Schaalvergroting in Nederland, een vervoersanalyse van de aanwezigheid van stedelijke netwerken

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Graduation Date:
25 June 2002

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Background
The Fifth National Policy Document on Spatial Planning, published in 2001, has introduced the spatial concept of 'urban networks' in the Netherlands. Starting point of this concept is the idea that the Dutch city regions are operating more and more together as functional units. For an increasing number of activities, the spatial scale of the single city region is not large enough anymore. The introduction of the concept was influenced by the supposed rise of the network society and network economy.

Questions on whether the networks really exist, and on whether they are defined well by the Fifth National Policy Document, are not answered unambiguously. In the Document, six regions are appointed as urban networks. The two largest ones are the Deltametropolis (the 'former' Randstad, that consists of the city regions of Amsterdam, Rotterdam, The Hague, Utrecht, and the smaller intermediate city regions), and Brabantstad (consisting of the five largest cities in the province of Brabant, in the south of the Netherlands). But critics have argued that these networks should be divided into several smaller networks. Some people even say that that the level of the individual city regions still offers the best description of people's mobility patterns.

The aim of the concept of urban networks is increasing the quality in the network. The cities and their surrounding municipalities have to complement each other, so that each city or municipality can further develop its specific qualities. This can be applied to land use, economic and environmental aspects, the housing market and the supply of facilities. But, when lacking a good interpretation of the right scale of the activity patterns, the aim of the concept cannot, or will only partly, be achieved.
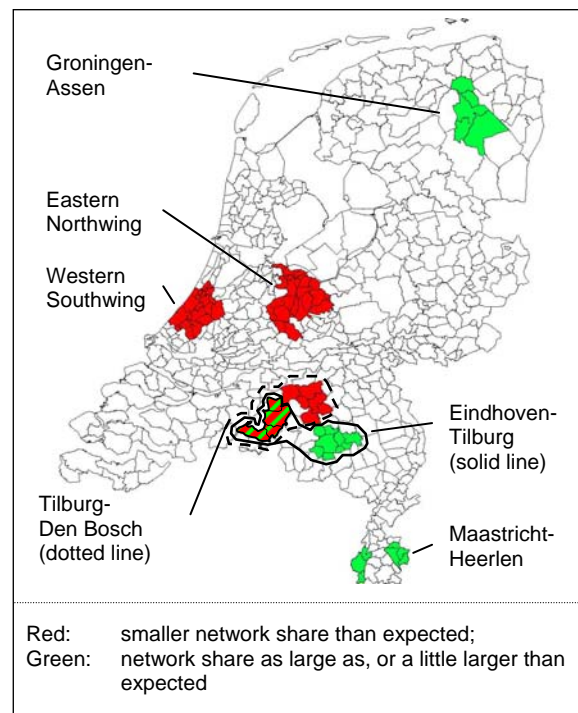
Goal and method used
This study tries to provide more understanding of the existence of urban networks. The central assumption in this study is that an area is only a network if within that area more trips are made than expected. The expected number of trips is based on the national average travel behaviour. If fewer trips are made, it means that the city regions in the network are not complementary. Therefore, they cannot offer any 'added value'. The most important question that has been asked is: at which spatial scale can the biggest overrepresentation of trips be found? Furthermore, some traffic characteristics in the networks have been investigated.

For the investigation, data from the national travel survey have been used. Based on this survey, a 'standard' was developed. By applying this standard an expected number of trips between two municipalities has been determined. It uses average travel behaviour of people with different travel purposes and levels of education. The standard also takes into account the size of the municipalities (i.e. the number of origins and destinations), and characteristics of the surrounding area (i.e. the density of destinations). Afterwards, the number of trips between two municipalities was translated into trips in city regions and urban networks.

Results

The primary and most remarkable result of the study is that in almost all of the urban networks, the overrepresentation of the share of trips *within* the city regions is bigger than the overrepresentation of the share of trips *between* the city regions. The share of trips between the city regions is in reality often even smaller than expected. The only networks in which the share of trips between the city regions is not smaller than expected, are Maastricht-Heerlen, Groningen-Assen and Eindhoven-Tilburg. These high scoring networks are the green areas in Figure S.1. In this map, also the three lowest scoring networks are shown: the Western Southwing of the Randstad (The Hague and Leiden), the Eastern Northwing of the Randstad (Utrecht, Hilversum and Amersfoort), and Tilburg-Den Bosch (two of the cities within Brabantstad). In these areas, the actual share of trips at network level (i.e. between the city regions) is 60% smaller than the expected share.

Compared to the low scoring networks, the high scoring networks are situated in relatively low-density areas. Especially for Groningen-Assen and Maastricht-Heerlen, the number of (Dutch) destinations that can be reached within a short distance is small. This may explain the results. Maastricht, Heerlen, Groningen, and Assen have few alternative destinations in their direct surroundings that can offer 'added value'. On the other hand, the Western Southwing and the Eastern Northwing are situated near respectively Rotterdam and Amsterdam. Besides this, it is investigated that the distances in the higher scoring networks can be covered faster than in the low scoring networks. Therefore, the barrier for travelling to the other city region is smaller in the green networks.

