Karst Geurs and Jan Klinkenberg

Successfully combining space, mobility and accessibility

A consistent approach to urban planning policy and infrastructure policy is high on the policy agenda of the Dutch central government, but nothing is self-evident. Simultaneous planning of transport networks and urban planning can potentially create synergy. New financing tools provide opportunities for implementing Transit Oriented Development, a high-profile concept in this field. Nevertheless, implementation remains difficult in practice.

Cities and urban areas do not function properly without effective traffic and transport systems. In this article, we demonstrate that the integration of urban planning and infrastructure planning improves mobility and accessibility. In addition, the article focuses on Transit Oriented Development (TOD) as a specific policy strategy to adapt trends and developments in urban planning to the development of public transport hubs. TOD comprises a public transport and city-planning concept whereby infrastructure and urban planning relating to planning, financing and operation are addressed as a whole and transport networks are synchronised. In this, the public transport system is regarded as the backbone and driver of urban development. This article describes new tools (including financing tools) for TOD, along with high-potential initiatives in this field.

Network synchronisation

Efforts to improve accessibility currently focus too much on expanding the capacity of transport networks, when in fact accessibility can also be improved by ensuring that

various transport networks – including bicycle and train – are better coordinated. Another way of achieving this is the careful installation of activity locations – including work locations, shops and healthcare facilities – in relation to the transport network and the support facilities for parking and transfers. This phenomenon is known as “network synchronisation”.

Using the traffic model developed by Liao et al. (2013a), in which individual activities in time and space are coupled with multimodal transport networks (i.e. public transport, walking and cycling), Van Wee et al. (2014) investigated the accessibility effects of synchronisation between activity locations and transport networks, such as good coordination between buses and trains or Park & Ride facilities. The combination of public-transport improvements, parking fees and spatial interventions have a greater impact on the use of facilities such as Park & Ride and Bike & Ride than the sum of the individual scenarios (Van Wee et al., 2014), thereby resulting in synergy. Whether synergy also occurs in accessibility gains remains the subject of research. It has been demonstrated, however, that concentrating or spreading activities in Rotterdam’s city centre or in the vicinity of large Dutch railway stations in a TOD strategy can generate substantial changes in the accessibility of activities for individuals and the accessibility of locations. These effects are stronger than doubling parking fees in urban centres (Liao et al., 2013b).

The mobility and accessibility effects of network synchronisation are likely overestimated in the model, since transport options – particularly those in multimodal networks – are likely to be more complex than transport in unimodal networks. Chen et al. (2012) demonstrate that people, when faced with more complex choices and with time pressure, make more random (and therefore suboptimal) decisions. This means that the optimum paths predicted by the model are not generally chosen – something the model analyses do not yet factor in. With travel information systems improving and being consulted increasingly often anywhere, anytime, it is also likely that opportunities for more complex journeys will be seized more effectively. Further research into this area is to be recommended.

Impact of TOD

Expectations of the effects of concentrating urban planning in the vicinity of railway stations tend to be high: including increased train travel, higher property values and lower vacancy rates for office buildings. Below, we examine whether this also applies to the Randstad conurbation.

This area has a high density of train stations, and several new suburban stops have been added in the past few decades, including Almere-Poort, Almere Parkwijk and Utrecht-Terwijde. The number of train stations and their locations have an impact on the modes of transport people use for commuting, the level of congestion, and on urban-planning trends and developments. Building a large number of railway stations is a good strategy for reducing congestion, but if you want to boost specific economic areas, a small number of strategically located stations is actually more effective (Dröes & Rietveld; research in progress). Koster (2013) demonstrates that the addition of new public transport stops in suburban areas scarcely has an effect on house prices and commercial property prices. One of the reasons for this is that these new suburban stops compete with larger intercity stations, which provide access to a larger number of stations within a single transfer.

Around 15 per cent of Dutch offices were vacant in early 2013, and at 18 per cent, Amsterdam has one of the highest vacancy rates of all European cities. There are substantial discrepancies in vacancy rates between cities (ranging from 5 per cent to 35 per cent), and this can be explained to a large extent by features of the buildings themselves, including rent prices and the age of the building. A common perception is that office vacancy rates tend to be lower in areas near railway stations than elsewhere, due to the high level of accessibility. In the southern Randstad conurbation (i.e. the South Wing), however, office vacancy rates are neither higher nor lower than elsewhere in the area if we adjust for other factors determining vacancy, and this includes intercity train stations. The re-prioritisation of new developments, elimination of some of the oversupply, and the conversion of office sites will be essential factors in the coming years in reducing vacancy rates near train stations and – by extension – determining the success of the TOD policy (Geurs et al., 2012).

The optimum use of employment locations near train stations is important in boosting train travel. The vast majority of people who travel by train live and work in the vicinity of a railway station. A survey conducted among residents of the southern Randstad conurbation shows that the choice of the train as a mode of transport is determined more strongly by the distance of the work location to the station than the distance between a person's home and the railway station. Finding a workplace that is easily accessible by public transport is viewed as a more successful option in terms of increasing the appeal of train travel than is finding a home closer to

public transport facilities. It is also expected that the combination of telework and the freedom of employees to determine when they start and finish work will make train travel more appealing. This would indicate that promoting train travel calls for a more comprehensive set of policy measures; that is, measures beyond merely building new homes near public transport stops (Hubers & Maat; research in progress).

