



Urban planning and transport infrastructure provision
in the Randstad, Netherlands – a global city cluster

Dominic Stead & Evert Meijers

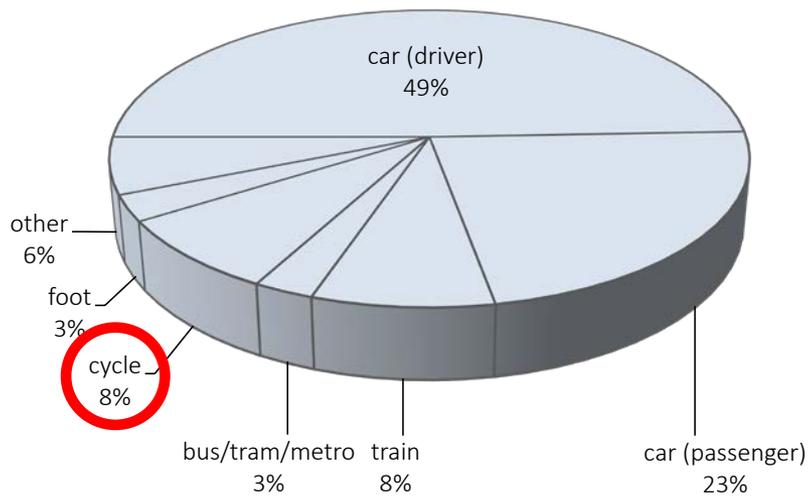
The Netherlands

- 16.8 million inhabitants (64th largest population)
- 17th largest economy
- 450 people per km²
- 3.2% increase in population (2004-2013)
- 3.8% increase in urban population (2004-2010)
- 0.52 cars per capita
- >1 bicycle per capita

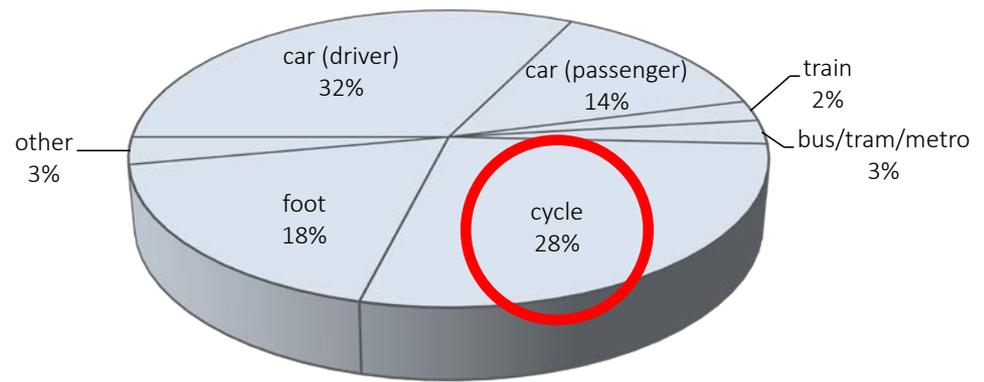
China

- 1,357 million inhabitants (largest population)
- 2nd largest economy
- 141 people per km²
- 4.4% increase in population (2004-2013)
- 22.6% increase in urban population (2004-2010)
- 0.12 cars per capita

Modal split in the Netherlands

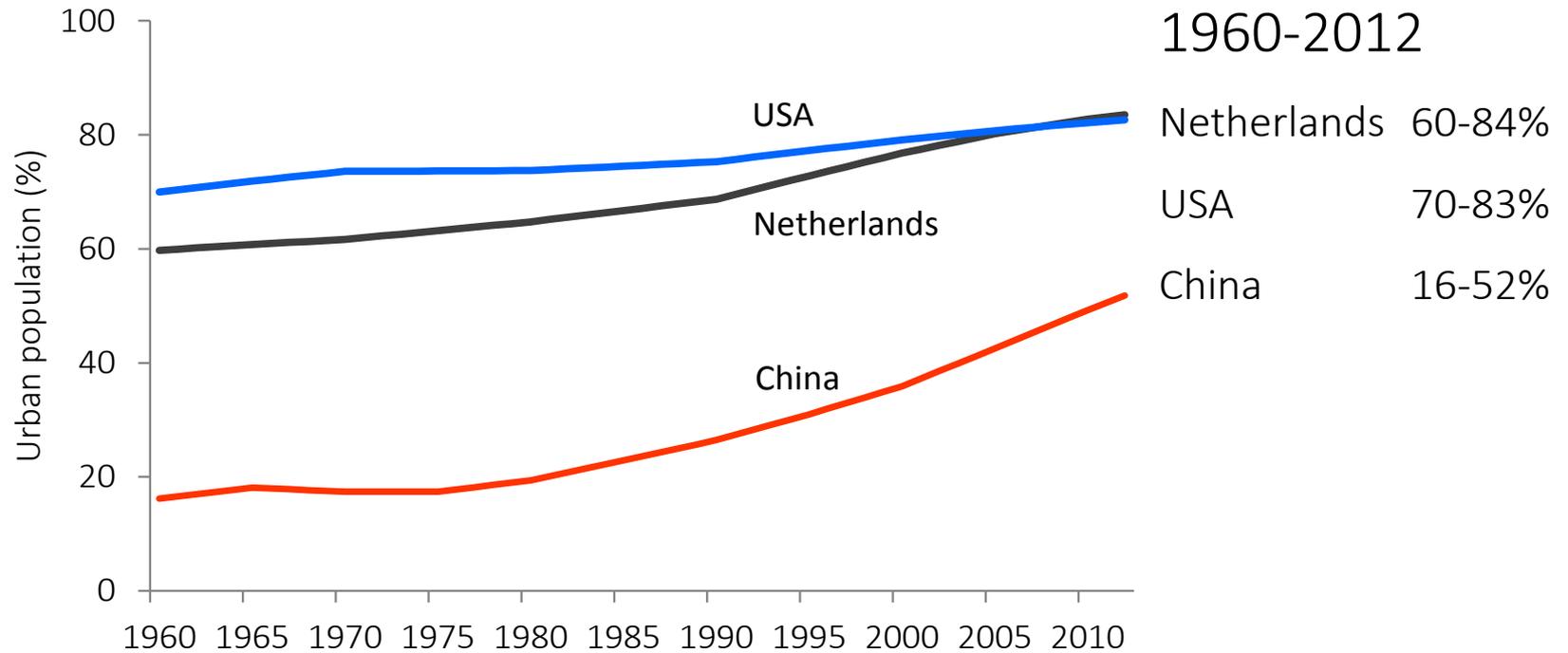


by distance



by trip

Urbanisation in the Netherlands



Urbanisation in the Netherlands, 1950



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Urbanisation in the Netherlands, 2010



rijksoverheid.nl

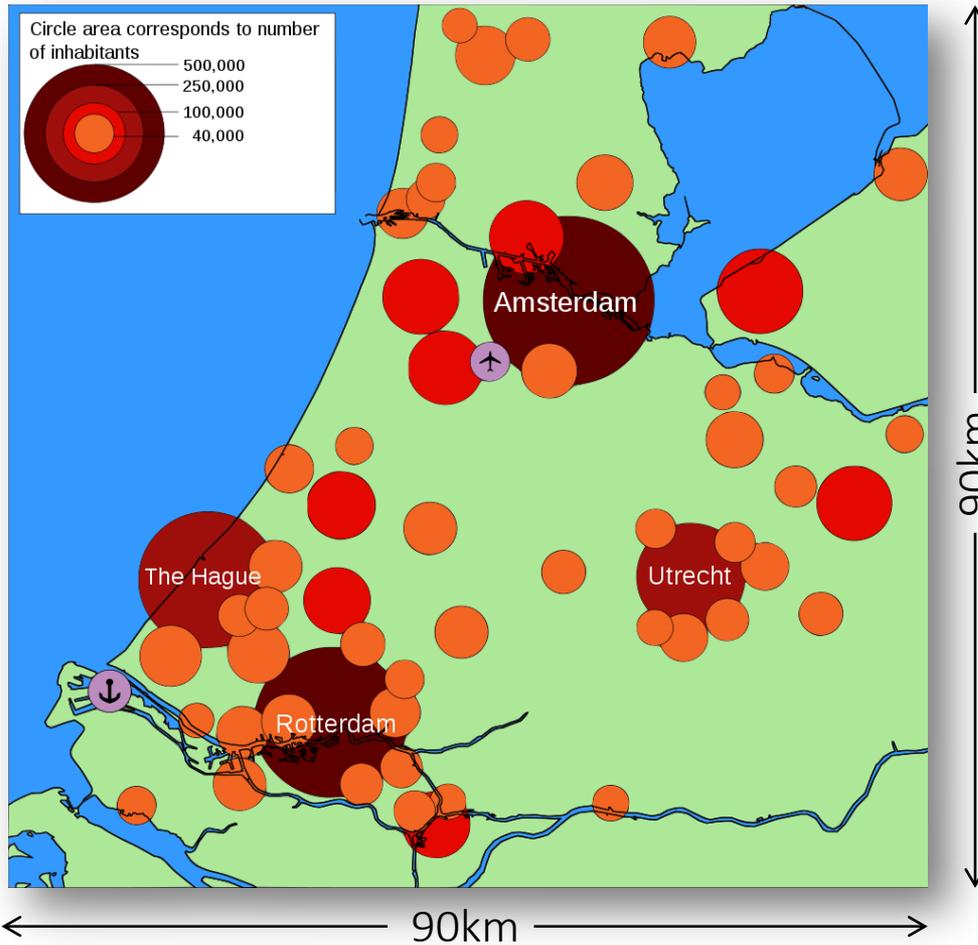
The Randstad



- High-density, low-rise
- Large proportion of the country's population
- No dominant core city
- Not a tier of government
- No official boundary
- One of Europe's most populous metropolitan regions (after London, Rhine-Ruhr, Paris and Milan)

rijksoverheid.nl

The Randstad



Contains the 4 largest cities in NL:

