



Dortmund-Ems Landscape Canal

adjusting the post-navigable canal to
the landscape system of Münster

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P5, June 29th, 2015



The traditional infrastructure in modern city: highway #5 Los Angeles, California, USA, 2009 / Courtesy of Edward Burtynsky.



A converting experiment of infrastructure: highline of New York.

WHAT IS REFLEXIVE INFRASTRUCTURE ?

- # “The reflexive infrastructure”
- # Possibilities: what could it be?

WHY CONVERT REFLEXIVE INFRASTRUCTURE ?

- # Site selection: a case study
- # Site introduction: the reflexive canal in Münster
- # Problem & possibilities of the post-navigable canal
- # Research goal & question

HOW TO CONVERT REFLEXIVE INFRASTRUCTURE ?

- # City port introduction
- # Design overview
- # Deconstructing thematic layers
- # Summary of principles

- # Master plan
- # Thematic strategies
- # Development schedule

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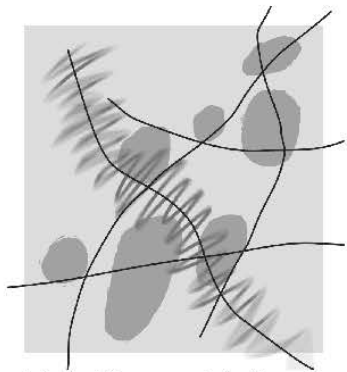
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Reflexive infrastructure in the dispersing city

“the reflexive infrastructure”

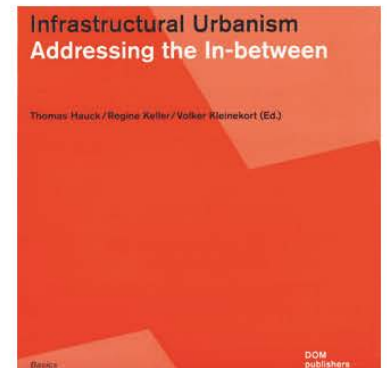
According to Regine Keller (Infrastructural Urbanism: addressing the in-between), the current discourse on infrastructure is its “reflexivity”.

One presentation of reflexivity is the relevant spaces that are no longer useable, or become harmful, and consequently shut down over time.

Urban infrastructure influenced, dominated and even defined these spaces as its context.

Thus the reflexivity is reflected in the infrastructure and its relevant domains.

These spaces are significantly marginal in big cities. Infrastructures such as railways, highways and drainage canals have this situation more or less.




Hauck T., Keller R. & Kleinert V., Infrastructural urbanism: addressing the in-between (2011). Berlin: DOM publishers.

New possibilities of the reflexive infrastructure

Highline in New York,
a connector of people's life and emotion, providing programs for people from different ages and different social groups, in different seasons.



Highline's north view from West 17th Street, 1934. Photographer unknown.

 FRIENDS OF THE
HIGH LINE

VISITSEE & DOBLOGABOUTSHOP

SUPPORT

CALENDARADULTSKIDSTEENSCHOOLSVOLUNTEERSVENUE RENTALS

UPCOMING EVENTS



Stargazing

EVERY TUESDAY, APRIL THROUGH OCTOBER, DUSK TO 9:00 PM

You don't have to leave New York City to see the stars. Gaze at the stars, planets, and moon through the high-powered telescopes of the Amateur Astronomers Association, and chat with the experts about the sights you see.



After Sunset: Poetry Walk

April 25, 2015
6:30 — 9:00 PM

AFTER SUNSET: Poetry Walk

SATURDAY, APRIL 25 2015 6:30 PM TO 9:00 PM

Stroll the High Line at sunset and encounter a series of poetic performances along the park. Celebrate National Poetry Month with ten blocks of traditional readings, spoken word, and ASL Poetry.

Check the available activities at highline park at thehighline.org

New possibilities of the reflexive infrastructure

Madrid Rio in Madrid,
a backbone of urban spaces, bridges enhance the connection of two sides along the route.



The old highway under converted into urban space. Photo via West8.



The new look of the riverfront. Photo via West8.



Plan of Madrid Rio. Image via West8.

New possibilities of the reflexive infrastructure

Baana in Helsinki,
a lowspeed traffic route for daily commute and leisure.



Baana is an old railway corridor in Helsinki, which was used for freight trains. This is the situation before converted. Photo via HBL.fi by Tor Wennström.



This Helsinki's new "Low Line" (as opposed to NYC's High Line) opened on June 12, 2012. It runs through the city centre, providing a safe bicycle and pedestrian route to many points in the city. Photo via HBL.fi by Tor Wennström.

New possibilities of the reflexive infrastructure

Bishan Park in Singapore,
a naturalized drainage stream, also acts as an ecological corridor in urban context.



The old Kallang River is an artificial channel to collect and drain the rainwater from nearby urban surface .
Photo via wikipedia.



Now it is a naturalized drainage canal. The new canal has the functions of purification, ecology and recreation.
Photo via wikipedia.

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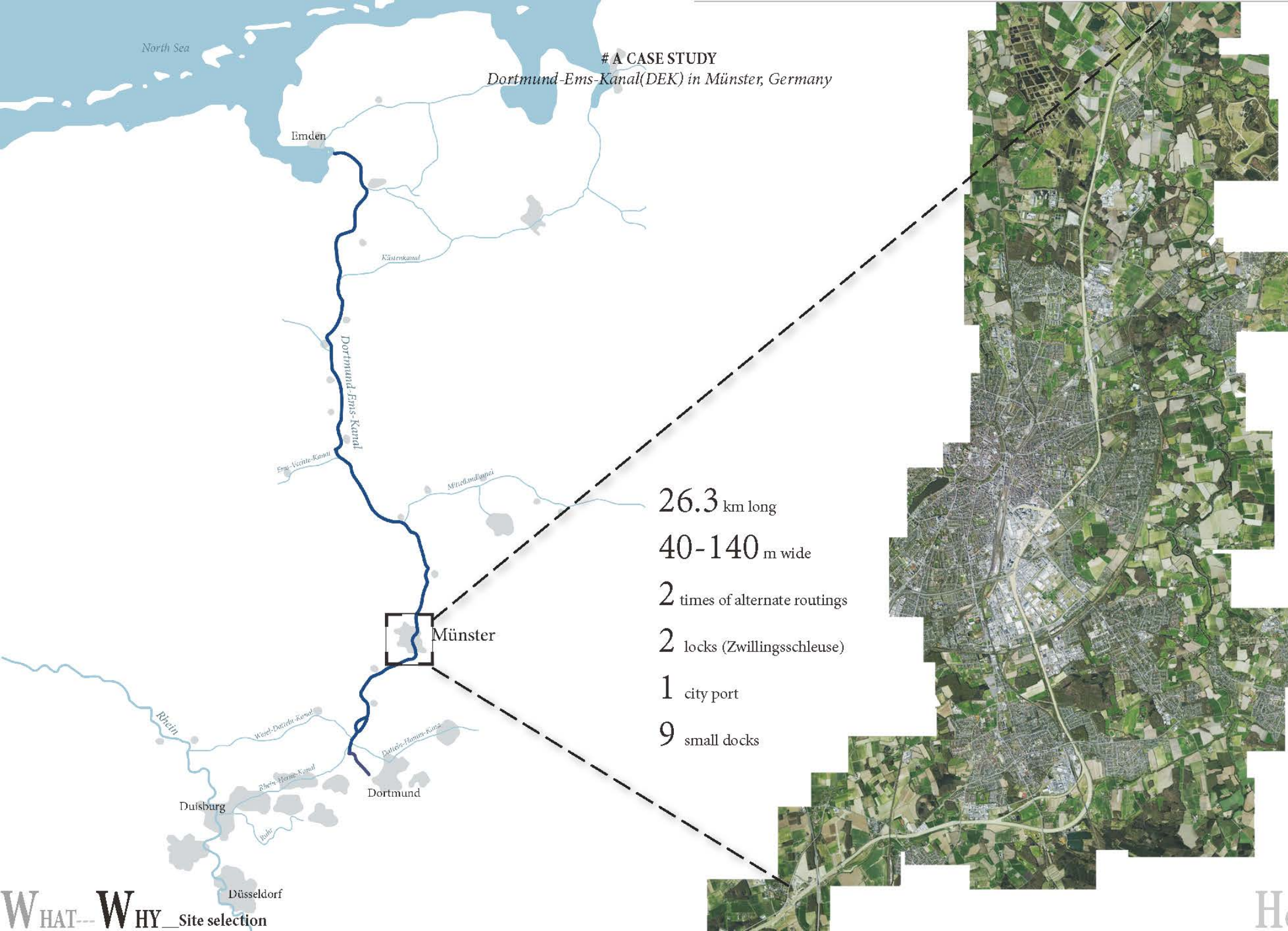
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6th century --- roots

793 --- officially existence

805 --- a cathedral city
since "Monasterium"
cloister founded

1170 --- got the town charter,
a religious Christian center in
Westphalia, a commercial and
political hub.

14-15th century --- an out-
post of Hanseatic League.

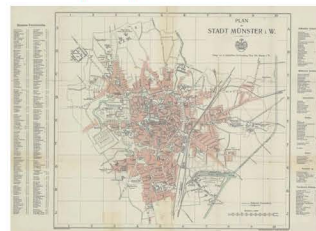


1773 --- one of Germany's most
significant university cities

1816 --- capital of new
province of Westphalia in
the Kingdom of Prussia



1899 --- opening of Dortmund-Ems-Canal



World War II --- old town bombed, [the canal attacked](#)

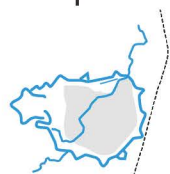


post WWII --- historical reconstruction,
canal widened and new route constructed

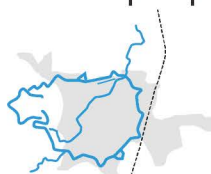
now --- an economic, scientific
and service industry hub



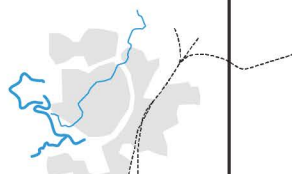
PRE-NAVIGATION TIME --- NAVIGATION TIME ----- POST-NAVIGATION TIME



1839



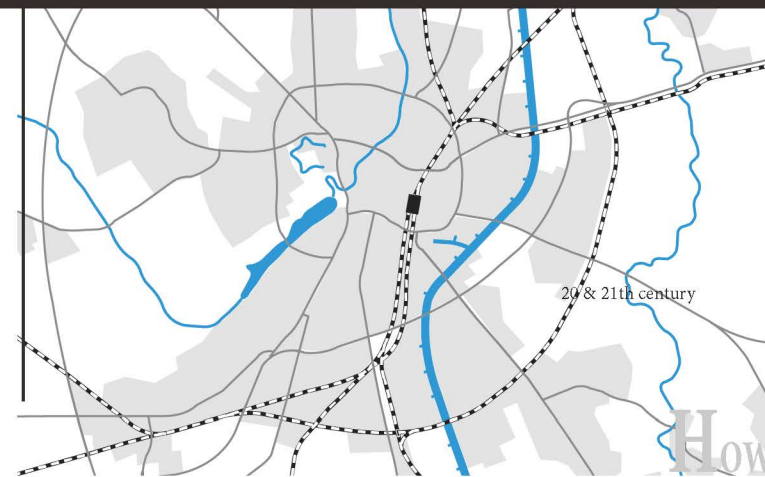
1864



1892



1899



20 & 21th century

The city's development was once tightly related to the canal.
However, the canal has not kept the pace with the city's.

Münster: "the international awards for liveable communities 2004"

– a brief portrait

Innovation and tradition characterise Münster

Münster's history spanning more than 1200 years is reflected by the medieval ground plan of the Altstadt (old part of the city) and numerous historical buildings. The Altstadt is an exceptional example of the European city tradition with its varied functions in an enclosed space and high urban development qualities. The Prinzipalmarkt with the Lambertikirche (church) and the Rathaus des Westfälischen Friedens as well as the cathedral and the cathedral square represent just a few of the internationally significant constructions of the Altstadt spanning a period of eight centuries. Historical buildings, modern architecture, contemporary sculptures – this composition ensures the Altstadt is a lively central point of the city. In addition the outstanding qualities of Münster include the fact that the city is very green with the Promenade, a green ring around the Altstadt, and the fact it is embedded within the charming park landscape of Münsterland.

The modern city of Münster. Now the Westphalian metropolis presents itself as the city of the universities with outstanding international reputations, which accommodates approx. 50,000 students, and as the headquarters of innovative centres in the field of research and technology transfer. This academic potential forms an important basis for the future-oriented development of the economy. A lot of young people, numerous institutions attached to the university, a varied and exciting cultural life as well as the bicycle as the omnipresent form of transport characterise the city's unmistakable atmosphere. In addition the international sculpture exhibitions and the new Picasso Museum that have attracted a lot of public attention have helped Münster to gain a high profile as a cultural city.

Data and facts

- Germany
- The federal state of North Rhine Westphalia
- Higher administrative centre and university city
- 302 km² – of which approx. 26% is made up of developed areas and vehicular infrastructure and 74% countryside
- More than 1/3 of the area is a nature reserve
- 51°57'46.6" degrees North
- 7°37'43.3" longitude East
- 61.3 metres above sea level
- 750 mm precipitation per year
- 1959 hours of sunshine a year
- Maritime influenced climate
- Approx. 280,000 inhabitants
- Population density: 926 inhabitants/km²
- 151,300 employees
- 66,000 commuters
- Approx. 50,000 students
- Approx. 5 million tourists a year
- Modal split (traffic routes): 13% by foot, 35% by bike, 41% by car, 11% local public transport, that represents 60% environmentally sound means of transport
- Approx. 270 km of cycle paths and additionally approx. 255 km of cycle paths on farm paths

(As at 2003/2004)

The regional capital. Münster assumes important functions for a region with more than 1.5 million people as the service, trade and administration centre of Westphalia. This is not least the reason why the city has also given the region – Münsterland – its name. Regional cooperation takes on an ever higher status due to the varied links with the surrounding areas.

A city in Europe with links to the outside world. As a result of its open European stance Münster engages in close cross-border cooperation with its Dutch partners, e.g. in the city triangle of "Münster – Osnabrück – Netwerkstad Twente". At the same time the city is a member in several European city networks, such as EUROCITIES and ICLEI.

Münster has partners throughout the world. The city has entered into eight lively global city partnerships since 1957.

Future sustainability is a tradition in Münster. Urban development has been promoted with the objectives of sparing resources and environmental compatibility for a number of decades. The evolved city structure – a compact city centre with a lively Altstadt, attractive district centres and a virtually ideal green system – ultimately provides the ideal preconditions to this end and simultaneously constitutes an obligation towards the future. In this process the most important area of potential are the active citizens as a lot of the successes of the sustained urban development would have been inconceivable without their commitment and their initiatives.

Münster is a balanced city. This demand requires that economic, ecological, social and cultural objectives are observed simultaneously and with equal emphasis. The integrated approach of the urban development of Münster consistently takes account of this consideration and is emphatically proved by the many awards and prizes won in national city competitions.

Awards and prizes

- 2004 The most children-friendly city in Germany
- 2004 (and 1991) Bicycle capital city
- 2004 Amongst the top ten "cities willing to make reforms in Germany"
- 2004 and 2003 came second in the Solar federal state league of North Rhine Westphalia for cities
- 2003 Local Agenda Best Practice Project: Renovation of old buildings' subsidies programme
- 2003 Local Agenda Best Practice Project: Saving energy and waste at schools and day nurseries' project
- 2003 Local Agenda Best Practice Project: Energy and climate protection inventory
- 2002 Gold medal in the national competition "Gardens in urban development": Allotment Am Lammerbach
- 2001 National champion with the "münster.mobil" concept at the 13th ADAC cities competition with respect to the issue of the "Accessibility of city centres" in the field of "New approaches, visions, concepts"
- 2001 Gold badge in the state competition "Small gardens in North Rhine Westphalia": Allotment Am Lammerbach; Silver badges: Allotments Hansa and Lebensfreude Post
- 2000 Award for the best advertising concept with respect to the climate protection 2000
- 2000 and 1999 several awards for the implementation of urban development projects
- 1999 International award for the "Local Agenda 21" process
- 1999 1st Prize in the "Customer information" assessment category within the framework of the VCD National competition "Royal conditions in trains and buses"
- 1998 Online capital
- 1998 Gold medal in the national competition "Gardens in urban development": Allotment Münster Ost
- 1997 "Climate capital of Münster" National champion in the area of climate protection (198 applicants)
- 1997 1st prize as the most bicycle-friendly city

Front page:
Lively centre of the Münster
Altstadt: the Prinzipalmarkt. Guests
and locals love the atmosphere
between the gabled houses and the
arcades.

Münster made a colourful bicycle
into its jubilee logo to celebrate its
1,200 year anniversary – and with
good reason.



LANDSCAPE SYSTEM of Münster

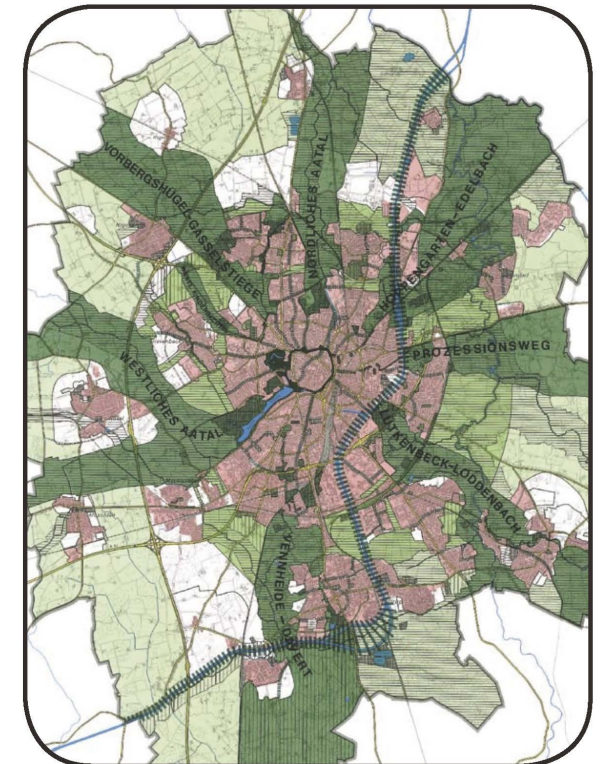
According to the Green Space Ordinance of Münster, there is a systematic approach during the planning of green areas. The ordinance defines a green system consisting of:

three annular green rings;

seven green corridors/wedges. The wedges run towards the city center in a radial manner from the open countryside.



- park
- forest & wood
- golf
- sports pitch
- cemetery
- meadow
- farming
- brownfield
- urban area



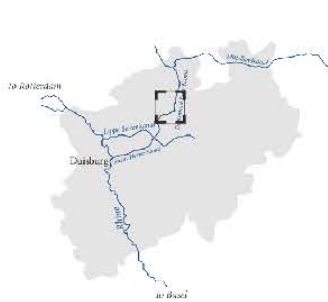
The declining inland navigation ...



