

(RE)CONNECTING BORDERS

Functional and institutional integration in relation to the urban pattern of the cross-border Euregio Maas-Rijn.



The region



Image 1. Euregio Maas-Rijn, 2018.

The region

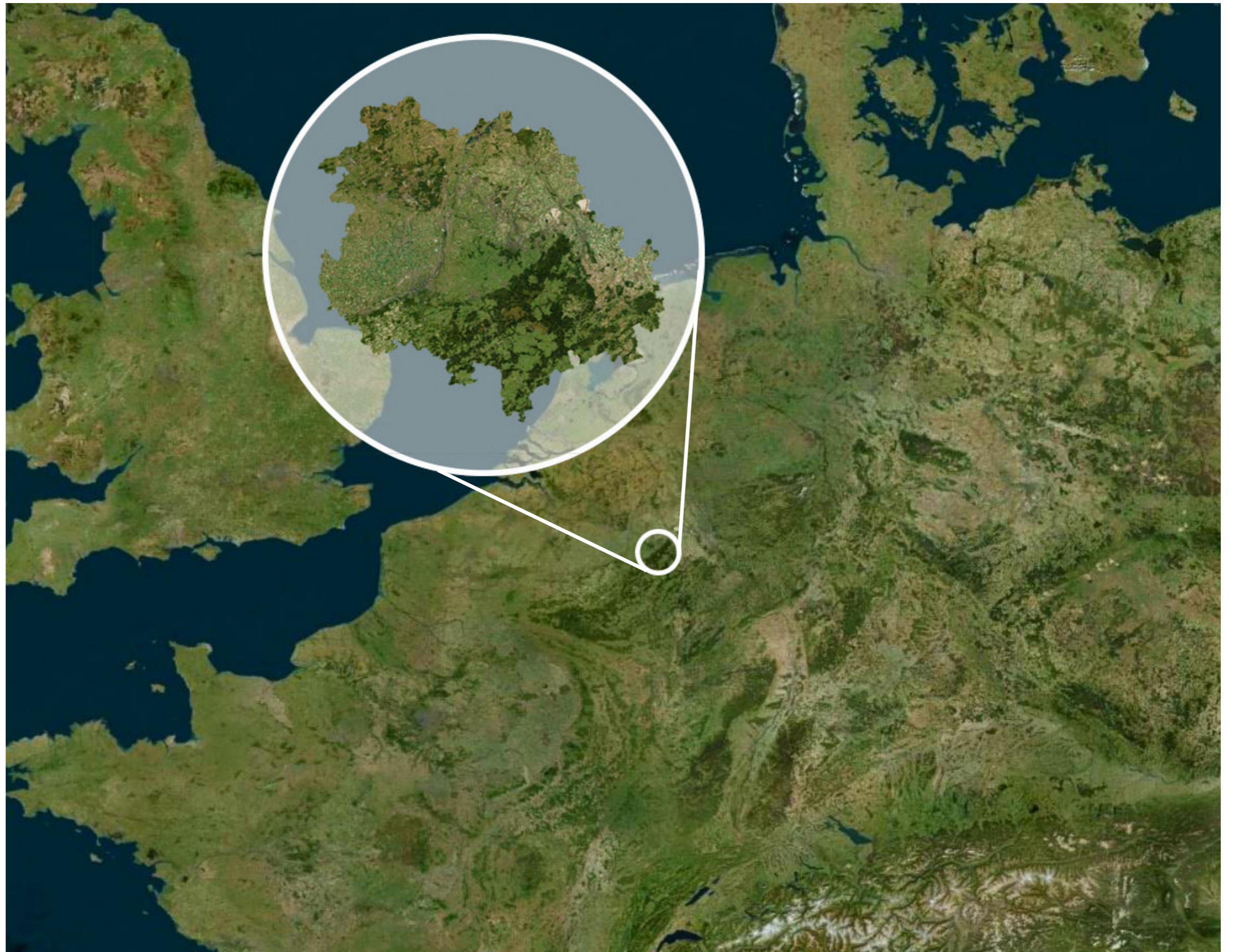
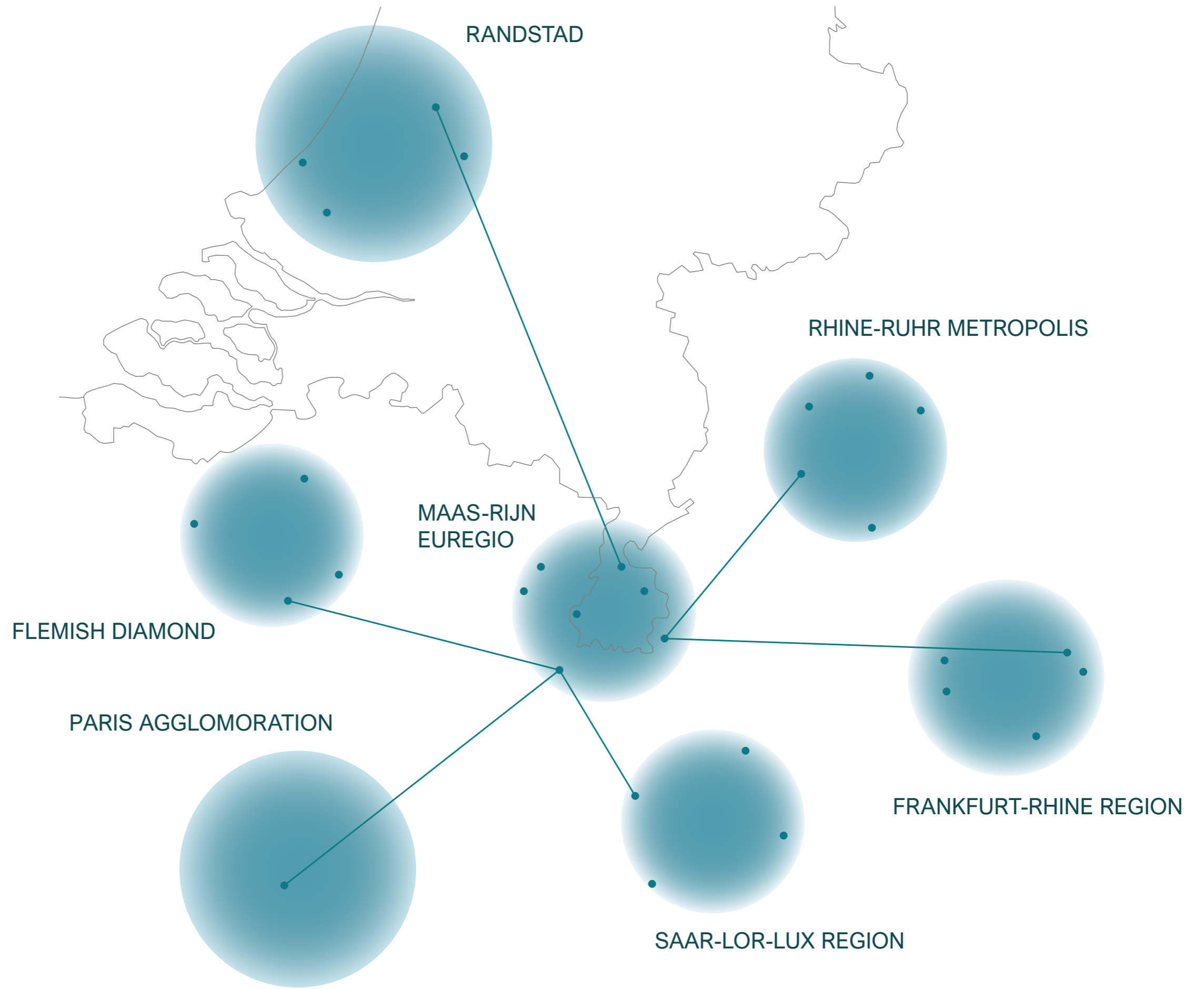
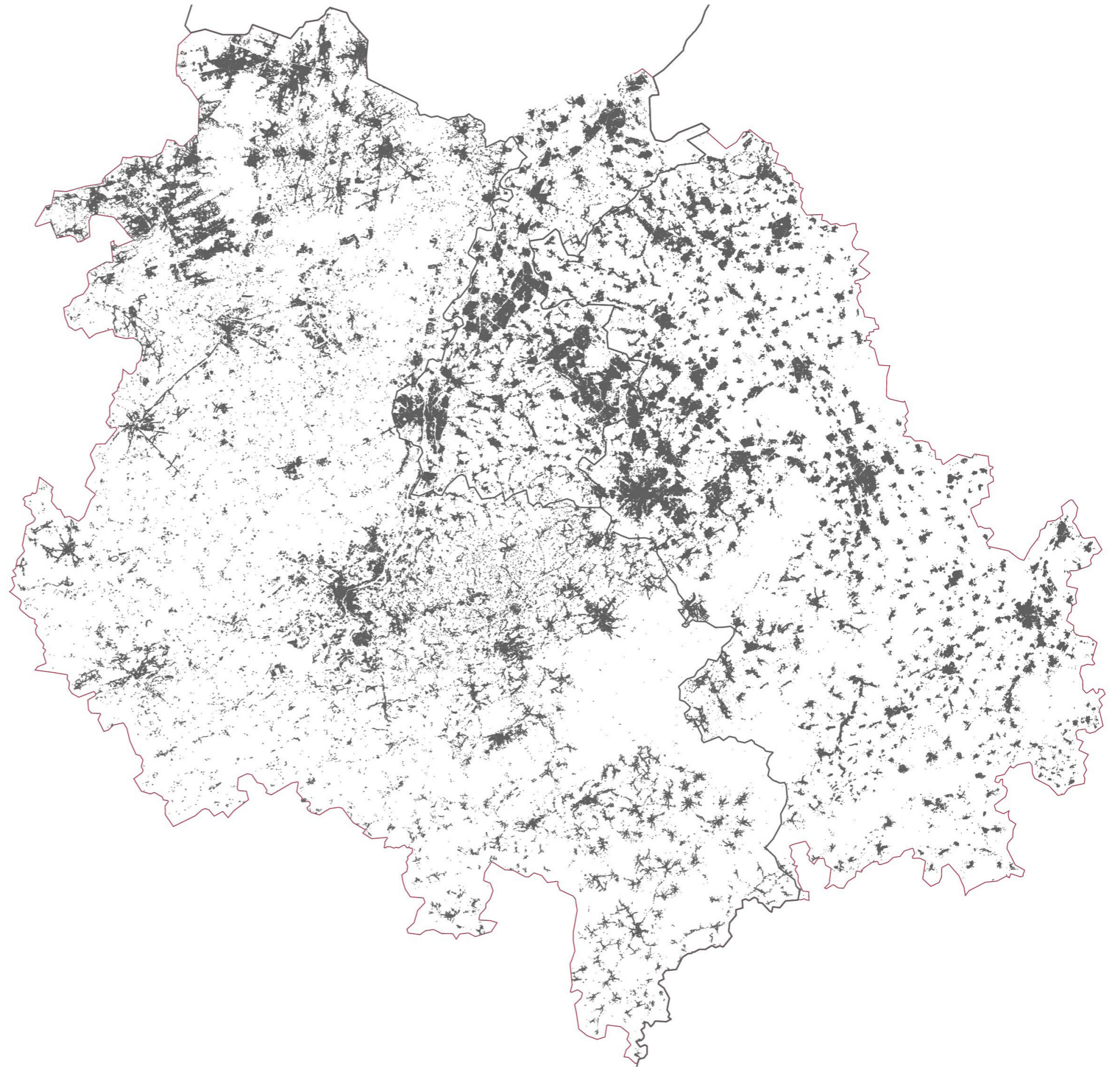


Image 2. Bing Maps, 2019.

The region

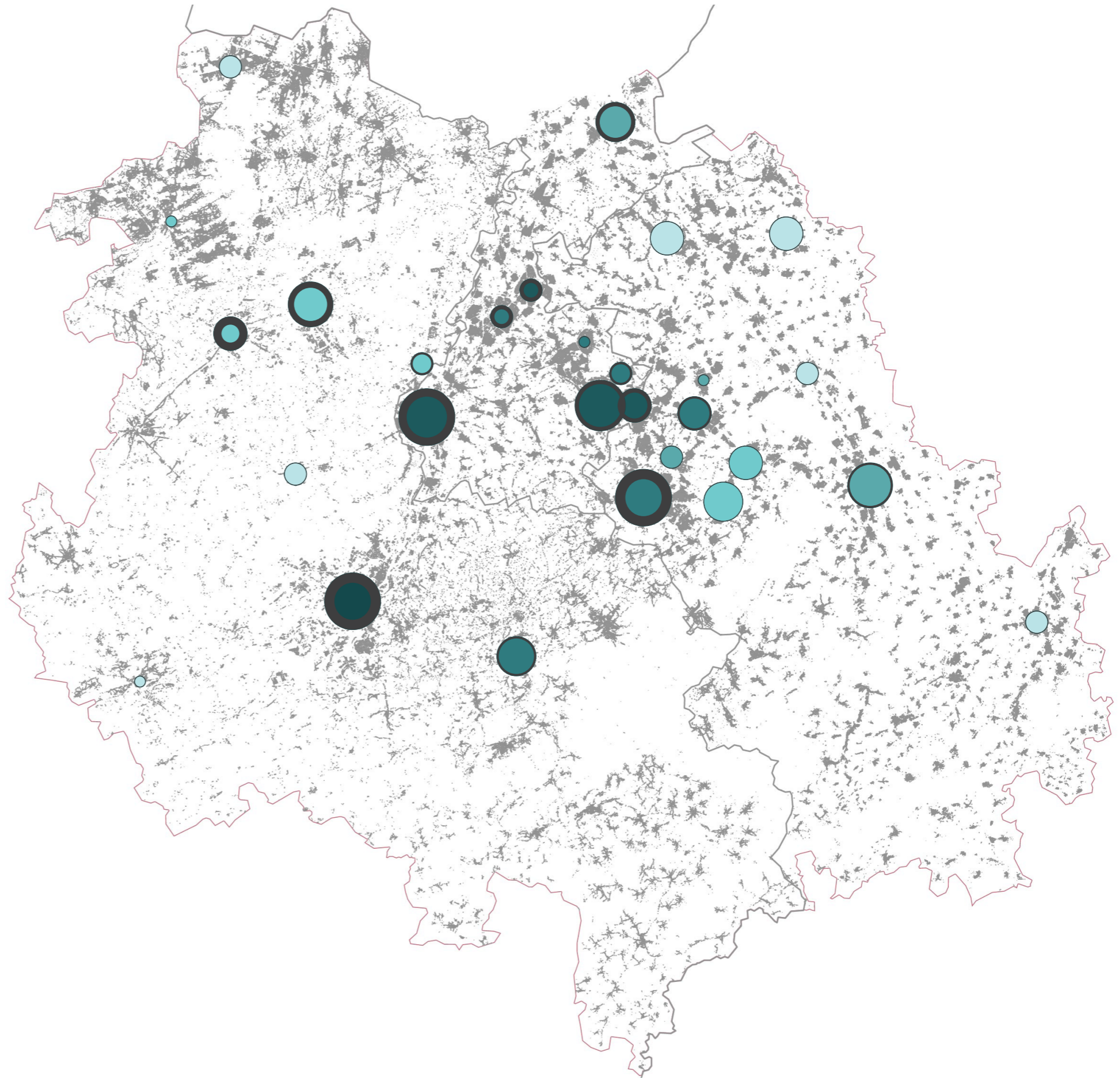


The region

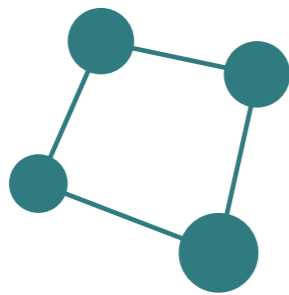


The region

Upward cycle of economic benefit by increasing agglomeration benefits



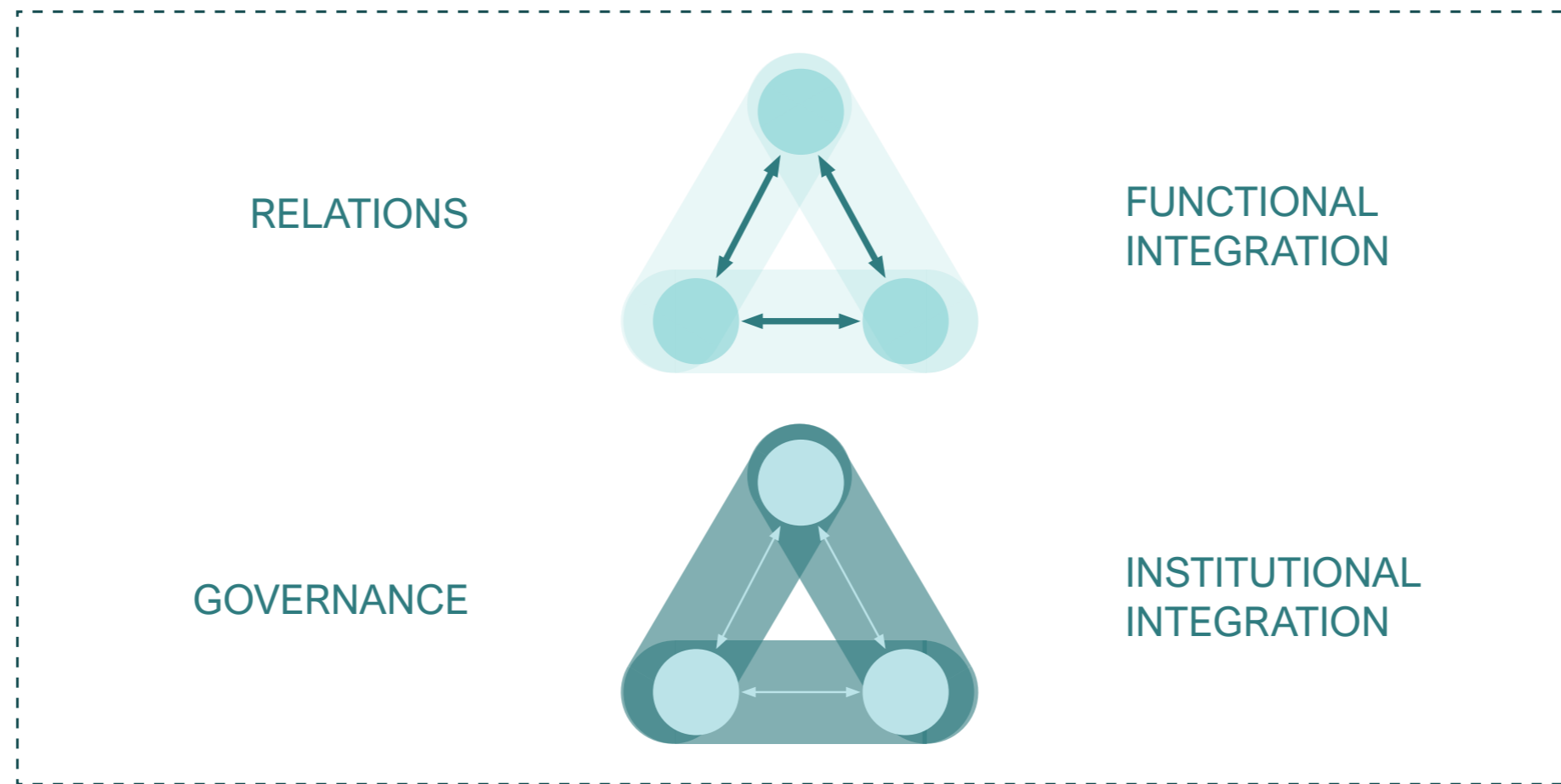
CENTRALISED



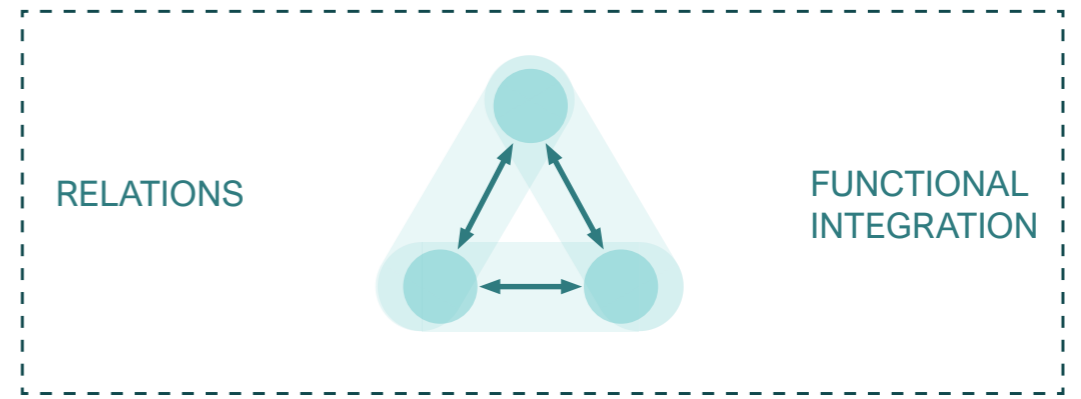
POLYCENTRIC

Aspects of polycentricity by
ESPON projects
Dühr, 2015

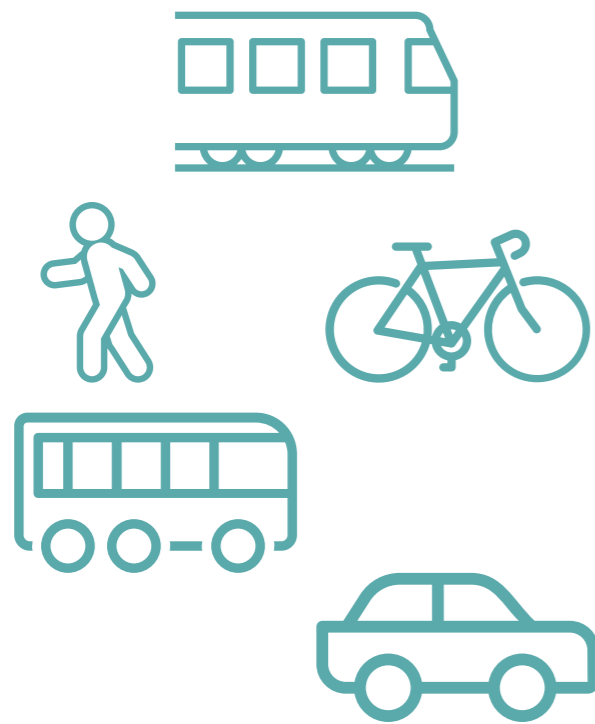
Integration can increase
agglomeration benefits in PUR's
Meijer et. al., 2017



Project focus



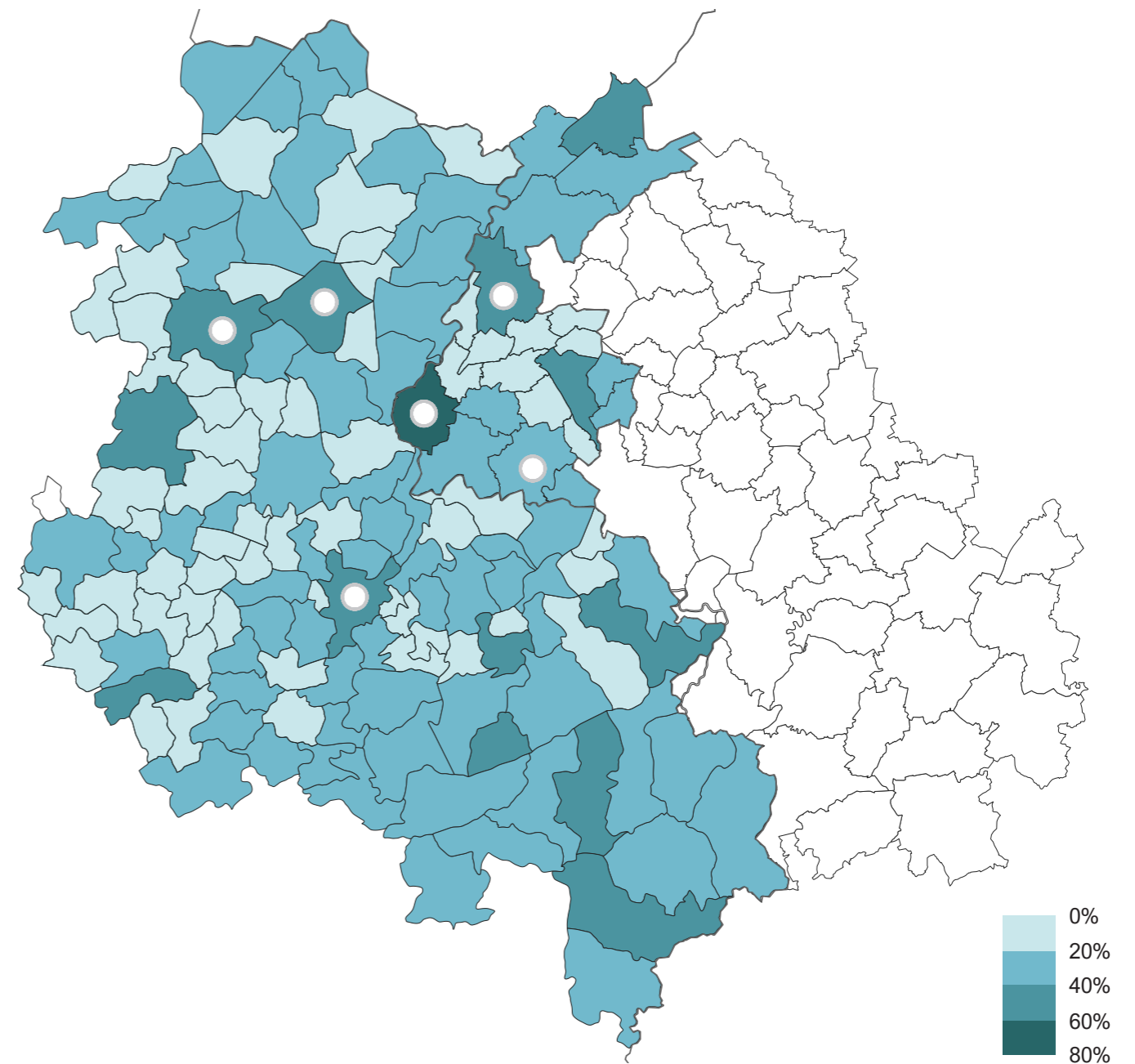
Literature



“Accessibility is key to a strong region”
Meijers, 2018.

Mobility demand in the EMR

People working and living in the same municipality.



Shift to public transport

Congestion

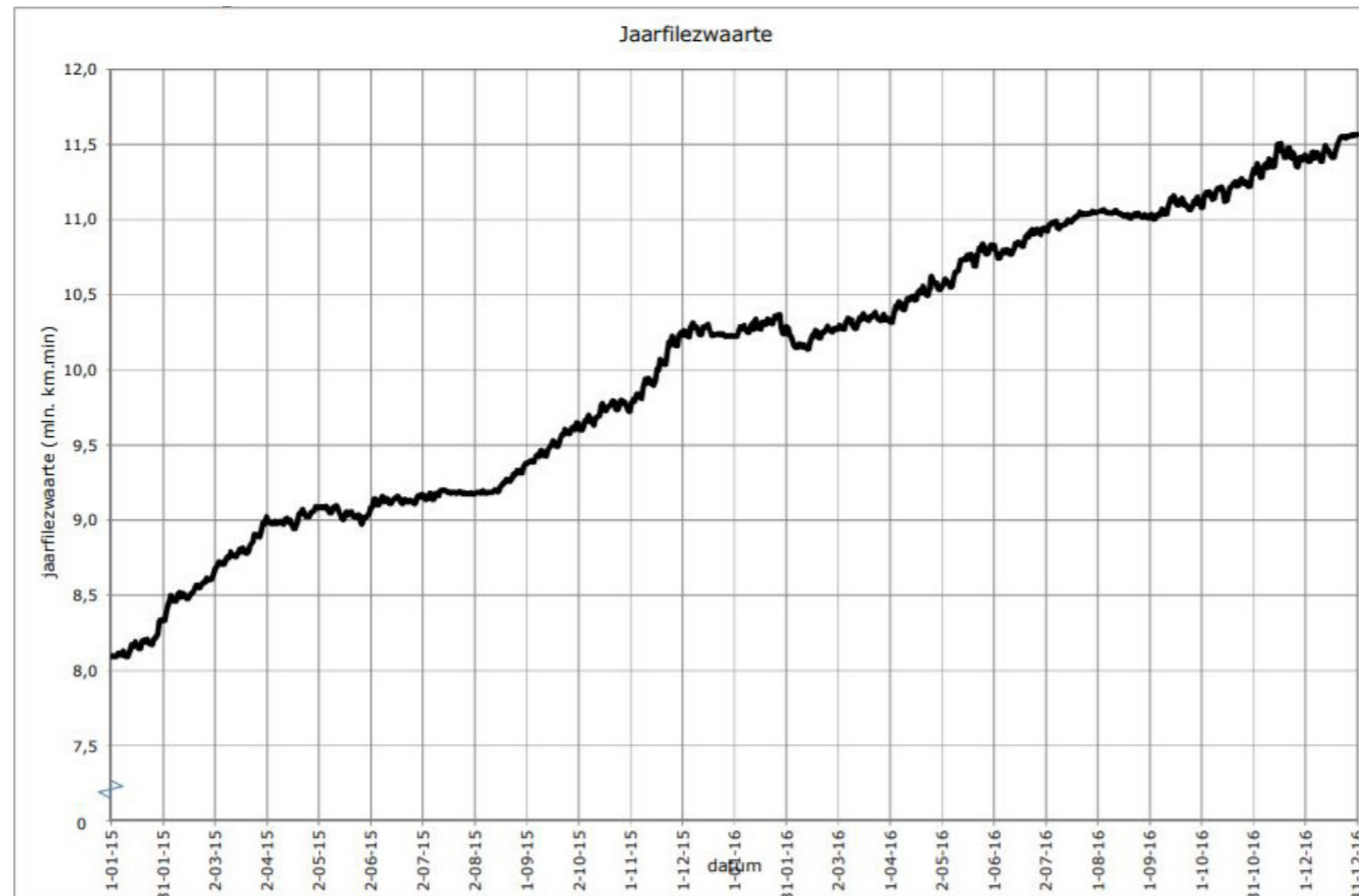
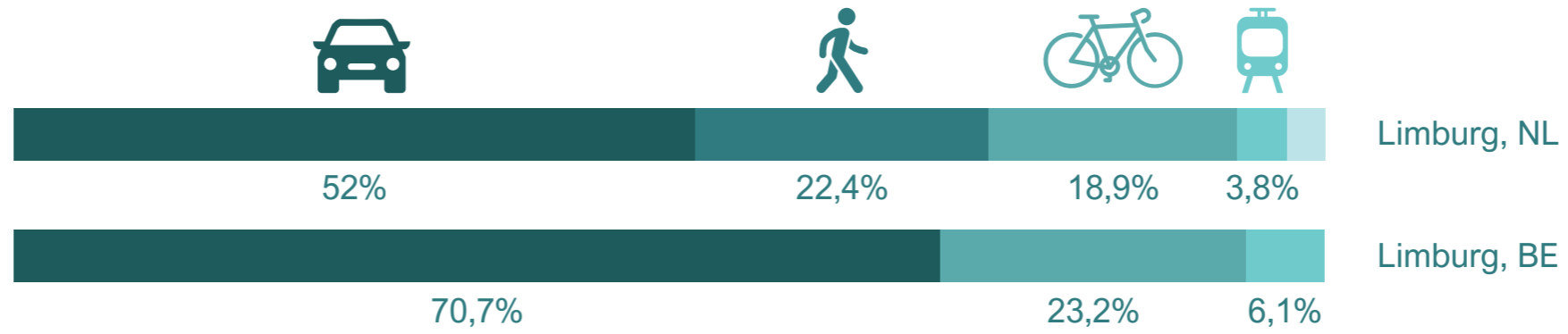


Image 3. Congestion pressure in the Netherlands (Rijkswaterstaat, 2017).