TOD and bicycles

The number of passengers who use train stations depends on the quality of the “pre-transport” and “post-transport” used by the passenger. Bicycles are a popular form of transport in the Netherlands, both as a primary mode of transport and as a way of getting to the train station. Around 40% of train passengers use their bike to travel to the station (see the article published by Klinkenberg and Bertolini elsewhere in this publication). La Paix and Geurs (research in progress) found that the train stations in the southern Randstad conurbation have a large scope of influence on account of the large number of cyclists: cyclists are willing to bike to the station up to a distance of roughly three kilometres. This means that housing does not need to be constructed in the immediate vicinity of a railway station in order to attract train passengers. A series of choice experiments conducted with residents show that the quality of bicycle journey to railways stations, in terms of cost and travel time, also help determine the choice of the train as a primary mode of transport.

Improving bicycle routes to the train station will increase train travel, and therefore merits appraisal in urban mobility policies. An additional factor is that train passengers tend to be sensitive to bicycle parking fees. NS Dutch Railways is currently conducting an experiment at the Amsterdam-Amstel, Breda and Den Bosch railway stations, which allows train passengers to park free of charge for a 24-hour period in secure NS bike parking facilities. If this is implemented on a national level, it may be an effective way of encouraging train use.

The tools are in place

Current urban planning policies tend to not focus enough on public transport. The tools required to promote the implementation of TOD across the Netherlands are already available (Lenferink & Van de Stoep, 2013; Van der Krabben et al., 2013), and the integration of urban planning and mobility development is also possible in a strictly legal sense. The study has also found that, during times of crisis, stakeholders are interested in exploring the use of new tools in pilot projects and trials (NWO, 2014). Examples of new financial instruments include tax increment financing (TIF), business investment

zones, urban re-allotment and marketable development rights. These instruments – along with the role of the central government – are outlined below. In addition, we also address the role of the central government.

The TIF concept is simple and can be implemented from a legal perspective. It is assumed that property values in a specific area will increase if that area is redeveloped. The future tax increase– resulting from the increased property values in a specific area – is then invested in the area. There is some degree of experience in the Netherlands with a programme similar to TIF in the Waalfront project in Nijmegen (Van der Krabben et al., 2013). However, TIF is perceived as high risk due to the tool's speculative element, and it has also been demonstrated that the tool's financial contribution is only limited: it's an effective lubricant, but that's as far as its use goes. In terms of TOD, the tool could become valuable if there is a rise in land values and property values, for example due to significantly improved accessibility.

In recent years it has become common for businesses in the Netherlands to fund investments in the business environment, in the form of "business investment zones". (BIZ), but it has been practised on a relatively small scale in terms of both space and the amount of the funds invested. These business investment zones are currently used mainly for Park & Ride and park management. While businesses like the tool for its directness, they tend to be put off by all the paperwork associated with a business investment zone. In order to genuinely make a difference with business investment zones in terms of TOD, economies of scale are essential. There is effectively already a tentative trend in this direction, involving the establishment of mobility funds in which several business investment zones are combined (Lenferink et al., 2014b).

Urban re-allotment involves trading land in the city in order to facilitate development, and it is particularly suitable for locations near railway stations, where land ownership tends to be scattered. In addition, the tool also helps achieve cost savings , since the payment of transfer fees is circumvented , and it can therefore contribute to the efficient organisation of area development. Urban re-allotment requires a significant focus on cooperation and management processes, while another significant issue is the role of legislation and compensation. Legislation can help in making negotiations proceed more smoothly and in creating an equitable compensation scheme. The roles of the municipal government as a potential land owner, facilitator, inspirer and problem owner are vital. The municipal government, for its part, plays a role in establishing and successfully running re-allotment processes (Van der Stoep et al., 2013).

The introduction of marketable development rights (i.e. construction options which can be purchased from land owners and used elsewhere) is difficult from a legal point of view, since it requires strict separation and disconnection from land ownership and usage. Additionally, the trade in permits also requires a well-structured and well-monitored market, and this market is not in place at this stage. In everyday TOD practice, negotiations on compensation for cancelled development plans match this most closely.

The tools described above can be used at both local and regional levels, although there is also a role to be played by the central government, which must not only enable other parties – including local governments and the railway sector – to fulfill their roles adequately, but can also focus on TOD directly. For example, in the roll out of the High-Frequency Rail programme, the central government can raise funds designated for spatial development from third parties based in the vicinity of railway stations, which can contribute to TOD. Experiences in Denmark have shown the effectiveness of national legislation in creating conditions for TOD. For example, it is prohibited in Denmark to establish large-scale public facilities outside railway stations' immediate scope of influence. This has resulted in a high concentration of urban planning projects around train stations (Hartoft-Nielsen, 2013).

