



Connected Cities

Several new public transport systems are being introduced in the urban conurbation of Zuid-Holland: TramPlus, RandsstadRail, Stedenbaan and the Rijn-Gouwe Light Rail line. These offer tremendous opportunities for sustainable urban development based on closer ties between transport and spatial development. But although the planning community is buzzing with talk of 'urban networks', little thought is given to the network itself. It is time to put that right.

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In the second half of the 20th century the number of people using public transport in the Netherlands fell far below the numbers travelling by car. The total length of the journeys people make each day has increased considerably. Motorway traffic in the Randstad has increased to five, ten and on some roads even twenty times the volumes forty years ago. On some stretches, the number of vehicles already exceeds 200,000 per day. At the same time, the cities have grown in size and are enveloping roads that originally lay beyond the urban edge. These new urban areas suffer from high levels of noise disturbance, air pollution and congestion. To stimulate the use of sustainable transport systems, Dutch planning policies promote new development near stations and transport hubs to shorten distances between public transport stops and places where people live and work. Concentrating homes, shops, educational institutions and offices near the stations and hubs served by bus rapid transit, light rail, metro and train services will make these services more competitive. The high-quality public transport lines would then have the potential to form the backbones of dispersed conurbations like the urban area of Zuid-Holland – the 'South Wing of the Randstad'.

Such a sustainable approach towards mobility and urban planning involves simple, straightforward principles and can be designed with ease: there is always a railway line that can be extended or a station that can be added to open up new areas for development. Alternatively, existing urban areas surrounding stations and stops can be intensified. But in the Dutch province of Zuid-Holland things are not that easy. The cities of Rotterdam and The Hague are gradually merging to form into one larger regional urban network. New towns like Capelle aan den IJssel, Spijkenisse and Zoetermeer have grown as big as the smaller cities of Delft, Gouda, Vlaardingen and Schiedam, and the functional relationships between the new towns, cities and urban centres are becoming stronger. All this translates into an increase in traffic and a growth in the number of criss-cross relationships. The network serving private vehicles is relatively well equipped to deal with such structural changes, but the public transport network is still focused on the centres and central stations of its two largest cities: Rotterdam and The Hague.

The existing public transport network

In the 1990s the regional public transport network in the South Wing of the Randstad consisted of the Metro/light rail, the Sprinter (rapid transit) and local train services (commuter rail). This network is supported by city and rural bus services and a tram system in the Rotterdam/The Hague urban area.

Metro/light rail The Rotterdam Metro/light rail system has two, largely underground trunk lines: the Erasmus line and the Caland line. In the eastern part of the city the Caland line branches off into three separate lines, two of which continue as light rail services.

Sprinter The Sprinter (rapid transit) service runs on three local lines in the national rail network: the Hofplein, Hoekse and Zoetermeer lines, the last specially built for connecting Zoetermeer new town with its mother city, The Hague.

Local train service The local train service (commuter rail) runs on the 'Oude Lijn' (Leiden-The Hague-Delft Rotterdam-Dordrecht), the two lines from Gouda (Gouda-The Hague and Gouda-Rotterdam) and the Rijn-Gouwe line (Gouda-Leiden). The commuter rail services share their infrastructure with interregional trains, intercity trains, high speed trains and even freight trains.

The emerging public transport network

In the period to 2010 several important additions and changes will be made within the overall network: TramPlus, the Metro, RandsstadRail Rotterdam, RandsstadRail The Hague, Light Rail and Stedenbaan.

TramPlus Rotterdam is making a real effort to update a limited number of trams with its TramPlus initiative. This will improve connections with the southern part of Rotterdam, Barendrecht, Schiedam and the northern part of Vlaardingen.

Metro In 2003 both of the Rotterdam Metro trunk lines were connected and now share a common route in the new town of Spijkenisse.

RandsstadRail The Hague Construction of the tram tunnel in the centre of The Hague was completed in 2004. This tunnel is an indispensable link in The Hague's version of RandsstadRail, a hybrid tram/train. In 2006 RandsstadRail will replace the Sprinter using the Zoetermeer line, providing direct connections between Zoetermeer and the western part of The Hague, including the city centre. RandsstadRail uses former parts of the national rail network and parts of the existing tram network in The Hague.

RandsstadRail Rotterdam Two years after RandsstadRail replaces the Sprinter on the Zoetermeer line, the Rotterdam version of RandsstadRail will replace the Sprinter on the Hofplein line, which will be connected through a tunnel to the Rotterdam Metro at Rotterdam Central station. The Rotterdam variant of RandsstadRail is not a hybrid tram/train as in The Hague, but is a metro that runs on a former railway line. Because of their different backgrounds, the versions of RandsstadRail in The Hague and Rotterdam differ technically: the carriages in The Hague have a low floor and those in Rotterdam have a high floor. Between Zoetermeer and The Hague both systems will share the same infrastructure and stop at the same stations. Half of the platforms at these stations will be low and half will be high. The two systems will separate in The Hague and the Rotterdam version will end at The Hague Central Station because its high floor makes integration with the tram system in The Hague impossible.