Shift to public transport

Climate change



Image 4. Amount of space required by 60 people (Wright, 2005).

Population in the EMR

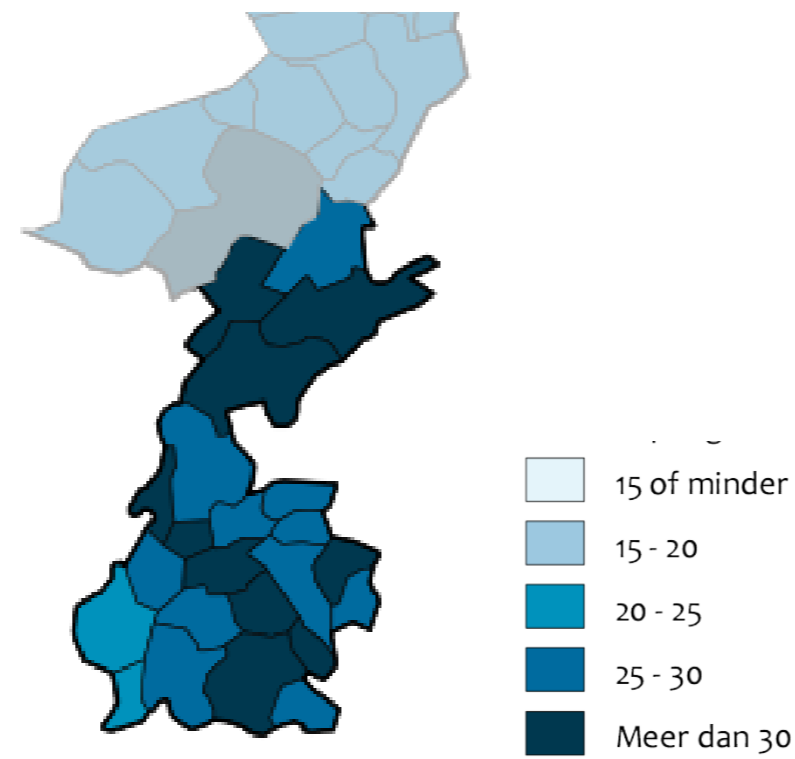
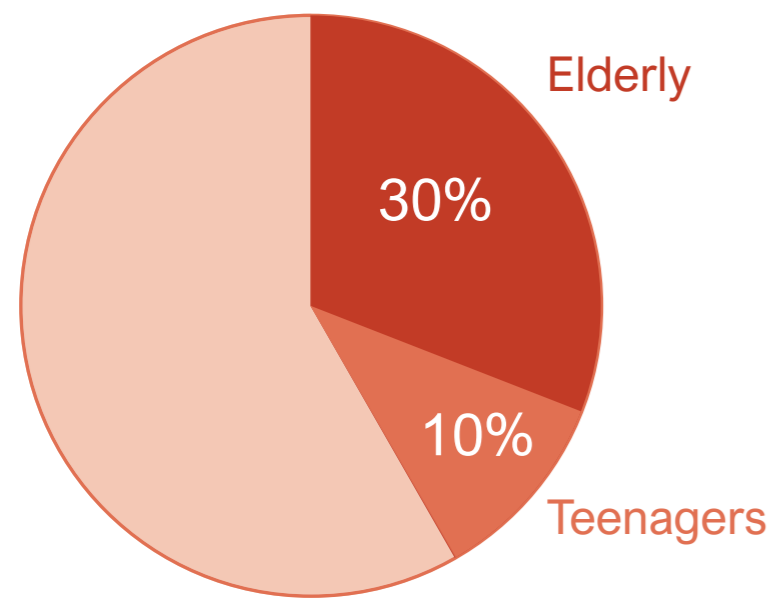


Image 5. Prognosis percentage of population age of 65+ in 2047 (CBS, 2017).

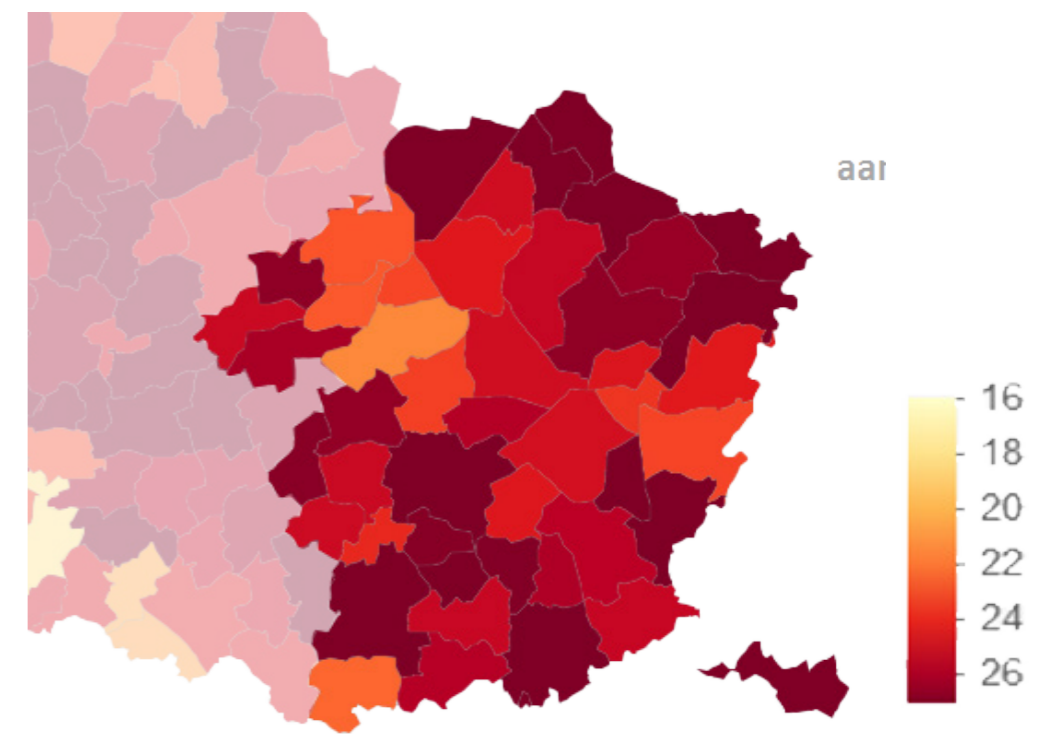
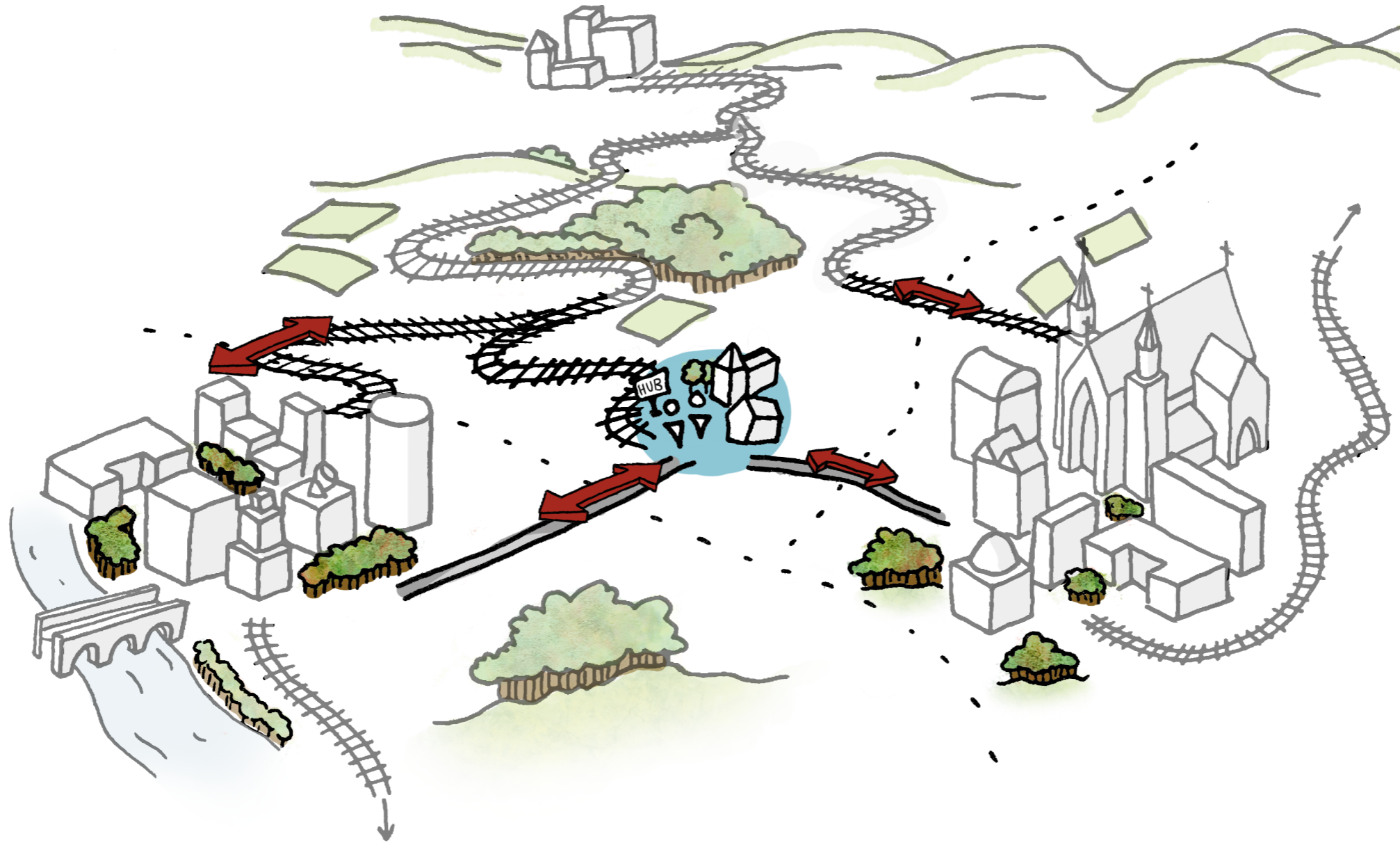


Image 6. Prognosis percentage of population age 65+ in 2027 (Statbel, 2017).

Vision

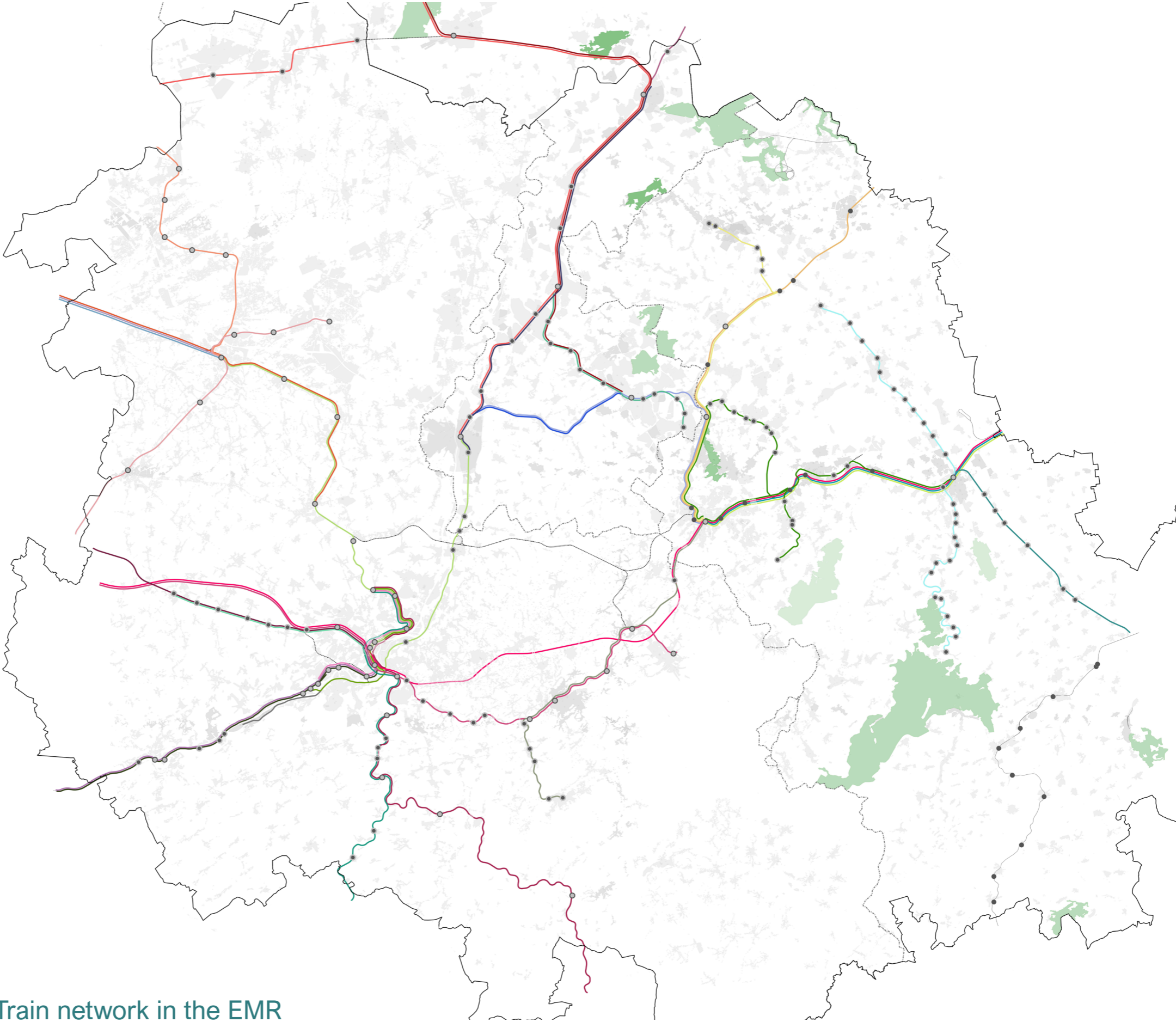
A convenient, **cross-border public transport network** that improves **integration** in the region, and functions as one of the building blocks for a successful region.

Finding a balance between **improving the accessibility** and preserving the **characteristic urban structure** of the region.