- Amsterdam (0.8 million)
- Rotterdam (0.6 million)
- the Hague (0.5 million)
- Utrecht (0.3 million)

Total population \approx 7 million

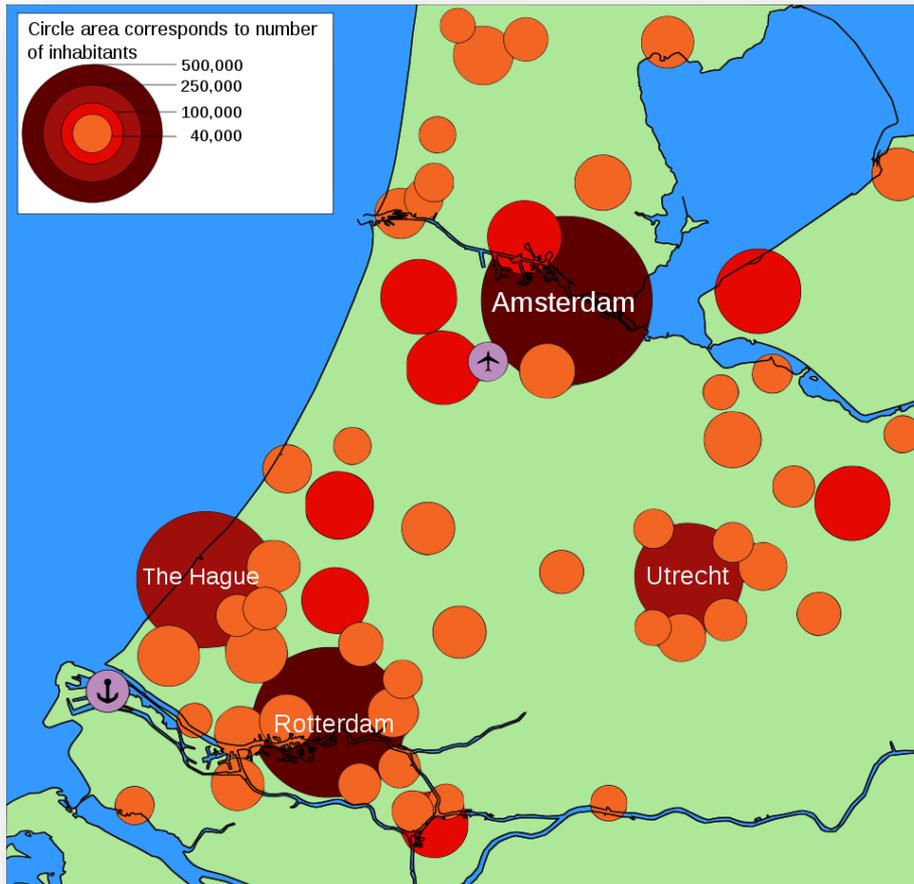
> 40% of NL population

Another 7 cities with >100,000 residents:

Almere, Amersfoort, Dordrecht, Haarlem, Leiden, Zaanstad, Zoetermeer

Polycentric, networked urban structure

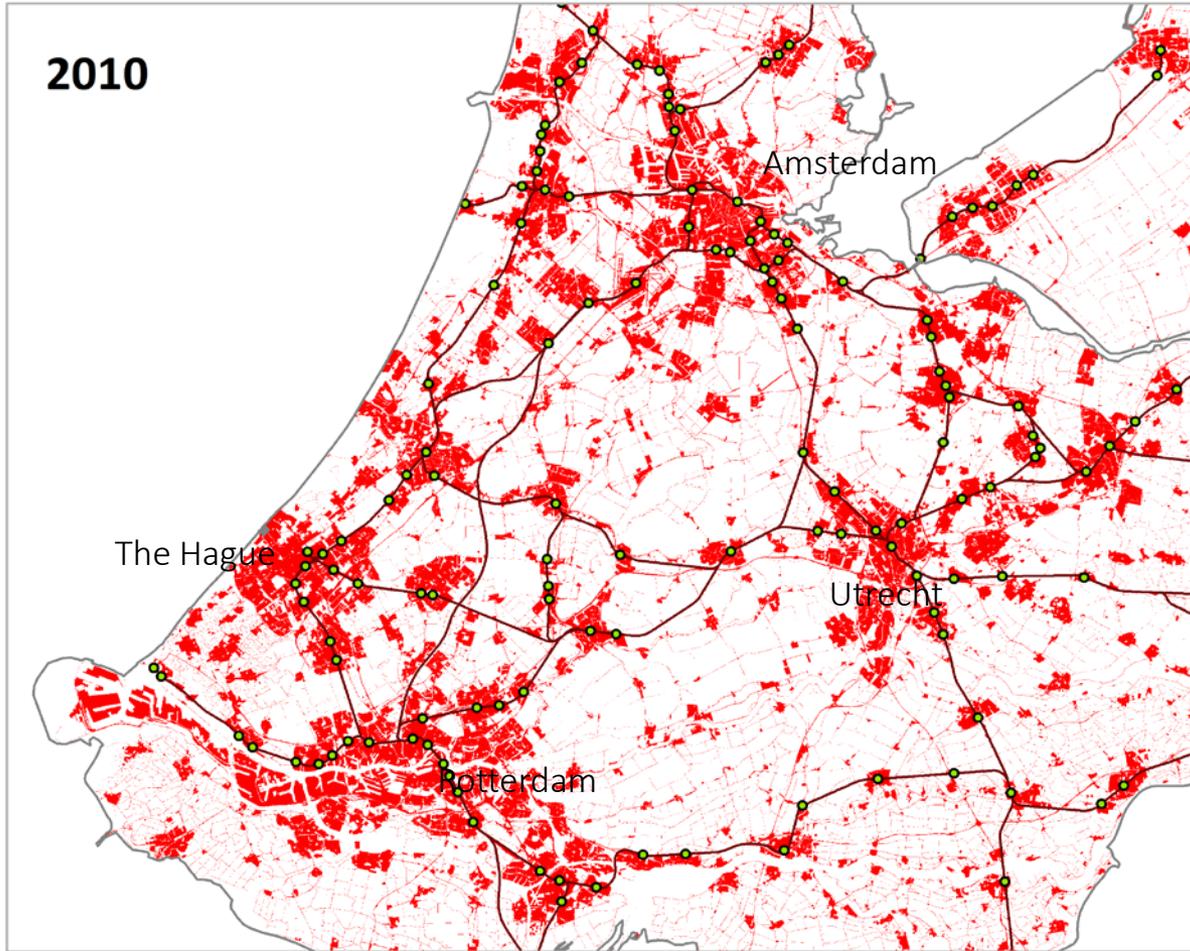
The Randstad



Complementary urban functions

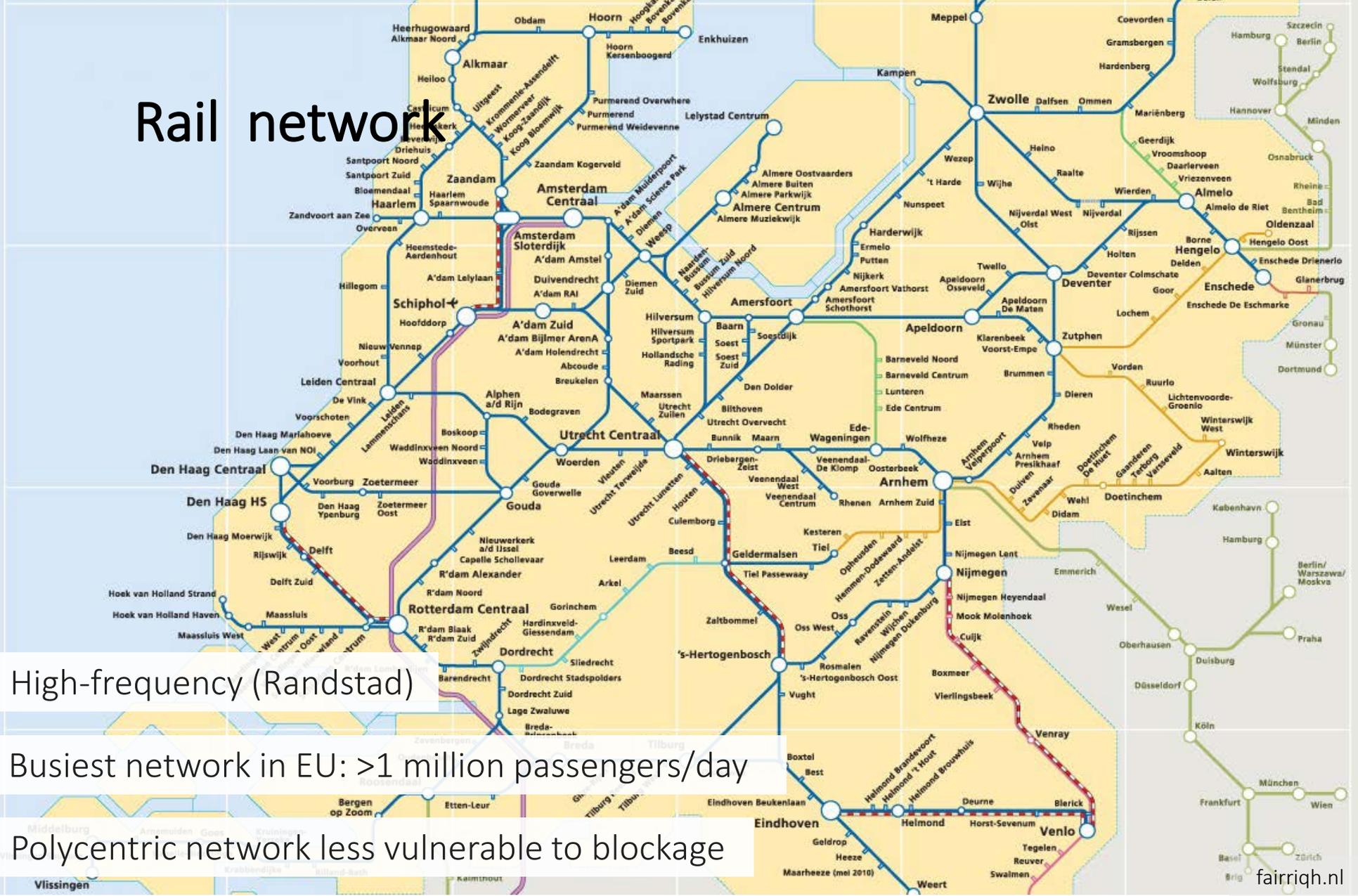
- Amsterdam: culture and finance
- Rotterdam: shipping and trade
- The Hague: government and international organisations
- Utrecht: health and service sectors

