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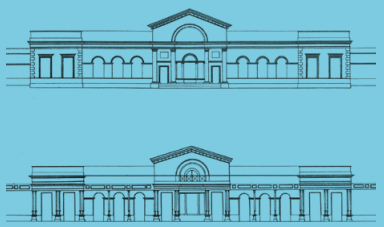
Introduction

This issue of OverHolland presents the results of the first part of the research project *5x5 – Projects for the Dutch City,* which is being carried out at the Faculty of Architecture of the Delft University of Technology. With 'Research by Design', *5x5* intends to research the cohesion between architectonic interventions and urban transformations of the station areas in the five smaller historical cities of Randstad Holland: Delft, Dordrecht, Gouda, Haarlem, and Leiden. OverHolland 5 presents analyses of these locations, together with a problem statement that has been tentatively formulated for the design research. These locations serve as a starting point for the second part of the project, where five teams of architects will design the five station areas. The basic assumption here is that the railway in the city centre area will be built underground, following the Delft example. The results of this design research will be published in 2008.
Historically speaking, building railways and stations constituted an important period in the development of Dutch cities. Because of recent changes in Dutch railways, the relation between the historic city core and the railway is again open for discussion. This issue begins with an introductory article by Henk Engel, in which the background and basic assumptions of the 5x5 project are explained and the current architectonic issues, with regard to the restructuring of these station areas, are also addressed. Next, Roberto Cavallo provides a general description of the history of the railway in the Netherlands in his article 'Railway in the Dutch City'. In more abstract terms, Leslie Kavanaugh researches the effects of the introduction of the railway on time and space in the city in her article 'Time and the City'. Further, the analyses of the station areas in the five cities are the main focus, showing the combination of city expansions and transformations of the respective station areas, which provide a new view on the possible development of the smaller historical cities in the 21st century.
The 'Polemen' section concludes this issue with two book reviews: Leslie Kavanaugh discusses the latest study by historian Auke van der Woud entitled *Een nieuwe wereld. Het ontstaan van het moderne Nederland ('A new world. The origin of the modern Netherlands')*, while Endry van Velzen elaborates on his vision in the book *De tussenmaat: een handboek voor het collectieve woongebouw ('The intermediate size. A handbook for collective residential building')* by Lieke Bijlsma and Jochem Groenland, which he places between a design study and an architecture handbook.



5x5: Projects for the Dutch City

Henk Engel *

As a prelude to *5x5: Projects for the Dutch City,* this issue of OverHolland presents city analyses of the station areas in the five smaller historical cities of Randstad Holland: Haarlem, Leiden, Delft, Dordrecht and Gouda. By way of 'Research by Design', 5x5 intends to research the cohesion between architectonic interventions and urban transformations. The research project contains two parts. The first part analyses the various locations, and a problem has been tentatively formulated for the design research. This issue of OverHolland is the conclusion of this part of the research. In the second part, five teams of architects will make designs for the five station areas, the results of which will be published in 2008.

'Research by Design', which aims at profiling designing as a scientific activity, was put on the research agenda a few years ago by the Faculty of Architecture of the Delft University of Technology. The university council understood its importance and 'Research by Design' was recognised as one of the spearheads of research at the Delft University of Technology. Although it is an institution for scientific education and research, it is mainly focused on educating designers. This is true not only for the Faculty of Architecture, but for other faculties as well. It is therefore important to find a term, which values 'design' as a result of scientific research. This way doctoral research could be considerably broadened and could offer a new framework for appointing teachers and researchers strongly orientated towards the practice of designing. Such teachers and researchers are simply crucial in order to educate designers. From this perspective, by recognising 'Research by Design' the management of the Delft University of Technology has not just given the Faculty of Architecture the benefit of the doubt, but has reserved a pioneering role for the entire university.
In general, three criteria have been formulated for designing as a scientific activity: "1) the design must offer a solution for a wealth of problems, 2) the mode of thought and rules used in the process must be determined, 3) the design must bring about new knowledge or alternative skills, or show how existing knowledge and skills can be used to generate new and unique designs."[1]. These criteria will need to be specified for various disciplines, based on the theoretical framework and verification methods that apply in the field in question.
This concerns architectonic research in which one and the same description and interpretation method is used for both urban analysis and architectonic design, namely that of the typological and morphological research of urban spaces and built-up forms. Besides the 'social-economic survey', which is an important instrument of spatial planning and all-encompassing urban planning, typo-morphological urban research specifically focuses on the description and interpretation of changing urban use of land and concrete changes in the form of cities. This type of research mainly tries to develop instruments for 'designing the mid-scale', a project-oriented approach in which the architectonic component is of decisive significance.[2]

As object of research, the station areas are interesting in two respects. Firstly, the construction of railways and stations are an important moment in the development of cities, as it marked the beginning of a new

period of urbanisation. Train traffic made it obvious to everyone that a new era is linked with a leap in technological development, bringing spatial aspects together in another context. Travel times were shortened. Local isolation was forced open, while old fortifications around cities were dismantled. Train traffic introduced new artefacts in the urban periphery: railway dikes and viaducts. The station buildings were 'monuments' of a new territorial order. With their squares, stations formed new focus points of urban development in relation to the historical city centres.[3] This complex of new developments confronts the typological and morphological urban research with a number of pertinent questions, especially if the further development of city expansions and the restructuring of historical city centres are involved in this process. That brings us to the second point, which makes researching station areas so interesting today: the current architectonic questions with regard to the restructuring of these areas.

General framework: Randstad Holland

In previous issues of *OverHolland*, the general framework of this research has been expanded in principle. In these issues, the most important results of recent historical, geographical and urban history research have been addressed. In issues 2 and 3, Reinout Rutte contributed a draft on the development of Dutch cities.[4] For the last part of his studies, he made an overview that rendered the growth of a large number of cities graphically legible by using growth maps of an equal scale. For the 5x5 project, the cities in the area of the current Randstad Holland were selected and complemented by growth maps of The Hague, Dordrecht and Utrecht. This overview of the nine most important historical cities of the Randstad shows their unequal development until 1700 (see 001, p. 37). The size of these cities at the beginning of the eighteenth century is practically unchanged more than a century later, after a long period of economic stagnation and de-urbanisation, and forms the starting point for modern urban expansion, which took off in the second half of the nineteenth century and still continues today to a limited extent.

The comparative overview of the development of the nine most important historical cities shows that the starting point of modern expansion for the various cities was very different. In 'Mapping Randstad Holland', population figures provide insight into this unequal development.[5] The tables clearly show that the network of cities formed in the late Middle Ages, which make up the starting point for the development of the current Randstad Holland, underwent a fundamental change in structure in the sixteenth and seventeenth centuries. The polycentric urban system of the late Middle Ages was then transformed into a hierarchal urban system of which Amsterdam formed the biggest city and dominant economic centre by far.

During the economic stagnation and de-urbanisation of the eighteenth century and the beginning of the nineteenth century, an important change in structure took place once more and the basis was laid for the current hierarchy of cities in Randstad Holland. As far as population size was concerned, Amsterdam was able to hold its own well in this period, while The Hague, as the seat of government, continued to grow and Rotterdam began to develop into the most important port city for the transit of goods to Germany in the first half of the nineteenth century. Utrecht, the biggest city of the late Middle Ages, prevailed once more in this period, but mainly because the two large seventeenth century industrial cities, Leiden and Haarlem, had seen their population reduced by more than half. The two smaller cities of Delft and Gouda also suffered this fate, as they had also lost half of their population. The population size of Dordrecht remained almost unchanged. The urban system of four big cities at the top was maintained during the modern expansion, be it that the underlying differences in size of the four big cities in fact diminished considerably and the difference with the five smaller cities increased. At the same time, these smaller historical cities were accompanied by 15 other mid-sized cities.

These five smaller historical cities in the Randstad were actually so unique that a research project was specially dedicated to them. There are many reasons for this. First of all, it must be noted that with regard to the Randstad in the past 10 years, attention has been exclusively paid to the four big cities. Since the end of the 1980s, when the policy of the national government was no longer focused on pacifying the tendency to create a metropolis in the Randstad but rather to use it in the global competition, all attention has been concentrated on the economic potential of the big cities and the hub function of Schiphol Airport and Rotterdam's sea harbour. The possible potential which the mid-sized cities could have here, remains outside of the picture. In professional circles, one is mesmerized by the unbridled development of Asian metropolises. Mentioning the mid-sized cities usually refers to the new ones: Zoetermeer, Hoofddorp, Almere and Nieuwegein, as they offer a worriless environment for company headquarters.

Here, we touch upon what makes the smaller historical cities in the Randstad so unique and problematic at the same time: they possess a relatively large medieval core. The reason for this is that for a long time during the first growth of the Dutch cities they were bigger and more important than Amsterdam and Rotterdam, not to mention The Hague. As a sea port, Dordrecht was the biggest city of the County of Holland for a long time and the second big city in the area of the current Randstad after Utrecht. Haarlem, Delft and Leiden were important industrial cities at that time. Gouda belonged together with Amsterdam and Rotterdam to the newest Dutch cities and was initially the most important of the three. Gouda had a strategic position in the North-South connection of the County of Holland by way of the 'within the dunes' navigation route. Tolls were an important source of income, as the city knew how to link a market function and important forms of industry to its position in the navigation route with varying success. In the sixteenth century, Amsterdam rose to the top and prevailed over all other cities, including Utrecht. Rotterdam still did not have a significant role. In the States of Holland, the six most important Dutch cities were represented: Amsterdam, Haarlem, Delft, Leiden, Dordrecht and Gouda.

The five smaller historical cities in the Randstad have the honour of being the guardians of an important part of the architectonic and urban planning heritage of the Netherlands. This is surely the case since the 1960s, when the protection of monuments was extended to the entire 'protected cityscapes and townscapes', making it not a great honour. Nowhere else it is becomes so clear that architectonic culture is completely divided up between operations aimed at conservation in the historical centres on the one hand and the development of 'modern' city expansions on the other. This schizophrenia has notably led to lengthy procedures and constrained results with the necessary transformations of historical centres. The view of the architecture of the historical city centres that was enforced was showy and picturesque, with integration into the 'environment' of the old city being the only criterion. Little was learnt from the fact that these cities had a rich and inventive tradition of urban transformation. At the very most, it was an alibi for grotesque interventions to the benefit of large-scale retail companies.

Centre and periphery

The typological and morphological urban research is ideally aimed at the joining of two types of research, which generally take place separately from each other: architecture historical research and urban historical research.[6] In *OverHolland 3*, an example was given in the study 'The first commodity exchange and the forming of the centre of Amsterdam'.[7] This study intended to make clear that when researching the development of cities, it is important not just to look at the successive expansions of a settlement, but also at the development of urban institutions. The study mainly focused on the first public buildings for the city council and trade as an important indicator of the process of city formation. Besides the expansion of the urban territory, the further development and differentiation of these kinds of buildings also provides an important indication for the growing size of the urban economy, the increasing complexity of the city council and the greater urban self-awareness.

Buildings that are treated as isolated properties in the succession of building styles in contemporary architectural history, such as the Nieuwe Waag (1561-1566, designed by Joost Janszoon Bilhamer), the Commodity Exchange (1607-1611, designed by Hendrick de Keyser) and the new City Hall (1647-1654, designed by Jacob van Campen), are important urban historical witnesses of the second growth of Dutch cities in the sixteenth and seventeenth centuries. The typological and morphological urban research takes this a step further by considering these buildings not as passive reflections of social-economic developments, but as catalysts in the new development phase of the city. In this view, they were not alone. In combination with city expansions, they brought the organisation of urban functions to a higher level. Reconstruction drawings show that the city expansions went hand in hand with the spatial transformation of the city centre.

The combination of city expansions and transformations of the already existing parts of the city also provides a new view on the development of the smaller historical cities in the Randstad area. Except for Leiden, city expansions are not very important to these cities in the second growth period. In Dordrecht, only a small expansion was carried out, while the northern expansion of Haarlem in fact came too late in the second half of the seventeenth century. The 'Nieuwstad' ('New City') of Haarlem was not fully built up, and during the stagnation following the growth of the Golden Age many houses were even torn down. In the sixteenth and seventeenth centuries, Delft and Gouda were not expanded at all, even though this period was a Golden Age for these two cities as well. The new development phase of Delft and Gouda was done entirely by compressing within the boundaries, which were already established in the mid-fourteenth century, making the development of these two cities particularly interesting for typological and morphological urban research. For five centuries, the history of these cities has been one of constant transformation of one and the same built-up area. Only at the end of the nineteenth century, with the beginning of modern urbanisation, did these cities step outside their centuries-old boundaries.

The expansion of the urban territory in the Randstad since 1850 was mapped in the 'Atlas Randstad Holland'.[8] In the urbanisation of the Randstad, four periods were captured: 1850, 1940, 1970 and 2000. These years mark four periods of urban development, which are legible on the city maps, based on the clearly recognisable morphological

characteristics of the urban areas, which appeared in the different periods: up until 1850 the City of Canals, from 1850 to 1940 the City of Streets, from 1940 to 1970 the Open City and from 1970 to 2000 the Cluster City. For the 5x5 project, a period was added: 1910 (see the overview map on p. 38 in this issue). This marking has been of major importance for the research into the development of station areas.

As of 1910, the effect of the Dutch 'Woningwet' ('Housing Law') of 1901 became clear, obliging the cities to establish expansion plans. Later, the city expansions were regulated by urban planning designs, which reviewed the entire municipal territory. The large morphological differences, which can be determined later for the various periods of city expansion, are largely the result of a few major upheavals in the architectonic and urban planning culture of the Netherlands. To keep it simple, for the period 1910-1940 the Berlagian urban planning was indicative, for the period 1940-1970 the Delft School and, increasingly, the New Objectivity, and finally, for the period 1970-2000, Structuralism, which gave way to various types of urban planning eclecticism at the end of this period.

The urban areas built up between 1850 and 1910 did not include any kind of urban planning. In the zone between the historical city centre and the newly planned city expansions, the built-up areas appeared incidentally and were often of a mixed nature, with very diversified purposes. The overview map 002 on p. 38 clearly shows that after 1850 the expansion of the built-up urban area of the various cities also took place asynchronously. With the five smaller historical cities, it is striking to see that the city expansions in the period 1850-1910 were still small in size. Initially these cities could absorb the ever-increasing number of residents within the already present built-up area. The population size of Haarlem, Leiden, Delft and Gouda had in fact decreased by almost half or more in the previous period, during the stagnation. Although Dordrecht suffered less of a blow, the city expansion area between 1850 and 1910 was combined with the outskirts of the historical city, which in the past already had a mixed, half-rural, half-urban, use. The zone of the first city expansions of the five smaller historical cities shows all the signs of what the historical geographer M.R.G. Conzen called a 'fringe belt'.

One of Conzen's teachers, Herbert Louis, drew attention to the phenomenon of the 'fringe belt' for the first time in 1936 during a discussion about the geographical development of Greater Berlin. At the time, he spoke of 'Stadtrandzone' ('Urban fringe'). Since Conzen's study of the English town of Alnwick in 1960, this notion has been widely applied by urban geographers.[9] A recent definition reads as follows: 'The urban fringe belt is a zone in which elements coalesced, having been pushed to the edge of the urban area as a result of inner restructuring and differentiation. If, at a time of boom and demographic growth, the town experiences physical extension, then these fringe zones are leapfrogged by residential areas and remain fossils of earlier developments'.[10] It is precisely in this 'urban fringe' that the railway lines were established in the smaller historical cities of the Randstad and station buildings were given a place. The route from the station on the edge of the historical city to the old centre in the middle of it was the perfect location for establishing new urban functions, such as large-scale retail companies, offices and hotels. At the same time, a barrier was thrown up on one side of the city by the railway. The leap of the city expansions across the railway to the area 'behind' the station was the next significant moment for these cities. At the same time, traffic-related problems of railway overpasses also became a recurring theme in all successive urban development plans.

Station areas

During the entire twentieth century, the railway path has been a determining factor in the development of cities. The comparative overview of the city maps of Haarlem, Leiden, Delft, Dordrecht and Gouda (p. 40) shows the peripheral location of the railway in the urban fringe of the historical cities in 1850, and in four steps shows the ever further surrounding of the railway within the built-up urban area. The railway lines are now in the middle of the city. In the essays about the station areas of these five cities, the questions and possible meanings of the particular location of the station in the city are explored further, using historical maps and station area designs. Naturally we can also see what the various city councils are currently planning in these areas. The most radical plans are in Delft, where preparations are currently underway for the underground construction of the railway on the viaduct along the city centre. Delft is therefore following in the footsteps of Rotterdam where 20 years ago the decision was made to replace the railway viaduct built straight across the city centre with a tunnel.