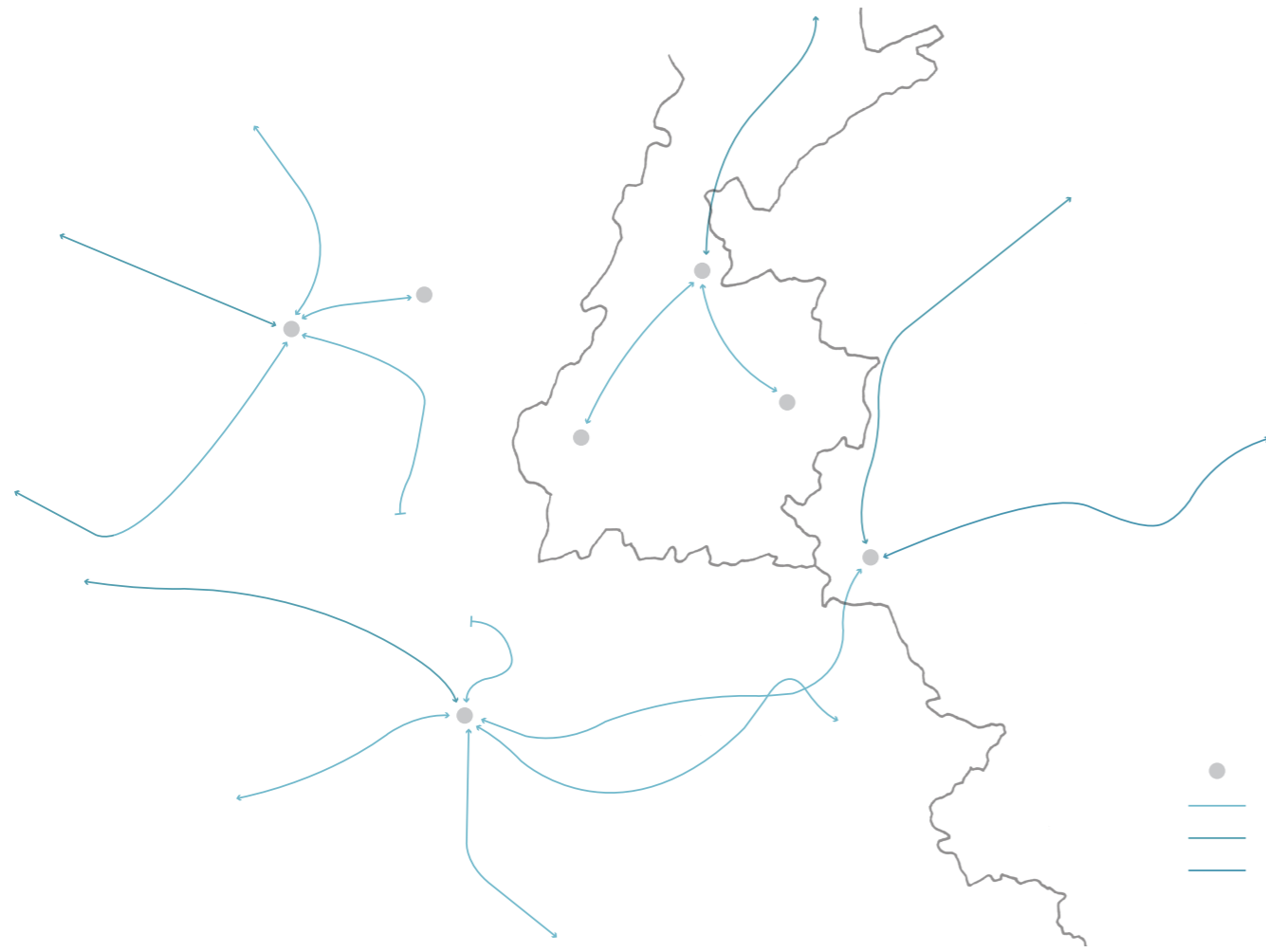


Barriers

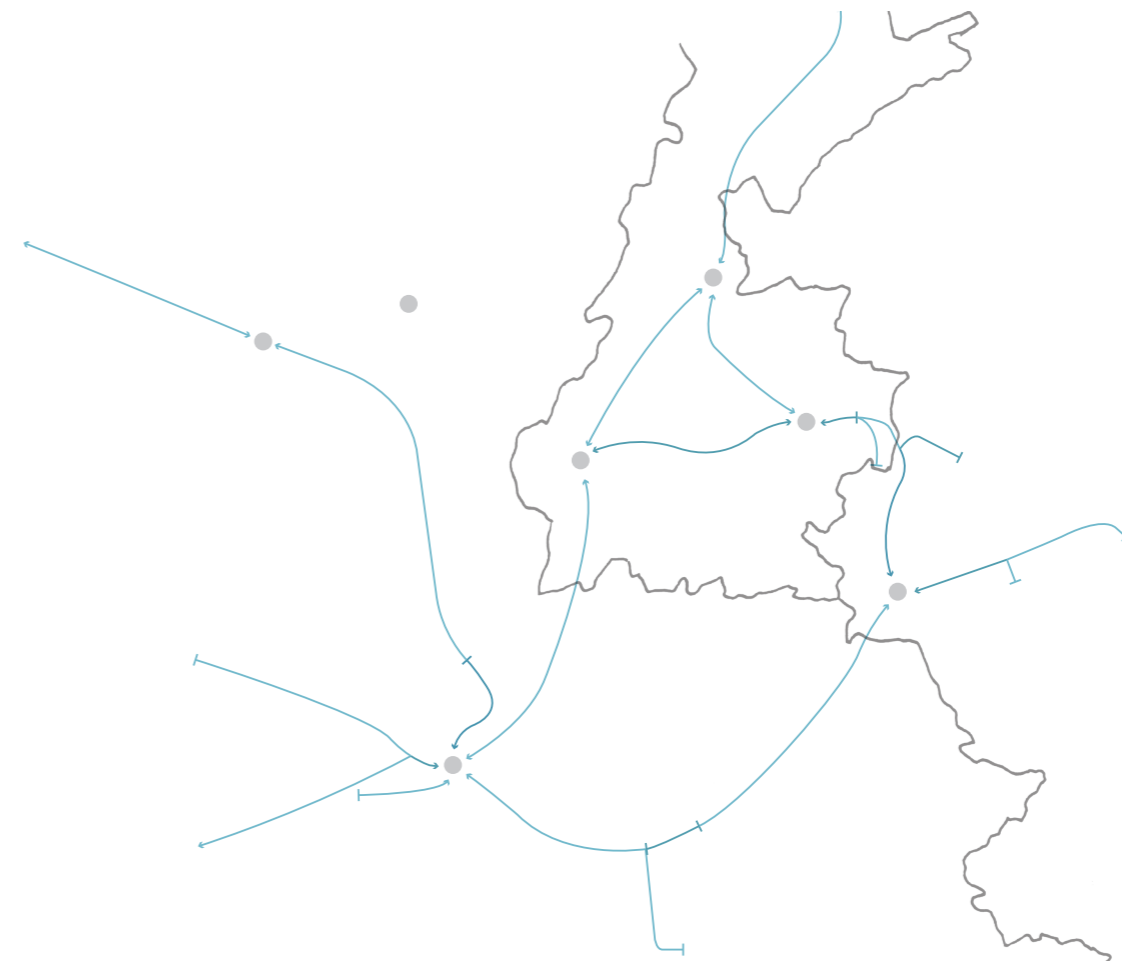


Train network in the EMR

Barriers

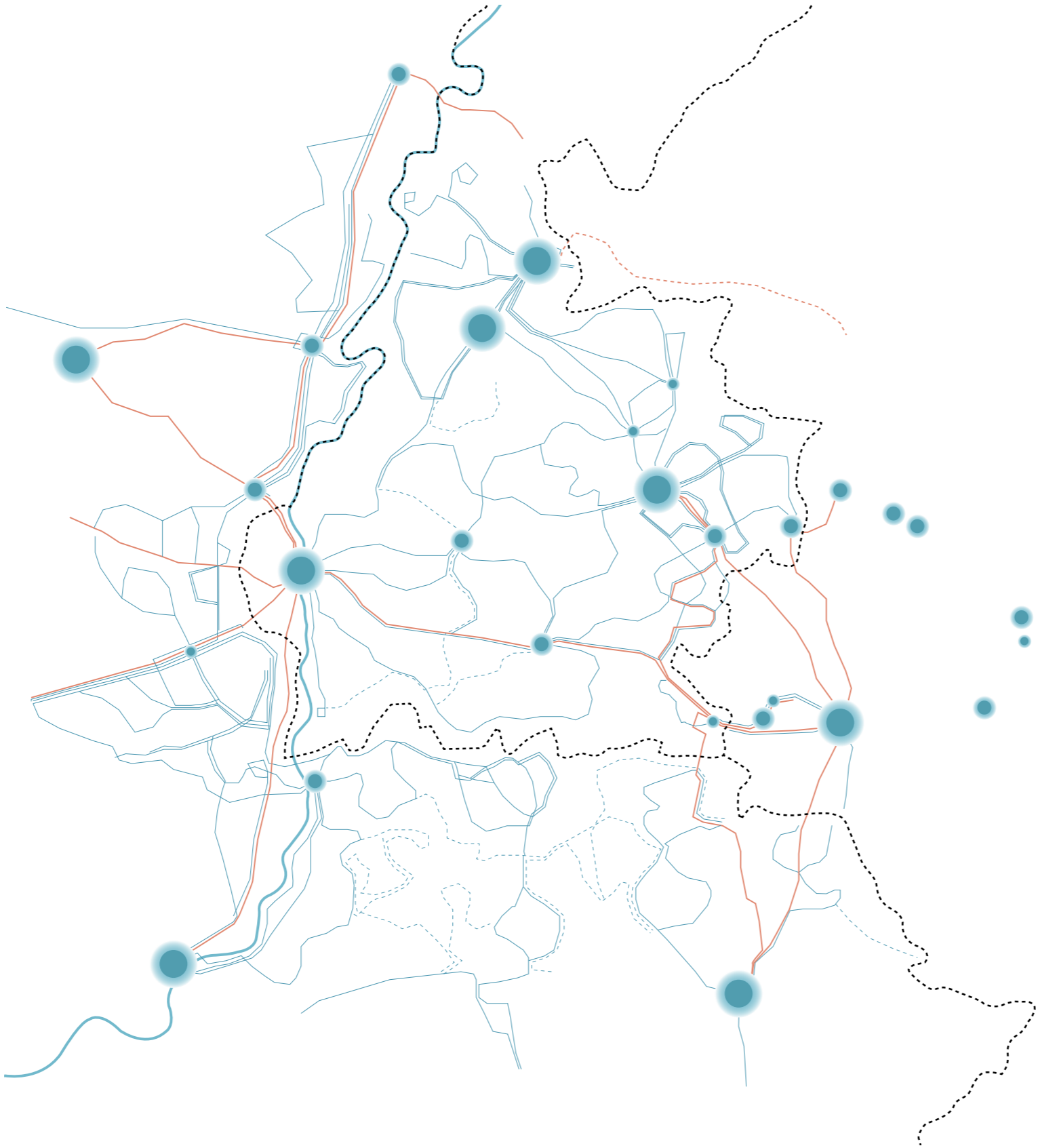


Intercity connections



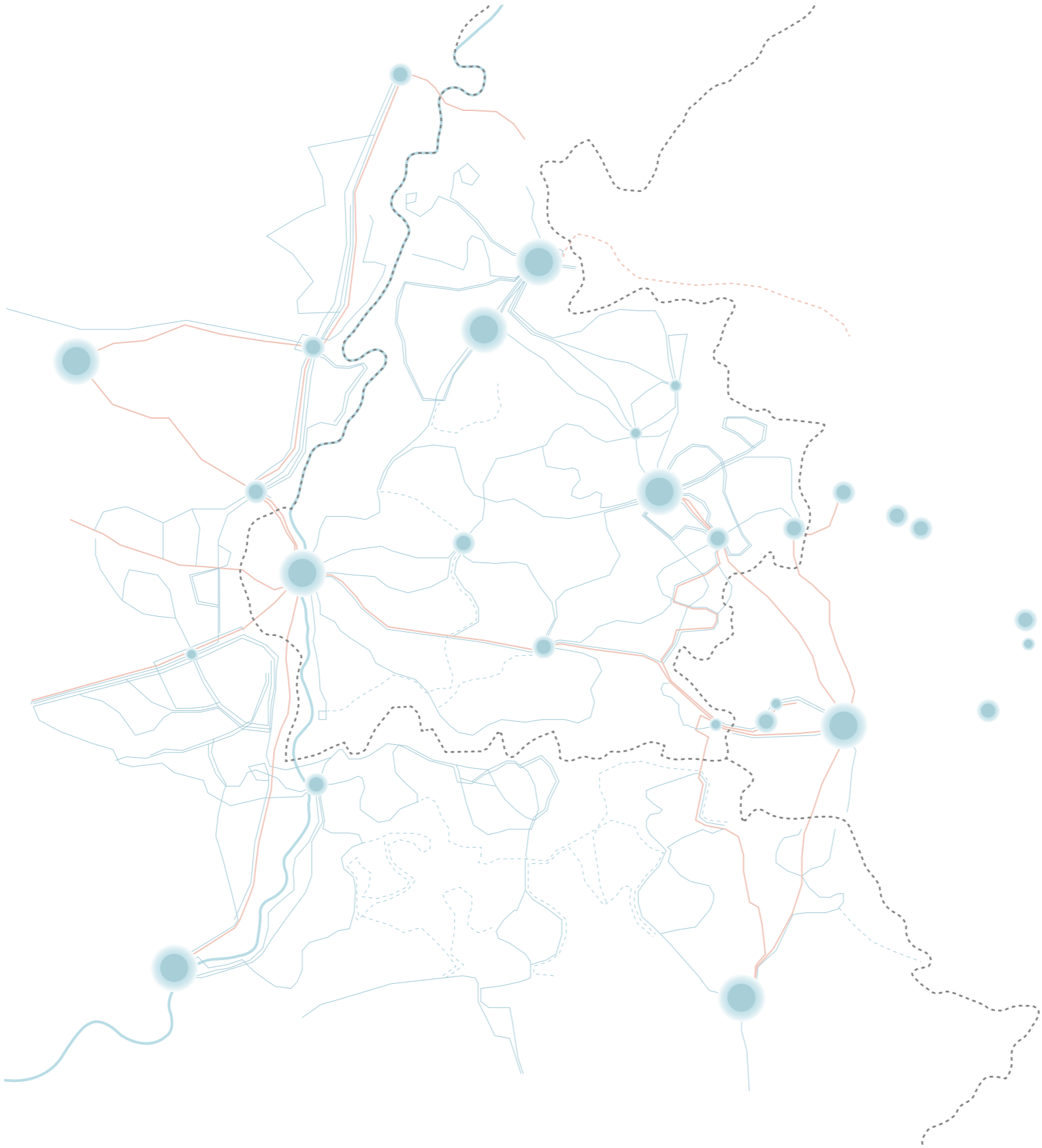
Local train connections

Barriers



Bus network in the EMR

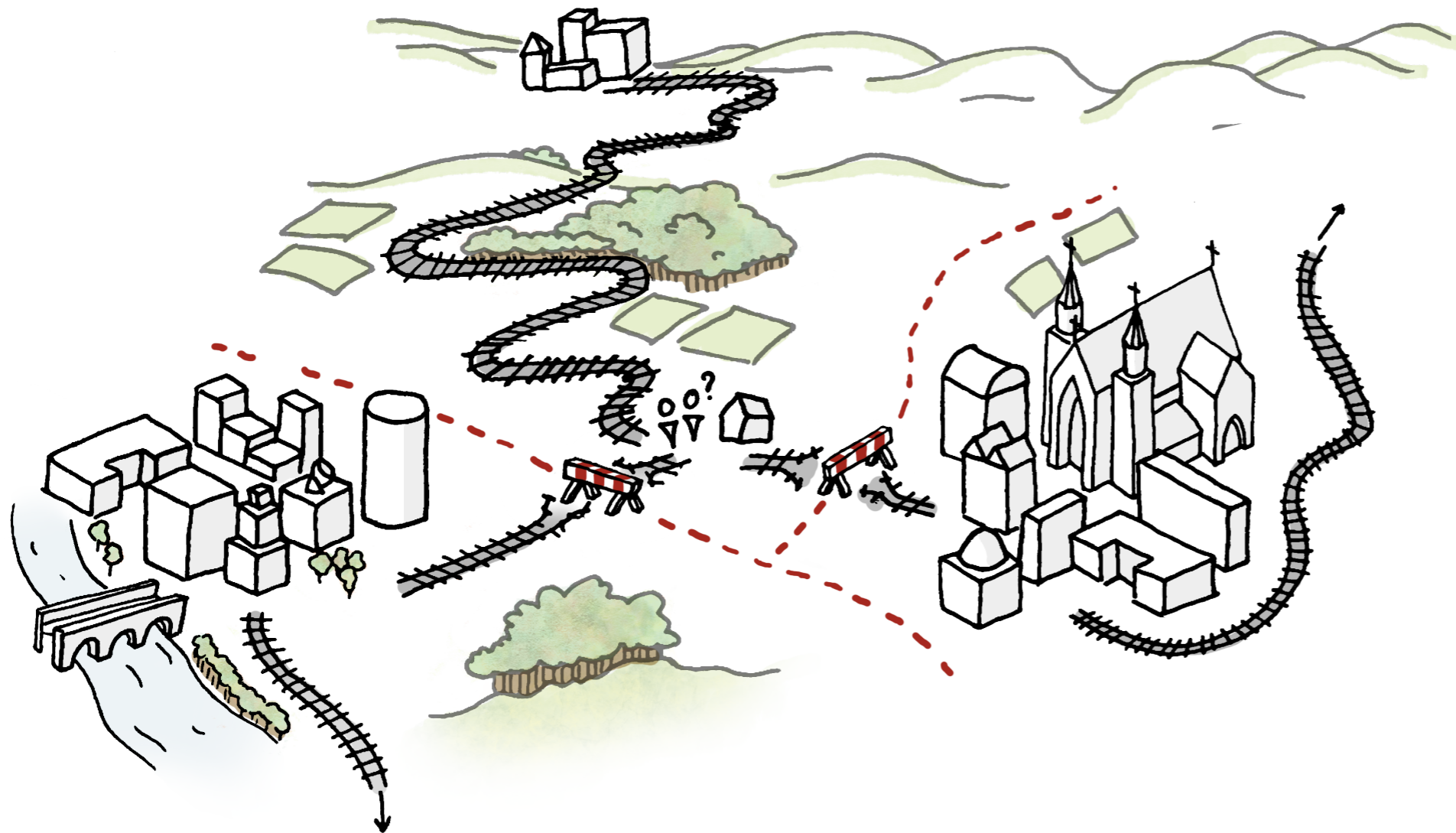
Barriers



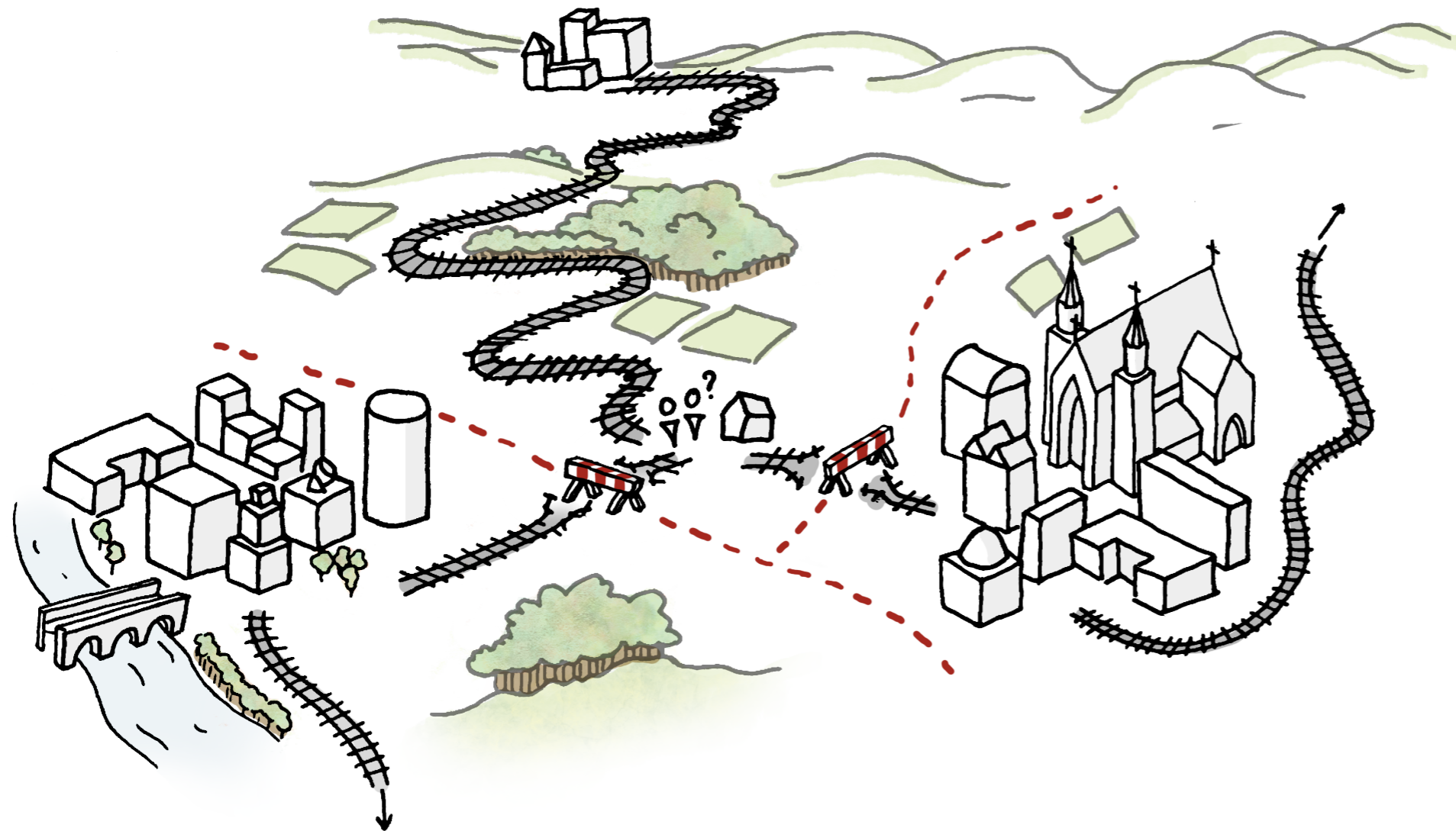
Bus network in the EMR

Problem statement

PUR in which **accessibility** is key



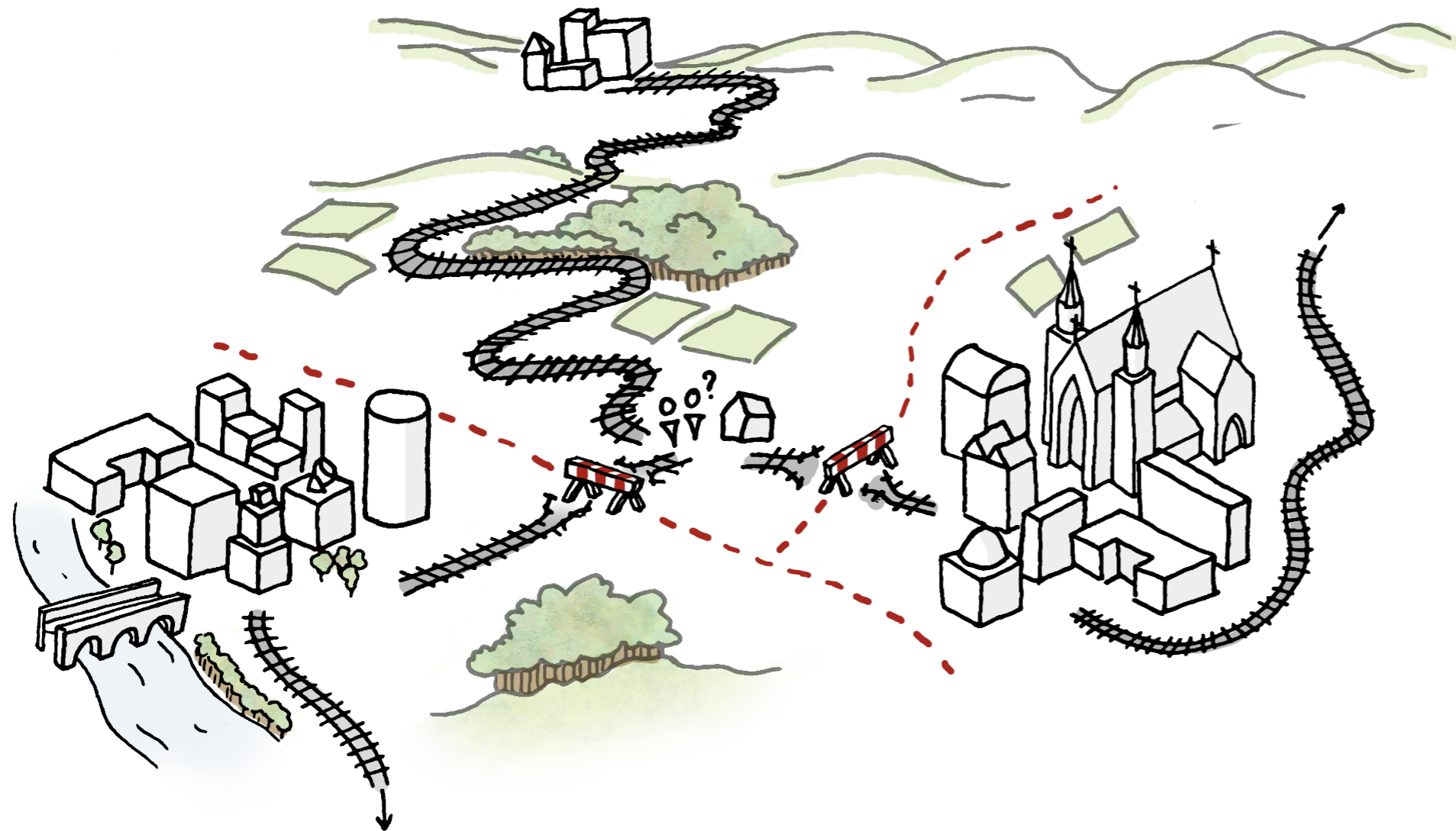
**Problem
statement**



PUR in which
accessibility is key

**Functional and
institutional
integration** necessary
to strengthen region

**Problem
statement**

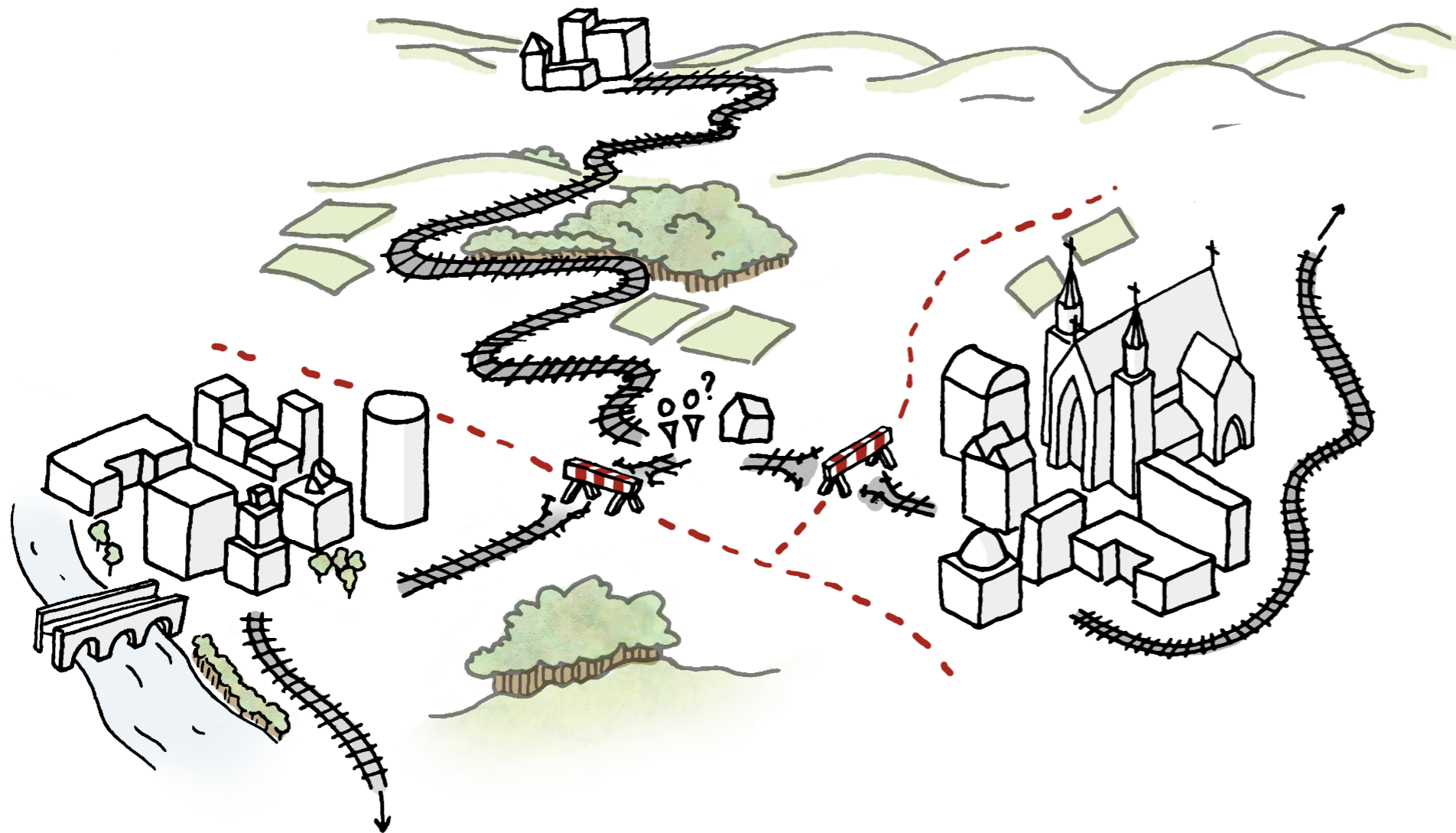


PUR in which
accessibility is key

**Functional and
institutional
integration** necessary
to strengthen region

**Three administrative
borders** create
barriers in institutional
cooperation

**Problem
statement**



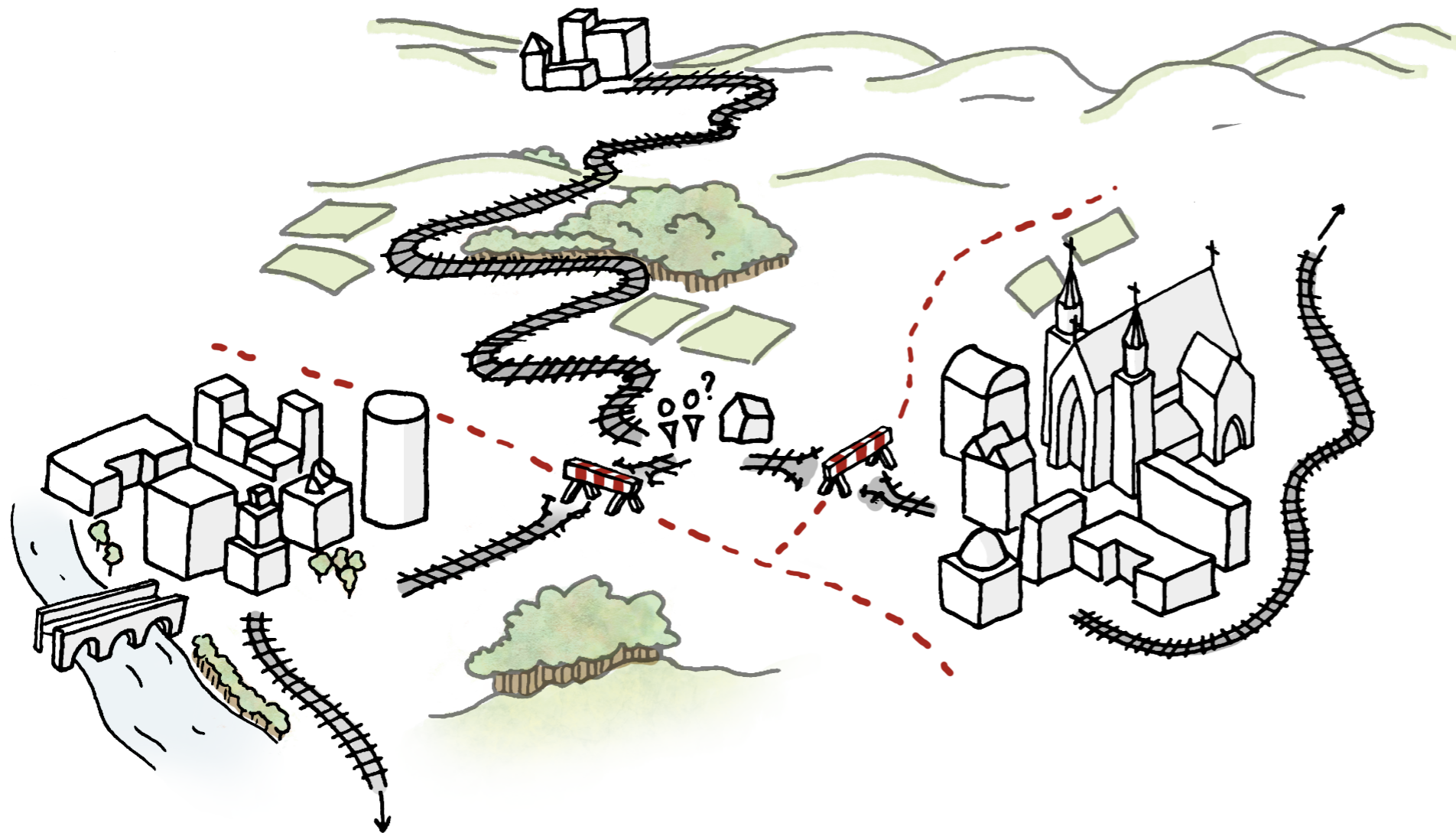
PUR in which
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**Functional and
institutional
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**Three administrative
borders** create
barriers in institutional
cooperation

Transport dominated
by car, trends of
**congestion, climate
change** and **population
demographics**
show **shift to public
transport**

**Problem
statement**



PUR in which
accessibility is key

**Functional and
institutional
integration** necessary
to strengthen region

**Three administrative
borders** create
barriers in institutional
cooperation

Transport dominated
by car, trends of
**congestion, climate
change** and **population
demographics**
show **shift to public
transport**

No convenient and fast
**cross-border public
transport connections**
train or bus

Research Questions

How can a cross-border public transport network, including the structure of governance in these networks, improve integration in the Euregio Maas-Rijn in relation to its urbanisation pattern?

How can the urbanisation pattern of the region be described, and what governance structures have an influence in this?

How does the public transport network in the region function, and what actors are related to this?

What is the relation between the urbanisation pattern and public transport in the current developments, and how have they co-evolved?

ANALYSIS

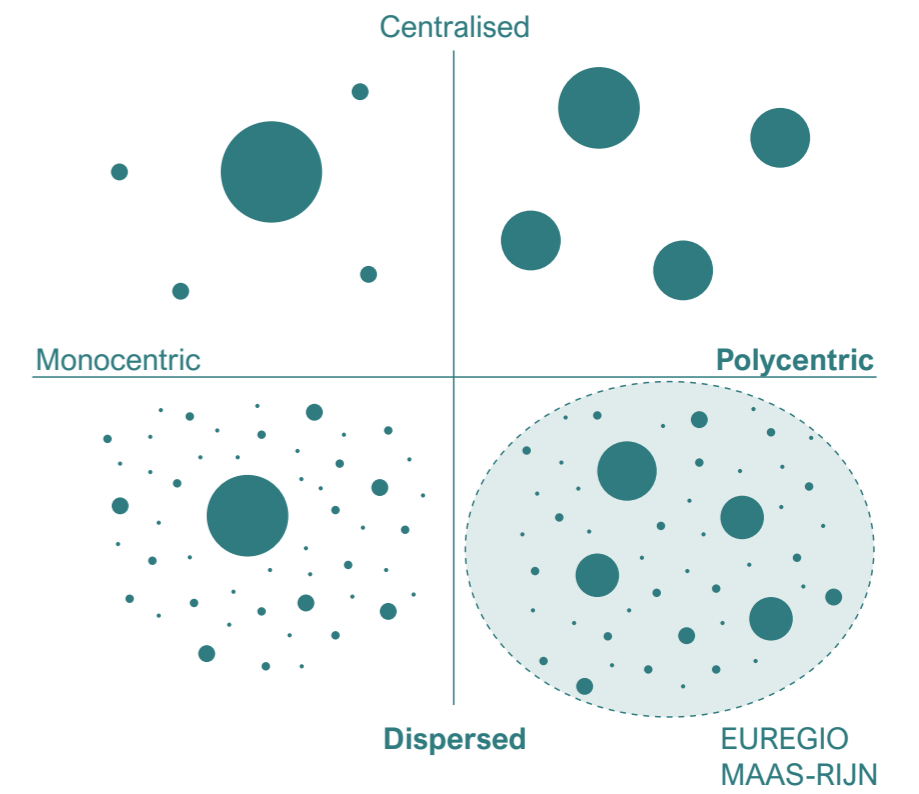
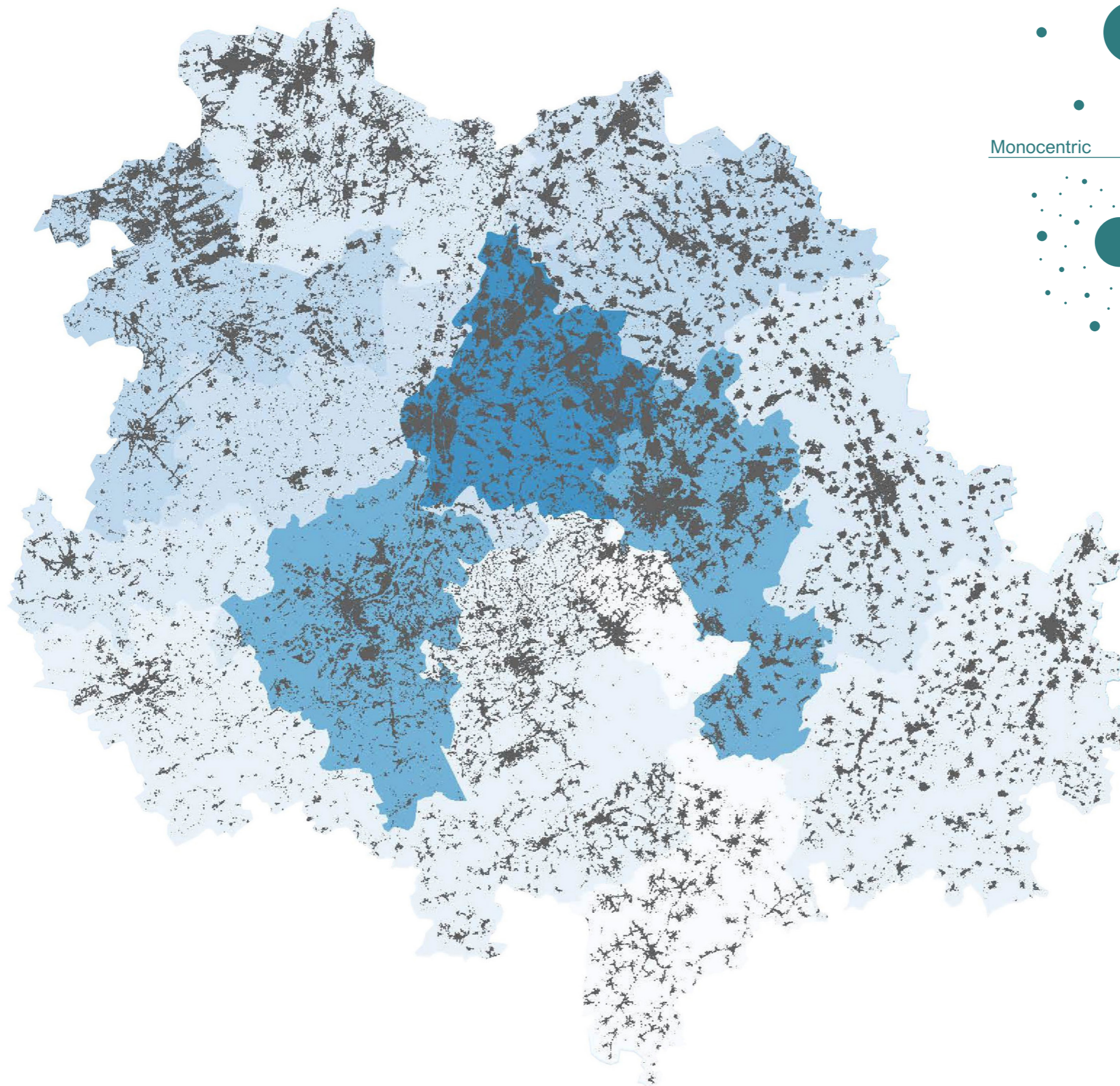
DESIGN

How can a new vision, including a spatial and governance strategy, focussed on the public transport network, increase integration in the region?

What design principles can be used on a local scale to improve access to the main public transport network in relation to the scattered urbanisation pattern?

Analysis & conclusions

Analysis & conclusions



Analysis & conclusions

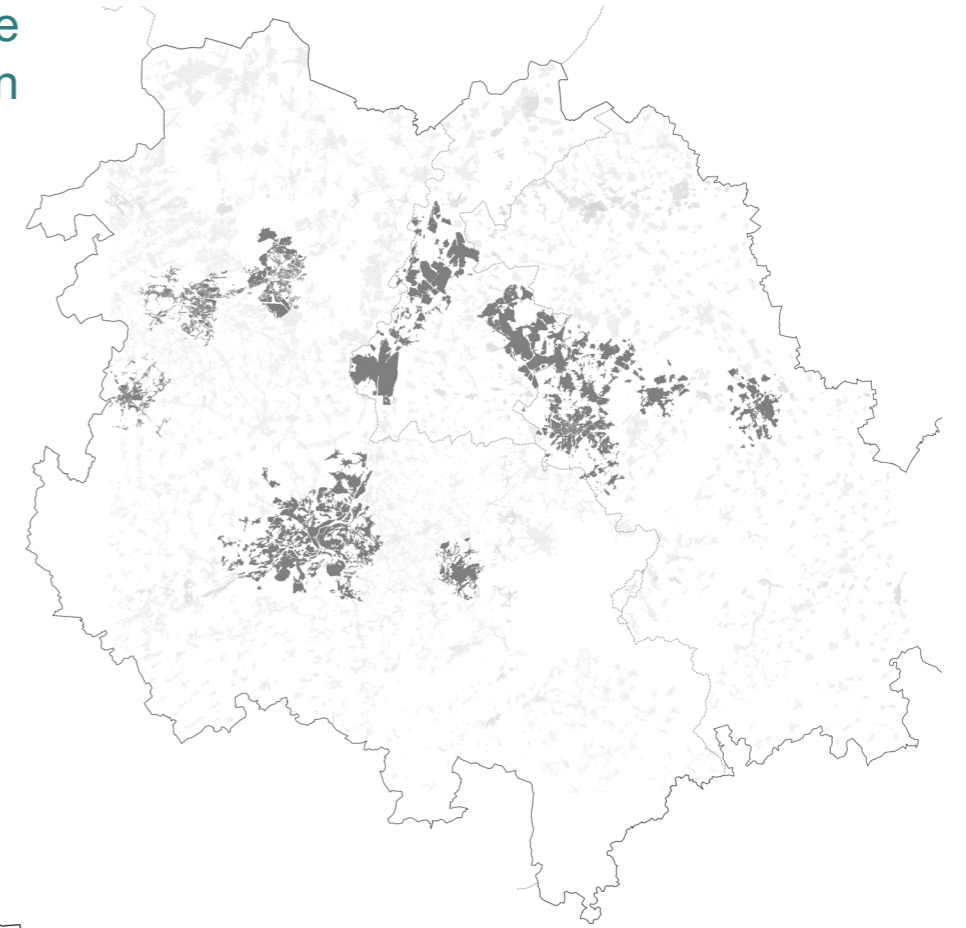
25-30% of the population



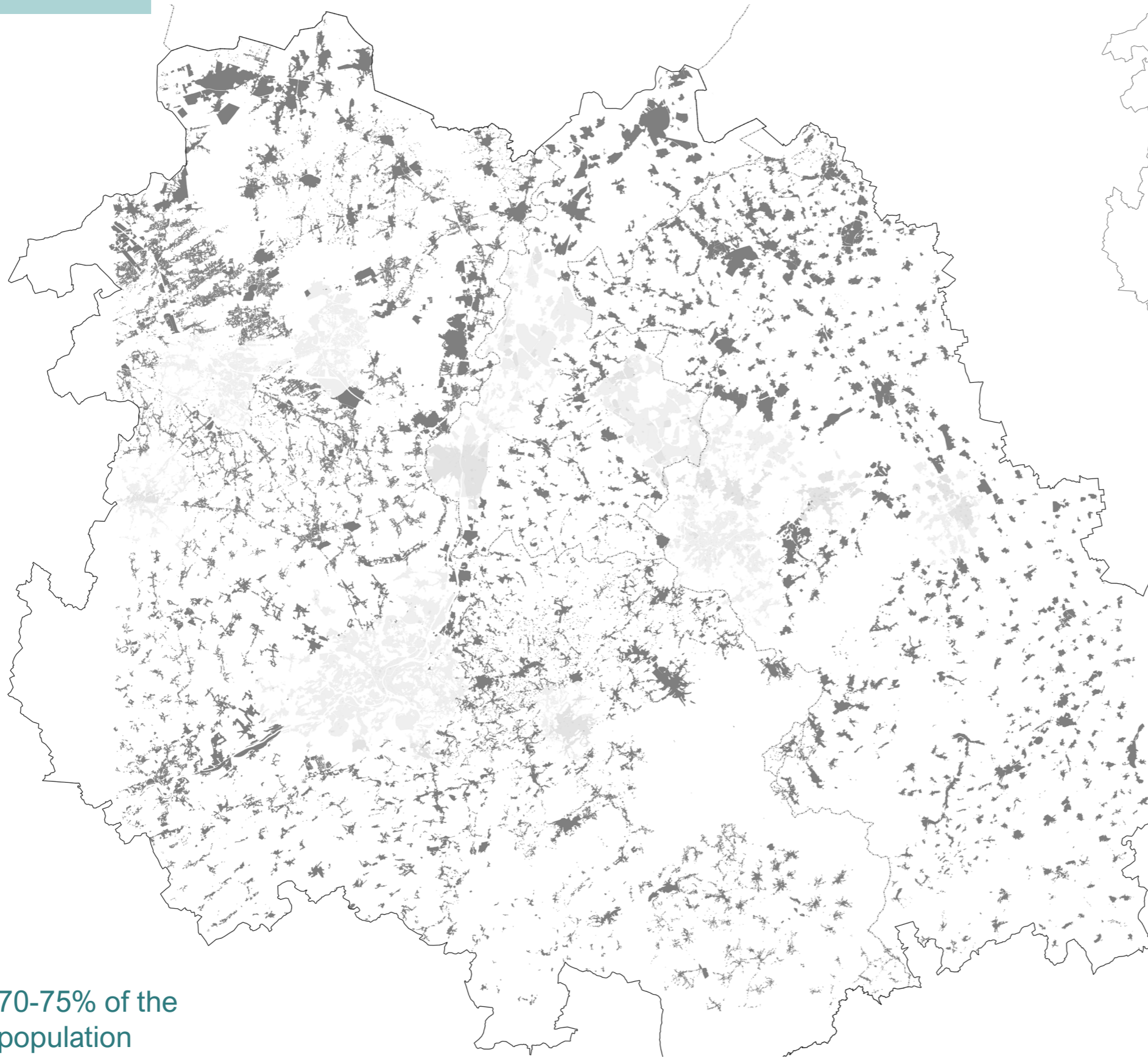
70-75% of the population

Analysis & conclusions

25-30% of the population

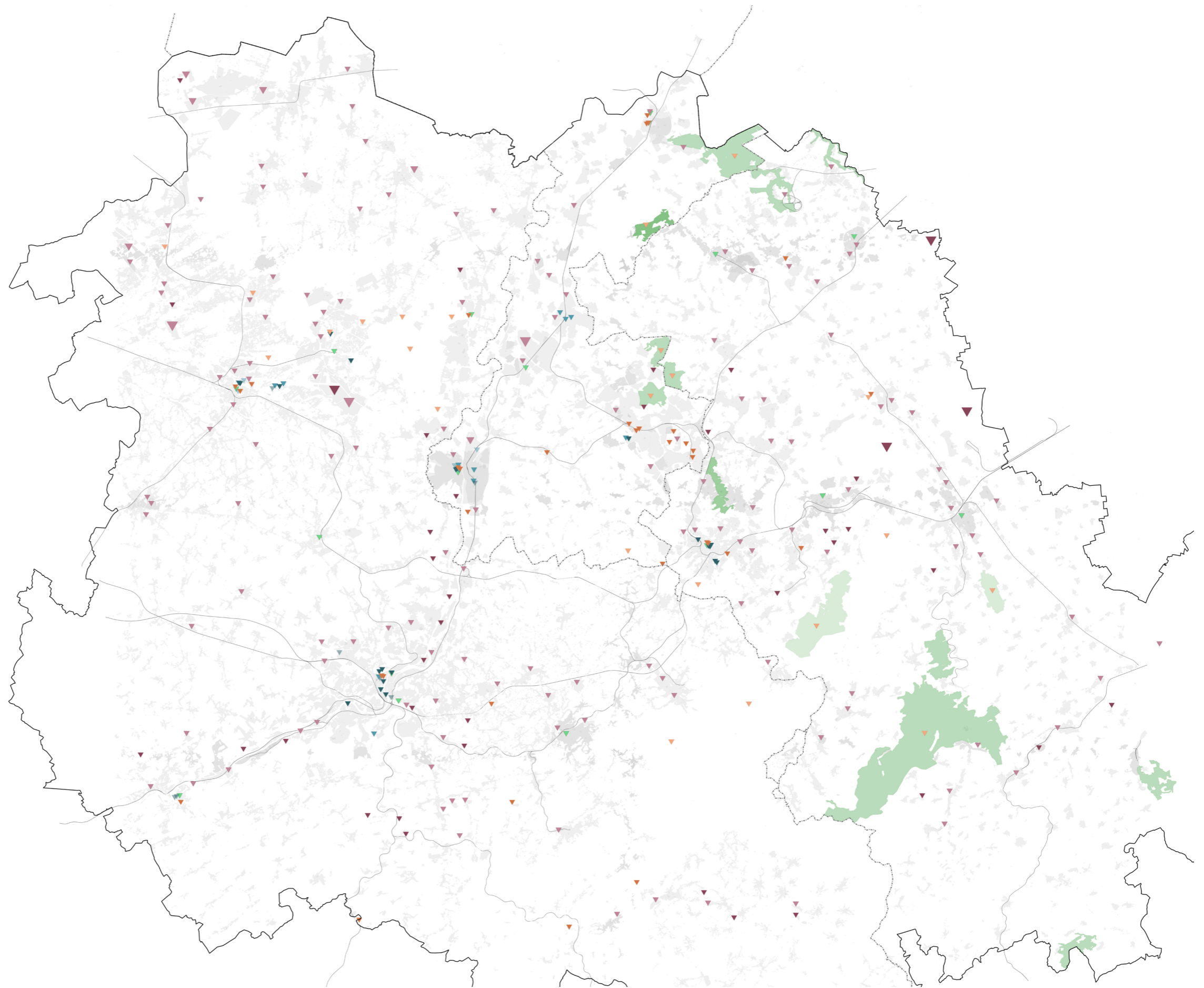


70-75% of the population



principle public transport
based on connecting concentrations of people and functions