Groningen-Assen

Eastern Northwing

Western Southwing

Eindhoven-Tilburg (solid line)

Tilburg-Den Bosch (dotted line)

Maastricht-Heerlen

Red: smaller network share than expected;
Green: network share as large as, or a little larger than expected

Figure S.1: High and low scoring networks

The distinction between trip purposes learns that people who travel for business purposes and people who travel to work, are least focused on their own city regions (not only in absolute, but also in relative terms). These purposes have the highest financial interests, and may therefore be influenced less by the traditional travel patterns. It was also found out that people with a high level of education travel relatively more at network level than people with a lower education level. Partially, this is caused by the fact that higher-educated people are overrepresented in the purposes 'business' and 'travel to work'. Social trips, 'facility trips' - the combined group of trips to all kinds of facilities (e.g. recreation, school, shopping)-, and low-educated people are focused more on the city region level. These trips and people do not find a surplus value outside the region.

One of the main factors that stimulated the network concept, has been the continuous increase in land consumption between the cities. These areas (in the suburbs) used to be empty, but their built-up area is increasing its size rapidly. It was supposed that the inhabitants of these areas were important contributors to the rise of networks. This study states that this is not the case. As written before, for (the majority of) networks as a whole, the actual share for traffic to other city regions was significantly lower than expected. This applies even stronger to the suburbs. From the central cities of the city regions, the share of trips to other regions is as large as expected, or even larger. Especially from the largest cities, see Figure S.2, the actual share of network trips is larger than expected; this ranges from +50% until +200%.

Several explanations can be given for the phenomenon that the cities achieve high scores. In the first place, many of the facilities in a city are the same. Therefore, when an inhabitant of a city 'wants something else', the most likely option is that the destination will be in a different urban area. It is not probable that many small suburbs are able to realise highly specialised facilities that offer a surplus compared with the central city's facilities. Also the fact that the urban population consists of relatively many highly educated and young people, who are used to travelling more than on average, can explain the results.
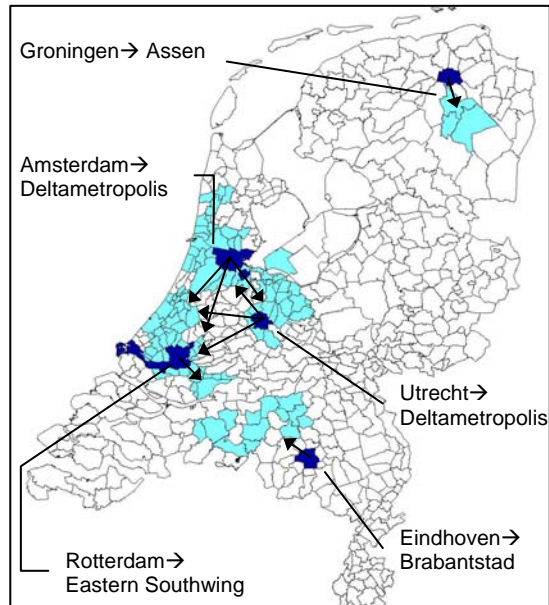
Infrastructure can play a role too. Outcomes of the TNO Inro model SMART show that the speeds by which the distances (in straight lines) between city regions are higher for central cities than for the suburbs. Suburbs are less congested, but not always are they situated favourably regarding the national highways.

Figure S.2: Larger share of fetwork traffic from the big cities than expected

It is the trips made for facility purposes and by middle-educated people that score particularly high from the central cities. The presence of (university) students, who are middle-educated, can (amongst others) explain this. Compared to the original inhabitants, they have less affinity with the city and its direct surroundings. Furthermore, students travel less for work and business purposes than the average middle-educated person, so that the 'facility purpose' can become the highest scoring purpose.

Future developments
Mobility increases. The service industry grows. The number of dual-income households rises. These are all developments that lead to more trips between the city regions. Partly, these developments will decrease the number of trips that are made in the direct surroundings of the house and workplace. But whether network relations will be intensified substantially depends on more aspects. The city regions will have to become more complementary. Co-ordination at network level can result in a more varied supply of houses, facilities, inhabitants, and jobs. But also in the near future the Dutch will not be prepared to travel over big distances for the larger part of their activities.

Conclusions and recommendations

The most important conclusion is that urban networks only exist partially. For as far as they exist, they are 'networks of cities'. To a large extent, the suburbs are excluded from the networks. The intended networks however, contain both the central cities and suburbs, in order to create a mass as big and divers as possible. Especially, this relates to the housing market. From an economic point of view, it can be stated that the biggest centres are connected in a relatively strong way. But the complementary functioning of the larger suburbs, many of which have higher economic growth rates that the central cities, is partly absent.

An important recommendation regarding the way this study has been carried out is refining the input data. These data are used to determine the expected number of trips, and are therefore highly important in this study. An administrative recommendation is that policy makers have to realise that, despite the ongoing scale enlargement, the local and city region levels remain the most important playing fields for the larger part of the activities. The city regions are big enough to create sufficient mass for most of the daily activities and facilities. The further development of stronger regional administrative bodies, a hot topic in the Netherlands at this moment, can lead to more fine-tuning and complementarity at the level of urban networks, but in the near future this will mainly relate to (inter)national top facilities and activities with a strongly space-consuming character (as a result of environmental and/or noise nuisance or safety).