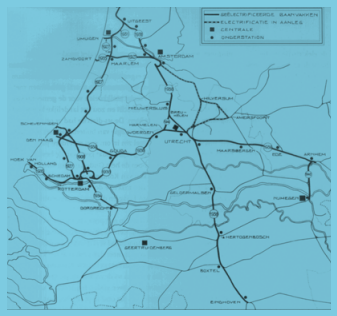
For the 'Research by Design' of 5x5, the radical Delft solution of the railway issue was used as a basic assumption for designing architectonic proposals for station locations in all five smaller historical cities in the Randstad. It does not regard the civil engineering issues of tunnelling, which are surely complicated and will require a large investment, which is a well-known fact. Even more important is the question of what a similar intervention provides. The solution seems so simple: build the railway underground, and the noise nuisance and any other inconvenience is taken away. But what to do with the space that has been freed up? The railway path in Rotterdam still looks like a major question mark and Busquets' plan for Delft has all the qualities of a blanks exercise. The most important question raised in 5x5 is an architectonic one: what could take the place of a remarkable artefact like the railway, which has been determining the image of the city for a century? The station buildings themselves offer less and less starting points in the smaller cities, as they are in fact nothing more than subway stops. Services are limited to a minimum. What is left, are ticket machines and a traffic junction with a bus station, taxi stands and numerous bike parks.

The studies presented in *OverHolland* show that tunnelling offers many possibilities for providing answers to questions that have previously arisen in urban development plans. Starting points are mainly found in the fact that the station areas are located in an intermediate area, a fracture surface, which could become a connecting space between the historical city centre and the expansion neighbourhoods. However, its architecture cannot easily be derived from the context. In this respect, the characteristics of a 'fringe belt' are now simply inconsistent.

Notes

***** The maps of this article were made by Oliver van der Bogt, Otto Diesfeldt and Iskandar Pané. The same for the manipulations of the kadestral, topographical and Bonne maps in this issue. These maps are printed on scale 1:12.500.

1. Leen van Duin, as cited in VNSU, *Architecture, Building and Planning. Quality Assessment of Research*. Utrecht 1998, p. 31.
2. François Claessens, Endry van Velzen, 'The topicality of the urban project', in *OverHolland 4*, 2007.
3. **Roberto Cavallo, 'Railway station: monu**ment versus multi-use terminal. The case of Amsterdam Central Station', in *OverHolland 4*, 2007. In this issue of *OverHolland* are included: Roberto Cavallo, 'The railway and the Dutch city' and 'Haarlem's railway zone', which both form part of the recently published doctoral research *Railway space in the Urban Context: an Architectural Approach*. IUAV, Venice 2007.
4. Reinout Rutte, 'A landscape of towns: on the genesis of Dutch towns and their street plans in the eleventh to fifteenth centuries', in *OverHolland 2*, 2005, pp 72-90 and 'Expansion and contraction of Dutch towns. Urbanisation, urban planning and deurbanisation in Holland from the fourteenth to nineteenth centuries', in *OverHolland 3*, 2006.
5. Henk Engel, 'Mapping the Randstad Holland', in *OverHolland 2*, 2005.
6. A long tradition in this type of research can be found in Germany, starting with the work of A.E. Brinckmann and R. Eberstadt from the beginning of the twentieth century. See François Claessens, *De stad als architectonische constructie. Het architectonisch discours van de stad in Duitsland 1871-1914*. (*'The city as architectonic construction. The architectonic discourse of the city in Germany 1871-1914')*. Dissertation, Delft, 2005. A nice example is Karl Gruber, *Die Gestalt der Deutschen Stadt ('The shape of the German city')*. München, Callwey, 1952. More recently, Cordt Meckseper, *Kleine Kunstgeschichte der Deutschen Stadt im Mittelalter ('Summary of art history of the German city in the Middle Ages')*. Darmstadt, Wissenschaftliche Buchgesellschaft,1982.
7. Henk Engel, Esther Gramsbergen, 'The first commodity exchange and the forming of the centre of Amsterdam', in *OverHolland 3*, 2006.
8. Henk Engel, Iskander Pané, Olivier van der Bogt, 'Atlas Randstad Holland', in *OverHolland 2*, 2005.
9. H. Louis, 'Die geografische Gliederung von Gross-Berlin' ('The geographical layout of Greater Berlin'), in *Länderkundliche Forschung ('Geographical research')*. Stuttgart, Krebs-Festschrift, 1936, pp. 146-171. M.R.G. Conzen, *Alnwick, Northumberland. A study in town plan analysis*. London, Georg Philip & Son, 1960, pp. 56-65.
10. **B. von der Dollen, 'A historical-geograph**ical perspective on urban fringe-belt phenomena', in T.R. Slater (ed.), *The built form of Western cities. Essays for M.R.G. Conzen on the occasion of his eightieth birthday*. **Lei**cester, Leicester University Press,1990.



The Railway and the Dutch City

Roberto Cavallo

In order to understand the transformations that the Dutch cities have undergone in the last one hundred and fifty years, the creation and development of railroads are important key issues. In the article '*Randstad Holland in kaart*'[1] Henk Engel schematizes the process of urbanization of the Randstad in four phases, collecting the most relevant data into four maps: 1850, 1940, 1970 and 2000. The choice of these four periods allows a straightforward comparison of a range of different issues at a single glance. Henk Engel emphasizes in his article that the choice for four 'morphological periods' is based on the different kinds of urban fabric characterizing the Dutch city. The 'canal town' is typical up to 1850, the 'town of streets and building blocks' for the period between 1850 and 1940, the 'open town with green belts and built-up areas' for the time span between 1940 and 1970 and finally the 'cluster city' for the period after 1970.

Not coincidently, the time span of the maps is also the trajectory of the full development of railroads in the Dutch cities, with the only exception of being the omission of the situation just prior to the construction of the first railway lines (1839-1850). Considering the issue of infrastructures in a more detailed way, a closer look at the maps will show that the time span between 1850 and 1940 is actually poorly represented; therefore, another map interjected in between would be useful in order to point out some important developments. To this end, Henk Engel introduces another date in between, the year 1910. Adding the map of 1910 would mean taking into account the extensive development of infrastructures in the second part of the nineteenth century and the consequences upon the development of the cities regulated by the '*Woningwet*' (Housing law) of 1901.

The construction and the implementation of infrastructures, and of railway lines in particular, needs special attention in the case of the Netherlands. The transportation on water, characteristic until the beginning of the nineteenth century, changed in the first half of the nineteenth century into a network of road and railway communications. This fact had an important impact on the way the Dutch cities would develop.
In one important study, W. van den Broeke made an attempt to schematize in various periods the evolution of railways in The Netherlands following the way railway companies operated[2]. As he suggests, we can classify the development of Dutch railways into four time spans. The first is characterized by the private construction and exploitation of railways up to 1860, when the railway law S45 was implemented[3]. Between 1860 and 1890, the railroads were mainly realized by the State, yet were operated by private companies. After 1890, several contracts signed between the State and railway companies resulted in a phase of concentration of activities and competition. This period was ended by the 1917 agreement between HIJSM (a private railway company) and SS (the State railway company). In the fourth phase, between 1917 and 1939, the two railway giants worked cooperatively together. After 1939, in the last and current phase, the Dutch railways functioned as the publicly held *N.V. Nederlandsche Spoorwegen*[4], the only remaining railway company set up after the reorganization law issued in the same year.

This study, in particular, focuses upon offering a general insight into the phenomenon of railroads in the Netherlands from the viewpoint of urban planning and architecture. Starting with the means of transportation before the construction of railways, and ending with some considerations about the contemporary developments, the most relevant issues are examined in a chronological order.

The Low Lands: Territory and Transport until the First Decades of the Nineteenth Century

The relationship between the organization of land uses and the development of cities and landscapes is quite exceptional in the Netherlands if compared to the rest of Europe. The most particular aspect is certainly the continuous effort of reclaiming land and protecting it from the water. In order to comprehend fully this specific territory, it is necessary to consider the geomorphologic and historical context of the Rhine delta.

Until 1500 the central part of the country, the area that we could identify today as the Randstad, was nothing more than an extended swampy area in which flat-bottomed boats were the only way to facilitate transport. Maps of that time show large lakes, rivers and other watercourses. Ever since the Middle Ages, a system of rationally developed canals characterized the area in question, ordering the landscape as well as cities. In contrast, only a few traces of roads existed.

The sparsely dispersed cities were erected mainly on the higher elevations of sand tops and surrounded by dikes, protecting them from the water as well as from enemies. Utrecht is the oldest city. The first Dutch cities behind the North Sea dunes were Alkmaar, Haarlem and Leiden; Dordrecht and Delft were founded later. The initial settlements of Amsterdam and Rotterdam were realized on dikes, while The Hague was the first city behind the North Sea dunes without fortification walls. Gouda, in contrast, was built effectively in the swampy land.

The canals, fundamental to the organization of the Dutch cities and far more important than roads, were widely used for transport inside the city as well. Initially built as critically necessary drainage facilities, by the year 1600 the canals also fulfilled an important role in passenger transportation outside the cities. Not really optimal, certainly not for goods, a multiple system of barges ensured the links between the economic centres of the west Netherlands. The network of canals developed further and already by the end of the seventeenth century the water transportation through *trekschuit*[5] reached is peak period in terms of passengers numbers.[6]

At that time, the industry of the *trekschuit* declined in the eighteenth century due to a period of poor economic performance. For the same reason and in the same period, several Dutch towns were affected by a serious depopulation problem, with the most depressed point at the beginning of the nineteenth century. In same period, the construction of roads also was initiated, but highway transport played a minor role until about 1800[7]. Furthermore, the condition of roads was quite poor up to the Napoleonic time. In fact, only during the first decades of the 1800s a number of well-paved highways were built in order to accommodate the increasing traffic of coaches and wagons[8].

In this period, water transportation also underwent a substantial transformation. Existing navigable canals were improved and new ones were built, for the first time offering an integrated transport network in combination with the new highways on the ground. The most important work of this period was certainly the realization of the North Holland Channel (1824), which allowed a direct connection from the harbour of Amsterdam to the North Sea avoiding the circumnavigation of the inner sea.[9] In the meantime, the port of Rotterdam was also improved and enlarged, offering serious competition to the harbours of Amsterdam and Antwerp in Belgium. In terms of transport, one important issue of that time was the creation of a more efficient and expedient connection with the Rhineland region of Germany. This industrialized area was growing rapidly and needed transportation of goods to and from the North Sea.

With the industrial revolution, steam power was further studied and improved. The steam engine was developed at the end of the eighteenth century for various purposes and was also used in road and water transportation vehicles. The first application of steam power for locomotives took place in 1804. In this year the Cornish engineer Richard Trevithick constructed the first steam locomotive able to run on tracks[10]. This experiment, although successful, showed the importance of finding the right balance between the weight of the locomotive and the thickness of the tracks. Based on the extensive studies of George Stephenson, the locomotive could be improved further into a machine that would fulfil a pivotal role in the transportation on tracks. In 1822, George Stephenson organized a successful demonstration of these technologies for Edward Pease, at that time involved in the planning of the first official railroad from Stockton to Darlington. The main line of this railroad was over forty kilometres long, planned to transport both passengers and goods. The opening of the Stockton & Darlington railroad was held on September 27, 1825 and a locomotive built by George Stephenson pulled the train that was carrying the passengers. Next to the locomotive, horses and stationary engines were also required to pull the train in some areas on the rail line. George Stephenson's machine was a great success and marked the beginning of a new era for transportation in the world.

The First Dutch Railways

Despite the great success of the locomotive and the publicity which it generated in the media all over the world, the actual realization of the railway remained an English phenomenon up until 1830, the point at which France opened a section of the St.-Étienne and Lyon line. In this period almost every European country, having been convinced of the advantages of the train, was industriously developing plans for railroads. The actual construction of a railroad was in fact a difficult matter. Once its layout was determined, the building of each section of a railway line required many bureaucratic permissions, a clear plan for the expropriation of land and, last but not least, a vast capital investment. For these reasons, the development of railway lines took generally more time than originally foreseen.

Projects for railroads in Holland were discussed from the 1830s, but a general lack of interest by the national politicians caused extra delays in the realization of the first railway line. Local politicians and Chambers of Commerce were more interested in the possibilities the railways offered for transporting goods than in passengers. Introducing the railroad in the Netherlands was certainly not a facile undertaking. From an economical point of view there were several uncertainties. Most importantly, the investors in the HIJSM,[11] who planned to finance the first

railway line of the country, had to compete with the existing mass transportation system over water. For more than two hundred years the economy of the country relied upon an extensive network of canals where, beside the transport of goods, inexpensive passenger services were widely offered. Although the transportation on water eventually in time lost customers to the emerging coach services on the road, it remained the most important means of transportation in the first half of the nineteen century.

In the Netherlands, the first railway was opened between Amsterdam and Haarlem on September 20, 1839, fourteen years after the Stockton & Darlington line in England. Just a few months before its official opening, a pamphlet was printed and handed out in both cities showing a dramatization of an ideal conversation between the *trekschuit*[12] and the train.[13] The *trekschuit* was manifesting his pride in being reliable for centuries and had no intention of bowing to the train. Indeed, the Dutch railway entrepreneurs feared the competition with the *trekschuit* and did not take the prospect of success for granted. On the other hand, the existence of the network of canals gave considerable advantages to the railway investors, providing information about routes and traffic volumes; not coincidently the first Dutch railroads were placed parallel to the canals. In these areas, the appropriation of the land was often more easily facilitated and the layout of the railway line could be kept as straightforward as possible in order to save funds. These considerations also came into play with the positioning of the rail line connecting Amsterdam to Haarlem parallel to the existing canal. A terminal station was situated at the two ends of the track, Willemspoort in Amsterdam[14] and Amsterdamsche Poort[15] in Haarlem, both working simultaneously as terminal station as well as gateway to the city. After two hundred years of service, the quicker train marked in time the decline of the link by hourly barges between the two cities.[16]

While the popularity of the train slowly grew, especially for the transport of passengers, investors and government agencies in Holland observed the developments in Belgium with attention, particularly in and around Antwerp. After its separation from The Netherlands in 1830 under the leadership of Leopold I, Belgium was busily engaged with the realization of a rail connection between the port of Antwerp and the Rhineland region in Germany. This rail line represented a major threat for the economy of Rotterdam and Amsterdam. As a consequence, a highly efficient rail link between Amsterdam and Rotterdam and further to Utrecht, Arnhem and the Rhineland became an urgent necessity. The decision to extend the first railroad through Haarlem to Leiden, with the intention to connect Amsterdam to Rotterdam, came quickly. In 1842, the railway reached the city of Leiden, traversing the city of Haarlem. With Haarlem being the only exception, the first Dutch railway was situated outside the cities. The smaller cities were all walled at this point in time, and the railway passed near the city gates. Keeping the railroads always outside the city had the advantage that there was no direct confrontation between the historical city and the new means of transportation.

After being extended, passing along The Hague and Delft and following also in this case the main lines of the canals, in 1847 the 'Old line' finally reached Rotterdam, ending in the north of the city at the Delftsche Poort station.[17] In fact, we could say that with this railroad line the first half of the ideal circle that forms the current Randstad was completed. We must note that the course of history would have been different if the reclamation of the land of the Haarlemmermeer polder (1849-1852) was completed some years earlier. A straightforward trajectory of the railway line between Amsterdam and Rotterdam, traced through this polder, would have shortened the distance quite considerably. Rotterdam, like Amsterdam, had a terminus station outside the city walls where the railway tracks were ending. For this reason the stations of Amsterdam and Rotterdam were for a long time an obstacle for the creation of an effective railway network.

In the meantime, the 'Rhine railway' was also under construction.[18] Starting at the terminus station of Weesperpoort in Amsterdam this railway line followed more or less the line of the river Vecht[19] until the city of Utrecht where the station was also constructed just outside the city walls.

In 1855, the railway circle encompassing the 'Randstad' was finally completed. Looking at a map of this period, the recognizable railway lines circumscribed strongly the territory of the Randstad, much more than the existing waterways. The 255 kilometres of railroads linked both Amsterdam and Rotterdam with Utrecht and Arnhem,[20] close to the German border. In order to give an idea of how protracted the construction of railroads was in the Netherlands, a comparison with Belgium indicated that their country already had a network five times longer than that in the Netherlands, and furthermore a network that was connected with the German Rhineland region. Possible explanations for the delays and limited scope in the Netherlands can be found in the economic stagnation and the initial low return on investment entailed in the railroad enterprise. Probably also the strong competition of the *trekschuit* traffic played an important role. Between 1850 and 1870, although some local services were suspended, the passenger transportation on water prevailed and remained the most prevalent means of transportation. Nevertheless, the disappearance of the *trekschuit* was only delayed; its demise in direct competition with the railroad would become inevitable.

Railway Companies and Stations

L.J.J. Serrurier and R. Chevalier, two businessmen from Amsterdam, together with the civil engineer W.C. Brade, officially founded the first Dutch railway company, the *Hollandsche IJzeren Spoorweg Maatschappij* (HIJSM) on August 8, 1837. Although with certainty the project for the railway line between Amsterdam and Haarlem was the responsibility of Brade, the designer of the two stations in Haarlem and Amsterdam-Willemspoort was not clearly attributed. Although C. Outshoorn (1810-1875) is often named, for these two stations as well as for the one in Leiden (1842) and The Hague HS (1843), most historical sources name F.W. Conrad Jr. (1800-1870) as the designer. Conrad studied at the Royal Engineers School (*Genieschool)* in Delft and worked as engineer for the Department of Buildings and Roads (*Waterstaat*) in The Hague. By 1847, the HIJSM had completed the 'old line' from Amsterdam, via Leiden, The Hague and Delft, to Rotterdam.[21]

The second Dutch railway line, the one connecting Amsterdam with Utrecht (1843) and Arnhem (1845), was commissioned and constructed by the State. The *Nederlandse Rhijnspoorweg Maatschappij* (NRS),[22] established in 1845 in turn, took over the control of this line from the State. In the same year the NRS began the realization of a railway link between Amsterdam-Weesperpoort station and the harbour of the city. In 1855 the NRS also obtained permission to build a railway link between Utrecht and Rotterdam, passing through Gouda and ending at the temporary station of Rotterdam-Maas I,[23] the second terminus station in the city of Rotterdam. Although in general the stations of the NRS are not architectural monuments, the management of the company, heavily influenced by the English railway practice, developed plans for a large station in combination with a hotel in Rotterdam.[24] This building, never constructed, would have been the first mixed-used railway building in the country.