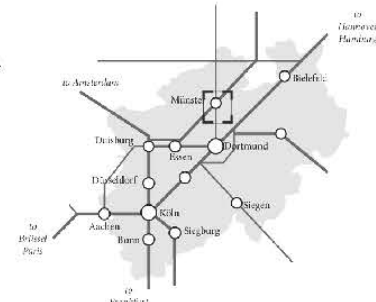
LAST CENTURY



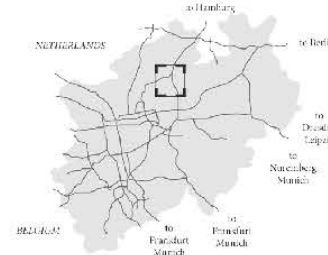
THIS CENTURY



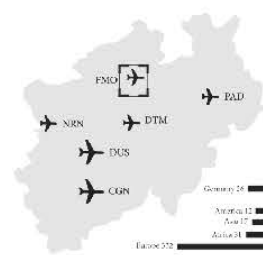
Navigable waterway network



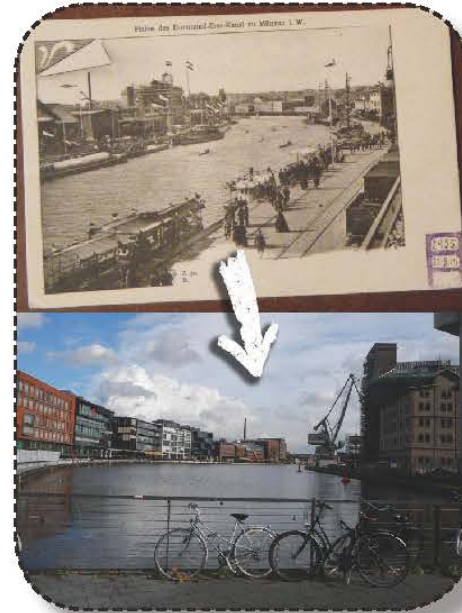
Rail network



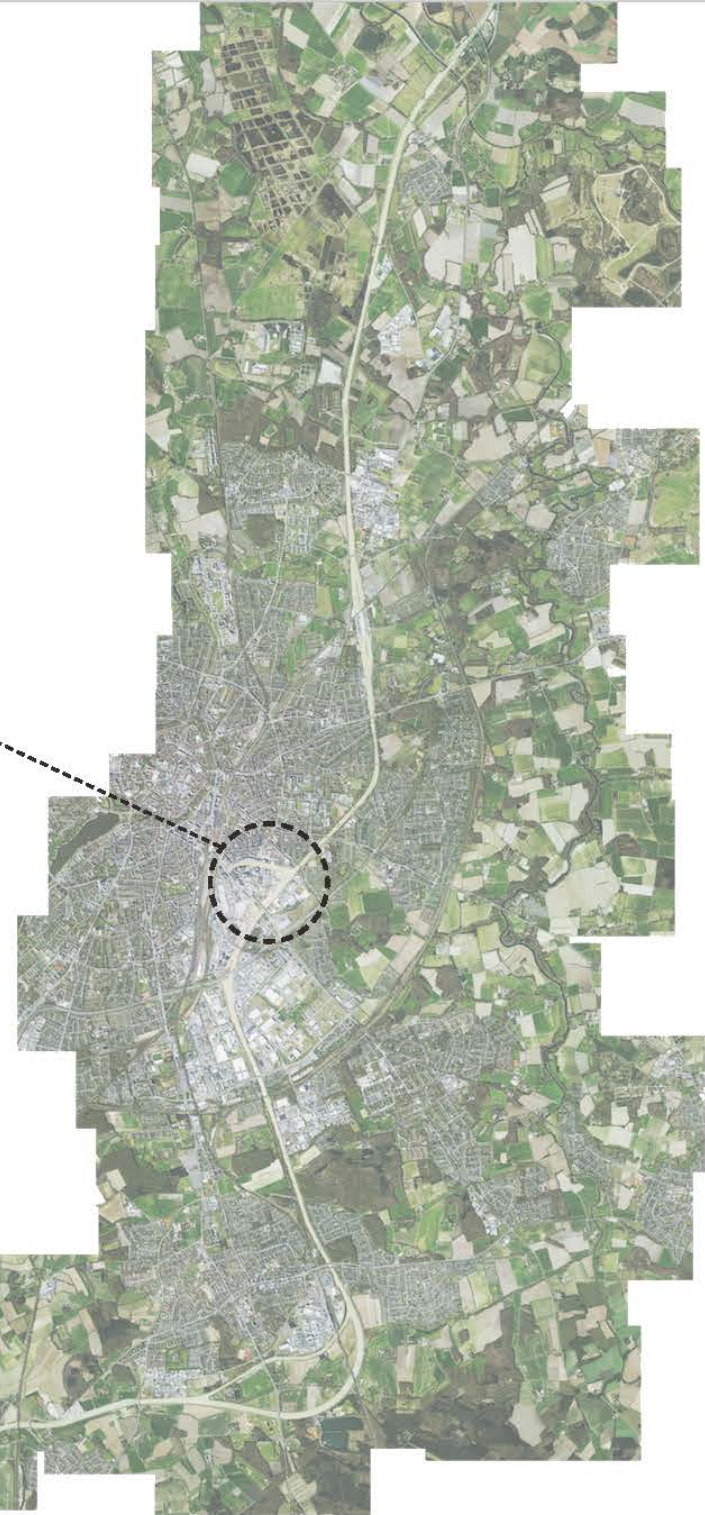
Road network



Airports and flight destinations



Münster's transportation connection to cities in North Rhine-Westphalia



PROBLEM I
a marginal space

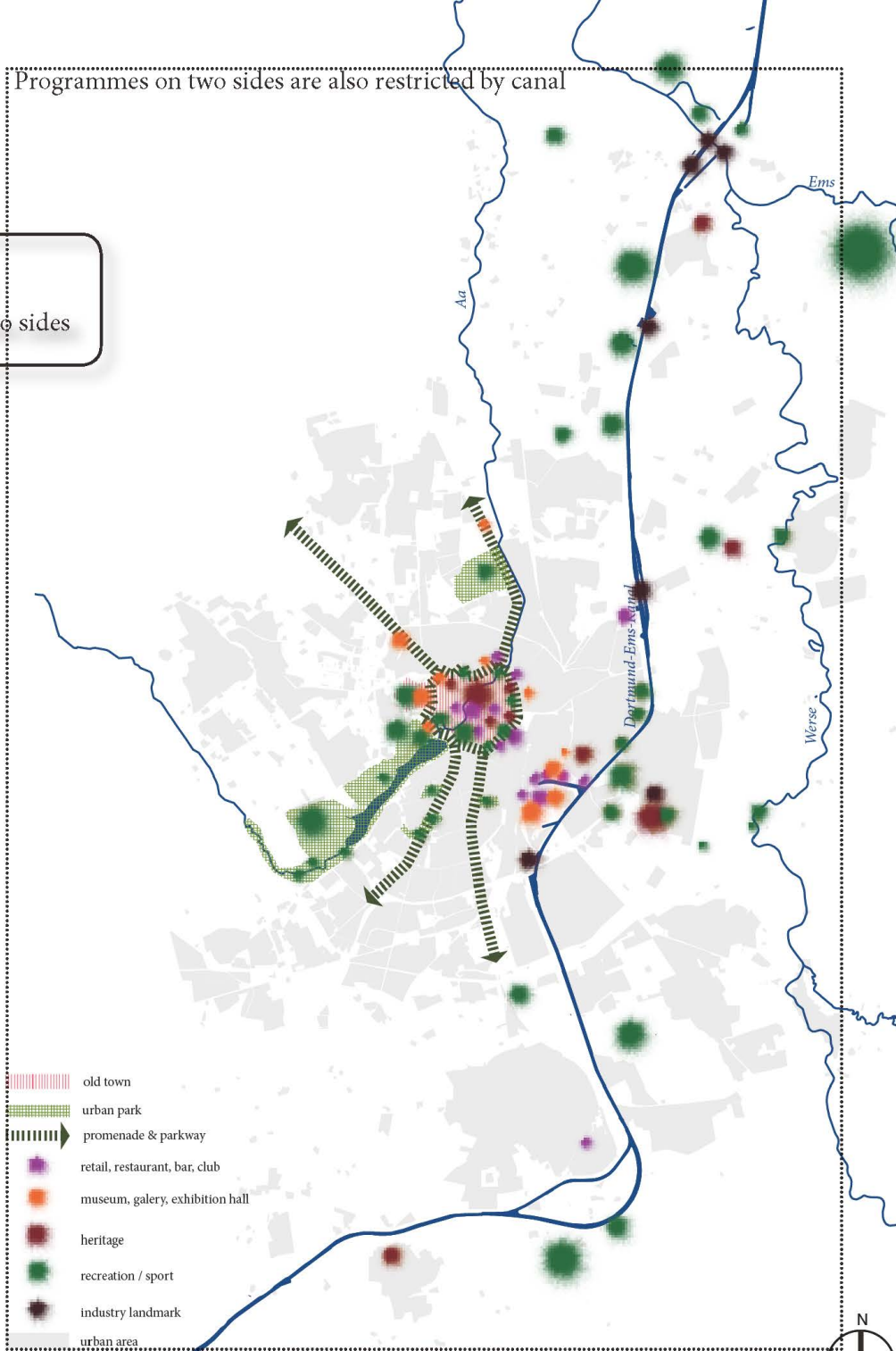
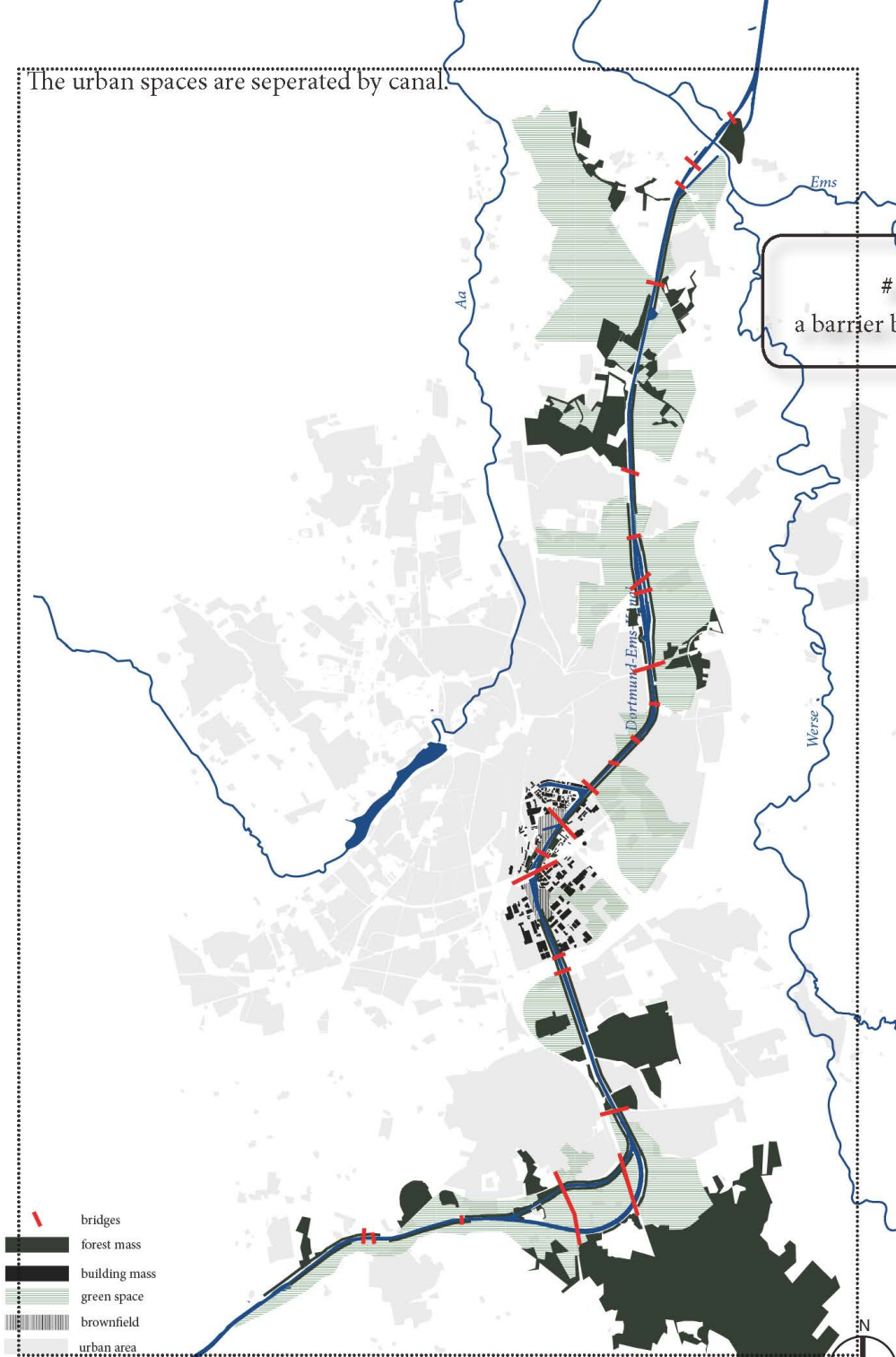


Brownfields along DEK

The urban spaces are separated by canal.

Programmes on two sides are also restricted by canal

PROBLEM II
a barrier between the two sides

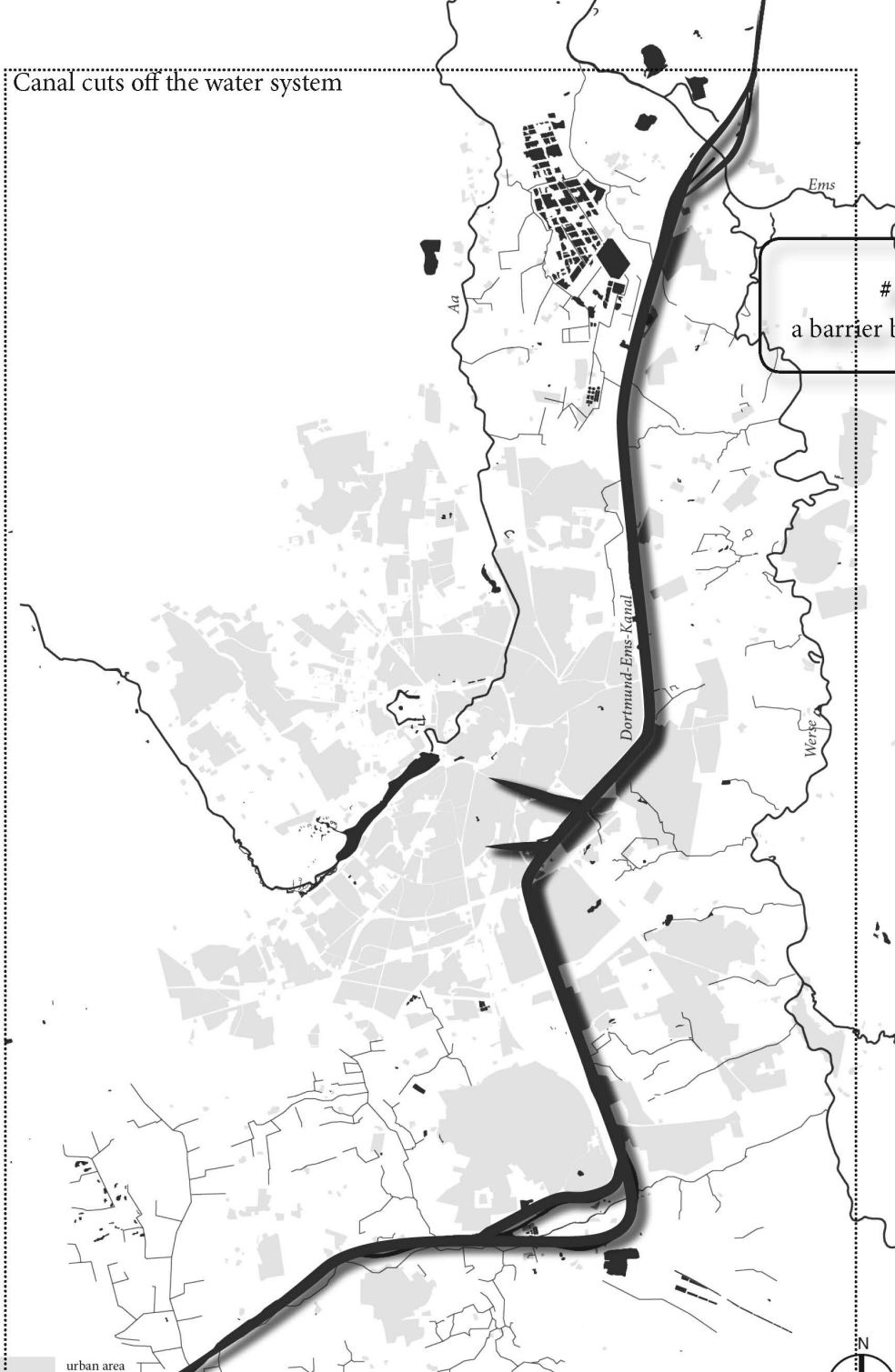


Canal cuts off the water system

Species cannot circulate between habitats

PROBLEM II

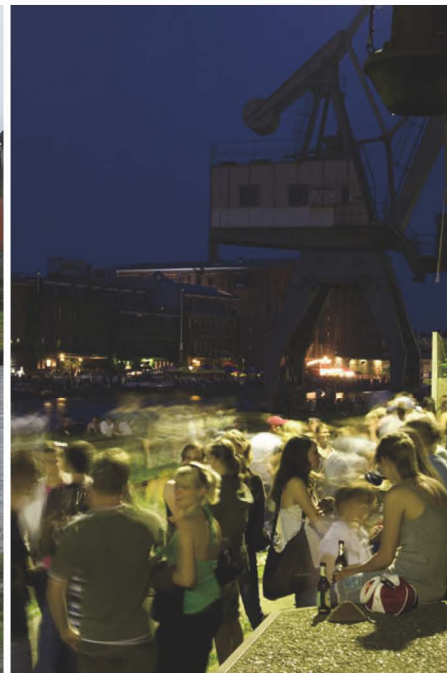
a barrier between the two sides



POSSIBILITY



_the canal is a new urban space



_the port is the third urban frontier



_the canal is a new habitat

RESEARCH GOAL

The project will explore a comprehensive landscape approach with *Dortmund-Ems-Canal* in Münster. By integrating the canal into the context of Münster, I want to gain a capacity strategy to convert the *post-navigable canal* into a crucial component of the landscape structure in the modern city.

RESEARCH QUESTIONS

Main research question:

As the navigable function is declining, how could we find Dortmund-Ems-Kanal's new effective and positive role in Münster, as a component of the city's *landscape system*?

Sub research questions:

- What are the *landscape opportunities* between the canal and city?
- What *principles* could be used?
- How to apply the principles at *local scale* ...
- and at *city scale*?

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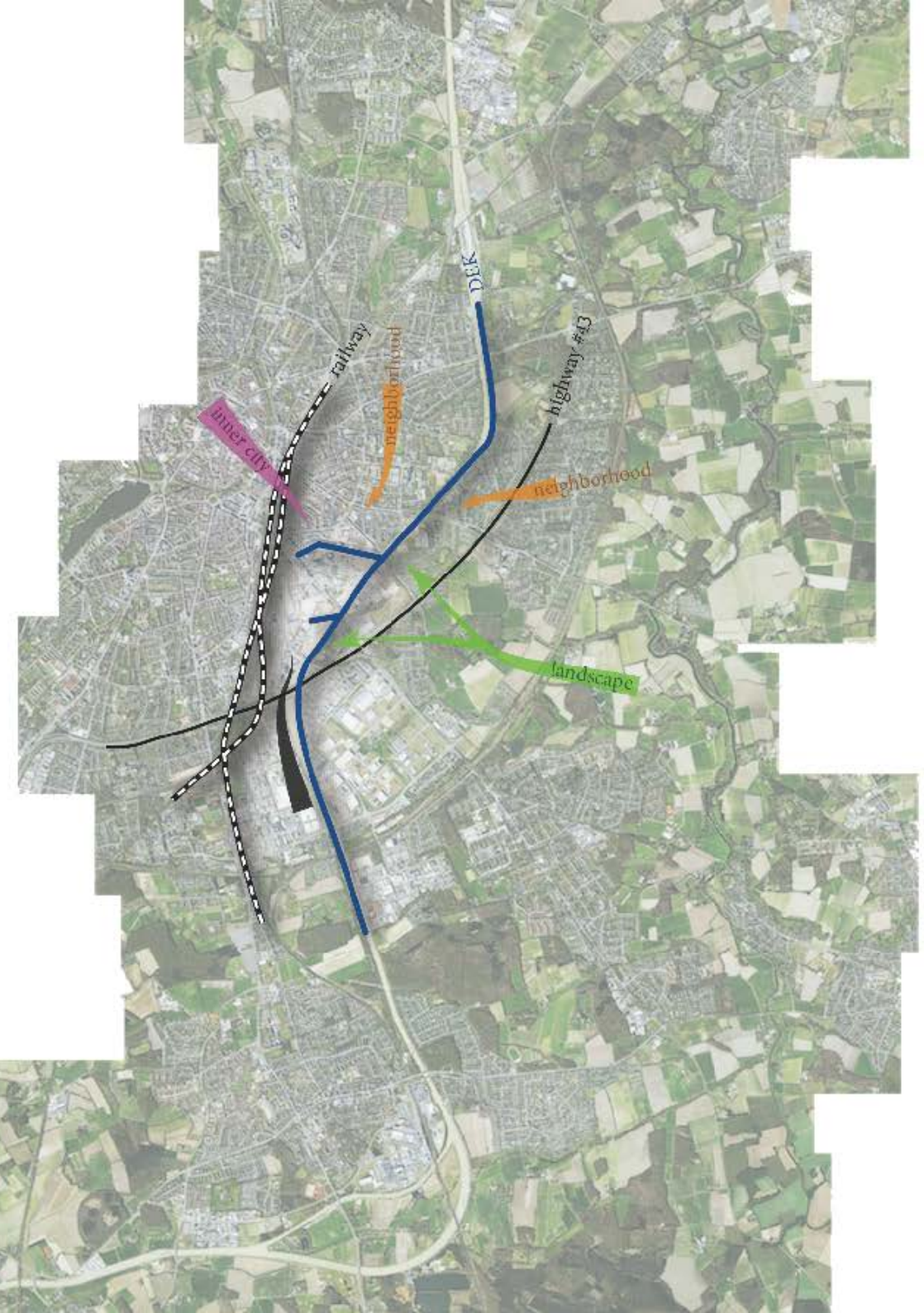
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A design test at a crucial sport

the city port

From the view of external, there are types of landuses bordering here: industrial land, neighborhood, woods, suburban gardens, agricultural land, etc. On the other side of the central railway station is the old town of Münster. The port is also the conjunction point of infrastructural lines, canal, railway and highway, which cut the place into segments.



