



BRED - OOSTERHOUT CITY PLAN

Institution	: Eindhoven University of Technology
Course	: Urban form
Code	: 7QX8M0
Tutor	: Hans Snijders
Group	: 4B
Students	: Jorrit Heide, Max Slangen, Patricia Hulsman

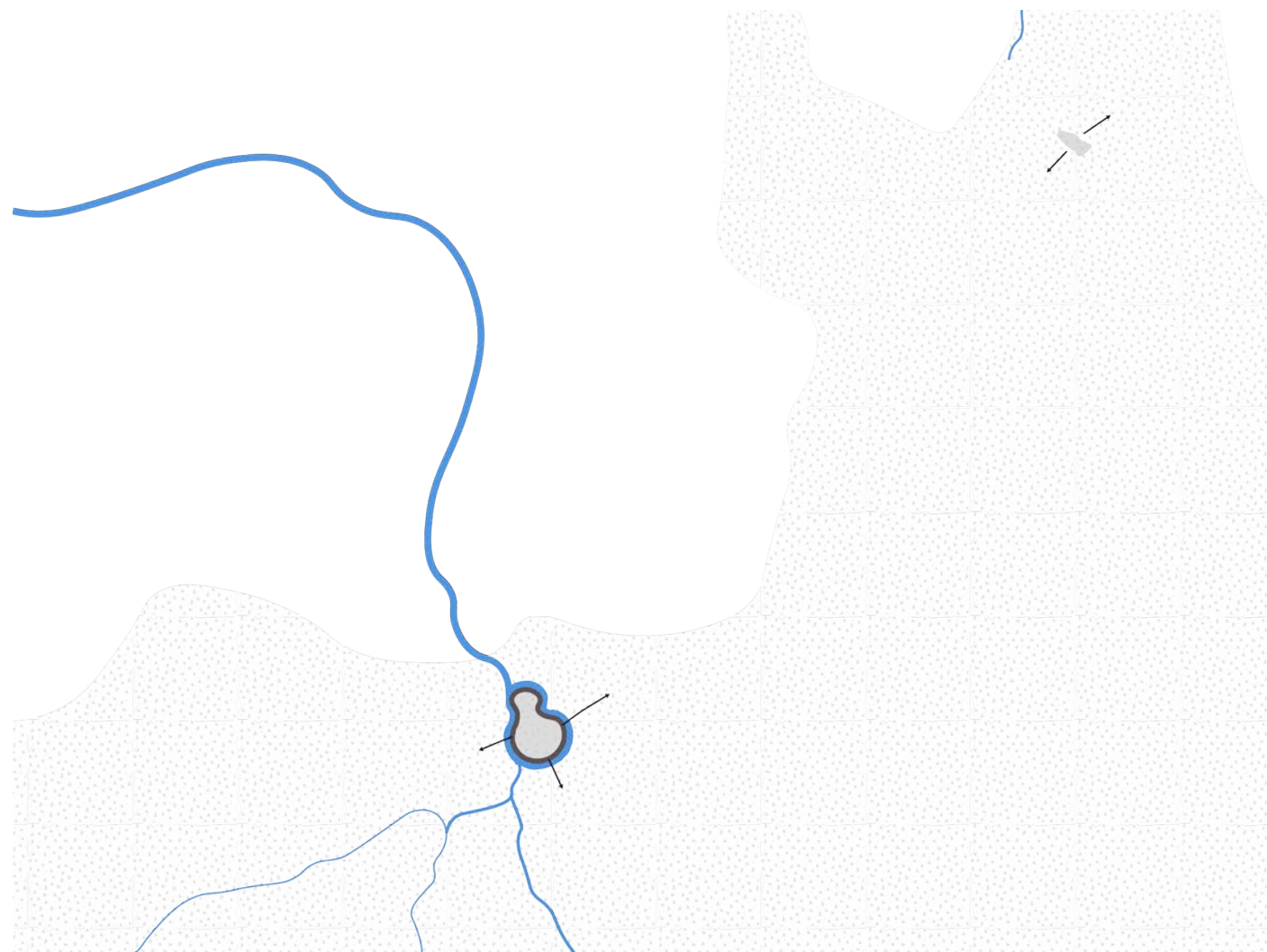
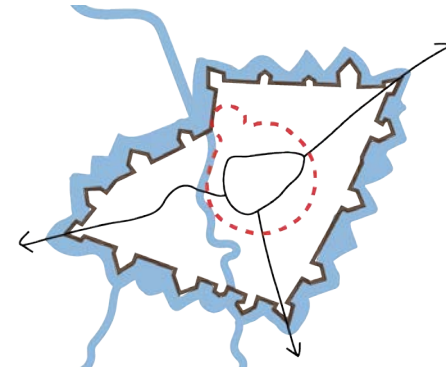
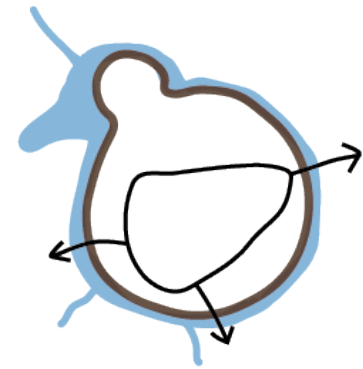
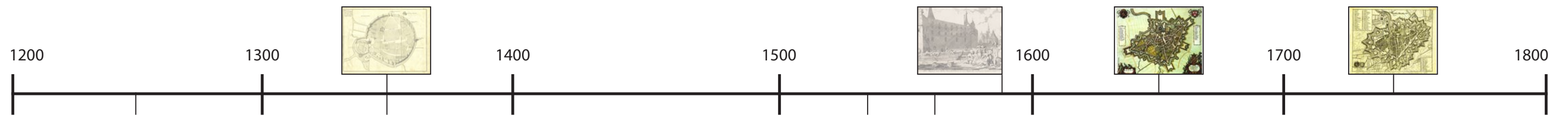
INTRODUCTION

This document discusses the past, present, and future of the Dutch city of Breda. More specifically, it aims to research and grasp its 'urban form': what is the morphology of the city, and how can it be explained by looking at topographical, landscape, social and economic factors? It is the interplay of these factors (and indeed more) which determine how the city looks, functions, and feels.

The starting point is a historical analysis: one must understand how something came to be, to be able to make sense of it. Consequently, the current situation is analysed concerning the themes of connectivity and public spaces. Combined with research from other groups, this will enable us to understand why the city looks the way it does, what functions well within it, and what could be improved.

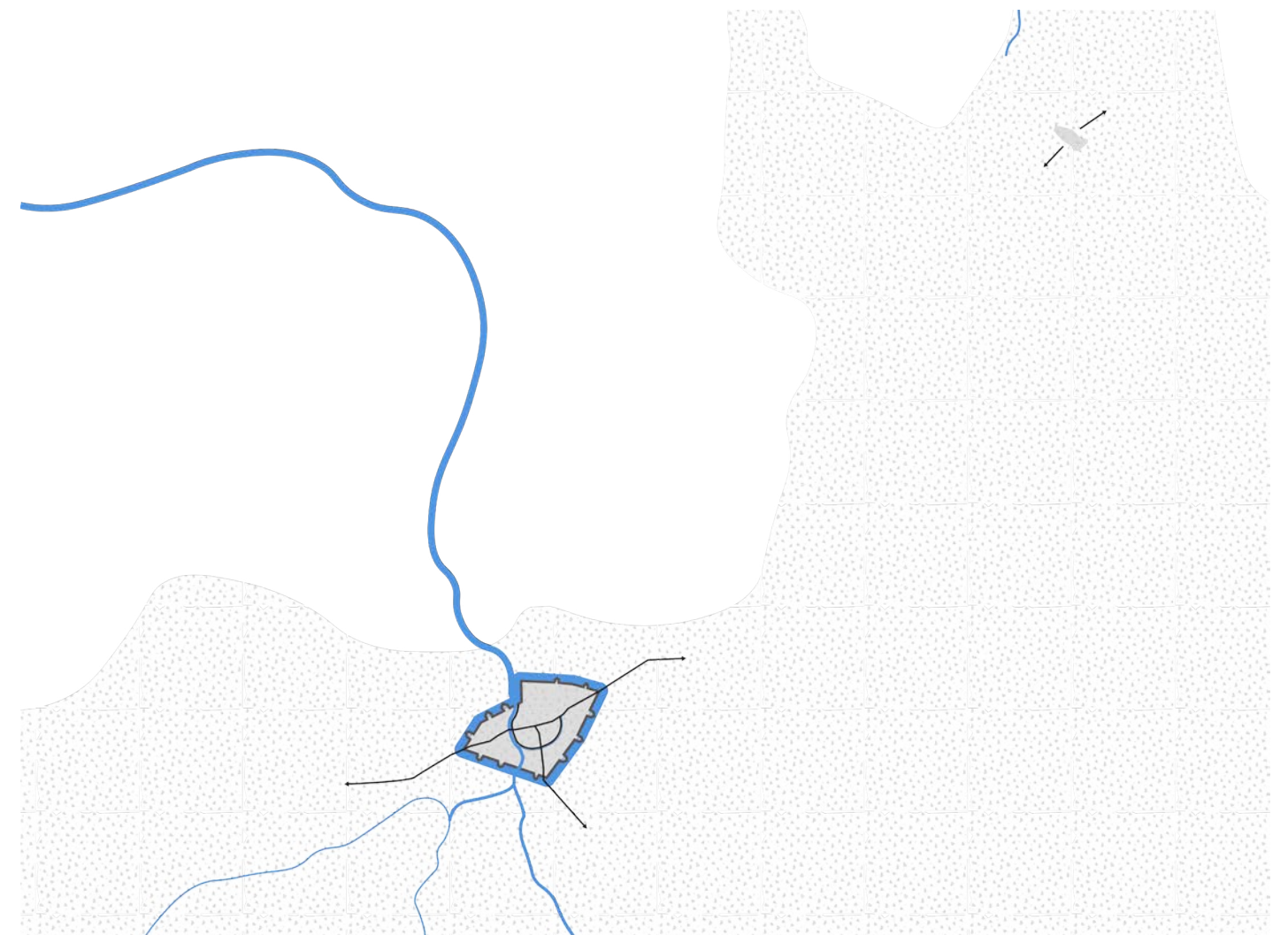
The final stage concerns looking forward. With the thorough urban analyses as a starting point, a vision for the situation of 2050 is drawn up. How will Breda look in thirty years? How to preserve and strengthen the city's strong points, and improve on the weak? Next to the conducted analyses, this vision draws on relevant literature on urban planning.

HISTORY



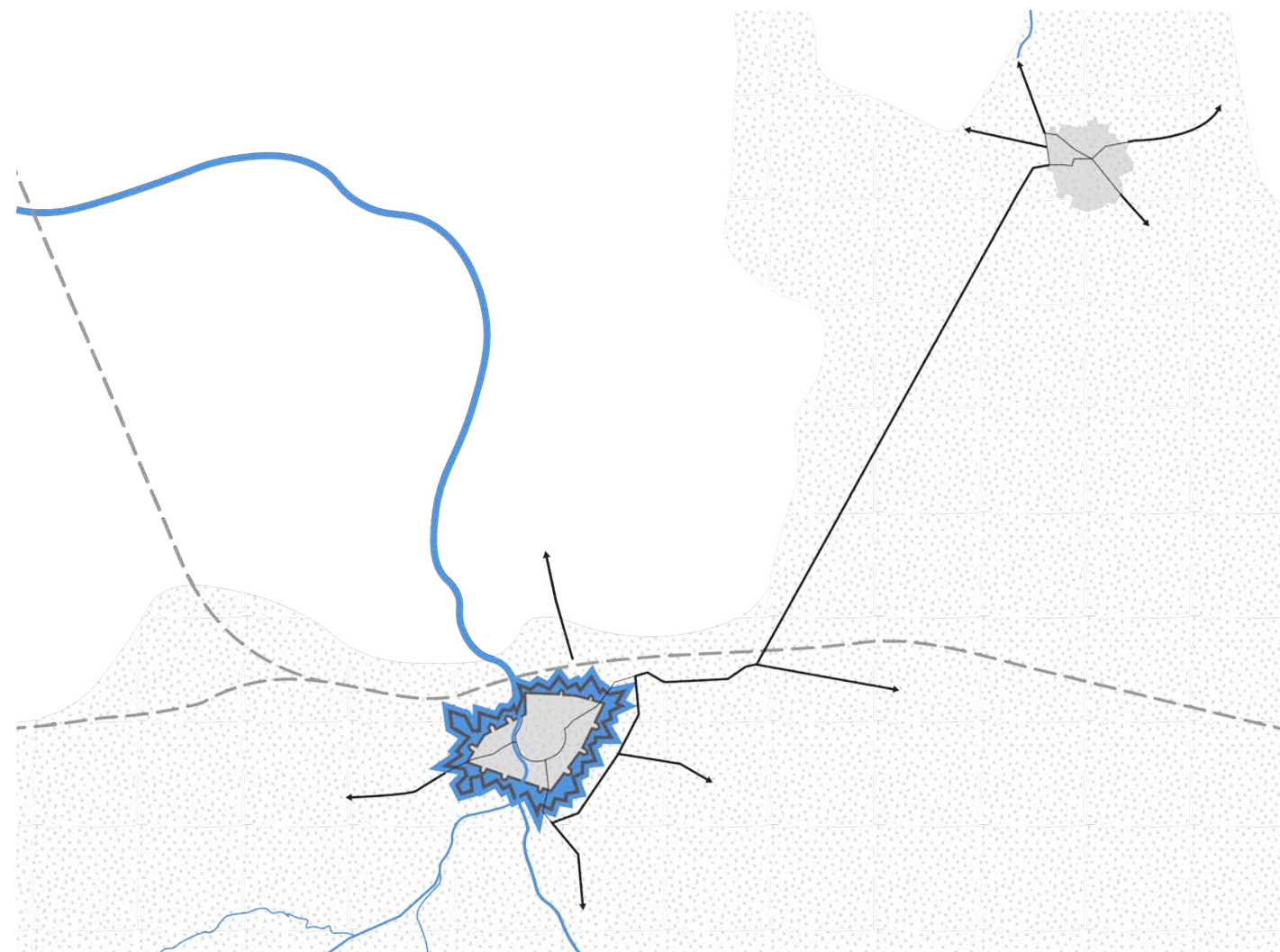
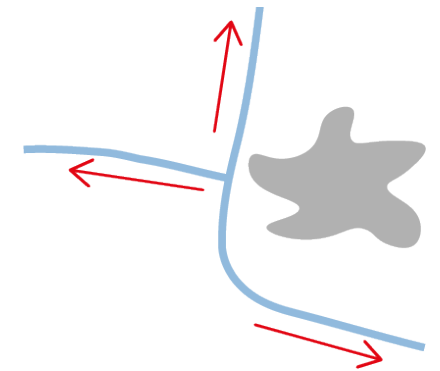
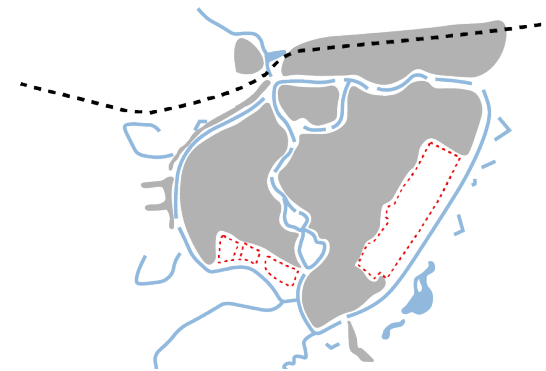
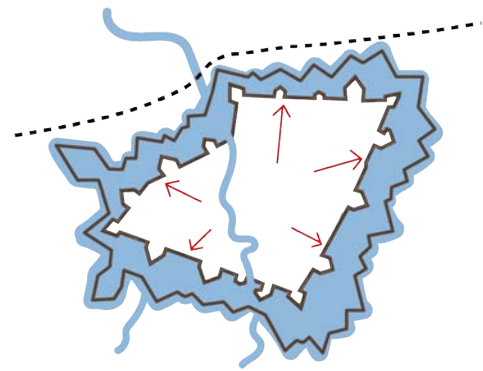
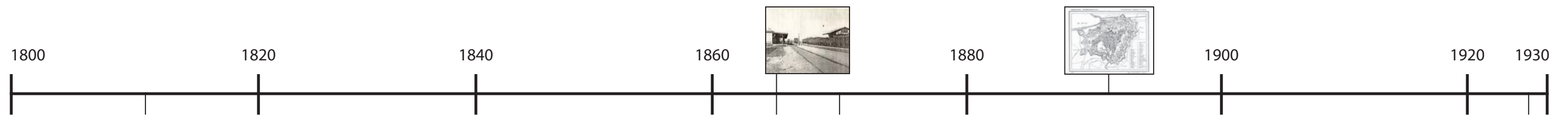
1350 - The city of Breda is confined to its first city walls, resulting in a shape known as 't eitje (the little egg). Three gates and three roads leading out of the city are identifiable. Both the initial shape and the main roads remain visible in Breda's

urban form. The principles of Oosterhout are also visible to the northeast of the city.



1650 - Breda has become one of the heaviest fortified towns in the Netherlands, mainly due to its importance in the eighty years' war. The fortifications take up more space than the actual city they protect; although this too has by now expanded beyond

't eitje, along the aforementioned three roads. In the same century, an extensive pottery industry arose in Oosterhout, due to the presence of suitable loam in the soil. The industry flourished well into the 19th century, with which the village grew as well.



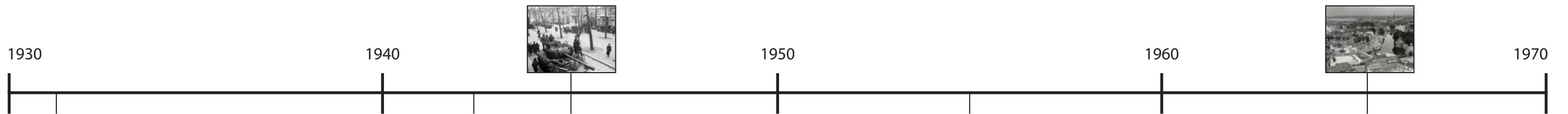
1869 – Breda has hardly expanded during the last two centuries. The fortifications, still clearly visible at this point, prohibit any such expansion. In 1869 they are finally dismantled, allowing for the expansion and industrialization of Breda. Another important

factor in this is the railway station, making Breda a node in the (inter-)national railway system. The port in Oosterhout provided a good and fast connection with Zeeland and the former province Holland for the export of goods.



1924 – Breda is still a very compact city. Its outer limits coincide with the former fortifications, by now dismantled and converted to singels. The ground occupied by the military institutions is clearly visible and largely free of buildings. With the completion

of the Wilhelmina Canal and the Mark Canal, Oosterhout can be reached from Breda by water and other southern cities like Tilburg and Eindhoven are connected to the Maas.