Time for experimentation

The use of TOD can potentially improve mobility and accessibility and, to a limited extent, the regional economy as well, as the tools required are certainly available. However, the actual implementation of TOD has proved to be an arduous process. The article by Luca Bertolini in this issue of Rooilijn discusses the success factors for TOD implementation. This appears to be a good time for action and experimentation, and experiments are already underway in two regions: the Zaan Corridor in North Holland and several train stations located on the South Wing of the Randstad conurbation. There are lessons to be learned from each of these experiments. In communities along the Zaan Corridor (i.e. the Amsterdam-Heerhugowaard railway track), there is a growing willingness to take on TOD projects together, and a location for a pilot project has already been designated. The provincial government intends to sign a letter of intent and to create an implementation programme with municipal governments, property developers and social housing associations along the the Zaan Corridor. A design study is currently also being prepared. The StedenbaanPlus programme,

involving a partnership between NS Dutch Railways, ProRail and provincial and local governments of Zuid-Holland, is dedicated to improving the quality of areas near railway stations. Cooperation between land owners, transport companies, surrounding companies and others is essential to this process. “Alliance talks” are being conducted in order to create a strategy to kick-start development in the vicinity of the Den Haag Laan van Nieuw Oost-Indië, Gouda and Delft Zuid railway stations.

Karst Geurs (k.t.geurs@utwente.nl) is a Professor of Transport Planning at Twente University and a programme director of the TOD Randstad South Wing TOD programme. Jan Klinkenberg (jan.klinkenberg@platform31.nl) is Networks Sustainability Director at NWO and Transumo Footprint Programme Manager at Platform31.

Bibliography

Chen, C., C.G. Chorus & E.J.E. Molin (2012) Measuring the Impact of Task Complexity and Time Pressure on Activity-Travel Choices: A Travel Simulator Approach, 13th Conference of International Association for Travel Behaviour Research, Toronto

Dröes, M.I. & P. Rietveld (in preparation) The Effect of Railway Travel on Urban Spatial Structure Geurs, K., H. Koster & G. de Visser (2013) Kantorenleegstand en OV-knooppuntontwikkeling in de Zuidelijke Randstad, DBR-notitie 06

Hartoft-Nielsen, P. (2013) Interview over het ‘Vingerplan’ van de regio Kopenhagen op website VerDus, http://kennisdeling.verdus.nl/nieuwsitem.asp?id=1470 (last visited on 25 February 2014)

Hubers, C. & C. Maat (in preparation) Commuters’ perspectives on improving the attractiveness of commuting by train

Koster, H. (2013) The internal structure of cities. The economics of Agglomeration, Amenities and Accessibility, VU University Amsterdam, Amsterdam

La Paix Puello, L. & K. Geurs (2014) Adaptive stated choice experiment for access and egress mode choice to train stations, presented at the World Symposium for Transport & Land-use Research congress, Delft, 24-27 June 2014

Lenferink, S., & H. van der Stoep (2013) Innovative governance and finance strategies for implementing Dutch transit-oriented development, AESOP / ACSP 5th Joint Congress 2013, Dublin, Ireland (15-19 July, 2013)

Lenferink, S., A. Samsura & E. van der Krabben (2014a) Tax Increment Financing as a tool for public infrastructure development: Findings from a simulation experiment, FIG congress 2014, Kuala Lumpur, Malaysia (16-21 June , 2014)

Lenferink, S., A. Samsura, R. van Melik & E. van der Krabben (2014b) Private investments in public space: Negotiating for funding Dutch business improvement districts, RSA conference 2014, Fortaleza, Brazil (27-30 April , 2014)

Liao, F., T. Arentze & H. Timmermans (2013a) Incorporating space-time constraints and activity-travel time profiles in a multi-state supernetwork approach to individual activity-travel scheduling,

Transportation Research Part B: Methodological, vol. 55, p. 41-58
Liao, F., T. Arentze, E. Molin, W. Bothe & H. Timmermans (2013b) Effects of integrated land-use transport scenarios on travel patterns: a multi-state supernetwork application, 13th World Conference on Transportation Research, Rio de Janeiro, Brazil, NWO (2014)
Eindrapportage project ‘Delta Oost; Nieuw sturingsperspectief op water en mobiliteit in het licht van duurzame gebiedsontwikkeling’, NWO, The Hague
Van der Krabben, E., S. Lenferink, K. Martens, J. Portier & H. Van der Stoep (2013) Onderzoek innovaties bij integrale gebiedsontwikkeling en knooppuntontwikkeling, Radboud University Nijmegen, Nijmegen
Van der Stoep, H., J. Groot Nibbelink, M. Bonke, & E. van der Krabben (2013) Stedelijke herverkaveling als aanjager van stedelijke herontwikkeling, Real Estate Research Quarterly, vol. 12, no. 2, p. 40-51
Wee, Bert van, W. Bohte, E. Molin, T. Arentze, & F. Liao (2014) Policies for synchronization in the transport–land-use system, Transport Policy, vol. 31, p. 1-9