Urbanisation and rail infrastructure development

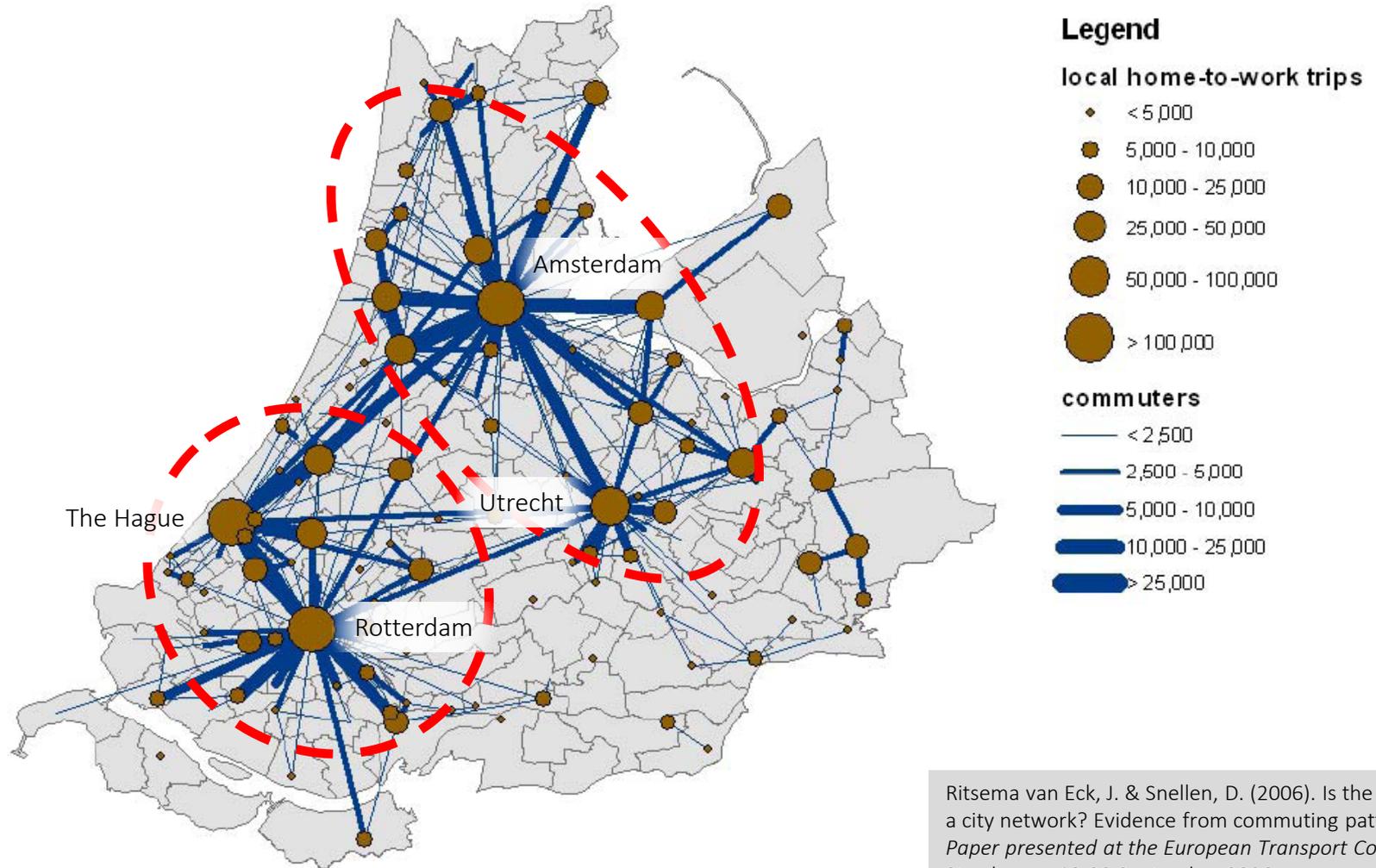


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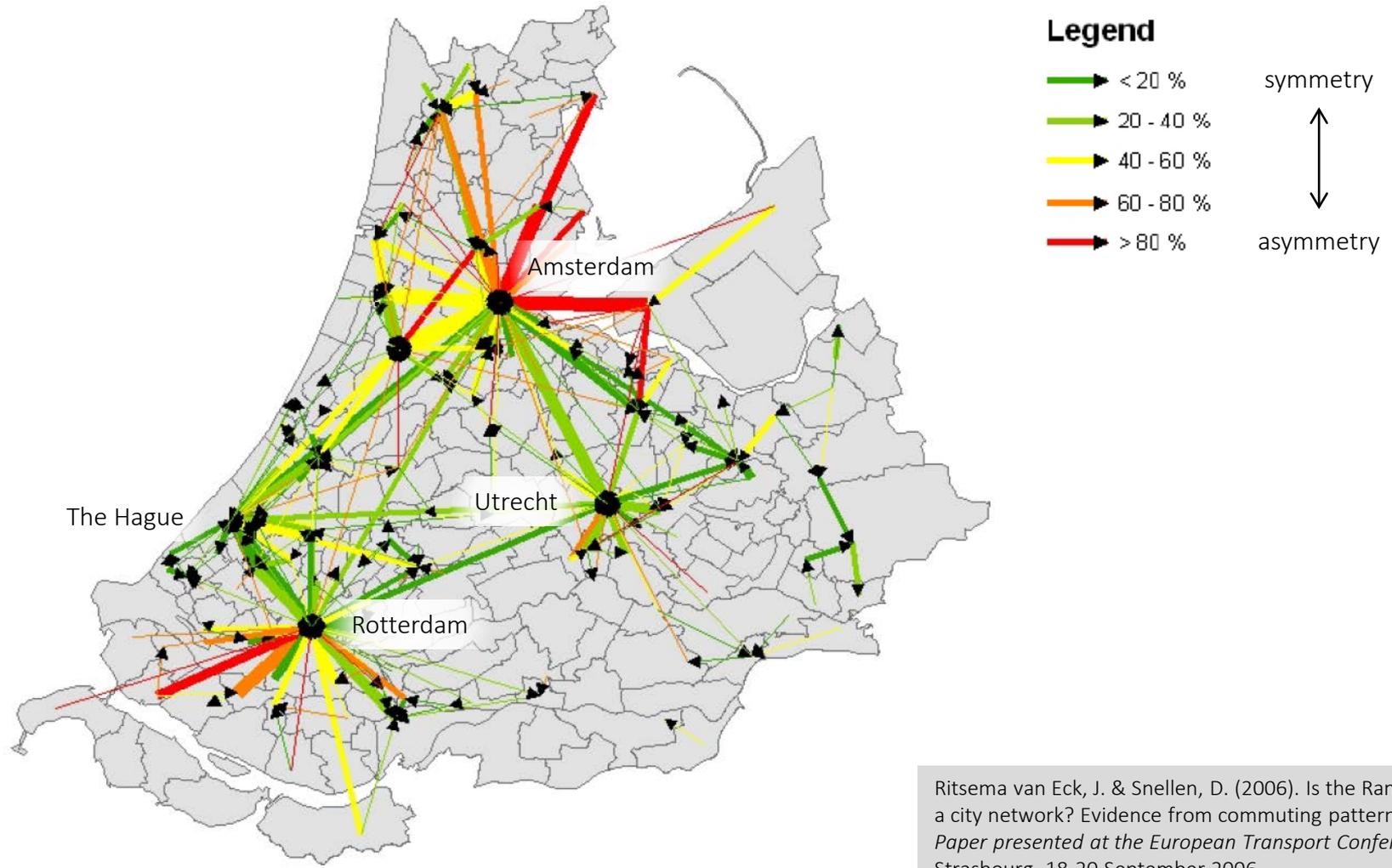
Rail network