1930's
Expansion on
annexated
territory

1940
WW2 starts;
Breda falls
May 12th

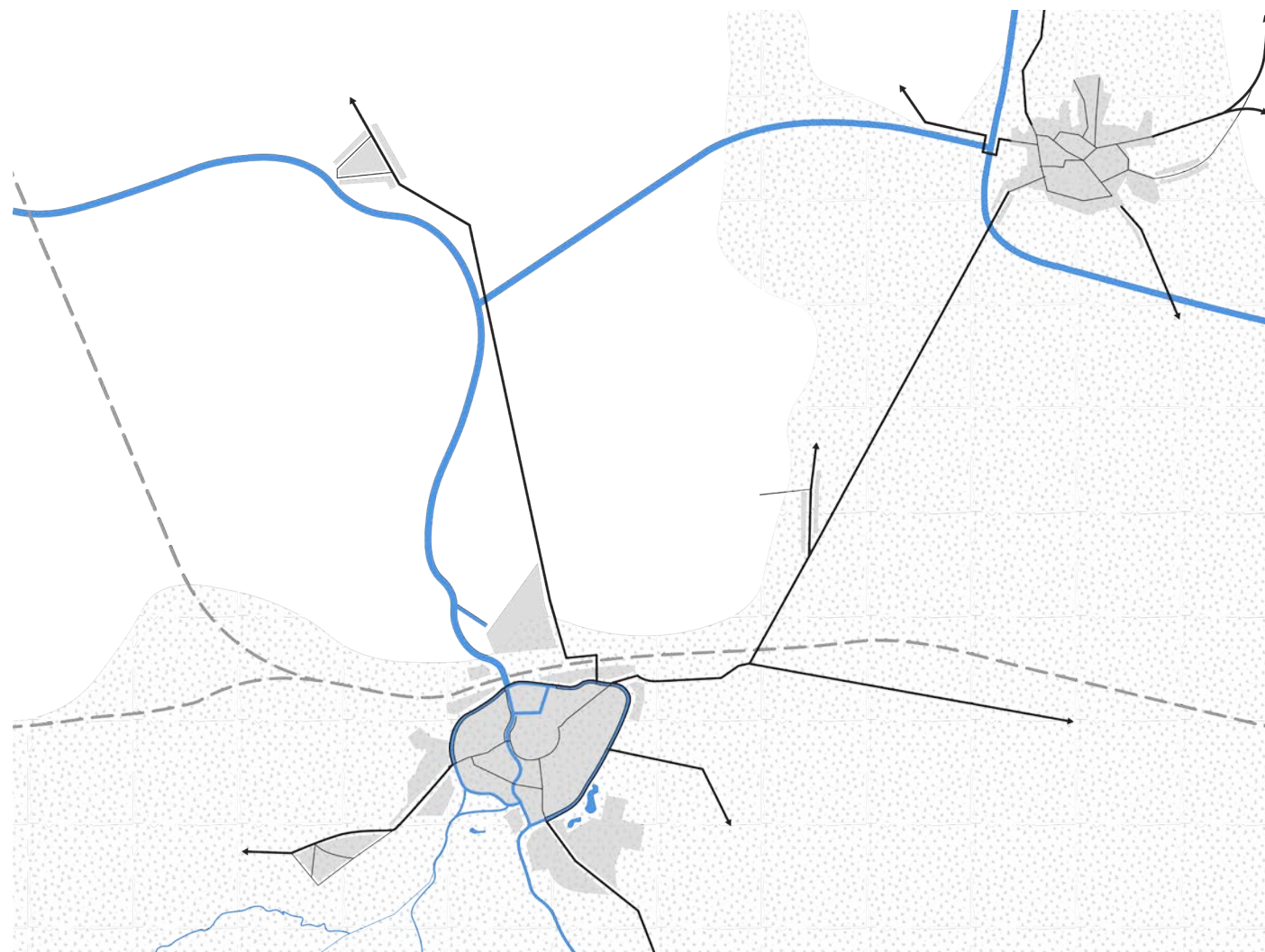
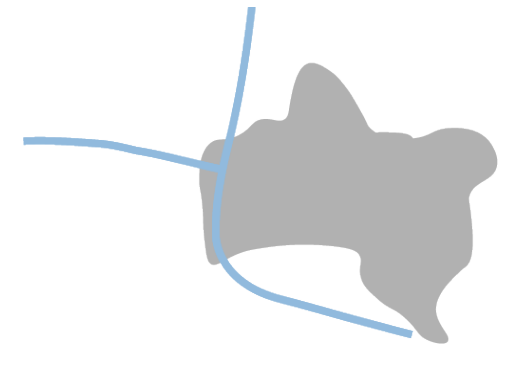
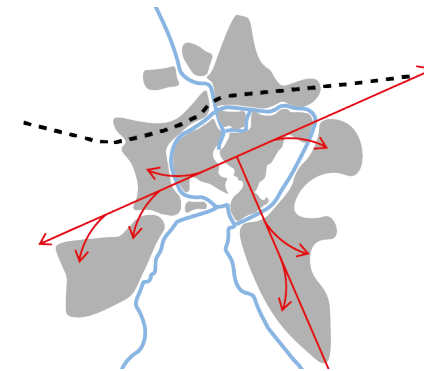
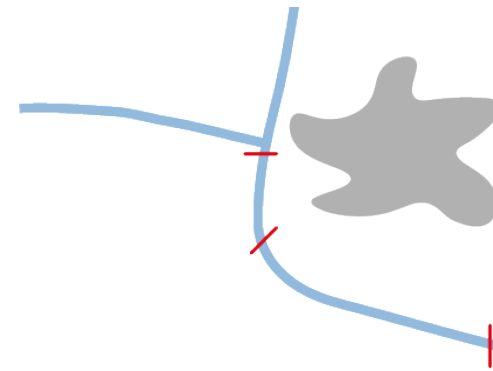
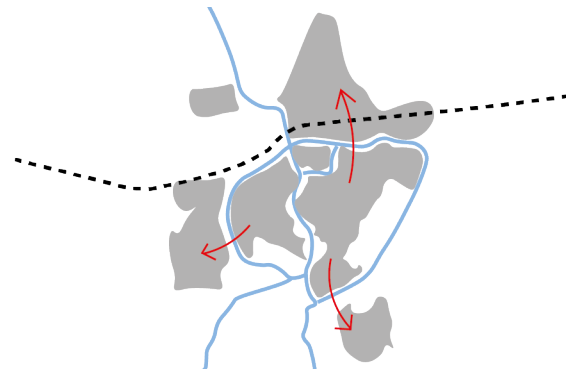
1942
Annexation
Ginneken &
Princenhage

1944
Liberation
by Polish
forces

1950's
'Wederopbouw',
partially on basis of
CIAM-principles

1955
Construction of first
motorway; city reaches
100.000 inhabitants

1966
Filling up of the Oude
Haven and construction of
the ring road

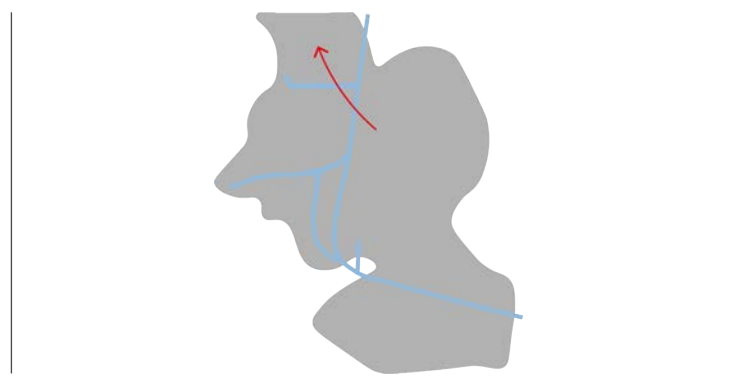
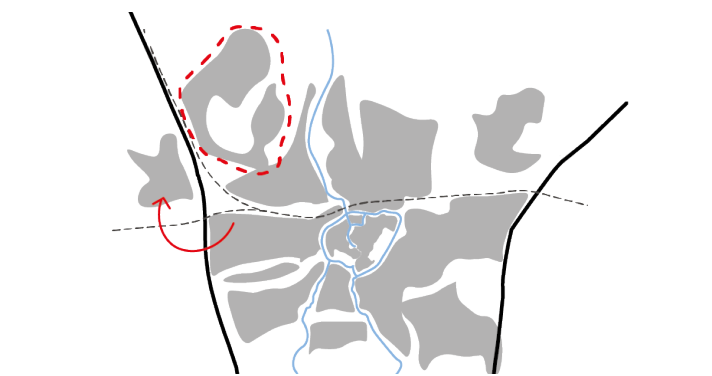
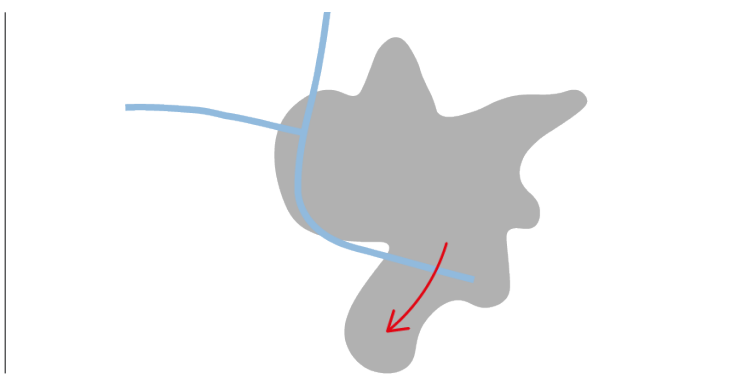
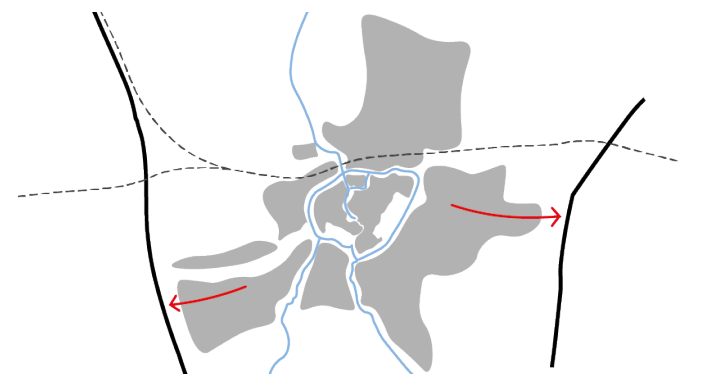
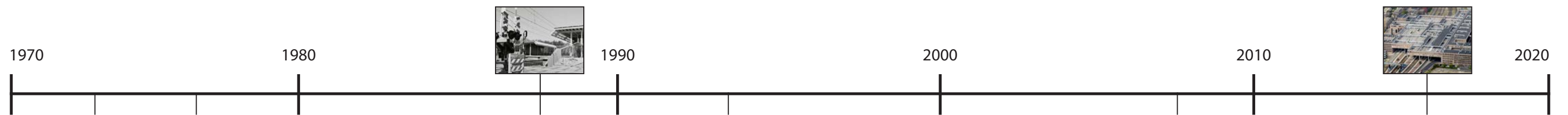


1940 – As a result of annexations, Breda's territory has significantly increased in size, allowing for new developments outside of the singels. This development mainly takes place along the main roads out of the city to the south, southwest, and north.

Lowergrounds between these roads remain agricultural. No major changes are taking place in Oosterhout. The Breda bridge, Wilhelmina bridge and Tilburg bridge form important crossings to nearby cities.

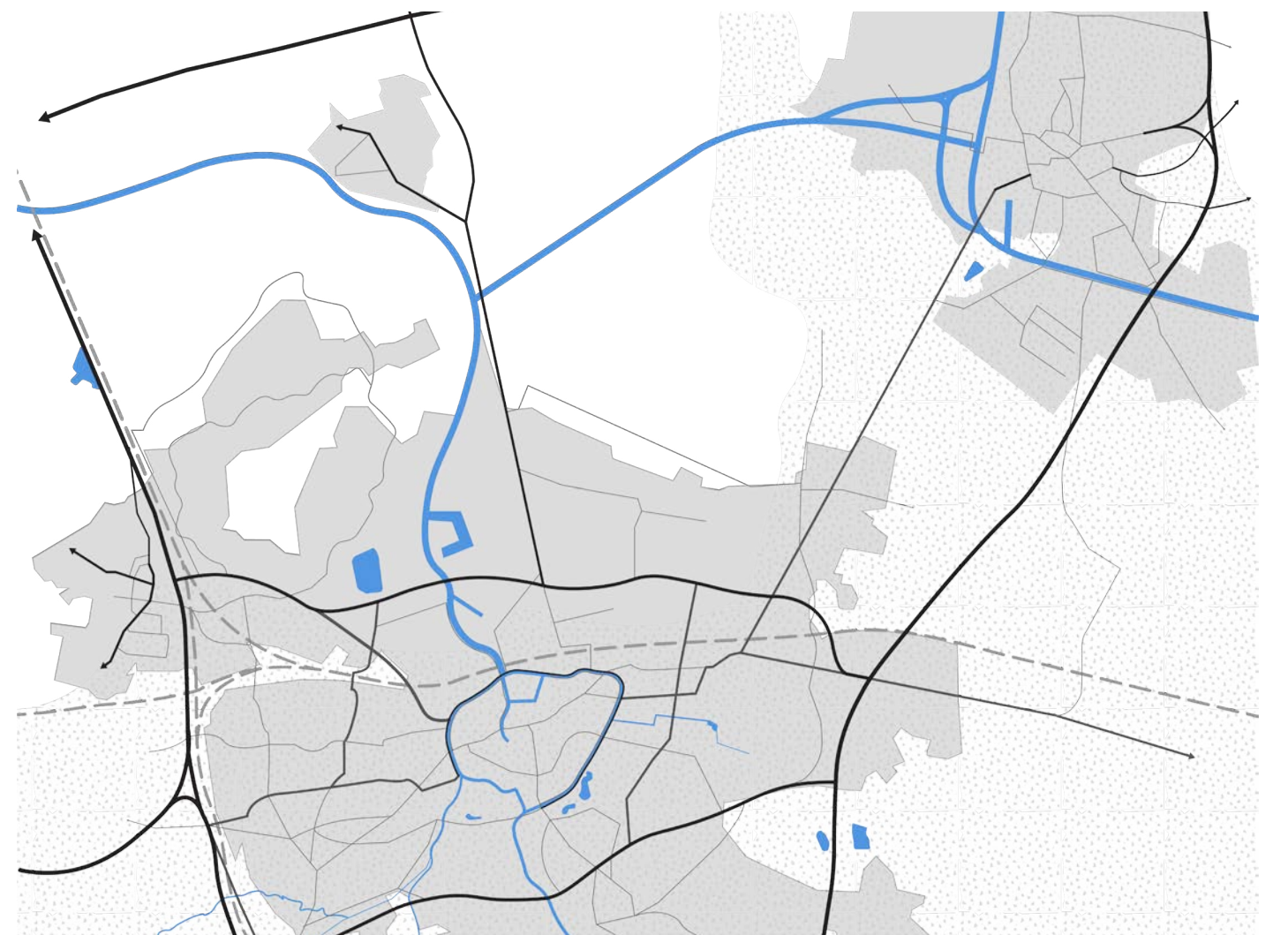
1960 – Between 1940 and 1960, Breda's number of inhabitants more than doubles. This is reflected in the speed and volume of construction after the war. Initially, also these post-war developments adhere to the ancient roads, but gradually start filling up

the spaces between as well, often in a 'carte-blanc'-approach reminiscent of the functional city ideals. Oosterhout starts to grow considerably too. It is an attractive commuter location, but it also develops a lot of employment itself, mostly in industry.



1980 – Breda keeps expanding outwards, albeit at a slower pace. New residential and industrial development takes place to the west and east, closing the areas up to the motorways. In Oosterhout, the buildings expand on the other side of the canal and

grow slowly towards Breda.



2020 – To the east, Breda's expansion 'jumps' over the A27 motorway. Most significant, however, is the construction of the Haagse Beemden to the northwest. The 27.000-inhabitant neighbourhood is designed and constructed between 1975 and

2000, on the principles of what is designers called 'inversie stedenbouw', where the landscape takes a leading role in the urban development. Oosterhout is expanding mainly on the north side towards the Maas.

urban morphology

before 1960

Breda was founded in 1252 on the eastern bank of the river Mark, where a settlement and a stronghold were built. This was about halfway between Brabant and Holland and on the higher laying sandy soils that history had shown to be a good place for a city. The city was walled at the beginning of the 14th century during the Dutch Revolt, a defense that was further extended during the 16th century with the construction of two fortification towers around the harbor, the Spanjaardsgat. Outside of the city, small settlements like Boscheind, Ginnekeneind en Haagdijk appear. In the late 19th century, railways to Roosendaal, Rotterdam, and Eindhoven were constructed. The railway station was built within shooting range of the city walls. Until now, Breda was

still a small city. This changed when around 1870, the city walls were demolished, which facilitated the expansion of the town. First, the city expanded along the railroad in the north (Belcrumpolder) and in the 1930s through annexations also to the west (Tuinzigt and Haagport) and to the south-west (Zandberg), along the roads that were on higher ground. As a result of further annexations between 1940 and 1960, the city further expanded. This post-war development mostly adhered to the initial radial road layout, but the spaces in between are also slowly filled up, starting from the ring around the 'singels' canals. The surrounding villages of Princenhagen and Teteringen were also annexed by Breda, altogether raising the population more than twofold, to around 100.000.

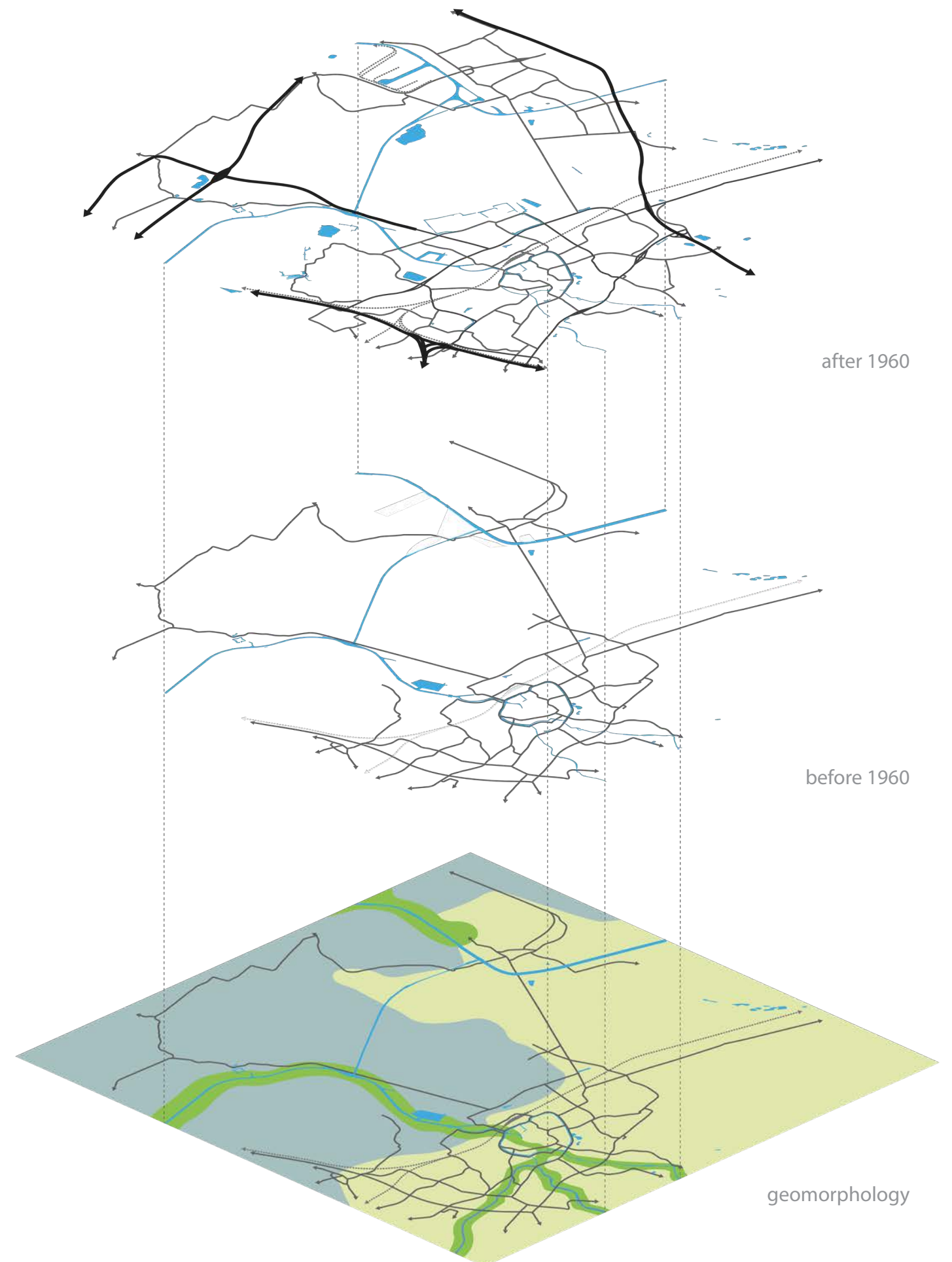
after 1960

After 1960, the arrival of the automobile and the population growth caused significant changes to Breda. New residential and industrial development takes place to the west and east, closing up the areas within the boundaries the motorways form. In 1965, the old harbor along the Mark within the singels was filled up, causing economic water activities to be moved north of the singels. Factories that existed along the railroad near the center moved.

geomorphology

Breda lies on a geological divide that stretches from the southeast to the northwest. The city was built on a terrace on the transition of the old 'Maas Schelde terrace' (old river clay grounds) and the lower grounds in the north. We see that in the south, the terrace is covered with a layer of 'cover sand' (dekzand), making the transition to the north more smooth. In this sandy area, many streams have taken shape that comes together in Breda's center, giving the city access to fresh water, fish, and the logistics necessary for trade. We see that further south, the valleys are smaller and steeper, but as we come nearer to Breda, they become wider and less deep. This

made Breda an excellent place to cross the river. In between the stream valleys lie cover sand ridges. These are heightened with manure layers from centuries of agricultural use. This makes the soil of high quality and because of its capacity to absorb water, well suited for agricultural use. Historically, the area north of Breda consisted mainly of peatlands that could be used as pastures or peat extraction. After the St. Elisabethsflood in 1492, most peat disappeared, being replaced by sea clay. In some places, there are still remnants of the historic peat ground present.



before 1960

Historically, roads were typically constructed on the higher laying grounds. The first roads in Breda were roads connected to several villages such as Etten, Rijsbergen, Oosterhout, and Terheijden. From these villages, the road would connect to other nearby towns, facilitating extended travel to nearby cities, such as Roosendaal or Tilburg.

It was not until 1814 that a national road network began to take shape. Under Napoleonic influences, the construction of a road network following the French style was initiated by Willem I. Two of these roads led through Breda, connecting the neighboring cities of Tilburg, Roosendaal, 's Hertogenbosch, Dordrecht, and even Antwerp in Belgium. The road connecting Paris with Amsterdam, constructed between 1813 and 1816, also went through Breda and Oosterhout.

In the mid-1800s, the Province began with constructing a paved road network to promote trade and industry. New roads were seldom built; instead, the existing road network was improved and widened. In this era, public transport was still the norm. With the introduction of the steam train, the rail connections Straatslijn I and Staatslijn E were constructed. Lijn I allowed people to travel to the harbor of Moerdijk, where they could take the paddle steamer to Rotterdam, while Lijn E connected Breda to Tilburg, Eindhoven, and Maastricht. In 1880, The first steam tram in Noord-Brabant drove between Breda and

Oosterhout, via the Osterhoutse- and Bredaseweg and through Teteringen.