In addition, several years passed before the NRS connected to the German railway network; this delay was mainly due to the difference in width of the tracks. The line between Arnhem and Emmerich in Germany opened in 1856. Another railway company, the German *Aken-Maastrichtse Spoorweg Maatschappij* (AMS), established in 1845, operated the line between Maastricht and Aachen in 1856. The NRS also had its own station designer, A.W. van Erkel (1839-1877) who worked on the stations in Arnhem (1867), Den Haag (1868), Gouda (1868), Rotterdam-Maas II (1875) and other minor stations along the rail line operated by the company.[25]

Despite the industrious activity of these private railway companies, the Dutch railway network was not growing rapidly enough. For this reason, the State initiated the construction of several new railway lines and offered private investors a stake in the exploitation of these lines. In 1860, introduced by the government minister van Hall, the well known railway law S.45 was issued.[26] A few days later an agency was established, charged with the design and construction of the railway projects already approved by the minister. Eight different building sites started simultaneously. The coveted contract for the operation of the new railway lines[27] went to the *Maatschappij tot Exploitatie van Staatsspoorwegen* (SS), established in 1863 by a number of Dutch investors mainly from Amsterdam and Rotterdam. All the railway lines built by the State after 1860 were subsequently operated by the SS,[28] with the only exception being the new line along Amsterdam-Zaandam-Nieuwdiep (Den Helder)[29] operated by the HIJSM from 1863.

Importantly in this period, the realization of the line from Dordrecht to Rotterdam was finished in 1872, followed in turn by the so-called Binnen-Rotte junction built on a viaduct running through the inner city of Rotterdam in 1877 and ending at the Beurs (Stock Exchange) station.[30]

Singularly in the Netherlands, with the law of 1860, the construction of rail stations also came under the authority of the State. Considering the vast number of new railways that were to be realized, the Ministry of Transport decided to standardize the type of rail stations into five categories. A station of the first category was the most extensive, while a station of the fifth category would have a more residential scale. The category would be chosen according to the needs and the number of inhabitants of the city in question. Among the stations in the first category built by the State were only in Zwolle (1868), designed by N.J.Kamperdijk, and the one in Dordrecht (1870); while the ones in Zutphen, Hengelo, Meppel, Enschede and Deventer are of the second type. The architecture of the stations was mainly characterized by a neo-classical stylistic approach, very common in those years. The design of the stations was strongly influenced by the work of Durand and the French *L'École Polytechnique*. The actual design of the standardized stations came straight from the Department of Buildings and Roads (Waterstaat) in The Hague.[31] Although based upon standardized types, the stations allowed the implementation of site specific details on the part of local architects.

In the years between 1865 and 1890, the SS, although initially struggling with low financial returns, grew to be the largest and most powerful railway company in the country. The constantly increasing freight transportation consolidated the financial position of the SS, and only the HIJSM seemed able to compete. In these years, the Dutch

railway network further expanded; the law of 1874 about the decontrol of the fortifications and the subsequent demolition of the city walls offered fresh opportunities for the planning of new railways. Next to the HIJSM and SS, the two largest companies around 1890, there were also three smaller ones active in the country: the NRS, *the Nederlandsche Centraal Spoorwegmaatschappij*[32] and the *Noord-Brabantsch-Duitsche Spoorweg Maatschappij*[33]. Some other railway and tram companies were also operating limited local services. In 1890, the State took over the weakened NRS giving the operation of its lines to the SS. The competition on the railway market was reduced effectively to only the SS and HIJSM. At the end of the nineteenth century both were very active in taking over the operations of the smaller local railways. The HIJSM became the most important company controlling almost all of the railway lines in the west of the country while the SS expanded its activities into the rest of the Dutch rail network.

In the last quarter of the nineteenth century, the construction of stations especially for the most important cities, became an important architectural issue. Stations became a critical question, performing more and more a vital function in the cities. Although the main Dutch railway companies all had specialized designers for stations, we hardly see any great or innovative design for stations until the building of the Central Station of Amsterdam. The critical Dutch saying of "*Het is waterstaat wat-er-staat*"[34] is very illustrative of a time in which the State was taking care not only of railways and stations but also of churches and other public buildings.

The situation of Amsterdam was different. The World Fair was planned for 1883, and the projects for the Rijksmuseum and the new Central Station formed the occasion to put Amsterdam clearly on the European map. In this respect, the commission given to P.J.H. Cuypers as the chief architect for the Central Station of Amsterdam, formed an exception to the rule, and simultaneously was a strong admission of the fact that the station was an important public building for the city.

In conclusion, in the last twenty years of the nineteenth century the urban area of many Dutch cities expanded considerably. The railways, once built outside the cities, became increasingly an important part of the cityscape. This fact stimulated interesting developments in the city; for example, the renovation and improvement of the existing railway yards and stations. The construction of new stations and the reconstruction of existing ones were mainly in the hands of a limited group of architects. The HIJSM (since the last quarter of the nineteenth century also called HSM) had from 1879 to 1909 D.A.N. Margadant as the chief architect of the company. G.W. van Heukelom worked from 1891 as a permanent consultant for the SS, designing many of their projects. Another important issue during this period, was the construction of secondary stations on existing railway lines in order to support development of suburban areas. In addition, the realization of smaller local railways would become an important matter also at the beginning of the twentieth century.

The Twentieth Century and the Dutch Railroads

The period between 1890 and the First World War was characterized by a substantial development of the rail network with the increased realization of new railways, particularly in the northern and the southern provinces of the country. This enlargement of the railway network with a number of local railways was not an unpredicted phenomenon but a planned policy promoting another, specifically twentieth century development: the commuter train. From 1900 onwards, the non-resident train traffic became an important issue for the Dutch railways. For the first time, these railworks were strongly influenced by the way the cities had grown around railroads. After the *Woningwet* of 1902, Dutch cities were required by law, to plan and to implement strategies for their expansion (*uitbreidingsplan*). Obviously, the organization of the railways and public transportation in these cities became extremely critical.[35]

Among the new railways of this period worth mentioning is the one opened by the ZHESM (*Zuid-Hollandsche Electrische Spoorweg-Maatschappij*) in 1908, the connecting Rotterdam-Hofplein with Scheveningen and passing through The Hague.[36] Between 1912 and 1918, local railways were also built in the "green heart" of Holland. The so-called "Haarlemmermeerlijnen" were made to connect Haarlem, Nieuwersluis, and Alphen a/d Rijn with the existing railway network and had their own terminal stations in Amsterdam and Leiden. These lines, however, did not prosper and their operation ended quite soon.[37] Another relevant local railway is the one linking Gouda with Alphen-aan-de-Rijn, completed only in 1934. In addition at this time, other local railways were built around Utrecht[38] and Maastricht.

The First World War brought quite a few changes to the organization of railways. First of all, the electrification of the most lines became an essential matter. This fact brought about the realization of elevated railway structures in most cities, and the subsequent reorganization of traffic – and not just around the stations. In the second place, the State got more control in matters regarding the railroads, particularly during the war, deciding to force an agreement between the SS and the HIJSM in order to improve the quality of railway transportation. This merger from 1917 onwards, required both companies to work together under the responsibility of the State. The process of growth of the SS continued and the eventual cooperation with the HIJSM became more effective. From 1917 on, as a proof of the good-faith collaboration, both companies begin signing most of the new contracts together. The actual merger of both companies into the *N.V. Nederlandsche Spoorwegen* was signed in 1937. From that moment, further developments in the Dutch railway were regulated by a law issued on May 26th 1937.[39]

Besides the creation of a national railway company, the years between the two wars were also characterized by the increased competition with vehicular road traffic. The financial loss of many railway lines forced the NS to revise the service concentrating on long-distance travel, subsequently reducing the frequency of service on regional lines. This reduction caused the closure of around 150 stations between 1920 and 1940. The enlargement of the network was rather marginal in this period and concerned mainly some freight services.[40] As a matter of fact, the NS was forced to concentrate on renewing its image and becoming a modern company in order to compete with the ever-increasing road traffic. The difference between first and second class travel became a non-issue, and step-by-step the station transformed into a dynamic building where the passengers played a central role. The facilities in stations became available for everyone with the abolition of separate waiting rooms for first class passengers, and the platforms were elevated in order to improve the accessibility into the railcars.

Around the stations, the demand of space in order to accommodate other means of transportation increased and, on the other hand, the necessity of marshalling yards decreased because the electric locomotive did not need to be serviced after every journey. In realizing stations in this period, the work of the architects S. van Ravesteyn employed by the SS from 1912, and H.G.J.Schelling at the HSM from 1916, was remarkable. Van Ravesteyn is known for his interpretation of the 'Neue Sachlichkeit' while Schelling stations are representative examples of Expressionism in architecture. Their involvement with the two railway companies would last until the end of the 1950s.[41]

The condition of the Dutch railway network after the Second World War was disastrous, however. The Germans destroyed a great part of the infrastructure and the material was also heavily damaged. The NS worked diligently, and through an efficient reconstruction campaign the railway network was fully operational by 1948. Despite the constant growth of road traffic, the railway kept an important share of the passenger and freight market until the end of the 1960s. In the period between 1945 and 1960, a considerable number of stations were fully or partially renovated following a simple common strategy: keeping the costs as low as possible. New stations had to be integrated into the existing traffic network and had to become a central node in the changing structure of the city. The new stations of Enschede, Den Helder, Leiden, Eindhoven, Venlo and, in some ways, Rotterdam Central Station were in fact integral parts of the reconstruction plans after World War II.[42]

In the 1960s, the financial position of the NS worsened. Vehicular road traffic definitively took over the travel business from the railways and other public means of transportation. From 1964 onwards, the NS was unprofitable every year; a renewal plan was strongly needed. In 1969, the NS implemented a radical strategy called 'Spoor naar '75' (Rail towards 1975). The changing strategy of the NS interestingly arose to the new challenge of bringing the railway to where the potential passengers were. This strategy sounded quite logical, and in fact rather obvious, but was a reaction to the planning failures of the reconstruction and expansion period up to the 1970s rather than a directly feasible plan. Indeed, the majority of the realized and planned works on new housing areas were more oriented towards motorways and roads than rail stations. For this reason, the NS proposed to concentrate its efforts on a decade of new railway construction: the new Schiphol line, the building of The Hague Central Station, the Zoetermeer line, and the Flevo line are the most important projects of this period. Through these important projects the NS regained a bit of its credibility, and underwent a process of re-styling that somewhat changed its dusty image in the public imagination into a model of modern public service.

Contemporary Developments: High Speed Rail and the Randstad

Despite the rapid increase of car and air traffic, in one and a half centuries the train has grown into one of the most utilized means of transportation in Europe. Even today, the railway network continues its development and expansion. Several European countries, including the Netherlands, are presently investing significant funds into High Speed network projects inside and outside major cities. Especially the traffic congestion in the Randstad due to the intensive use of cars, makes an advanced train network an attractive travel alternative. The layout, morphology, and function of the Randstad is determined and supported by the presence of an efficient train network. The construction of the High Speed Railway Line (HSL) is meant to integrate the Netherlands with the European High Speed Railway network. The main railway line, connecting Amsterdam with Brussels, should be ready in 2007 and should be an environmentally

friendly alternative to the car and air traffic. Expectations run high: seven million passengers each year are expected to travel comfortably from city centre to city centre.
The Dutch HSL will make use of both existing and newly constructed railway tracks. From Amsterdam to Schiphol Airport the train will follow the existing track; after Schiphol, at Hoofddorp to be precise, the new high-speed track begins and proceeds until Rotterdam. Between Rotterdam and Barendrecht the high-speed train returns to the existing track and from Barendrecht onwards, continues using a new track joining up with the Belgian HSL network. In spite of delays as result of the use of existing tracks, the travel time between Amsterdam and Rotterdam will be reduced from 55 to 35 minutes. Also Paris (only 3 hours) and London will get closer to Amsterdam when the High Speed train will start to operate.

The realization of this project is still under construction, yet the Ministry of Transportation anticipates that the deadline of 2007 will be met. Particular attention is paid in the media to the construction of the most important nodes in the new line. In which way the new railway tracks integrate with the rest of the Randstad remains unelucidated. An interesting discussion ensues about the role of the existing railway connections after the advent of the High Speed train in the Randstad. The current railway links functioning on a regional level, will probably be relegated to transportation on a local level, while the High Speed Train will gradually take over the regional connections. With these changes, a partial mutation of the existing railways will occur with the realization of a metro-like railway connection with the cities in the Randstad. What happened with the subsequent construction of metropolitan railways in other European metropolis at the end of the nineteenth century, may become an actual theme for transportation in the Randstad, be it for different reasons.

Because of this it is quite interesting to follow the ongoing railway projects in the Netherlands and try to foresee the future impact of railways in the process of transformation of several Dutch cities. The cities directly served by the HSL are obviously profiting from their position and developing or re-developing business areas. Some examples are the Zuidas (South axis) in Amsterdam, a new trade area, or the huge urban renewal project planned right outside the central station of Rotterdam. In addition to these projects, which are already getting extensive attention in the media, our interest should turn to the impact on other smaller cities, the ones without a straightforward connection with the HSL. In order to keep up with the future developments of the Randstad, these cities will probably have to build efficient transportation links with the closest HSL hub. Building or renewing the means of transportation in these cities will in turn give rise to new architectural interventions. These facts taken together, although currently not yet attracting the attention of the planning authorities, constitute an interesting field of research that is being addressed with a number of design projects at the Faculty of Architecture of the TU Delft.