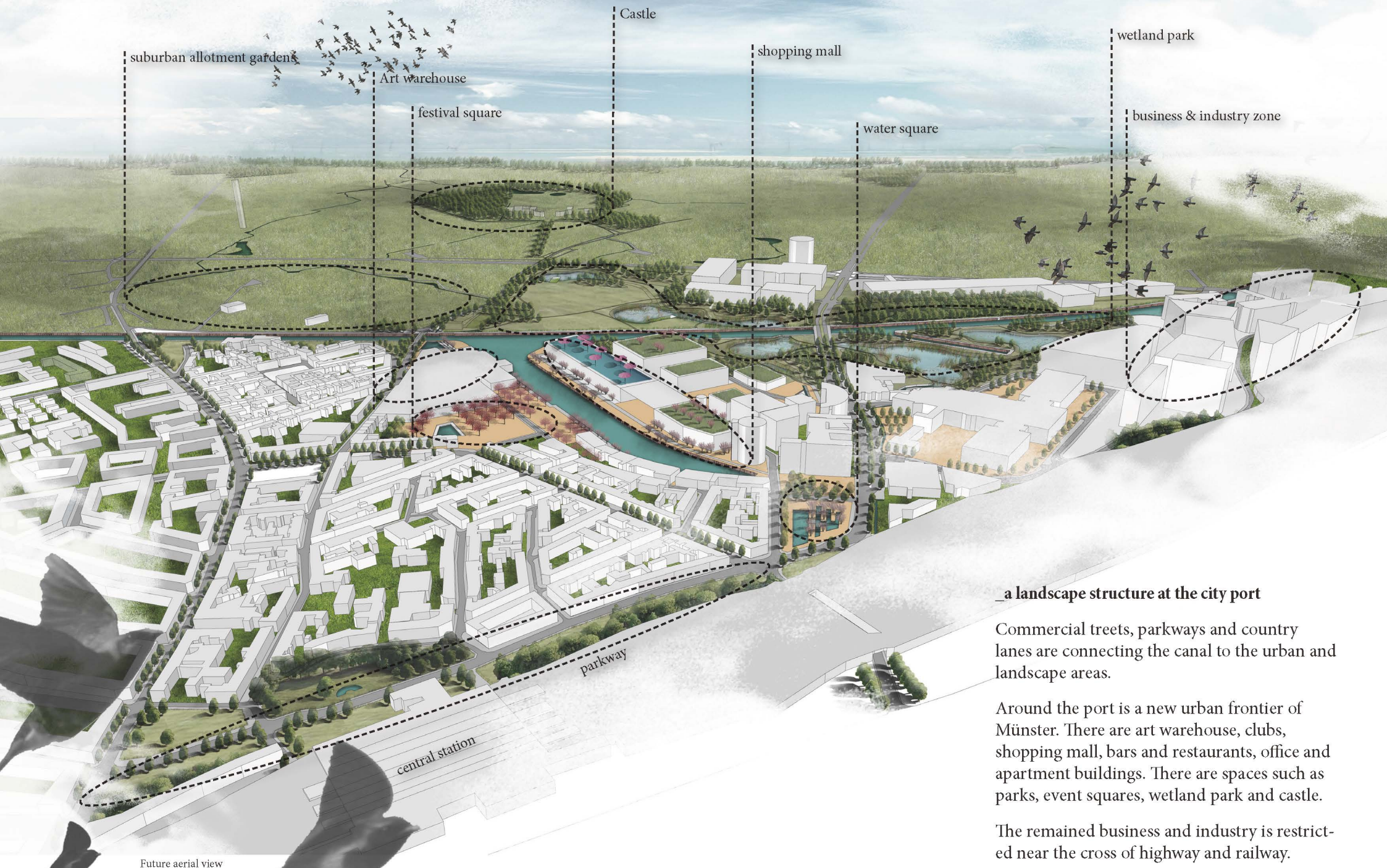
_ The port in 1902: a freight and industry center



The city port in 1902



Current aerial view



a landscape structure at the city port

Commercial trees, parkways and country lanes are connecting the canal to the urban and landscape areas.

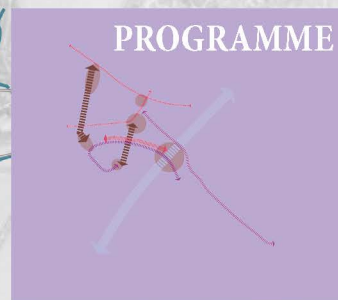
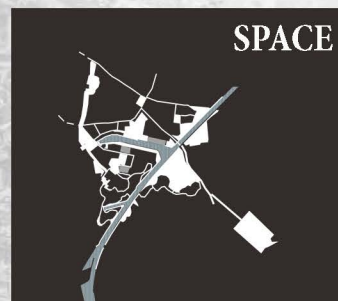
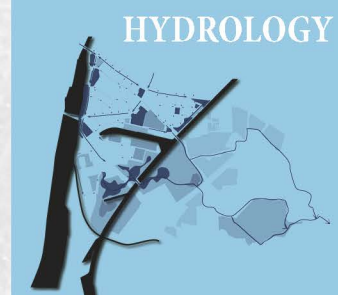
Around the port is a new urban frontier of Münster. There are art warehouse, clubs, shopping mall, bars and restaurants, office and apartment buildings. There are spaces such as parks, event squares, wetland park and castle.

The remained business and industry is restricted near the cross of highway and railway.

Future aerial view



- 1 railway station
- 2 art warehouse
- 3 cinema
- 4 congress center
- 5 city hall
- 6 shopping mall
- 7 tourist center of wetland park
- 8 music house
- 9 sports club
- 10 apartment building
- 11 office building
- 12 industrial building
- 13 glasshouse
- 14 cathedral
- 15 castle hotel
- 16 telecommunicate tower
- 17 water tank
- 18 street park
- 19 water square
- 20 port square
- 21 festival square
- 22 arcade
- 23 playground
- 24 sports field
- 25 suburban allotment gardens
- 26 nersury
- 27 wetland park
- 28 woods
- 29 parking lot
- 30 trampoline bridge

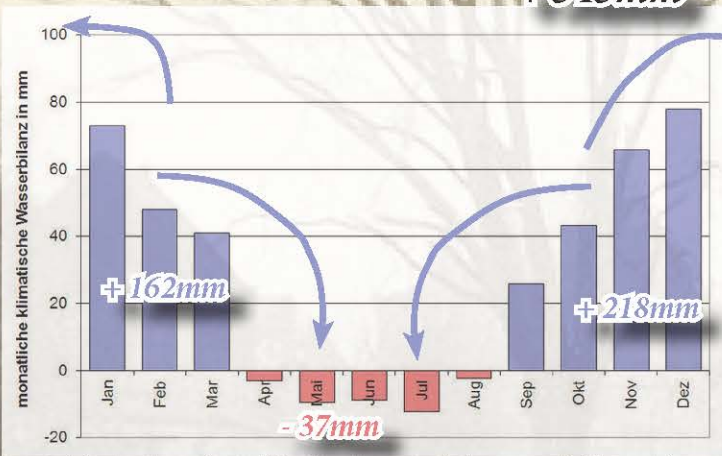


A rainwater discharge network



net amount of redundant water

+ 343mm



A well-known saying in Münster is “Entweder es regnet oder es läuten die Glocken. Und wenn beides zusammen fällt, dann ist Sonntag” (“Either it rains or the church bells ring. And if both occur at the same time, it’s Sunday.”).



The rain water from oldtown area flows to the big lake "Aasee"

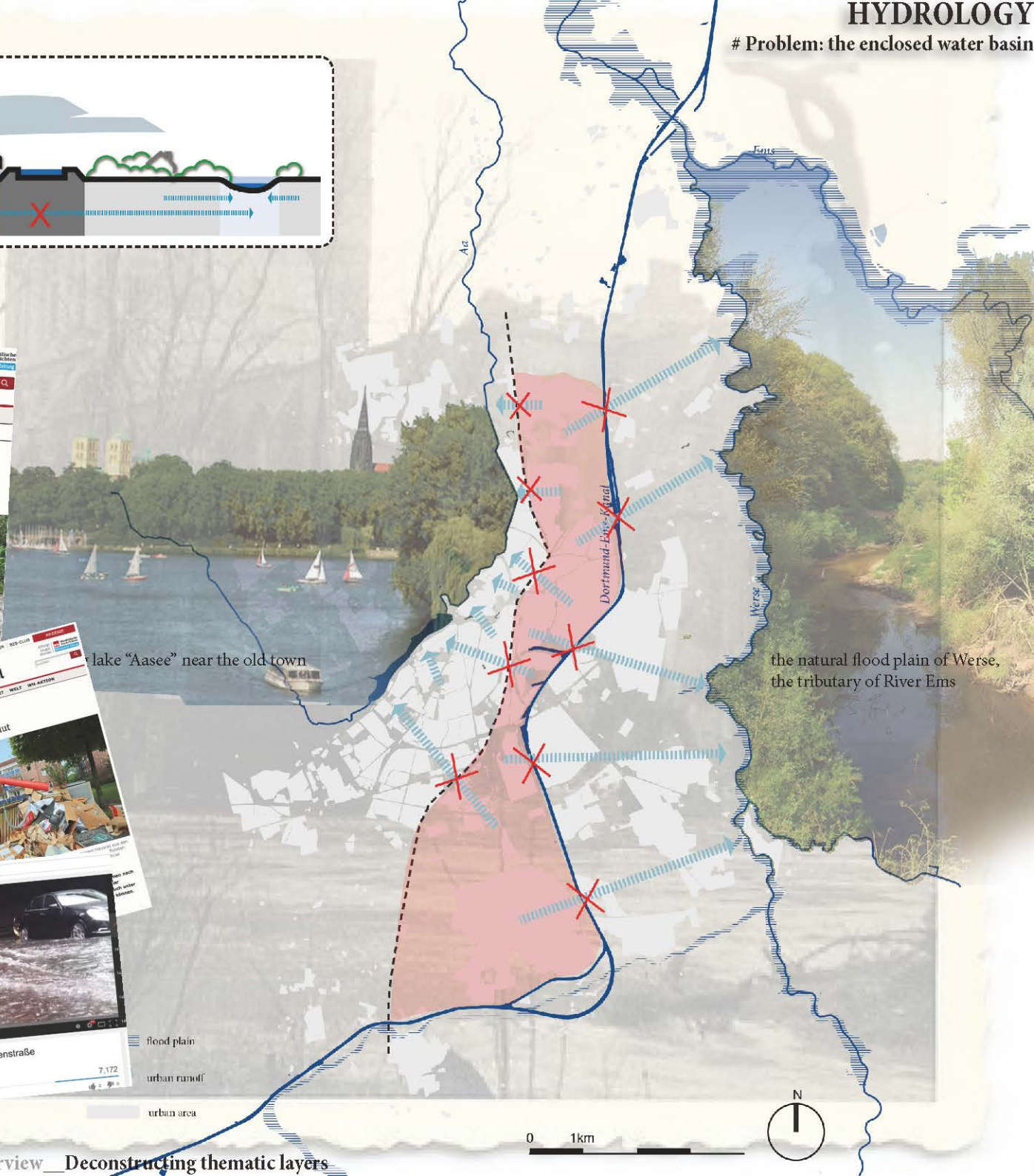
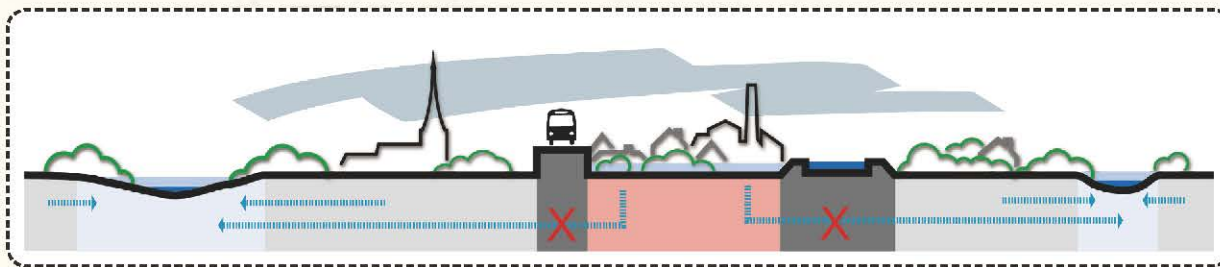
the big lake "Aasee" near the old town

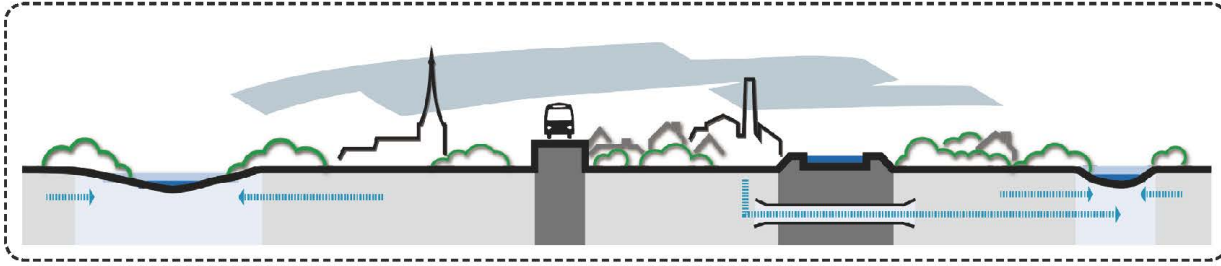
the natural flood plain of Werse, the tributary of River Ems

 flood plain
 urban runoff
 urban area

0 1km





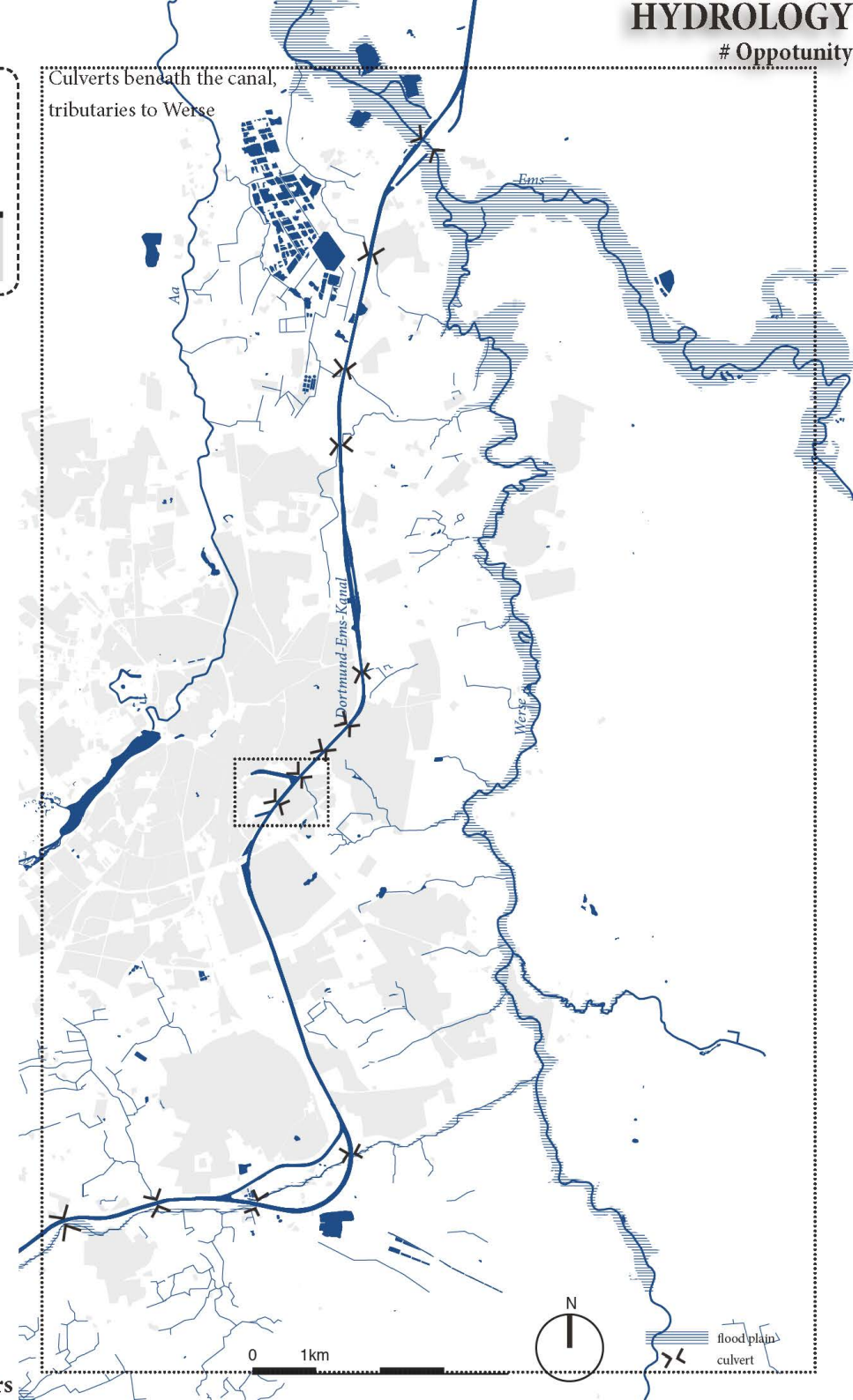


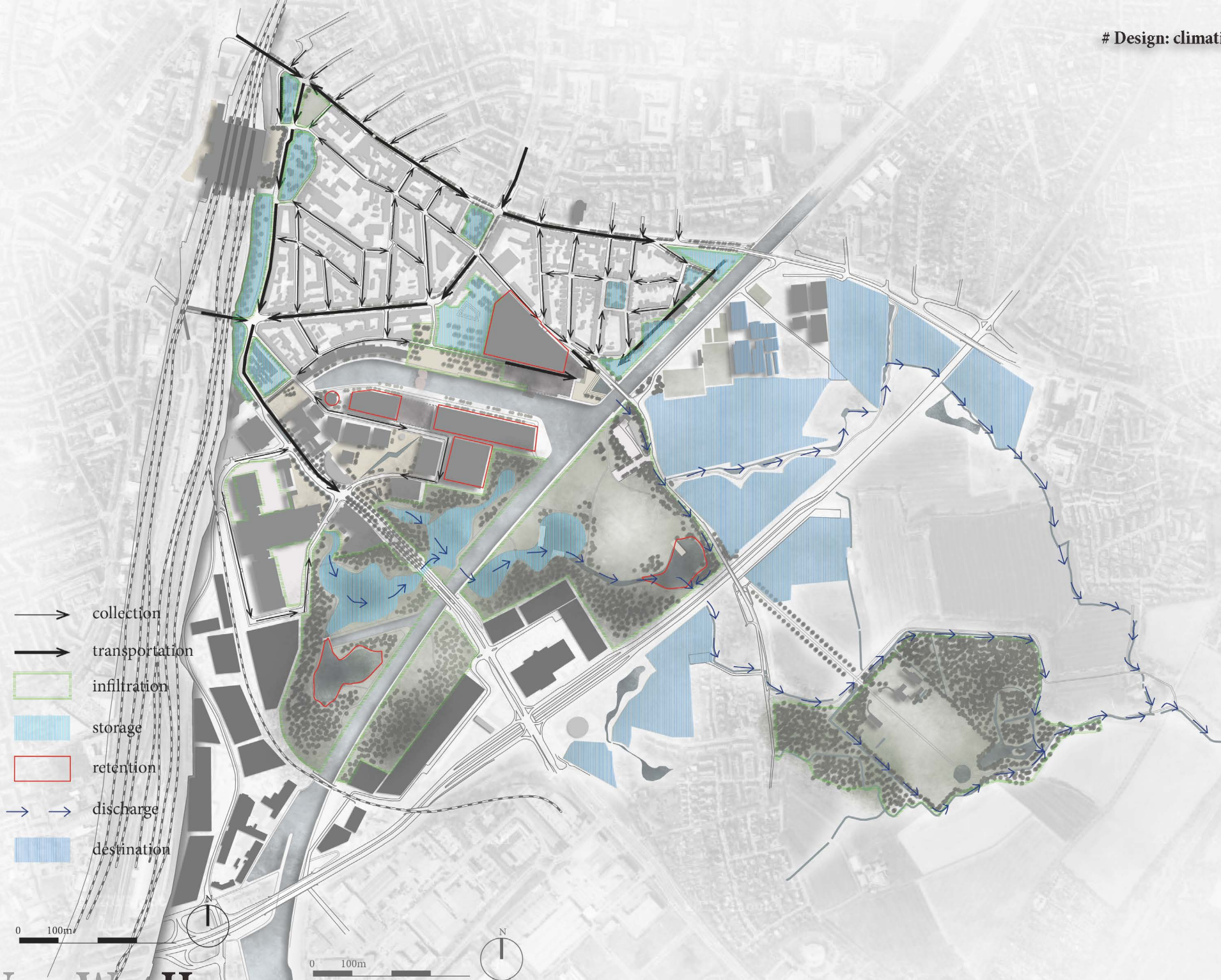
Oppotunity

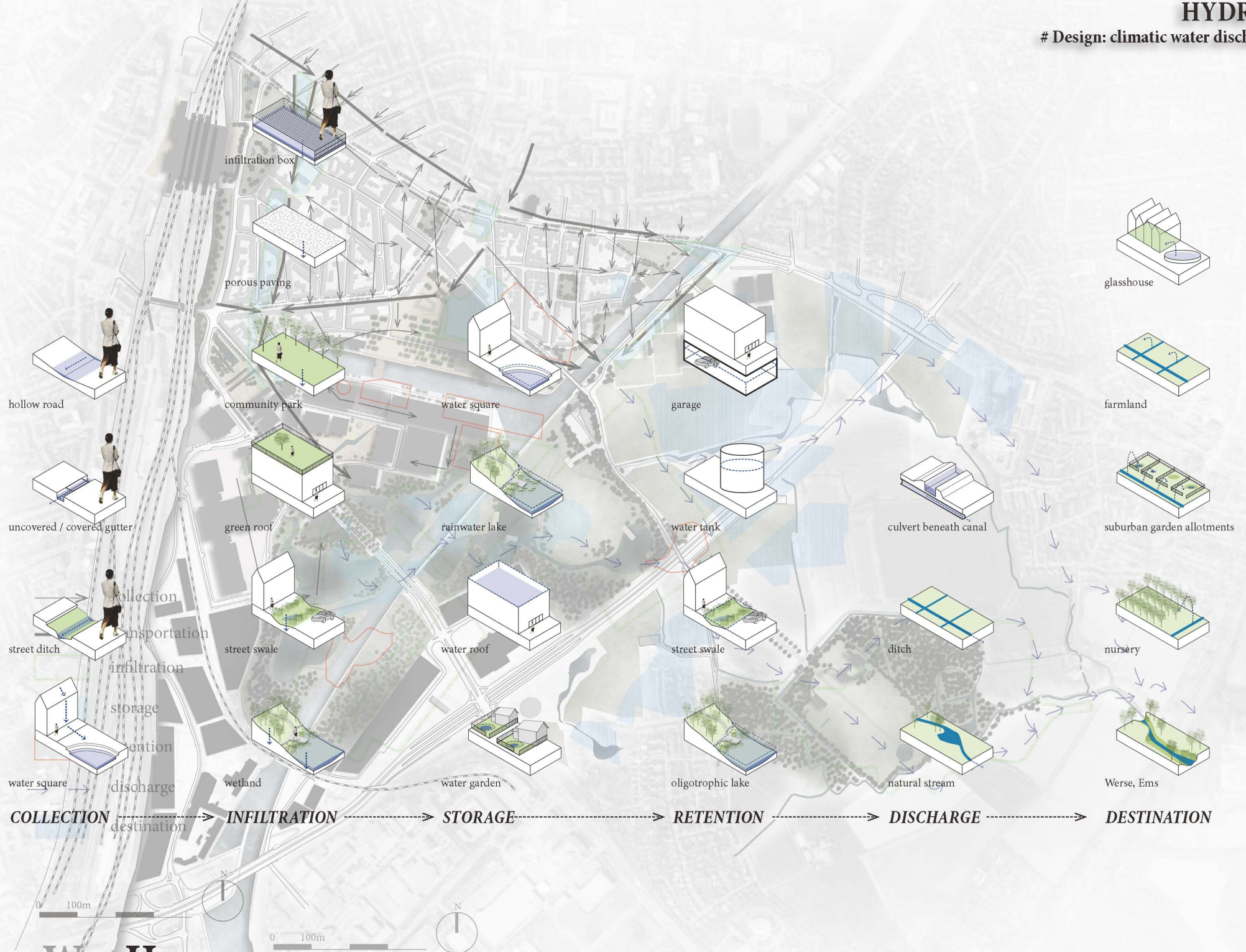
_ The culvert beneath the canal is connecting the urban drainage system with the natural streams. It is the opportunity to discharge urban water to natural river system.