Transport over the water was also vital, mainly for the industry. In 1884, the first plans for the Wilhelminacanal were made. This canal had to connect Eindhoven and Tilburg with the Maas and goes right past the harbor of Oosterhout, making it an important route for trade.

Before the First World War, the bicycle was one of the most popular personal means of transportation. In 1902, the first bicycle path in the province was constructed, connecting Breda with Tilburg.

After the First World War, the automobile slowly became more popular. In 1927, the Wegenbelastingwet and the first plans for a national highway system (Rijkswegenplan) were introduced. In this plan, the highway connecting Rotterdam and Antwerp would no longer go past Breda, making the city fear for their economic position. In 1955, this road would eventually be constructed between Princenhagen and the Liesbos forest, connecting to the city with a newly constructed ring road. Part of this ring road was the Northern Ring Road (Backer en Ruebweg and Nieuwe Kadijk), which now serves as a tangent between the A16 and A27 highways. The Southern Ring Road (Graaf Engelbertlaan and Franklin Rooseveltlaan) was another part of this ring road that kept through traffic from the streets along the singels.

after 1960

After the Second World War, the number of automobiles skyrocketed to around 2 million in the late 1960s. The construction of the Rijkswegen A16 and A27 finishes in the 1960s, including a ring road past Oosterhout (Bovensteweg). The 3-lane road between Tilburg and Breda was not yet a highway. This often caused accidents at the crossings, and in 1989 the construction of the highway Rijksweg 58 solved this issue.

The increase in automobile traffic also brings changes to the inner city. The old harbor along the Mark within the singels is filled up to make way for wider roads and an underground parking garage. Because of the Wilhelmina- and Markcanal closing in Oosterhout, its inhabitants are isolated from Breda. To solve this, and to keep the center of Oosterhout accessible, several tangents and six new bridges over the Wilhemina canal were constructed around 1970.

In the 1970s, with the Oil crisis and the increasing awareness of the detrimental effects of progression on the environment, public opinion towards the Dutch infrastructure became highly negative. In 1977, under this pressure, the Structuurschema Verkeer en Ver-

voer (SVV) was published, which showed constraints in the construction of new roads. Also, the importance of safe infrastructure in the city and proper bike infrastructure find their origin in this period.

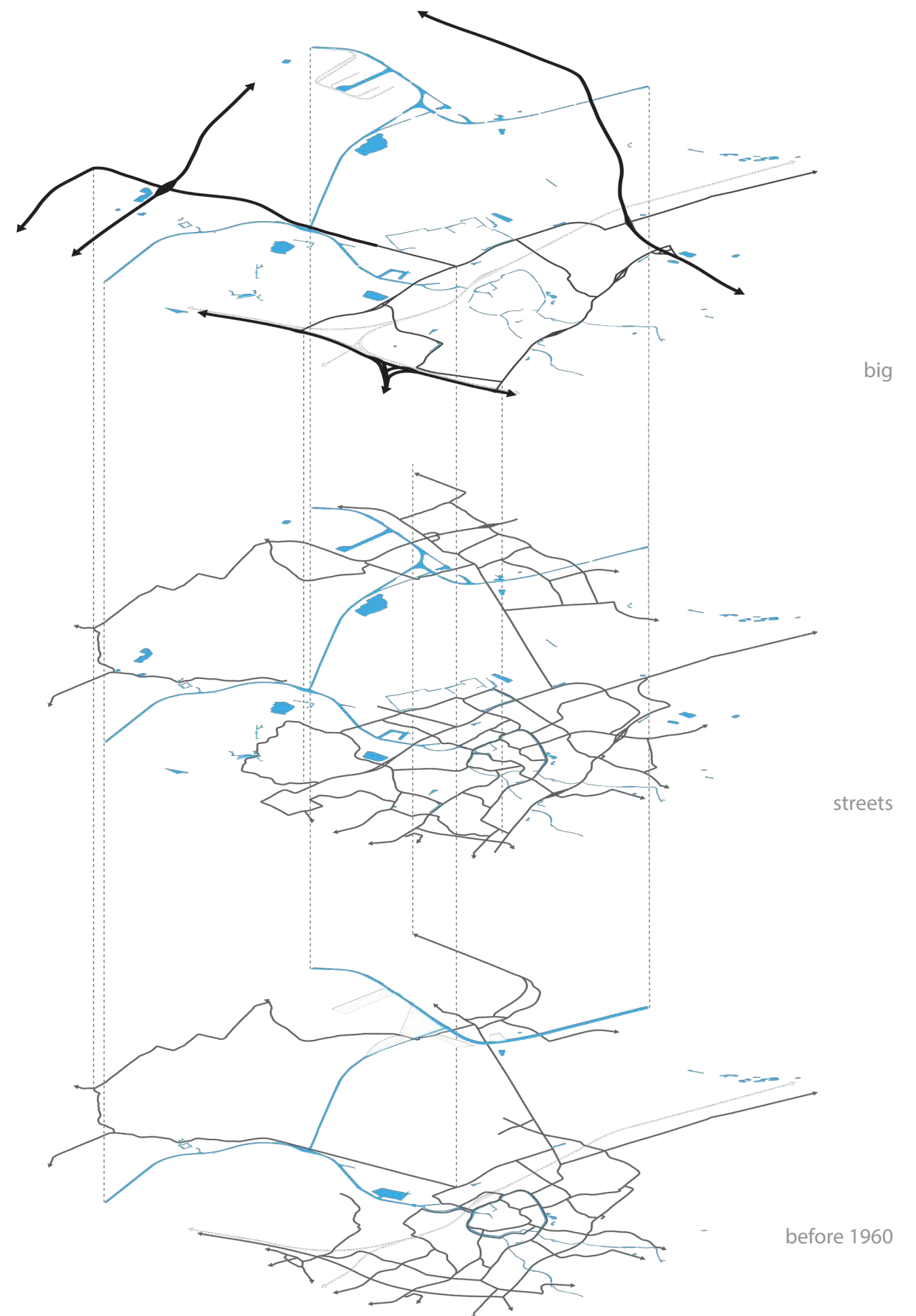
In 1997, the principle of Duurzaam Veilig was formally introduced on a national scale. These principles were partly meant as guidelines for new infrastructure and have shaped the road hierarchy and construction guidelines for all of Breda's roads since then.

With the completion of the A58 at the end of the 20th century, the highway network around Breda was finished.

The HOV, a fast, comfortable, and frequent bus connection is realized between Breda and Etten-Leur in 2005 and later, in 2010, also between Breda and Oosterhout, via Teteringen.

In 2007, the old harbor was recreated, allowing small leisure vessels access to the city center.

To accommodate the HSL rail connection, the A16 highway was slightly moved. This rail connection connects trains from Amsterdam over a high-speed track to Antwerp.



CONNECTIVITY



water

The Mark (usually called Bovenmark until Breda) is a river that flows through the provinces of Antwerp and North-Brabant. On Dutch territory, the Mark enters the city canal of Breda. Just to the west, the river Aa of Weerijis also joins this canal. On the center's north side, the water leaves the city and continues as the river Mark. The Mark canal, located east of the

Mark, connects Breda with the Wilhelmina canal adjacent to Oosterhout. The Wilhelmina canal is a major waterway from Eindhoven via Tilburg and Oosterhout to the river Maas. It connects to the harbor of Oosterhout and separates Oosterhout from Breda. Although waterways can be an attractive element, mostly, they form a barrier within the city.



traffic machine

Breda is located between two highways, the A16 and A27, which connect to the A58 highway just south of Breda. These highways are connected through Breda by the northern and southern ring roads that diverge into several main roads to lead traffic to and through the city. The city also has a train station north of the center from where you can travel in the

direction of Roosendaal, Dordrecht, Tilburg, and Antwerp and a station near Prinsenbeek, where local trains depart from. The city of Breda is connected to Oosterhout by the Oosterhout-seweg, which turns into the Bredaseweg close to Oosterhout. All of this big infrastructure take up space and can be hard to cross. Especially for cyclists and pedestrians, they form a barrier.



barriers

The rivers, lakes, canals, railways, highways, and roads together form the barriers one will have to cross to get to another place in or around the city. These barriers separate the city in a way, especially for pedestrian and cycle traffic.



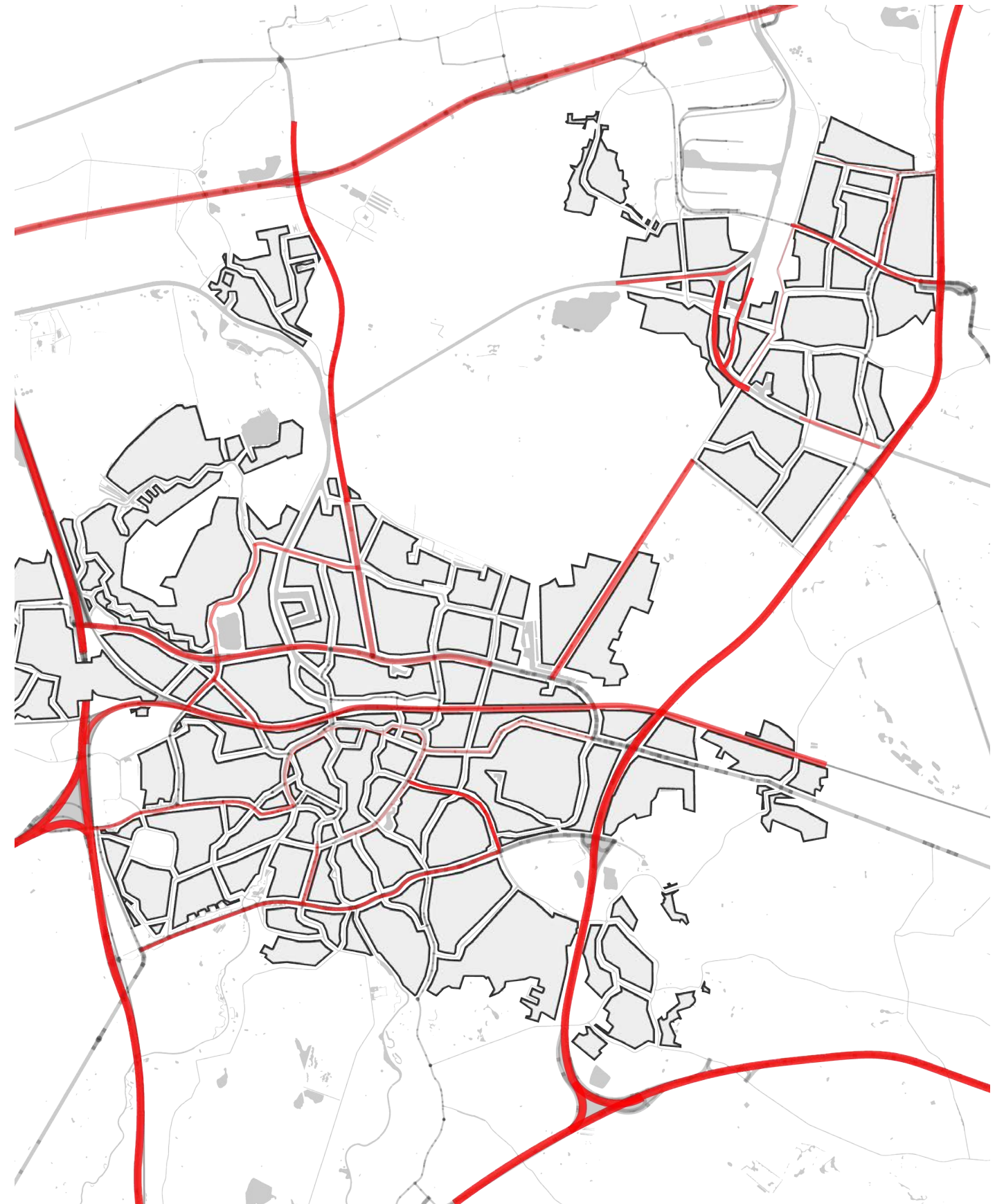
crossings

To overcome the barriers throughout the city, crossing such as intersections, bridges, tunnels, crosswalks, overpasses, and underpasses are present. These facilitate inhabitants to be less disconnected.



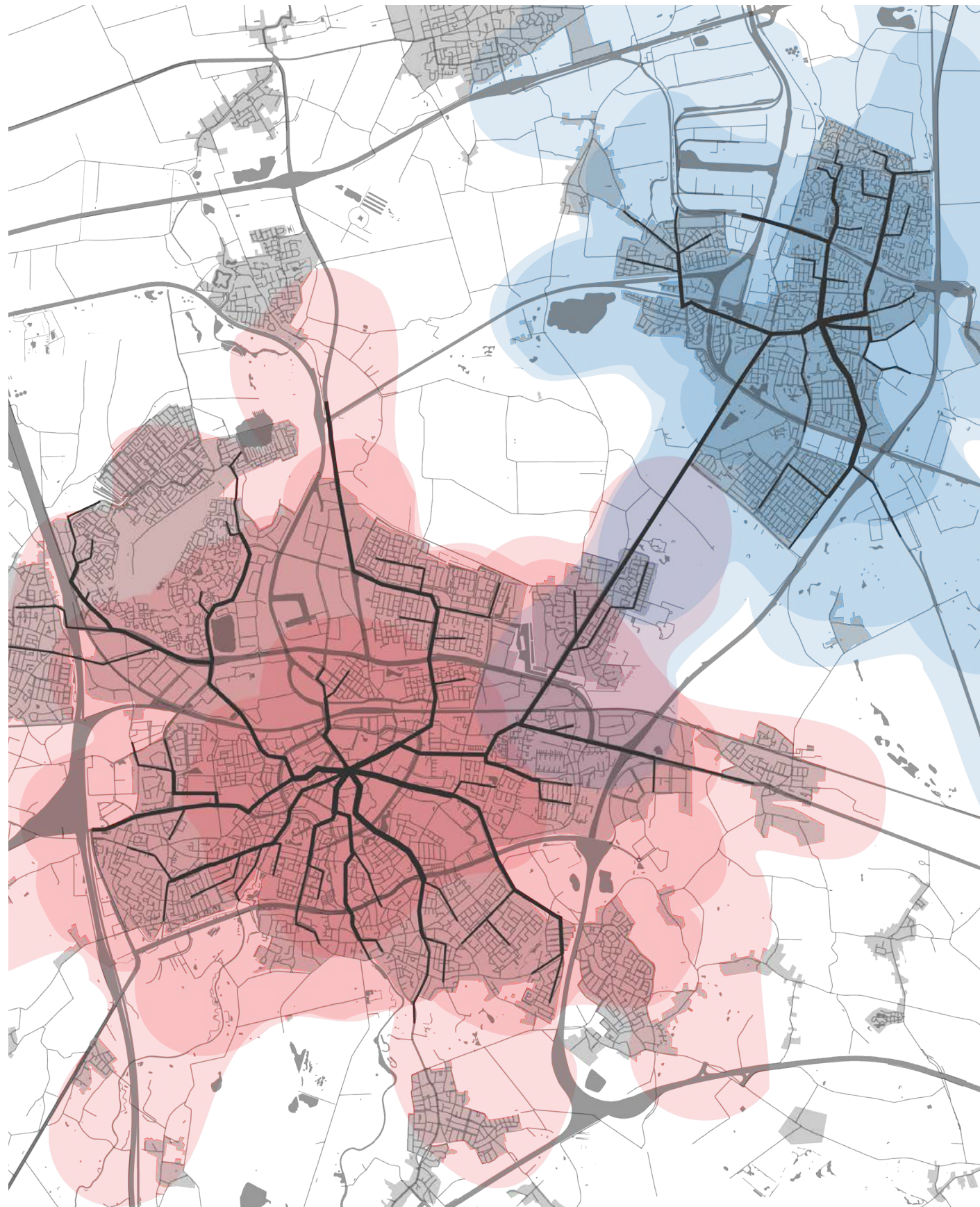
strong and weak barriers

Not every barrier is the same. Depending on the number of crossings nearby, the population density of the area, and the location of critical public amenities, barriers can have a stronger or a weaker effect on the freedom of Breda's inhabitants.



islands

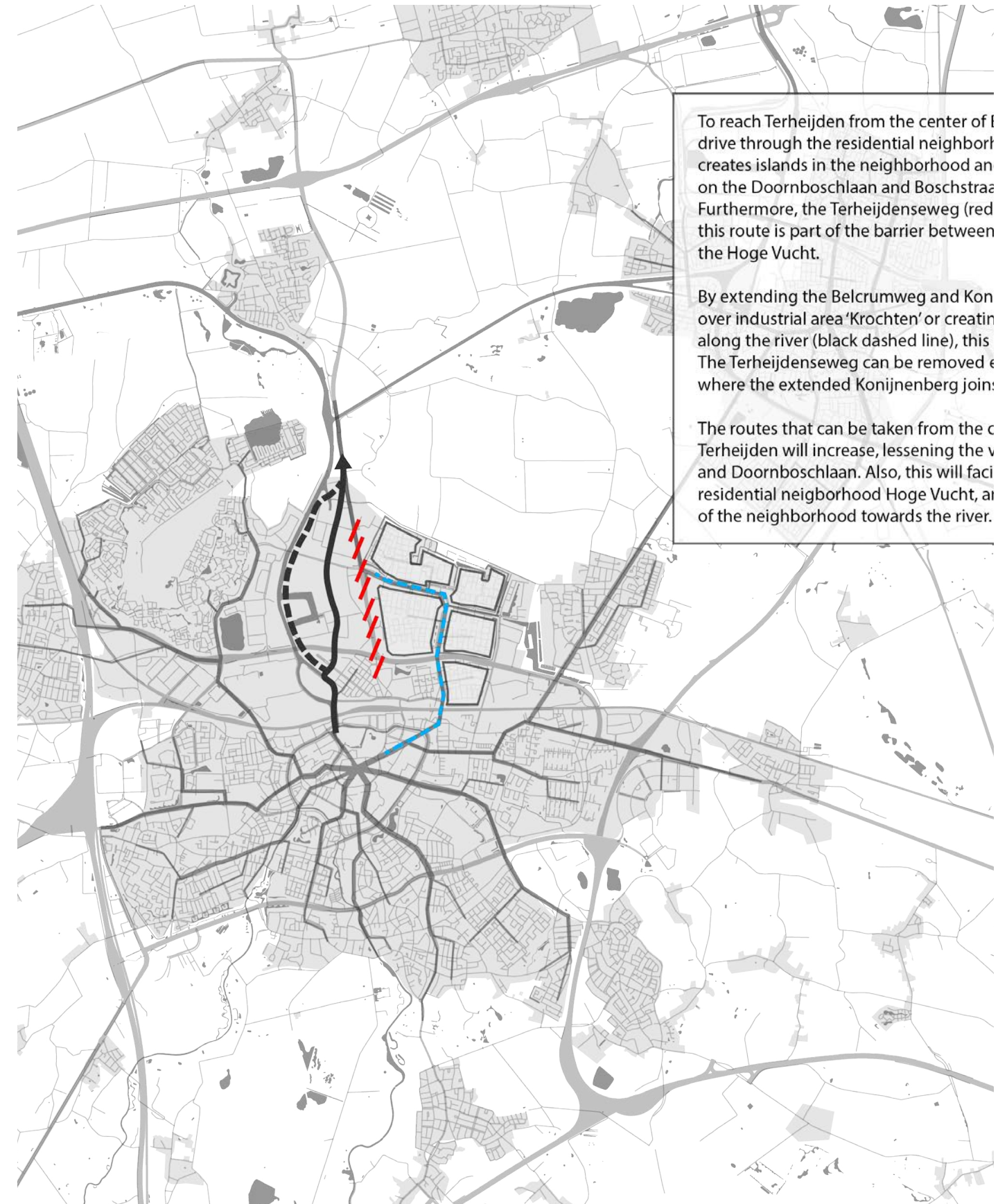
The traffic machine and waterways divide the city into islands. Depending on how strong the barrier is, these islands can be experienced as more remote or disconnected to the city than others.



fluxes

This figure shows the fluxes of people in Breda and Oosterhout, based on the location of crossings and essential public amenities. The black lines show the path people take to get to the center of the cities of Breda and Oosterhout due to the barriers. The red and blue molds show the bikeability from the center of Breda and Oosterhout. The molds show which

areas can be reached in different time units from 10 to 30 minutes. The bicycle has been chosen as a means of transport since this gives a proper indication of the effect of the barriers.



opportunities

To reach Terheijden from the Breda, it is now required to drive through the neighborhood 'Hoge Vucht'. This creates islands and causes a high traffic volume on the Doornboschlaan / Boschstraat (blue dashed line). Furthermore, the southern Terheijdenseweg (red stripes) is part of the barrier between the Haagse Beemden and the Hoge Vucht. By extending the

To reach Terheijden from the center of Breda, driving through the residential neighborhood 'Hoge Vucht' creates islands in the neighborhood and increases traffic volume on the Doornboschlaan and Boschstraat. Furthermore, the Terheijdenseweg (red stripes) is part of the barrier between the Haagse Beemden and the Hoge Vucht.