Notes

1. H. Engel, Randstad Holland in kaart, *OverHolland* 2, 2005.
2. W. van den Broeke makes a suggestion for the classification of the first 100 years of Dutch railways into four periods. See also his article, 'Het spoor terug gevolgd. De eerste honderd jaar (1839-1939)', in J.A. Faber, *Het spoor, 150 jaar spoorwegen in Nederland*. Amsterdam (Meulenhoff Informatief) 1989, p. 11-12.
3. On August 18th 1860 the so-called S.45 railway law was issued, favouring the construction of railways by the State. See also J. H. Jonckers Nieboer, *Geschiedenis der Nederlandse Spoorwegen 1832-1938*, p.97.
4. The N.V. Nederlandsche Spoorwegen, currently called Nederlandse Spoorwegen, is the publicly held Dutch Railway Company.
5. Typical Dutch barge towed along canals.
6. **See also J. de Vries, Barges & Capital**ism. *Passenger transportation in the Dutch Economy (1632-1839)*, p. 167.
7. **As Henk Schmal explains in his article 'Cit**ies and railways in The Netherlands between 1830 and 1860', published in the book R. Roth & M. N. Polino, *The City and the Railway in Europe*, 2003, p. 29-44.
8. See also A. van der Woud, *Het lege land. De ruimtelijke orde van Nederland 1798-1848,* p. 141-161.
9. The so-called Zuiderzee.
10. Source: J. Simmons, *The making of British Railways*, p.3.
11. The HIJSM (Hollandsche Ijzeren Spoorweg Maatschappij), Dutch Railway Company, gets the permit for the construction of the oldest railway line in the Netherlands, see also J. H. Jonckers Nieboer (note 3), pp.337-342.
12. The typical Dutch barge towed along canals.
13. Source J. de Vries (note 6), pp. 204-205.
14. In 1839 the railway track actually started in the council of Sloten and was functioning by a temporary station named 'd'Een Honderd Roe', see also H. Romers, *Spoorwegarchitectuur in Nederland*, 2000, p. 14. The line was extended only in 1841 until de Haarlemmerpoort and the Willemspoort station was realized in the same year, see also A. Doedens, L. Mulder, *Een spoor van verandering.* Baarn, 1989, p.21.
15. **This station was no more than a tempo**rary wooden shed.
16. The difference between the third class railway fare (45 cents in 1850) and the trekschuit (30 cents in 1850) was still a reason for passengers to keep travelling on the water, especially in bad economical times. In 1851, a year of recession, the HIJSM lost 3% of passengers on this route; the two trekschuiten transported 32.877 passengers, 3000 more than in 1850 holding 11% of the market. For the periods 1840-1842 and 1848-1853 in the book of J. de Vries (note 13), pp. 208-209, there are interesting tables about the railroad social saving.
17. The railway line between Amsterdam and Rotterdam is known as the 'Oude lijn', the old line. The company owning the line was de HIJSM.
18. The construction of this railway line was completed in 1843.
19. **Vecht is the name of an important water**course.
20. The NRS (Nederlandsche Rhijnspoorweg Maatschappij), Dutch Rhine Railway Company, is responsible for the two trajects.
21. **The station of Rotterdam at the Delf**schepoort (Delft gate) was designed by C. Outshoorn (1810-1875).
22. The NRS is set up with the financial resources of English investors, as mentioned by R. Dijksterhuis, *Spoorwegtracering en Stedenbouw in Nederland*. PhD research TU Delft 1984, p. 6.
23. This temporary station was constructed in wood and designed by J. Enschedé
24. The project of this building dates 1862 and the designer is G. Somers Clarke; see also H. Romers, *Spoorwegarchitectuur in Nederland*, 2000, p. 25.
25. Idem, pp. 25-40.
26. **On August 18th 1860 the 'railway min**istry', supported by the government van Hall-van Heemstra, issues the so called S.45 railway law, see also J. H. Jonckers Nieboer, (see note 3), p.97.
27. In 1860 the SS run the following lines: Arnhem-Zutphen-Deventer-Zwolle-Leeuwarden, Harlingen-Leeuwarden-Groningen-Duitse grens, Maastricht-Venlo-Helmond-Eindhoven-Boxtel-Tilburg-Breda, Roosendaal-Vlissingen and Rotterdam-Breda. See also A. Doedens, L. Mulder, *Een spoor van verandering*, 1989, p.12.
28. The SS also run two lines ending beyond the Dutch border, the Eindhoven-Luik and the Arnhem-Zutphen-Hengelo-Bentheim-Salzbergen.
29. **For detailed information about the con**cession of this railway line see J. H. Jonckers Nieboer (see note 3), pp.99-101. The majority of the stations of this railway line were designed by A.L. van Gendt (1835-1901), a quite well known architect in that time, especially for his design for utilitarian buildings. See also J. W. van Dal, *Architectuur langs de rails. Overzicht van de stationsarchitectuur in Nederland*, 1981, p. 44-47.
30. See also W. Vanstiphout, *Maak een stad. Rotterdam en de Architectuur van J.H. van den Broek,* pp. 69-72.
31. **It is not completely certain but the stand**ard design of stations could come from the hand of N.J.Kamperdijk. For accurate information about the five classes of stations see also J. W. van Dal (see note 29), pp. 21-29.
32. This company was exploiting the local railways between Den Dolder-Baarn, Nijkerk-Ede and Bilthoven-Zeist.
33. **One of the lines controlled by this com**pany was the Boxtel-Goch-Wezel.
34. A sensible English translation would be 'Whatever is there is from the State', although in Dutch 'Waterstaat' is the 'Department of Buildings and Roads' and 'wat-er-staat' means 'what is there', see also J. W. van Dal (see note 29), p. 22.
35. Amsterdam, Rotterdam, The Hague, Utrecht and Groningen are the first Dutch cities where in the Uitbreidingsplan the problem of reorganizing the railway is considered extensively.
36. This line, ending at the famous Kurhaus in Scheveningen, is the first electric powered railway line in Holland. Source: P. Saal & F. Spangenberg, *Kijk op stations*, 1983, p. 61.
37. On January 1th 1936 most part of the Haarlemmermeerlijnen was already closed.
38. The NCS, a railway company that still exists although incorporated first by the SS and by NS after that, gets the operation of these railways: Den Dolder-Baarn, De Bilt-Zeist. Another company, called De Veluwe, opens the line between Ede and Nijkerk. Source: P. Saal & F. Spangenberg (note 36), p. 60.
39. See also J. H. Jonckers Nieboer (note 3), pp.316-328.
40. Some local railway lines are started in the province of Groningen and the line between Gouda and Alphen a/d Rijn is opened (1934).
41. For more information about the work of S van Ravesteyn and H.G.J. Schelling see also P. Saal & F. Spangenberg (note 36), pp. 76-106.
42. More details about the topic in P. Saal & F. Spangenberg (note 36), pp. 85-106.

Bibliography

A.A., *Bronnen op het spoor.* Utrecht (Uitgeverij Matrijs) 2000.
A.A., *Le temps des Gares.* Paris (Centre George Pompidou) 1978.
A.A., *Randstad, constructie van een metropool.* Delft (Publikatieburo Faculteit der Bouwkunde) 1989.
Arets, W., et al., *Tracé spoortunnel Rotterdam, opdracht en negen concepten.* Rotterdam (Rotterdamse Kunststichting) 1988.
Barman, C., *An introduction to railway architecture.* London (Art and Technics) 1950.
Bertolini, L., T. Spit, *Cities on rail, the redevelopment of railway station areas.* London, New York (E & FN Spon & Routledge) 1998.
Binney, M., *Architecture of the rail, the way ahead.* London (Academy idioticons) 1995.
Bock, M., V. van Rossem, K. Somer, *Bouwkunst, Stijl, Stedenbouw. Van Eesteren en de avant-garde.* Rotterdam & The Hague

(NAI publishers & EFL publicaties) 2001.
Broeke, W. van den, *'Het spoor terug gevolgd. De eerste honderd jaar (1839-1939)'*, in: J. A. Faber, *Het spoor, 150 jaar spoorwegen in Nederland*. Amsterdam (Meulenhoff Informatief) 1989.
Burke, G.L., *The making of Dutch Towns*. London (Cleaver Hume Press) 1956.
Cavallo, R., *'Existing Buildings and changing infrastructures', Dimensions. Building City Territory.* Venice (IUAV Venezia) 2006.
Cavallo, R., *'Stationeiland Amsterdam', Area 87.* Milan (Federico Motta Editore) 2006.
Cavallo, R., *'Terminal update. Amsterdam Stationseiland', Dimensions. Building City Territory.* Venice (IUAV Venezia) 2006.
Dal, J.W. van, *Architectuur langs de rails*. Deventer, Antwerp (Kluwer Technische Boeken bv) 1981.
Dijksterhuis, R., *Spoorwegtracering en Stedenbouw in Nederland*. Delft (PhD research TU Delft) 1984.
Doedens, A.L., Mulder, *Een spoor van verandering*. Baarn (Bosch & Keuning) 1989.
Dollen, B. van der, *'An historical-geographical perspective on urban fringe-belt phenomena'* in: T.R. Slater, *The Build Form of Western Cities,* Essays for M. R. G. Conzen on the occasion of his eightieth birthday. Leicester (Leicester University Press) 1990.
Douma, C., *Het stationsgebouw*. Utrecht (Ned. Spoowegen afd. Voorlichting) 1964.
Engel, H., *'Randstad Holland in kaart', Over-Holland 2*, Amsterdam (SUN) 2005.
Faber, J.A., *Het spoor, 150 jaar spoorwegen in Nederland*. Amsterdam (Meulenhoff Informatief) 1989.
Ham, W. van der, *Tot gerief van de reiziger. Vier eeuwen Amsterdam-Haarlem*. Den Haag (Sdu uitgevers) 1989.
Hameleers, M., *Kaarten van Amsterdam, 1866-2000*. Bussum & Amsterdam (Uitgeverij Thoth & Gemeentearchief Amsterdam) 2003.
Ingen, A. van, *'Het Oude Station'. Revisiebedrijf Haarlem 150 jaar zelfstandig*. HIJSM *1844 -NS 1994*. Rosmalen (Stichting Rail Publicaties) 1994.
Jonckers Nieboer, J.H., *Geschiedenis der Nederlandse Spoorwegen 1832-1938*. Rotterdam (Nijgh & van Ditmar) 1938.
Knippenberg H., B. de Pater, *De eenwording van Nederland*. Nijmegen (SUN) 1988.
Lansink, L., *Geschiedenis van het Amsterdamse Stationsplein*. Amsterdam (Stadsdrukkerij van Amsterdam) 1982.
Leeuwen, W. van, H. Romers, *Een spoor van verbeelding*. Zutphen (Walburg pers) 1988.
Meene, J.G.C. van de, P. Nijhof, *Spoorwegmonumenten in Nederland*. The Hague (Drukkerij Moretus)1985.
Musterd, S., B. de Pater, *Randstad Holland. Internationaal, regionaal, lokaal*. Assen (van Gorcum) 1994.
Oomen, J., 'Het dossier HSL-stations / Megametamorfoses, zes toplocaties binnen een straal van 60 kilometer', *De Ingenieur 22-23*, 2006.
Oxenaar, A., *Centraal Station Amsterdam, Het paleis voor de reiziger*. Den Haag (Sdu Uitgevers) 1989.
Parissien, S., *Station to station*. New York, London, Hong Kong (Phaidon Press Limited) 1997.
Polano, S., *H.P. Berlage: opera completa*. Milano (Electa) 1987.
Raatgever jr., J.G., *De spoorwegen in Nederland*. Amsterdam (Algemeen Publiciteitskantoor) 1948.
Richards, J., J. M. MacKenzie, *The railway station, a social history*. Oxford, New York (Oxford University Press) 1988.
Romers, H., *Spoorwegarchitectuur in Nederland*. Zutphen (Walburg Pers) 2000.
Roth R., & M. N. Polino, *The City and the Railway in Europe*. England (Ashgate Publishing Limited) 2003.
Saal P., & F. Spangenberg, *Kijk op stations*. Amsterdam / Brussel (Elsevier) 1983.
Schivelbusch, W., *The Railway Journey, the industrialization of time and space in the 19th century*. Los Angeles (University of California Press) 1986.
Smithson, A. & P., *The Euston Arch and the growth of the London, Midland & Scottish railway*. London (Thames and Hudson) 1968.
Speet, B., *Historische Atlas van Haarlem*. Amsterdam (SUN) 2006.
Vanstiphout, W., *Maak een stad. Rotterdam en de Architectuur van J.H. van den Broek*. Rotterdam (Uitgeverij 010) 2005.
Veenendaal, G., *Spoorwegen in Nederland, van 1834 tot nu*. Amsterdam (Boom) 2004.
Vries, J. de, *Barges & Capitalism. Passenger transportation in the Dutch Economy (1632-1839)*. Utrecht (Hes Publishers) 1981.
Vries, N. de, *'Netherlands: six stations for the future' Rassegna 84*, 2006.
Woud, A. van der, *Het lege land. De ruimtelijke orde van Nederland 1798-1848*. Amsterdam (Meulenhoff Informatief) 1987.

Time and the city

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Obviously, architecture and urbanism deal with space. We architects build something and it stays there. Period. We are unaccustomed, conversely, to thinking about *time* with regard to architectural space. We deal with objects, that is to say buildings in space. Yet in this essay I would like to begin to participate in the calls from various sectors: social geography, philosophy, urban planning and development, and some architectural theory, for a thinking of space with, or in conjunct to, or alongside, or intertwined with time. As Jon May and Nigel Thrift write in their edited volume, *Timespace: Geographies of Temporality*,[1] a growing dissatisfaction is being heard with the dichotomous treatment of the categories of space and time. Architects and other professionals dealing with cities tend to regard the problem chiefly as one of space: spatial planning, zoning, building locations. In contrast, historians, sociologists, and urban planners privilege time over space; that is to say, primarily a linear conception of time.[2]

However, in drawing such a hard and fast distinctions between space and time, the complexities – and indeed the richness – of both are seldom addressed. Nevertheless, we will not pretend here to finally theorize the penultimate space/time. Rather, what has become more than obvious in recent years, is that there are many spatialities and multiple temporalities, each one heterogeneous and yet interrelated with the others. Because this essay deals specifically with "time and the city", I will briefly explicate some of the spatio-temporal layers that could conceivably be of import to the considerations of the unfolding dynamic of the urban environment. Cities, as we all know, change and mutate over time. One way to begin to understand them in a more dynamic fashion will be to examine various theoretical frameworks that can give us a grip on the continually flowing, organic character of the city.

Mixed Temporalities

We have a tendency to take time for granted. We point to our watch and say to ourselves, "it is nine thirty seven". Actually, we often say, "it is 9:37" because we are so used to dealing with time in such small digital increments, as if this was normal, as if this was the way it always has been. In fact, it is of recent historical time that time was at all measured out, synchronous, and minutely (literally) attended to. We forget that time was always governed by the cyclical rotation of the planets, the seasons, the gentle passing of each day. We forget that several calendars, at present, are operating at the same time – Julian, Gregorian, Persian, Islamic, Hebrew, Hindu, etc.. Most importantly, time was most humanly experienced as a "lifetime", and the "end of time" was interpreted in religious terms. We forget that the time of only a few decades ago was an entirely different time – a time before computers dominated the world, before time was "instant messaging" and "streaming video". We experience the world totally differently now. And indeed, we can in fact never experience the "now", for time travels in our world at the speed of light, so that there is always a gap, a delay, a dénouement to our every experience.

Railroad time – the fast and the slow

For millennia, the technology of horology was such that anything shorter than about an hour was impossible to measure. And, in fact, this state of affairs was perfectly acceptable. Time was longer then. You would say, "I will come visit after the market on Saturday", or "that construction project will be completed in the autumn". Any time increment longer than parts of a day was simply unnecessary. Mechanical clocks were invented in the thirteenth century, yet life remained to be regulated by the solar and seasonal rhythms of everyday life. Only with the advent of clocks that could be small enough to carry about, were people concerned about smaller increments of time. In 1780, the "marine chronometer", or portable clocks for the shipping industry were introduced. Furthermore, time was local, based upon local needs and the specific geographical conditions: time was quite simply longer in a Southern European country than in Scandinavia.[3] Different communities would have different times, often measured by the standard of the local church bells or city hall clock. Yet this fact never posed a problem until transportation and communication systems in the nineteenth century began to connect all these disparate temporalities. Prior to the introduction of standard time, every municipality set its official clock, if it had one, according to the local position of the sun. This condition served adequately until the introduction of the steam engine, the telegraph, and rail travel, which made it possible to travel fast enough over long distances to require almost constant re-setting of timepieces, as a train progressed in its daily run through several towns. Standard time, where all clocks in a large region are set to the same time, was established to solve this problem.

Linking up all these local times, the independently owned railroad companies established one standard along the rail line in order to compose their rail timetables. Such determinations of time, not only the industrial revolution itself, but technologies of time, would forever alter our experience of time. In fact, these new layers of temporality would forever alter our experience of space as well,[4] for time calibrates space in dis-

tances. Although time is not dependent on motion, only time in motion over distance is measurable.[5] Yet the travelling of even larger distances, and the communication between ever more remote places, entailed a quantifiable system that was able to encompass the entire globe. Greenwich Mean Time was instituted in 1884, along with the division of the earth into 24 segments in order to implement time zones in a worldwide universal standard. Time became "measured out", spatialized into a global referent.

As a result of the tying-down of the entire earth and the standardization of time, the earth began, then, not just to be "local", but to be "global". The universalization of time standardized space as well. Suddenly it was possible to identify any location with respect to its longitude and latitude. Obviously, developments in the technologies of time, horology, as well as communication and transportation had immense implications for the experience of time. Not only did time speed up, making it possible to travel greater distances for the first time – but space became nearer due to the fact that accessibility was greater. Time became faster while space became smaller.

The Standardization of Time in the Netherlands

Specifically in the Netherlands, although inland shipping canals ("*trekvaart*") formed the first systematic network of links between cities, the railroad and telegraph were the networks that would finally join the various places not only in space but in time as well. Initially, "the coming of the railroad did not radically alter the long-established travel patterns of the *trekvaart* network."[6] Yet the standardization of time to one regional standard only began to be a reality in the mid-eighteenth century with the advent of the railroad. As Jan de Vries explains in *Barges and Capitalism: Passenger Transportation in the Dutch Economy (1639-1839)*:

The organization of space made possible by the *trekvaart* network further stimulated the consolidation of an urban system; moreover, the structural features of the network, as they existed for nearly 200 years, help to explain several unique characteristics of Dutch society. A "time frame" was created which, by its stability, permitted the development of "modern" notions of time, distance, and the role of these two concepts in economic life. The comparatively low cost of intercity transportation endowed the regions served by the *trekvaart* network with a physical mobility that probably existed nowhere else before the railway age. Moreover, that mobility extended down the social ladder even to the poor.[7]

As a transportation network for goods, services, and passengers, the inland shipping canals were far superior to the emerging railroad for many years. Not only was this organization long established, but also the Netherlands itself, given its geography and topography, was far better suited to a system of water canals than a railroad.

Nevertheless, the railroad formed the first impetus to universalize time. Furthermore, the railroad systematized time in another important aspect. Concurrent with the laying out of rail lines, was the laying out of telegraph lines. Subsequently, every rail station became a communication center where also the synchronization of time in practical terms was possible. Conductors could check the local times, and the times on their pocket watches, with the times further down the line through sending telegraphs messages within a matter of seconds.[8] The possibility of an universalisation of time was only possible with a standard that could be universally measured and a technology of temporal synchronization.