Analysis & conclusions



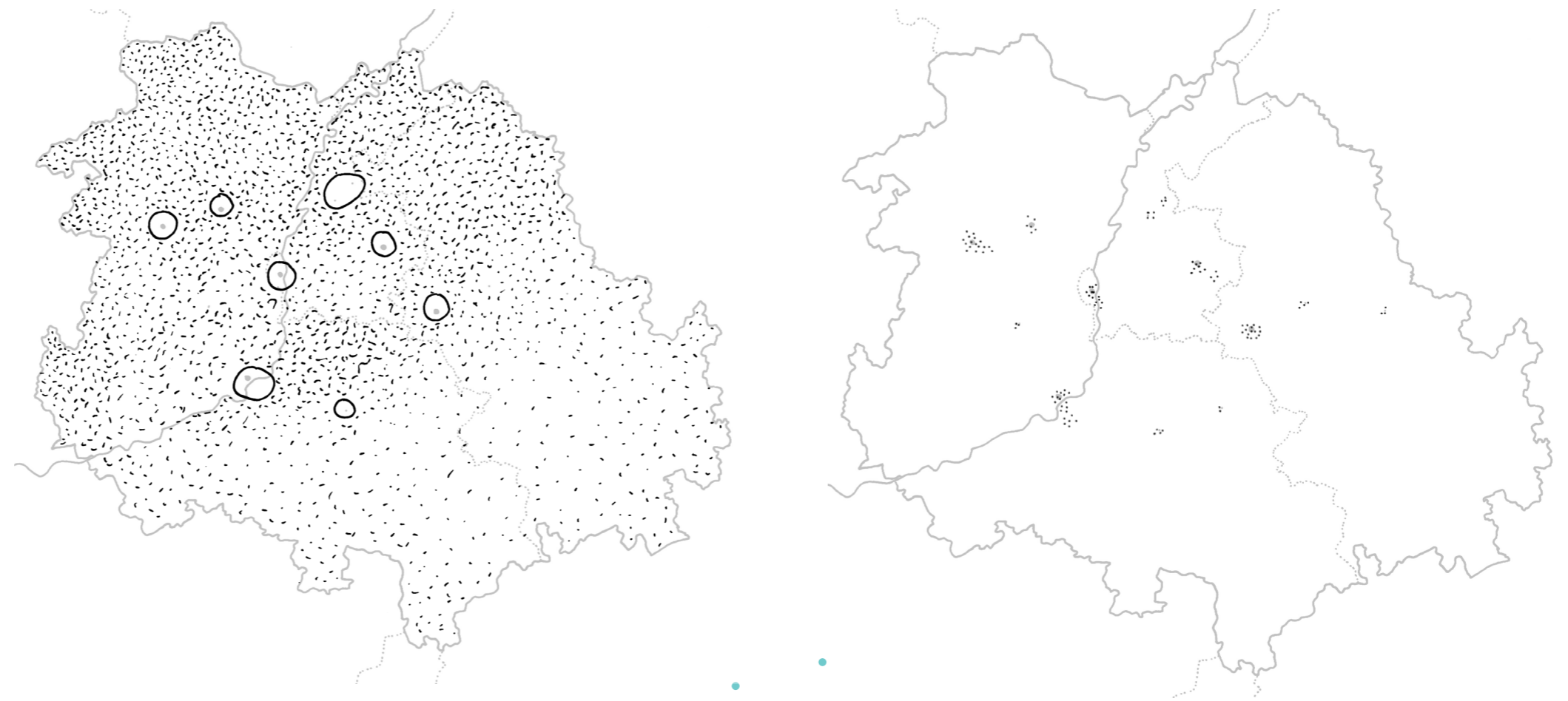
Analysis & conclusions

75% residents live in dispersed area

Attraction & economic centres concentrated

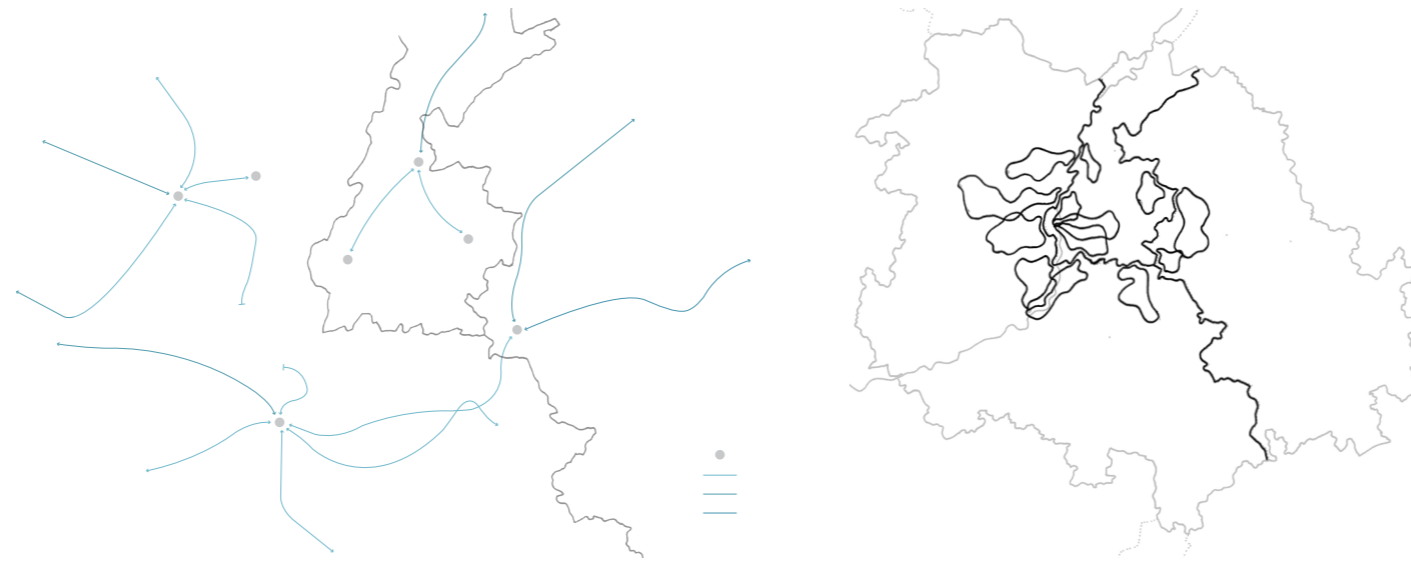
Generates high level of dispersed mobility in the region

does not relate to principle of public transport



Diversity of demand

Analysis & conclusions



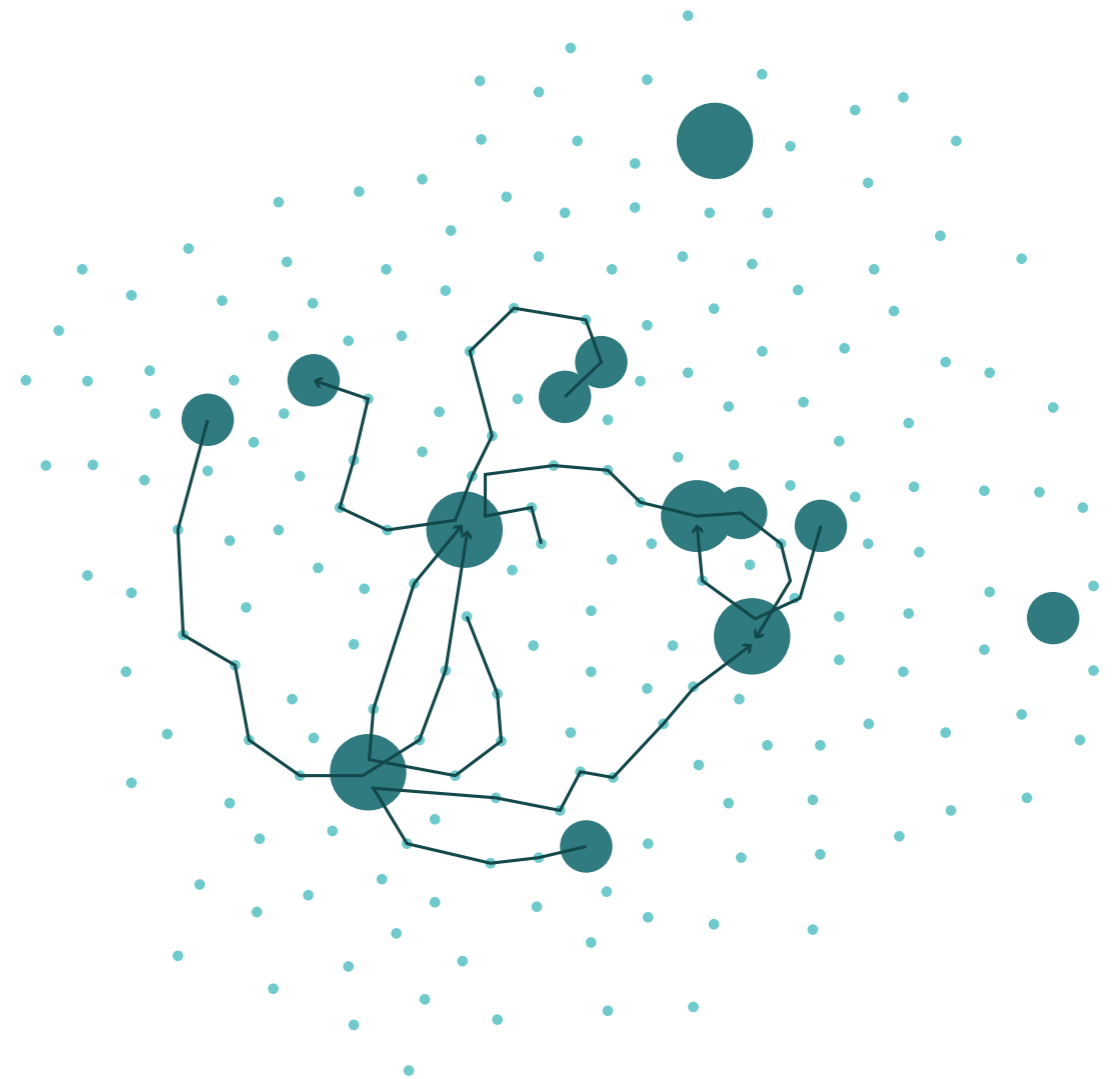
Lack of cross-border connections



High diversity of transport demand



Principle of public transport



Complex connections to supply for varying demand

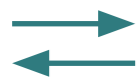
Analysis & conclusions



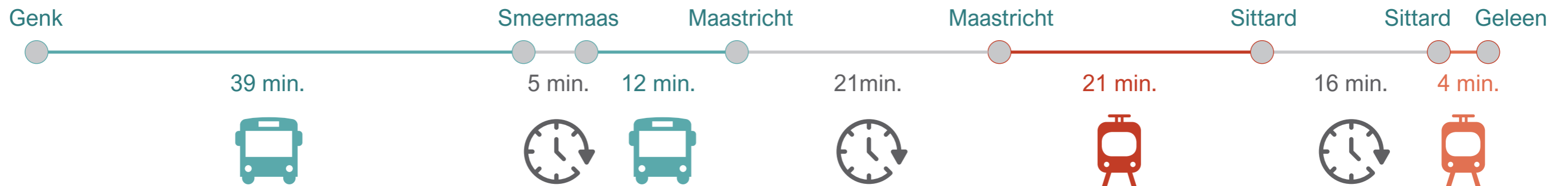
Genk - Geleen = 25 km.
= 118 min.



= 32 min.



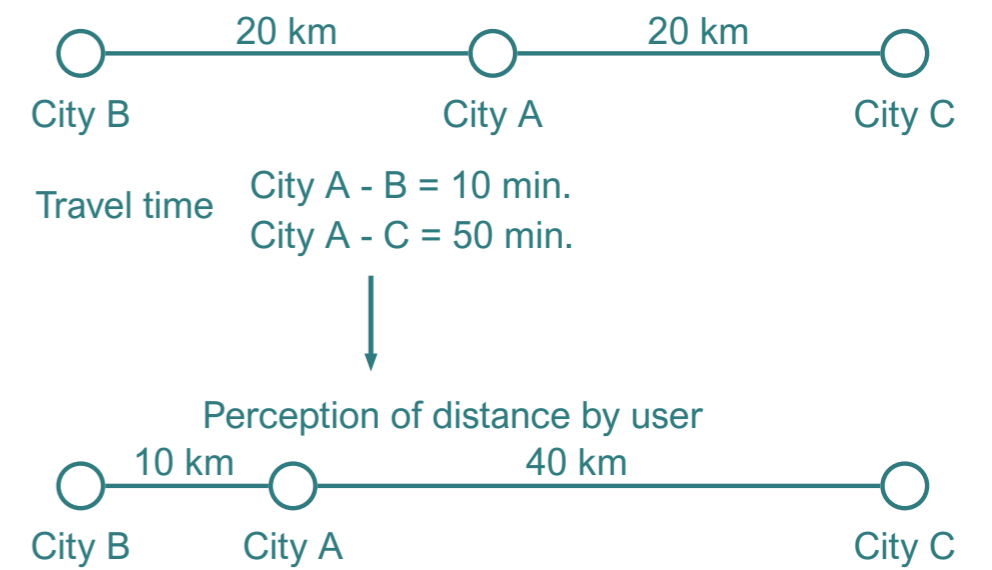
= 2 transfers



Analysis & conclusions

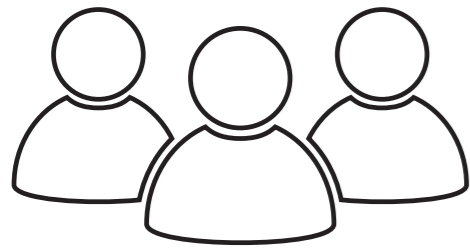


Image 7. Bus line 45 from Maastricht to Genk (De Lijn, 2018).

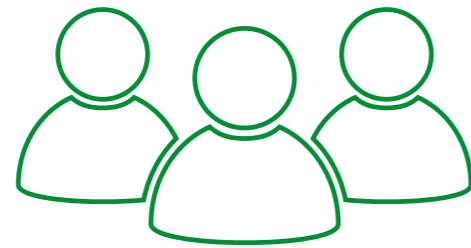


**Analysis &
conclusions**

Governance



Governmental body responsible for **urban planning**



Governmental body responsible for **public transport**



Private / semi-private **public transport companies**



Governmental body represented in the **Euregio Maas-Rijn foundation**



Actors included in the **EMR connect** project

Transportation regions in Nordrhein-Westfalen, Germany.

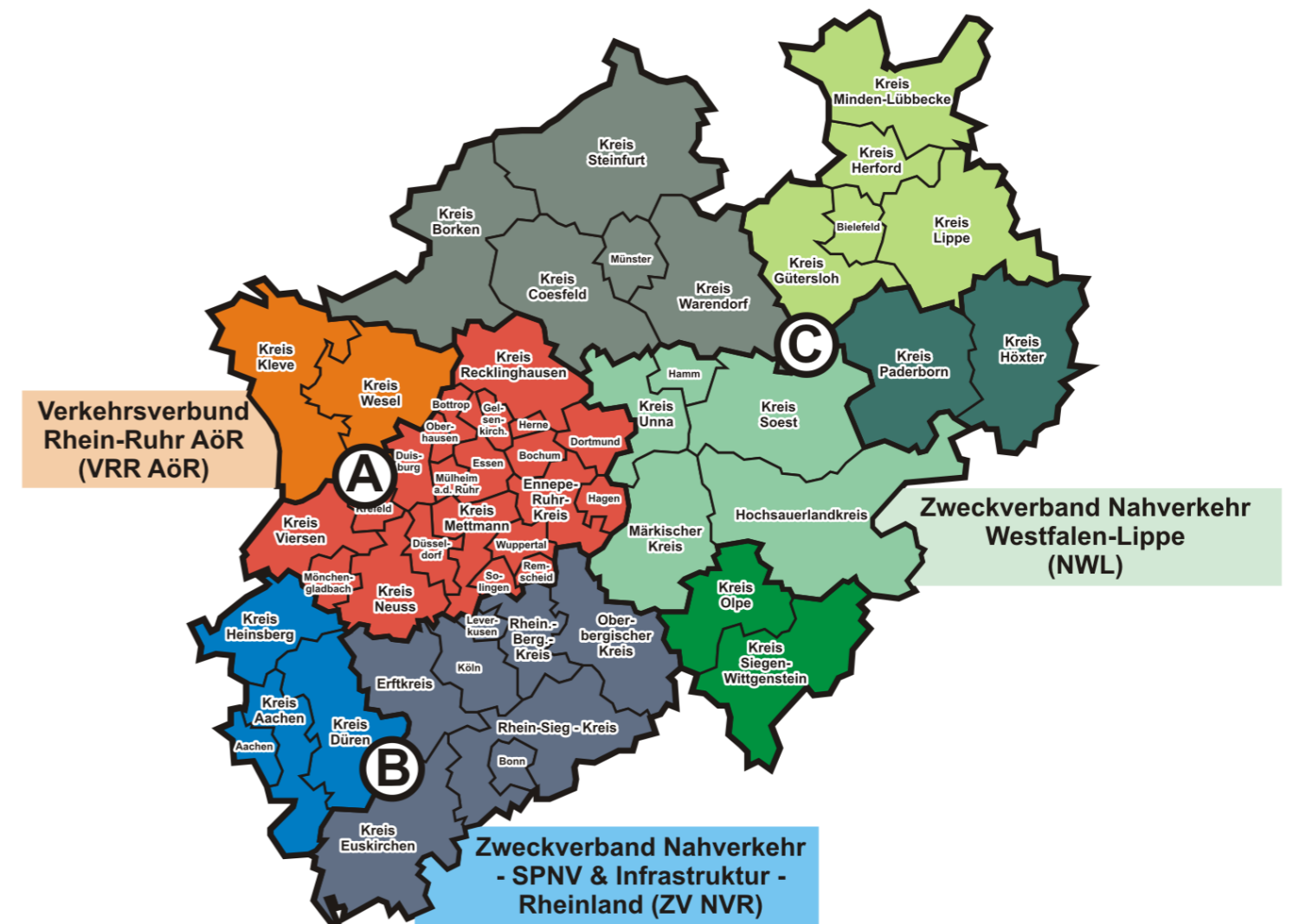
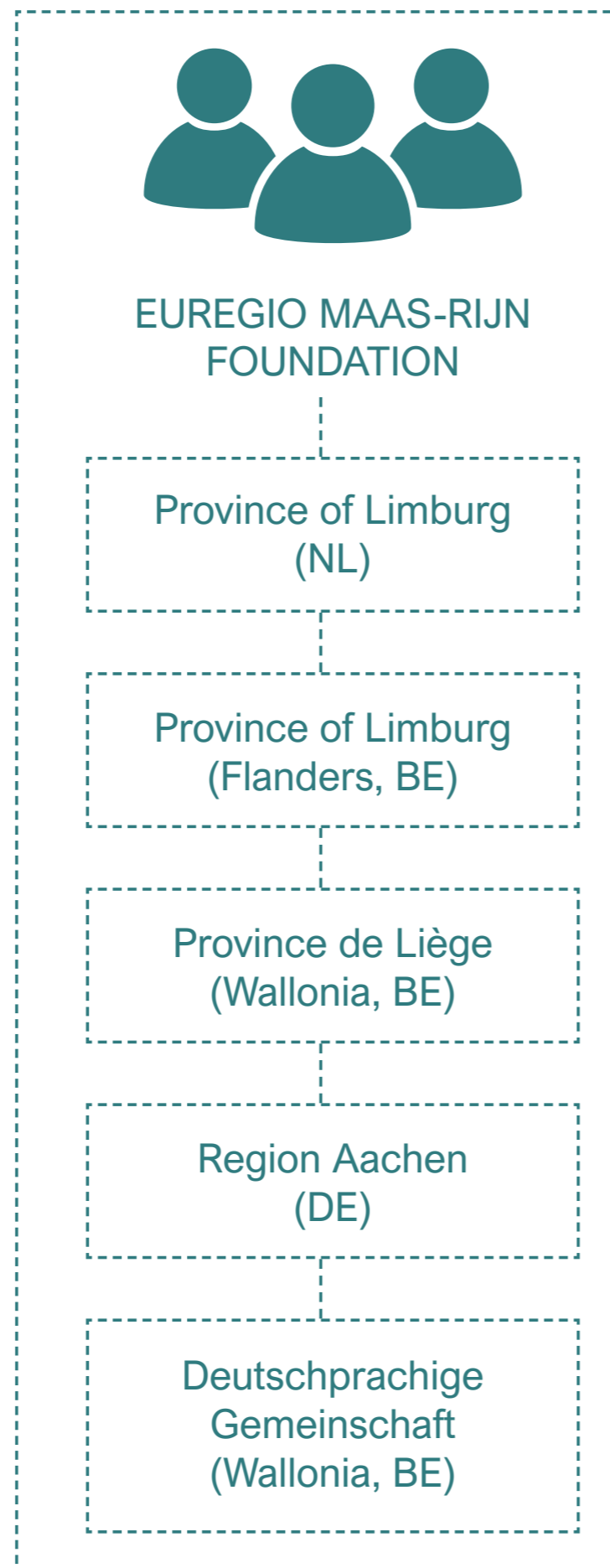


Image 8. Transportation regions Nordrhein-Westfalen (VM Nordrhein-Westfalen, 2008).

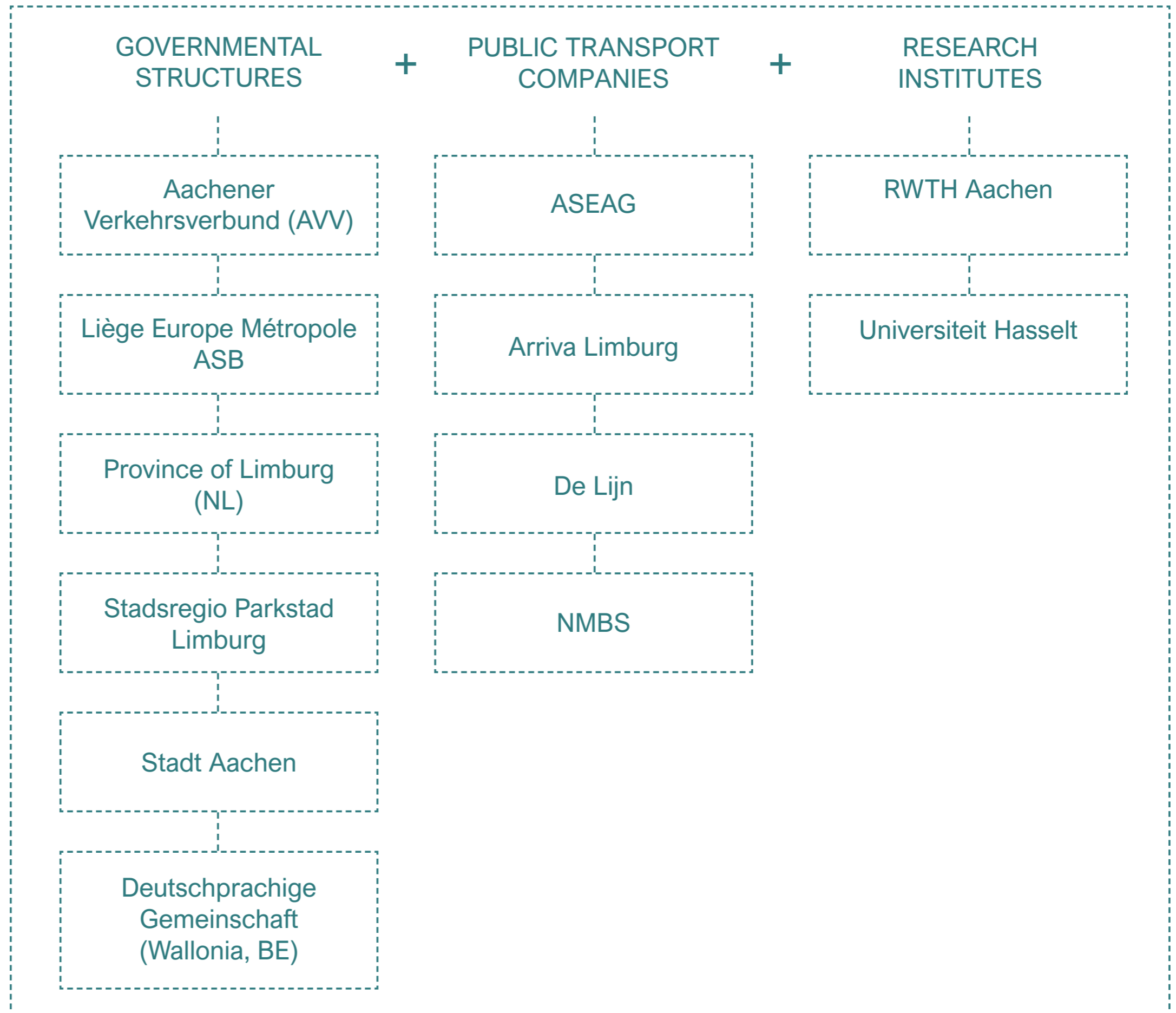


European Grouping of Territorial Cooperation (EFTC)

Analysis & conclusions



EMR CONNECT



Analysis & conclusions



INFLUENCERS
ON RESEARCH
AND TRANSPORT
BEHAVIOUR

Universities - Hasselt,
Aachen, Liège, Maastricht

Large companies - DSM,
Chemelot, Maastricht
Aachen Aiprort



EUREGIO MAAS-RIJN
FOUNDATION

Province of Limburg
(NL)

Province of Limburg
(Flanders, BE)

Province de Liège
(Wallonia, BE)

Region Aachen
(DE)

Deutschsprachige
Gemeinschaft
(Wallonia, BE)



DECISION-MAKERS
PUBLIC TRANSPORT

Mobility region Limburg
(Flanders, BE)

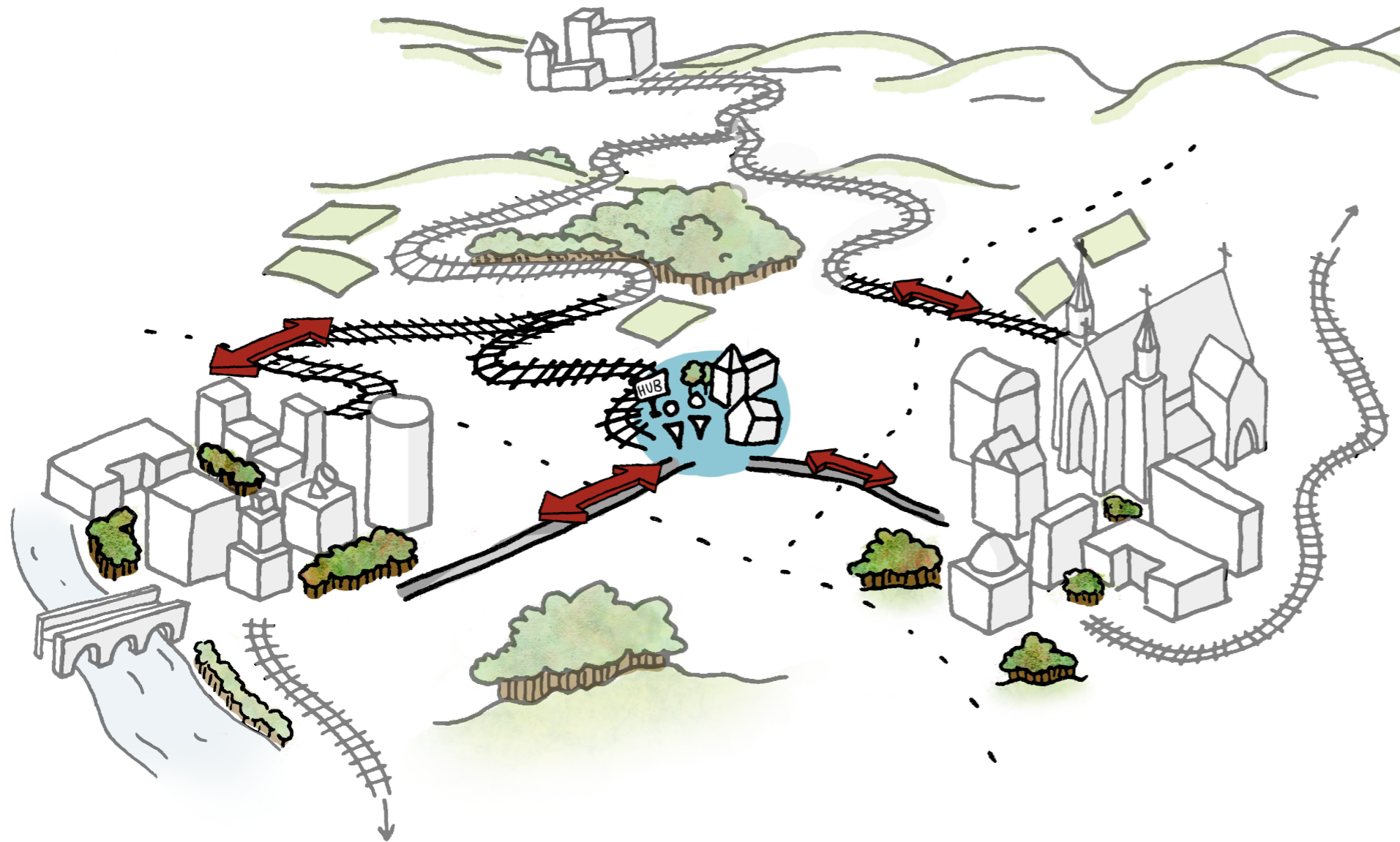
Territorial Division de
Liège-Verviers

Aachener
Verkehrsverbund

Verkehrsverbund
Rheinsieg

Vision & Design

Vision



Open up borders,
allowing further
cooperation and
integration

Opportunity to grow as
'one city'