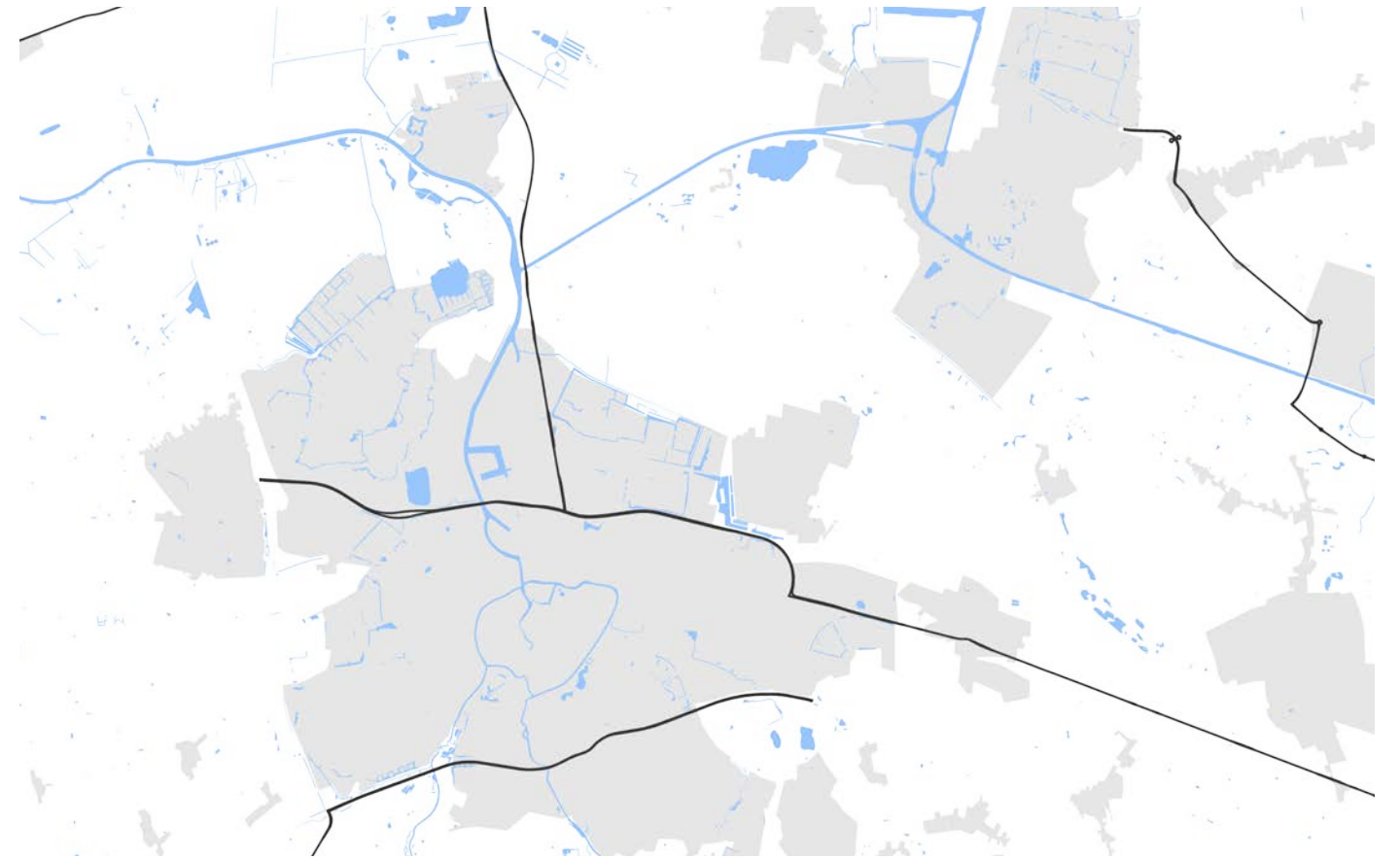
By extending the Belcrumweg and Konijnenberg over industrial area 'Krochten' or creating an entirely new route along the river (black dashed line), this barrier will become weaker. The routes that can be taken from Breda to Terheijden will increase, lessening the volume of the busy Boschstraat and Doornboschlaan and facilitating less traffic in the residential neighborhood Hoge Vucht, also of the neighborhood towards the river.

The routes that can be taken from the center of Breda to Terheijden will increase, lessening the volume of the busy Boschstraat and Doornboschlaan and facilitating less traffic in the residential neighborhood Hoge Vucht, also of the neighborhood towards the river.