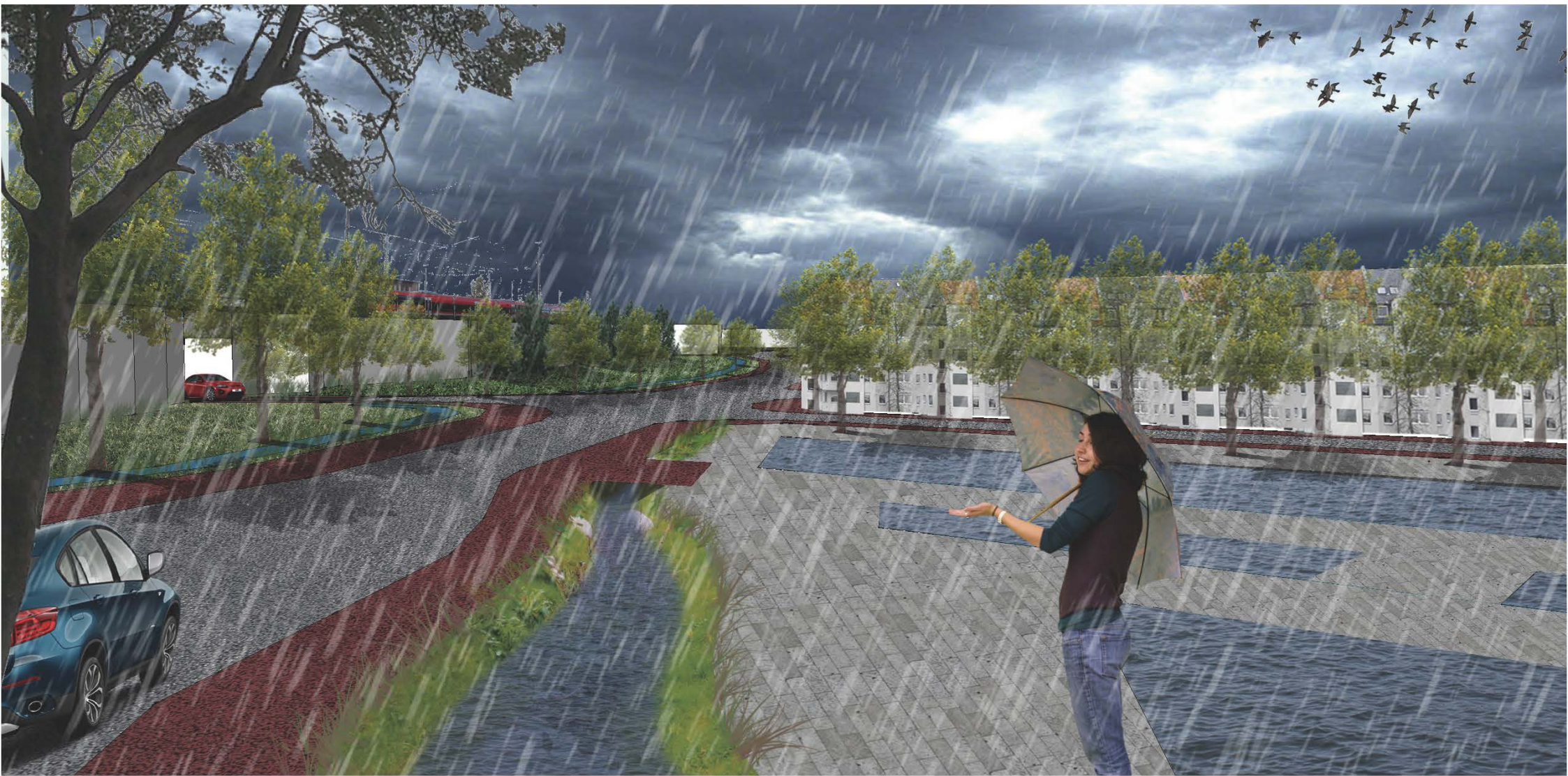
Zoom-in:
culverts beneath the canal,
tributaries to Werse













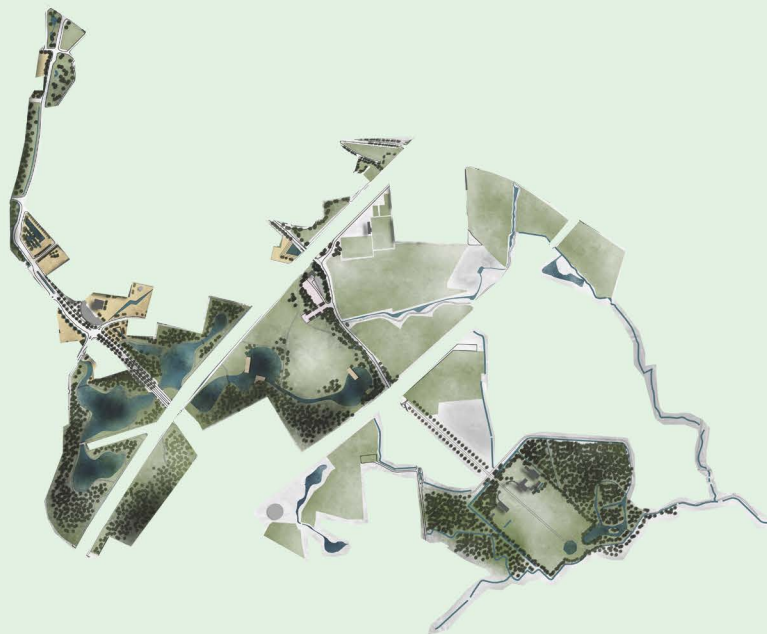








A crucial section of natural habitat circuitry



Ems flood plain, 2722.8 ha

Species: amphibian-2, birds-35, invertebrate-10, mammal-6

Habitats:

- 32.7% natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation abunda
- 24.5% old acidophilous oak woods with Quercus robur on sandy plains
- 13.7% Asperulo-Fagetum beech forests
- 6.5% Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
- 6.2% bog woodland
- 5.7% transition mires and quaking bogs
- 4.3% Riparian mixed forests of Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia, along the great rivers
- 2.9% Juniperus communis formations on heaths or calcareous grasslands
- 2.4% lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)
- 0.9% water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation

Rieselfelder Münster, 436.7 ha

Species: amphibian-2, birds-35, invertebrate-10, mammal-6

Habitat:

- shallow lake zone
- deep lake zone
- wet pasture zone
- meadows and fruit orchards
- renaturalising and broaden the Aa-Ableiter stream

Davert, 2227.6 ha

Species: amphibian-1, birds-8, invertebrate-7, mammal-8, plants-14, reptile-2

Habitats:

- 48.9% sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli
- 42.6% old acidophilous oak woods with Quercus robur on sandy plains
- 6% Luzulo-Fagetum beech forests
- 2.4% bog woodland

Natura2000


Habitats Directive Sites (SCI)

Scale above 1:100,000

 Habitats Directive Sites (SCI)

Bird Directive Sites (SPA)

Scale above 1:100,000

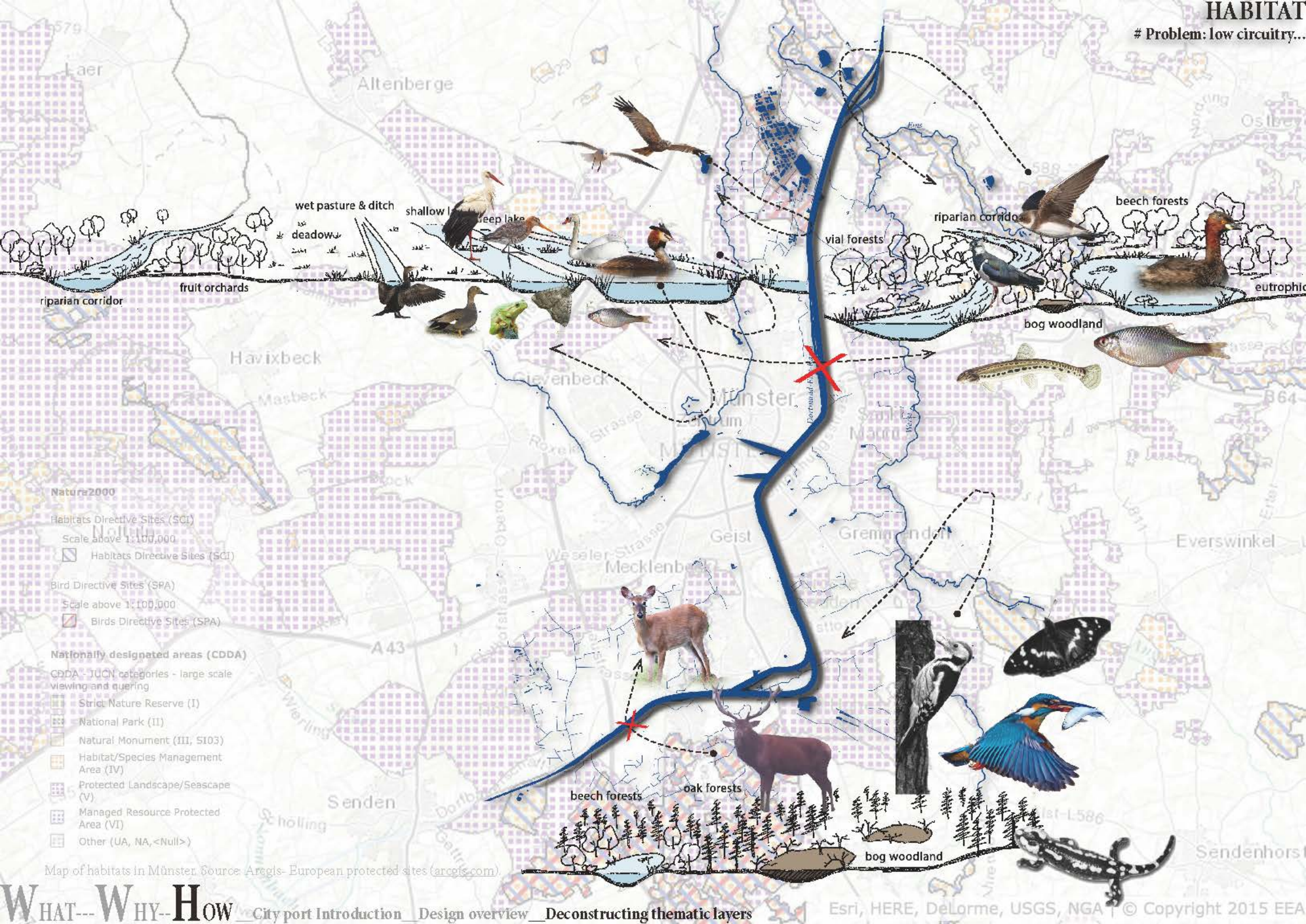
 Birds Directive Sites (SPA)

Nationally designated areas (CDDA)

CDDA - IUCN categories - large scale viewing and quering

-  Strict Nature Reserve (I)
-  National Park (II)
-  Natural Monument (III, SI03)
-  Habitat/Species Management Area (IV)
-  Protected Landscape/Seascape (V)
-  Managed Resource Protected Area (VI)
-  Other (UA, NA, <Null>)

Map of habitats in Münster. Source: Aregis- European protected sites (arcgis.com).



HABITAT
Problem: low circuitry...

- Natura2000**
- Habitats Directive Sites (SCI)
Scale above 1:100,000
[Symbol] Habitats Directive Sites (SCI)
- Bird Directive Sites (SPA)
Scale above 1:100,000
[Symbol] Birds Directive Sites (SPA)
- Nationally designated areas (CDDA)**
CDDA - IUCN categories - large scale viewing and querying
- [Symbol] Strict Nature Reserve (I)
 - [Symbol] National Park (II)
 - [Symbol] Natural Monument (III, S103)
 - [Symbol] Habitat/Species Management Area (IV)
 - [Symbol] Protected Landscape/Seascape (V)
 - [Symbol] Managed Resource Protected Area (VI)
 - [Symbol] Other (UA, NA, <Null>)

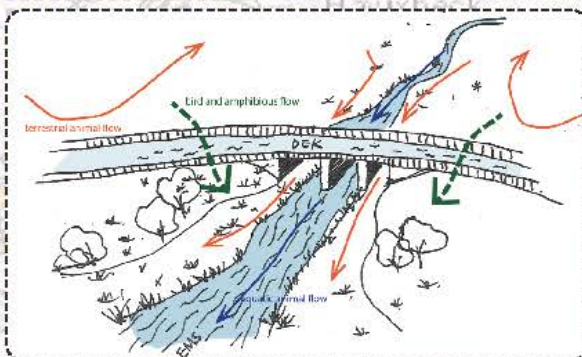
Map of habitats in Münster. Source: Arcgis- European protected sites (arcgis.com)



DEK goes over Erns by the new and old aqueduct.



Culverts go beneath the canal. Image from bingmap



Bird Directive Sites (SPA)

Scale above 1:100,000

Birds Directive Sites (SPA)



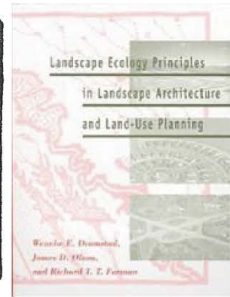
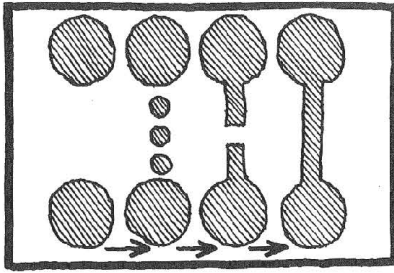
The canal is a new habitat. Photo by author

Opportunity

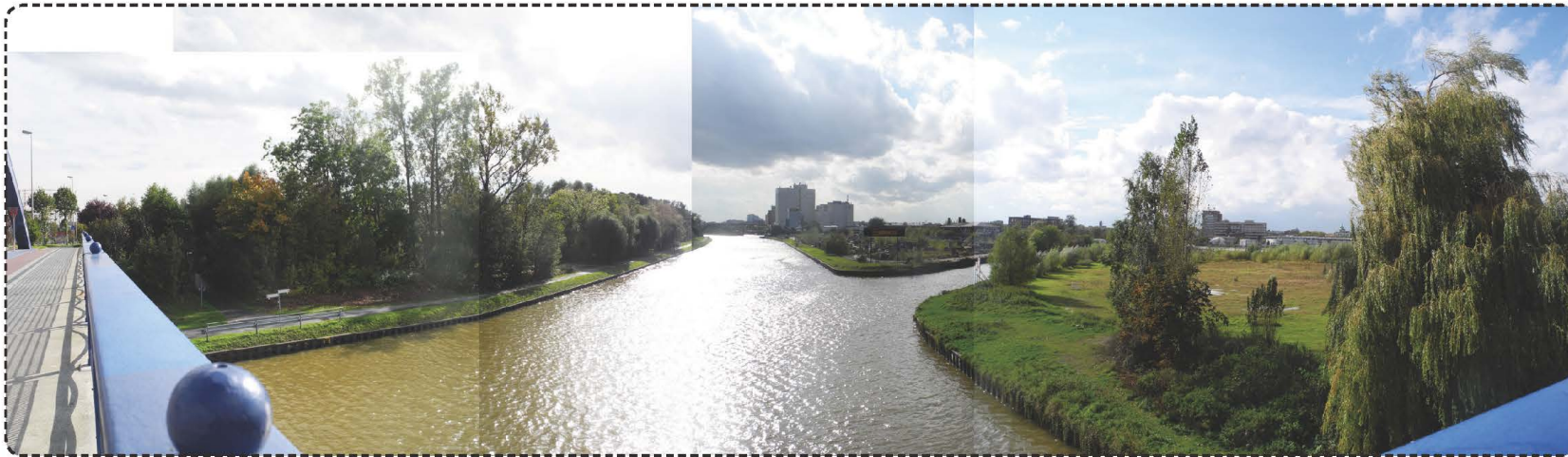
- Since it is the third main water way of the city, the canal could be seen as a possible habitat for the protected fauna, such as birds, fishes mammals, etc.
- Here the culverts beneath the canal could also be used as fauna passage (for aquatic and terrestrial animals), to improve the ecological circuitry.

C4. Stepping stone connectivity

A row of stepping stones (small patches) is intermediate in connectivity between a corridor and no corridor, and hence intermediate in providing for movement of interior species between patches.



Stepping stone connectivity. Source: Landscape ecology principles in landscape architecture and land-use planning.

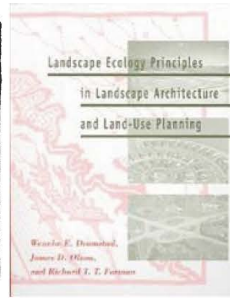
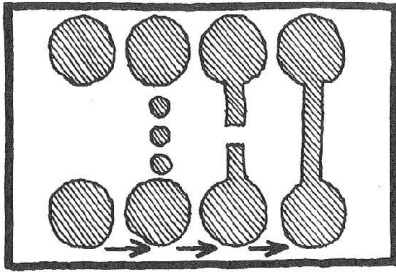


A view of potential area near port

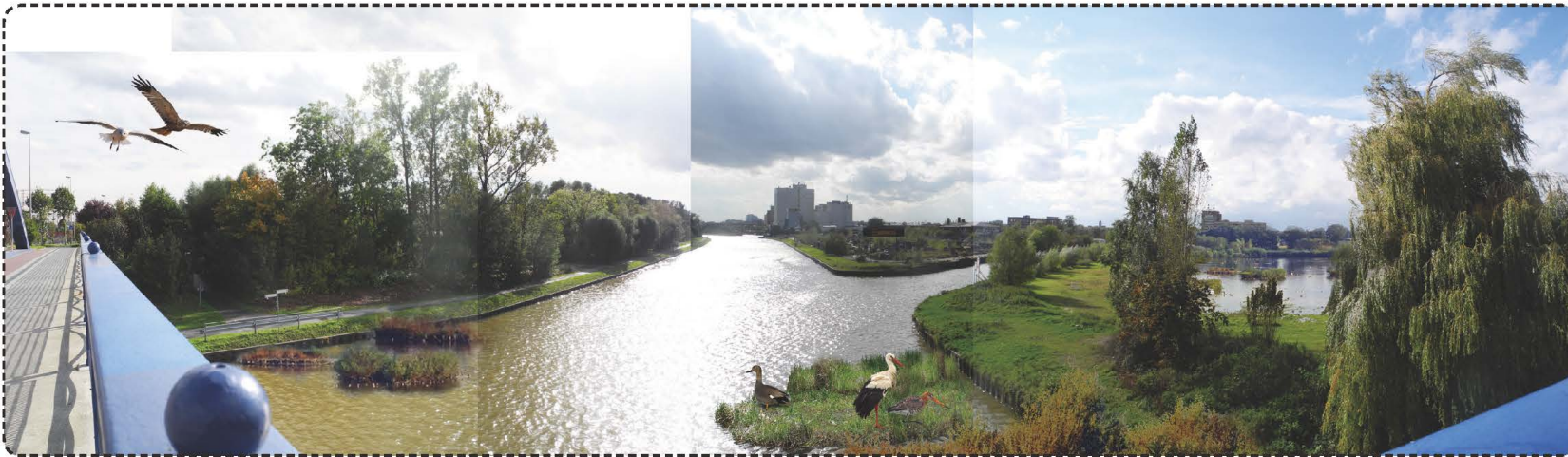


C4. Stepping stone connectivity

A row of stepping stones (small patches) is intermediate in connectivity between a corridor and no corridor, and hence intermediate in providing for movement of interior species between patches.