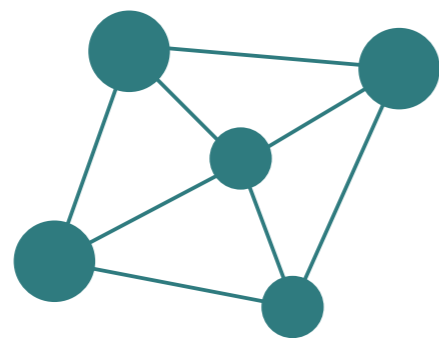
Multi-scalar
relationship between
public transport
network and **dispersed**
polycentric urban
pattern

Governance structures
harmonise urban
and public transport
development

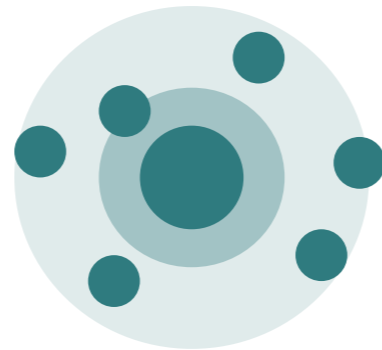
Create a **competitive**
and **sustainable cross-**
border region in the
future

Urbanisation mechanisms

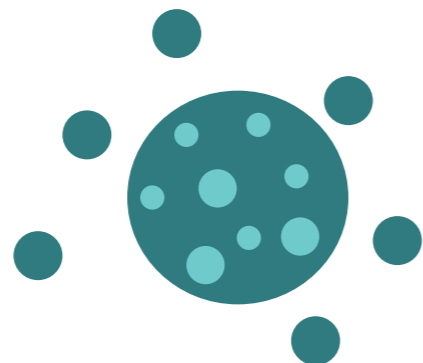
Meijers & Van der Wouw, 2019



City network integration



Borrowing size



Urban concentration

Conclusions analysis

No fast, direct connections between main centres

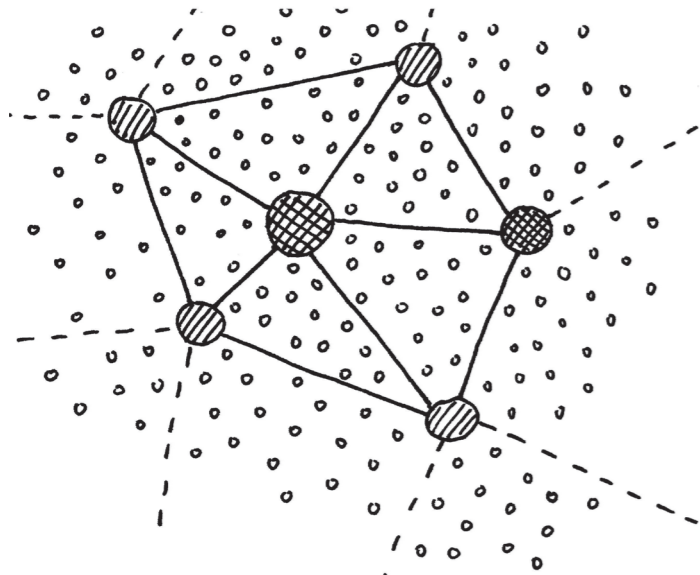
Complex connections

+

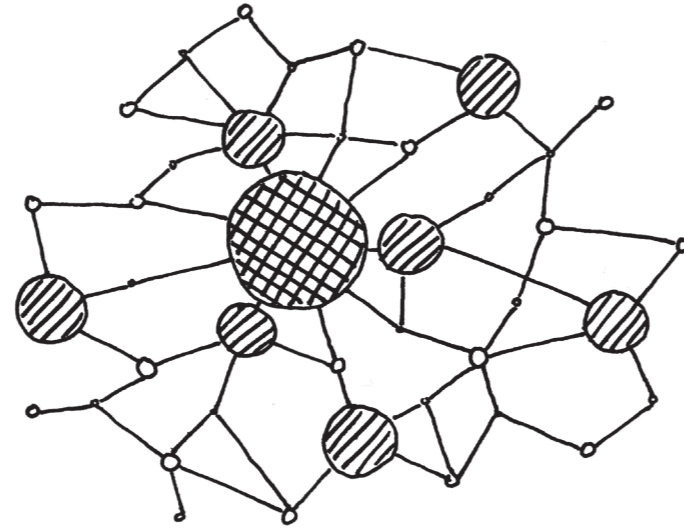
Dispersed urban pattern does not relate to the principle of public transport

Power-actors in public transport are not included in the euroregional governance structure

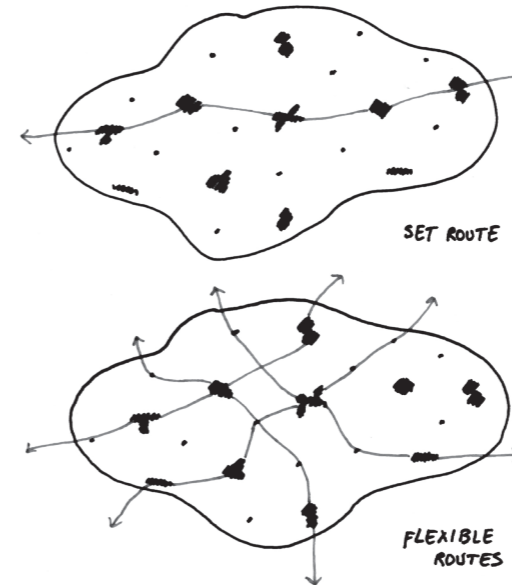
Design principles



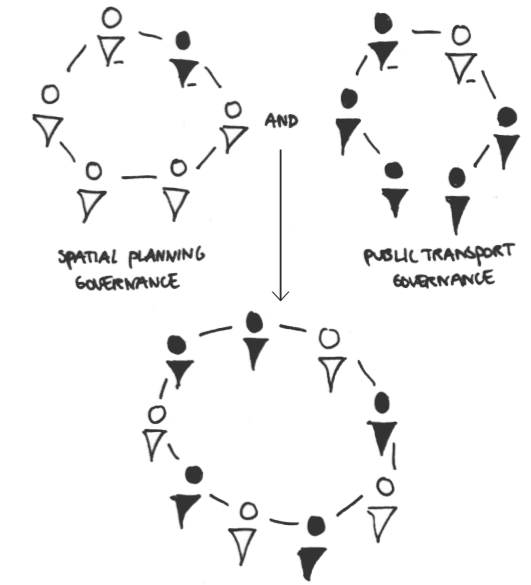
Design principle 1
Regional network of cities



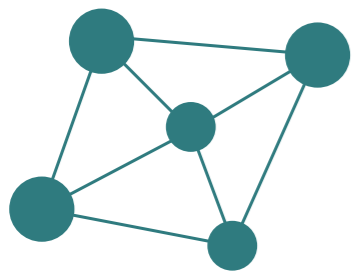
Design principle 2
Connecting urban centres and its surrounding



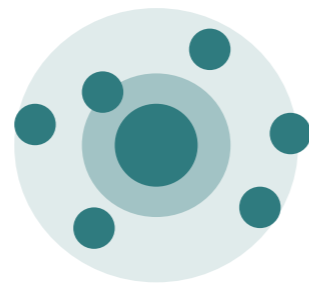
Design principle 3
Local public transport



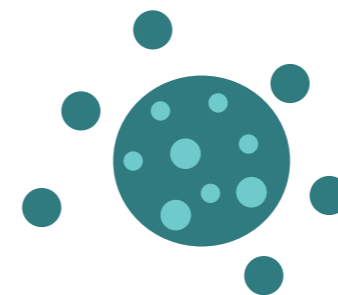
Design principle 4
Integrating actors



City network integration



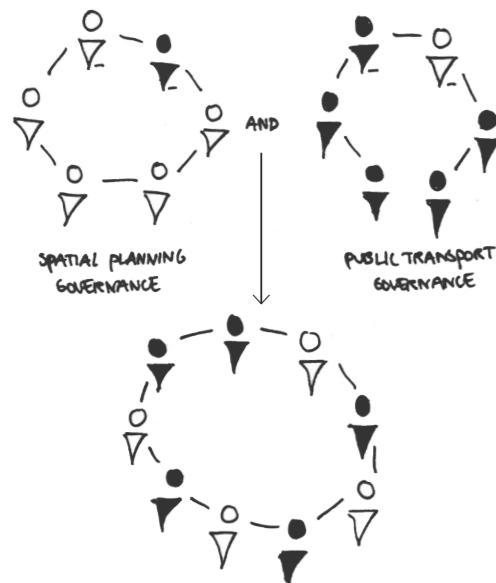
Borrowing size



Urban concentration

Design principle 4

Design principle 4 Integrating actors

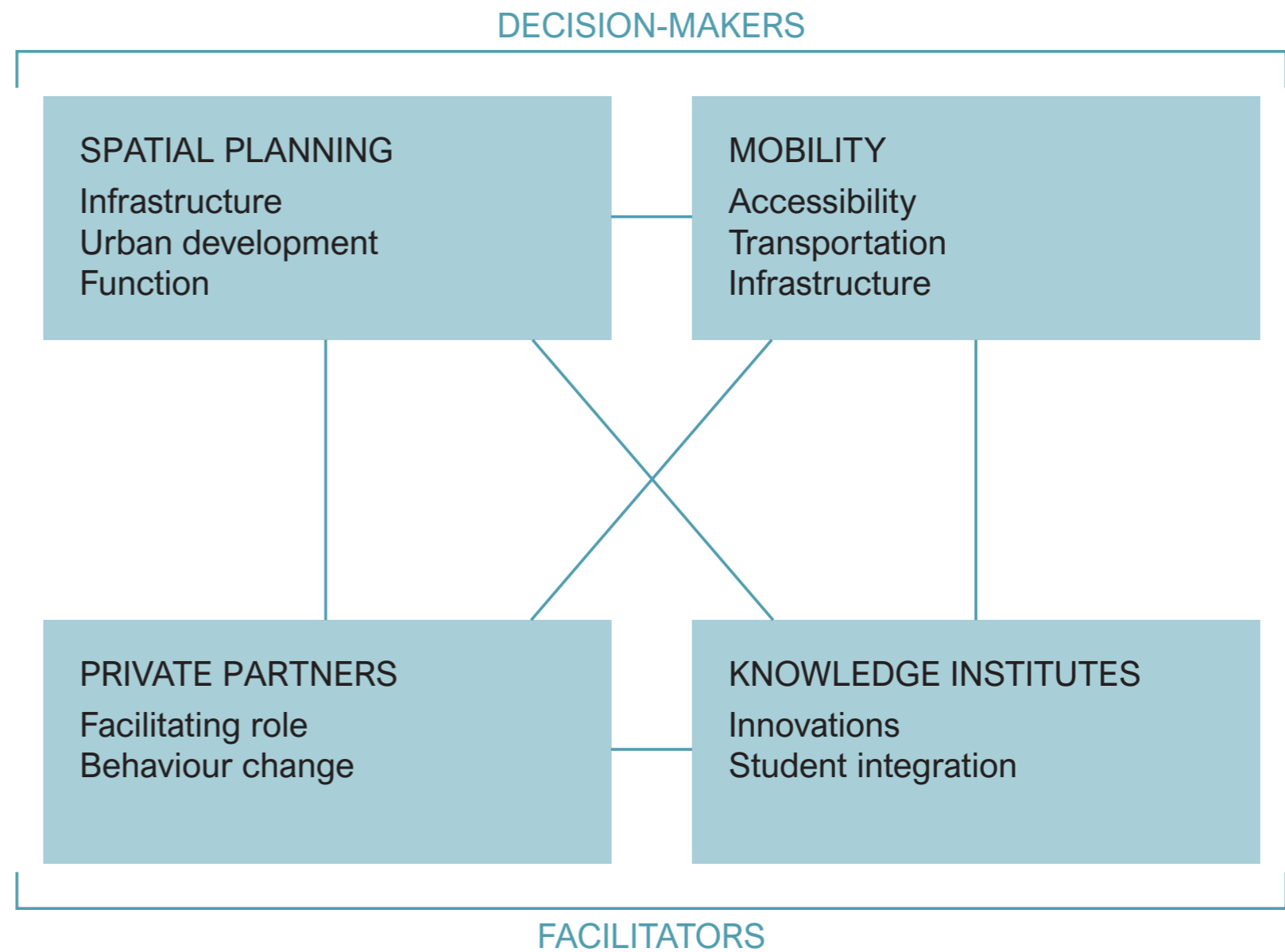


Urban pattern

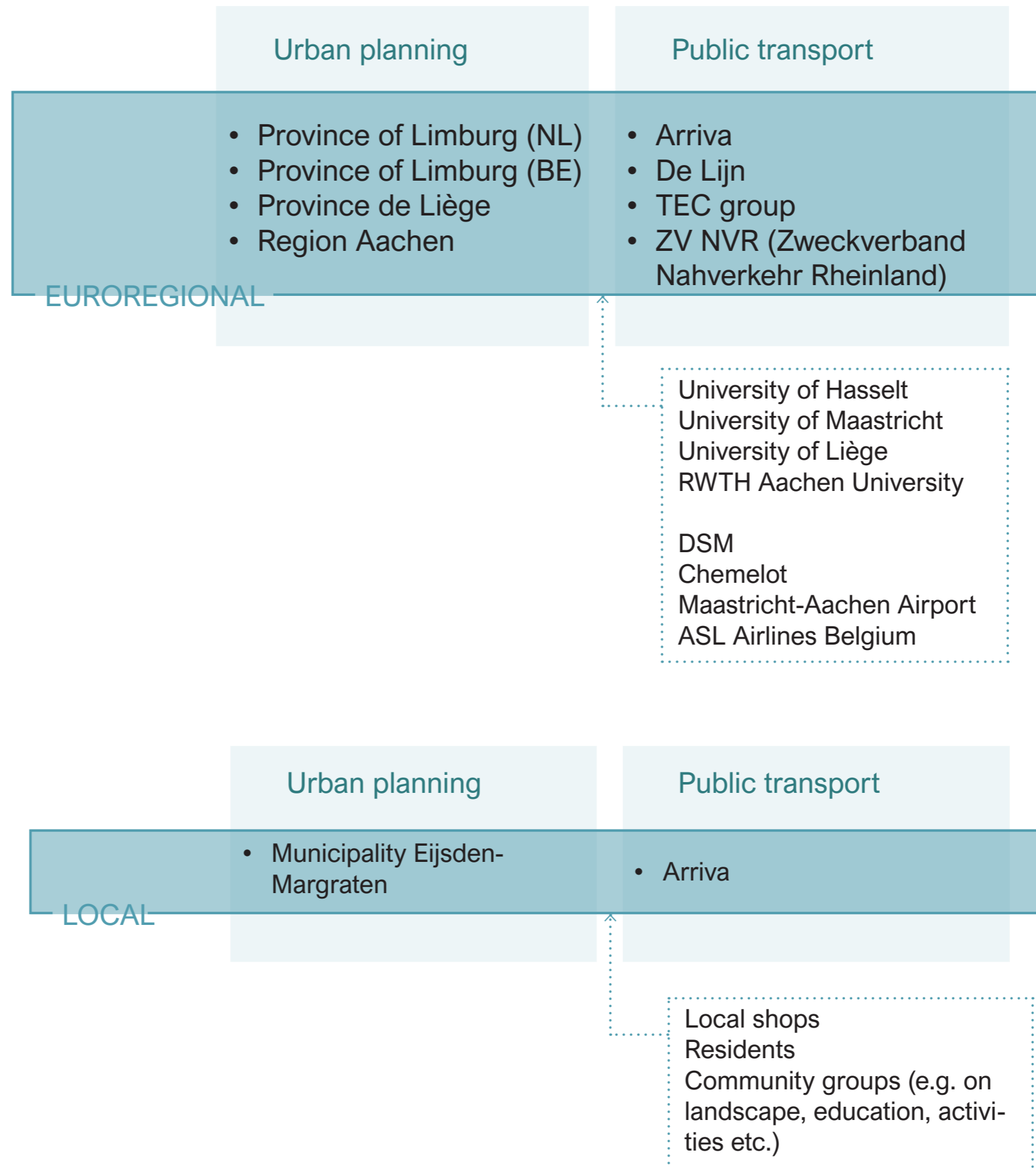
Public transport

Cross-border

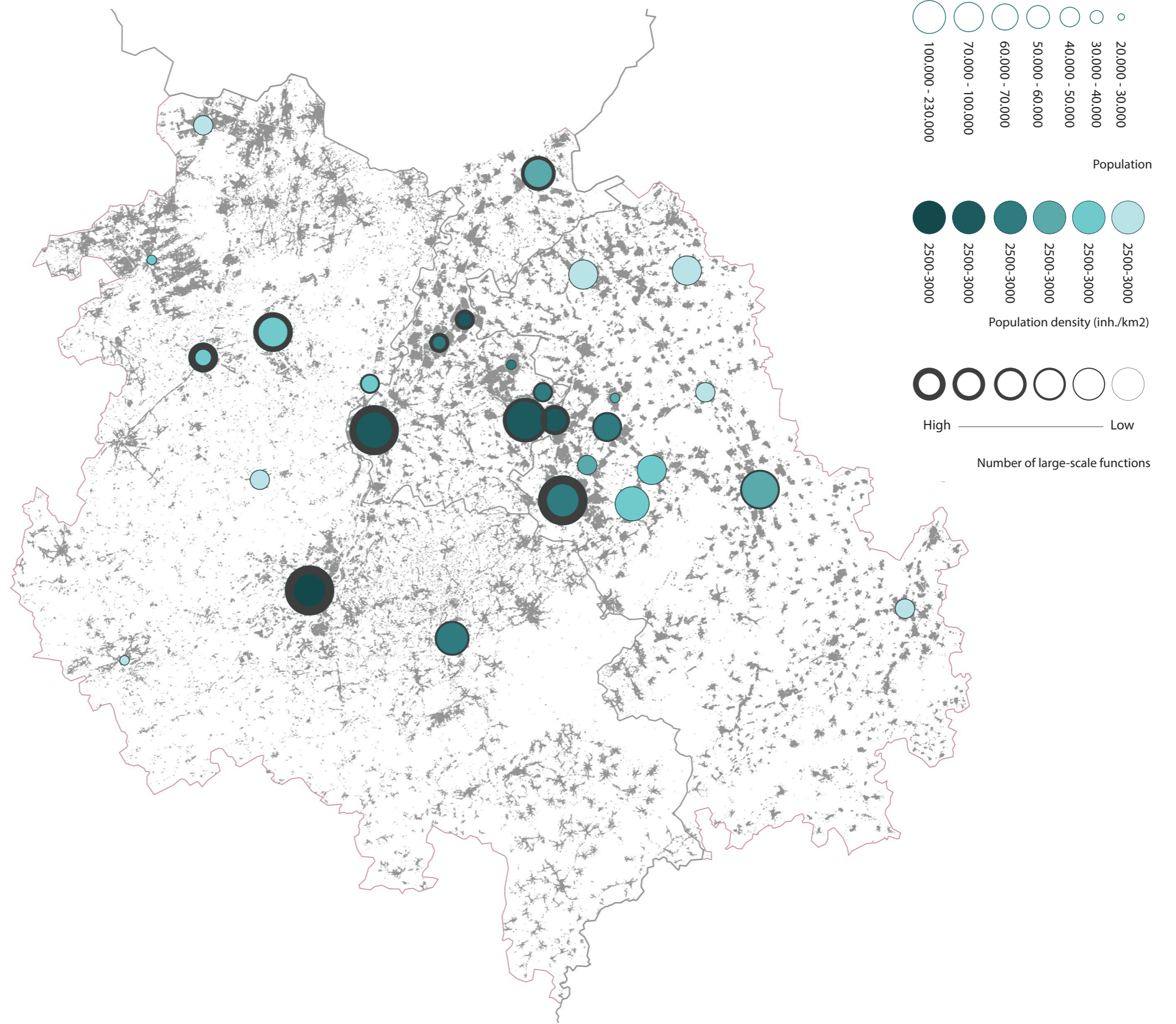
Governance



Design principle 4

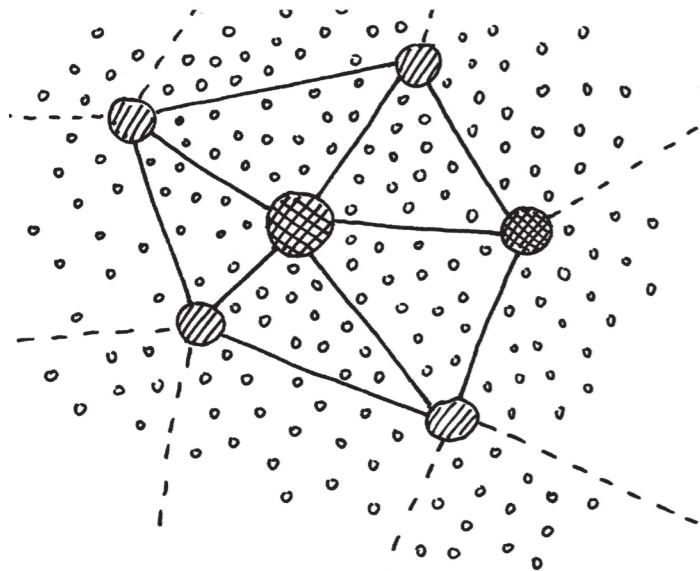


Design principle 1

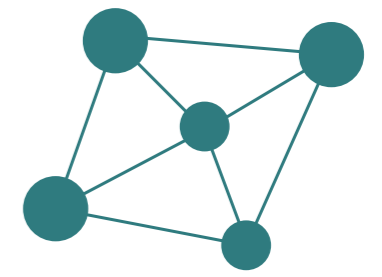
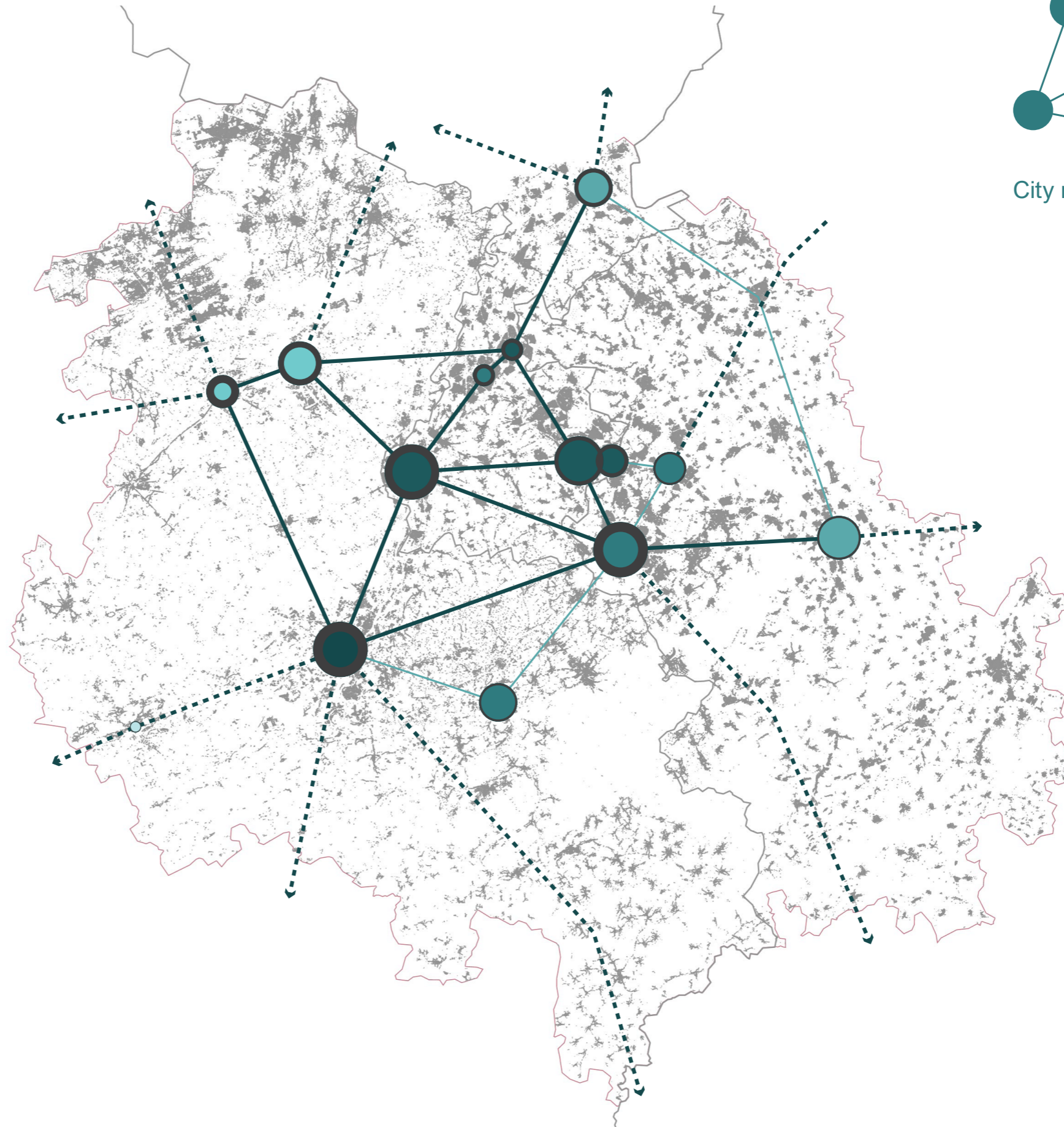


Design principle 1

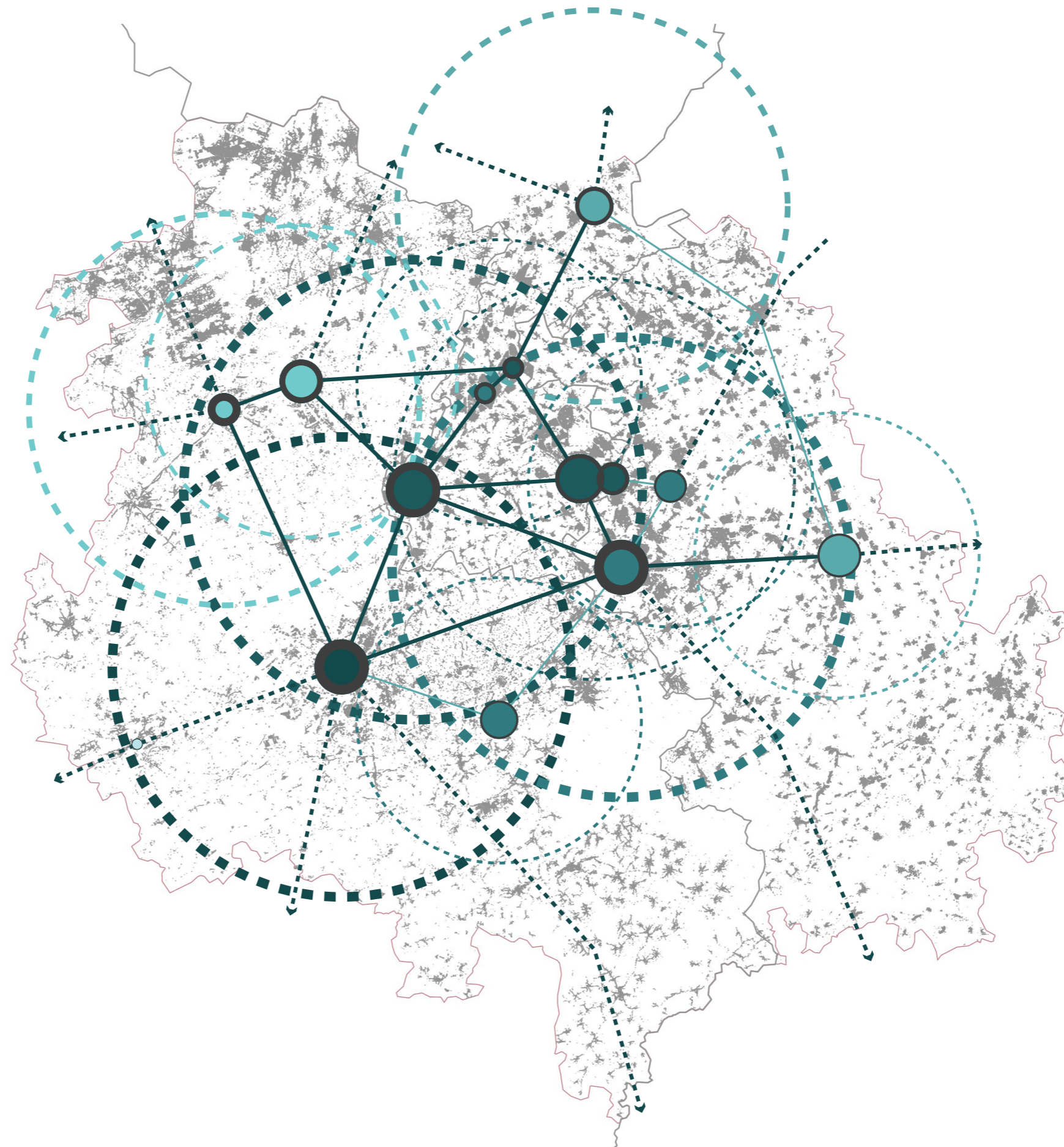
Design principle 1
Regional network of cities