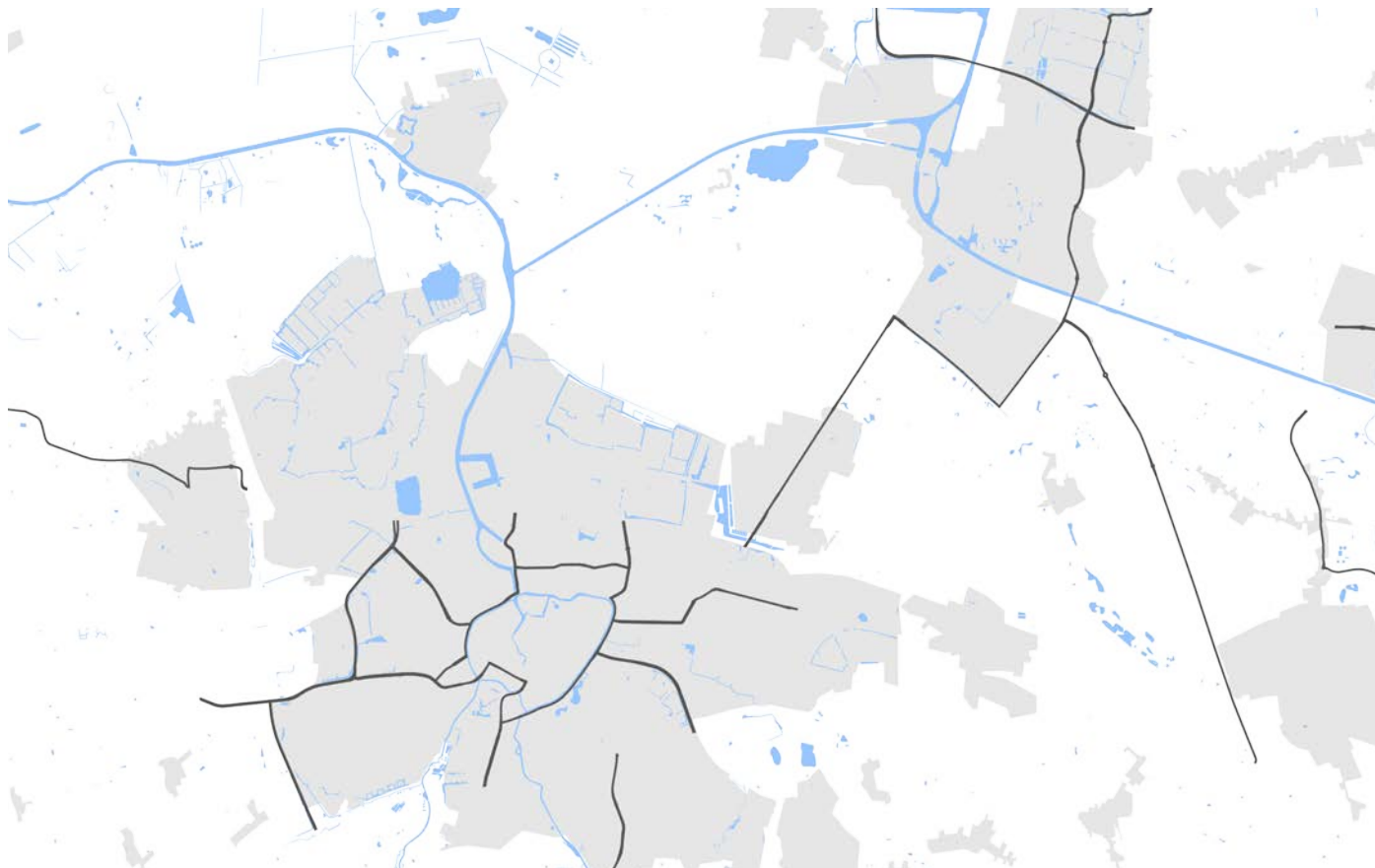
PUBLIC SPACE



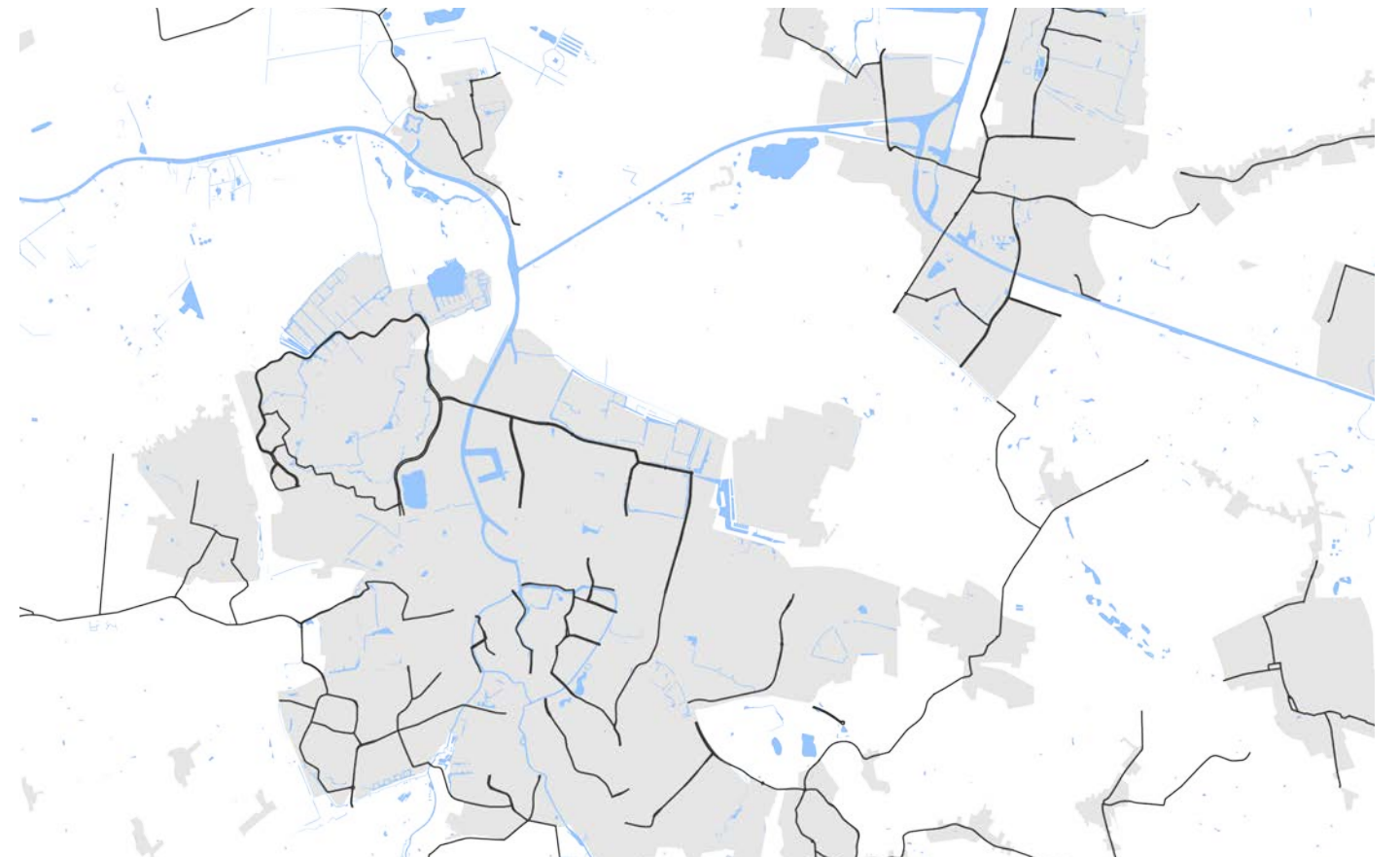
highways



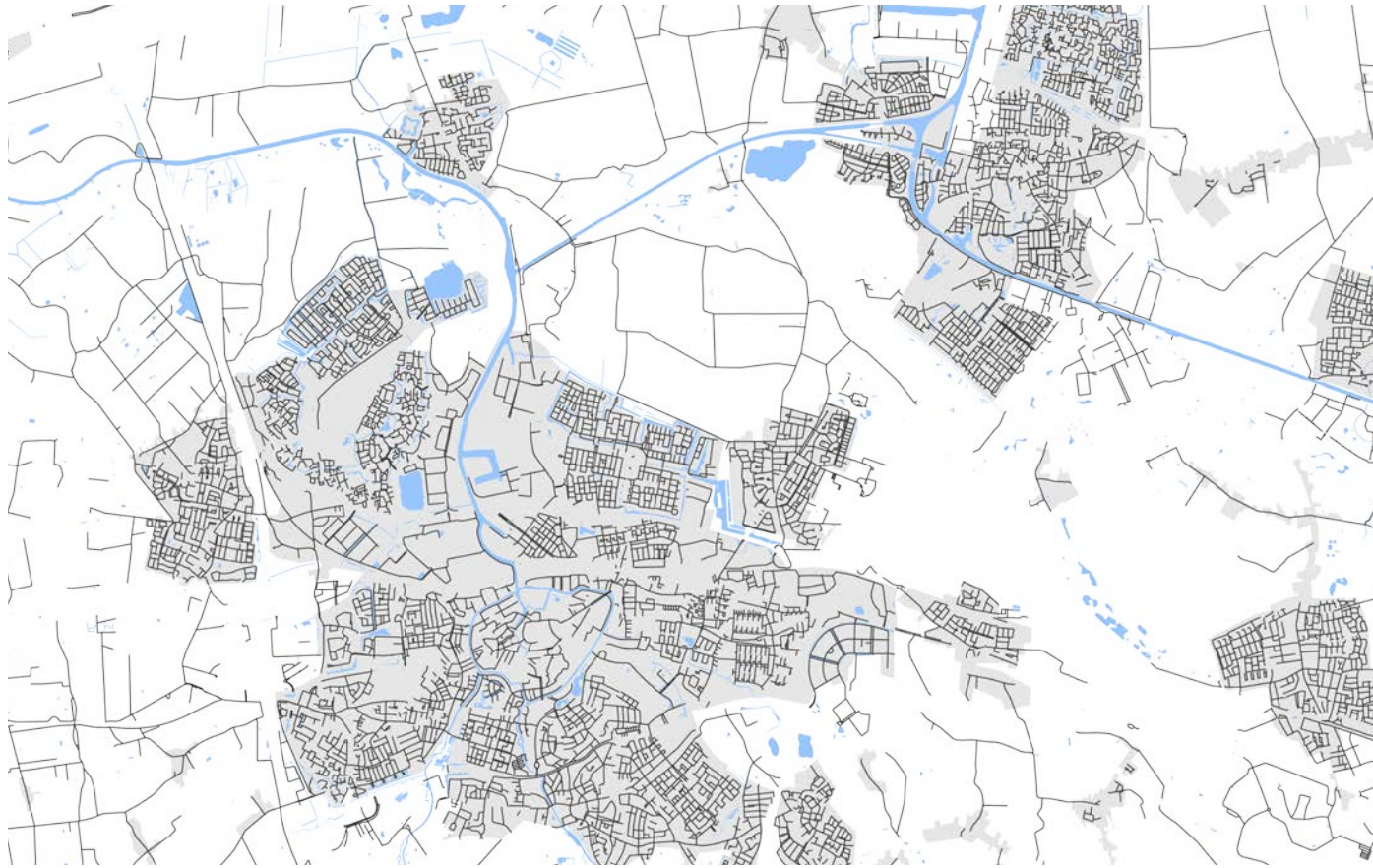
arterial roads



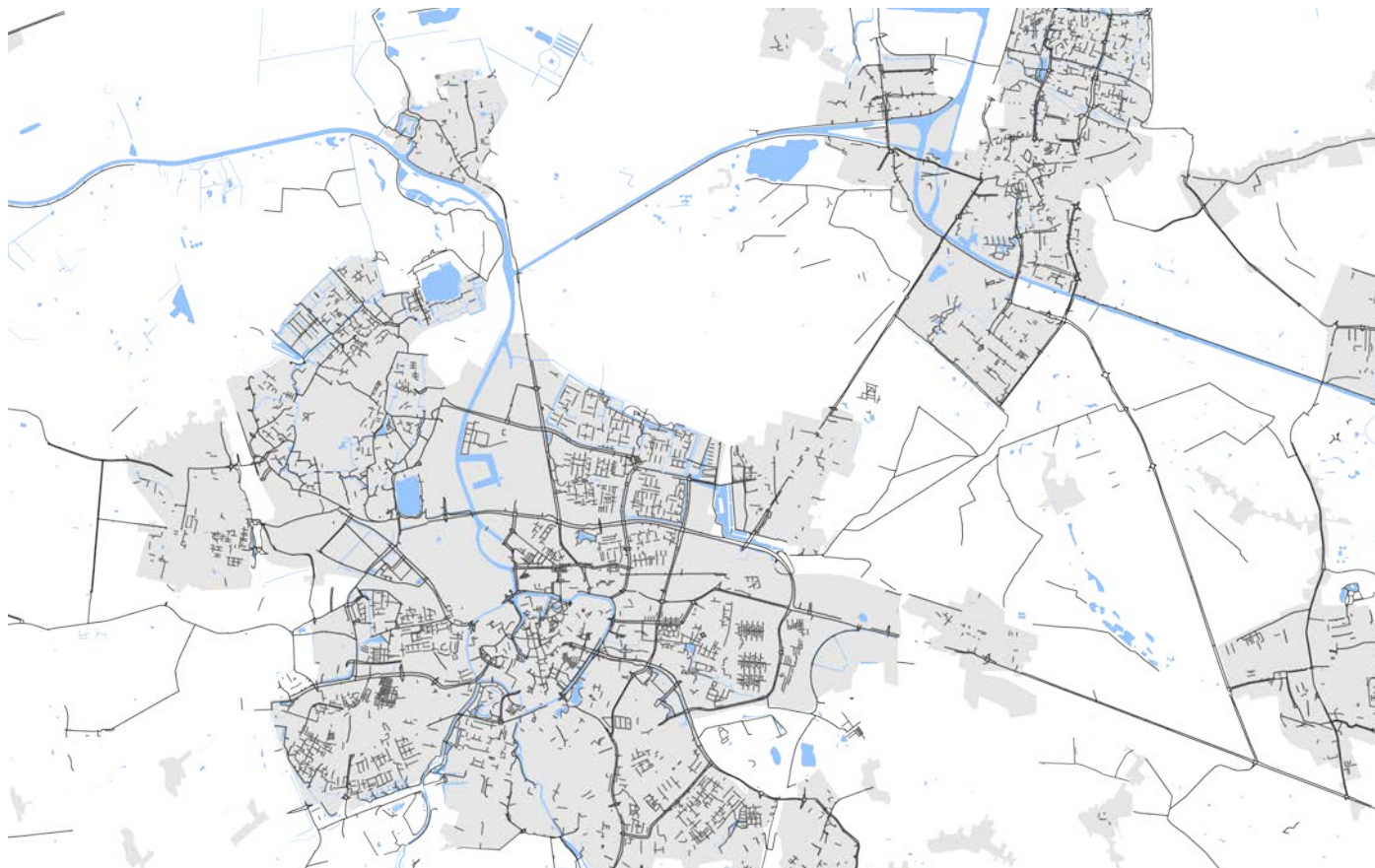
primary distributor roads



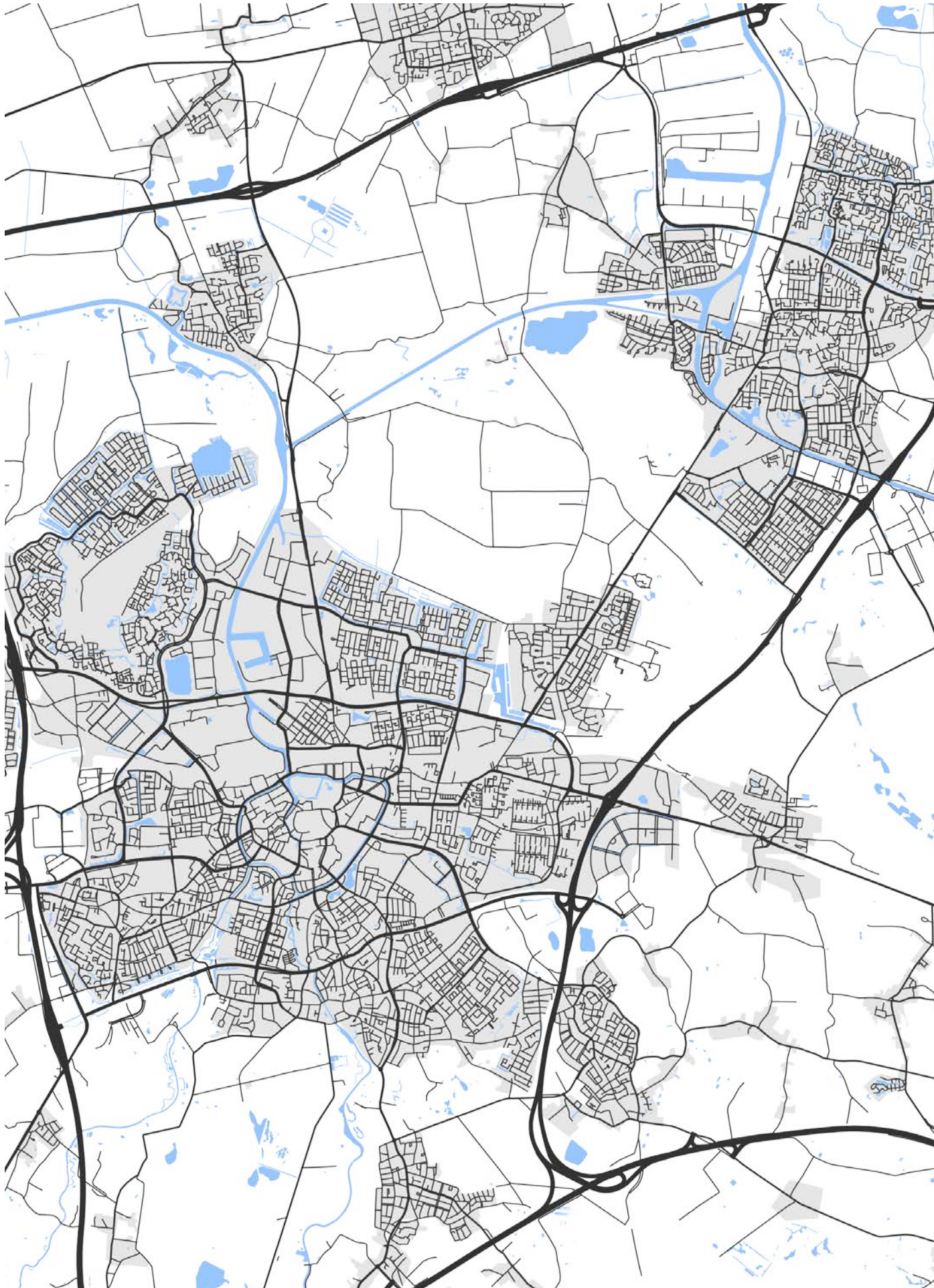
secondary distributor roads



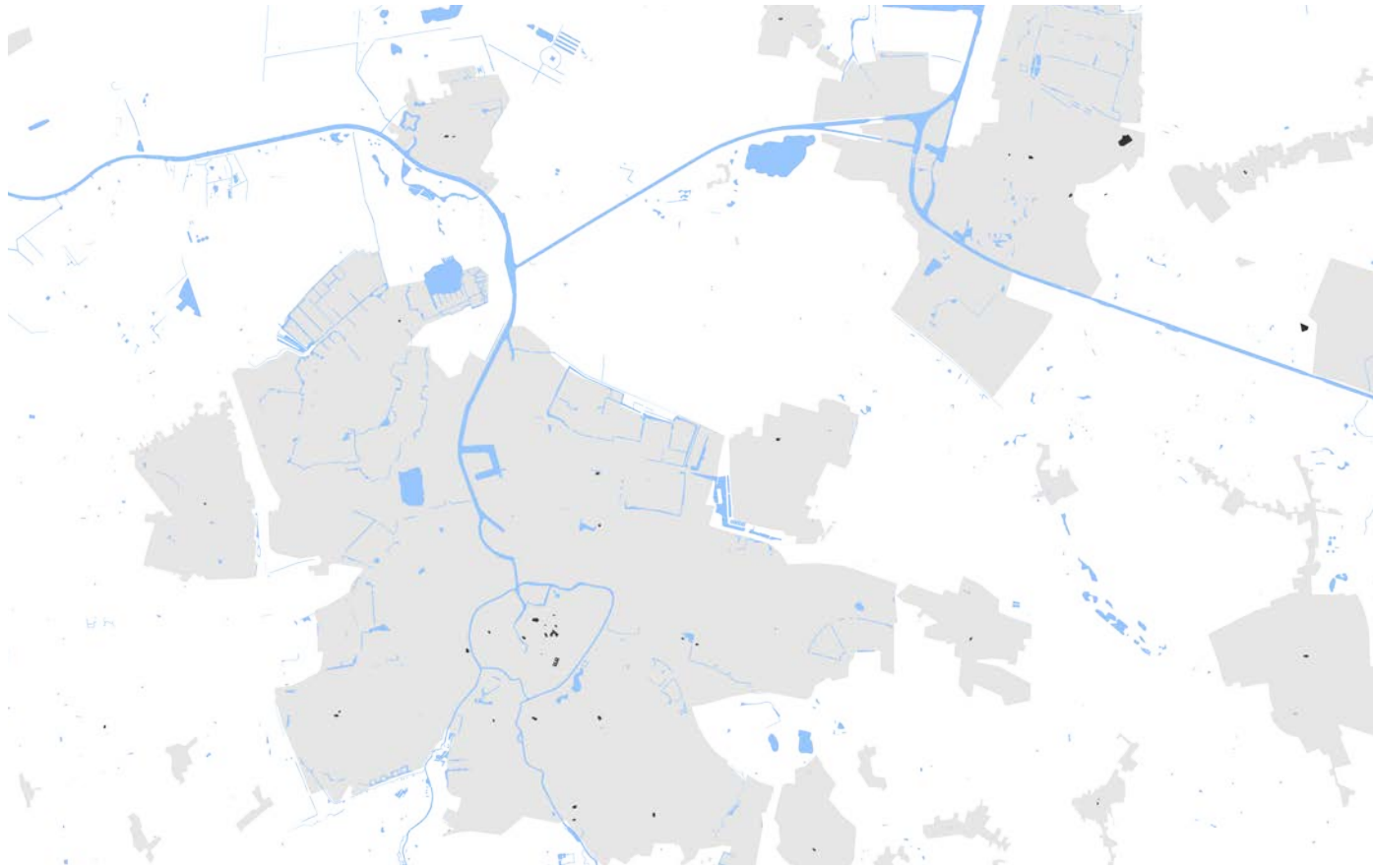
access roads



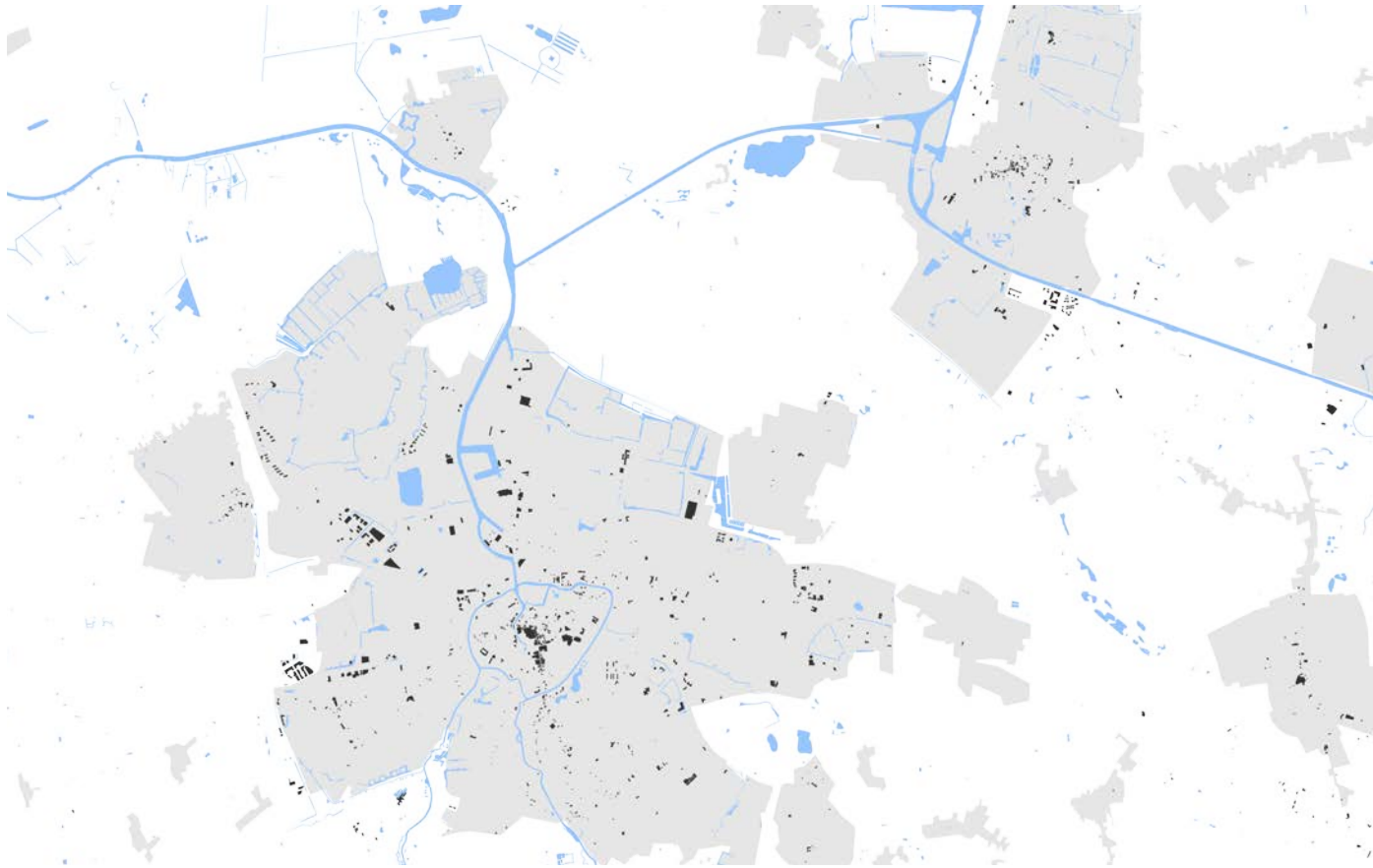
pedestrian and cycle network



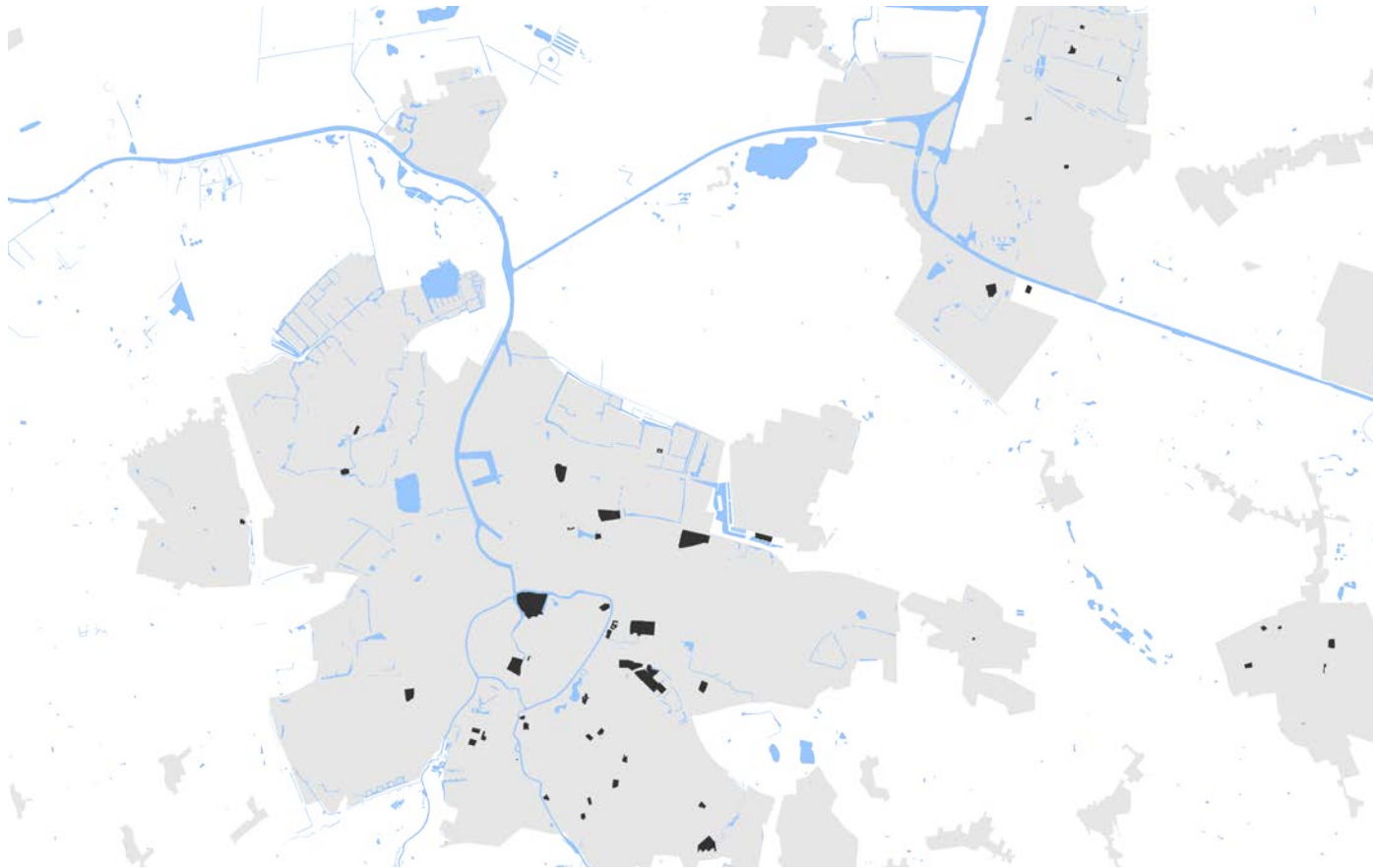
all roads



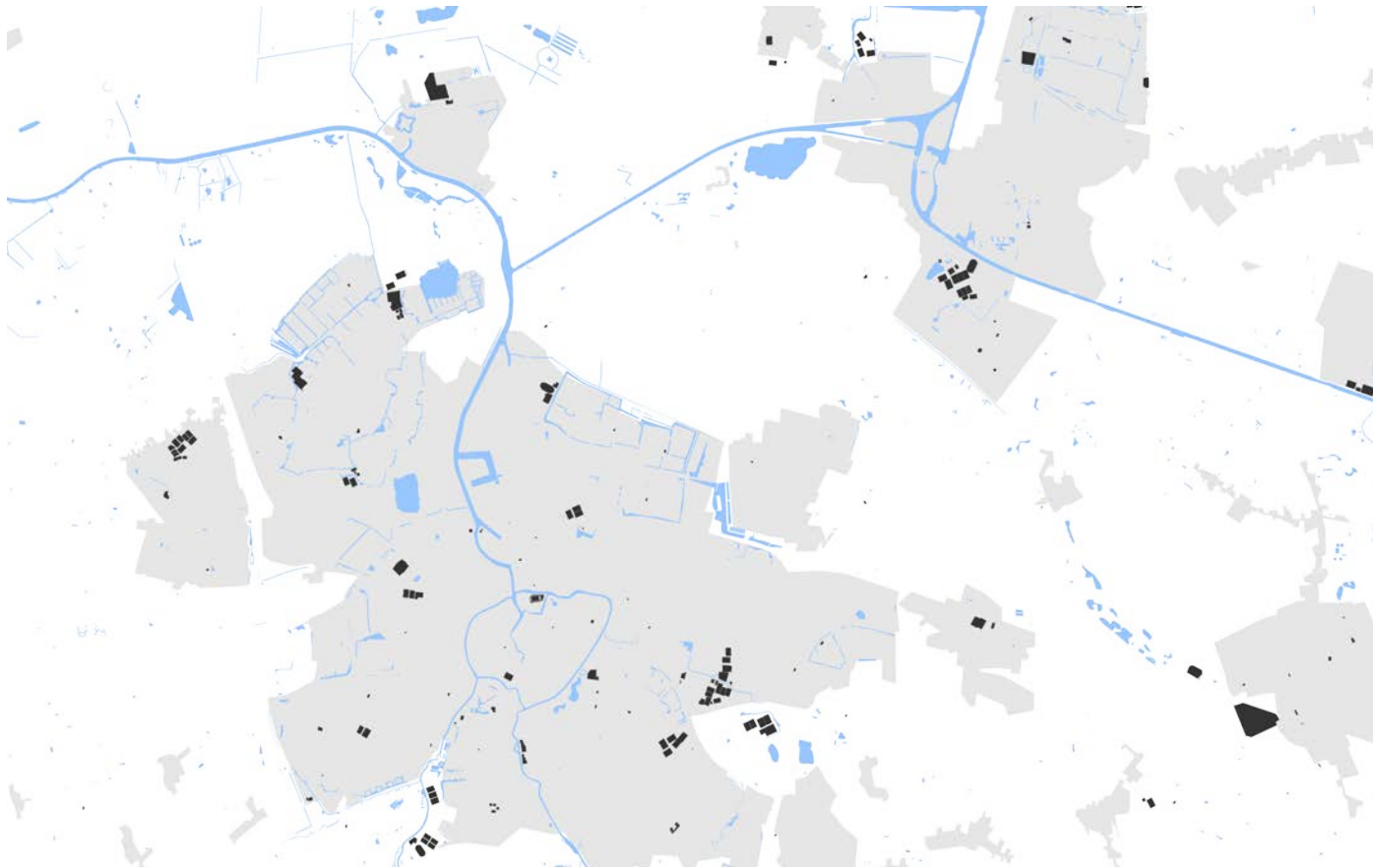
cultural



retail



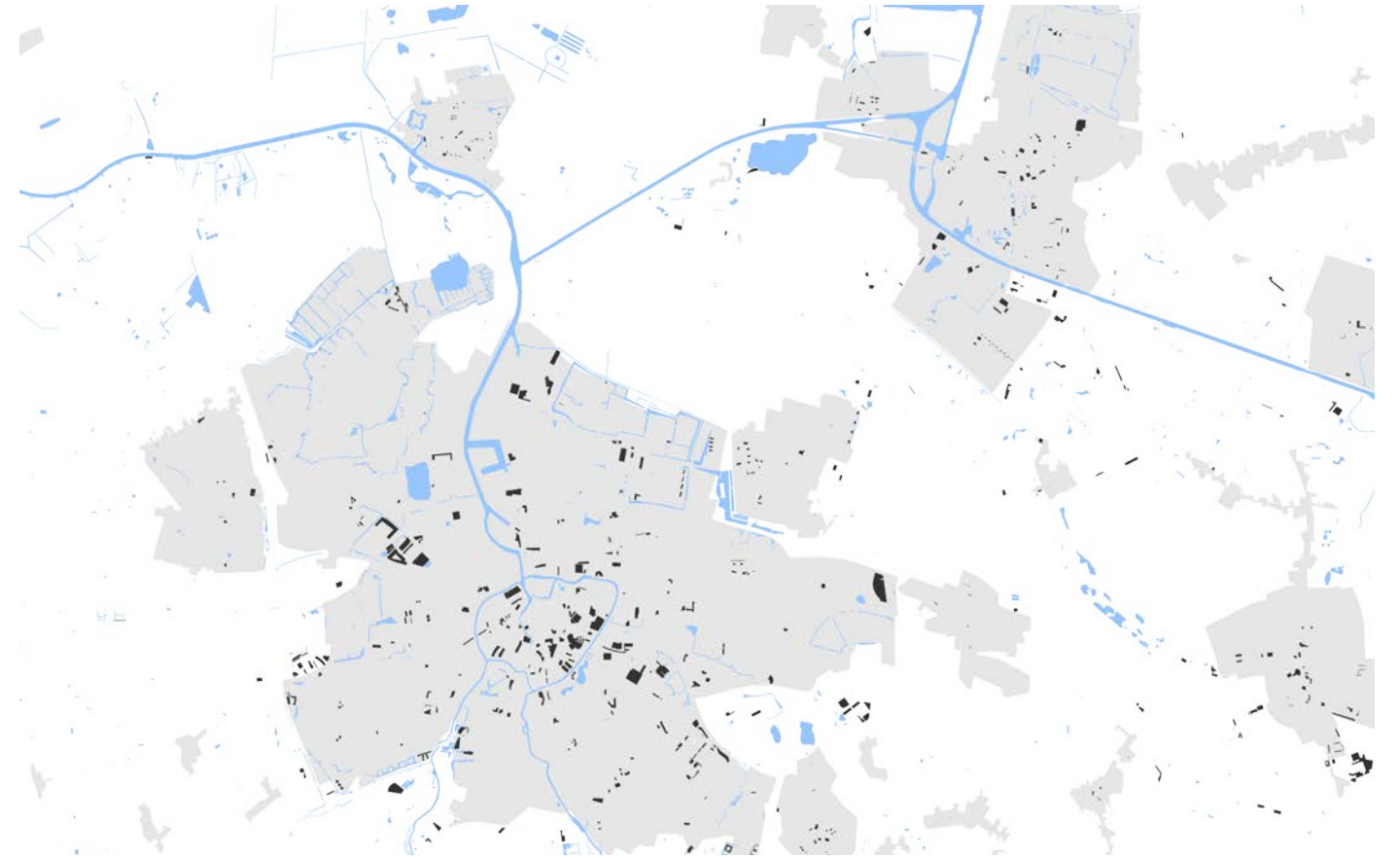
education



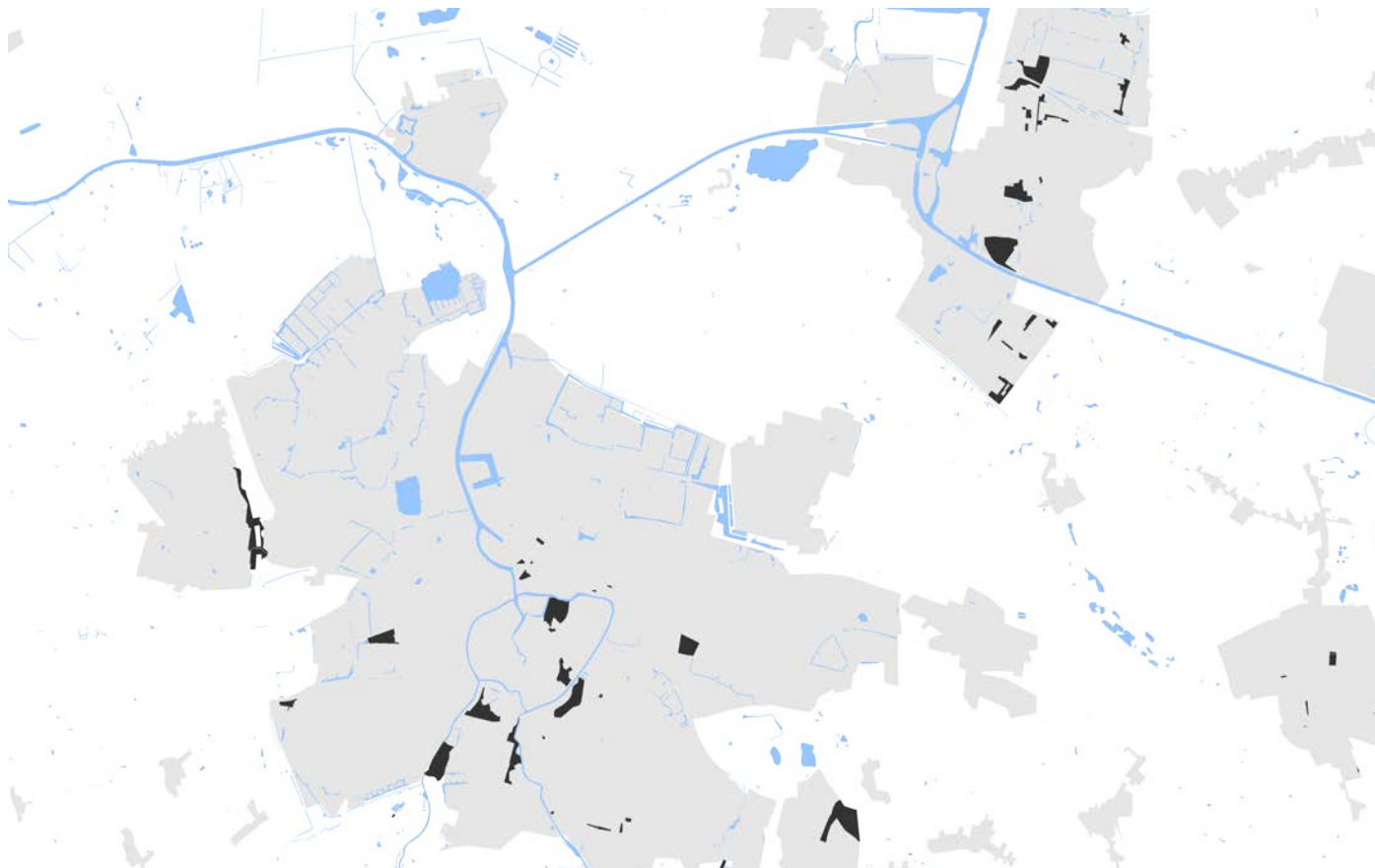
sports



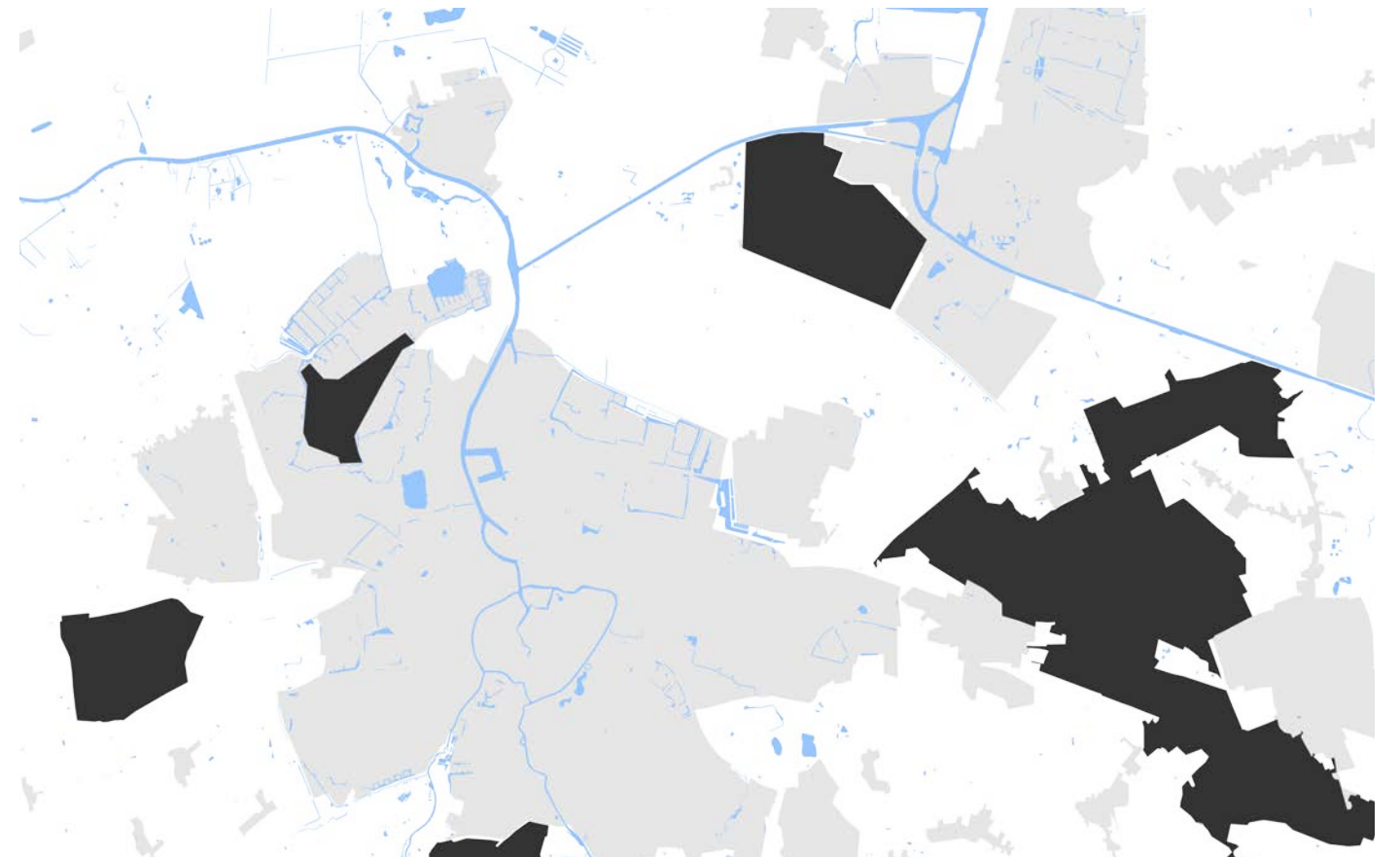
squares



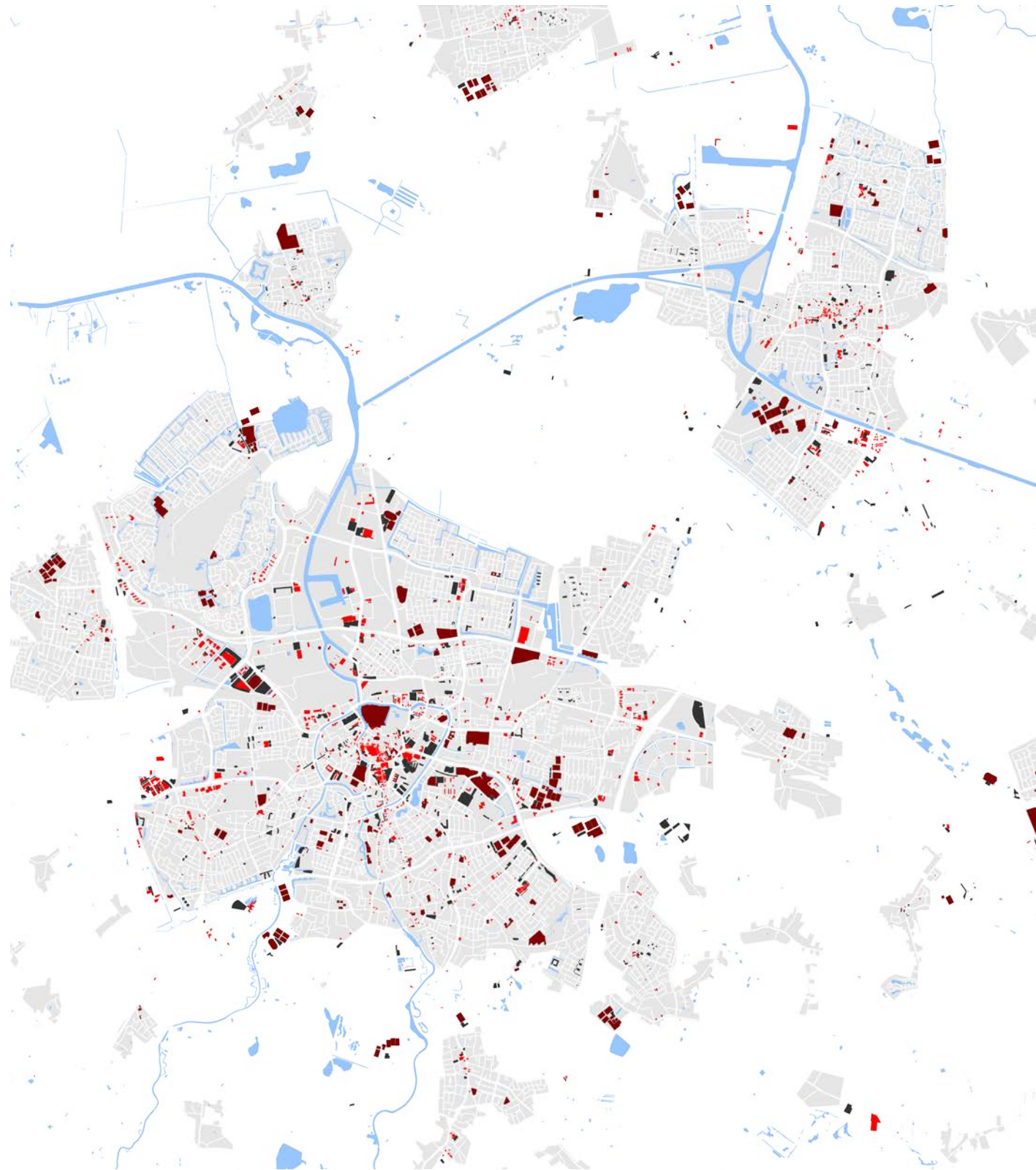
parking



parks



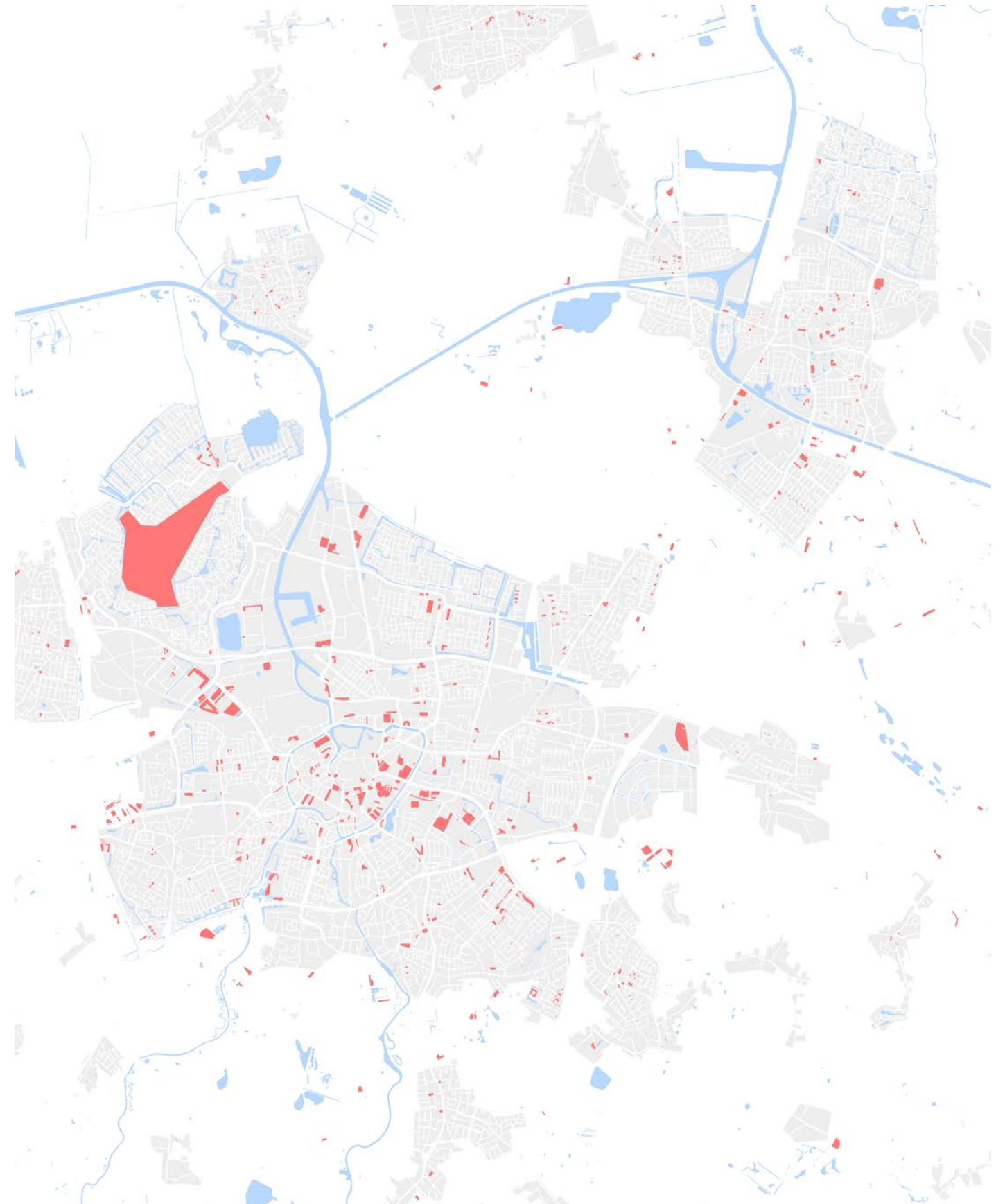
leisure landscape



time and ownership

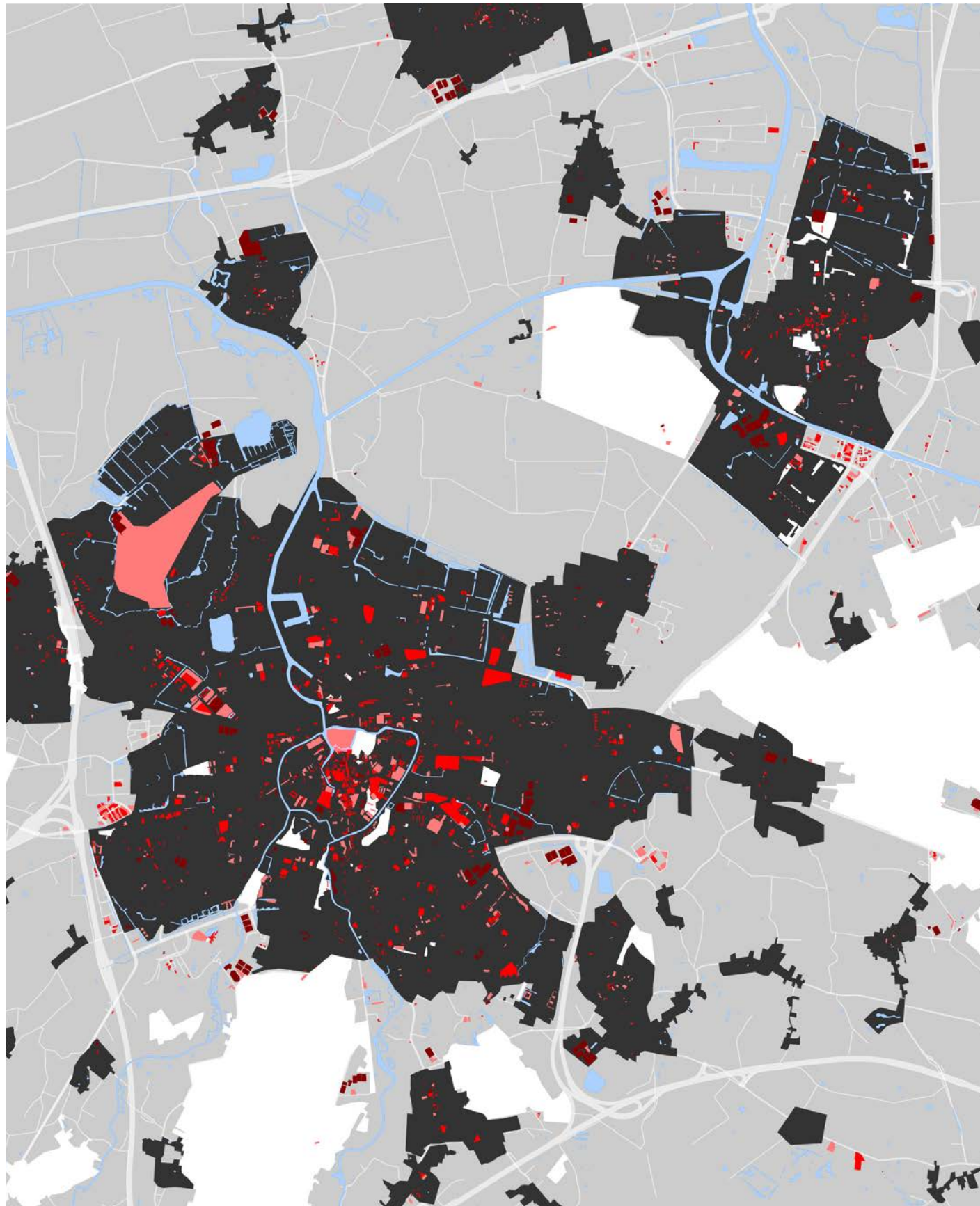
This map shows the public spaces that are privately owned and cannot be accessed at all times. Mostly, these are the places that act as major public attractors. The brighter red an area is coloured, the more restricted it is, or the less time a day it is publicly accessible.