As a consequence, the distances became smaller, not only in the sense that travel times were reduced, but also because due to the communication between people, social distances were reduced. Communities and persons were connected in a way never before thinkable. Alongside the networks of rail (1839) and telegraph (first commercially exploited in 1845), were the systematic deliveries of post (1850), periodicals, and newspapers. Although the system of shipping canals was already firmly in place in the Netherlands in the eighteenth century, the connection between these inland waterways and the sea in 1873 with the "New Watercanal", along with the use of steam engines in the large seagoing ships, served to connect the Netherlands as never before with the wider world.[9] Consequently, increased mobility of persons and goods went hand in hand with an increased circulation of information and the increased contact with other cultures and other ways of thinking. In the middle of the nineteenth century, space not only became smaller due the distances traveled in increasingly shorter amounts of time,[10] but space became wider. Space became a node in an infrastructure that encompassed the local, the national, and the international. As Auke van der Woud explicates, it became unavoidable that with the new forms of mechanization, organization and infrastructure, the Netherlands was taken up in a worldwide system of alternative ways of looking at the world.[11]

Indeed, the Netherlands, even after the network of the railroad, still operated with no less than three contemporaneous time systems:[12] the Greenwich mean time, the "average Amsterdam time" that was originally established as a standard for the rail timetables on the first lines, and various "local" times from municipalities that for various reasons refused to conform to either a national or international time standard. In 1892, that is to say more than sixty years after the institution of a standard time for the railroad, Europe finally agreed upon a universal time tied to the Greenwich Mean Time which had been established in 1884. In the Netherlands, an agreement upon a time standard within the country was not implemented until 1908.[13] This time was the so-called "Average Solar Time of Amsterdam". Yet the establishment of this time standard for the country by law on the 23rd of July 1908, did not mean that all the cities and towns of the Netherlands agreed to cooperate with such a standard. Knippenberg and de Pater extensively describe the unfolding of the history of chronological time in the Netherlands from the 1830s to the eventual acceptance of participation in a global standard.[14] Remarkably, it was not until 1940, under the German occupation of the Netherlands during World War II, that the entirety of the Netherlands conformed to the universal standard of European time which was tied to the global time standard.[15] The railroad network and the necessary timetables in 1839 were the impetus for a time standard, but this impulse would take one hundred years to actually implement. Gradually the reality that an individual in his village in the Netherlands would co-exist with various, "non-contemporaneous temporalites",[16] became an excepted fact; indeed, became so "normal" as to be almost beyond worthy of attention.

Fast Forward: Hybrid Chronologies

"*The railroad reorganizes space*,"[17] according to Schivelbusch. Just as the railroad compresses time, increasing the distances that can be traveled in the same amount of time, the railroad *expands space in the city.* The railroad demands more and more space for infrastructure just as, at the same time, the technologies of building construction are able to span greater and greater areas of enclosed space in order to accommodate the rail tracks coming into station buildings. The building becomes a place to go *through* instead of a place to remain. *The space becomes "fast".* The railroads not only regulated time, but standardized the station buildings as well.[18] Indeed, "…just as the railroad's increased speed disorients the traditional perception of space, the motion of the railway, proceeding uniformly and in a straight line, is experienced as *abstract, pure motion, dissociated from the space in which it occurs.*"[19] Velocity blurs, and displacement becomes synchronized into motion.

Moreover, the railroad not only joined local or regional spaces with the larger world, or instrumentally varied the manner in which we measure time increments, but also in fact altered forever, the experiential structure of our world. The entire structure of our relation to the rest of the world was seemingly different. Each place was no longer unique, with its own geography, seasonal time, and topography, but was merely a node or a nexus in a grander schema. One was suddenly aware of a multiplicity of times and a plethora of spaces. The world was closer than ever before. As David Harvey explicates in his discussion of the importance of how we represent space and time to ourselves: "…the objective qualities of time and space [are such] that we are forced to alter…how we represent the world to ourselves…[as] space appears to shrink to a "global village" of telecommunications and a spaceship earth of economic and ecological interdependencies…and as time horizons shorten to the point where the present is all there is…so we have [had] to learn to cope with an *overwhelming sense of compression* of our spatial and temporal worlds."[20] Suddenly, the global village became our village too, our concern, even though it was a world away. Paradoxically, as the world gets spatially larger since we can travel in very short periods of time the four corners of the globe; space becomes compressed into the little compartment that we occupy as the outer world speeds by at a rate that is incomprehensible, to the experience of our chair, our telephone conversation, our computer. Our world becomes narrower. With the advent of the railroad, space becomes linear, cutting through the landscape, leveling elevations, making it impossible to experience the world except at a filmic speed, the passing revue of ever-changing landscapes. With air travel, our experience of motion through space is in fact imperceptible, fast like a cinematic frame, yet is reduced to where our body is. *Time too is contracted.* As Harvey suggests, the world has become smaller with the advent of global communications, where time has shrunk down to the interval necessary for an electronic signal to be transmitted. Time is no longer measured in days, or lifetimes, or even historical epochs; rather, the micro seconds on a digital clock.

Admittedly, the industrial revolution brought about many socio-economic changes that were cataclysmic in their impact and reach. *Time became faster.* Time became a commodity. Time was spatially directed. Time was "progress". Obviously, persons experiencing time and the city in that period of time – the bridge between when time simply "flowed" to when time "proceeded" – experienced time as "out of joint". Time became the mathematically measured out sequence of events rather than the temporal flow of experience. Time was ordered into increments of hours and minutes, disjointed from the seasonal and solar rhythms of everyday life. All the same, several temporalities co-existed in the same space.

Consequently, an uneven, non-linear, disjointed "co-existence of different temporalities"[21] occurred; and not necessarily happily. Rather, these "mixed temporalities"[22] were in fact often "competing temporalities"[23] - sometimes "speeded up" and sometimes artificially slowed down, resulting

in a non-uniform chronology. So now we *fast forward*, forward to the "now"; that is to say, the "now" that slips incessantly away in every instant. Time is "out-of-sync". On the one hand, I am here; "I am on the train". Yet, on the other hand, although my body might be "here" spatially, my time has become a hybrid chronology. I exist here in space at one location, but experience a multitude of temporalities in every single moment.

Spatio-Temporal Matrix

Ultimately, "mixed temporalities" co-exist not only alongside each other, but also in a heterogeneous, complex, and dynamic inter-relationship. The technologies of movement and speed, including the railroad infrastructure, played an important part not only in the standardization of time, but also in the changing morphologies of the urban environment. In thinking the city as a dynamic space/time, a city can no longer be taken in isolation, but as a participant in a "spatial-temporal matrix",[24] a matrix that is at once economic/political, epistemological, and cultural. Cities live and die in relation to other cities, in a complex web that unfolds over time, in a nexus that is not only historical but also a personal experience of time and space. As Manuel Castells has said: "Cities are socially determined in their forms and in their processes….Sociological analysis of urban evolution must start from the theoretical standpoint of considering the complexity of these interacting trends in a given time-space context."[25] Concerning time and the city, space becomes "speedy"; time becomes not only measured out and standardized, but also layered into a hybrid chrono-topography.

So, in asking about time and the city, we must also ask: "what are the possible implications be for architecture which has chiefly been thought of as a static object, as "being-there", as quintessentially ever-present? These questions are undeniably complex, yet a beginning has been made on various fronts in thinking about *time* with regard to *space*. For in the end, undoubtedly, the "present" affords the only generative site for making of architecture, the only time of future possibility.

Notes

1. May, Jon and Thrift, Nigel; *Timespace: Geographies of Temporality* (London: Routledge, 2001).
2. Obviously, the problem of thinking space and time together is extraordinarily complex. *cf. eg.* Claessens, François; *De stad als architectonische constructie: het architectonisch discours van de stad (Duitsland 1871-1914)* (Delft: unpublished dissertation TU Delft, 2005).
3. *cf.* Landes, David S.; *Revolution in Time: Clocks and the Making of the Modern World* (Cambridge, Mass.: Belknap, 2000) and Bartky, I.R.; "The Adoption of Standard Time" in *Technology and Culture* (1989) 30:25-56.
4. *cf.* Lefebvre, Henri; *Rhythmanalysis: Space, Time and Everyday Life* (London: Continuum, 2004).
5. *cf.* Aristotle; *Physics IV.*
6. De Vries, Jan; *Barges and Capitalism: Passenger Transportation in the Dutch Economy (1639-1839)* (Utrecht: Hes Publishers, 1981)p.331.
7. De Vries, Jan (note 6), p.326-7.
8. *cf.* Woud, Auke van der; *Een nieuwe wereld: het ontstaan van het moderne Nederland* (Amsterdam: Uitgeverij Bert Bakker, 2006) p.157.
9. **For an account of the process of indu**strialization in the Netherlands, see Lintsen, H.W. (eds.); *Geschiedenis van de techniek in Nederland. De wording van een moderne samenleving 1800-1890* (Zutphen: 1992-1995) and Jonge, J.A. de; *De industrialisatie in Nederland tussen 1850 en 1914* (Nijmegen: 1976).
10. *cf.* Schivelbusch, W.; *The Railway Journey: The Industrialization of Time and Space in the Nineteenth Century* (Berkeley: University of California Press, 1988) p.41. As Schivelbusch explains: "'Annihilation of space and time' is the early nineteenth-century characterization of the effect of railroad travel. The concept is based on the speed that the new means of transport is able to achieve. A given spatial distance, traditionally covered in a given amount of travel time, can suddenly be dealt with in a fraction of that time; to put it another way, the same amount of time now permits one to cover the old spatial distance many times over. In terms of transport economics, this means a *shrinking of space*…". In addition, space not only "shrinks", but it expands as well, as economic development is expanded into areas previously inaccessible. *Space multiplies*.
11. *cf.* Woud, Auke van der (note 8), p. 80. Ultimately as well, the move towards an international infrastructure would means a move from the individual to the "masses"; from transportation to mass-scale mobility; from the dissemination of information to mass communications; from the representation through maps, geological surveys and historical accounts to "mass media".
12. Woud, Auke van der; *op cit*, p.159. and Knippenberg, Hans and de Pater, Ben, *De eenwording van Nederland. Schaalvergroting en integratie sinds 1800*, 1988, p. 81.
13. *cf.* Knippenberg, Hans and de Pater, Ben (note 12), p.77.
14. Knippenberg, Hans and de Pater, Ben (note 12), pp.77-82. See especially Figure 3.11 on page 79.
15. Woud, Auke van der (note 8), p.161. and Knippenberg, Hans and de Pater, Ben (note 12), p.82.
16. Indeed, several temporalities co-existed in the same space. So time was also a matter of coming to terms with this phenomenon of mixed temporalities, a phenomena that Ernst Bloch has termed, "non-contemporaneous contemporality". *cf.* Bloch, Ernst; *Heritage of Our Times,* trans. Neville and Stephen Plaice (Berkeley: University of California Press, 1991).
17. Schivelbusch, W. (note 10), p.50.
18. *cf* Romers, H.; *Spoorwegarchitectuur in Nederland* (Zutphen: Walburg Pers, 2000).
19. **Schivelbusch, W. (note 10), p.53. Schivel**busch goes on to describe the feelings of estrangement that resulted from technologies of speed in the nineteenth century. No doubt the industrial revolution in England was a cataclysmic socio-economic unfolding of events; the experience of being "out of time" or "out of sync" being only one of the many consequences.
20. Harvey, David; *The Condition of Post-modernity: An Enquiry into the Origins of Cultural Change* (Oxford: Blackwell, 1989), p. 240.
21. Harootunian, "Remembering the Historical Present" (2005), p.5. Unpublished Manuscript. Paper given at the occasion of The Alexander Humboldt Lectures in Human Geography, Radboud University, Nijmegen, The Netherlands, 21-23 November 2005. I am most grateful to Prof. Harootunian for supplying me with an advance copy of this manuscript to be published in *Critical Inquiry*, Spring 2007.
22. A term from Kosellek, Rheinhart; *Futures Past,* translated by Keith Tribe (Cambridge: MIT Press, 1985).
23. Harootunian, 'Remembering…', *op cit*, p.33.
24. Poulantzas, Nicos Ar.; *State, Power, Socialism* (London: Verso, 2000). especially pp.93-120.
25. Manuel Castells, *European Cities, The Informational Society, and the Global Economy*, (Amsterdam: CGO, 1992) p.11.

Bibliography

Bartky, I.R., 'The Adoption of Standard Time', in: *Technology and Culture*, nr. 30, 1989, pp. 25-56.

Bender, J. en D.E. Wellberry, *Chronotypes: The Construction of Time*. Palo Alto, Cal. (Stanford UP) 1991.

Borja, J., en M. Castells, *Local and Global: the Management of Cities in the Information Age*. London (Earthscan) 1997.

Castells, M., *European Cities, the Informational Society, and the Global Economy*. Amsterdam (CGO) 1992.

Castells, M., *High Technology, Space, and Society. Beverly Hills*, Californië. (Sage) 1985.

Castells, M., *The Information Age: Economy, Society and Culture*. Cambridge (Blackwell) 1996.

Castells, M., *The Informational City: Information Technology, Economic Restructuring, and the Urban-Regional Process*. Oxford (Basil Blackwell) 1989.

Castells, M., *The Rise of the Network Society*. Cambridge (Basil Blackwell) 1996.

Castells, M., *Technopoles of the World: the Making of Twenty-first-century Industrial Complexes*. London (Routledge) 1994.

Corfield, P. J., *Time and the Shape of History*. New Haven, Conn. (Yale UP) 2007.

Cox, K. R.(ed.), *Spaces of Globalization*. London (Guilford Press) 2007.

Graham, S., en S. Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*. London (Routledge) 2001.

Gurvitch, G., *The Spectrum of Social Time*. Dordrecht (Reidel) 1964.

Hall, P., *Cities in Civilization: Culture, Innovation and Urban Order*. London (Phoenix) 1999.

Harootunian, H., 'Some Thoughts on Comparability and the Space-Time Problem', *Boundary* 2 (Duke University Press), 2 (2005), nr. 32, pp. 23-52.

Harootunian, H., 'Remembering the Historical Present', niet gepubliceerd manuscript; artikel ter gelegenheid van de Alexander Humboldt Lectures in Human Geography, Radboud Universiteit, Nijmegen, Nederland, op 21-23 November 2005. Ik wil prof. Harootunian bedanken voor het sturen van een kopie van het voorlopige manuscript, dat in de lente van 2007 zal worden gepubliceerd in *Critical Inquiry*.

Harvey, D., *The Condition of Post-modernity: An Enquiry into the Origins of Cultural Change*. Oxford (Blackwell) 1989.

Harvey, D., *Justice, Nature and the Geography of Difference*. Cambridge (Blackwell) 1996.

Harvey, D., *The New Imperialism*. Oxford (Oxford UP) 2005.

Harvey, D., *Spaces of Capital: Towards a Critical Geography*. Edinburgh (Edinburgh UP) 2001.

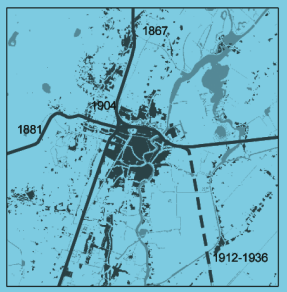
Hongladarom, S., 'The Web of Time and the Dilemma of Globalization', *The Information Society*, vol.18 (2002), nr. 4, pp. 241-249.

Hongladarom, S., en M.R. Kelly, 'Time, Technology and Globalization', *Journal of Philosophy in the Contemporary World*, 11 (2004), nr. 2, pp. 55-62.

Jameson, F., *Postmodernism, or the Cultural Logic of Late Capitalism*. London (Verso) 1991).

Jameson, F., 'The End of Temporality', *Critical Inquiry* 29, Summer 2003, nr. 4, pp. 695-718.

Jonge, J.A. de, De industrialisatie in Nederland tussen 1850 en 1914. Reprint Nijmegen (SUN) 1976.
Kern, S., The Culture of Space and Time, 1880-1918. Cambridge, Mass. (Harvard UP) 1983.
Knippenberg, H., & B. de Pater, *De eenwording van Nederland. Schaalvergroting en integratie sinds 1800*. Nijmegen (SUN) 1988.
Kosellek, R., *Futures Past*. Transl. Keith Tribe, Cambridge, Mass. (MIT Press) 1995.
Kosellek, R., *The Practice of Conceptual History*. Transl. Todd Samuel Presner et al., Stanford, Cal. (Stanford UP) 2002.
Landa, M.de, *A Thousand Years of NonLinear History*. New York (Zone Books) 1997.
Landes, D. S., *Revolution in Time: Clocks and the Making of the Modern World*. Cambridge, Mass. (Belknap Press) 1983.
Lefebvre, H., *Rhythmanalysis: Space, Time and Everyday Life*. London (Continuum) 2004.
Lefebvre, H., *The Urban Revolution*. Transl. Robert Bononno, preface: Neil Smith, Minneapolis (University of Minnesota Press) 2003.
Lintsen, H.W. (ed.), *Geschiedenis van de techniek in Nederland. De wording van een moderne samenleving 1800-1890*. Zutphen 1992-1995.
May, J., & N. Thrift, *TimeSpace: Geographies of Temporalities. London (Routledge) 2001.*
Nowotny, J., Time: Modern and Post-modern Experience. Oxford (Polity Press) 1994.
Poulantzas, N. Ar., *State, Power, Socialism*. London (Verso) 2000.
Robertson, R.; 'Glocalization: Space-Time and Homogeneity-Heterogeneity', in: M. Featherstone, S. L. en R. Robertson (eds), *Global Modernities*. London (Sage) 1995, pp. 25-44.
Romers, H., *Spoorwegarchitectuur in Nederland*. Zutphen (Walburg Pers) 2000.
Rosenberg, J., *The Follies of Globalization*. London (Verso) 2000.
Roth, R., en M.N. Polino, *The City and the Railway in Europe*. Aldershot (Ashgate) 2003.
Sassen, S., *Cities in a World Economy*. London (Pine Forge Press) 1994.
Sassen, S., *Global Networks: Linked Cities*. New York (Routledge) 2002.
Schivelbusch, W., *The Railway Journey: The Industrialization of Time and Space in the Nineteenth Century*. Berkeley (University of California Press) 1988.
Short, J. R., *Global Metroplitan: Globalizing Cities in a Capitalist World*. London (Routledge) 2004.
Thrift, N., *Cities: Reimagining the Urban*. London (Polity Press) 2002.
Thrift, N., 'Space,' in: *Theory, Culture & Society* (ed. Mike Featherstone, London: Sage Publications), Vol. 23 (2006), nr. 2/3, pp. 139-155.
Thrift, N. en J.May, 'Introductie', in: Jon May & Nigel Thrift, *TimeSpace: Geographies of Temporalities*. Londen (Routledge) 2001, pp.1-46.
Vries, J. de, *Barges and Capitalism: Passenger Transportation in the Dutch Economy (1639-1839)*. Utrecht (Hes) 1981.
Whitrow, G.J., *What is Time?* Londen (Thames & Hudson) 1972.
Woud, A. van der, *Een nieuwe wereld: het ontstaan van het moderne Nederland*. Amsterdam (Uitgeverij Bert Bakker) 2006.



