

## **Light rail provides a design for a healthy and liveable urban public space**

### **Introduction**

Transport planning and policies on a regional and city scale need to make it easier to get around in ways that are less carbon intensive. The shift to lower carbon forms of mobility such as walking, cycling and public transport can deliver better health and quality of life for people and results in more attractive towns and cities with less congestion and better air quality.

In transport literature there is an ongoing discussion on the potential of light rail in mitigating congestion and supporting mobility around urban centres. Throughout Europe, many policy makers see light rail as an interesting option to improve the accessibility of urban centres. Tram and train used to be entirely different public transport systems. The tram served the shorter urban distances and the train served longer regional (intercity) distances. Tram and trains were physical incompatible systems and vehicles could not cross over from the one to the other network. The users of these systems had to bridge the gap, which meant walking, waiting and too often losing connections.

But the difference between the urban and regional scale is fading away. In the new geography of Europe network cities and urban sprawl are demanding a new way of public transport. The new generation of light rail vehicles can play the role of both tram and train. Light rail transit offers an important transition in planning urban and regional mobility, and opportunities for transport-oriented spatial development.

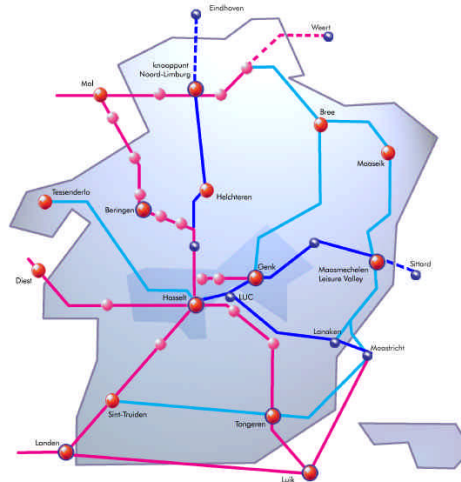
The German city of Karlsruhe is known as the pioneer of this all. In the early nineties of last century the model of combining two networks, train and tram, in one operation led to a significant increase of its use. Technical and management differences and safety aspects could be overcome.

Besides the obvious environmental gains, the introduction of a light rail systems in many European cities demonstrates how high profile infrastructure can reshape the city. In Karlsruhe the above ground light rail system is a preferable alternative over an underground metro. And so a light rail system not only structures a more sustainable urban lay-out, but also creates a more friendly and liveable public space and accessible urban neighbourhoods. The example of Karlsruhe also showed that an adapted tram can successfully operate over far greater distances than the 5-10 kilometres, considered as the maximum. Light rail shows that there is a regional future for the tram and for a stronger regional strategy in public transport-oriented planning of urban development and structure.

The introduction of a light rail system, by the Flemish regional public transport authority, in the existing urban setting of the city of Hasselt is a challenge for urban planners, infrastructure engineers and landscape / streetscape designers. In contrast to underground and metro systems of urban public transport, a light rail system forms part of the public realm of streets and squares. This principle demands great urban design effort. In most places 'space' has to be claimed from the car. This is an advantage. Fundamental rethink of the place of cars in the city offers opportunities to redesign streets and squares and regain public space for people.

## Light rail and sustainable urban development

If a city is to function in a sustainable and liveable way, it is of great importance that it be optimally accessible from the region. The high-speed tram project in Limburg (Belgium) offers an exceptional opportunity to improve the accessibility of the peripheral areas and centres of Hasselt and Genk from the region, in brief to strengthen the regional function.



*De Lijn, 2008, Spartacusplan*

The light rail routes supplement the incomplete railway network and also constitute the public transport vectors to which bus transport in the region is linked. Carefully located high-quality Park & Ride amenities can persuade commuters and visitors to the city centre to change their private car to comfortable and congestion free mobility. But, even more than conventional rail transport and bus transport, a high-speed tram on its own track bed is the means of transport of the future for securing accessibility of the town from the region.

Within the town the high-speed tram project has resolutely opted to serve the important urban functions (railway stations, commercial centre, public arenas, sports infrastructure, university and technical college campus, etc). The light rail can penetrate deep into the central area of the city. The train-tram vehicles are flexible trains and can take shorter curves and steeper inclines. They also have a low-floor, obviating the need for high platforms. In this way, the major centres of attraction of the town centre and the transfer points of public transport are connected to the region quickly and conveniently.

