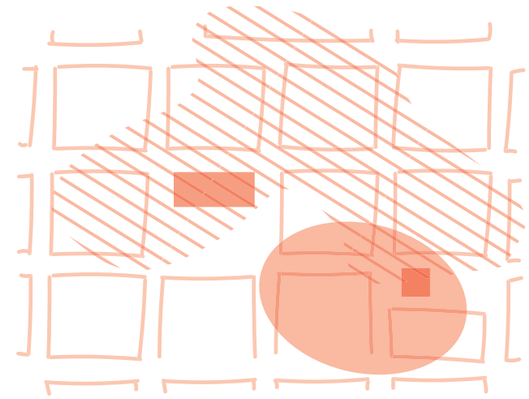
1. Strengthening existing structures and functions, rather than pursuing complete transformations, should be prioritized. By improving and optimizing the area's current assets, we can preserve its character while enhancing its potential.

2. Emphasizing small-scale interventions that blend harmoniously with their surroundings is crucial. By identifying spaces of opportunity and making use of available land, we can subtly alter areas, introduce new functions and spaces that seamlessly connect with the existing environment.

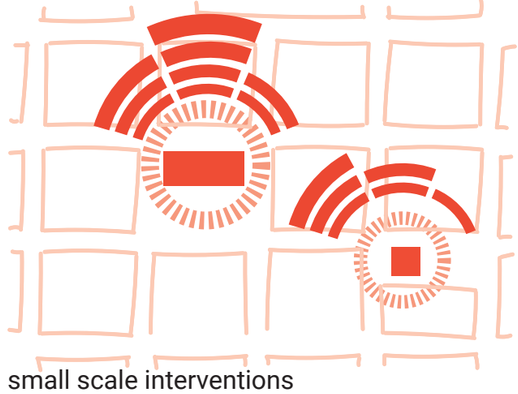
3. Stakeholder engagement is essential to embed the development in the area effectively. By actively involving citizens, businesses, and associations through neighborhood contracts and committees, their perspectives can shape the projects, ensuring local relevance and ownership.

4. Establishing a well-connected network is vital. Addressing issues related to integrating different activities, enhancing the liveability of spaces, and improving connectivity is crucial. One potential solution is to establish two overlapping networks: a logistics network that focuses on efficient transportation and a walkability network that connects all five 'hubs' within the canal zone. By designing well-defined logistical routes, we can provide structure to the road network and mitigate potential nuisances.

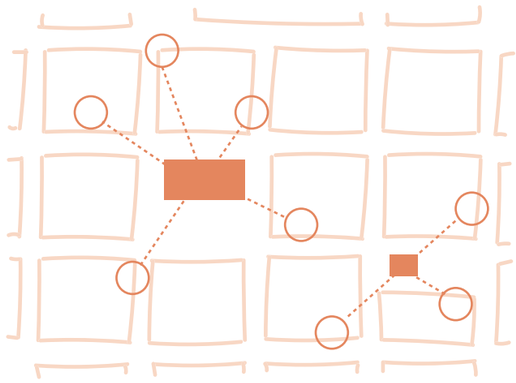
A pattern language can be a valuable tool in the process of path renewal. By implementing a sequence of individual, specific design solutions that collectively work together, path renewal can be achieved. This approach demonstrates that large-scale transformation is not the sole solution for development. Instead, by improving existing structures, making small adjustments to the urban fabric, and developing functions that integrate well with the surroundings, path renewal in path-dependent spaces becomes possible.ons can be actively involved in the projects.



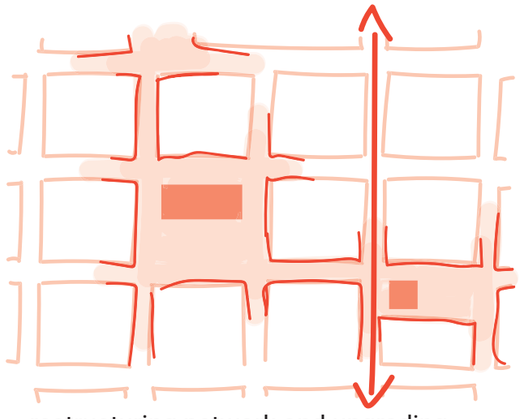
strengthening existing functions



small scale interventions
embedded in context



Stakeholder engagement



restructuring network and upgrading
exisitng public space

11.3 REFLECTION

Relationship between project, studio and Urbanism track

This projects was conducted within the studio of planning Complex Cities, which has a more research driven focus.The basic starting points of graduation projects in this studio are observations of disparities and conflicts arising from the distribution of spatial resources across communities and territories.

The starting point for the graduation projects in this studio is to observe and analyse the consequences of neoliberalism and gentrification in our cities. I seeked to find an alternative approach towards urban development, and did so by employing a research by design methodology and going through multiple scales. The approach of this studio let me to start the project research focused, later shifting my focus more on design.