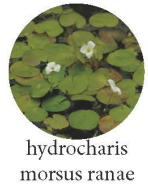
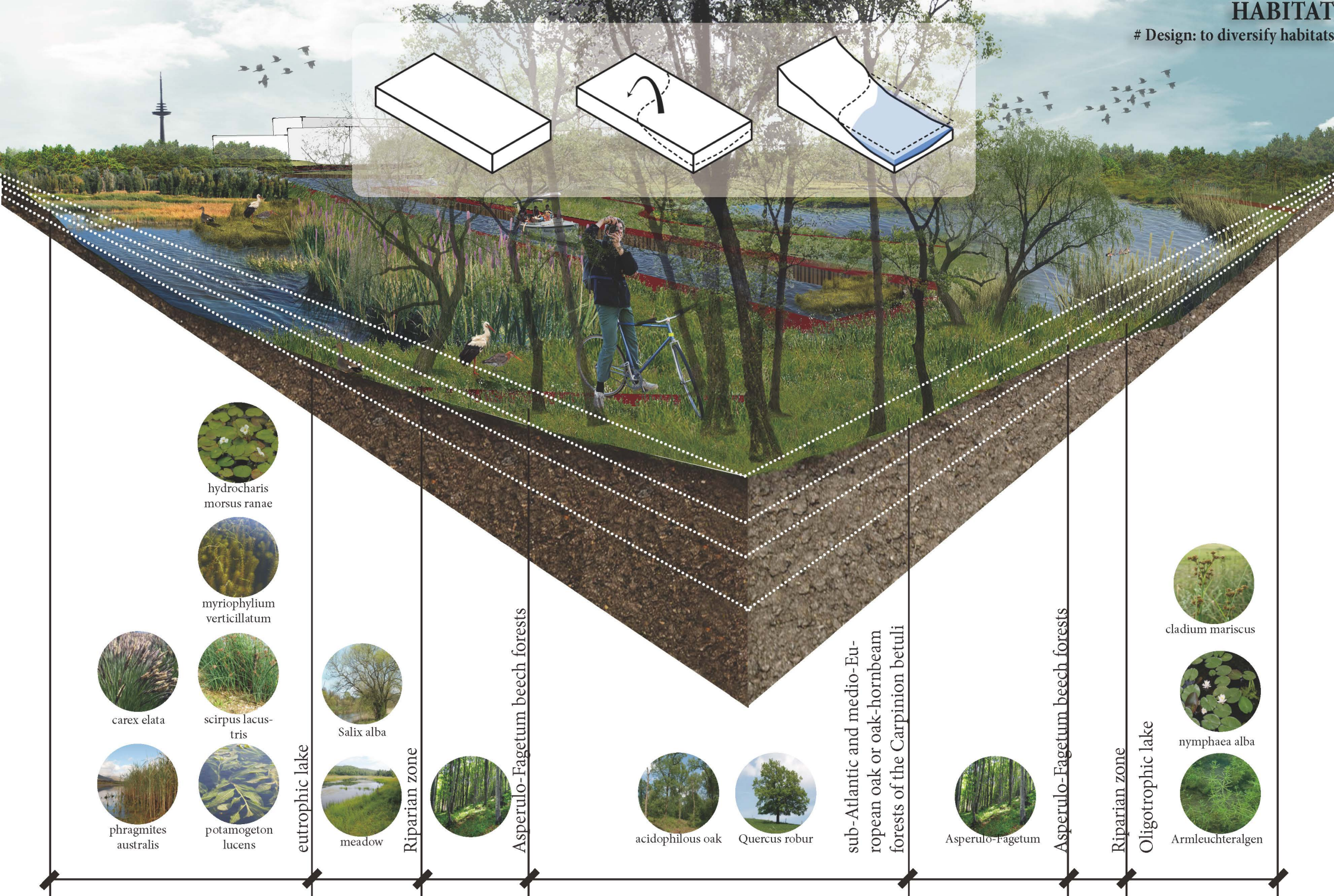


Stepping stone connectivity. Source: Landscape ecology principles in landscape architecture and land-use planning.



A perspective collage of future habitat steppingstone





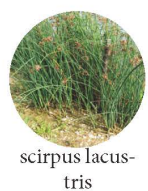
hydrocharis morsus ranae



myriophyllum verticillatum



carex elata



scirpus lacustris



phragmites australis



potamogeton lucens

eutrophic lake



Salix alba



meadow

Riparian zone



Asperulo-Fagetum beech forests



acidophilous oak



Quercus robur

sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli



Asperulo-Fagetum

Asperulo-Fagetum beech forests

Riparian zone

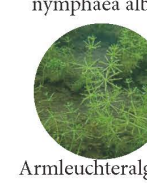
Oligotrophic lake



cladium mariscus



nymphaea alba



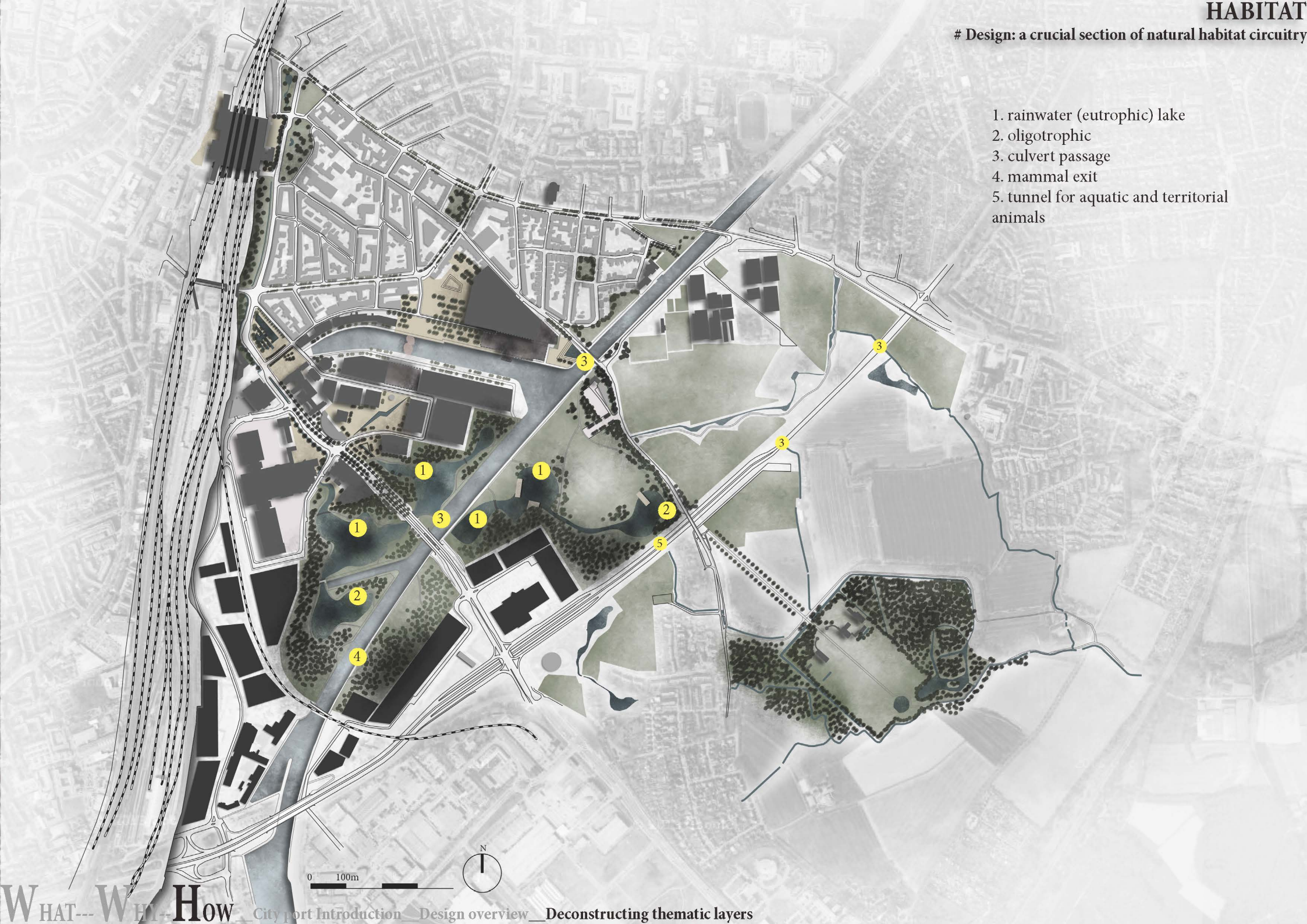
Armleuchteralgen



Different fauna passages. Source: Wildlife and traffic.



1. rainwater (eutrophic) lake
2. oligotrophic
3. culvert passage
4. mammal exit
5. tunnel for aquatic and territorial animals

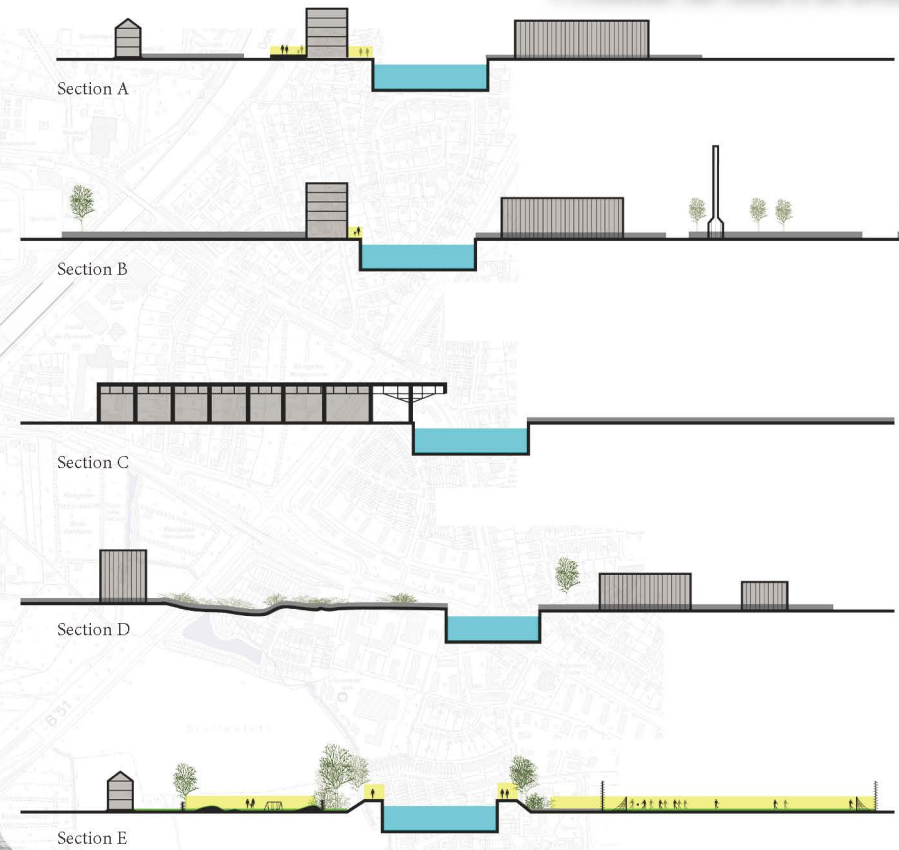
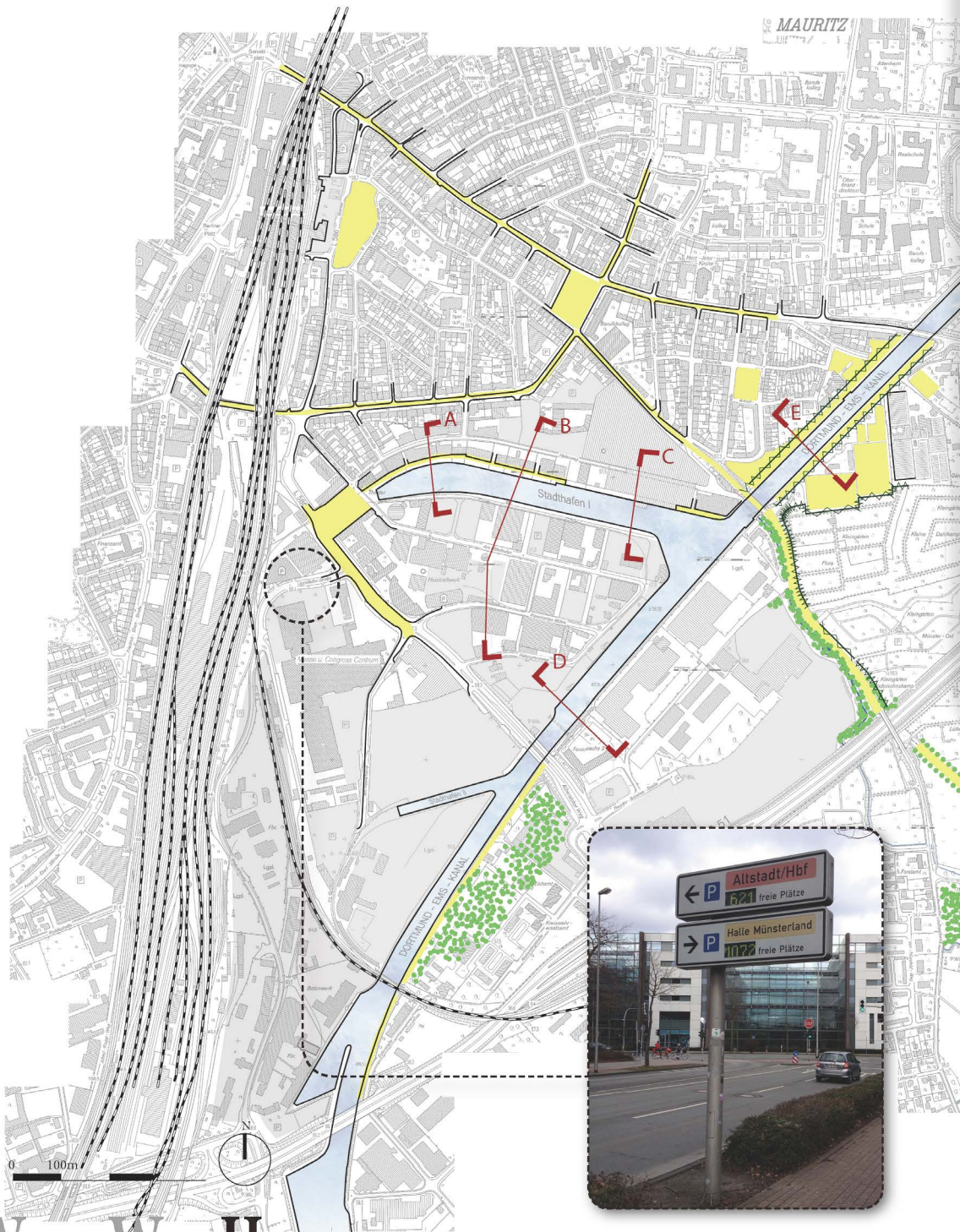


Serial urban-canal-landscape spaces





Problem: the canal is an urban backyard...



_ There are streets, spaces and buildings directing and marking the spacial form.

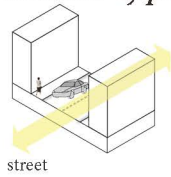


_ There are spaces in, on and beside the canal.



Design: to extend the urban & rural spaces to canal;
to define and connect the urban space & canal space.

