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

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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**
- car (driver): 49%
- car (passenger): 23%
- train: 8%
- bus/tram/metro: 3%
- cycle: 8%
- foot: 3%
- other: 6%

**by trip**
- car (driver): 32%
- car (passenger): 14%
- train: 2%
- bus/tram/metro: 3%
- cycle: 28%
- foot: 18%
- other: 3%
Urbanisation in the Netherlands

Urban population (%)

1960-2012

Netherlands: 60-84%
USA: 70-83%
China: 16-52%
Urbanisation in the Netherlands, 1950
Urbanisation in the Netherlands, 2010
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)
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 ≈ 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
High-frequency (Randstad)

Busiest network in EU: >1 million passengers/day

Polycentric network less vulnerable to blockage
Commuting patterns – flows

Legend

Local home-to-work trips
- <5,000
- 5,000 - 10,000
- 10,000 - 25,000
- 25,000 - 50,000
- 50,000 - 100,000
- >100,000

Commuters
- <2,500
- 2,500 - 5,000
- 5,000 - 10,000
- 10,000 - 25,000
- >25,000

Commuting patterns – direction of flows

Commuting – lower-skilled

http://dx.doi.org/10.1080/09654313.2013.771619
Commuting – higher-skilled

http://dx.doi.org/10.1080/09654313.2013.771619
Business travel

http://dx.doi.org/10.1080/09654313.2013.771619
Shopping

http://dx.doi.org/10.1080/09654313.2013.771619
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’ (-)
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

- Alkmaar (1972)
- Purmerend (1960)
- Haarlemmermeer (1981)
- Zoetermeer (1962) 0.12m
- Spijkenisse (1977)
- Hellevoetsluis (1976)
- Almere (1976): 0.18m
- Houten (1979)
- Capelle aan den IJssel (1977)
- Haarlem (1966)
- Lelystad (1967)
- Huizen (1967)
- Lelystad (1967)
- Purmerend (1960)
- Nieuwegein (1974)
- Hoorn (1966)

http://dx.doi.org/10.1177/0969776403010002003
Rail backbone – local and regional
rail axis

cycle network

access restrictions for cars

The newer area of Houten-Castellum to the south-east is built to similar design principles.
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

120 km HST line

Completed in 2009 at a cost of €7,195 m

Delays due to safety system and rolling stock problems
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
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.
Integrated ticketing
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
• 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

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