Commuting patterns – flows

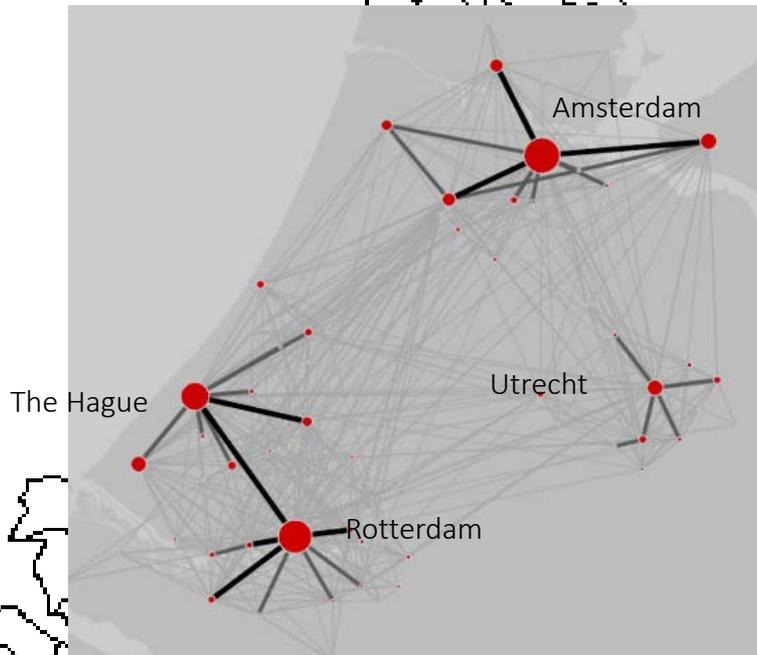


Commuting patterns – direction of flows



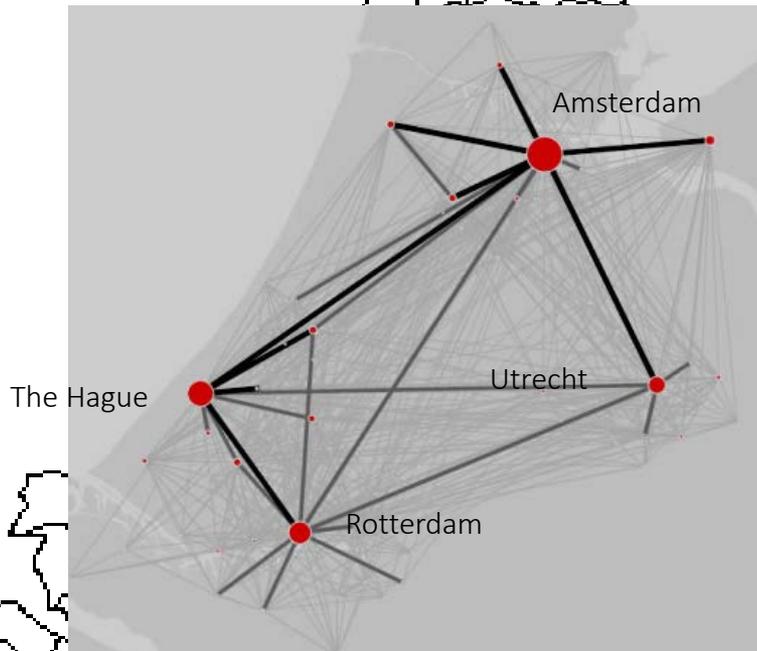
Ritsema van Eck, J. & Snellen, D. (2006). Is the Randstad a city network? Evidence from commuting patterns. Paper presented at the European Transport Conference, Strasbourg, 18-20 September 2006.

Commuting – lower-skilled



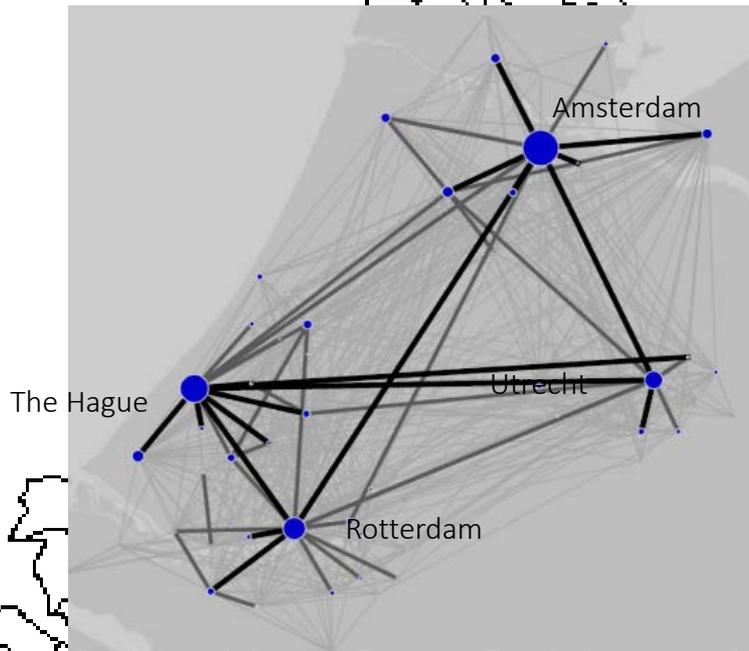
Burger, M. van der Knaap, B. & Wall, R.S. (2014).
Polycentricity and the Multiplexity of Urban Networks.
European Planning Studies 22(4) 816-840
<http://dx.doi.org/10.1080/09654313.2013.771619>

Commuting – higher-skilled



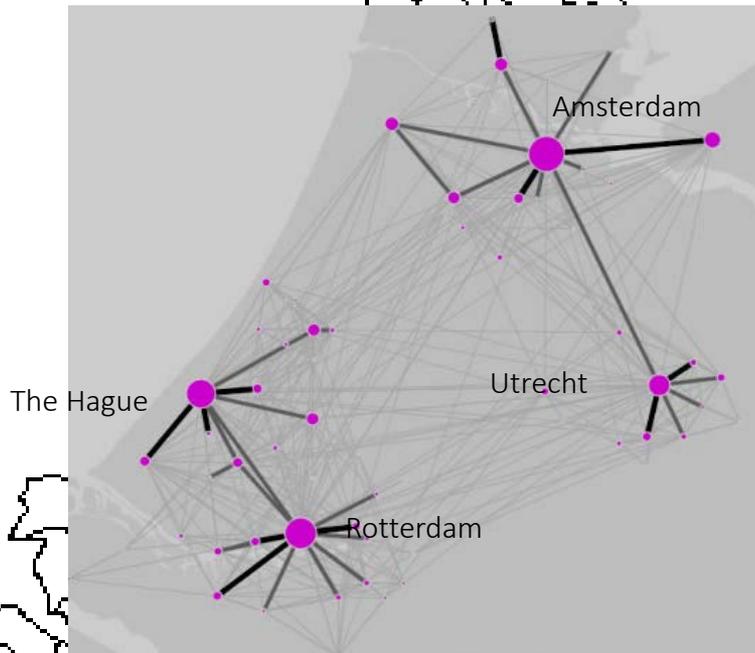
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Business travel



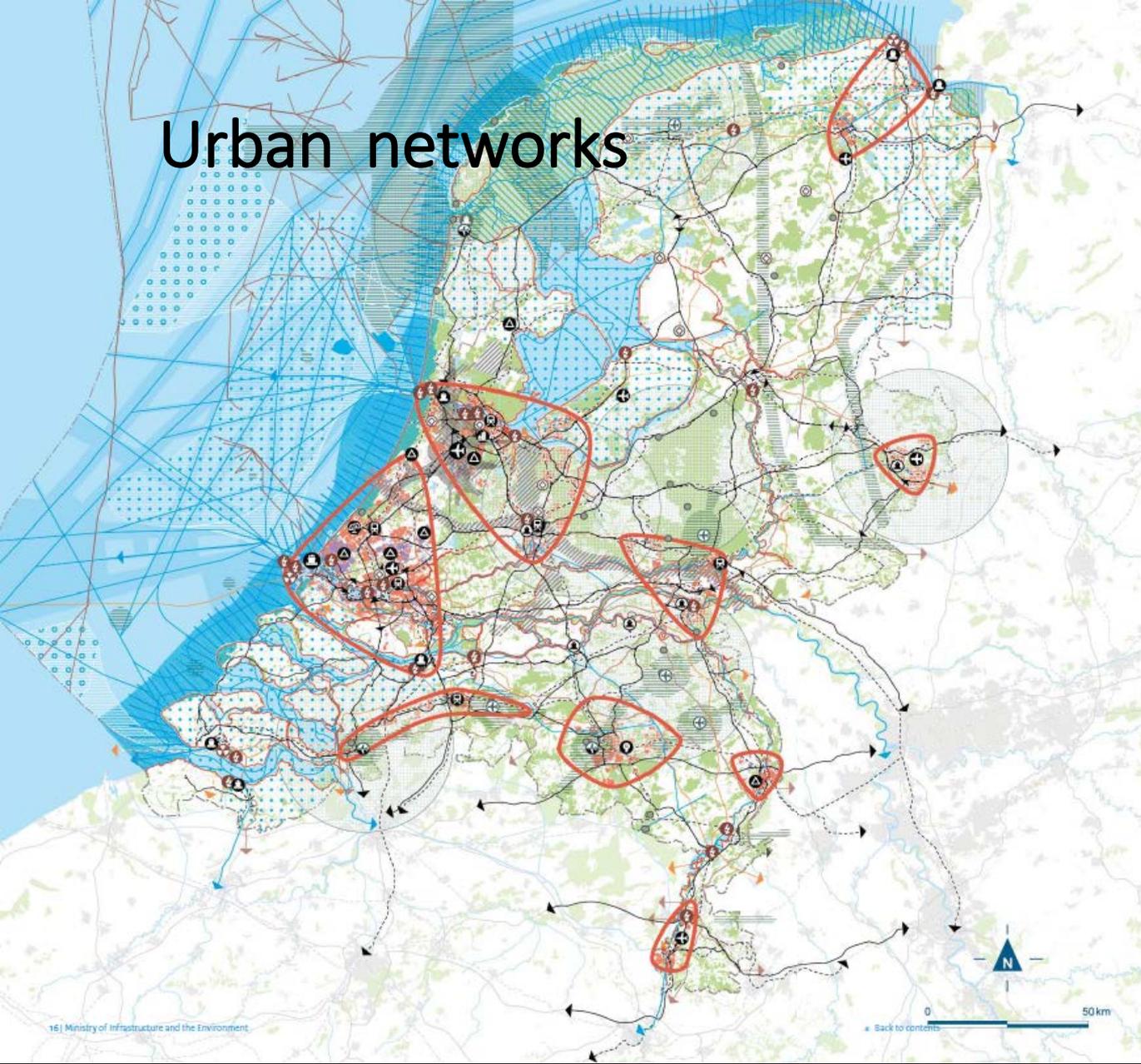
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Shopping