- Urban pattern
- Public transport
- Cross-border
- Governance



City network integration



Slow traffic



Urban green



High-scale functions



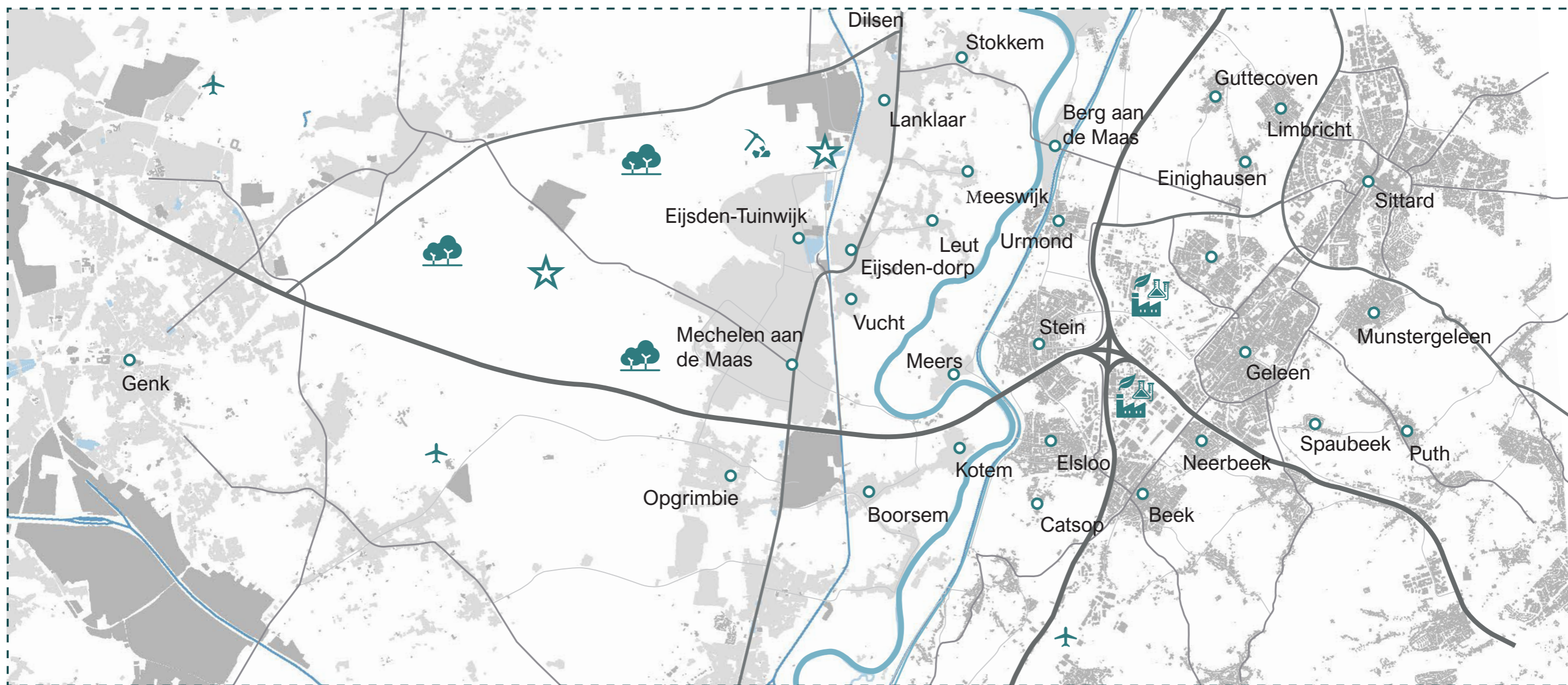
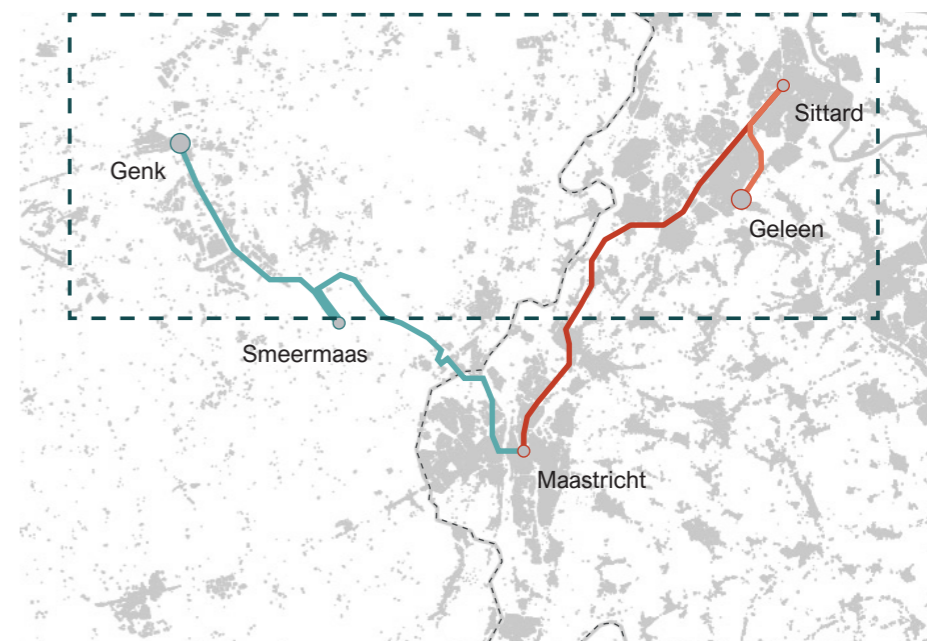
Diverse functions

Image 9. Luxigon, 2015.

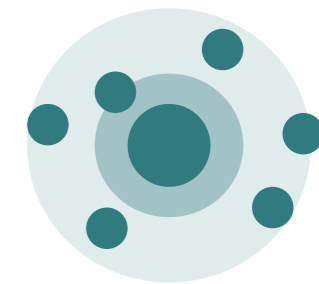
Image 10. A24 Landschaft, 2017.

Image 11. West 8, 2018.

Design principle 2

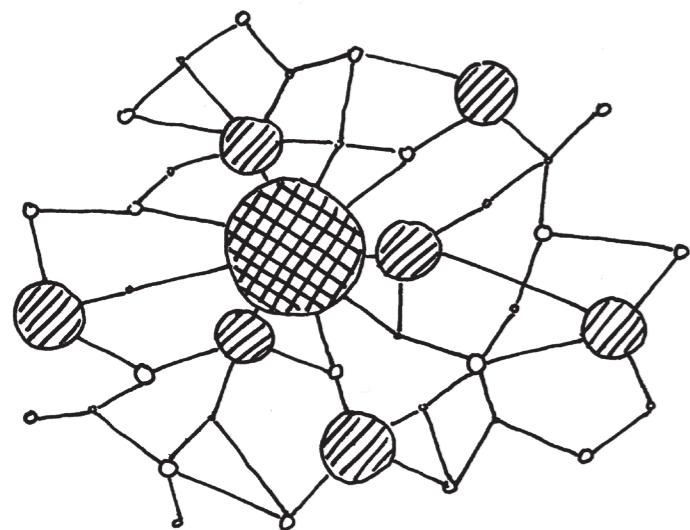


Design principle 2



Borrowing size

Design principle 2 Connecting urban centres and its surrounding



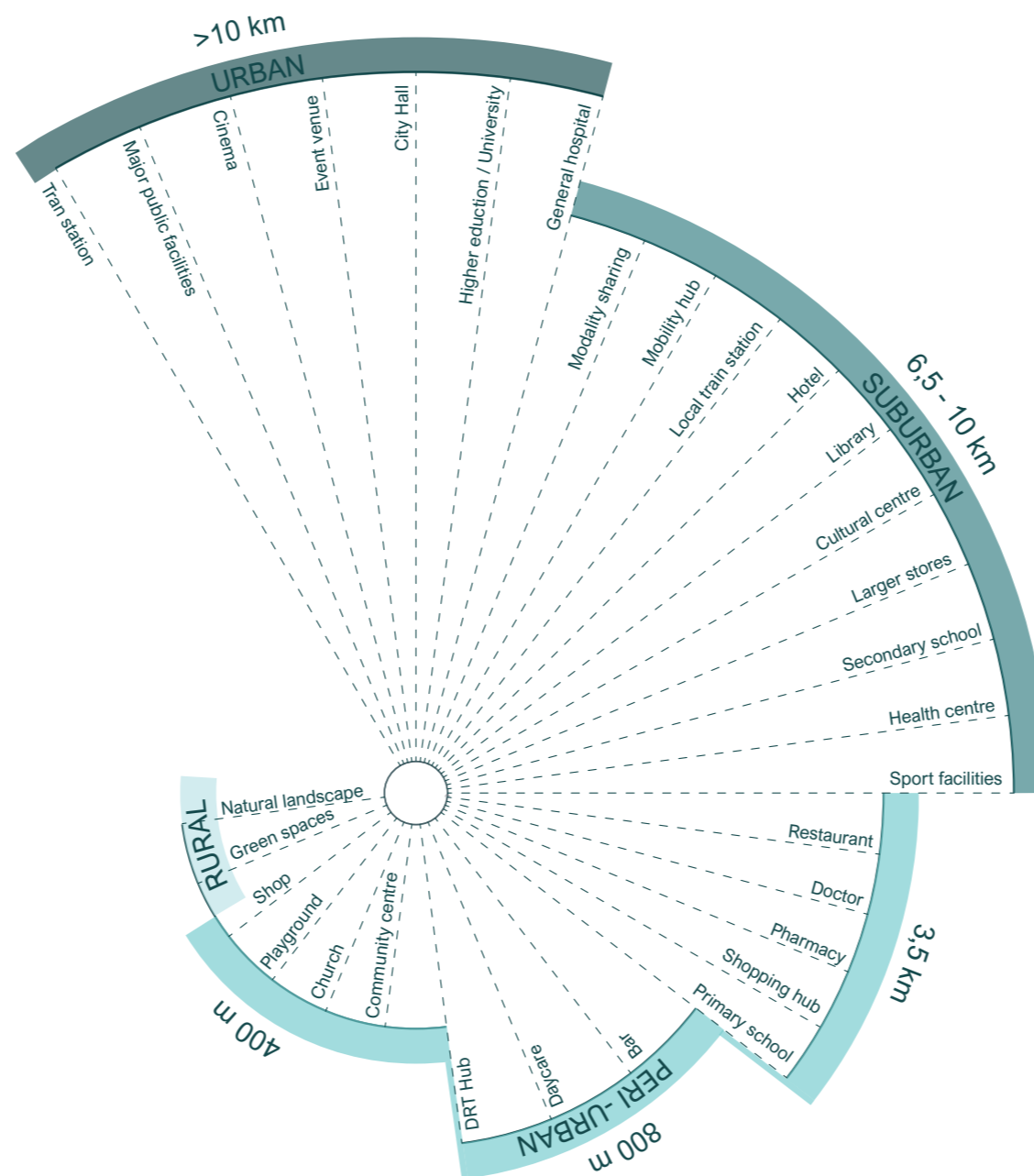
Urban pattern

Public transport

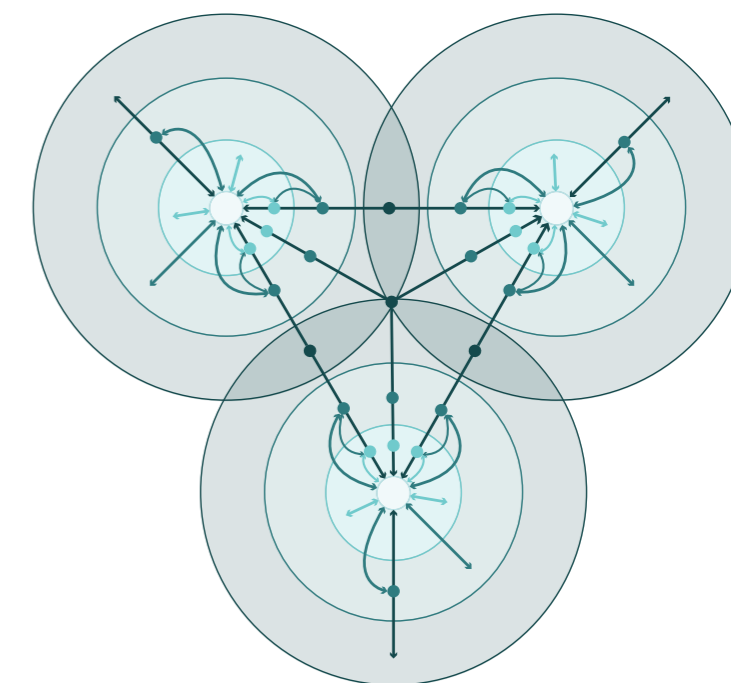
Cross-border






Governance

Nodes



Relations



-  Link to rural scale
-  Link to peri-urban scale
-  Link to suburban scale
-  Local mobility hub DRT
-  Urban mobility hub

Design principle 2

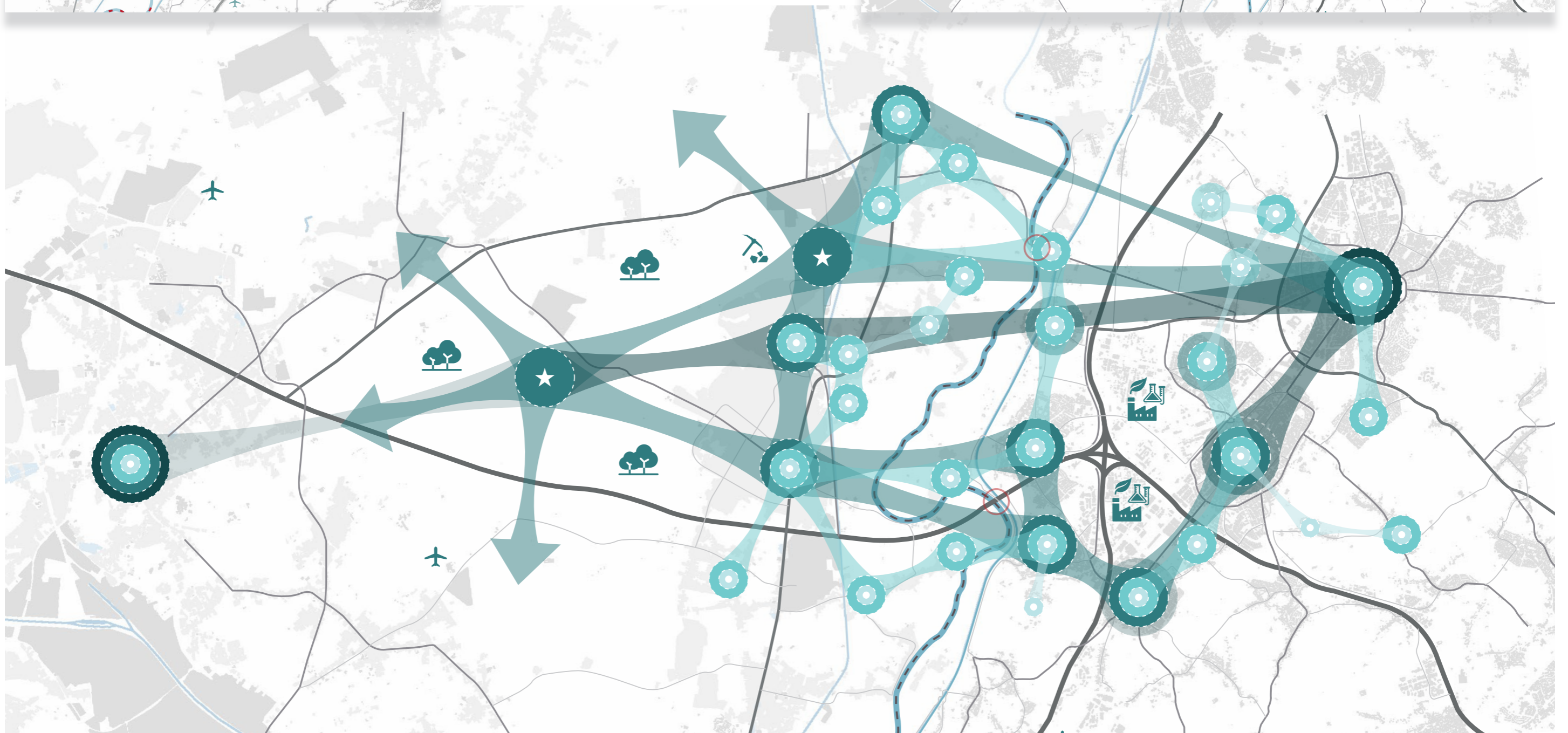
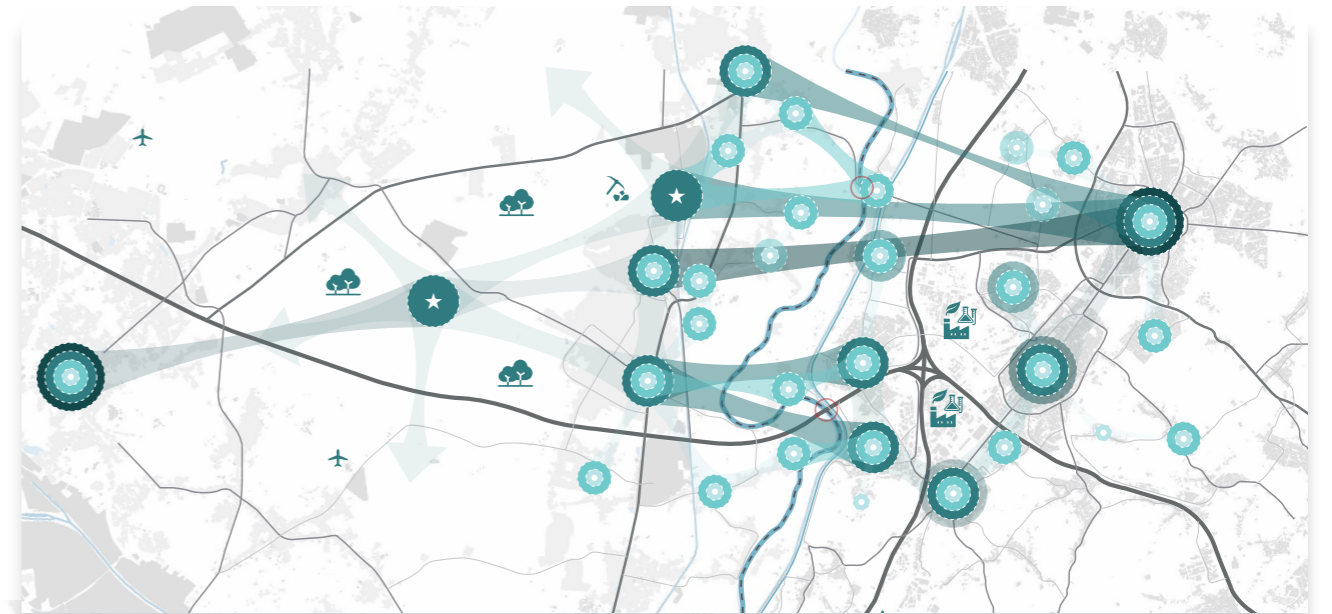
URBAN

SUBURBAN

PERI-URBAN

RURAL

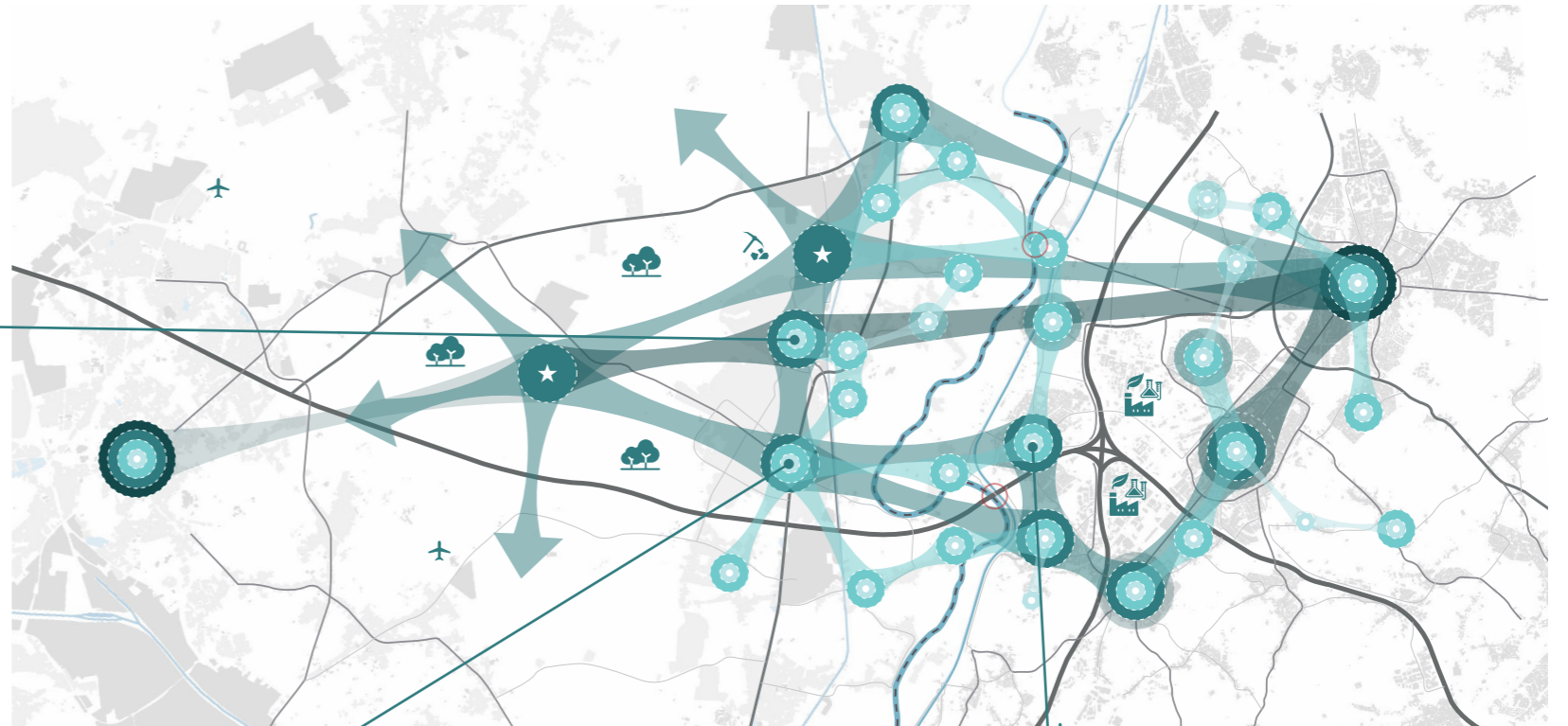




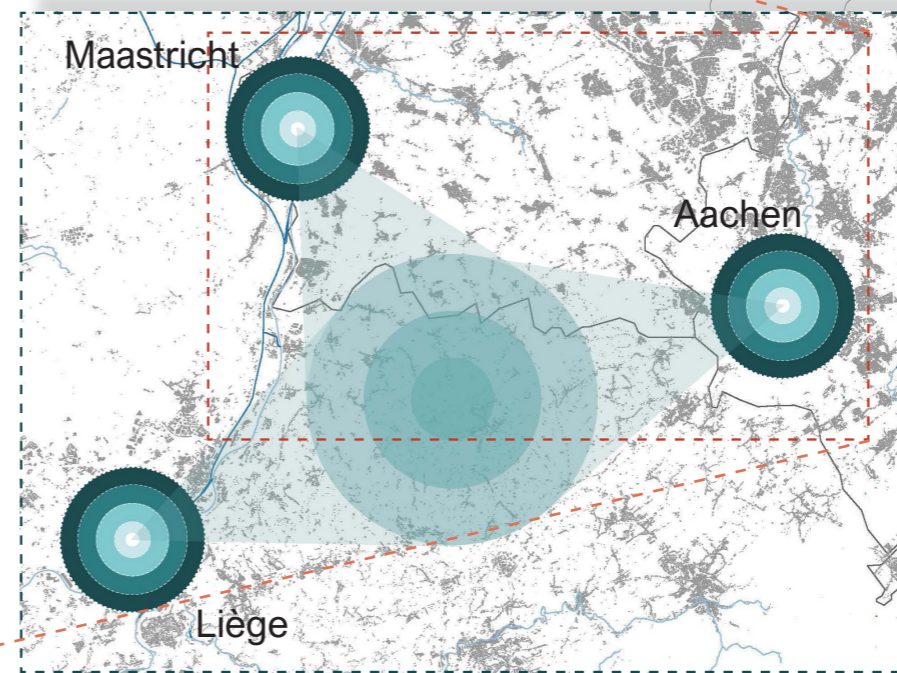
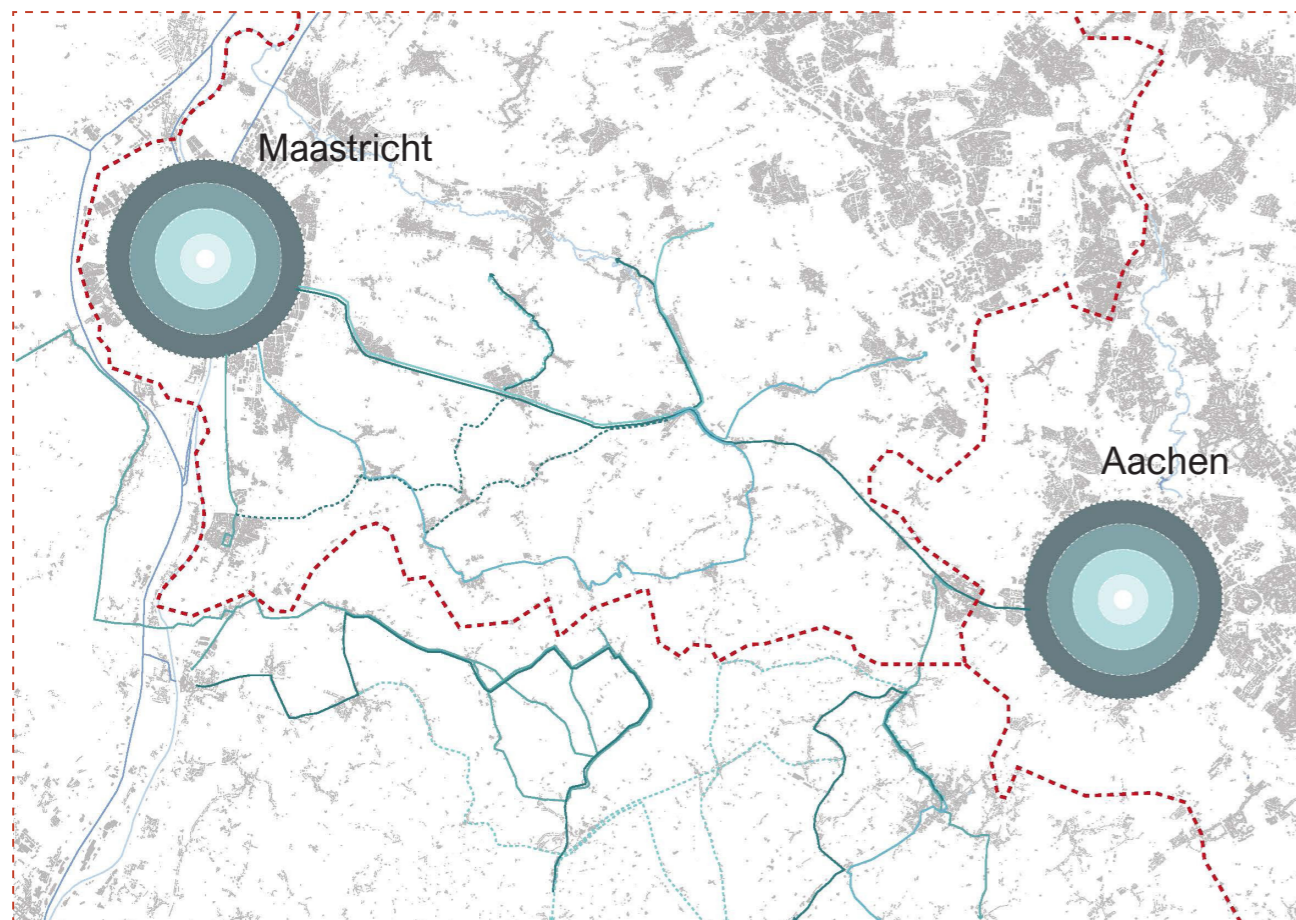
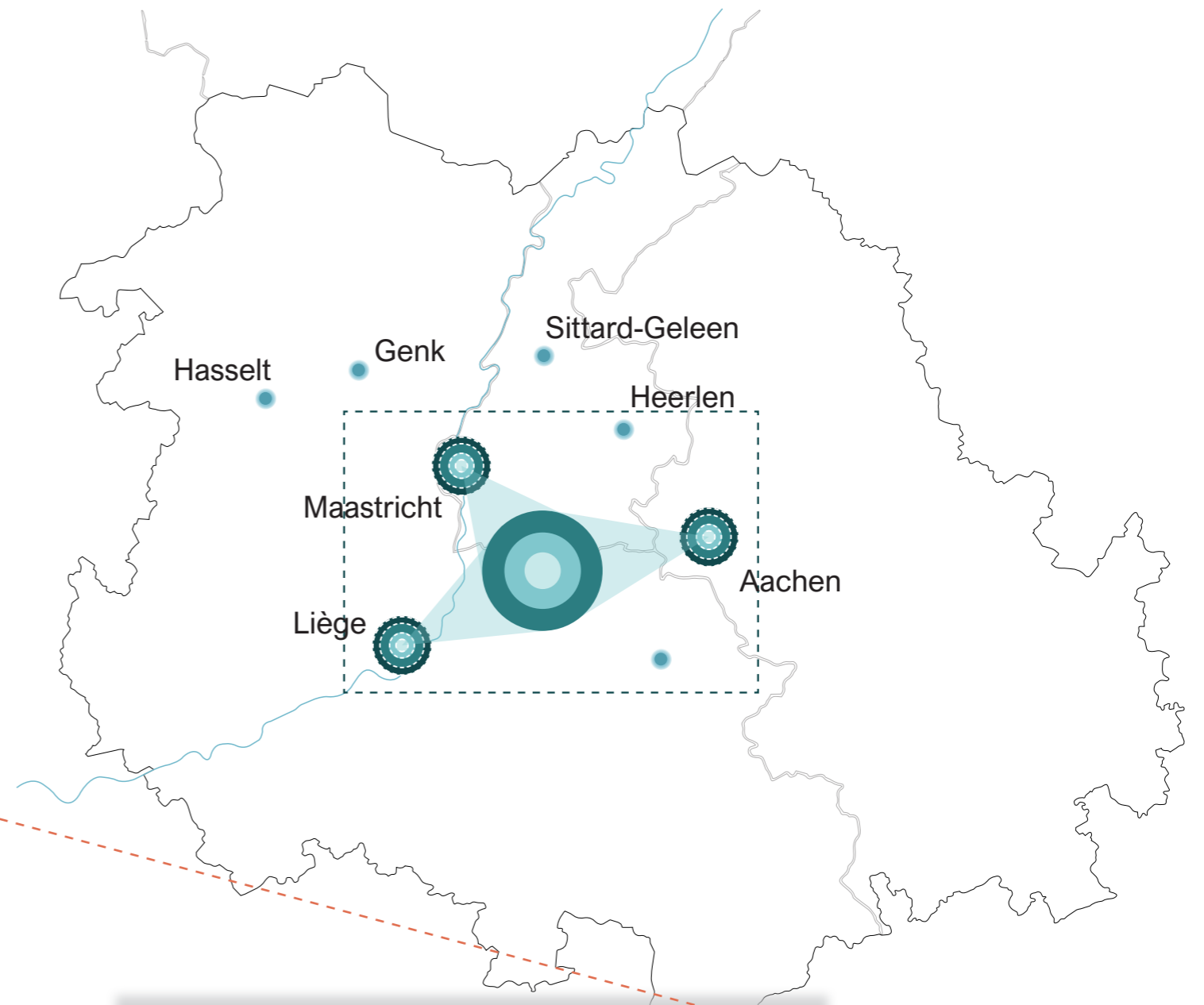
Design principle 2