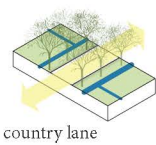
EXTEND by path



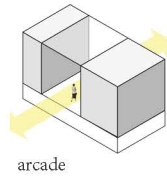
street



parkway

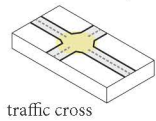


country lane

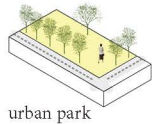


arcade

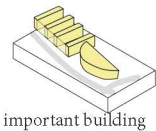
EXTEND by node



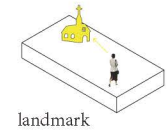
traffic cross



urban park

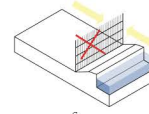


important building

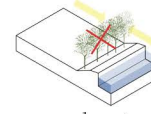


landmark

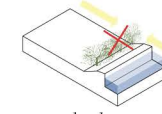
DEFINE / CONNECT - removing



remove fence

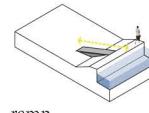


remove dense trees

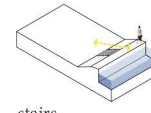


remove bushes

DEFINE / CONNECT - exit

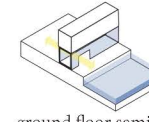


ramp

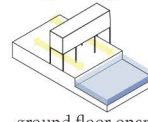


stairs

DEFINE / CONNECT - opening

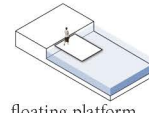


ground floor semi-open

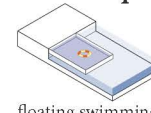


ground floor open

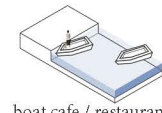
DEFINE / CONNECT - canal space



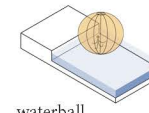
floating platform



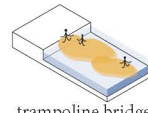
floating swimming pool



boat cafe / restaurant



waterball

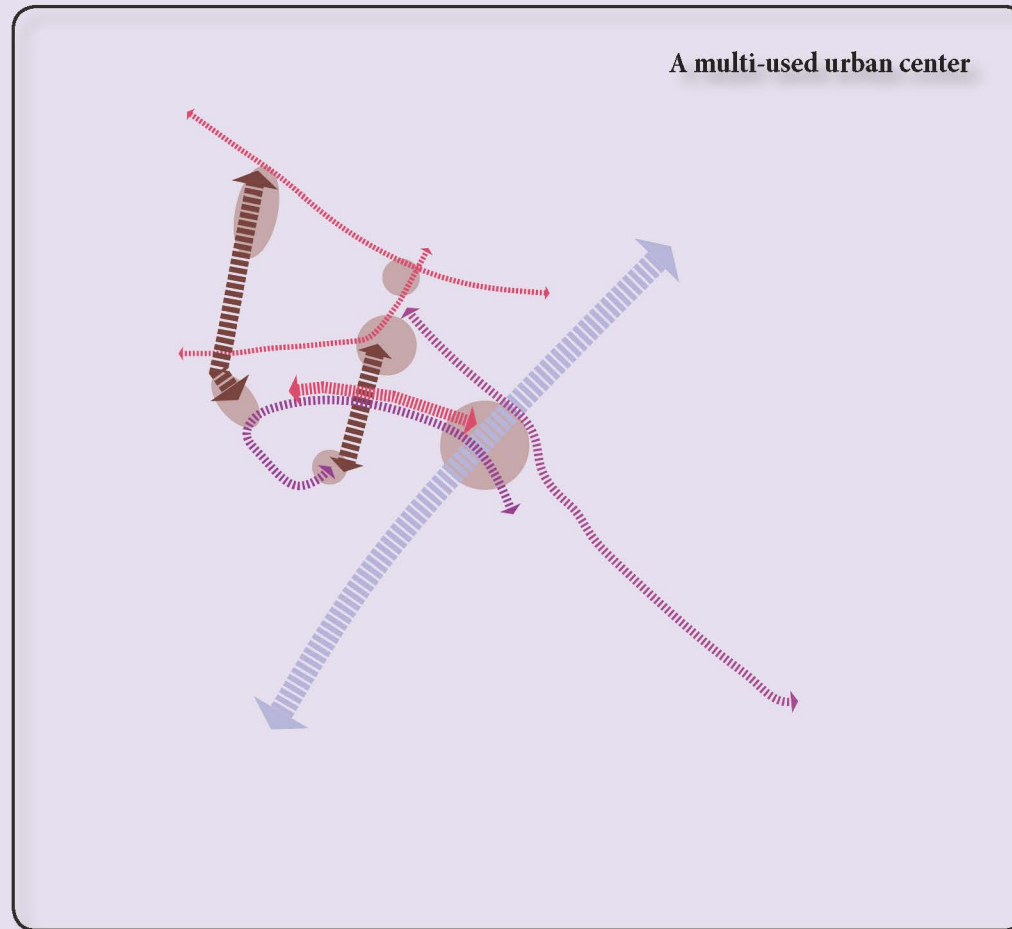


trampoline bridge

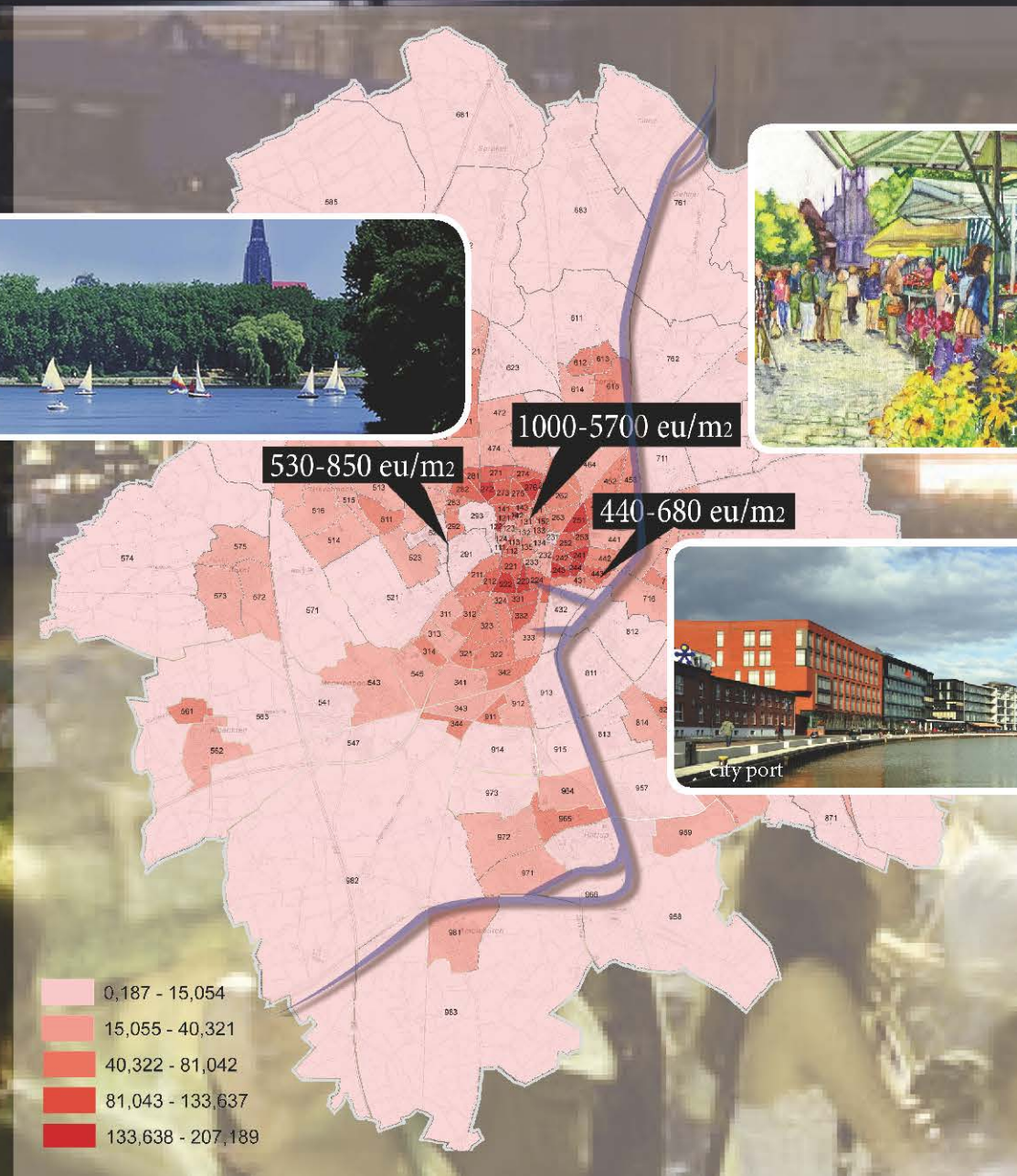
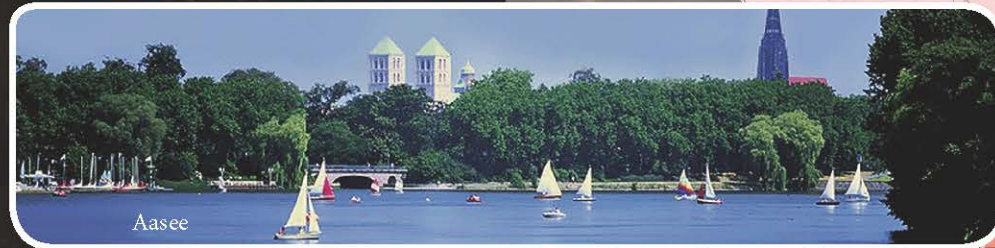












Population density of whole city (per hectare), source www.muenster.de

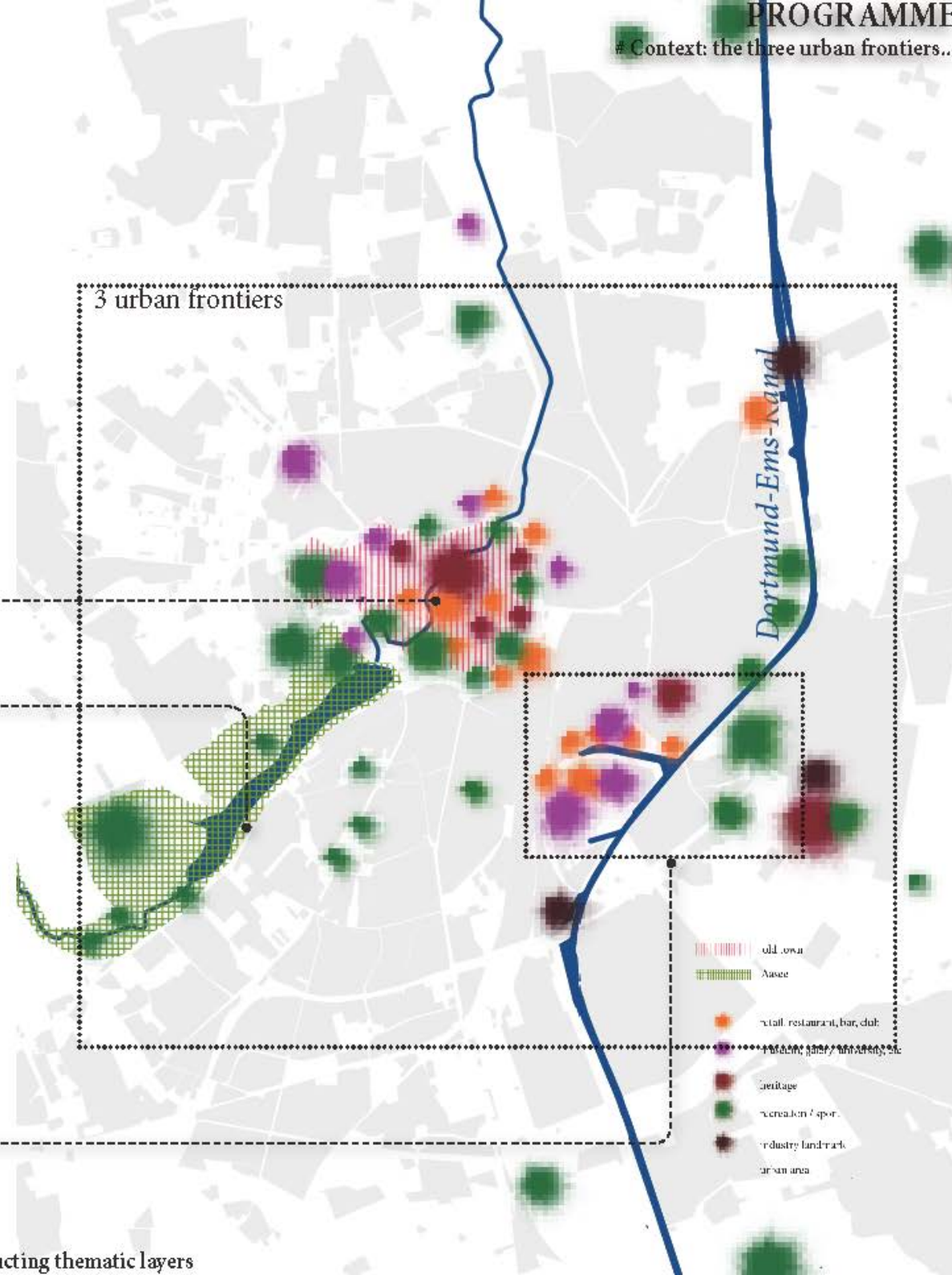
The old town

- _ It is now a heritage with many cathedrals, houses and fortresses, attracting tourists during the year.
- _ It is also the center of citizen's daily shopping and living life.
- _ So there is a conflict of people's daily life and tourism. The old town is too crowded.



Aasee

- _ The lake is the best recreation destination for local people in holidays. Besides the lake, there are parks, parkways, zoo, yachting clubs and so on.
- _ It is also serving the nearby neighborhood.

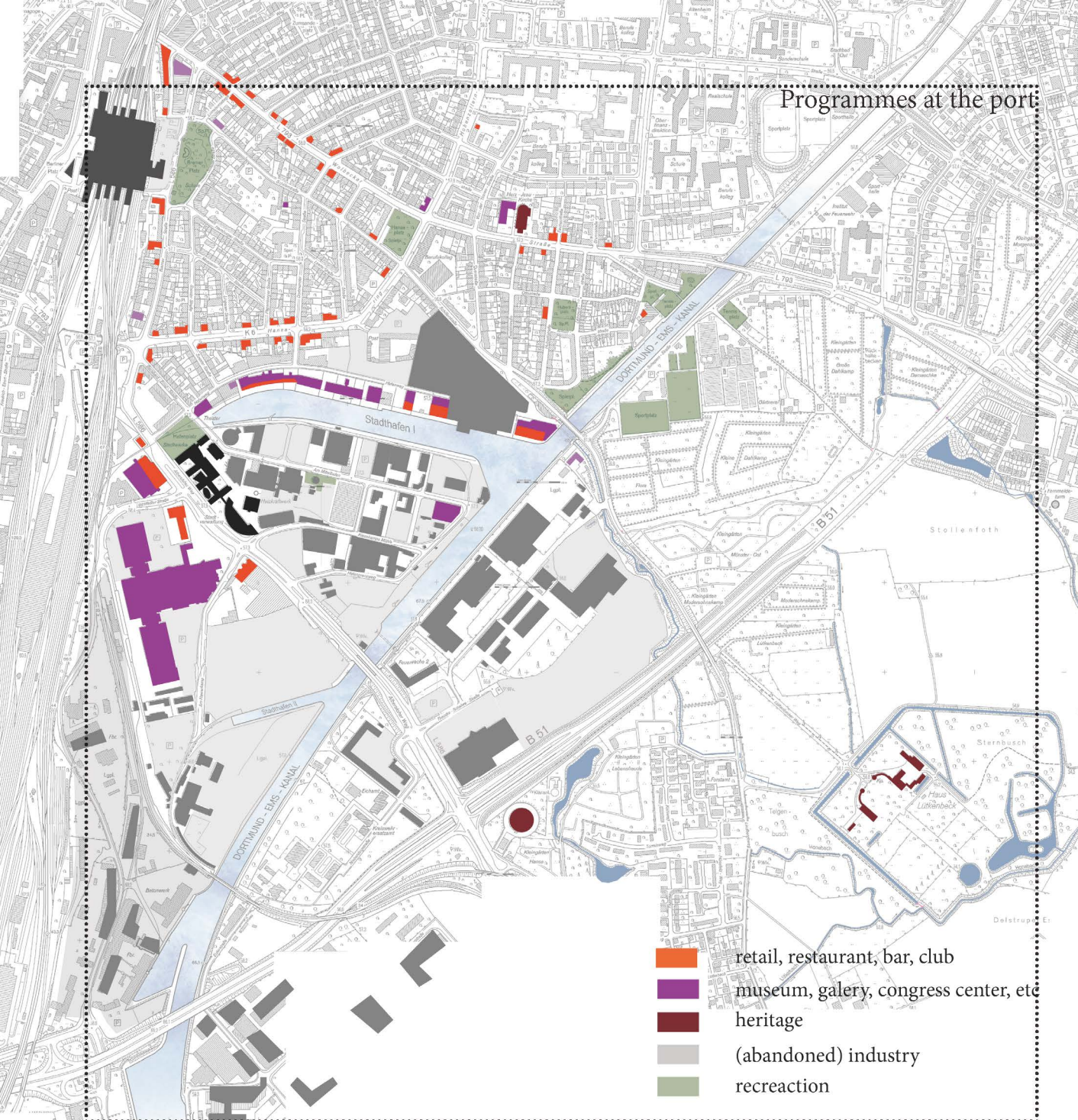


Programmes at the port

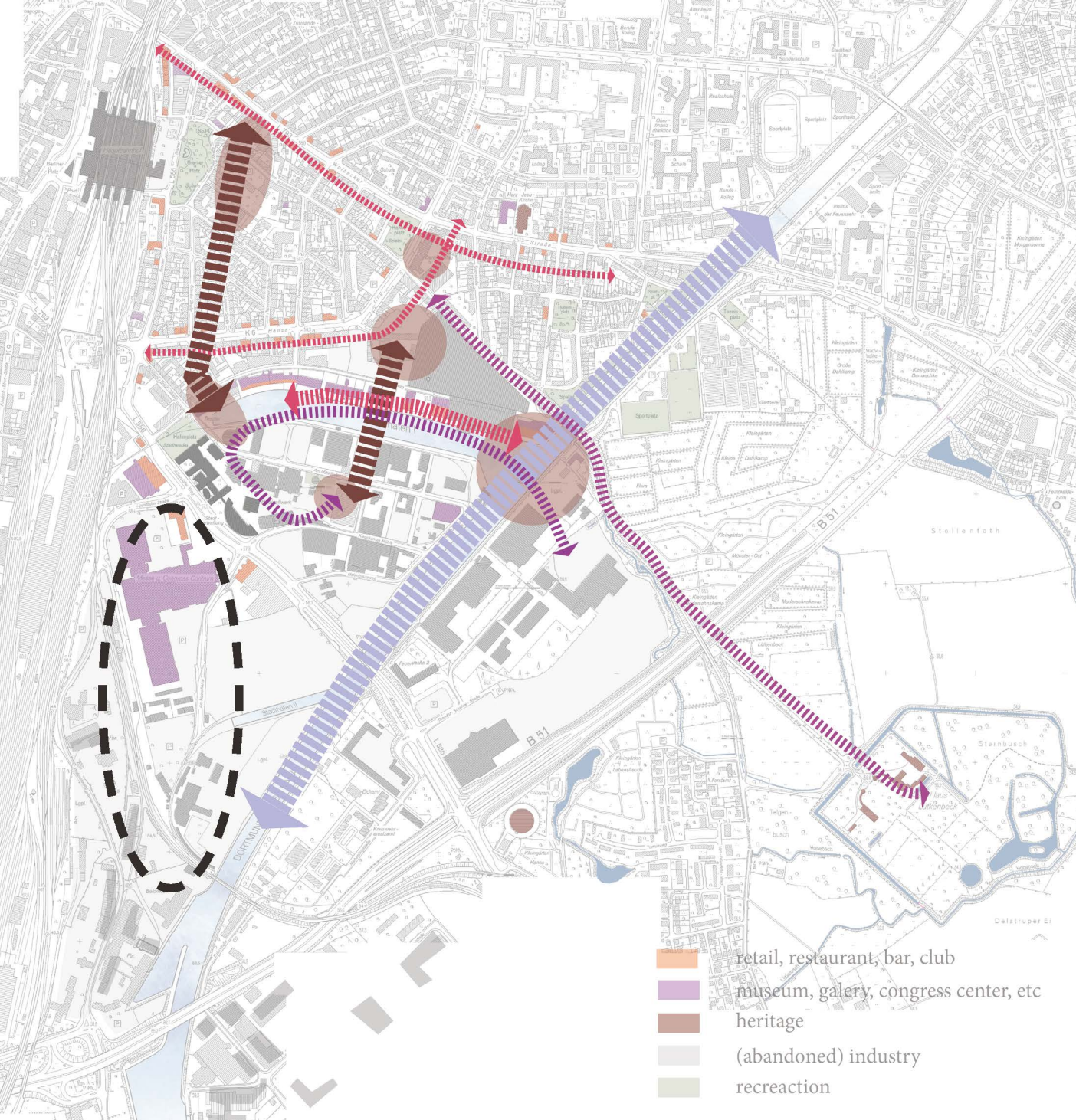


The city port

- _ The cultural activities take place in some discard industry buildings, mixed with some industrial activities.
- _ Other program in this area is mainly neighborhood retail shops.
- _ This area also lacks of outdoor activities.



- orange retail, restaurant, bar, club
- purple museum, gallery, congress center, etc
- dark red heritage
- grey (abandoned) industry
- green recreation



_ Principles

The port's objective is becoming the future center of citizens' modern life. There are principles need to follow:

Cultural potential is promoted.

Commercial program is also developed at the port, to distract the load of old town.

Recreation programs are also necessary to increase the area's competitiveness in the whole city's development.

Business & industry programs are constricted in particular place.

_ Application

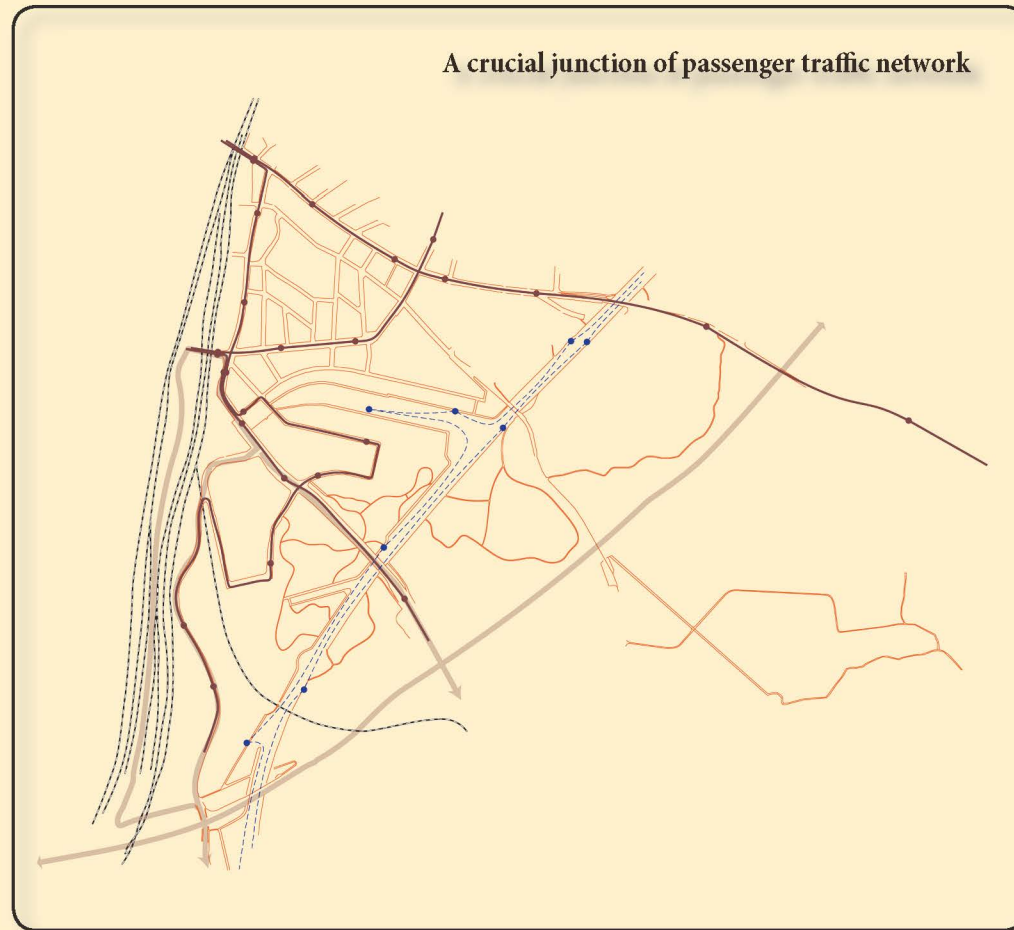
The program corridors integrate the port into the citizen's social life.