Especially the city centre, with its abundance of shops and cafés, has a high percentage of such partly accessible public space.



disfunctional public spaces

Not all public spaces are equally functional. Locations such as parking lots or hard-to-reach areas, for instance enclosed by (heavy) industry, can be considered as disfunctional. Haagse Beemden functions as an agricultural area, but not as a public space; considering its urban surroundings this would however be desirable. This map shows all these disfunctional public spaces.



distribution of public spaces

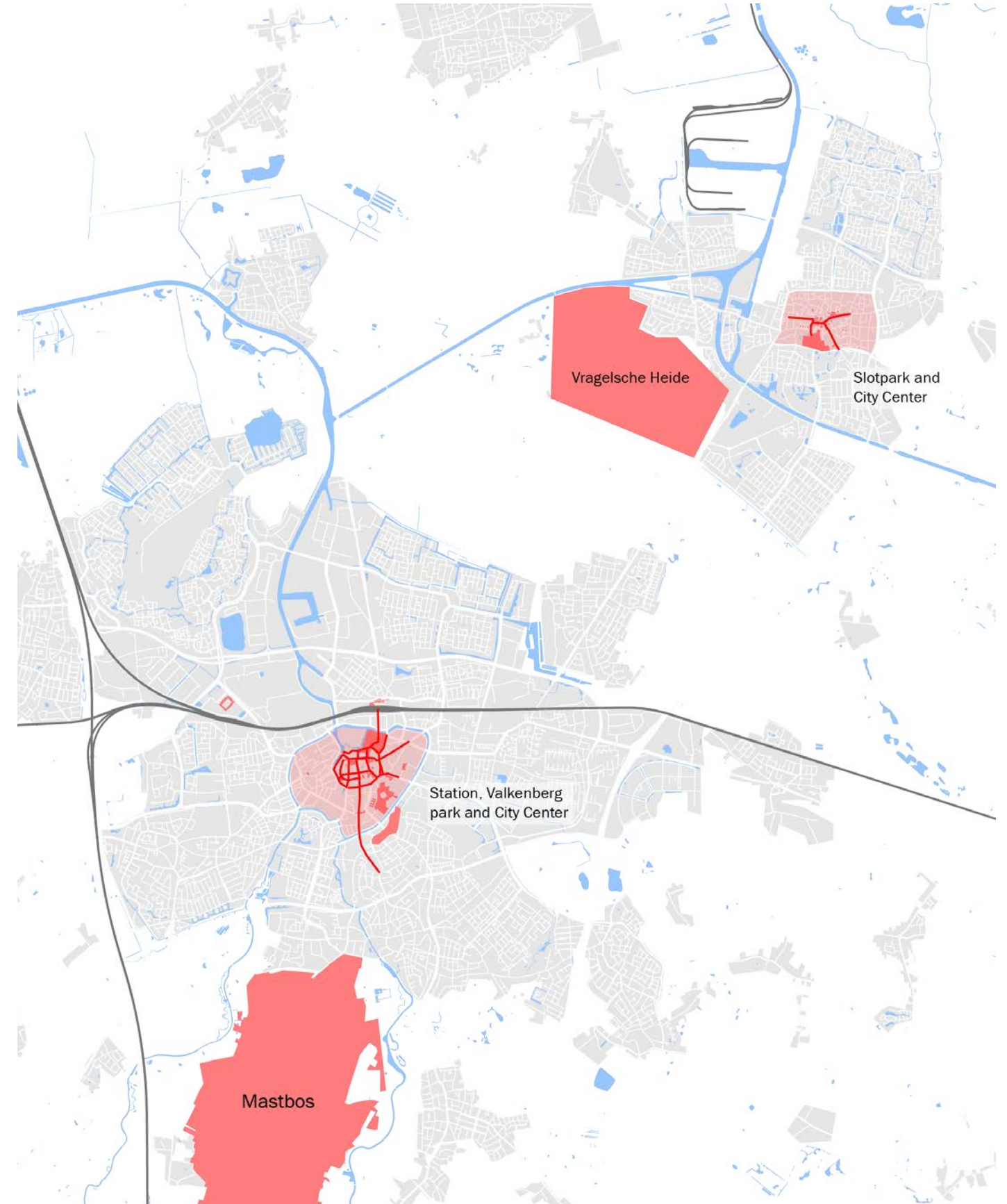
The city centers of Breda and Oosterhout are important urban districts, where the public spaces are more concentrated. The distribution in the surrounding areas seems more spread out, although the neighborhoods De Wijster and Vrachelen in Oosterhout seem a bit lacking compared to the rest of the city.