Transportation hubs

Provide diversity of transport to create individual journeys

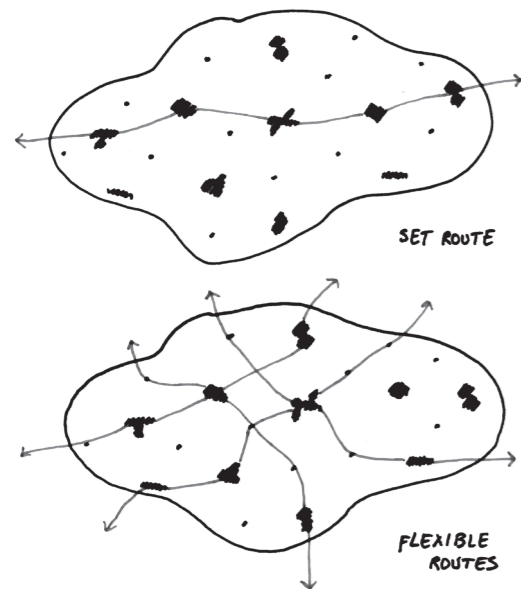


Design principle 3



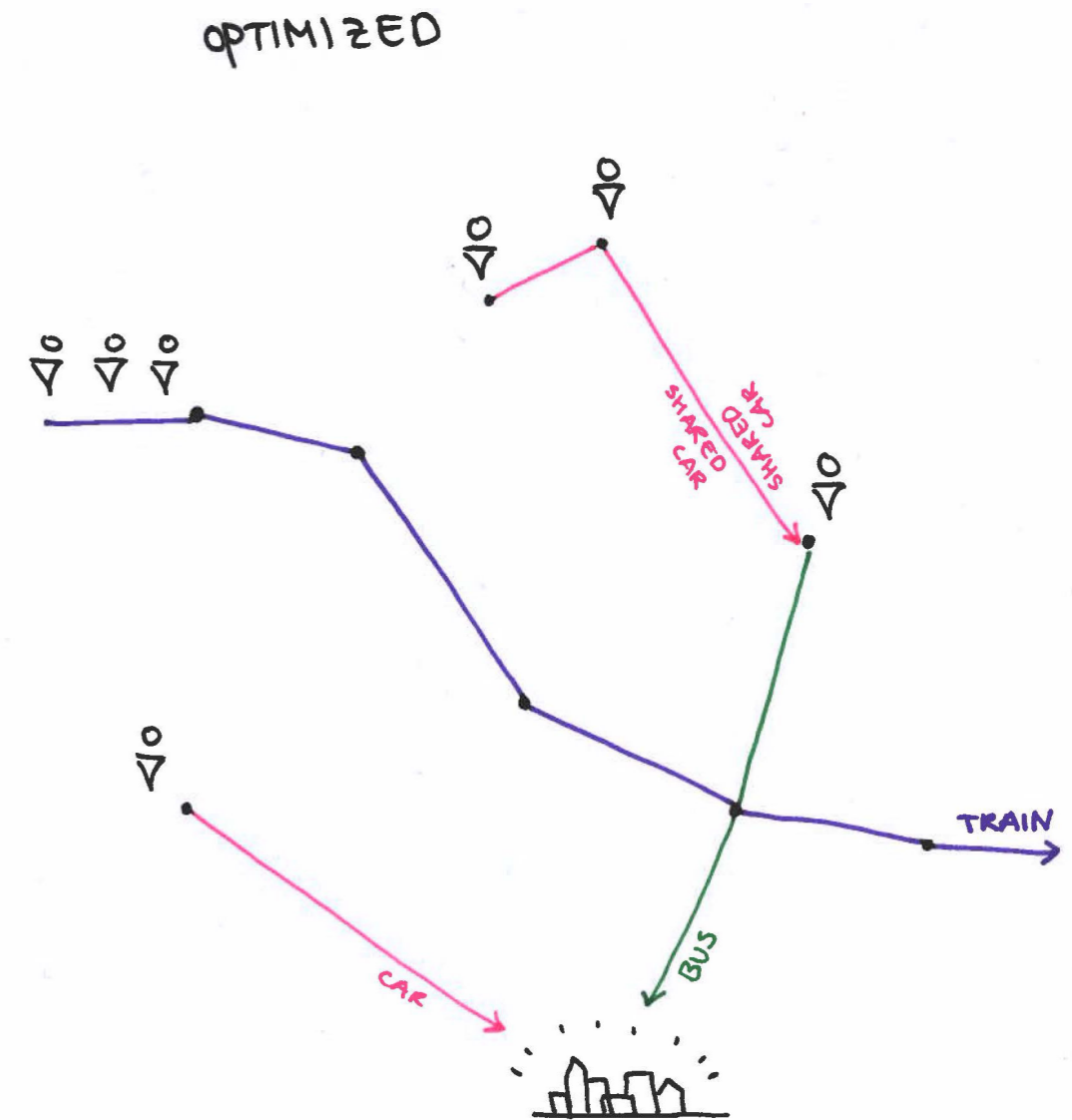
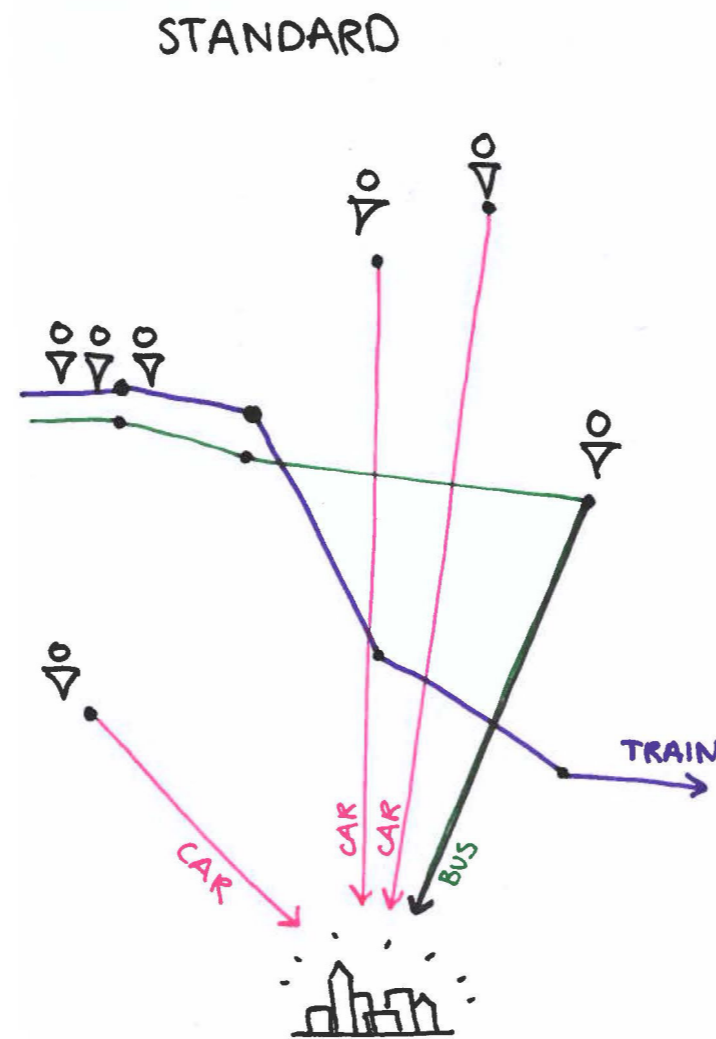
Design principle 3

Design principle 3 Local public transport



- Urban pattern
- Public transport
- Cross-border
- Governance

Demand Responsive Transport



Design principle 3

ELDERLY



DEMANDS

- Pick-up / drop-off close to home
- Meeting people
- Resting places

DESTINATIONS

- Medical centres / hospital
- Local shops
- Caring homes

FLEXIBILITY DEMAND

Low

ONLINE COMPETENCE

Low

COMMUTERS



DEMANDS

- Efficient system
- Combining work & children
- Safe parking stations car / bike

DESTINATIONS

- City centre / Business district in city
- Train station
- University / reserach centre

FLEXIBILITY DEMAND

Medium / Low

ONLINE COMPETENCE

Medium - High

TEENAGERS



DEMANDS

- Night-time service
- Cheap service
- Flexible schedules

DESTINATIONS

- City centre
- High school
- Shopping area

FLEXIBILITY DEMAND

High

ONLINE COMPETENCE

High

Design principle 3

Phone



REAL-TIME UPDATES

IMMEDIATE RESPONSE

TIME AND LOCATION FLEXIBLE

App



REAL-TIME UPDATES

IMMEDIATE RESPONSE

TIME AND LOCATION FLEXIBLE

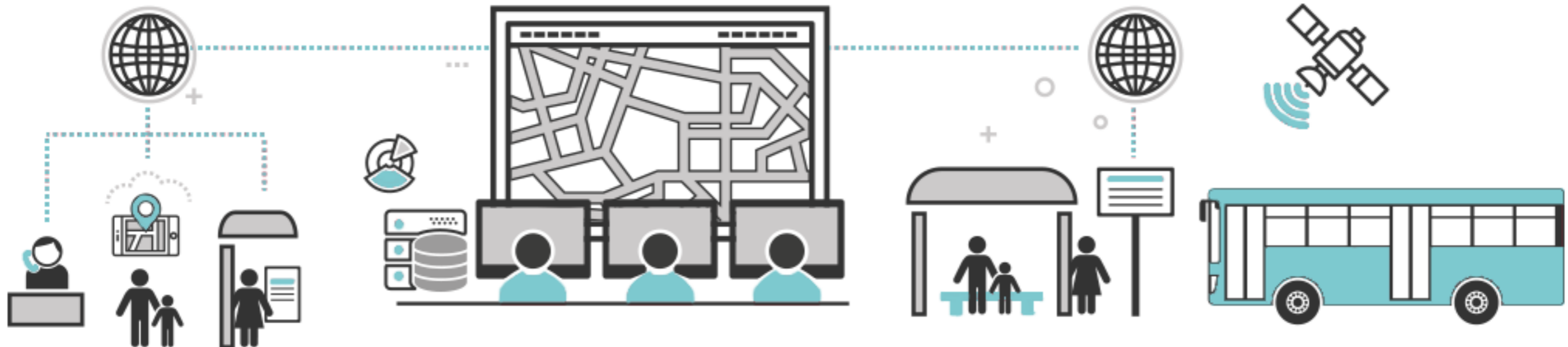
Community hub



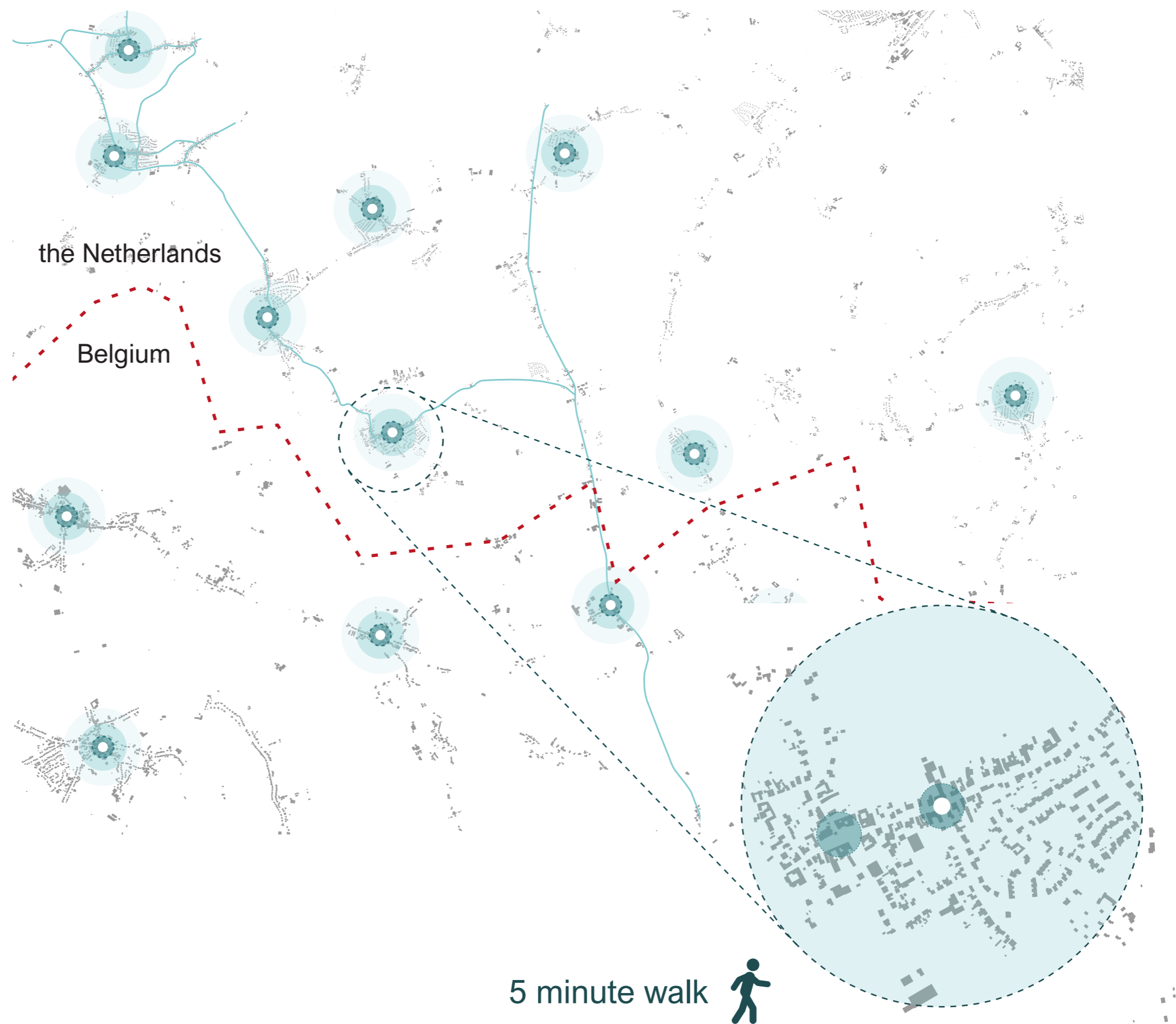
REAL-TIME UPDATES

IMMEDIATE RESPONSE

TIME AND LOCATION FLEXIBLE



Design principle 3



Design principle 3

New community centres in villages





Pick-up points for DRT include:

- real-time service updates
- comfortable waiting area
- option to include the pick-up point in a new journey

Community centre for activities

Childcare and package delivery point

Restaurant and pub



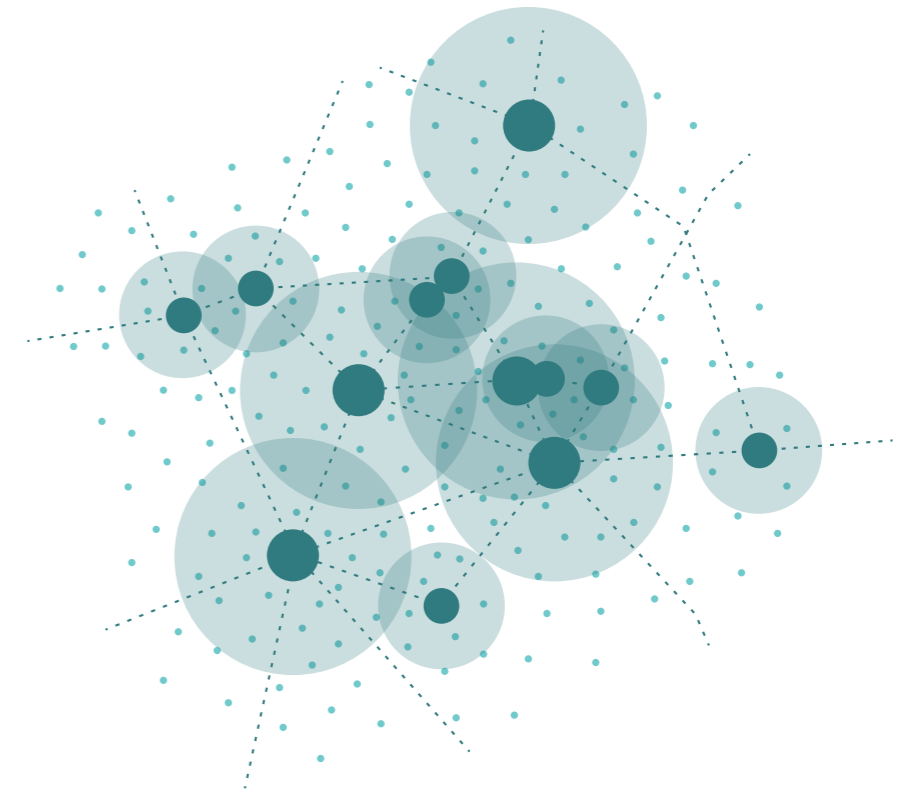
**Future Euregio
Maas-Rijn**



=



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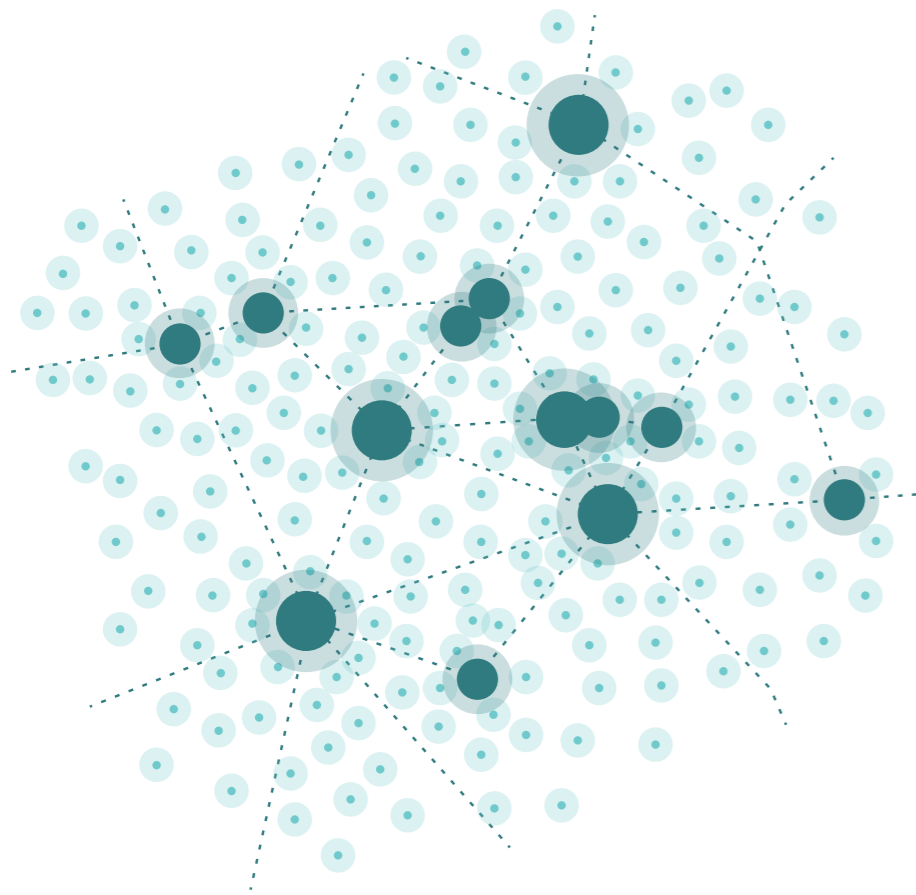
Increase population

Increase urban development

Concentrated urban development

High quality of life near natural landscapes

Space for healthy urban environments



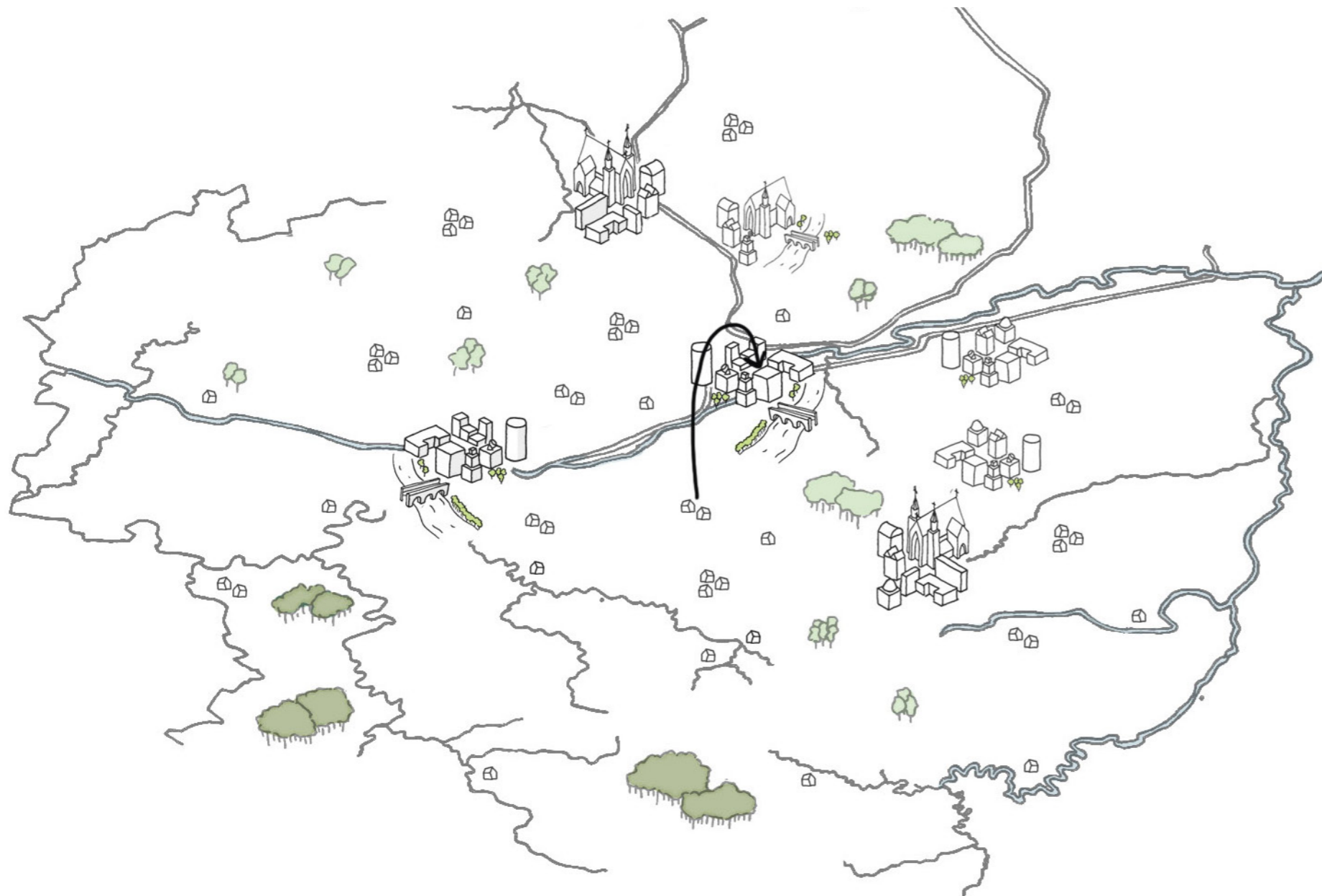
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Dispersed urban development

Future opportunities Euregio Maas-Rijn

Image 12. Groene loper Maastricht (LExCie1011).

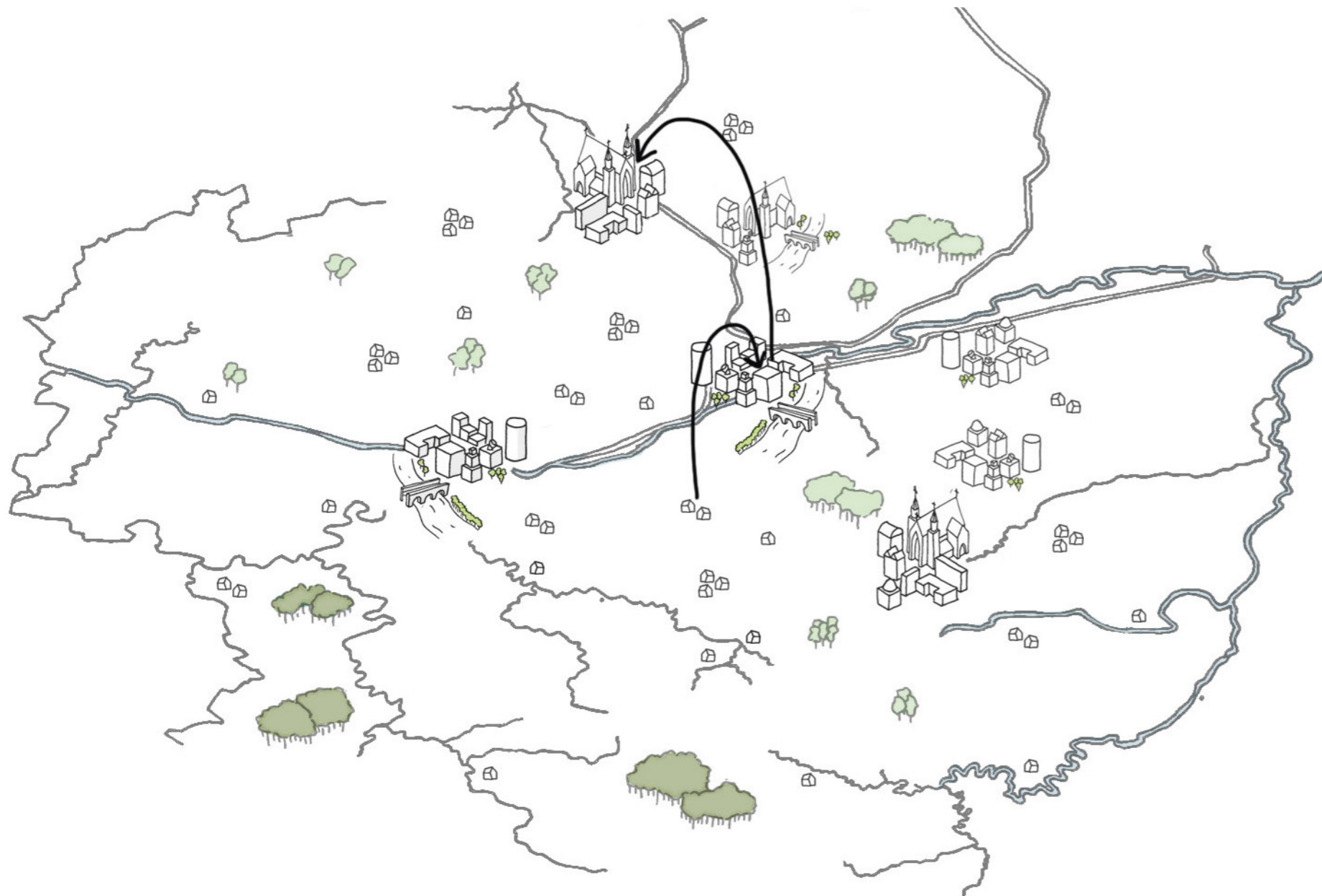


Travel diary

07.30u - 08.00u

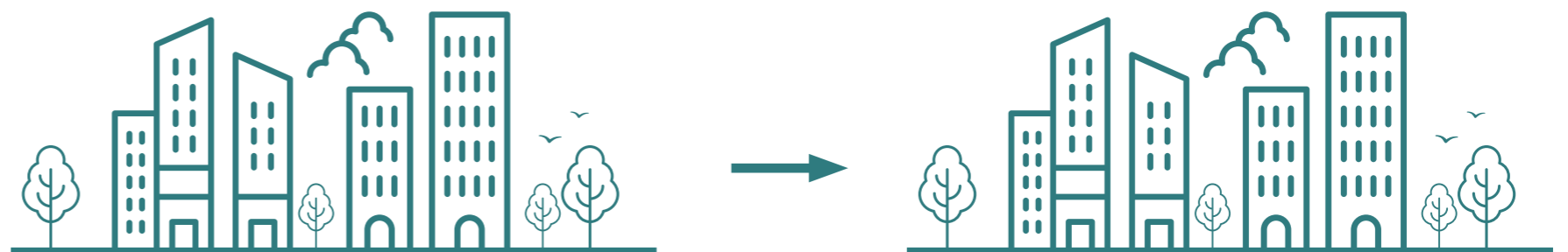
Travel to work

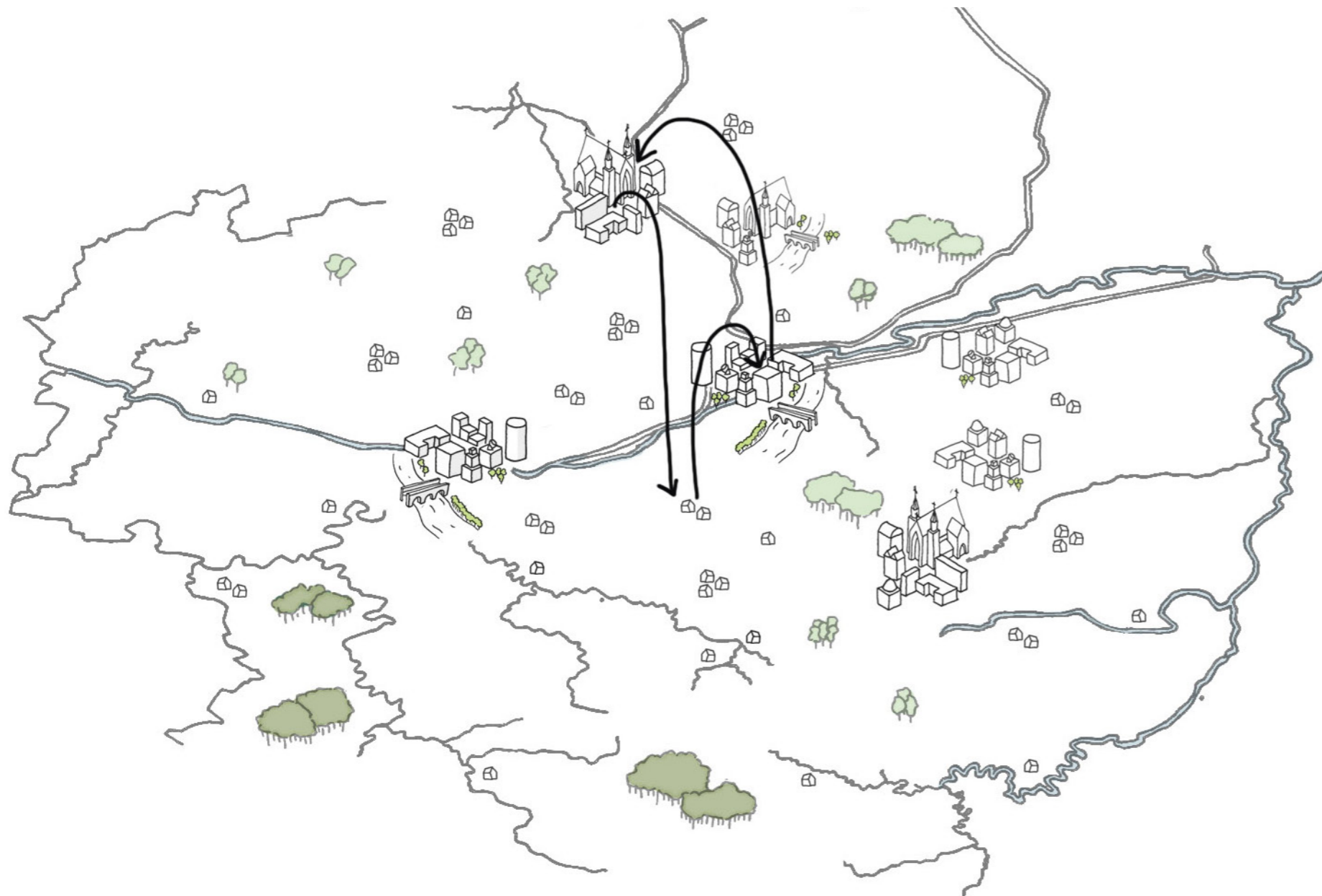




Travel diary

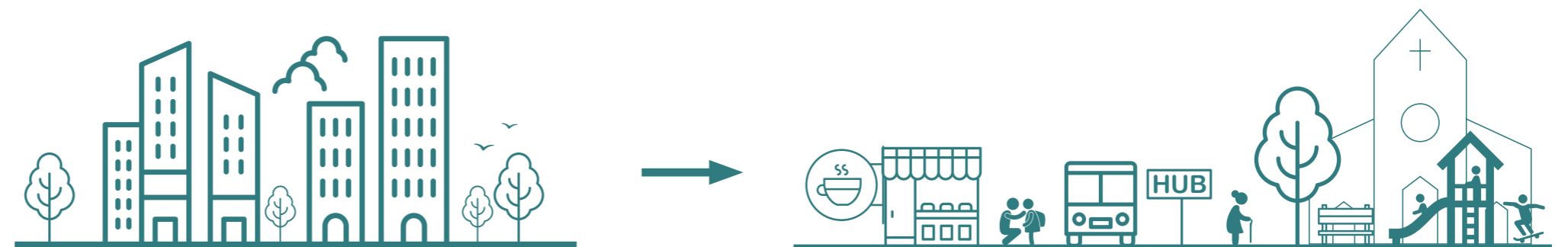
- 07.30u - 08.00u Travel to work
- 15.00u - 15.20u Travel to meeting in Hasselt