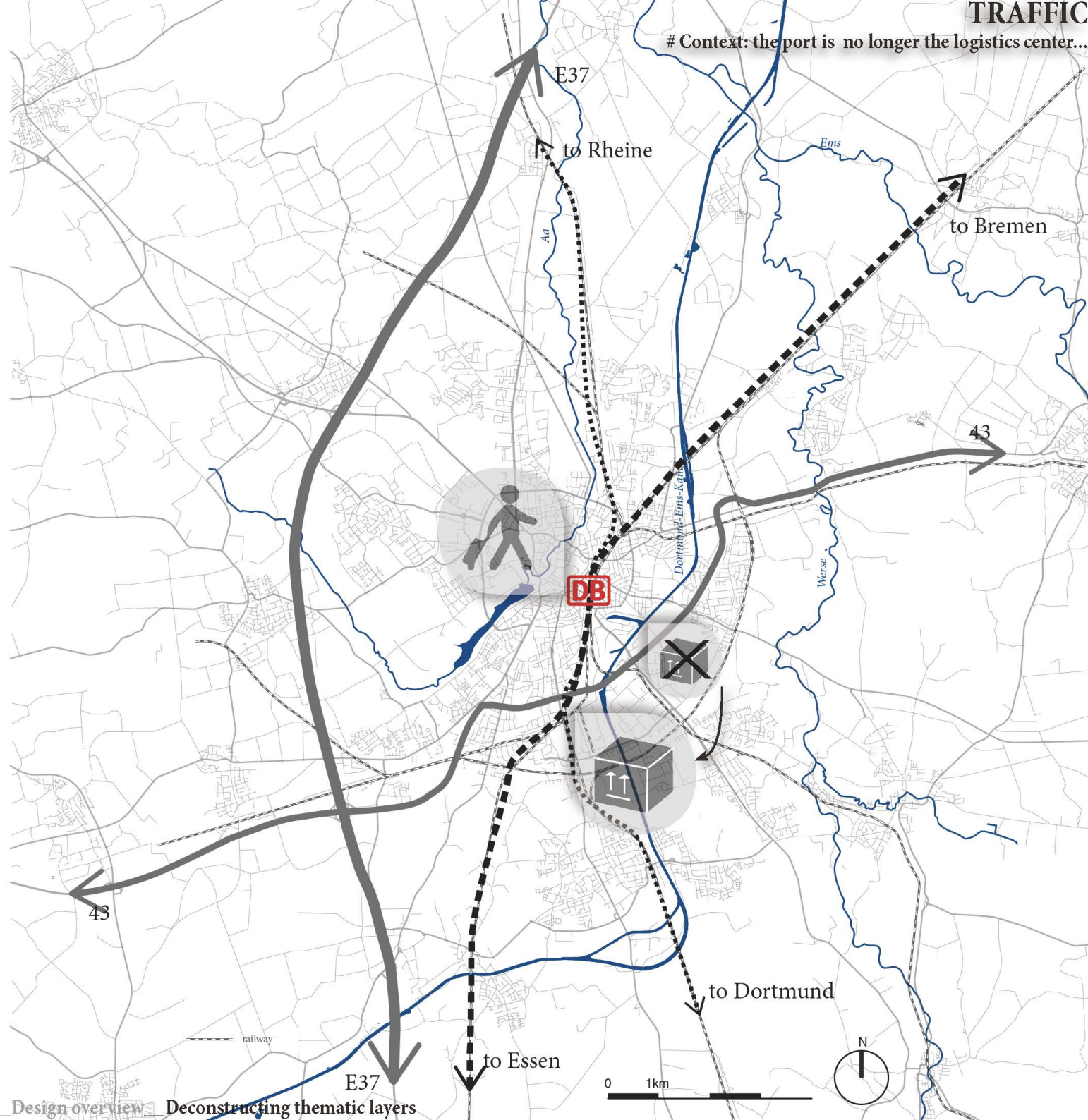
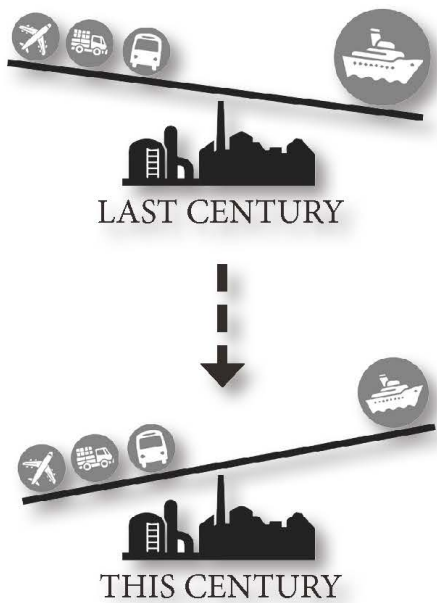
Design: a multi-used urban center





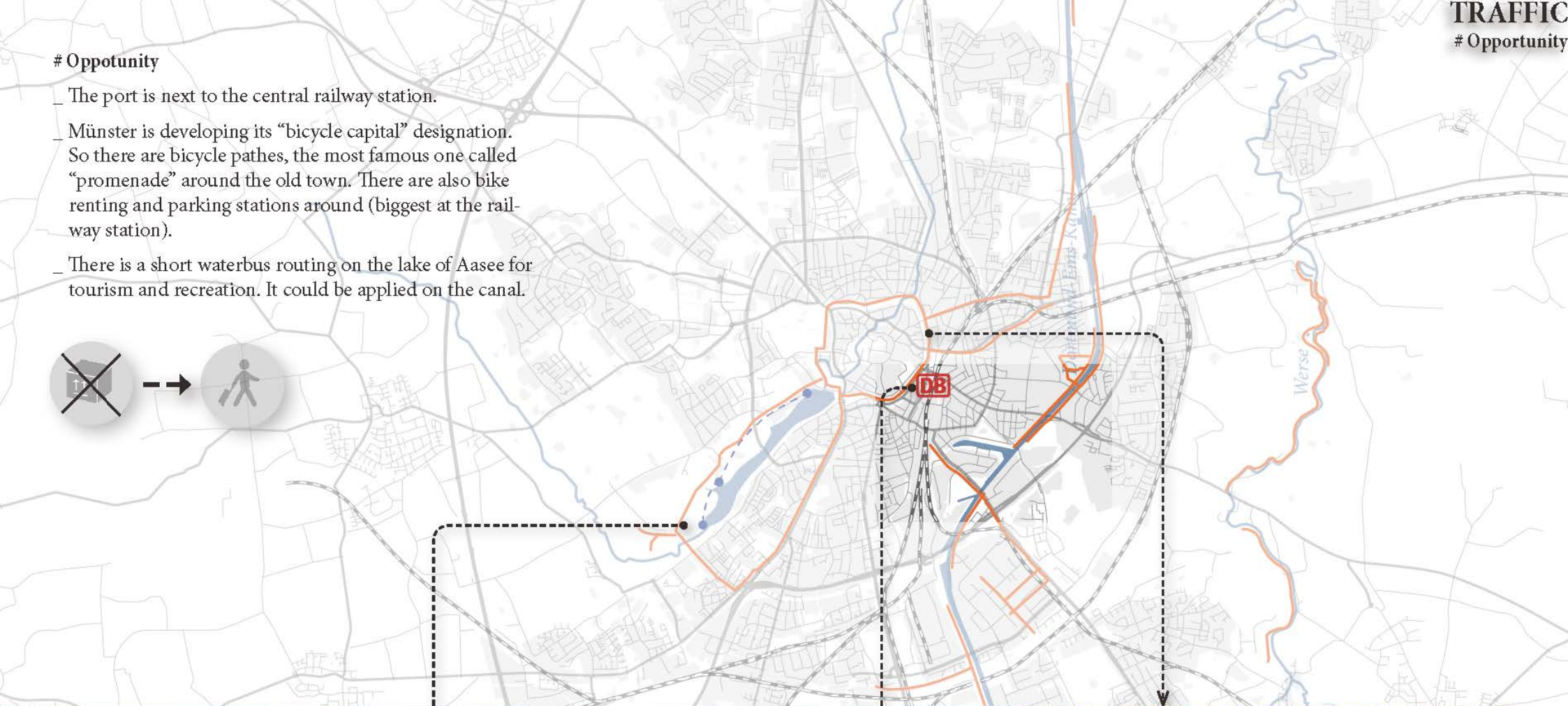
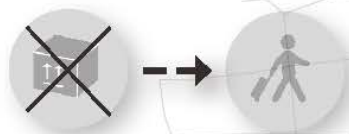


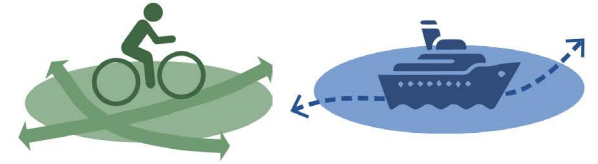
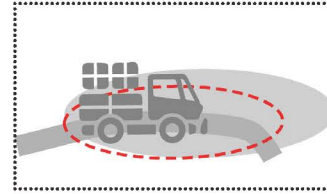




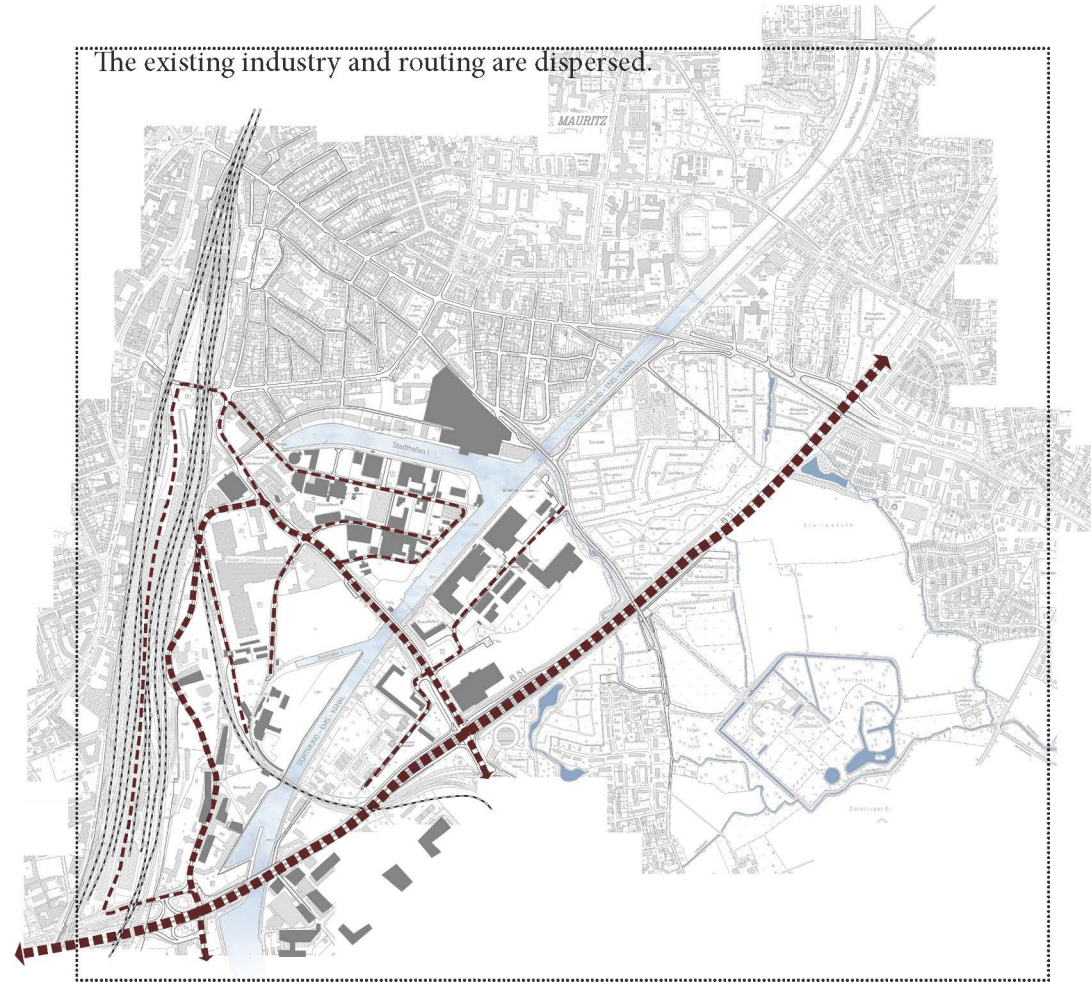
Opportunity

- The port is next to the central railway station.
- Münster is developing its “bicycle capital” designation. So there are bicycle paths, the most famous one called “promenade” around the old town. There are also bike renting and parking stations around (biggest at the railway station).
- There is a short waterbus routing on the lake of Aasee for tourism and recreation. It could be applied on the canal.

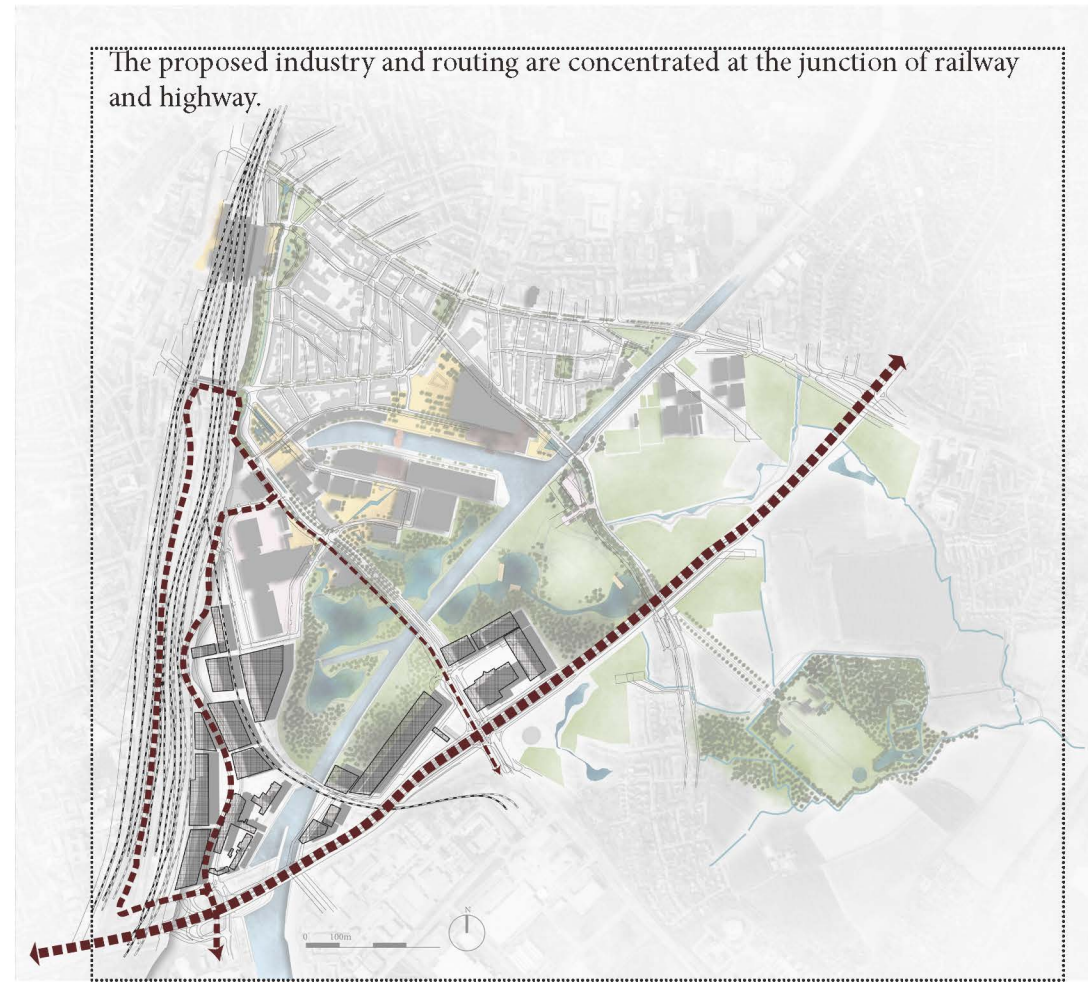


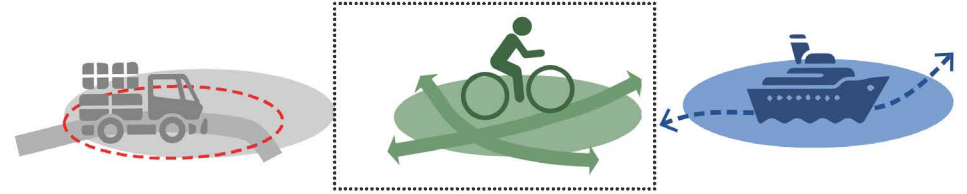


The existing industry and routing are dispersed.

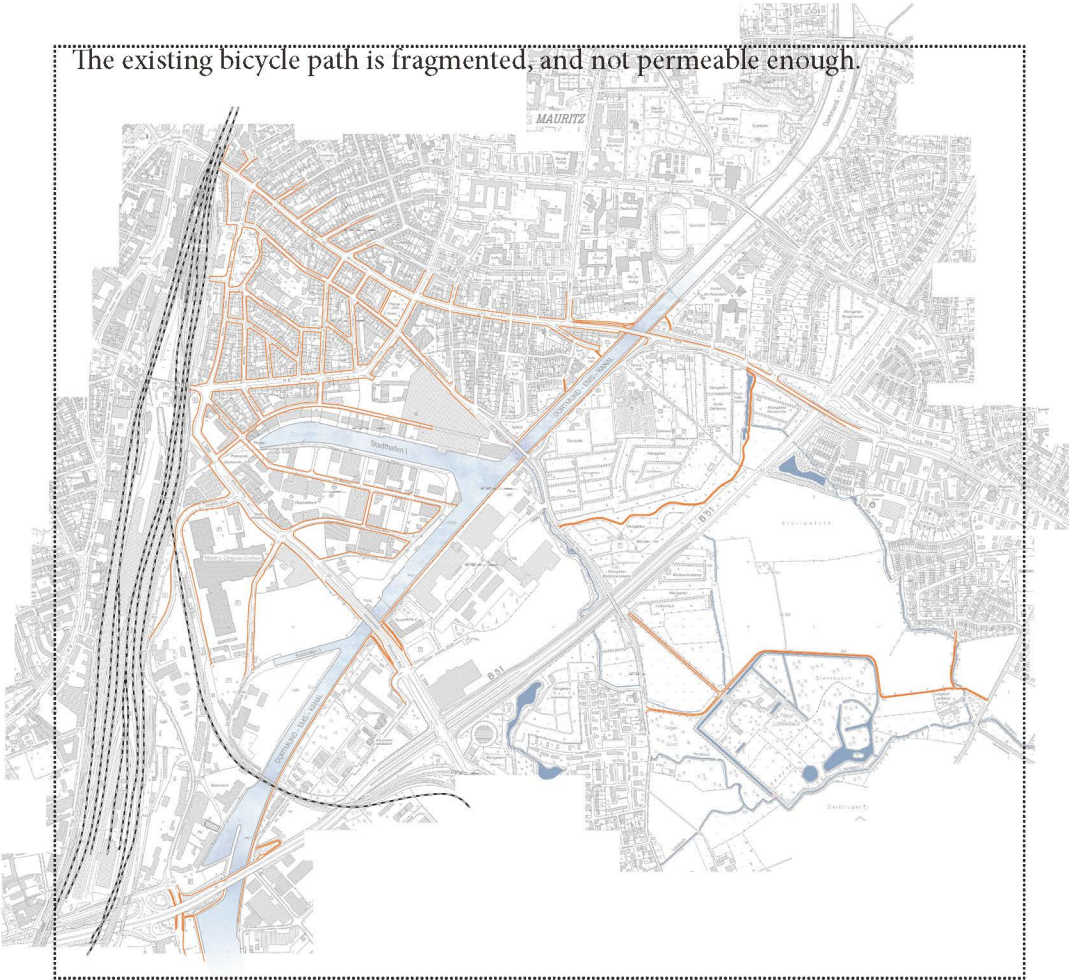


The proposed industry and routing are concentrated at the junction of railway and highway.

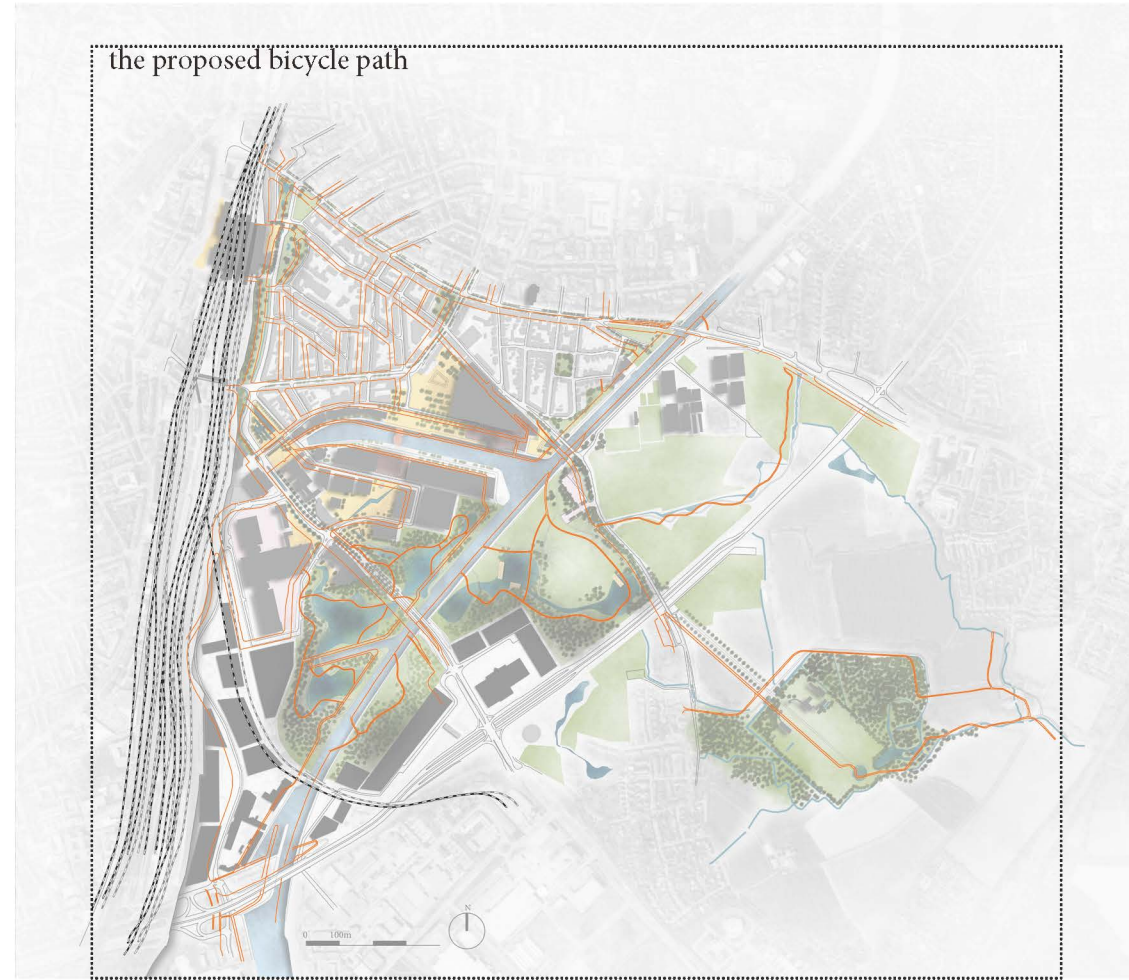




The existing bicycle path is fragmented, and not permeable enough.