Legenda:

White = public green

Pink = problematic public space

Shades of red = important public space



main public spaces

For both Breda and Oosterhout, the city centers are visited most. Both cities also have popular leisure areas; the Mastbos forest for Breda, and the Vrachelsche Heide for Oosterhout. Also, some of the parks that are outside the center are popular public spaces.

VISION

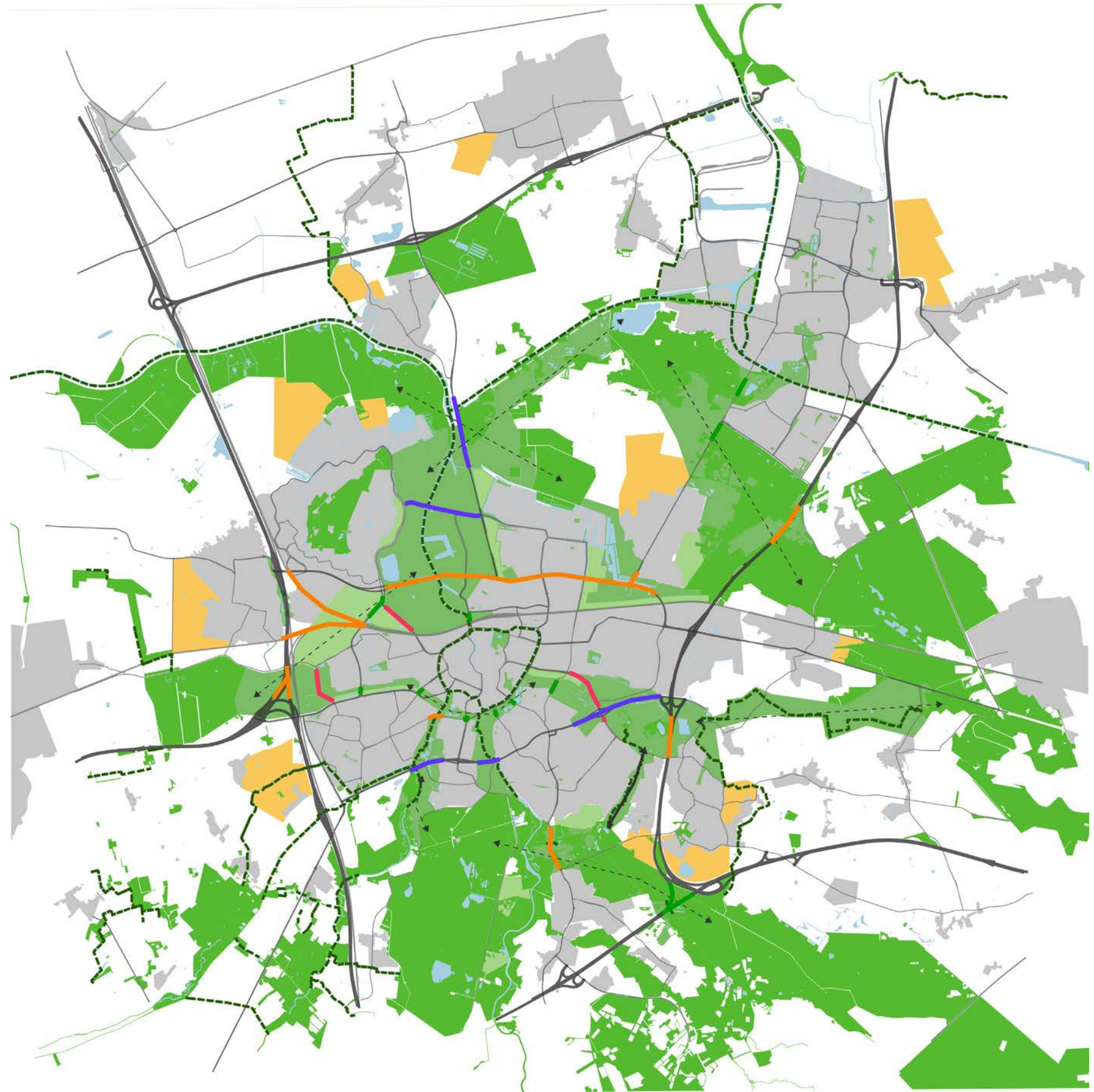
goals and starting points

Having analysed the city and its surroundings, the next step is to take them forward. This vision looks towards the future of Breda. How should the city meet the challenges it faces the coming decades? There are a couple of aims this vision hopes to achieve. These include:

- A larger housing stock for a growing number of inhabitants;
- Provide greenery within pantoffelafstand for all residents ;
- Connect the valuable greenery in the region in one structure;
- Mix functions and societal groups in neighbourhoods;
- Connect the (secluded) neighbourhoods with the city centre and each other;
- Work towards a sustainable and resilient Breda.

In this vision, greenery and the landscape are not only incorporated, but are leading in the urban development. The mental and physical benefits of a green living environment are well documented and need not be repeated here. Furthermore, qualitative and continuous greenery can serve as a connector of neighbourhoods. It will play a crucial role in facing climate challenges, by absorbing precipitation and reducing heat island effects.

The vision does not limit itself to the city, but is laid out on what one might call an agglomerational scale. This includes the nearby city of Oosterhout and villages such as Prinsenbeek, Bavel, Terheijden, Den Hout, and Teteringen. This larger scale is a necessity; if all the above aims are to be met, regional cooperation is indispensable.

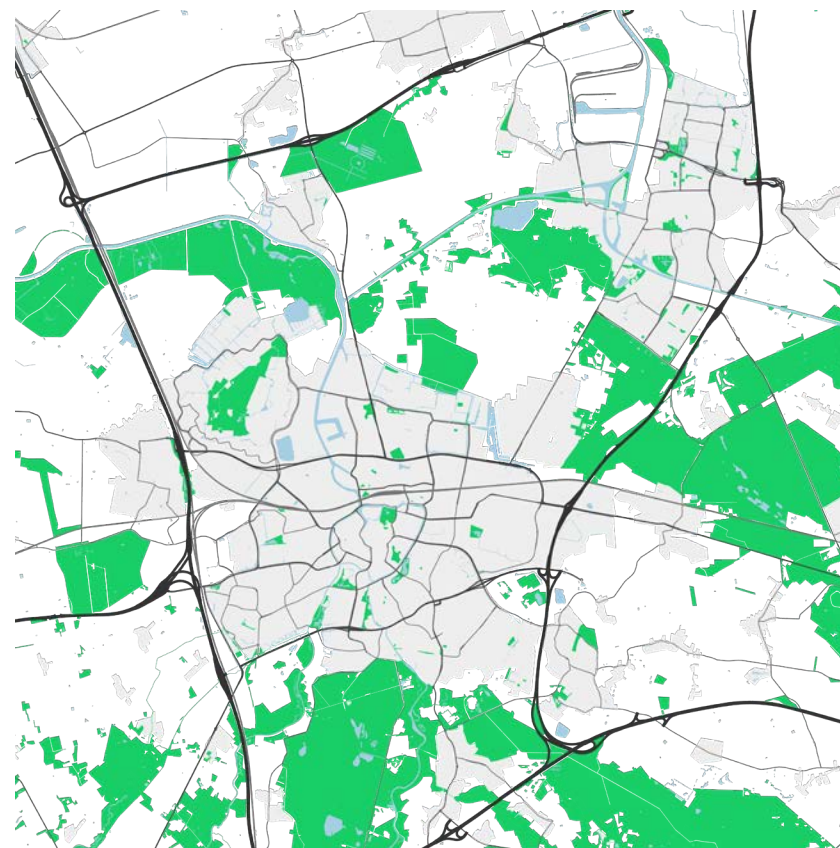


synthesis map

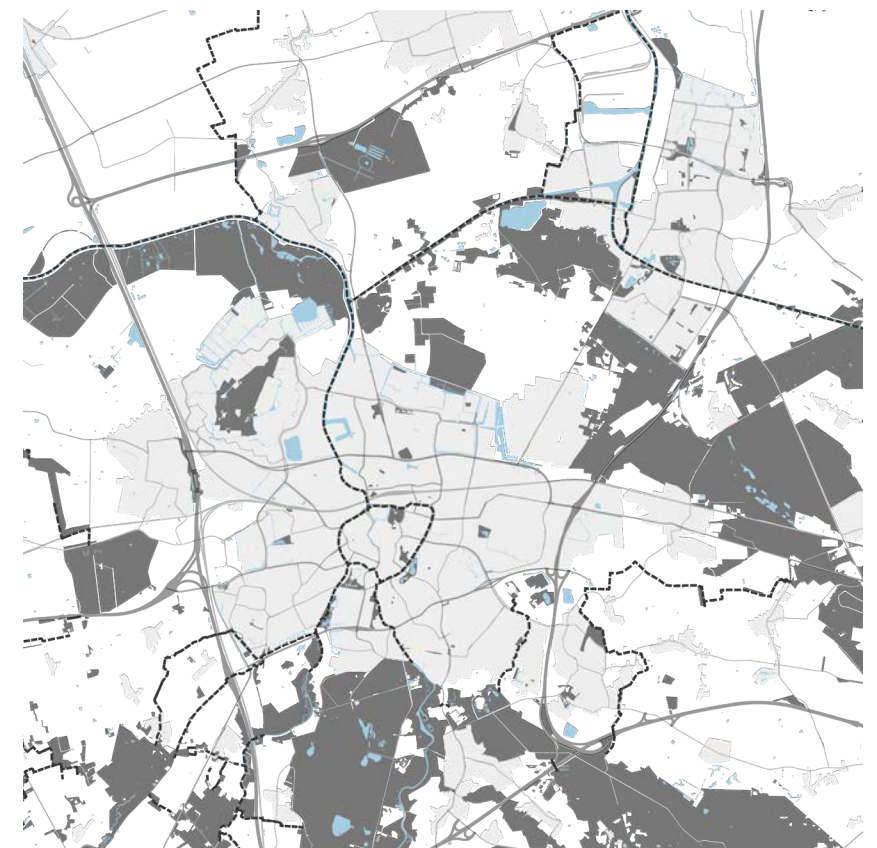
As mentioned, the landscape and its greenery will be the leading element in the urban vision. The region has a number of valuable natural elements. One can identify forests, heathlands, and small-scale cultural landscapes on the sand grounds, as well as marshy lands and typical polderlandscapes on the lower grounds towards the north. Throughout the region, historical estates are numerous and characteristic, and their lands are often of high cultural-historical value and high in recreational potential. Examples include De Blauwe Camer in Oosterhout and Ijpelaar between Breda and Bavel.

All these existing landscape elements are to be preserved. In addition, new qualitative greenery will be developed, especially within urban areas. By implementing this in the form of green wedges, connectivity to the countryside is provided. Such green wedges can also serve as connecting elements between neighbourhoods, whereas infrastructure or monofunctional industrial zones will often function as barriers.

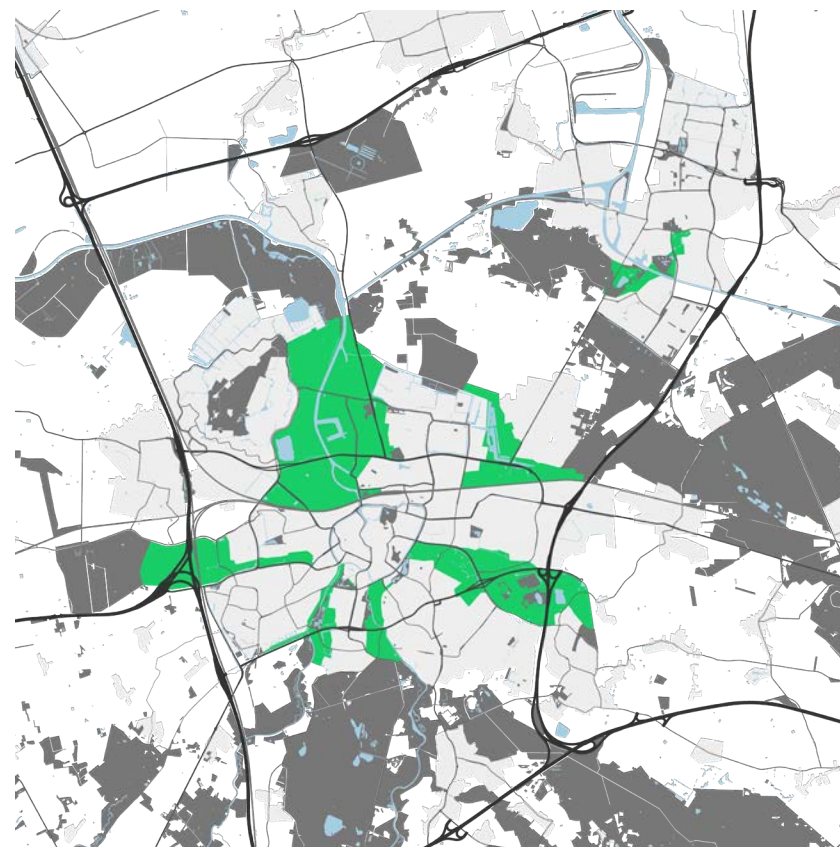
The preserved and newly developed green areas will be structurally connected to each other and to the national ecological structure. This ensures possible passages for wildlife (crucial in maintaining our biodiversity) and recreational traffic alike. Included in this structure are the *Ecologische Verbindingszones* (EVZ) connecting the entire province of Brabant. The United Nations Sustainable Development Goals state that 30% of all land area should in time become protected nature reserve; this is a good guideline for the natural development on the regional scale as well. 'Nature reserve' brings up images of wild and pristine nature, but these may also be small-scale and cultured landscapes such as those around our cities. Indeed, these will often sustain more biodiversity than large monotone areas.



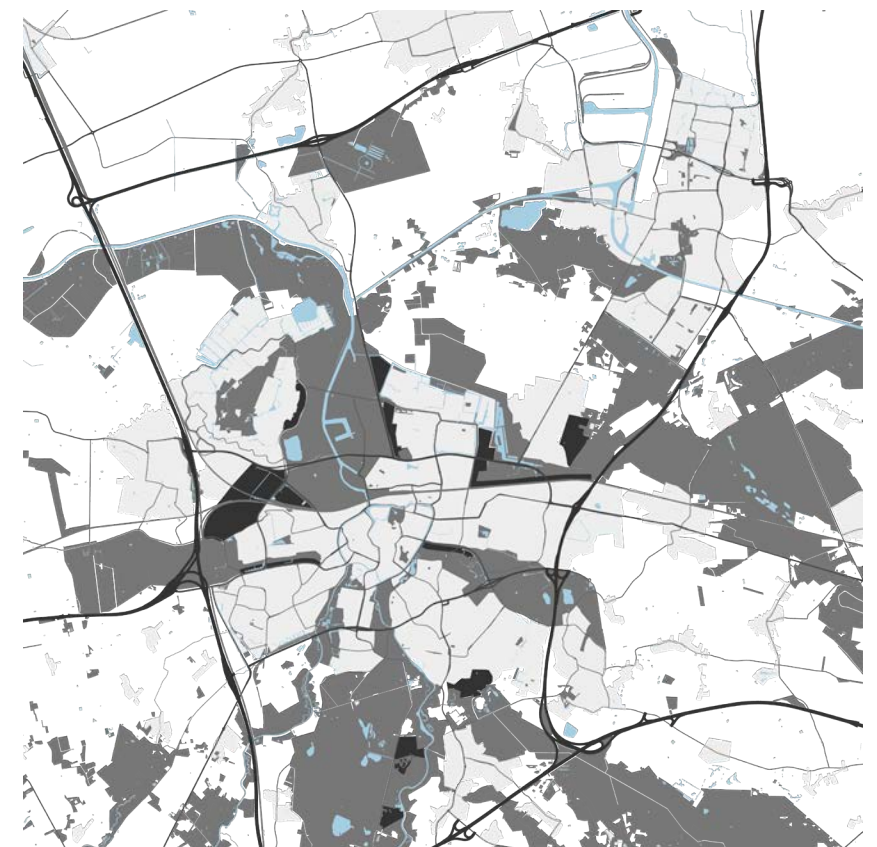
existing nature



proposed connections



green wedges



mixed use

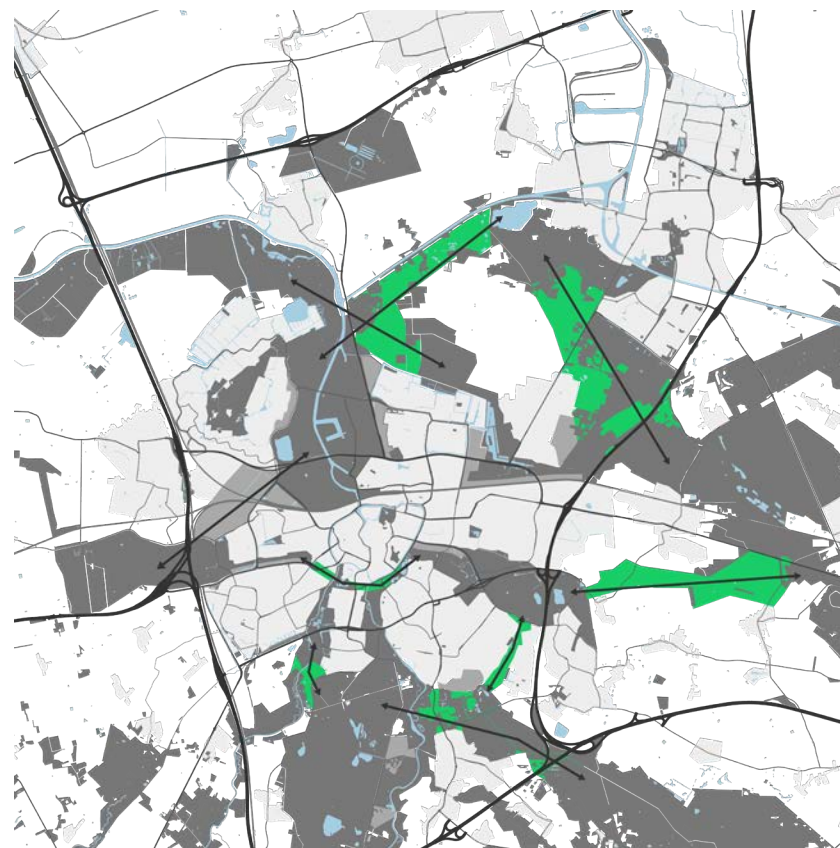
Having established the green structure around and inside the city, new urban development should take place next to and around these landscapes. Possibilities for this development are investigated on the same regional scale, and spread out over existing settlements rather than concentrated in new urban cores. Places such as Oosterhout and Prinsenbeek can expand without compromising the aforementioned goals concerning the preservation, development and proximity of greenery; this would be complicated in Breda itself, as the city already borders on valuable landscapes such as the Ulvenhoutsebos (Natura2000-area) or the Lage Vucht.

Developing on a regional scale also entails strengthening infrastructure and connectivity on a regional scale. A significant part of the region's population relies on Breda for employment and cultural amenities. It is therefore crucial that the region's towns are well connected to Breda, preferably in a sustainable manner. The largest intervention here is a new railway connecting Breda and Oosterhout, following the trajectory of the A27 motorway, eventually terminating in Utrecht. The new railway would make commuting between Oosterhout and Breda faster and less reliant on motorised traffic.

The A27 motorway now forms a serious barrier in the landscape between Oosterhout and Breda. Construction of the new railway is also an opportunity to tackle this barrier. Both the rail- and motorway can be deepened out, positioned several meters beneath ground level. Several viaducts and ecoducts can then be positioned on ground level. Noise and visual pollution would also be reduced.

Further south, near the IJpelaar green wedge and the village of Bavel, the A27 will also be deepened, for the same reasons as stated above.