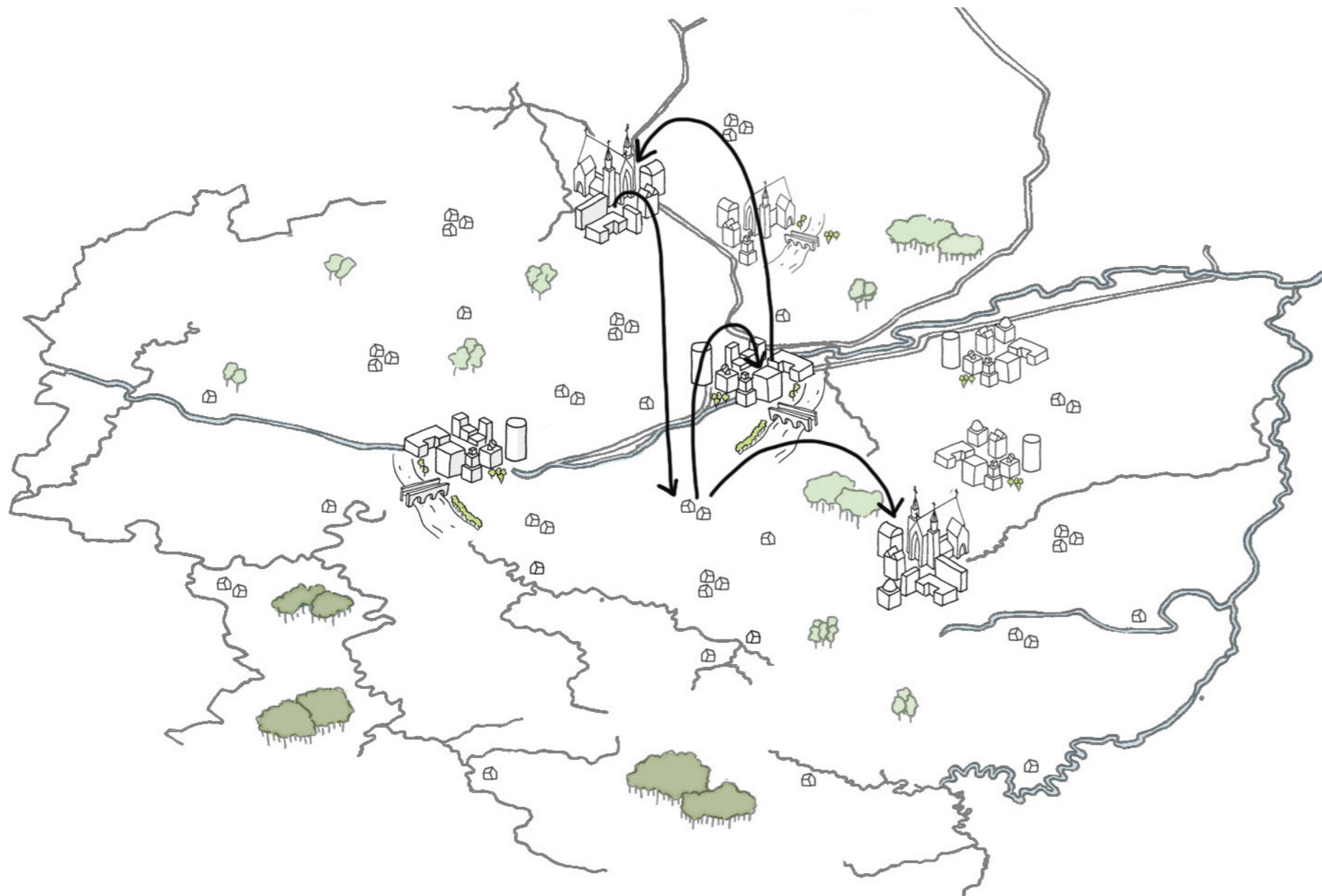




Travel diary

- 07.30u - 08.00u Travel to work
- 15.00u - 15.20u Travel to meeting in Hasselt
- 17.30u - 18.10u Travel home before dinner

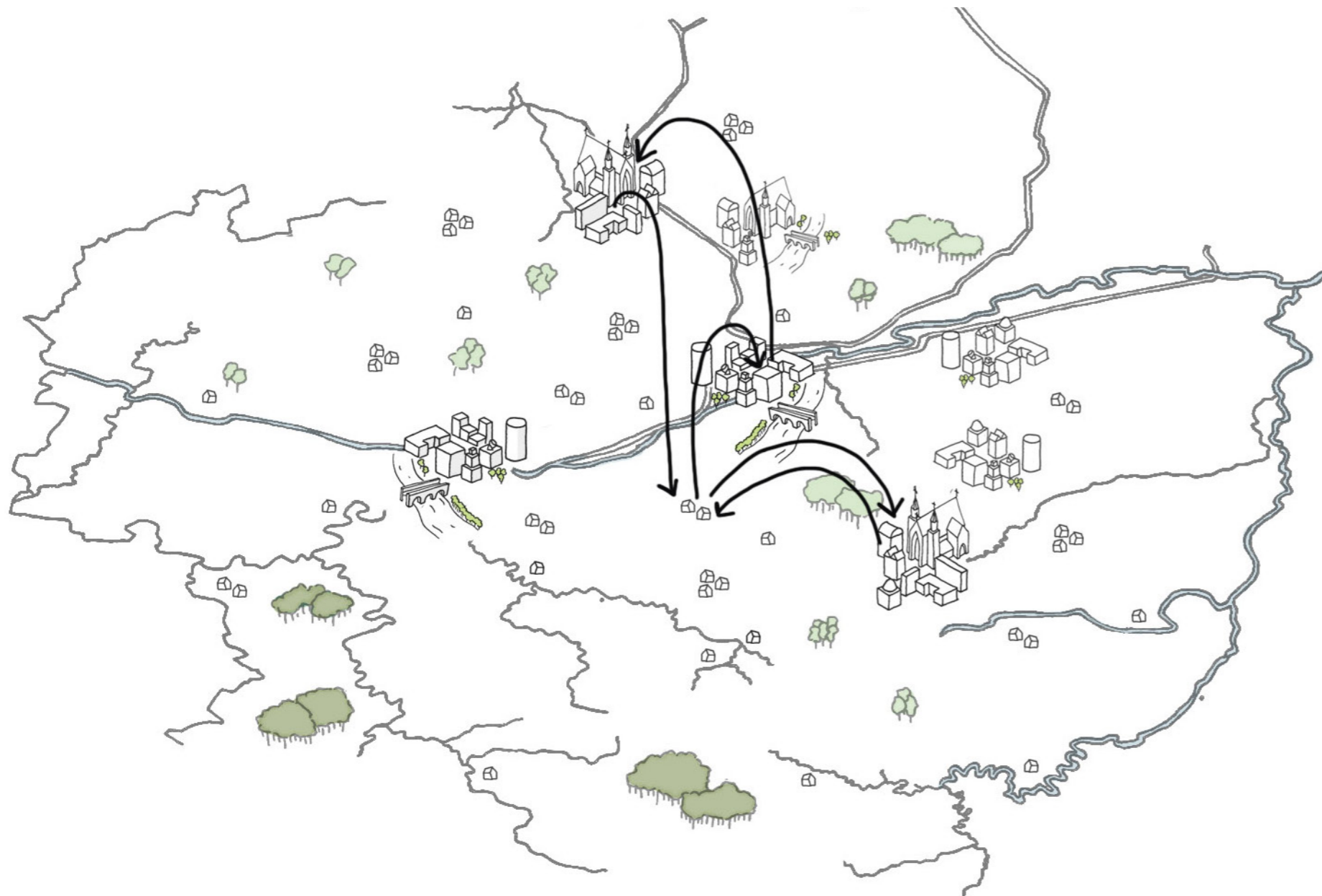




Travel diary

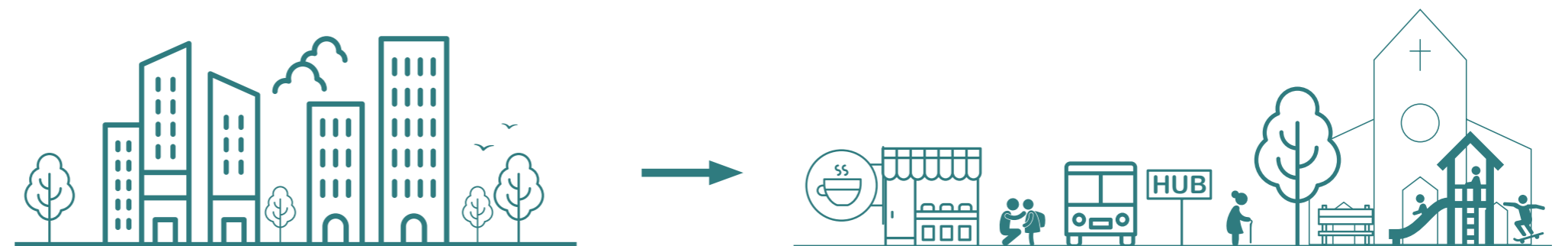
- 07.30u - 08.00u Travel to work
- 15.00u - 15.20u Travel to meeting in Hasselt
- 17.30u - 18.10u Travel home before dinner
- 19.30u - 19.50u Travel to dance performance in Aachen





Travel diary

- 07.30u - 08.00u Travel to work
- 15.00u - 15.20u Travel to meeting in Hasselt
- 17.30u - 18.10u Travel home before dinner
- 19.30u - 19.50u Travel to dance performance in Aachen
- 23.30u - 24.00u Travel home at night



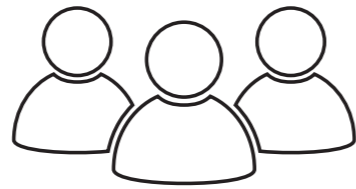


Unique Euregio Maas-Rijn in which natural landscapes, diverse urban centres and a high quality of life come together.

Accessibility throughout the region

Integrated, sustainable region, where all residents can profit from the benefits of the network of cities.

Analysis & conclusions



Government urban planning



Government public transport



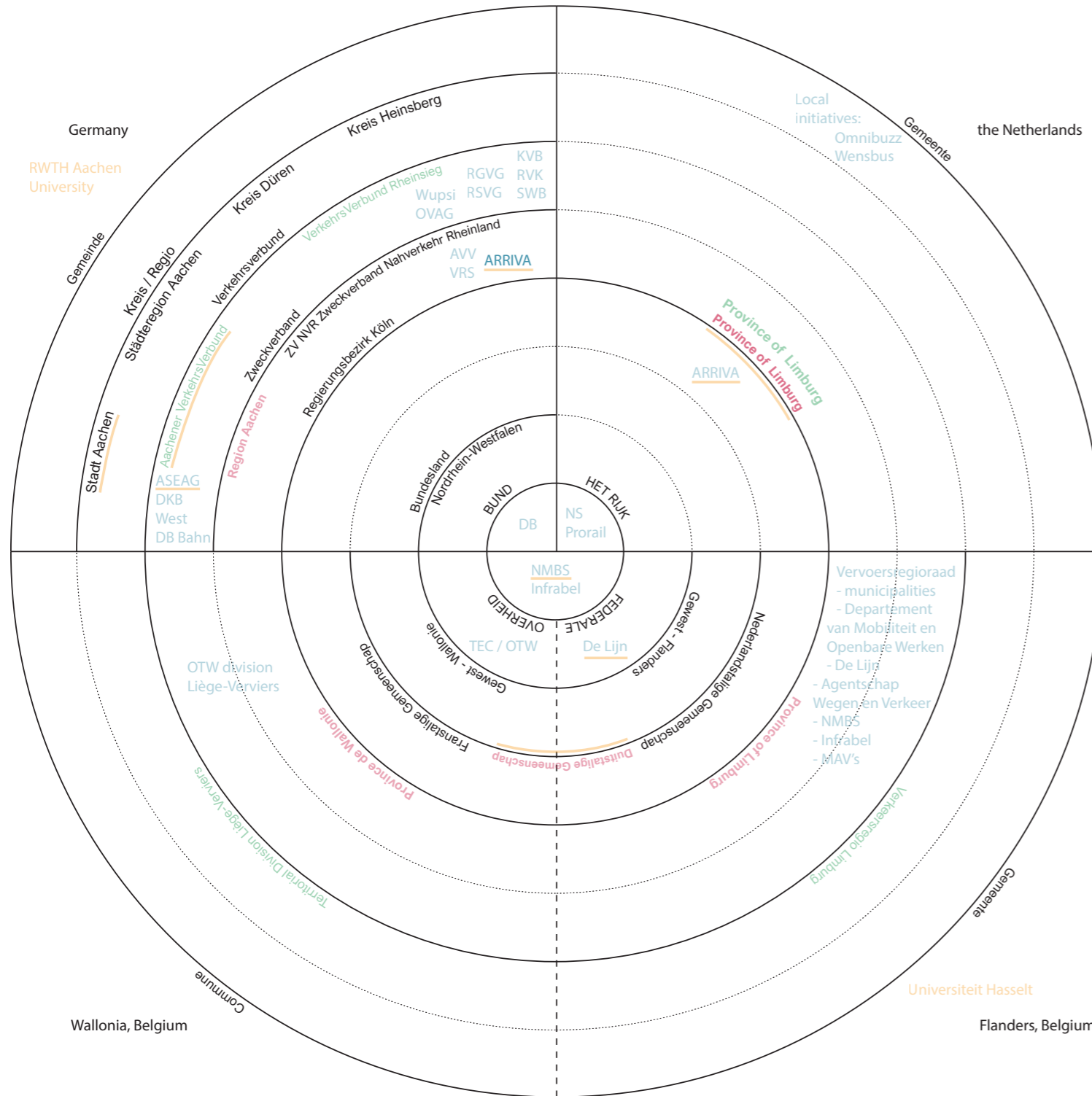
Public transport companies



Euregio Maas-Rijn foundation



EMR connect



Differences in number of responsible governmental bodies

Analysis & conclusions



Government urban planning



Government public transport



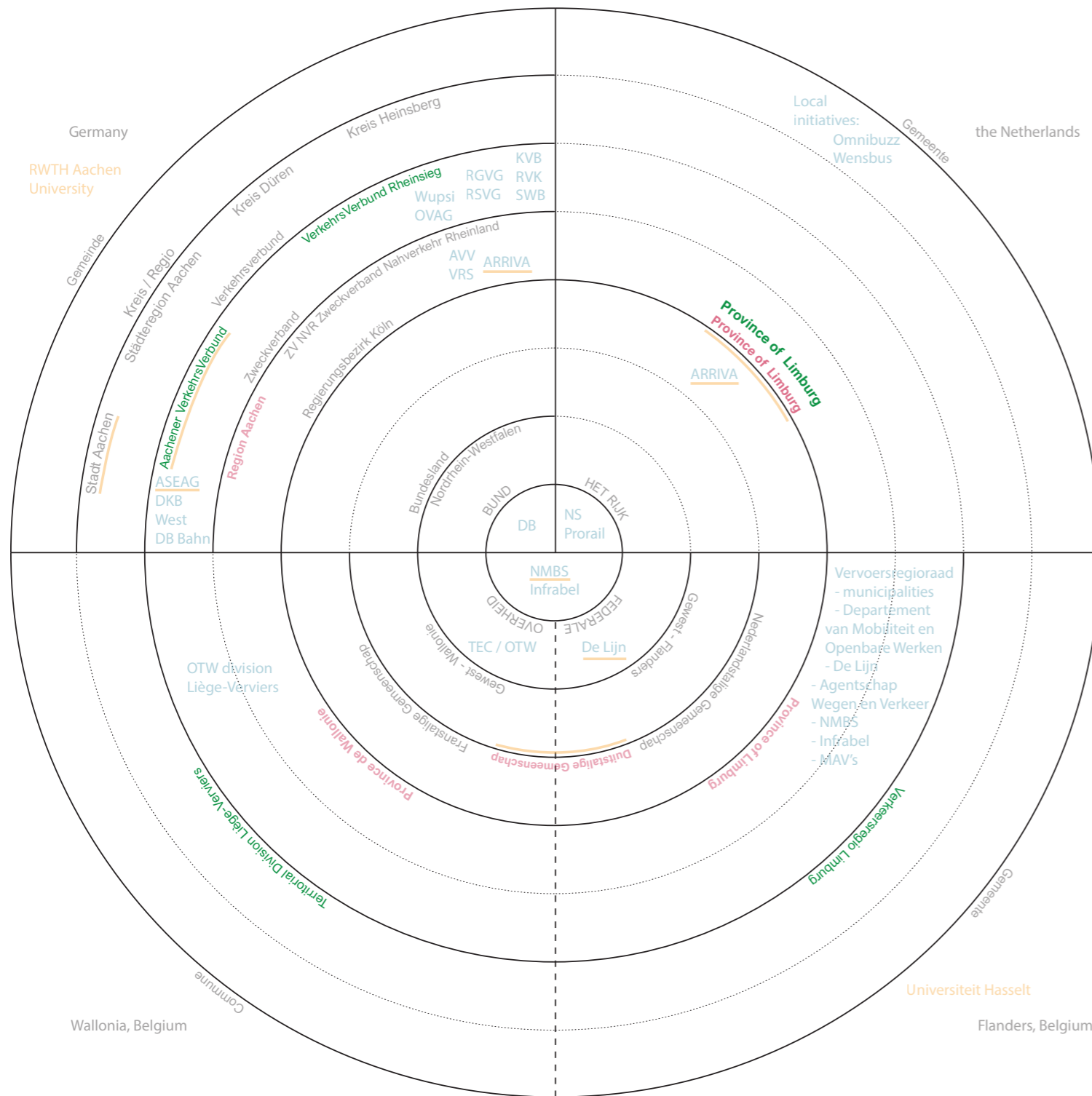
Public transport companies



Euregio Maas-Rijn foundation



EMR connect



Transportation regions do not always correspond to urban development territory

Analysis & conclusions



Government urban planning



Government public transport



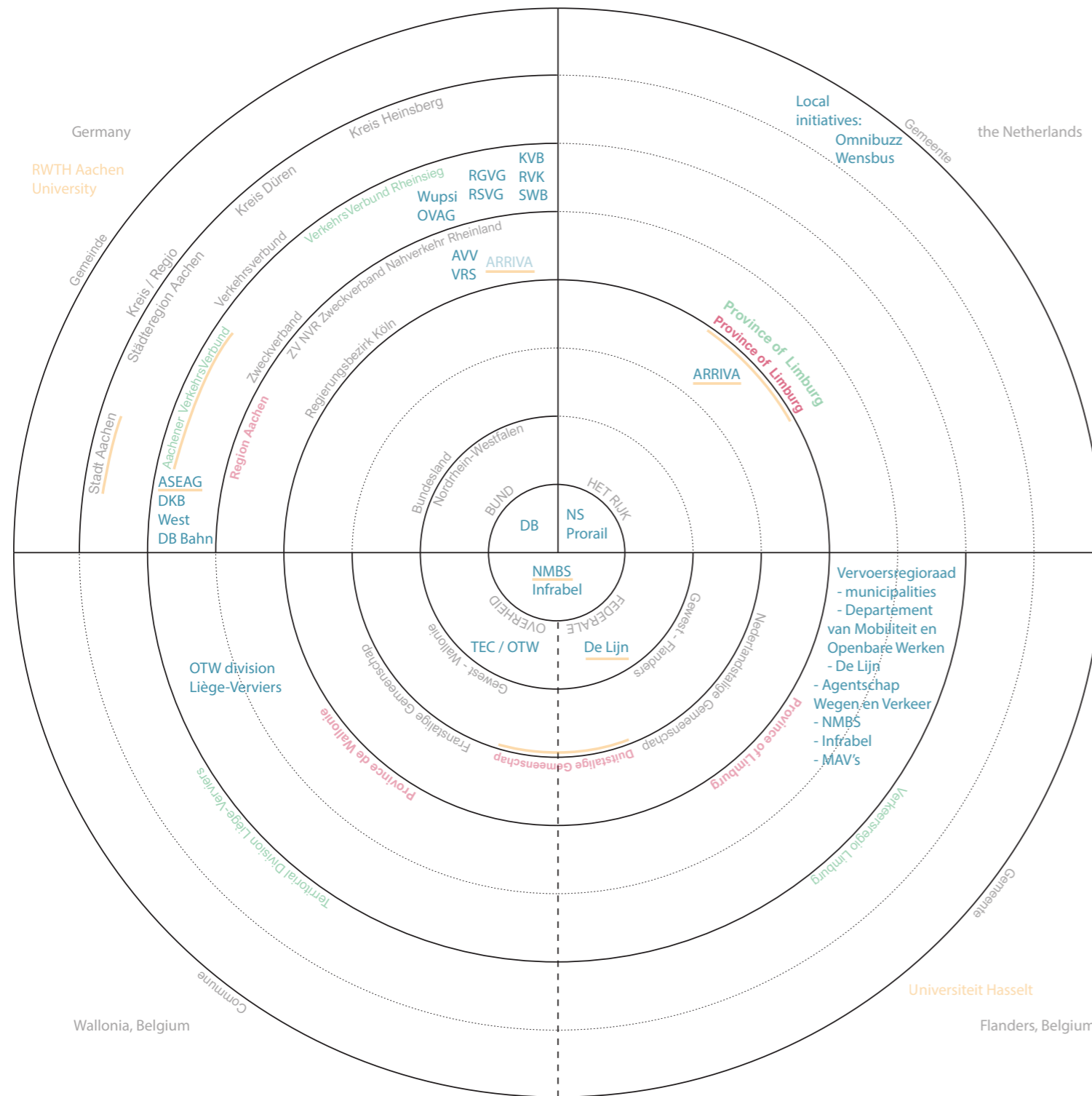
Public transport companies



Euregio Maas-Rijn foundation



EMR connect



Public transport companies operate under the responsibility of the government body that relates to the scale of the network

Analysis & conclusions



Government urban planning



Government public transport



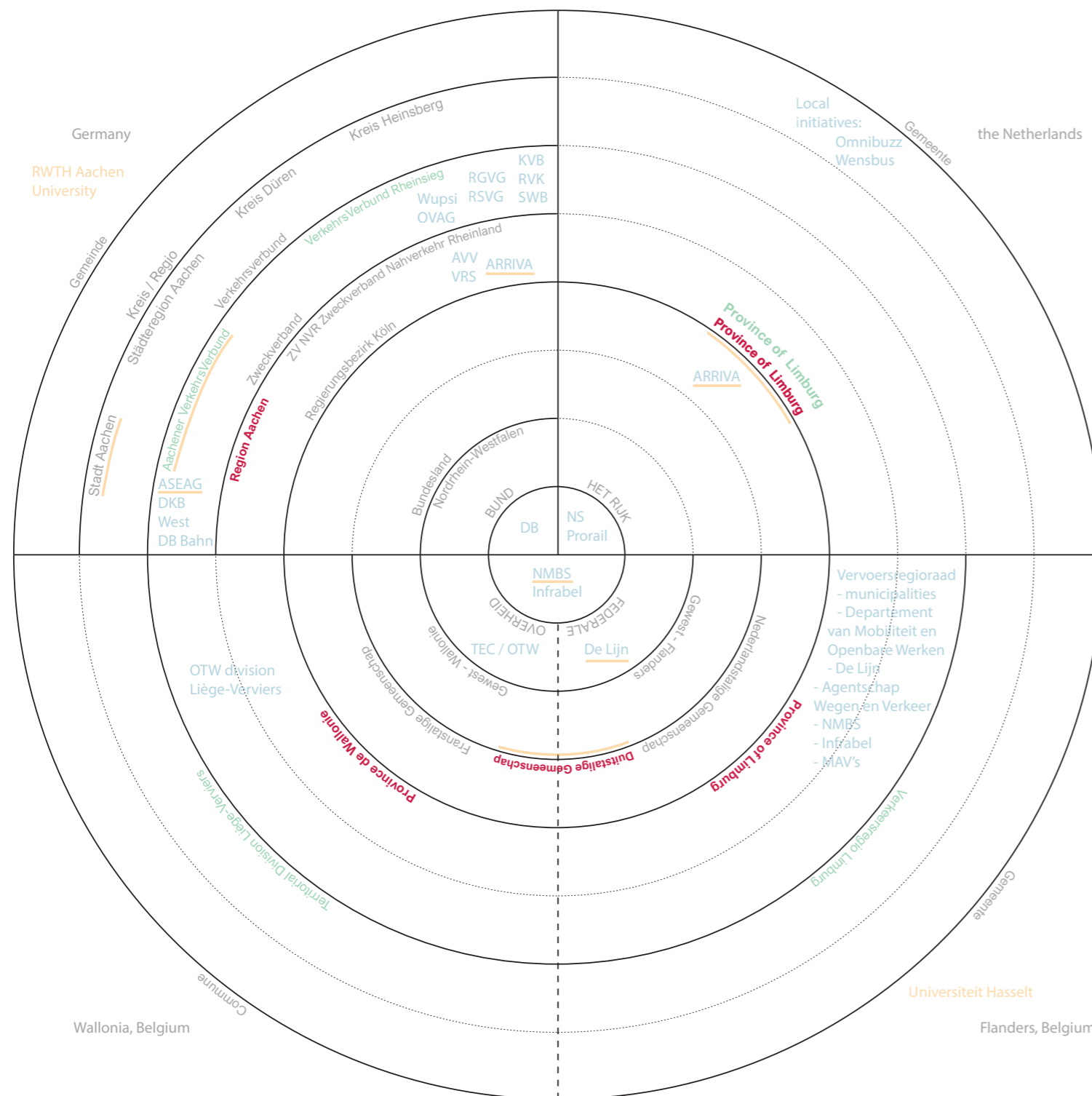
Public transport companies



Euregio Maas-Rijn foundation



EMR connect



Governance bodies in the EMR foundation do not correspond to responsible actors for public transport

Analysis & conclusions



Government urban planning



Government public transport



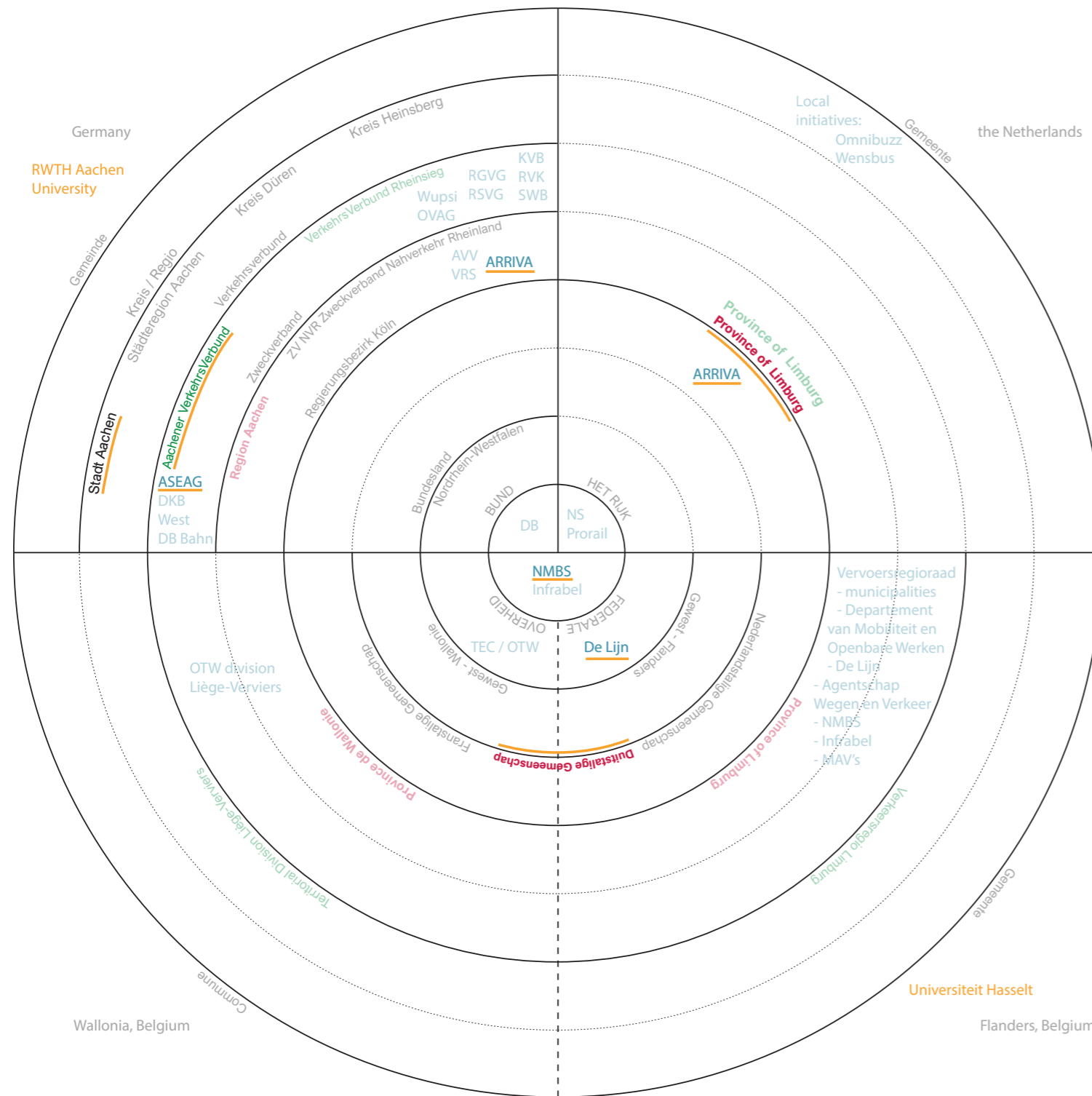
Euregio Maas-Rijn foundation



Public transport companies



EMR connect



Includes research institutions as well
 Incomplete group of actors related to public transport

Analysis & conclusions

Complexity of diversity of governance structures

Overlap of governance structures including the same actors