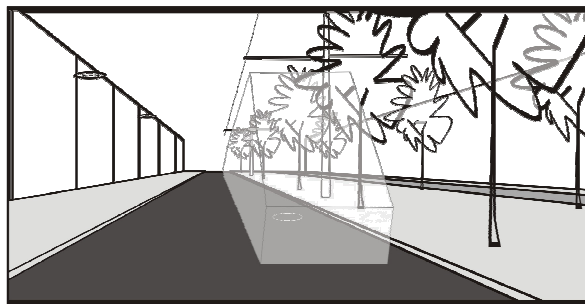
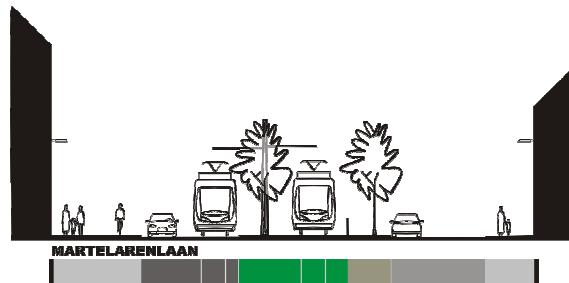
Just as in many other European cities, a hybrid public transport system has been chosen. Within the town the high-speed tram runs through the streets and squares and its speed is adjusted to suit. Outside the town, a high-speed tram behaves like a train that can cover large distances at high speed. The hybrid system makes the architecture of the public transport more flexible as the planners have additional opportunities to compensate for time loss elsewhere. The vehicles of the light rail system can travel as a tram at 30 or 50 kph but also at 90 or 100 kph. If a tram is delayed due to interaction with crowds in the inner-city, it can compensate elsewhere on the 'fast' tracks. The high-speed tram can share tracks with conventional rail transport or run on its own new track bed. Especially in a region with a highly fragmented spatial structure, construction of the new rail infrastructure is an expensive affair that is difficult to fit into the space available.

Hence the feasibility of such a project increases with the possibility of using the existing rail network outside the town. This is again dependent on the spare capacity of the surrounding rail network, the possibility to take all necessary safety precautions and the preparedness of the operator of that network to allow trains and high-speed trams to share tracks.

### **Safety and liveability**

In the central areas of a city there is not always space for a separate public transport line, and from the viewpoint of the quality of the public realm, there is even no need for it. The hybrid system makes it possible to go for a light rail system running through streets and squares within the town. This makes the tram – unlike a metro – visible and makes the town liveable and socially safer. The specially adapted tramway vehicles, which are easy to board because of their low floor, make an extra contribution to this. The vehicles offer fast and easy boarding to all passengers, including those with a handicap.

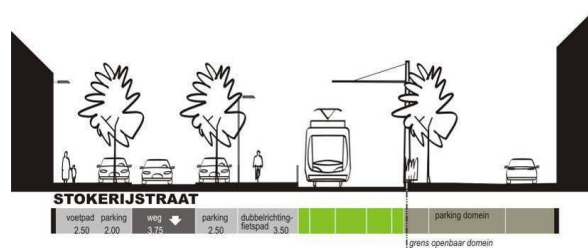
The coming of a tramway changes the face of the public space. In towns where road users are not used to trams, the debate on safety and liveability comes very much to the fore when a new line is built. It is a matter of finding a proper balance between a safe and a sophisticated outcome. This is a matter of making the tramway properly visible but, because of its simplicity, not obtruding on the public space.



*Grontmij, 2009, draft design streetscape with tram*

The route of a tramline requires space, whether or not it is on its own track bed. Fortunately a good designed light rail vehicle hardly zigzag at all. The almost negligible sideways movement means that this form of transport requires a relatively small amount of profile space in the urban structure. The cost of civil engineering structures remains, relatively, limited. A tram is more predictable than a bus because it cannot deviate from its track. This means that other road users can easily work out where they may expect its vehicles.

Nevertheless, when fitting a (high-speed) tramway into the fabric of a town, it is necessary to take organisational and design measures that reduce or eliminate risks since a tram has a longer braking distance than a bus. An appropriate speed regime and good lines of visibility make it possible to have the tram coexist safely with the other traffic.



*Grontmij, 2009, draft design streetscape with tram*

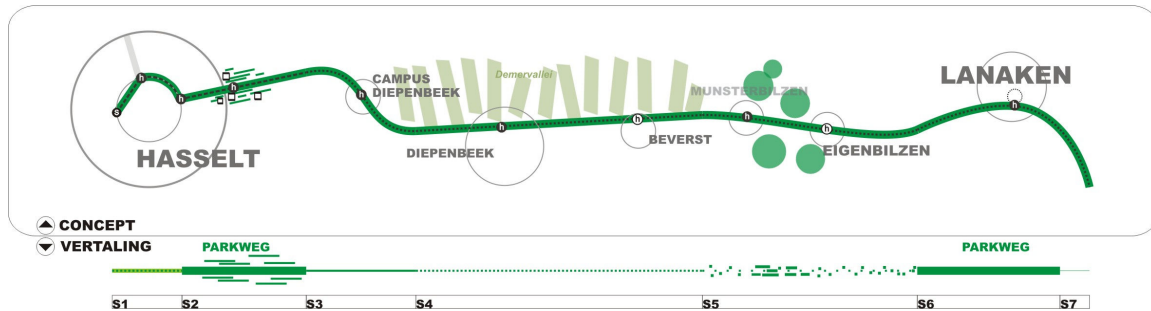
The assumption is that strict priority for the tram results in minimum regulation of traffic flows. An appropriate choice of materials for track beds, stops and their surroundings, any topographic features and edging stones increases the readability of the tram's free space and hence safety. At crossings with other traffic flows, a readily comprehensible layout is needed, supplemented by signs.