Light Rail Dutch Railways and the Province of Zuid-Holland are experimenting with a light rail vehicle on the railway line between Leiden and Gouda; the Rijn-Gouwe line. The idea is to extend this line into the city centres of both Leiden and Gouda at street level.

Stedenbaan In the meantime, the local and regional authorities in the Zuid-Holland urban region (the 'South Wing Platform') are building up political pressure to replace the existing commuter rail services with a system called Stedenbaan, which they describe as being a metro-like system. Dutch Railways speak about renewing their Sprinter formula. The (phased) introduction of the Stedenbaan will be possible when the doubling of the rail infrastructure to four tracks, begun in the late 1980s, is complete. Doubling the infrastructure will make it possible to separate the different train systems. Although this widening is only partly completed, additional capacity is already available. In 2007 the new routes for the High Speed Train to Belgium (HS1 Zuid) and the dedicated rail freight line to Germany (Betuweroute) will come into service and these high speed trains and freight trains will no longer use the existing infrastructure. It should be noted here that the Stedenbaan concept is not limited to introducing a new system; its main purpose is to act as a catalyst for building new homes, schools and offices around the stations on the network.

Redefining the south wing - Public transport network

In the beginning of the 1990s the transit network in the South Wing consisted of three systems: the Metro, Sprinter and the local train services. In 2008 it will consist of six systems: TramPlus, the Metro, RandsstadRail (two versions), the Rijn-Gouwe Light Rail and Stedenbaan. At the moment no one seems to care about the complete picture; each authority is working on its own pet project: The Hague city region (Haaglanden) on The Hague version of the RandsstadRail, Rotterdam city region on the Rotterdam version, the Province of Zuid-Holland on the light rail between Leiden and Gouda, and the South Wing Platform is putting all its efforts into the Stedenbaan concept. A comprehensive vision on how the different systems could be integrated into a flexible network serving the needs of the regional population is lacking. Standardising the different systems would be a logical step, with a view to the need to privatise the public transport companies and the obligatory procurement of their services. But is standardisation actually possible? What are the main similarities and differences between the six systems?

TramPlus/Light Rail TramPlus represents what the British or Americans would call Light Rail: the modern city tram, a tram with a higher than average speed (20-25 km/hour), a greater reach (< 10 km), high-quality stops and a rail vehicle with a low floor that matches its raised platform. The longest distance the TramPlus travels from the city centre is about 10 kilometres (Rotterdam Centre to Vlaardingen HoLy). At 2.4 metres wide, the tram is relatively narrow compared with a metro or train carriage.

Metro The metro is a classic and well known rail system. It is characterised by a high capacity vehicle with a high floor using tracks separate from other infrastructure, elevated or underground. The Rotterdam Metro is a partially hybrid system running at street level in the eastern part of the city, and so part of its network is in fact similar to light rail. The lines serving partially as light rail cover a distance up to 10 kilometres (Rotterdam centre to Ommoor/Zevenkamp). The lines serving fully as a metro cover a distance of up to 15 kilometres (Rotterdam Centre to Spijkenisse).

RandsstadRail The Rotterdam RandsstadRail is very similar to the Rotterdam Metro. It differs only in name and its use of a former railway track and the vehicles have a high floor – and that is the most striking difference with The Hague version of RandsstadRail. The technically minded reader will note the larger system reach of up to 25 kilometres (The Hague Central to Rotterdam Zuidplein). Regiotram In Dutch practice, the term light rail is used for everything that is not heavy rail. It refers especially to light rail systems that use the national rail infrastructure, like those in Karlsruhe, Kassel and Saarbrücken. The Germans call such systems Regiotram. The version of RandsstadRail in The Hague comes close to this concept and covers a distance of 15 kilometres (The Hague Centre to Zoetermeer Oosterheem), similar to the Rotterdam Metro. Currently in the South Wing the term light rail is only used to describe the Rijn-Gouwe line. When this line operates in the centre of Leiden in 2010 it will become a true RegioTram, in this case covering distances up to 25 kilometres (Leiden Central to Gouda).

Stedenbaan Although there is much hype surrounding the Stedenbaan, there is no clear picture of what system or lines will be involved. It might be a new version of the Sprinter formula. The main connections cover distances up to 30 kilometres (Rotterdam-Leiden or The Hague-Gouda), which is only marginally longer than the Rotterdam RandsstadRail or the Rijn-Gouwe line.