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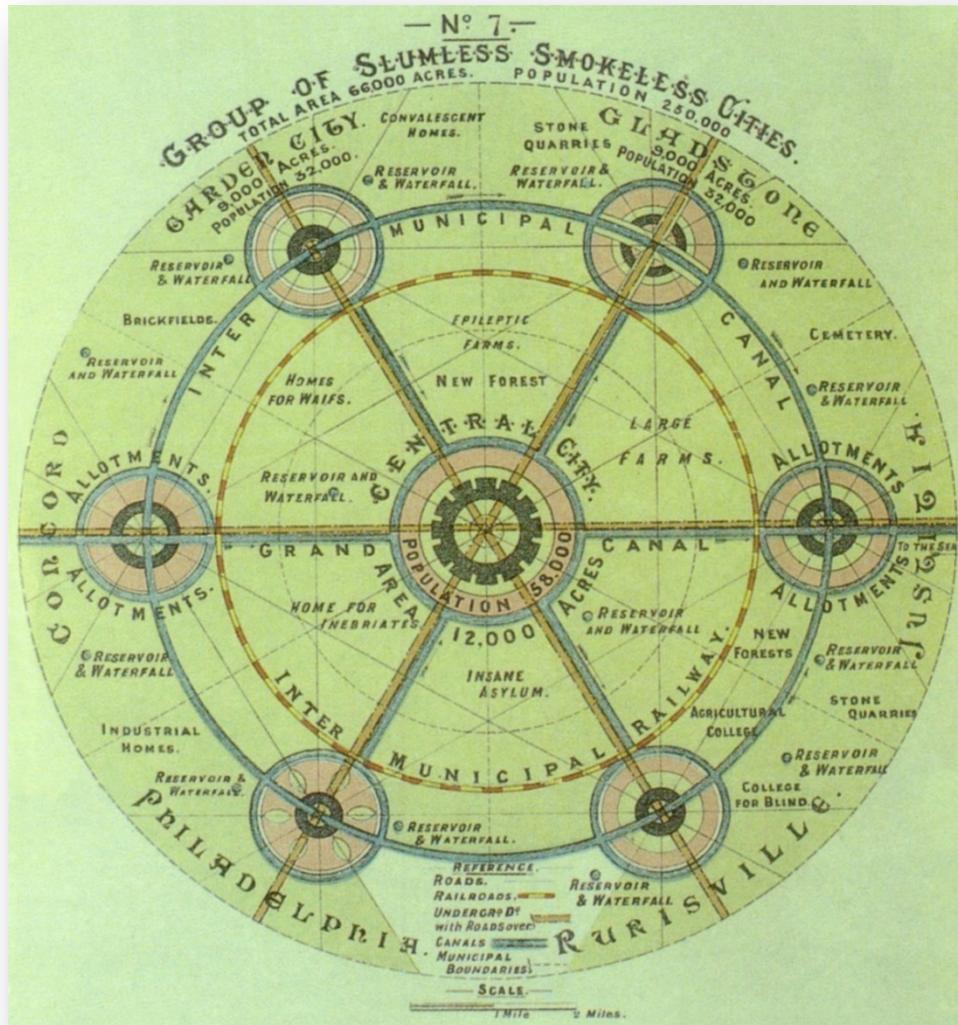
Urban networks



Map: National Spatial Structure

- Competitive**
- Urban region with a concentration of key sectors
- Mainport Schiphol
- 20 Ke noise contour
- Rotterdam Mainport
- Brainport Southeast Netherlands
- Greenport
- Zuidas development
- International city of peace and justice
- (Potential) site for power plant, from 500MW
- (Potential) site for nuclear power plant
- High-voltage power line, from 220 kV
- New high-voltage power line (approximate route)
- Pipeline zone
- Pipeline
- Existing offshore wind farm
- Designated area for offshore wind farm
- Potential area for offshore-onshore grid link
- Area with high potential for wind power
- Accessible**
- Railway station for high-speed/international trains
- Civilian airport of national importance
- Seaport of national importance
- Inland port of national importance
- Potential route for new road on main road network (not yet established)
- Potential route for new line on main railway network (not yet established)
- National or international main road network
- National or international main railway network
- National or international main waterway network
- Liveable and safe**
- Main water system
- Management of coastal foundation
- Primary flood defence
- Maintain unrestricted view to horizon
- Cultural heritage site on (tentative) World Heritage list
- Natural heritage site on World Heritage list
- Other property or site on (tentative) World Heritage list
- Revised national ecological network on land
- Military restricted zone
- Radar activity
- Military air base
- Military air base with civilian use
- Naval base
- Major military training area and/or artillery range

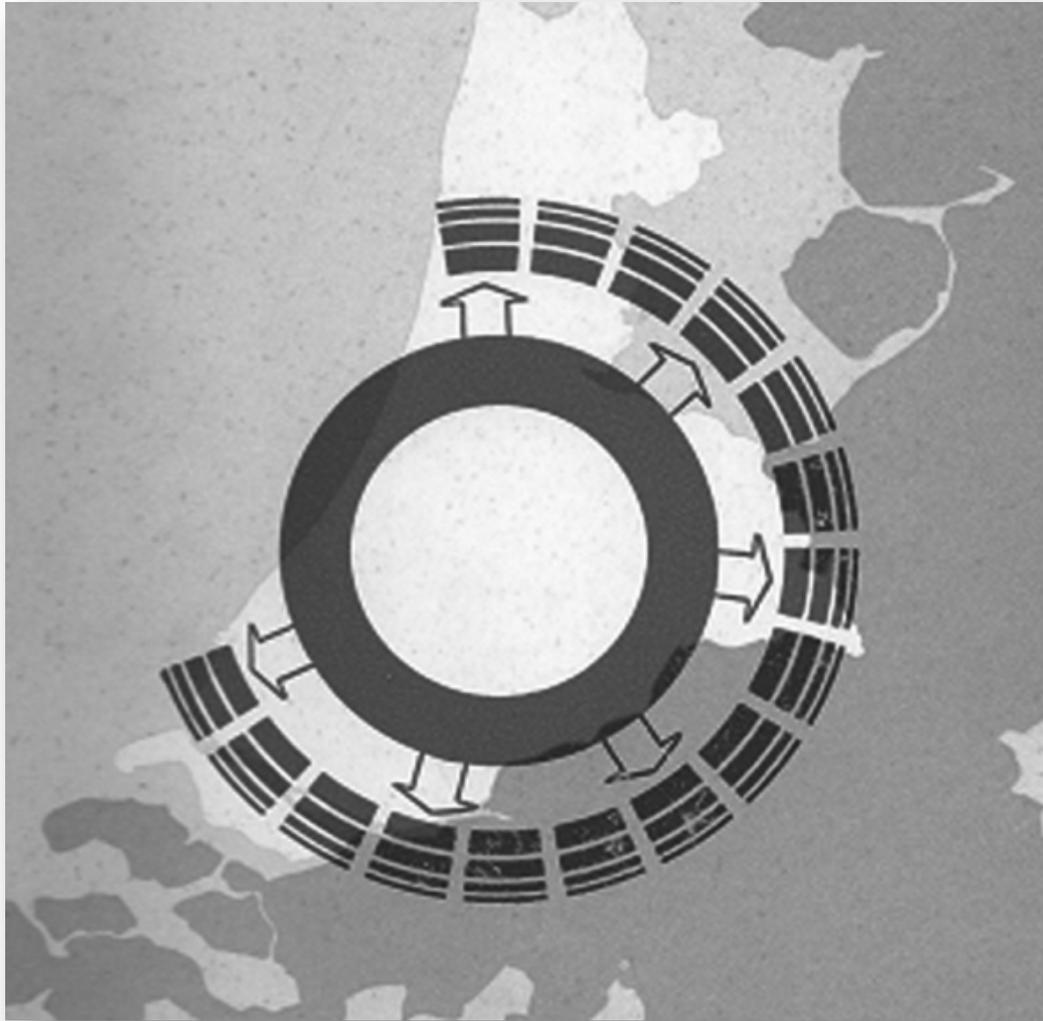
Urban form, city clusters and urban performance



- Ideas about city clusters are not new
- Whether city clusters perform economically, environmentally or socially better than single cities of the same size has not been established conclusively
- Agglomeration benefits/ 'borrowed size' (+)
- 'Agglomeration shadows' (-)