Public buildings will be positioned along the borders of the green structure and the urban development. Not only are these pleasant locations for such public services themselves, but they also enhance the liveliness and richness of the borders, making them permeable and attractive. The type and scale of public building is dependent on the location and scale of the green area in question. Along the sizeable green wedge which will be developed around Krogten and the river Mark, a large gesture such as NAC's Rat Verlegh stadium is fitting; in smaller areas, schools or community centres can fulfil this role.



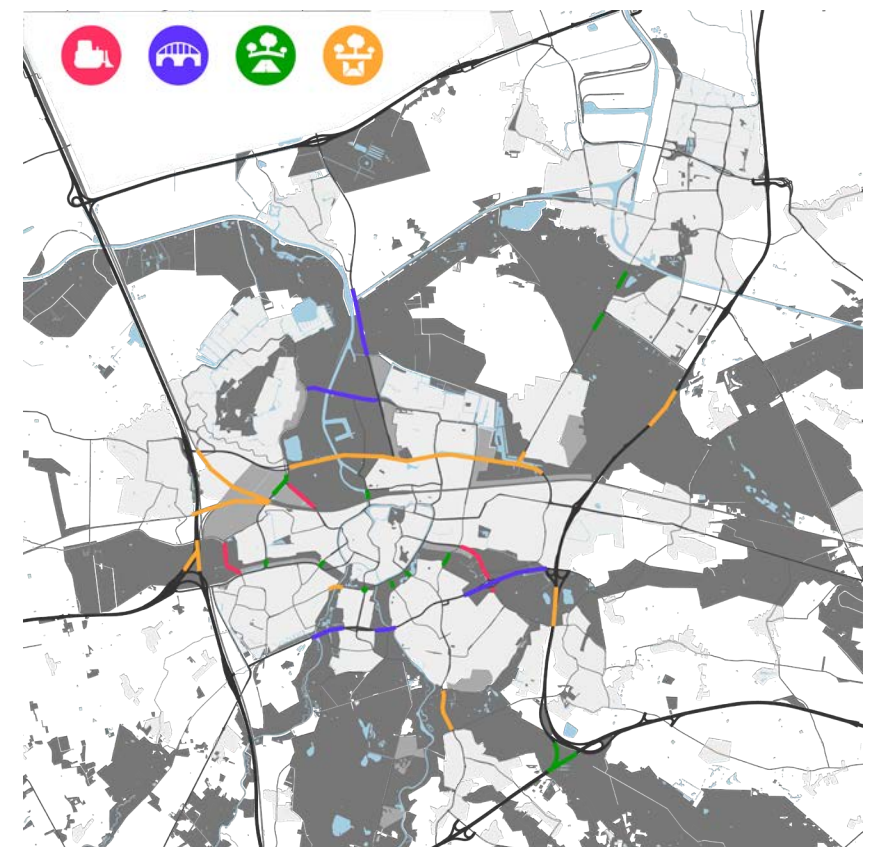
connections



public spaces



housing



roads

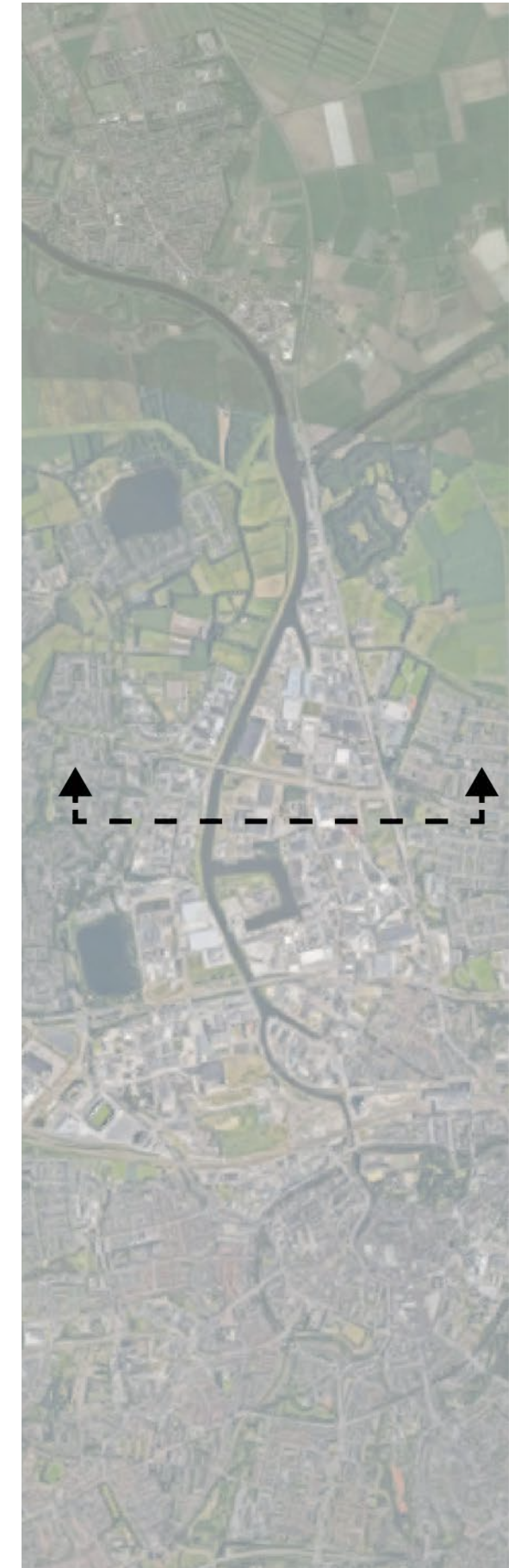
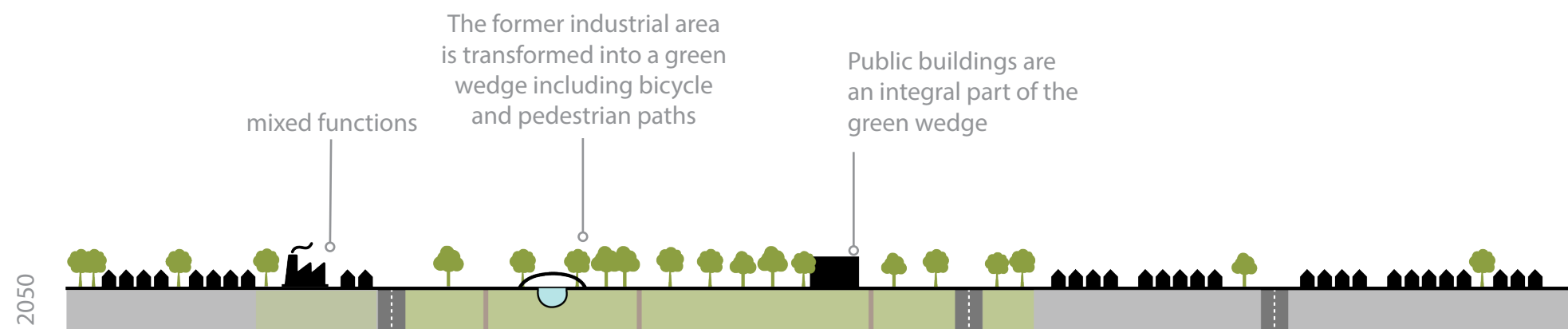
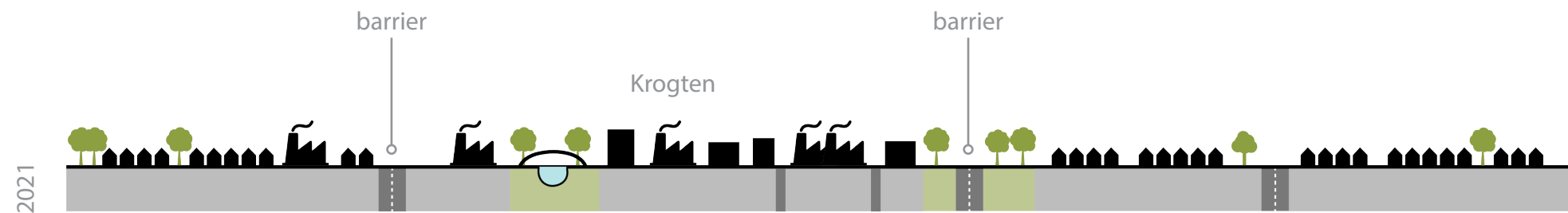
examples

Krogten

At this moment, Krogten is a monofunctional industrial area. The river Mark is canalised and enclosed. The area separates the Haagse Beemden and Hoge Vucht from each other, as well as forming a barrier towards the city centre.

This will be completely turned around. The river will again get space to find its own way and rise and fall depending on the season and the amount of precipitation. Around the river, a green wedge will take shape, reaching to the edge of the city centre. Instead of separating the Haagse Beemden and Hoge Vucht, the green wedge is an opportunity to connect them. Both neighbourhoods will make use of the new wedge, and in combination with a number of (mainly cycling and pedestrian) bridges over the Mark the connectivity between them will be improved. The green area around the Mark will be relatively large. This way, a true fragment of landscape can be brought right into the heart of the urban environment. It is however not necessarily singularly park. Slightly further away from the river there can be housing, small-scale business and industry, and the aforementioned public buildings. The green structure will however always be leading in this development.

It is important to note that this is a development over time; a gradual process where industry will in stages make way for greenery, and by no means an overnight overhaul. Rather than appointing one new area for the industry to be moved to, all cases should be reviewed and decided upon individually; some can move to other locations around the city, while others may be better off by resettling outside the region.

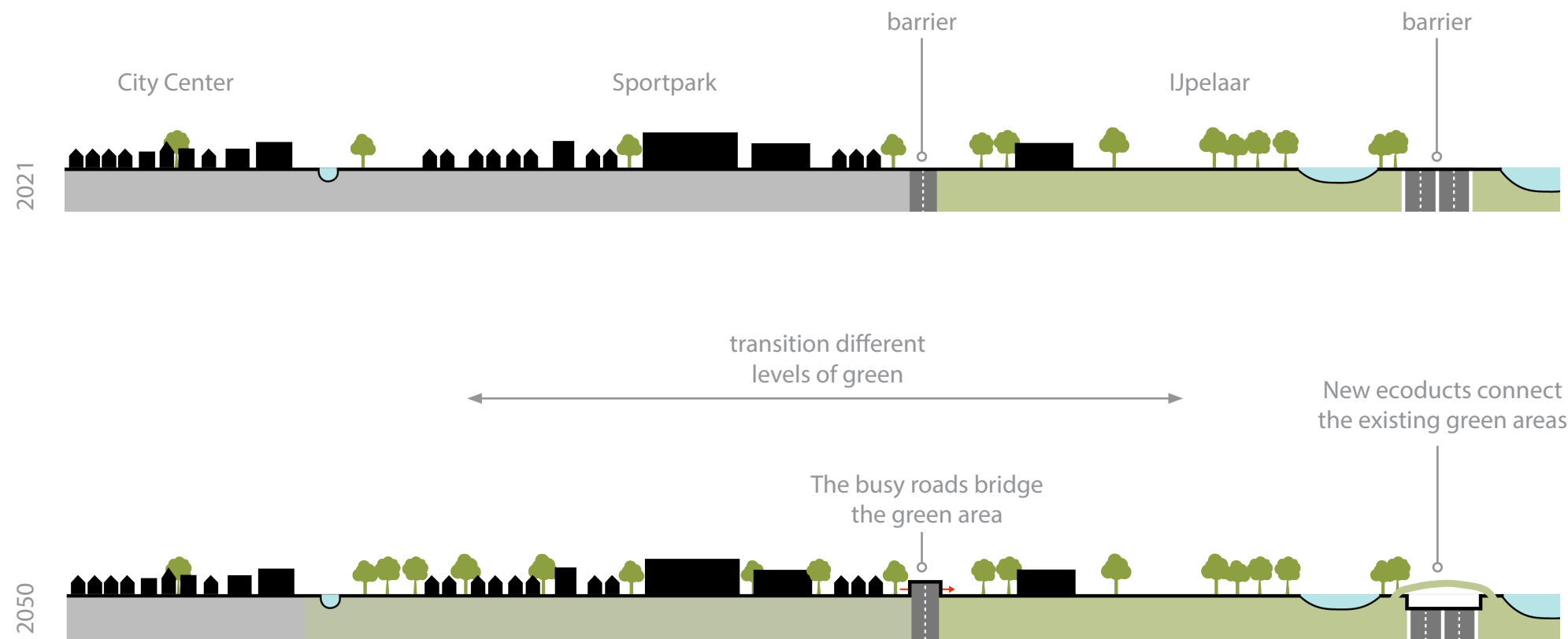


Ijpelaar

The area around Ijpelaar will also form a new green wedge, albeit slightly different in form and scale than the one around the river Mark. Here, the wedge will form a gradual transition from rural to urban landscape.

It starts with the predominantly agricultural area around the hamlet Tervoort, east of the A27 motorway. The motorway will be deepened, to become less of a visual, audial and physical barrier. West of the motorway, the historical estate landscape of Ijpelaar is the next step in the green wedge.

Further west, the area around the Amphia hospital and Avans Hogeschool will be transformed into a green campus. This third step of the green wedge borders on the singels and the Chassé-veld, and as such reaches to the city centre as well.



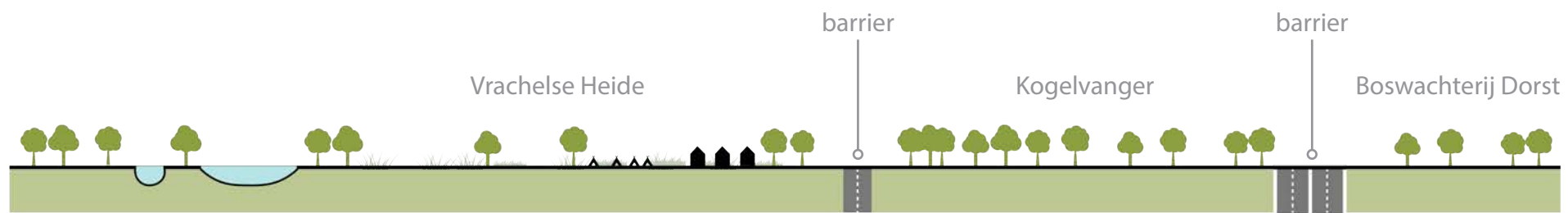
Vrachelse heide - Kogelvanger - Boswachterij Dorst

This third highlighted area is important for both Breda and Oosterhout. Indeed, it is a crucial connection in the natural structure of the entire region. This connection must be maintained and reinforced. Therefore, no urban expansion will take place in this area. The highway is the main challenge in terms of barriers; as mentioned, a railway will be placed along the same trajectory. By deepening this the barrier will be significantly reduced with limited costs (compared to for instance a tunnel construction). Viaducts for recreational traffic and ecoducts for wildlife will connect the two sides of the infrastructural trajectory.

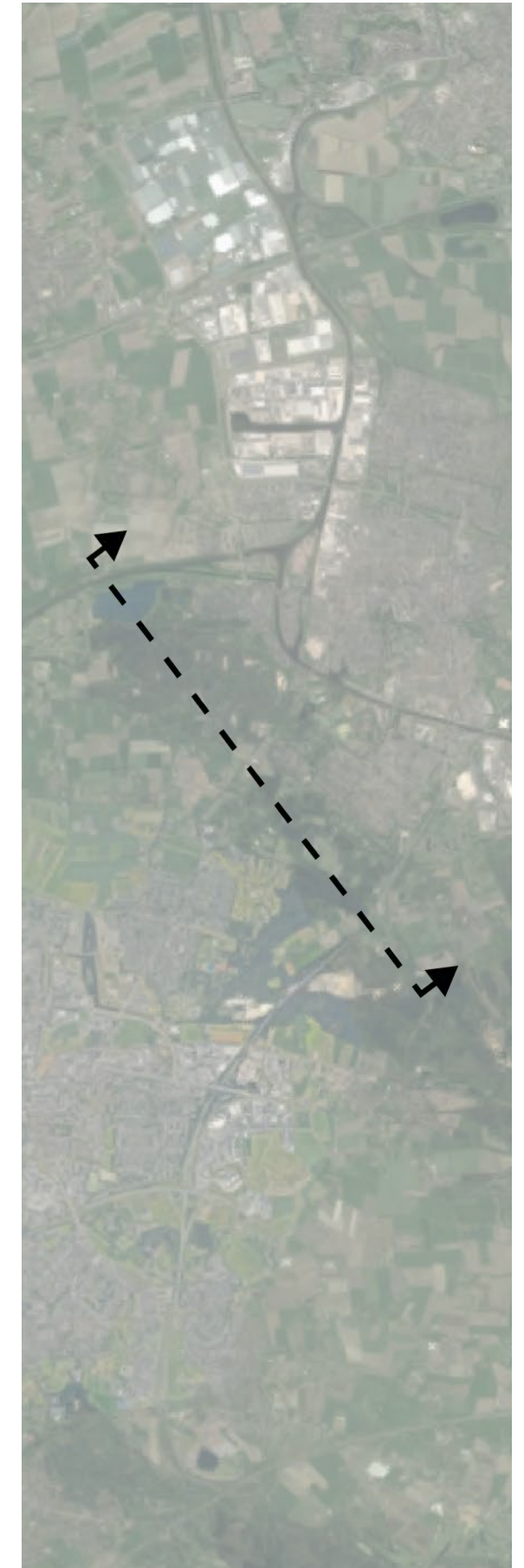
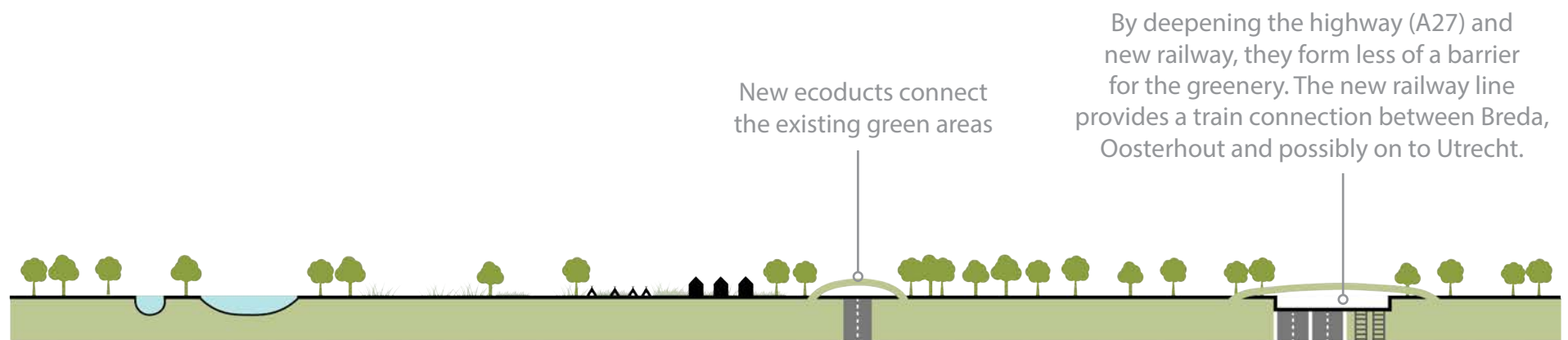
The Oosterhoutseweg between Teteringen and Oosterhout is part of Napoleon's road from Amsterdam to Paris. Its characteristic straightness and planting with oaks and beech are both historically and aesthetically valued. The new railway will help in relieving this old road of its often congested traffic situation. This is beneficial for both the nature of the Kogelvanger and the village of Teteringen.



2021



2050



BIBLIOGRAPHY

Kaartbank. ArcGIS web application. (n.d.). <https://noord-brabant.maps.arcgis.com/apps/webappviewer/index.html?id=b6414403e-f5e4e9aa8875a7c366209c6>.

Kuiphuis, V., Van Nispen, R., Tillmanns, M., & Grond, V. (2017). Klimaatatlas Breda. Gemeente Breda. <https://www.klimaatadaptatiebrabant.nl/l/nl/library/download/urn:uuid:-b4ab42dc-e300-4bea-9bc0-8de3deabaa43/klimaatatlas+breda.pdf>

Noord-Brabant. (n.d.). Ecologische verbindingzones (EVZ). Brabant.nl. [https://www.brabant.nl/onderwerpen/natuur-en-landschap/natuur/ecologische-verbindingzones-\(evz\)](https://www.brabant.nl/onderwerpen/natuur-en-landschap/natuur/ecologische-verbindingzones-(evz)).

OpenStreetMap. (n.d.). The free wiki world map. <https://www.openstreetmap.org>

PDOK viewer. (n.d.). Retrieved October 8, 2021, from <https://www.pdok.nl/viewer/>.

Regionaal Archief Tilburg, & Gemeente Oosterhout. (n.d.). Een overzicht van de geschiedenis van Oosterhout. De Oosterhoutse Tijdmachine. <https://www.tijdmachineoosterhout.nl>

Sweijen, S. (2016). Het ontstaan van het snelwegennet rondom Breda: Een planningsgeschiedenis van de twintigste-eeuwse rijkswegen. Jaarboek 'De Oranjeboom', 69. <https://deoranjeboom.nl/wp-content/uploads/2017/04/Jb-69-2016-11.pdf>

Tummers, L. J. M., & Tummers-Zuurmond, J. M. (2000). *Het land in De Stad: De Stedebouw van de Grote Agglomeratie*. Thoth.