The benefit of hybrid systems

The fact that all of these rail systems cover more or less the same distances suggests that TramPlus, the Metro, RandsstadRail (2x), light rail and Stedenbaan are interchangeable. This might offer room for improvement. The key to such an optimisation may lie in the hybrid nature of RandsstadRail, which provides what the urban structure of the South Wing of the Randstad needs. The South Wing requires a transport system with vehicles that can function in the city or conurbation like a metro or light rail, which do a better job in connecting housing areas and city centres. But the average speed of trains makes them a better choice for routes between the conurbations and cities. Combining the best of both these types of service in one system or one vehicle can be made to work. The projections for RandsstadRail forecast a significant increase in the use of the Zoetermeer line and the Hofplein line after it replaces the Sprinter. The number of passengers on the Zoetermeer line will increase from 17,000 to 42,000; on the Hofplein line an increase from 7000 to 28,000 passengers is expected.

Towards two integrated networks

The hybrid nature of RandsstadRail could form the basis of an optimised network for the South Wing of the Randstad. We will refer to this network as SWINGnet. With two RandsstadRail versions there are several possible scenarios, explored in this article from the Rotterdam perspective. With four parallel systems (TramPlus, Metro, RandsstadRail, Stedenbaan) it must be possible to devise a better operational system. To start with, we have to abandon the usual focus on 'systems'. Instead we could examine the 'network'; the fact that the Rotterdam transit network is used by three different systems (the Metro, light rail and RandsstadRail) is not that important. The transit network makes it possible to run an integrated service avoiding unnecessary transfers, and that is what counts for the user. The next question is what characteristics this network should have. TramPlus, the Metro, RandsstadRail and Stedenbaan could in principle use the same network. Hybrid vehicles like the Regiotram make this possible. But if we try to combine all these lines we run into a few practical problems. Things go wrong when the Rotterdam transit network has to be connected at Schiedam Central Station to the Spijkenisse Metro, the Holy and Kethel TramPlus, and to the Delft/The Hague Stedenbaan. This trunk line cannot cope with four high-frequency connections. We have to make choices.

RegioTram and Stedenbaan Better integration with RandsstadRail in The Hague would be possible if the Rotterdam transit network is adapted to the Regiotram concept. It could then absorb the TramPlus lines with Beverwaard, Camiselande, Schiedam-Noord and Vlaardingen-Noord. The Rotterdam transit and TramPlus networks could be interconnected at Schiedam Central Station and at Parkstad station to provide a better service for the north-western and southeastern part of the Rotterdam conurbation; the present network only serves the northeast and south-west. Translating such a model to the scale of the South Wing would result in three Regiotram networks: Rotterdam, The Hague and the Rijn-Gouwe line. Stedenbaan could link these networks together. Although this is a logical model, it would require adapting the rail infrastructure in Rotterdam to low-floor vehicles. Platforms would have to be lowered or the tracks raised, and rolling stock would have to be written off prematurely.

Stedenbaan and Light Rail If the Rotterdam transit network is integrated with Stedenbaan it could link destinations up to 25 to 30 kilometres apart: The Hague, Gouda and Dordrecht. In this model, light rail systems like TramPlus, The Hague RandsstadRail and the Rijn-Gouwe line could cover distances from 10 to 15 kilometres. The problem of premature replacement of rolling stock can be avoided as long as Stedenbaan and RandsstadRail in The Hague are operated separately, much like the current plans.

Regiotram and Light Rail Separating the transit networks in The Hague and Rotterdam, as in the previous model, does not seem very logical at first sight. Things might work better when Regiotrams arriving from the Rotterdam conurbation (Hofplein line or the 'Oude Lijn') can use the city tunnel in The Hague. This will be possible when the Rotterdam transit network adapts (in time) to low-floor vehicles and when the Rotterdam and The Hague network link up with the Rijn-Gouwe line using the Stedenbaan infrastructure. The resulting integrated network would serve the whole South Wing. TramPlus (≤ 10 km) could then become a role model for upgrading the Rotterdam and The Hague tram systems.

Towards one integral swingnet

Rail technology is so far advanced that the distinction between a commuter train, rapid transit, metro and light rail exists only in our heads. In a complex and dispersed urban area like the South Wing of the Randstad we should forget about them. We need to refocus our efforts on things like 'new stops' and 'adding houses and offices'. This is the link with urban planning and urban design. We can then concentrate on the spatial quality of the station areas and their day-to-day use by the travelling public. Having concluded that we need just one, possibly two systems to build a coherent SWINGnet, it is high time we turned our attention to these key planning issues.

<http://connectedcities.net>

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