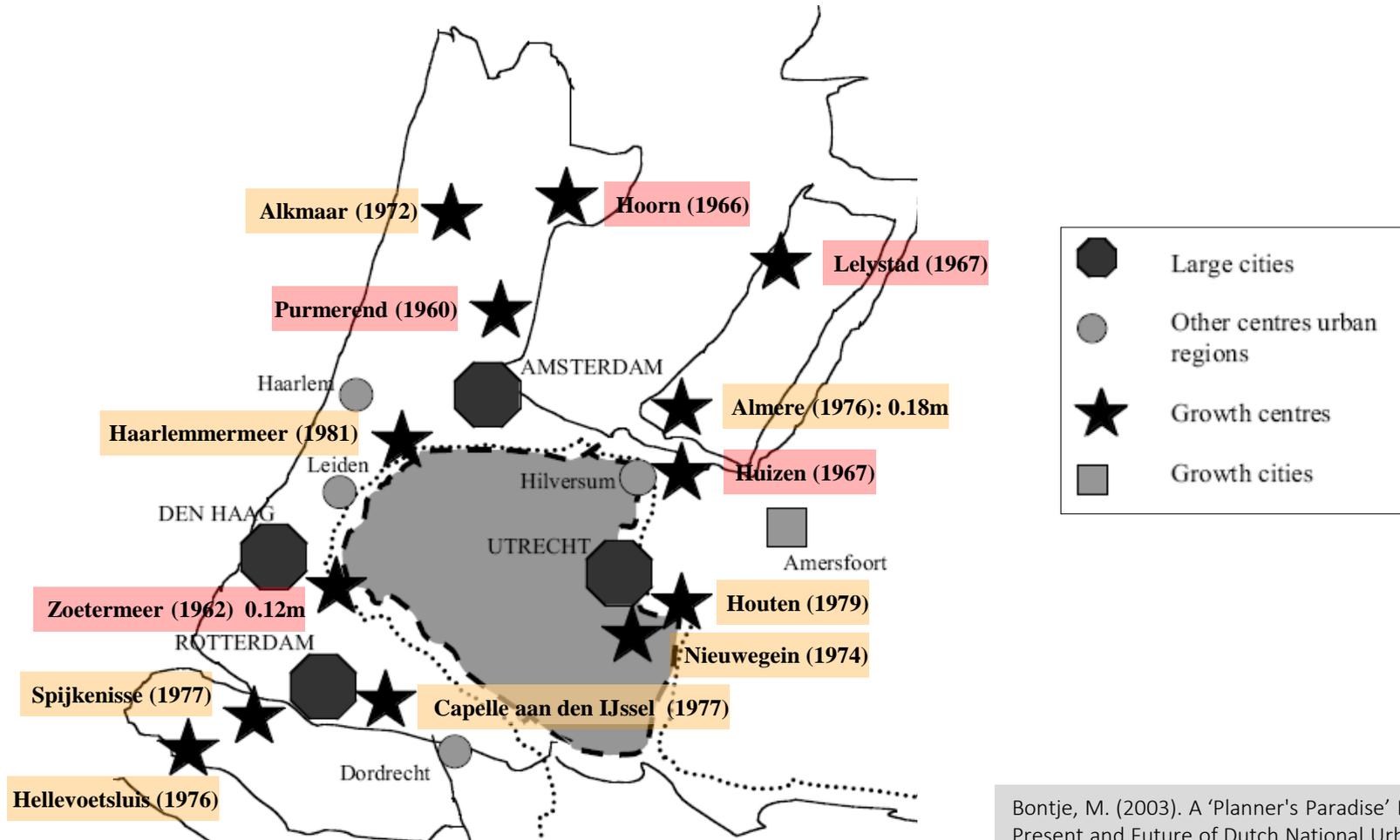
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Urban growth, 1950s

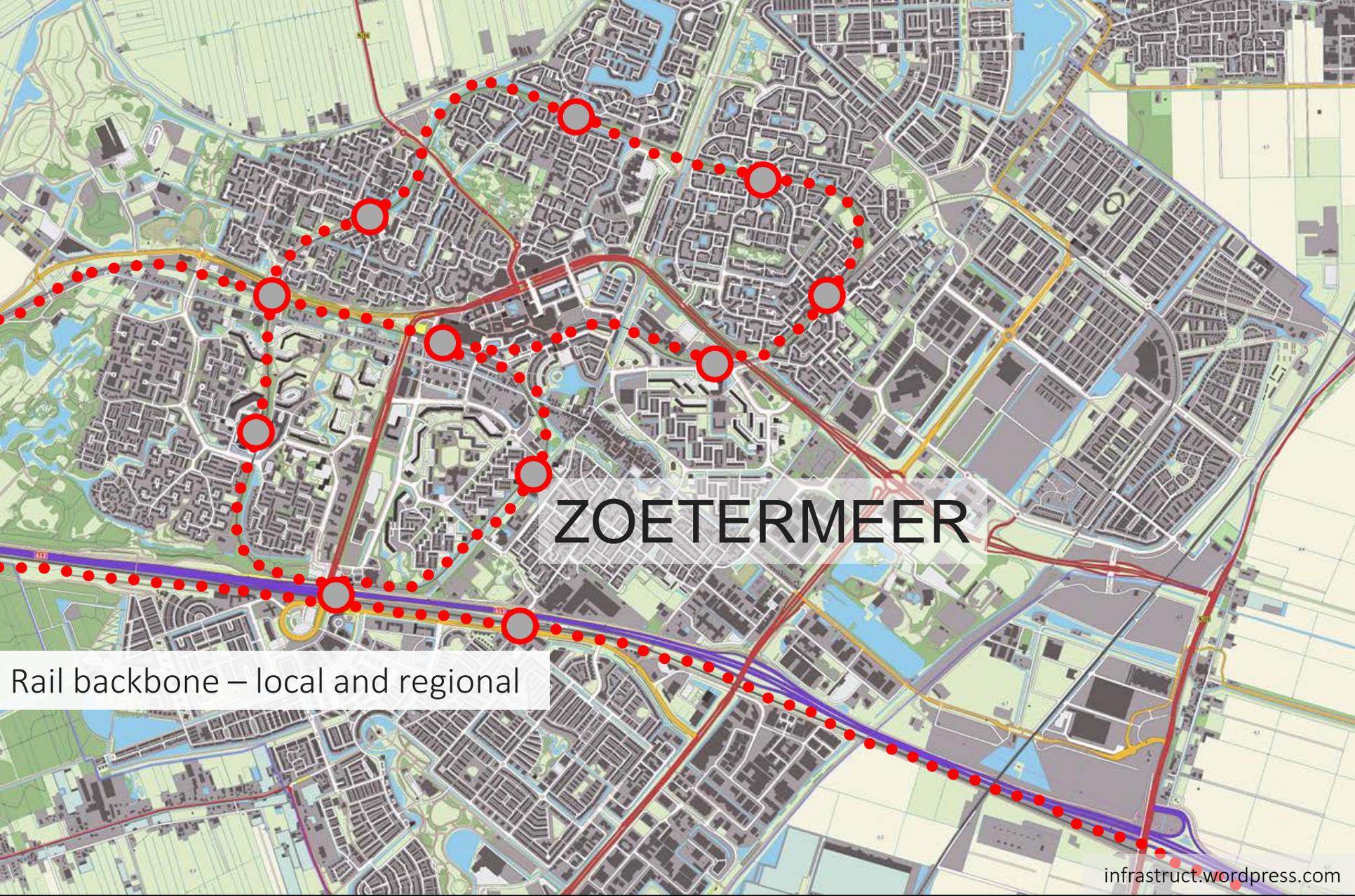


- post-war reconstruction
- extensive city expansion, suburbanisation
- protection of the 'Green Heart'
- concerns about overcrowding, air quality, healthy living conditions
- increasing motorisation, some cuts in rail infrastructure

Urban growth, 1960s-1980s



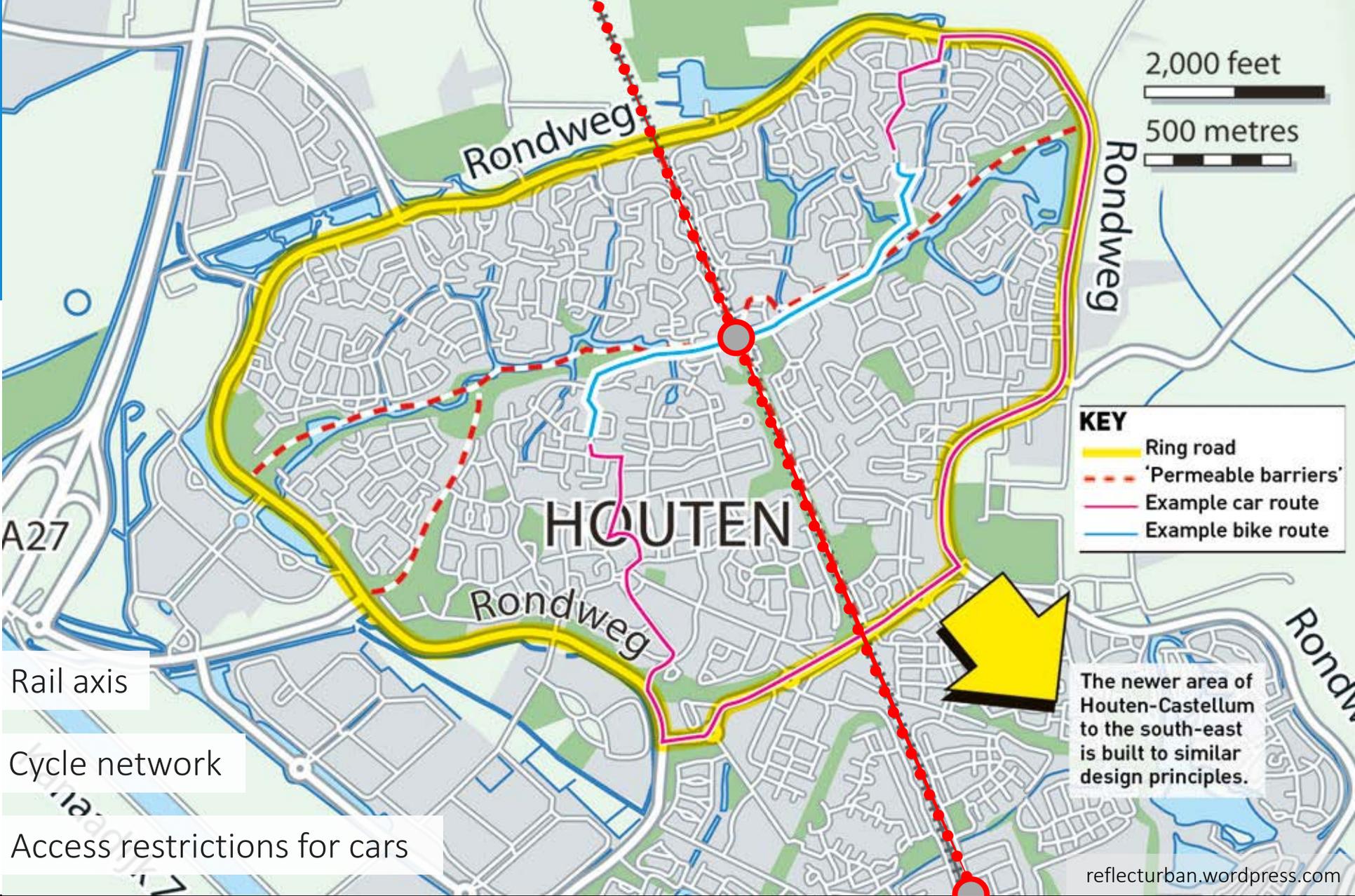
Bontje, M. (2003). A 'Planner's Paradise' Lost? Past, Present and Future of Dutch National Urbanization Policy. *Eur. Urban & Regional Studies* 10(2) 135-151 <http://dx.doi.org/10.1177/0969776403010002003>