Outside the towns, where higher speeds are reached, the safety aspects are comparable with those of railway infrastructure. In villages and the countryside where abandoned railway track beds are used, a more visible arrangement is needed to re-alert road users and residents to rail vehicles.

How to fit things in is very much determined by the urban context. For example, for safety and traffic flow reasons, a location in a residential street will demand greater regulation at points where the line crosses the road or where people, cars etc cross it. At a location in a central area, in a city square, many informal crossing movements may be expected. Because the tramline itself lays quite emphatic claim to that space, prudence is indicated in making any further physical intervention.

A tramway route on a car-oriented roundabout can address an incomprehensible road layout and lead to greater structuring and readability of the junction. Where the tram runs down a major boulevard, the profile of the road can be made more user friendly for pedestrians. Where the tramway is in the centre, islands can be linked to its track bed and/or stop infrastructure, which makes it easier to cross the avenue.

In most of the cases this is only possible after a fundamental reshuffle of car-traffic circulation in the city.



*Grontmij, 2009, draft design landscape concept tramway*

### Opportunity for urban renewal

A high-speed tramway is an important public investment and the starting point for a clear vision of sustainable urban mobility and development. Accordingly the project in the province of Limburg has also opted to develop the high-speed tramway as a powerful urban and rural feature. This identity-determining approach forms part of the foundation of social mobility and acceptance.

Fitting the stops into the town centre and peripheral areas thereby becomes a distinctive and visible act. Stops bring people into the town. They are excellent recognition points and places where people arrange to meet. Given a structure of high architectural quality, a stop can acquire visual significance on the street plan. Squares, a station environment and crossing points are highly suitable for safe, sheltered main stops.

The design of high quality and clearly visible transport stops demonstrates that a tram stop is more than giving shelter for people who are waiting for their tram. In the central urban areas the location of stops or nearby shopping streets and public building, at a junction of urban axes or at a main city square can result in a meaningful meeting places. It shows that the sustainable functioning of a city depends on a better use of available resources, for instance the existing public space. The rethinking of public space can change very dramatically by bringing tramways in the existing urban structure.

Fitting in a new tramline is an opportunity to rejuvenate the urban public space. One important matter is a design attitude in which the tramway is understood as a formative component of the public space. In urban design, the trick is “not only to think between the tramlines”! The public space in streets and squares is best taken in as a whole, “from frontage to frontage”. In this way we arrive at a spatial solution with the proper quality, an approach that also benefits safety.

Finally, such a high quality public transport system has a strong structuring effect on the spatial development of urban and rural regions. However, in the case of Limburg, this system comes late since the urban development and urbanisation of the region occurred mainly in the second half of the last century and resulted, very much driven by the accessibility of the region by car, in a widespread pattern of settlements and economic activities (spatial sprawl of urban activities, neighbourhoods and industrial estates). The fact that the economic structure is based on coalmines that were developed spread out over the rural areas in the

first half of the last century contributes greatly to this. It means that the choice of routes and stops must be very well thought out.

Potentials for urban development and concentration around stops and interchange points are an important criterion in this. The main stops in the town also form such focal points. This could help urban and regional planners to be able to anticipate possible rail-guided public transport in the urban and regional structure.



*Grontmij, 2009, draft design streetscape with tram and stop*

## Conclusions

With the light rail project the Flemish regional public transport authority offer a supplement to the incomplete railway network and also constitute the public transport vectors to which bus transport in the region is linked. The comfort on offer and the time-saved, psychological, can result in a growth on the public transport lines tot the city centre.

The introduction of this hybrid tram-train model is a challenge for urban planners, infrastructure engineers and landscape / streetscape designers. The embedding in the public realm of towns and villages demands great urban design effort. In this respect light rail development has demonstrated how high-profile infrastructure can help to regenerate cities and how it vastly improves image and liveability.

The coming of a tramway really changes the face of the public space and it shows that a new tramline is an opportunity to rejuvenate the urban public space a tramway is a formative component of the public space. The light rail system itself can become a structuring aspect of a more public-transport oriented spatial development.

The design of the layout of a light rail network and the location of nodes and stops is experienced as a multidisciplinary activity and composition of urban layers. The underlying design layers of development opportunities, green structures and the public realm enhance the development of a more sustainable urban region.

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