Haarlem's railway zone

Roberto Cavallo

In the near future, Haarlem plans to make better use of its strategic location in the region to attract companies by promoting itself as a good alternative to top locations such as Amsterdam, Hoofddorp and Schiphol. At the moment, however, Haarlem has the trademarks of a purely residential city. In the coming five years, about 5,000 more residences will be built[1] within the city limits. The wonderful city centre with its wide range of facilities, located just a short distance from beautiful dunes, a recreational area on the sea and the beach, make the city a very attractive place to live.[2]
As a result, many of Haarlem's residents work elsewhere. To keep commuter traffic under control, keep the companies and government agencies located there and still create room for new activities, the city has to ensure good accessibility and quick connections with Amsterdam, Schiphol and the rest of the Randstad area.
Automobile traffic is one of Haarlem's biggest problems, particularly in the area around the train station. Not only is commuter traffic to and from the city a concern, but recreational traffic to the North Sea burdens the city centre excessively. The busy provincial road that runs right behind the station parallel to the railway line is an important East-West connection.[3] This overburdened road and the location of the rail divide the city in two, as it were.
For years, the station area has been awaiting a solution where the requirements of a modern public transport hub can be combined with an architectonically responsible organisation of public space. Haarlem Central Station, which is one of the most beautiful stations in the Netherlands, is known today as one of the most chaotic station squares of the country.[4] No other building except the station is built up in such a way as to create a relation with the public space.
Differently than in other Dutch cities, the construction of the railway within the city walls had already taken place at an early stage in Haarlem, which had consequences for the further development of the city around the railway line. The goal of this article is to explain in chronological order the most relevant developments the city of Haarlem has undergone starting from the construction of the first railway. As well, this article is an attempt to sketch a general framework that can be used as a pretext for architectonic interventions in Haarlem's railway zone.

Construction of the rail in Haarlem

As of the Early Middle Ages, Haarlem developed itself relatively quickly thanks to its favourable site between the dune landscape along the North Sea and the river Spaarne.[5] These two geomorphological elements have also helped determine the current elongated shape of the city. Not only the shape, but other specific characteristics also make Haarlem a unique city. Already in the fifteenth century, the fortifications in Haarlem extended to the other side of the river, much earlier than in other Dutch cities.[6] Haarlem continued to grow until the end of the seventeenth century, albeit not entirely without setbacks. Since the brewery as well as the shipbuilding and textile industry provided work, the city attracted many people, especially from Spanish occupied Flanders.[7] At the same time, significantly better connections were made in order to support the economic growth of the region. In 1631, the working of the 'trekvaart' ('canal tow boat') to Amsterdam got underway.[8] Despite the fact that a transfer in Halfweg was necessary,[9] the connection between the two cities by tow boat was a major success as well as a profitable business.[10]

Haarlem's growth in the Golden Age was huge, and from about 1640, Haarlem worked on a plan for urban expansion in a northerly direction. In 1643, Salomon de Braey designed a plan to enlarge the entire city. Only a part of it was finally used to execute the urban expansion, which started in 1671 and was known under the name 'Nieuwstad' ('New City'). Contrary to expectations, the development of this new city district failed. Many plots of land were not sold and all work activities in the Nieuwstad had ceased as of 1691. Then, between about 1730 and 1800 Haarlem was hit by a major recession, which had not only halted construction in the half empty Nieuwstad, but in the historical centre as well. It was only in the beginning of the nineteenth century that building started up again. In 1799, Haarlem considered dismantling a part of the city walls. In 1820, the definite decision to take down the city walls was made, especially in order to put an end to the annual maintenance costs of the fortification. The northern part was destroyed in 1821, with the exception of the Kennemerpoort, which stood until 1866. For the redevelopment of the bastions, the landscape architect J.D. Zocher Jr. was called upon. His mission was to turn the freed up

area into a lovely park.[11]

The economic malaise influenced the population figures[12] as well as the tow boat connection between Amsterdam and Haarlem. The number of passengers dropped and the competition from road traffic increased, especially at the beginning of the nineteenth century. Around 1830, the signs of the long-standing crisis were clearly visible in the city. It is therefore understandable that people in Haarlem responded more enthusiastically than in Amsterdam when the news of the first Dutch railway came. On 20 September 1839, the HIJSM[13] opened the first railway of the Netherlands between Amsterdam and Haarlem, meant as the first part of the railway connection between Amsterdam and Rotterdam. The plan to build the first part of this 'Oude Lijn' ('Old Line')[14] almost entirely parallel to the existing canal tow boat between the two cities was carried out despite protests from the tow boat companies.

Even though the name of C. Outshoorn is often mentioned,[15] the designer of the first station in Haarlem on the east bank of the Spaarne was most likely F.W. Conrad Jr.[16] Architectonically, the station was not much to see. In contrast to the Willemspoort station in Amsterdam, the one in Haarlem was a temporary building, which served as a station and a workplace. On 22 June 1840, the HIJSM got permission to extend the Oude Lijn further in the direction of The Hague. W.C. Brade had thought up a perpendicular railway connection for Haarlem, but it could not accommodate through train traffic. After negotiations with Haarlem's city council and the promise to finally charge a toll and excise by way of train tickets, the HIJSM started building the railway line in the Nieuwstad that same year. In 1841, that part of the city was still half empty when the Oude Lijn, with a noticeable curve in the direction of Leiden, was built.

Haarlem saw the construction of the rail in the city as an opportunity for economic development. After many lean years, the city was desperately searching for economic improvement and the construction of the railway offered additional possibilities in any case. The desired developments, however, were long in coming. Around 1834, the Phoenix textile company established itself on the Spaarne.[17] The commercial activities in the Nieuwstad and around the station only really took off in 1858 when the Beijnes royal carriage factory[18] moved to the station square.

The construction of the rail in the Nieuwstad was accompanied by the construction of the first real station of the city on the Jansveld,[19] which was completed in 1842. The station had a total length of 140 metres, which was needed to be able to build a long wall as a separation between city and rail next to the station building. The central main building itself already had a floor of 32 metres in length and 6,5 metres in width, characterised by a median. Here, following Durand's example, four columns supported an arched façade, which marked the entrance to the main hall.[20] This station on the Jansveld was in use until 1867.[21]

Railways and the nineteenth century development of Haarlem

The situation before and after the building of the Oude Lijn in the Nieuwstad is visible on the first cadastral map of 1822 and on the map of 1858. Comparing these two maps, it appears that little was built in the Nieuwstad during this period besides the railway. Moreover, one can see that in 1858, almost all city walls had been torn down. Unfortunately, the area East of the Spaarne, where the first station of Haarlem was built, is not entirely indicated on the map of 1858. After the closing of the Amsterdam workplace complex in 1844 and the transfer of personnel and material to Haarlem, the original workplace of the station had become the most important 'repair haven' of the HIJSM. The first station from 1839 was torn down in 1853 and in its place came a number of wooden workplace buildings.[22] In 1861, a huge fire almost destroyed all of them. After this, only stone buildings were left on the grounds, of which a large part remained intact until the renovation of 1984.[23] Today, there is still a large workplace complex of the Nederlandse Spoorwegen ('Dutch Railways') at the same location, which the city would very much like to see somewhere else, given its location.

The year 1867 brought along many changes. First, on 1 May, the new train path between Haarlem and Uitgeest was opened. This railway was an important link between the northern and southern part of the HIJSM network and remained the only direct railway connection between Amsterdam and the North until 1878.[24] The station was heavily renovated and expanded following the design of P.J. Mouthaan (1824-1899). Even though some style attributes of the 1842 building were kept, the prominent middle ressault disappeared and an additional storey was added to the entire complex. The tearing down of the Kennemerpoort also dates from 1867 as well as the commencing of the work activities for the Kenaupark West of the station and the Ripperdapark beside the Phoenix site. In 1867, the Achter Nieuwe Gracht was also filled in as a result of which the current Parklaan developed, the green connection between the Kenaupark and the Ripperdapark.

On the map of the city of Haarlem from 1878 all the above-mentioned developments can be seen. The Nieuwstad further developed itself with construction around the Ripperdapark and the Parklaan, and with the building up of the Staten Bolwerk and the Prinsen Bolwerk. The area around the railway was also built up further, as small companies and workplaces established themselves, giving the area the allure of a fringe belt[25]. On the map one can also see that there is little built up in the area between the North of the bastions and the city limits right above it. Only an old hospital and the planned rifle-field[26] are indicated on this map.

In the following years, Haarlem got even more public transport connections. In 1881, the steam tram between Haarlem and Leiden was established.[27] To make the seaside resort of Zandvoort more accessible, a railway line was built from the Haarlem station that same year.[28] The construction of this railway line to Zandvoort, followed by the building of the short railway line between the Oude Lijn and the rail to Uitgeest in 1904 strengthened the separation of the so-called 'spoorwegdriehoek' ('railway triangle')[29] East of the station. In 1899, an electric tram connection between Haarlem and Zandvoort was opened, which was extended to Amsterdam in 1904.[30] Between Haarlem and Bloemendaal as well an electric tram service was started in 1899. The beginning of the twentieth century would bring along additional changes, as a result of using electricity as an energy source.

The railway zone and expansion of Haarlem in the twentieth century

In the last decade of the nineteenth century, Haarlem had become attractive again as a place to live and work thanks to the development of industry. The number of residents rose and the demand for residences grew. The provisions of the 'Woningwet' ('Housing law') of 1901 also obliged Haarlem to draw up an expansion plan. L.C. Dumont[31] designed the expansion plan of 1905 and road plan of 1906. Dumont's work was extensive and also regarded the planning of areas outside the city limits.[32] His expansion plan contained a clear zoning. Due to the proposed connections over water and land, the area on the Spaarne North of the railway was destined for work and industry,[33] while the Schoterkwartier, Leidsebuurt and Amsterdamse Buurt[34] were reserved for residential building. In Dumont's road map of 1906, the railway is clearly visible, including the railway triangle and the planned railway harbour in the Leidsebuurt.[35] A large part of his road plan has actually been carried out. In 1896, the Beijnes factory across from the station was further expanded. The traffic hindrance and pollution of the trains that ran on ground level remained unchanged. Around 1900, the proposal of the HIJSM to build a new station could not have come at a better time. The new station was part of a radical operation in which the rail path was built largely on elevated roads, so that by way of tunnels there was space for circulating city traffic at street level. An elevated drawbridge over the Spaarne also had to be built. Moreover, the plan contained the electrification of the railway line. D.A.N. Margadant, the architect of the HIJSM, designed the station that was built between 1905 and 1908.[36] The general ideas about the station design were modified in the mean time. Since 1870-1880, railway companies had noticed that stations needed to be more appealing in order to attract more passengers. The sole purpose of a station was no longer to just offer shelter to the train, the station had to become the monumental palace of the traveller. The first person to adapt this vision of the design of stations was the architect P.J.H. Cuypers when he built Amsterdam Central Station. Margadant's building is a great example of the series of stations which helped determine the face of the Dutch railway architecture. In the main lines of his design, the works of Berlage for the Amsterdam stock exchange influenced Margadant. The expression of form and experimental use of materials that the Art Nouveau stations of H. Guimard in Paris and O. Wagner in Vienna had, also played a role.[37] That the Haarlem station would be built on a street rather than a square can be clearly seen from the planning of Margadant's designs. He made separate building parts for departure and arrival of the travellers. While the Beijnes factory hindered the view of the departure part, the arrival part was located in the Western part of the complex to come more into contact with city. In the mean time, a hotel was also established there that together with the restaurants, cafés and terraces gave the impression of a bustling city. Despite a number of changes such as extended platforms, the beautiful station complex is still today largely in its original state.

The HIJSM was not only concerned with the station and railway, but also played a role in residential building. In 1908, the workplace East of the Spaarne had 1,300 workers, making it the biggest employer in Haarlem. As early as 1906, the railway company had eight residences built for its personnel on the Westergracht, close to the railway harbour in the Leidsebuurt. Then, the HIJSM lent money to the residential housing corporations, which were involved in the realisation of the Amsterdamse Buurt. A good workers' neighbourhood beside the central HIJSM workplace provided a guarantee for the continuity of work.

Meanwhile, residential building in Haarlem had taken off. The building of the Schoterbuurt, the Rozenprieel, the Leidsebuurt and the Amsterdamse Buurt continued, and there came also new neighbourhoods on the map, such as Bosch en Vaart, and later the Ramplaankwartier. After WW I, the city's growth continued, and with the annexation of the towns of Schoten and Spaarndam in 1927 the city got more than 30,000 additional residents in one go. Moreover, as a result of the annexation law of 1927, the neighbouring cities of Velsen, Bloemendaal, Heemstede and Haarlemmerliede were obliged to give up a part of their ground to

Haarlem. The building of satellite stations, especially on the North-South railway, would further encourage the development of these suburban areas.
In this period, public transport was going through changes. In 1919, the Noord-Zuid-Hollandse Vervoer Maatschappij (NZH)[38] took over all of Haarlem's tram connections.[39] Automobile traffic began to play a significant role as well. The first bus companies started to compete with the tram. Then in 1928, the first concession for three bus services was granted,[40] and the management of the NZH decided then and there that the battle was lost. All tram rails disappeared from the streets of Haarlem to make way for the bus. The last tram ride in the city dates from 1948 and in 1957, the 'Blauwe Tram' to Leiden also stopped.

The Post-war years brought much discussion about traffic in the city in Haarlem, except the reconstruction. Accessibility was sacred, as in the 1950s, everything was done to encourage the access of automobiles to the centre. The plan of 1954 by Kuiper and Van der Steld is an example of this. As well, in the structure plan of 1962, the focus was on accessibility to the centre. This plan determined that the road North of the railway, right behind the station, had to become an important artery. During that period the area around the station had changed drastically. The traffic flow of buses and automobiles increased, while the area around the station degenerated. In 1950, the Beijnes firm had moved its activities to Beverwijk; the factory building was torn down in 1958. In the years after that, demolition continued in the Nieuwstad. The entire area between the station and the Lange Herenstraat was levelled in the 1960s. Various project developers made plans for this area. In 1972, the city council approved the building of the Beresteijn complex, a large-scale new construction complex that was to become the Hoog Catharijne of Haarlem.[41] A determinant factor for the complex was first the traffic requirements and then the buildings. The definite programme for the area included 100 residences, 12,000 m^2 of offices, 1,800 m^2 of shops, 1,000 m^2 of hospitality services, an event hall and a parking garage for at least 400 cars. As the designers indicated many times, the idea of making a link between the complex and the environment never played a role, which is visible in the current situation. The Beresteijn complex is and remains an odd body in the city.
In the mid 1970s, the new neighbourhood of Schalkwijk was almost finished. Within the city limits, Haarlem was again fully built up and geographically speaking, the Central Station was no longer in the middle of the city.
Then the 1970s were finally over and there was again room and attention for the historical centre and the nineteenth and twentieth-century neighbourhoods on the political agenda. The policy note entitled *De inrichting van de Openbare Ruimte* ('The planning of public space') of 1991 as well as the *Uitvoeringsplan Binnenstad* ('Realisation plan of the city centre') of 1994 addressed improvements in the historical city centre. Today, the area around the station remains a major problem.

Conclusion

In the current policy, the city of Haarlem wants to pay more attention to solutions for increasing traffic and at the same time gladly concentrate on central locations along the railway. Ideas, programmes and plans for the various study areas around the railway were established in the *Masterplan Railway Zone* of 2003.[42] Contrary to what people would expect based on the document's name, the *Masterplan Railway Zone* features various current and future projects, brought together in an attempt to formulate a coherent vision of the city. After reading the document, one really gets the impression that this *Masterplan* offers little consistency, especially on the large-scale level. Haarlem's ambitions are mentioned in the explanatory notes of the *Masterplan*, but in general, the partial areas stand on their own too much. Moreover, there is no clear-cut solution recommended for the traffic in the city. Perhaps is it not a coincidence that the new city council finally decided to stop using this document as a leitmotif for development.