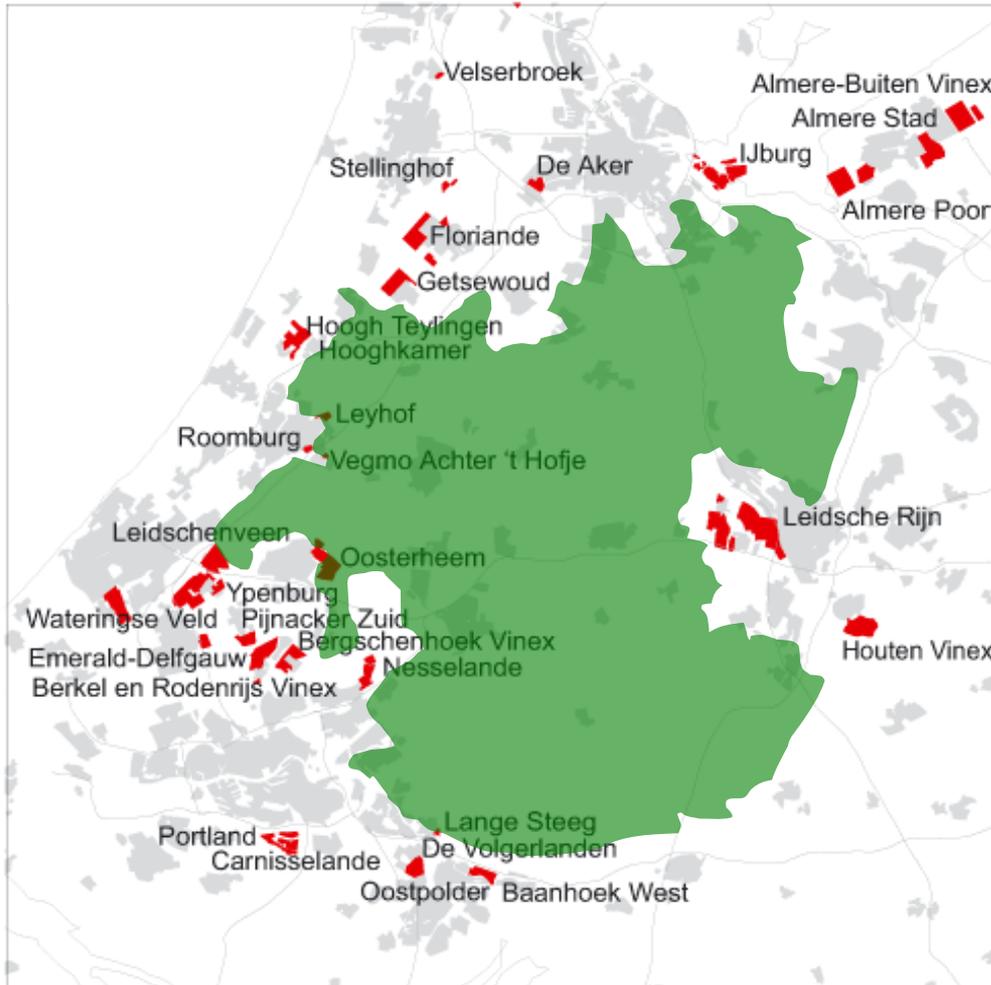
ZOETERMEER

Rail backbone – local and regional

infrastruct.wordpress.com

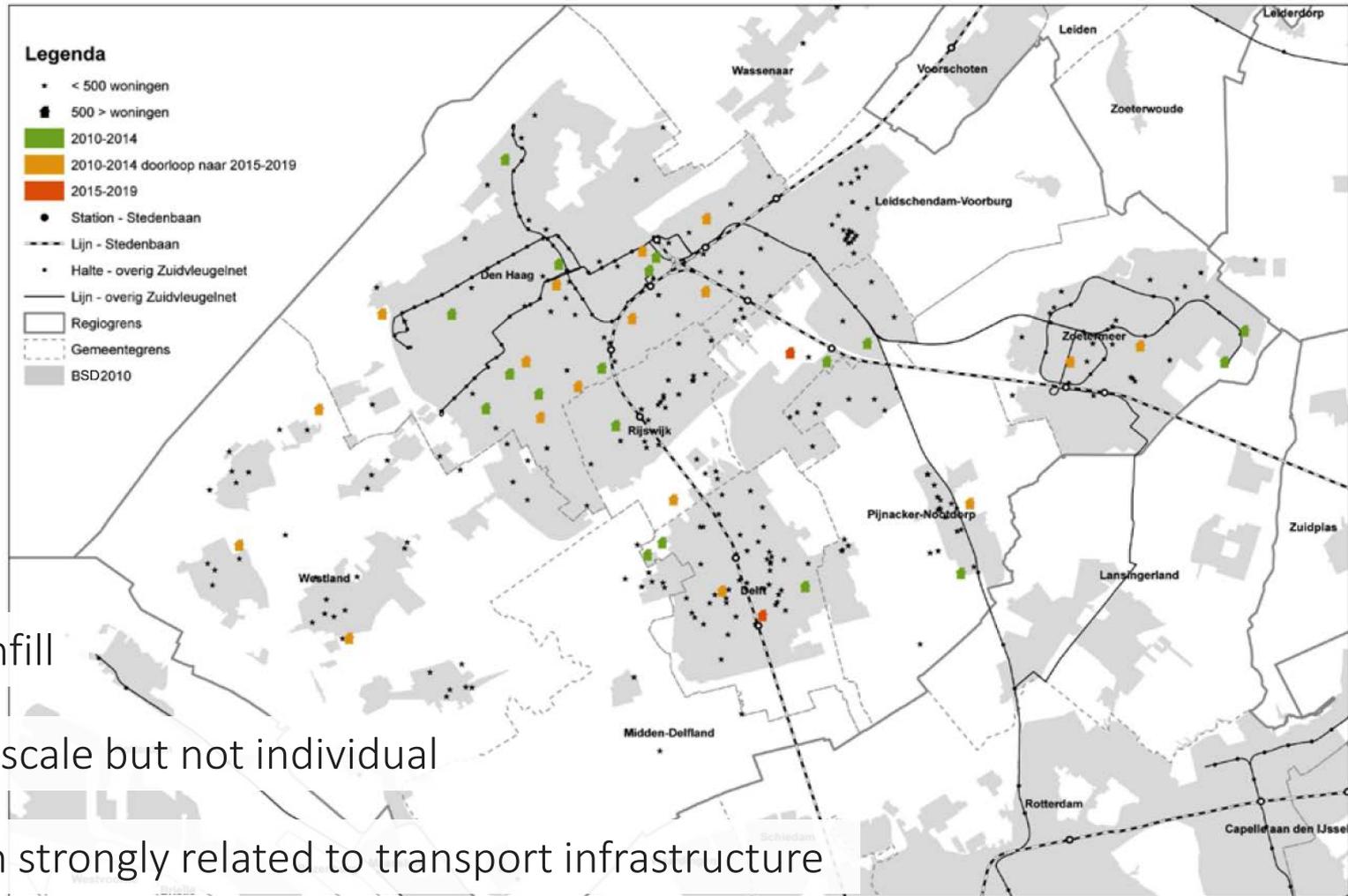


Urban growth, 1990s-2010



- urban extensions
- compactness
- public transport services provided late
- proximity to motorways increased car-reliance