Relationship between research, planning, and design within the project

The beginning of my thesis was more focused on research and provided a foundation to further base the project on. This research-driven approach helped to understand the broader concepts and challenges associated with the topics touched upon in my thesis.As the project progressed, the focus shifted towards design. The research findings informed the design process by providing insights into the specific context of the project.The pattern language, as a tool, helped to bridge the gap between research and design.

The pattern language also played a role in the flexibility of the strategy. The strategy employed does not adhere to a rigid end goal but embraces a flexible and adaptable framework that allows for participatory processes of trial and error. This recognition acknowledges the dynamic nature of a city, which is never truly finished and is constantly evolving. Unlike a neoliberal path-breaking approach that seeks a predefined end image, this approach to path renewal is nuanced, adaptable, and responsive to the evolving needs of the city and its inhabitants.

Relevance

The academic and societal value of this graduation project lies in its exploration of alternative approaches to urban development, by questioning the prevailing norms of neoliberal urbanism.

The project challenges the notion of profit drive development and raises questions about the potential consequences of letting neoliberalism shape our cities. Through the lense of the theories of the just city, productive city, and place-based development, the project seeks to explore alternative pathways for urban development. It aims to provide practical insights into how these theories can be implemented in a specific context, fostering a more inclusive, equitable, and locally rooted approach.

Moreover, the project recognizes the significance of path dependencies in shaping the built environment, local economies and social networks. It highlights the risks of breaking existing path dependencies and seeks to find ways to renew them in shaping future developments.

Reflection on the methodology

The making of a vision and a strategy were important products in this project. In the context of the project that aims to improve rather than transform the Canal zone of Brussels, it is valid to question whether the traditional approach of creating a vision for transformation is the most suitable. While visions are commonly used to inspire and guide large-scale transformative projects, they may not align with the objectives of improvement and path renewal.

To operationalise the vision in to a strategy a research by design approach was used. Research by design involves an iterative process of generating design proposals, testing hypotheses, and refining ideas through practical experimentation. This approach facilitates a deeper understanding of the unique characteristics and dynamics of the Canal zone of Brussels, allowing for context-specific solutions to emerge.

However, it is important to acknowledge that there can be downsides to utilizing a research by design approach. One potential challenge is the lack of clarity in the process itself. The iterative and exploratory nature of research by design may result in a less linear and structured process compared to more traditional research methodologies. This lack of clarity can sometimes make it difficult to define clear research objectives, establish a fixed methodology, or measure outcomes in a quantitative manner. In my project I got a bit lost in this stage, because the objectives where not very clear and coherent. This led me to lose quite some time, and postpone decisions, leaving me only a short time to finish up the report and focus on outcomes.

Furthermore I would like to reflect on the role of a pattern language in the context of this project. It proofed to be a valuable tool to explore path renewal. Due to specific individual solutions that complexily interweve with one another, it matches the more nuanced approach of path renewal instead of path breaking.

Transferability of the project

The transferability of the project results is context-dependent. While the project has a strong focus on the canal area in Brussels, the approach and methodology used in the research could be useful for other urban areas facing similar challenges, such as gentrification and neoliberal urbanism. The research also provides insights into the practical applicability of theories of the just city, the productive city, and place-based development, which could be relevant for urban development in other contexts.

The decision to utilise a pattern language was deliberate, driven by its capacity for generalisation and adaptability. While it is acknowledged that patterns may not always be seamlessly transferable to every context and may require careful positioning within each specific situation, they serve as valuable starting points. They provide a framework for approaching similar challenges in different contexts, while still acknowledging the need for customisation and context-specific adjustments. The approach of finding opportunities for small-scale development that benefits the surrounding community, and the use of the pattern language approach, could be transferable to other contexts with similar challenges. However, it is important to note that every context has its own unique characteristics and challenges, so any transferability needs to be carefully considered and adapted to the local context.

Overall, the transferability of the project results is limited, but the methodology and approach used in the research could be valuable for other urban areas facing similar challenges.

Ethical considerations

Ethical considerations are crucial in this project, particularly when it comes to addressing disparities, vulnerable demographic groups, and potential biases. It is essential to ensure that the research is reflective and inclusive, giving voice to those who hold less power and representing diverse perspectives.

Furthermore, it is important to acknowledge the Belgian context, recognizing that cultural differences and traditions may influence planning practices and preferences. Language in this context also plays a significant role, considering that Brussels is officially bilingual, with French being the predominant language. It is important to be aware of potential language biases and limitations when consulting sources and engaging with different narratives. Efforts should be made to access and incorporate perspectives that may be exclusively available in French to ensure a more comprehensive understanding of the issues at hand.

Lastly, the project challenges the prevailing norms and debates around gentrification in Brussels, which can be highly polarized. Acknowledging and navigating these debates requires a critical and nuanced approach, engaging with different perspectives. The project should aim to foster constructive dialogue and bridge the gaps between opposing views, seeking a more balanced and inclusive understanding of the challenges and potential solutions.

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