In Haarlem, the area along the railway line also has enormous potential. From the construction of the Oude Lijn in the middle in the city, the rail path has always played a special role. Once the Hogesnelheidslijn (HSL)('High-Speed Line') between Hoofddorp and Rotterdam with a junction to Schiphol and Amsterdam is completed, train transport on the Oude Lijn along Haarlem will become less important. Not only will the timetable look different,[43] the characteristics of the train connections will also change. The tunnelling of the railway line, and possibly the road parallel to the rail path, is perhaps a radical solution, but offers tons of opportunities for above ground restructuring. Large urban interventions, which could result from a similar project, regard themes such as the entrance to the city, the restructuring of the Nieuwstad after the tunnelling of the railway or the redevelopment of the Dutch railways' workplace site just outside the historical centre. Moreover, new development themes can also be addressed in order to further shape Haarlem's ambitions.

Notes

1. The ongoing exhibition 'Haarlem in uitvoering' ('Haarlem in construction') on the ground floor of the Brinkmannpassage on the Grote Markt in Haarlem gives a good idea of the city's future plans.
2. The figures of Statistics Netherlands of 2001 show that more than 70% of housing in Haarlem consists of single family homes.
3. From East to West, this road has the following street names: Oudeweg, Prinsen Bolwerk, Kennemerplein, Staten Bolwerk and Verspronckweg.
4. The current Haarlem Central Station was designed by D.A.N. Margadant and built between 1905 and 1908. Margadant worked as an architect from 1879 to 1909 for the HSM (the former HIJSM). See also P. Saal and F. Spangenberg, *Kijk op stations ('A look at stations')*. Amsterdam/Brussels, Elsevier, 1983, pp. 69-71.
5. Haarlem grew quickly in the Middle Ages, in part due to the fortification of the count's court. Already in 1245 the city received city privileges from William II. See also B. Speet, *Historische Atlas van Haarlem ('Historical atlas of Haarlem')*. Amsterdam (SUN), 2006, pp. 6-11.
6. Due to the increase in the number of residents, a city expansion was necessary as early as the fourteenth century. In 1426, Philip III, Duke of Burgundy gave the right to extend the city limits about 700 metres eastwards. However, building activities in this new area had to wait due to an economic recession.
The map of Jacob van Deventer (around 1560) precisely indicates the city limits. On this map, every important building of the city is drawn with precision as well as the contours of the fortification and the city gates. It is also clear that the walled area East of the Spaarne was not yet entirely divided up. See also Speet (note 5), pp. 14-15.
7. In 1585, the Spanish occupied Antwerp, which was good news for all Dutch cities. Dozens of experienced workers, particularly active in the textile sector, emigrated from Belgium to the Netherlands, especially to Leiden, Haarlem and Amsterdam. Haarlem could definitely use this new impulse for its textile industry.
8. On 26 May 1631, both cities signed the agreement for the construction of 'trekvaert, padt en wagenwegh' ('Tow boats, paths and roads'). See also W. van der Ham, *Tot gerief van de reiziger. Vier eeuwen Amsterdam-Haarlem ('To the enjoyment of the passenger. Four centuries of Amsterdam-Haarlem')*. The Hague (Sdu Uitgevers) 1989, p. 13.
9. In Halfweg, a 400-metre wide strip of ground was not dug up due to the possible risk that the water of the Haarlemmermeer would come into contact with that of the IJ. This was very convenient for Haarlem since because of the new tow boat, one could not navigate through from Amsterdam to the Haarlemmermeer. Cargo vessels had to continue to use the old route through Spaarndam and still pay the toll, which went into the city coffers of Haarlem. Travellers had to transfer in Halfweg. See also Van der Ham (note 8), pp. 18-19.
10. In 1632, about 36,000 passengers were transported. In 1633, there were 250,000, in 1648, about 290,000 and in the record year of 1661, about 320,000. Even though the tow boat service between Haarlem and Amsterdam remained the most profitable, various other connections were very quickly established, so that around the third quarter of the seventeenth century, a substantial waterway network had developed.
11. The basic assumptions of the design were already mapped in the first cadastral map of Haarlem by the surveyor F.J. Nautz in 1822, with help from his colleagues H. van Dooren and A. van Diggelen. See also Speet (note 5), p. 38.
12. Also, the number of Haarlem residents dropped drastically, from about 26,000 in 1750 to 21,000 in 1795. The low point was in 1815 with a population of just over 17,000. See also Speet (note 5), p. 38, and H. Engel, 'Randstad Holland in kaart' ('Mapping the Randstad Holland') in *OverHolland* 2 (2005).
13. L.J.J. Serrurier and R. Chevalier, businessmen from Amsterdam together with civil engineer W.C. Brade officially founded the HIJSM (Hollandsche IJzeren Spoorweg Maatschappij) on 8 August 1837.
14. The first railway of the Netherlands is also known as the 'Oude Lijn' ('Old Line').
15. The consulted sources do not provide clear information about the designer of the first station in Haarlem. Both C. Outshoorn (1810-1875) and F.W. Conrad Jr. (1800-1870) are mentioned alternatively as designers of the first station in Haarlem, the station Willemspoort in Amsterdam (1842) and the stations in Leiden (1842) and The Hague (1843).
16. F.W. Conrad Jr. (1800-1870) succeeded in 1839 W.C. Brade as head engineer of the HIJSM. C. Outshoorn was already working for the HIJSM under Brade.
17. In 1834, the Belgian firm Poelman established itself in Haarlem, a year later than the English textile magnate Thomas Wilson with his complex on the Muizenveld, between the Western canal and the Leidsevaart. On the city map of 1822, before the arrival of the Poelman firm, a large building site can be seen that was later annexed by this Belgian business to the Phoenix factory complex.
18. Johannes Beijnes started a carriage and wagon workshop. In 1855, he received the first order from the HIJSM. After the move from the Riviermarkt to the station square, the orders kept coming in, not only from the HIJSM, but later also from the Haarlemsche Tramway Maatschappij ('Haarlem Tramway Company'), the Amsterdamsche Omnibus Maatschappij ('Amsterdam Omnibus Company') and other businesses. See also Speet (note 5), p. 53. In this book, 1857 is mentioned as the year of the move, while other sources mention the year 1858. On the map of Haarlem from 1858, drawn up by C.K. de Geus, the plant on the station square cannot yet be seen.
19. Approximately where the current station lies today, between the Jansweg and the

Kruisweg.
20. More information about this station can be found in the following books: Saal and Spangenberg, *Kijk op stations ('A look at stations')*(note 4), p. 16; J.W. van Dal, *Architectuur langs de rails ('Architecture along the rails')*. Deventer/Antwerp (Kluwer Technische Boeken) 1981, p. 14; H. Romers, *Spoorwegarchitectuur in Nederland ('Railway architecture in the Netherlands')*. Zutphen (Walburg Pers) 2000, pp. 16-18. Romers (p. 16) also believes that the station of Haarlem from 1842 was designed by F.W. Conrad Jr. The station is on the map of Haarlem from 1858 also very clearly visible with the accompanying building on the north side of the railway line.
21. Also about this date the sources consulted are unclear. Although the years 1867 and 1869 are both mentioned there is a slight preference for 1867.
22. See also the drawing of J. Houben of the situation of the HIJSM workplace in Haarlem from 1853, in A. van Ingen *'Het Oude Station'. Revisiebedrijf Haarlem 150 jaar zelfstandig. HIJSM 1844 -NS 1994 ('The old station. Remanufacturing company Haarlem 150 years of autonomy. HIJSM 1844 -NS 1994')*. Rosmalen (Stichting Rail Publicaties) 1994, p. 22.
23. For detailed information see also Van Ingen, ibid, pp. 23-27.
24. With 'North' and 'South' of the HIJSM network is meant here the North and South of the North Holland Canal. On 15 October 1878, the link between Zaandam and Amsterdam was opened, so that the route from Den Helder to Amsterdam no longer needed to go through Haarlem. See also J.H. Jonckers Nieboer, *Geschiedenis der Nederlandse Spoorwegen 1832-1938 ('History of Dutch railways 1832-1938')*. Rotterdam (Nijgh & van Ditmar) 1938, pp. 148-149.
25. For a more detailed explanation of the fringe belt, see B. Von der Dollen, 'A historical-geographical perspective on urban fringe-belt phenomena', in T.R. Slater, *The built form of Western cities. Essays for M.R.G. Conzen on the occasion of his eightieth birthday.* Leicester (Leicester University Press) 1990, p. 319.
26. In 1877, the city of Haarlem gave permission for building a rifle-field North of the bastions, right near the station. On 11 October 1882, the building of the so-called Ripperdakazerne was started. The designer of the complex was Major I.J.H. Gijsberti Hodenpijl. In 1884, the first part of the barracks was finished. Source: www.deripperda.nl.
27. The so-called 'Blauwe Tram' ('Blue Tram') is the collective name for the trams that circulated between 1881 and 1961 in the area between Scheveningen, The Hague, Leiden, Katwijk, Noordwijk, Haarlem, Zandvoort, Amsterdam, Purmerend, Edam and Volendam. As of 1924, the trams had a dark blue colour. The Noord-Zuid-Hollandse Vervoer Maatschappij (NZH)('North-South-Holland Transport Company') operated these tram services.
28. This railway was built by Amsterdam businessman Gustav Eltzbacher who founded the NV Haarlem-Zandvoort Spoorwegmaatschappij ('Haarlem-Zandvoort Railway Company') and the Bouwgrondonderneming Zandvoort ('Building site company') in 1881. See also Speet (note 5), pp. 58-59.
29. The 'spoorwegdriehoek' ('railway triangle') is formed by the crossing of the Haarlem-Leiden, Haarlem-Uitgeest and Uitgeest-Leiden lines.
30. The first tram of the Eerste Nederlandsche Electrische Tramweg Maatschappij ('First Dutch Electric Tramway Company') ran as of 1899 between the Tempeliersstraat in Haarlem and the Raadhuisplein in Zandvoort. In 1904, the line was extended to the Amsterdamse Spuistraat. This tram remained in service until 31 August 1957.
31. In 1902 L.C. Dumont (1865-1935) was named manager of the Public Works by the city of Haarlem.
32. The surrounding cities were very displeased with Dumont's plan, especially Heemstede.
33. In this area on the Spaarne, the Droste chocolate factory had already established itself in 1896.
34. The Schoterkwartier, North of the bastions, lay partially outside Haarlem's city limits. Only the north-western part (the current Kleverparkbuurt and Frans Halsbuurt) is indicated as an area within the city limits. The Amsterdamsebuurt was developed East of the Heerensingel, right under the tow boat to Amsterdam. The Leidsebuurt was established between the Leidsevaart and the railway to Leiden. See also the map of Haarlem from 1904 in Speet (note 5), p. 48.
35. The discussion about the location of a railway harbour in Haarlem is a long one. As early as 1884, the Haarlem Chamber of Commerce brought up the issue of having a railway harbour. The area of the Spaarne and the Waarderpolder indicated as a location, East of the centre. For loading and unloading goods from wagons onto ships and vice versa, the HIJSM presented its own plan in 1902: a harbour location between the railway and the Leidsevaart. This was a much more complicated solution than that of the Chamber of Commerce. According to the plan of the HIJSM, ships had to navigate through the Spaarne and the city up to the Leidsevaart. Yet the city of Haarlem approved this plan and the works for digging the railway harbour took place between 1903 and 1907. As expected, this plan was not successful, and in 1939 a proposal was made to reserve an area of 15 hectares at the Lichtfabriek next to the Waarderpolder for a harbour that was built right after.
36. For extensive documentation about Margadant's station in Haarlem see Romers (note 22), pp. 224-231, and Saal and Spangenberg (note 4), pp. 69-71.
37. Already in his design for the station in Amersfoort (1901) Margadant had used Art Nouveau details.
38. The NZH was a subsidiary of the Dutch Railways.
39. In 1919, the NZH took over all the lines of the ENET (Eerste Nederlandsche Tramweg Maatschappij)('First Dutch Tramway Company') and ESM (Electrische Spoorweg Maatschappij ('First Railway Company') founded in Amsterdam) and the company controlled public transport in and around the city.
40. In 1928 the HBBM (Haarlemsche Brockway Bus Maatschappij) was given permission to start three lines.
41. The complex was finally designed by the architects of Hoog Catharijne in Utrecht: Spruit, De Jong and Heringa.
42. Extensive information about the *Masterplan Railway Zone* (2003) of Haarlem is available online on the website of the city of Haarlem at http://www.haarlem.nl/smartsite19787.htm.
43. As of 1 January 2007, Haarlem Central Station is no longer an intercity station, making Haarlem less important in the Dutch railway network.

Bibliography

Broeke, W. van den et al., *Bronnen op het spoor ('Sources on the rail'). Gids voor onderzoek naar de geschiedenis van de spoorwegen in Nederland* ('Guide for research into the history of the railway in the Netherlands') Utrecht (Uitgeverij Matrijs) 2000.

Dal, J.W. van, *Architectuur langs de rails ('Architecture along the rails')*. Deventer/Antwerpen (Kluwer Technische Boeken) 1981.

Dijksterhuis, R., *Spoorwegtracering en stedenbouw in Nederland ('Railway paths and urban planning')*. Delft, PhD research TU Delft, 1984.

Doedens, A., and L. Mulder, *Een spoor van verandering ('A rail of change')*. Baarn (Bosch & Keuning) 1989.

Dollen, B. Von der, 'A historical-geographical perspective on urban fringe-belt phenomena', in T.R. Slater, *The built form of Western cities. Essays for M.R.G. Conzen on the occasion of his eightieth birthday.* Leicester (Leicester University Press) 1990.

Douma, C., *Het stationsgebouw ('The station building')*. **Utrecht (Nederlandse Spoorwegen afdeling Voorlichting) 1964.**

Engel, H., 'Randstad Holland in kaart' ('Mapping the Randstad Holland') in *OverHolland* 2, 2005.

Faber, J.A., *Het rail. 150 jaar spoorwegen in Nederland ('The rail. 150 years of railway in the Netherlands')*. Amsterdam (Meulenhoff Informatief) 1989.

Haan, H. de, en I. Haagsma, *Stationsplein Haarlem: metamorfosen 1644-2044.* (*'Station square Haarlem: metamorphoses 1644-2044'*). Haarlem (Architext) 1999.

Ham, W. van der, *Tot gerief van de reiziger. Vier eeuwen Amsterdam-Haarlem ('To the enjoyment of the passenger. Four centuries of Amsterdam-Haarlem')*. The Hague (Sdu Uitgevers), 1989.

Ingen, A. van, *'Het Oude Station'. Revisiebedrijf Haarlem 150 jaar zelfstandig. HIJSM 1844 -NS 1994 ('The old station. Remanufacturing company Haarlem 150 years of autonomy. HIJSM 1844 -NS 1994')*. Rosmalen (Stichting Rail Publicaties) 1994.

Jonckers Nieboer, J. H., *Geschiedenis der Nederlandse Spoorwegen 1832-1938 ('History of Dutch railways 1832-1938')*. Rotterdam (Nijgh & Van Ditmar) 1938.

Leeuwen, W. van, and H. Romers, *Een rail van verbeelding ('A rail of imagination')*. Zutphen (Walburg Pers) 1988.

Meene, J.G.C. van de, and P. Nijhof, *Spoorwegmonumenten in Nederland ('Railway monuments in the Netherlands')*. The Hague (Drukkerij Moretus) 1985.

Raatgever Jr., J.G., *De spoorwegen in Nederland ('Railways in the Netherlands')*. Amsterdam (Algemeen Publiciteitskantoor) 1948.

Romers, H., *Spoorwegarchitectuur in Nederland ('Railway architecture in the Netherlands')*. Zutphen (Walburg Pers) 2000.

Roth, R., and M. N. Polino, *The City and the Railway in Europe*. Cambridge (Cambridge University Press) 2003.

Saal, P., and F. Spangenberg, *Kijk op stations ('A look at stations')*. Amsterdam/Brussels (Elsevier) 1983.

Schivelbusch, W., *The Railway Journey, the Industrialization of Time and Space in the 19th century.* Los Angeles, University of California Press, 1986.

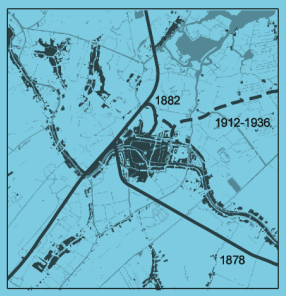
Speet, B., *Historische Atlas van Haarlem ('Historical atlas of Haarlem')*. Amsterdam, SUN, 2006.

Veenendaal, G., *Spoorwegen in Nederland, van 1834 tot nu ('Railways in the Netherlands, from 1834 till today')*. Amsterdam, Boom, 2004.

Important maps

1822 - The first cadastral map of Haarlem, mapped by the surveyor F.J. Nautz, with help from his colleagues H. van Dooren and A. van Diggelen.
1858 - Map by C.K. de Geus. Noticeable are the railway, the lack of large parts of the now torn down city walls and the presence of a few factories. The bastion area redeveloped by Zocher can also be seen.
1878 - City of Haarlem: Railway is clearly present. The city limits: Haarlem-Noord is Schooten, West is Bloemendaal, East is Haarlemmerliede, Noord-Schalkwijk and Hofambacht.
1904 - Map of Haarlem from 1904: the first neighbourhood outside the old city: Leidsebuurt, Rozenprieel, Amsterdam and the beginning of Haarlem-Noord.
1921- Map of Haarlem and surroundings

Railway clearly present (as well as the one to Zandvoort): Shift in city limits as compared to the map of 1878.
1927 - Map with the annexation of Schoten and Spaarndam.