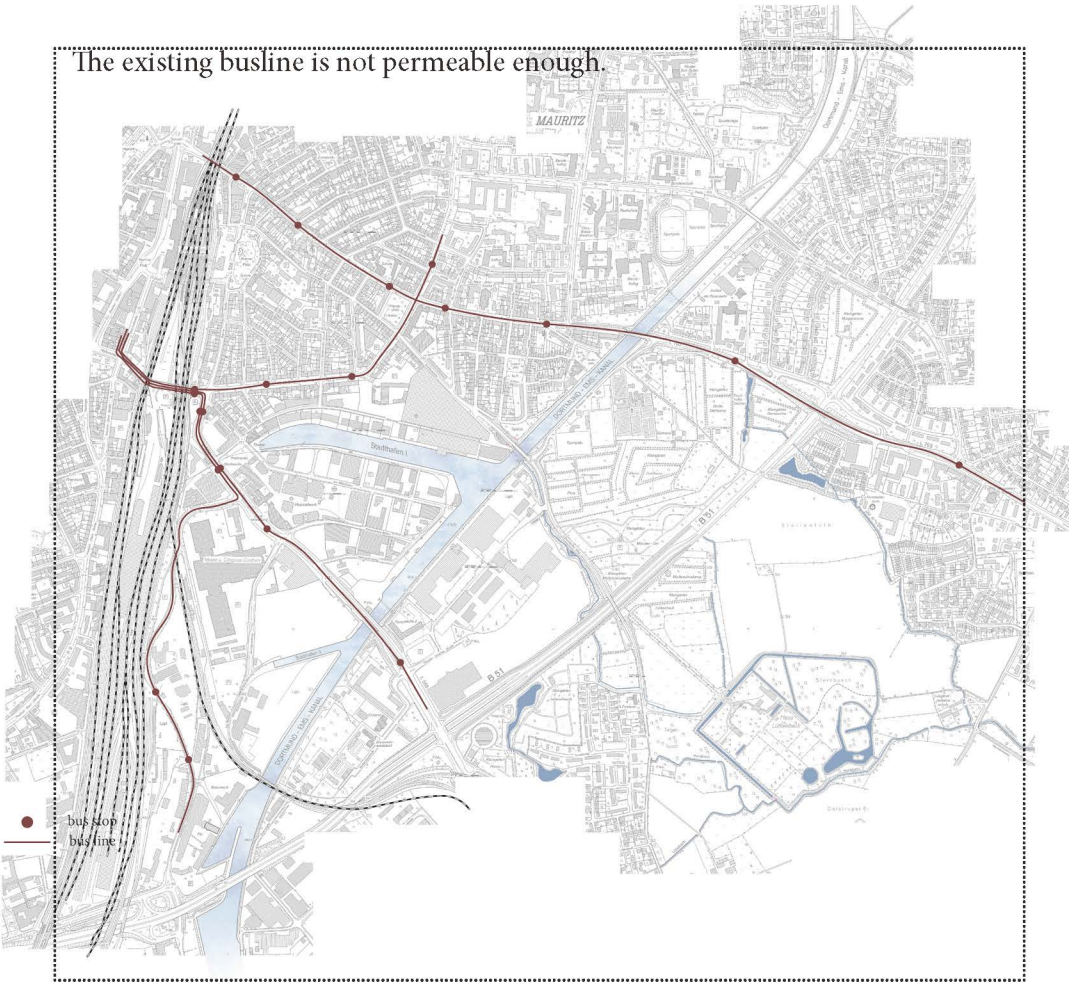


the proposed bicycle path

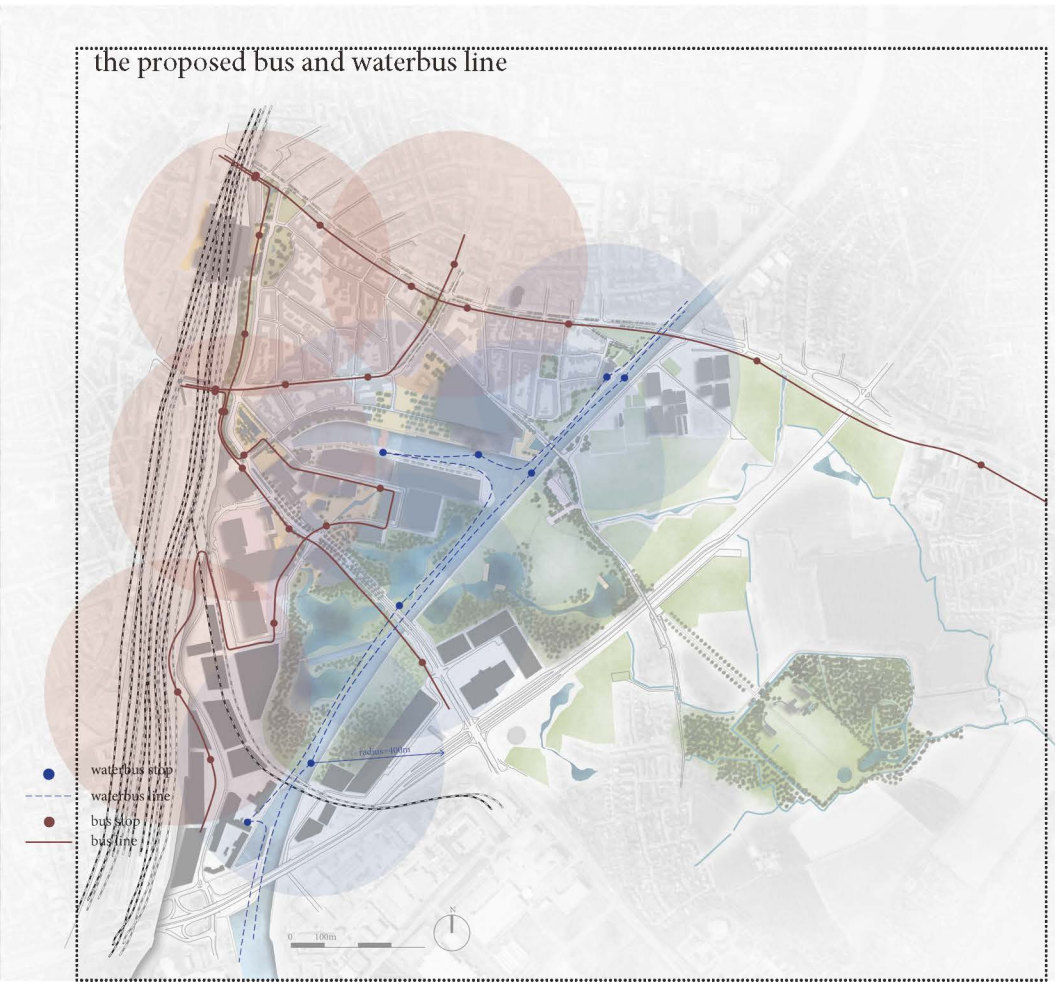




The existing busline is not permeable enough.



the proposed bus and waterbus line



Design: a crucial junction of passenger traffic network





_ HYDROLOGY Principles

To collect, to infiltrate, to store, to retention, to discharge, to get rainwater go to landscape.



_ HABITAT Principles

To diversify habitat;
to connect the seperated habitat.



_ SPACE Principles

To extend the urban& rural spaces to canal;
to define and connect the urban & canal space.



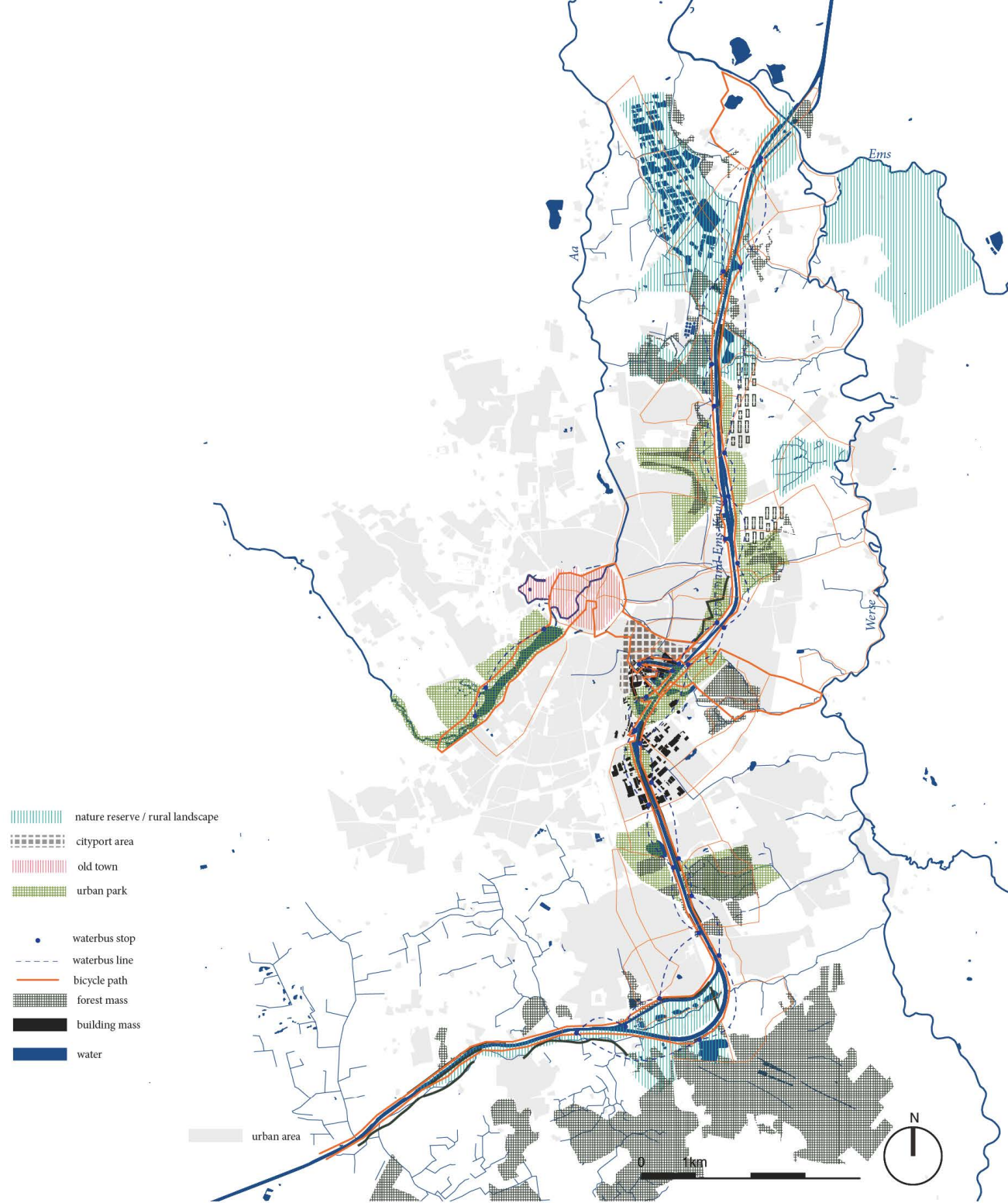
_ PROGRAM Principles

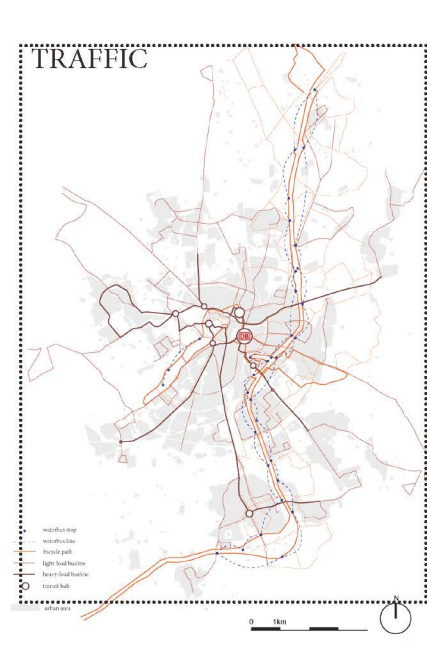
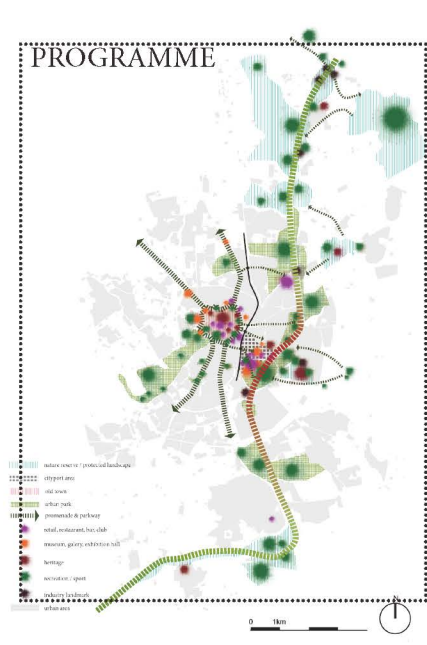
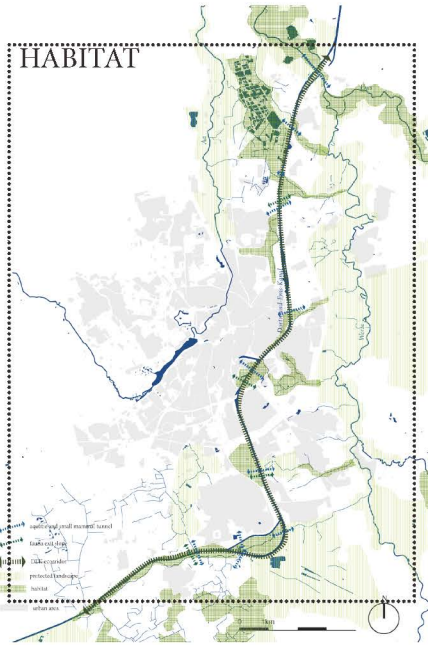
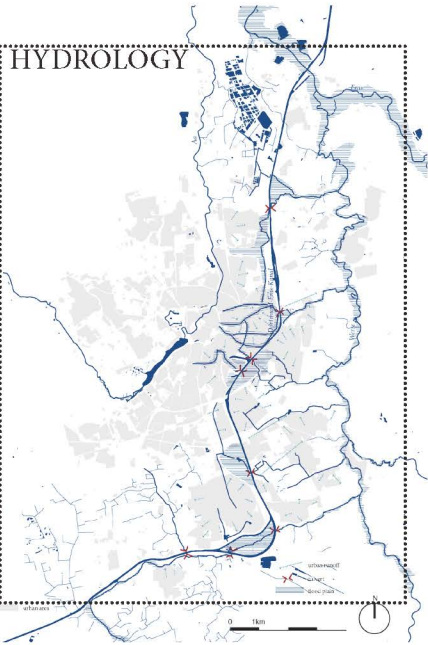
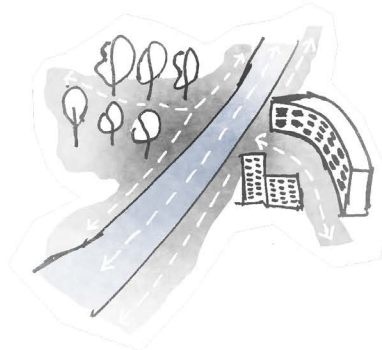
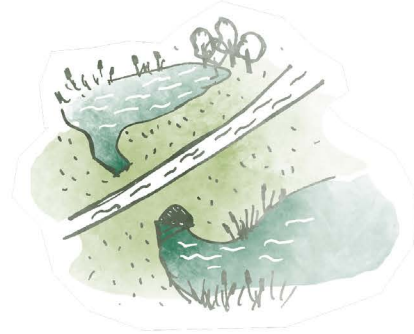
To promote cultural potential;
to develop commercial & recreation program;
to constrict business & industry.



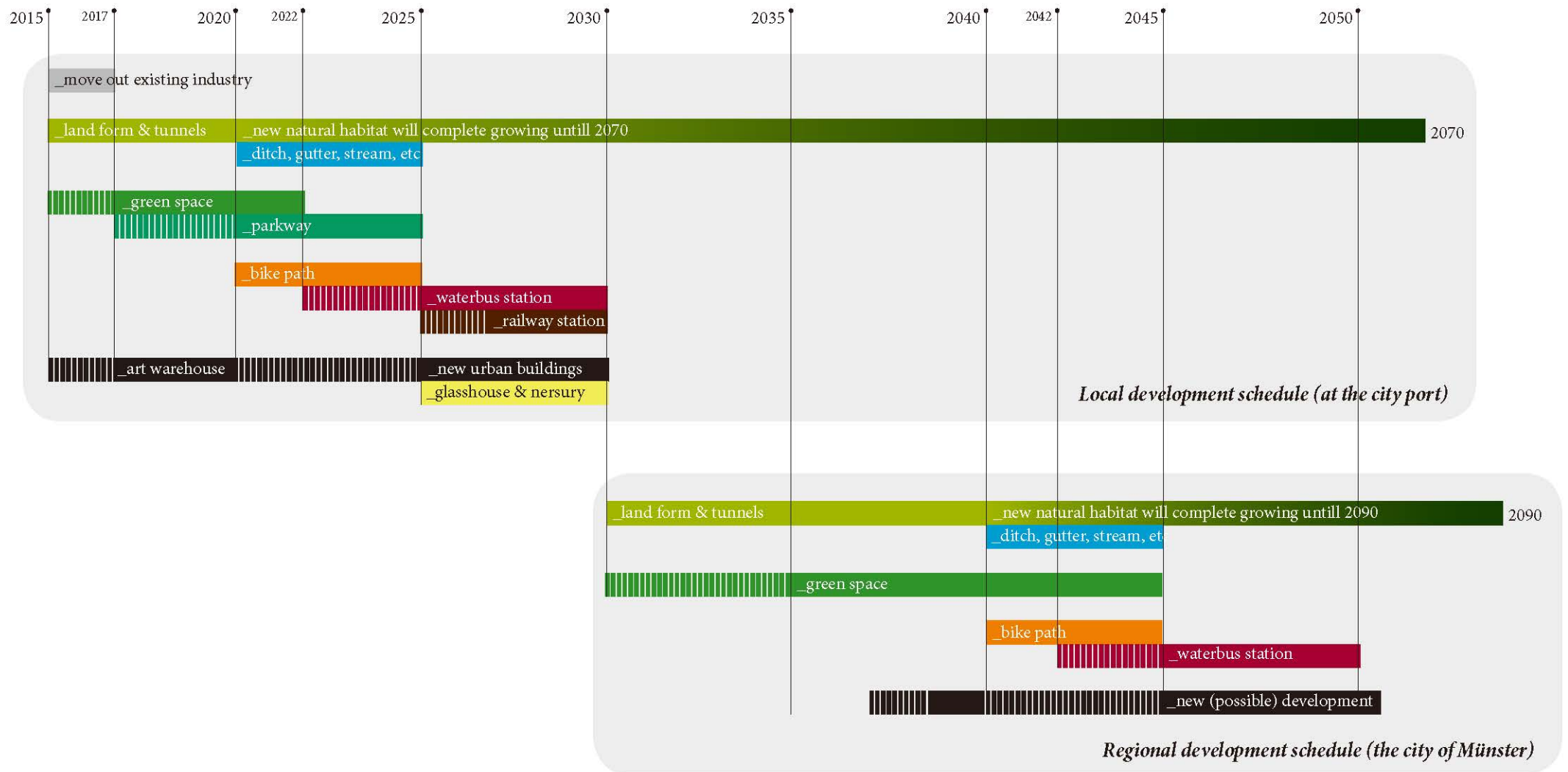
_ TRAFFIC Principles

To decrease the freight transport;
to complete the bicycle path;
to add waterbus as a means of public traffic.





Four steps of “landscape base -- green space -- traffic -- new urban development”



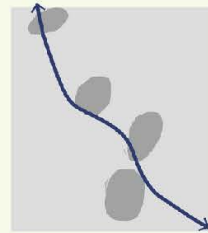


“the reflexivity of early infrastructure”

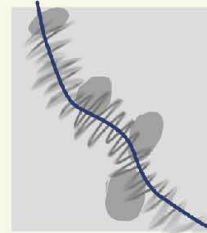
Early infrastructures could cause *problems* while provide *potentials*.

No matter inter-local transportation networks, military defence systems, or dikes, their relationships with city evolve through time. Now they keep the structural traces from the interlocal or separate fundamental origin. And the existing linear, curve, or loop shape is convenient to transform into crucial landscape intervention in cities (or a component of landscape system).

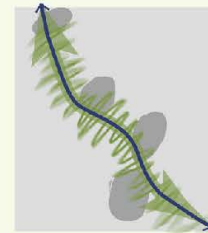
Landscape architecture intervention is also necessary to gain comprehensive proposal for the infrastructures' problems and potentials, from spacial, social and ecological view. My project explores a applicable way to transform the early infrastructure into a landscape infrastructure in modern city. *No matter at local or regional scale, an operative landscape structure could be developed on the base of the canal trace. And the structure works in various thematic layers, while our object is playing a complex role with no neglecting.*



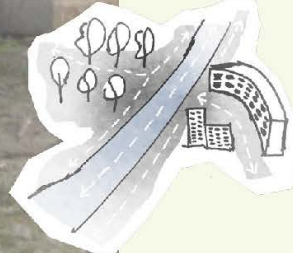
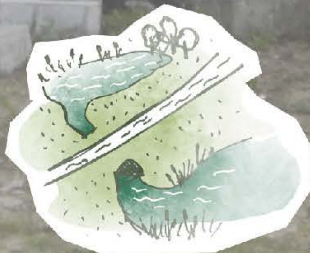
Past: canal as infrastructure



Now: canal as structure



Opportunity: canal as landscape infrastructure



REFLECTION