Urban growth, post-2010



Urban infill

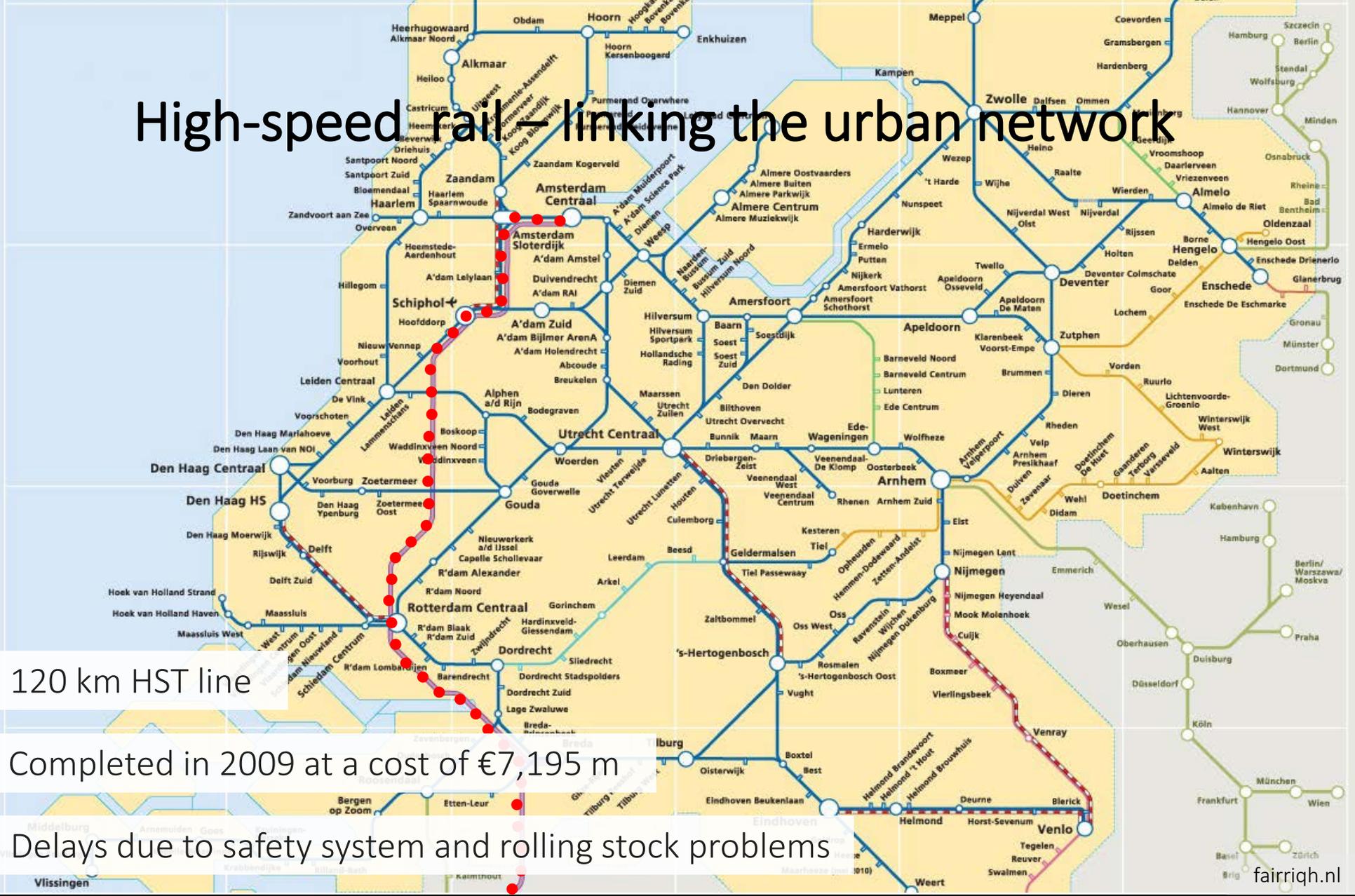
Smaller-scale but not individual

Location strongly related to transport infrastructure

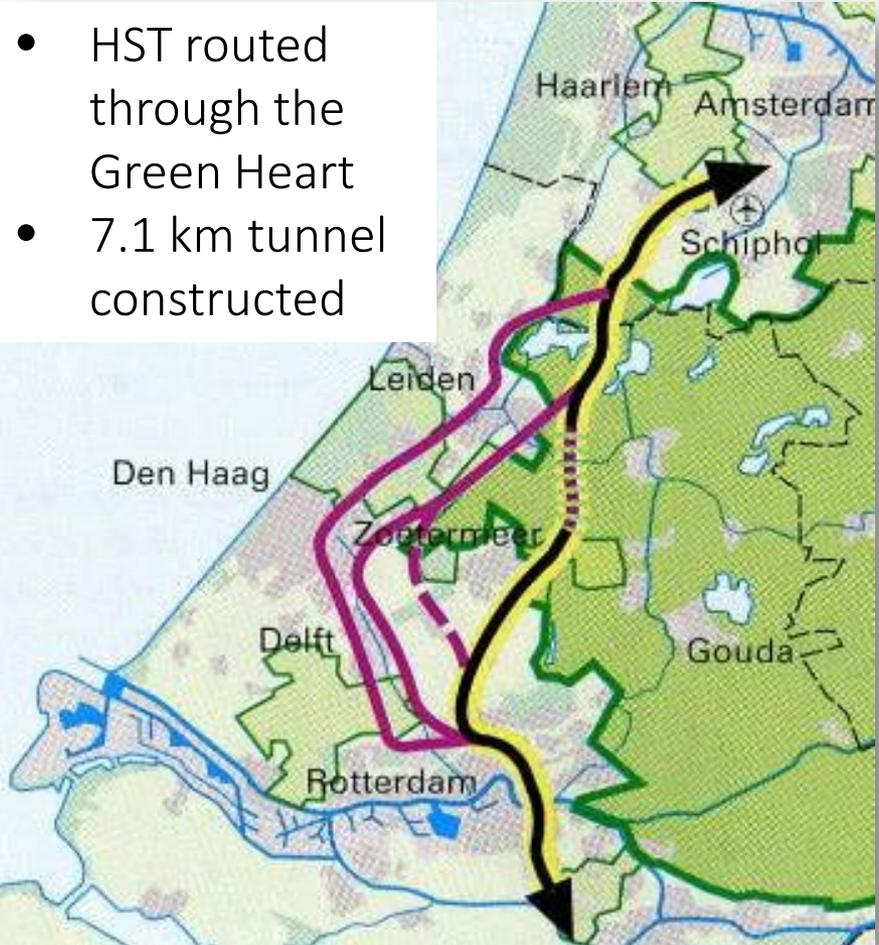
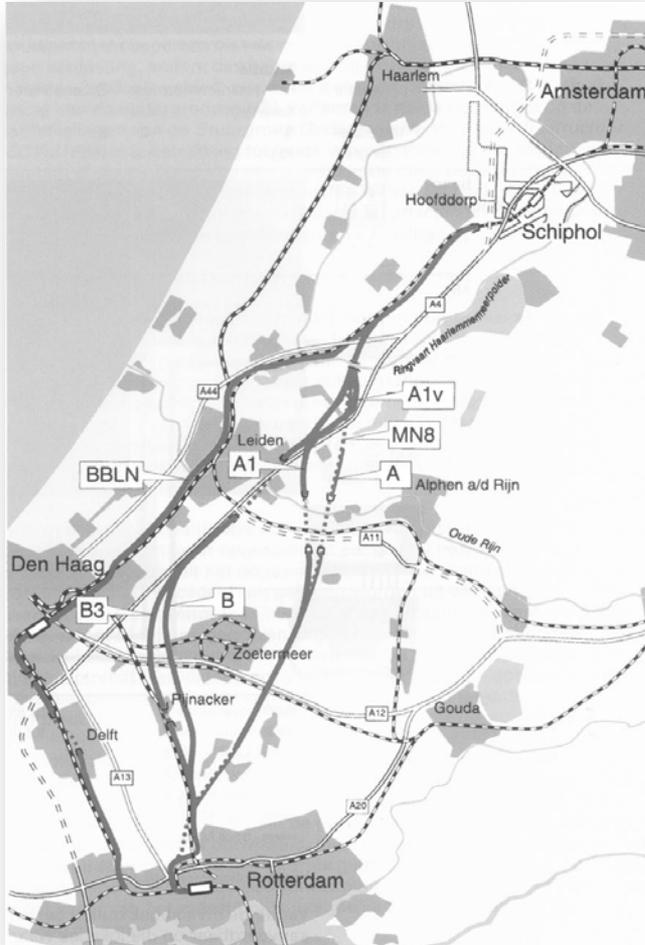
Key issues in transport policy

- dense road, rail and waterway networks – all heavily used
- importance of the transport sector to the national and regional economy
- linking the urban network
- maximising the use of capacity
- promoting more use of integrated modes
- reducing adverse impacts (e.g. air quality; landscape intrusion)

High-speed rail – linking the urban network



High-speed rail – linking the urban network



- HST routed through the Green Heart
- 7.1 km tunnel constructed

Maximising capacity



Maximising the use of existing infrastructure

beeldbank.rws.nl

Maximising capacity



Decision in 2007 that road pricing (per km) would be introduced

Possible way of reducing local traffic on national infrastructure

Plans abandoned in 2010

nrc.nl

Integrated ticketing



trouw.nl

Real-time travel planning



Conclusions/lessons

- transportation and infrastructure development in city clusters should be closely tied to urban development strategies
- disentangling local and metropolitan traffic (road and rail) may have benefits for the performance of city clusters
- maximising existing capacity, rather than adding capacity, is crucial



QUESTION
EVERYTHING

- Should long distance and short distance traffic be regulated separately? To what extent might this affect the performance of city clusters?
- How can infrastructure networks be prevented from fragmenting landscape and damaging natural areas?
- How can urban development be controlled effectively along road transport infrastructure?
- Should city clusters function as ‘daily urban systems’? If so, how should the transport system be planned and operated?

Thank you for your attention

<http://about.me/DominicStead>