Leiden's railway zone

Willemijn Wilms Floet

No other city in the Netherlands has had new stations as often as Leiden. The most important reasons have been the expansion of the railway network and an increased number of travellers. The arrival of the Schiphol line in 1994 meant a new station for Leiden, the fourth one since 1842. The successive stations show their various contemporary views and relation to the city.

The first two stations represented the status of train travel. The first station was romantic, while the second was monumental. They were situated on a separate square outside the city, on grounds owned by the municipality of Oegstgeest. The third station from 1953 had a more functional look, as train travel was emancipated into 'public transport', and was located right on the axis of the Stationsweg. Already at that time was the relation to the city centre particularly visual. The recently built fourth station is a transparent, bright passageway, whose traditional 'front' connects to the 'rear'.

Leiden's station is an attractive building site, where much is currently going on. At the front of the station, the project *Leiden Centraal ('Leiden Central Station')* is being developed, the important parts of which have already been built, such as the traffic-free pedestrian connection between the station and the city centre, a new bus station, and two towers, marking the station area in the skyline. The large-scale station square from the 1960s now offers room for compression. Less valued and written off dissonances in the cityscape have been replaced by residences and shops, which are better suited to the scale and character of the surrounding older buildings. As well, the city of Leiden wants to build a huge cinema theatre and a pop music centre in this area.

At the rear of the station, project *Stationsgebied Zeezijde ('Station Area Seaside')* will be realised.[1] Here, the university and the 'Regionaal Opleidings Centrum' ('ROC - Regional Studies Centre') were the catalyst for urban developments. Directly behind the station, next to the new Leiden University Medical Centre (LUMC), various large buildings of the medical faculty have been recently established. The Leeuwenhoek is destined for a 'bio science park' with companies related to the university and will be included in a new Dutch landscape park together with the science faculties near the A44 motorway. The terrain with old laboratory buildings will be transformed into a campus with student housing. The area of the old academic hospital is destined to become a 'lively part of the city with space to live, work, recreate, study and receive care.'[2]

On a higher plan level, the integration of the light rail connection between Noordwijk and Gouda is being worked on, which in Leiden will run across the university area behind the station via Central Station. New residential housing is planned along the tracks, and the route will also connect the future city to the former Valkenburg airfield. The light rail connection will bring the coast and the bulb fields that much closer to the city, particularly reinforcing Leiden's regional position.

The city of Leiden steers the urban development projects in the station area. The area development plan offers the legal framework, while the city tries to let clients and developers make their plans based on master plans for sub-regions. The planning of buildings is then carried out in consultation with the urban planning department and neighbours. A large working model on a 1:1000 scale provides an example of the future public space with a building typology the way the city pictures it. Around the station, the guide of traffic flows (pedestrians heading to the city, university or National Museum of Natural History; light rail, bus, automobiles) is a driving factor. The reconstruction of the station area is a very complex assignment: integrating the tram, taking into account very large and autonomous buildings, the presence of large parking facilities, little public programme on the ground floor and the big railway dyke body with complex foundations.
The area to be compressed is so limited in space that it is difficult to provide a qualitative urban planning cohesion between the old and new buildings.

Tunnelling can offer Leiden the chance to directly and properly connect the university campus, now 'the rear of the station', with Leiden's historical city centre. However, the city of Leiden has not yet researched this possible development spatially or programmatically. Here, the development of the railway zone in Leiden is described on the basis of a study of a chronological series of city maps, topographical maps and literature.[3] For this purpose, three major periods have been analysed.

1840-1899
In 1842, Leiden was the third city to be connected to the railway section Amsterdam-Rotterdam. The railway line was projected diagonally along the northwest side of the city, on grounds of the neighbouring municipality of Oegstgeest. As of Haarlem, the tracks followed the tow boat route and then slowly veered off to a loop parallel to the Oude Rijn ('Old Rhine') in the direction of The Hague. The station was located on the Rijnsburgerweg as closely as possible to the city and right beside the old arterial road to Haarlem.[4] It is not a coincidence that an old café located here with a rest stop for horses was immediately renamed *Stationskoffiehuis ('Station coffee house')*.

The shape of the area between the railway and the city was characterised by triangular bastions, which around 1840 formed a romantic stroll route. This green zone was also suitable for buildings, which were too big for the scale of the city centre, such as the academic Boerhaave hospital[5] on the Morssingel, now the Museum Volkenkunde ('Ethnology Museum'), university buildings, factories and cemeteries. The old entrance to the city from Haarlem, the Rijnsburgerpoort, was demolished in 1867.

The station square with its small, romantic station building designed by railway engineer F.W. Conrad and a public garden was surrounded by ditches and situated in a rural environment with gardens, bleacheries and a rifle-field (see the cadastral map of 1818). To get to the city, a train traveller first had to pass a small bridge and then a toll gate.[6]
The urbanisation of the station area started when the station was replaced by a larger building with more urban allure in 1879, designed by D.A.N. Margadant.[7] Passenger transport and goods transport grew, and the new railway line Leiden-Woerden was commissioned.[8] At the same time, a railway harbour was dug right across from the new station, where a site for goods was built. Due to this, the station square was no longer a valuable entrance to the city. As of 1879, two horse draw trams ran through the city centre, of which the main stop was across from the *Stationskoffiehuis*. The steam trams to Voorschoten/The Hague, Katwijk/Noordwijk and Haarlem ran as of 1884.
The Straatweg to Haarlem changed its name to Stationsweg. On the west side of the Stationsweg, manors, alternating with companies, were built. Striking was the strongly staggered building line. The area behind these houses was isolated by the harbour and the Singel. In 1882, the second Leiden workers' neighbourhood was built at right angles to the Stationsweg. The passages from the Stationsweg are still there today, even though the buildings have mostly disappeared or have been replaced by a totally different buildings.[9] According to the map, there were already buildings on the Morssingel in 1818, which were replaced by manors in the third quarter of the nineteenth century. On the map of 1850 and that of 1899,

one can see that the buildings here and on the Stationsweg were situated directly on a ditch, with small bridges running to front doors or front gardens. Only in 1911 was this water filled in because of odour nuisance and the electrification of the tram.[10] Luxurious manors were built between 1875 and 1900 on the east side of the Stationsweg, which formed a continuous building line. Alleys that still exist today opened up the terrains that bordered on the Schuttersveld with its old bleacheries. Thanks to the front gardens and the richly decorated façades, the Stationsweg as a whole still had a green character.

Since the ground on the other side of the railway was the property the municipality of Oegstgeest, no workers' neighbourhoods were built, as was the case in Delft, Gouda and Dordrecht. In Leiden, this development occurred in the areas between the railway and the city centre.

1896-1945

Between 1896 and 1930, the narrow strips between the railway and the city, and the Oude Rijn were built with speculative social housing, including the Transvaalwijk and the neighbourhood between the Schuttersveld and the Haarlem tow boat. These buildings were built after the annexation of the Oegstgeest ground by Leiden in 1896 and 1920. De Morsweg along the Oude Rijn, which originally had cottages of rich Leiden residences, was compressed. Villas, houses, small companies and a rowing club joined into a single building line. The small streets at right angles on the Morsweg followed the ditch patterns and simply ended at the railway. The presence of the railway did not play a role in the design, as it appears from the remarkable bevelled edge of the Transvaalhof (1930).

A major change in the station area occurred at the rear of the station where, until that time, only the Pesthuis ('House of the plague') from 1657 stood.[11] Here, from 1912 until 1932 a new academic hospital was built.[12] In 1900, the State had already bought 15 hectares of land from the municipality of Oegstgeest. Following the French and German example, it was decided to combine the various medical specialities and laboratories in pavilions, in a park-like environment in order to combat the risk of infection. The entrance to the complex was on the Rijnsburgerweg, with no relation to the station. The pavilion with the boiler house, kitchen and laundry shop stood by the tracks. The pavilions were made of dark brick buildings with large roofs. The terrain was further built up following the new buildings in 1984 with barrack-like buildings.

Besides the construction of the new office of the tram company in 1911, not much changed on the station square when the trams were electrified. In 1920, a wooden pedestrian bridge was built across the tracks, which served the platforms and the Rijnsburgerweg. The railway crossing here was very often closed for long periods of time and hindered tram traffic. Between 1912 and 1936, the local railway line ran to the Haarlemmermeer, meant for the transport of agricultural products. This line had a separate station on the northeast side of the city and was connected to Leiden Central Station with a winding temporary line. As a result of this, industry established itself on the north side of the city centre.

City expansions of Leiden were realised in a concentric ring around the city centre, with the railway lines and the Rhine-Schie canal as 'natural boundaries'. An important plan that carefully crossed over these city limits was the *Uitbreidingsplan 1933 ('Expansion plan of 1933')*, drawn up by P. Verhagen of the agency Granpré Molière.[13] First of all, the plan regards the expansion and reorganisation of the traffic through the new city neighbourhoods (with the help of a system of ring roads) and in the city centre (with the help of breakthroughs). In a draft from 1929, a very large, new station was planned on the Schuttersveld. The city dismissed this location upon closer examination, since the new Stationsweg plus the old Rijnsburgerweg would arrive in a dead straight line on the stately Rapenburg. They would function as an undesirable alternative for through traffic in the Breestraat and moreover, formed a threat for the status of this canal.

The *Uitbreidingsplan 1933* planned an elevation of the railway, which was carried out as of 1949 in the scope of the reconstruction plan for Leiden. The waiting time for the railway crossing at the Rijnsburgerweg was the decisive argument.

In the *Uitbreidingsplan 1933*, new neighbourhoods were planned, which were connected to existing buildings, according to the principles of a compact garden city. Along the north side of the railway and around the grounds of the academic hospital, a joint zone with residential building was planned, determined by the city limits with Oegstgeest. Since this area – Lage Mors – was completely isolated by railway sites, the limits of Oegstgeest and the Rhine, which were lacking bridges, only a very small piece of this planned residential building was carried out.[14]

1945-2004

Between 1950 and 1953, the railway was lifted up through Leiden by way of a dike body. On both sides of the new station, tunnels and new roads were built with very big roundabouts, which had few exits. The connection of the Rijnsburgerweg to the centre was moved in a northern direction. The large-scale infrastructure was meant as a tangent in the through traffic system, with a link to the station and city centre. They were ahead of the buildings of the large area behind the railway, which were surrounded by the Rhine, the A44 motorway and Oegstgeest.

The station and station square were completely scrapped and the railway harbour was filled in. The workers' neighbourhood, which was heavily bombed at the end of WW II, was torn down to make way for a large-scale building block, which guided the infrastructure in a contemporary way. The new station from 1955, designed by the engineer H.G.J. Schelling, was located on the axis of the Stationsweg. It now had a central position as compared to the city centre, on a modern square, but the wide road, which now runs along the front, formed a barrier for pedestrians. In the special railway edition of the *Leidsch Dagblad* of 4 May 1953, which was published following the opening of the new station, Schelling wrote: 'The NS ('Dutch Railways') will try and please some of the travellers by giving them the impression that they are being taken care of. In designing the station building, they especially strived towards simplicity, lightness, cheerfulness and clarity. The building will demonstrate as clearly as possible that it wants to be a modern station without any excessive luxury or representative fuss.'

As a result of the lines, which were expanded with the reconstruction, the structure plan for the Leiden agglomeration was established in 1958. Expansion and improvement of the traffic structure were once again on the agenda, at a local level and now also at an inter-local one. Until the switch to small-scale in the mid-1970s, this structure plan served as a starting point for projects on a smaller scale. In the structure plan, locations were determined for expansion of the university, industry, recreation and residential building. Apart from that, the city centre was also seen as an important assignment. Here, 3,000 dilapidated residences had to be replaced by 700 houses, which met the criteria of the new era.[15] The road plan built upon the *Uitbreidingsplan 1933*, for example, on the point of the traffic completion in the city centre via the East-West route, on the north side of the city centre over the filled in Langegracht and the North-South route via the filled in Hooigracht. The northern road through the city centre was important to the station area, which would split at the De Valk windmill in the direction of Rijnsburg, and via the Morssingel in the direction of Katwijk. The monumental houses on the Morssingel were bought up by the city with the plan of opening this street. When the priority was shifted from building traffic roads to maintaining the historical cityscape, by then the houses were so dilapidated that they still had to be demolished and replaced by apartments in a common dull, brick architecture of the times without any concern for urban quality. Many traffic interventions planned in 1960s were started but never finished because of the changed urban planning focus. Through roads are now connected to each other by odd bayonet connections, which complicate the orientation for automobile drivers; the roundabouts turned out to be too big.

At the end of the 1960s, the Plesmanweg and the Wassenaarseweg were built at the rear of the station, while motorway A44 was modernised. Then, an area was determined within which the science faculties of Leiden University could expand. The first new buildings appeared on the side of the A44. The university campus that was built there consists of large buildings, which stand as autonomous properties on their parcels, in the middle of large parking lots and grass fields. Between 1980 and 1984, on the side of the railway, a large new academic hospital was built, with a compact organisation and following a structural vision.

As of 1977, with the urban renewal operations in and around the city centre, the discussion about how the Schuttersveld must be developed into a business centre was addressed. This terrain, situated by the track, historically had a military purpose. Due to its low location, it was difficult to build on. The terrain was then used as a skating rink, event site and parking lot. The discussion was focused on the question whether the planned business centre should also house shops. With the image of Hoog Catharijne in Utrecht in mind and fear of the wasting away of shops in the historical city centre, only housing offices were built. Given the poor results and the potential of the place, it is a missed opportunity, according to many.[16]

The arrival of the Leiden-Schiphol railway in 1981 meant an increase in the number of travellers. Platforms, passages and the station itself became too small. Moreover, there was no space in the station for the shops that the NS now offers at every station. A new station also offered the chance to given up the strong division between the front and rear of the station. NS architect H.C.H. Reijnders designed an expressive white frame construction across the railway, which echoed the connection between the 'city side' and the 'sea side'. Under the transparent roof and in large empty spaces on the platforms there is an entrance hall built as a passageway, which was opened in 1996.[17]

Within the scope of 'Grotestedenbeleid' ('Large cities policy') established by the government, Leiden was able obtain the money for the tunnelling of the station square for the purpose of a traffic-free pedestrian route to the city centre. Due to the tunnelling of the square, the automobile traffic that wanted to go from the station square to the city centre now had to make an odd loop.

On the south side of the station square, an new additional opening up of the centre of Leiden is expected in the future, which will run from the new service road between the A4 and the A44. The construction of this

road makes a thorough reconstruction of the Transvaalwijk necessary, considered as written off by the city. The neighbourhood consists mainly of privately owned houses, which will be difficult to expropriate. A gate building had been planned at the site of the tax office that now borders the south side of the station square. When buildings will be placed in the zone right next to the railway, the stations square will look more like a boulevard. This development also complicates the possible completion of a railway tunnel.
Another assignment was based on the building blocks between the station and the canal. When the railway was built, there were isolated areas; now there are building blocks of which the buildings blend like chameleons into the environment. The size of these building blocks is somewhat bigger than those of the building blocks in the city centre. The inner spaces are accessible to the public. Both blocks consist of a bunch of buildings from different periods, from 1880 to 1980. These buildings are already signs of the times: they are all sloppy and give a bad impression. The buildings of the twentieth century are particularly of lesser quality. Although Leiden is a water city, the buildings on the Morssingel have no relation with water. Here as well lies an opportunity.

In the scenario where the train goes underground, the high railway dyke body, which is a 'logical' physical division between the historical city centre and the new 'world of knowledge' behind the station, will disappear. Today, they are two independent worlds, with a completely different spatial structure: urban fabric across from large-scale detached building complexes, which have no relation to their context or topography. The area between the tunnel and the canal is the zone between these worlds. Could this zone provide a new cohesion for the city?

Notes

1. *Masterplan Station Zeezijde ('Master plan seaside station')* was designed by the Kraaijvanger Urbis agency.
2. Source: City of Leiden online, *Plan Station Zeezijde* ('*Seaside station plan')*
3. 1818 Cadastral map by Poelgeest and Endegeest, H. Visscher
1850 New map of the city of Leiden, W.J. van Campen
1884 from the Atlas Leiden, library of architecture
1899 Map of Leiden in six parts, H.L.A. van Campen, P.W.M. Trap, A.W. Sijthoff
1920 Map of Leiden, Wed. J. Ahrend
1924 Map of Leiden, Municipal Public Works Department
1941 Map of Leiden, Municipal Public Works Department
1947 Map of Leiden, Municipal Public Works Department
1956 Map of Leiden, Municipal Public Works Department
1962 Map of Leiden, B. de Kler
1910 - 1923 - 1965-1974 - 1986 - 1995 - 2004 Topographical maps
4. This site is prototypical. **See R. Dijksterhuis**, *Spoorwegtracering en stedebouw in Nederland. Historische analyse van een wisselwerking ('Railway paths and urban planning in the Netherlands. Historical analysis of an interaction')*. Delft 1984, p. 205.
5. The pavilions of the academic hospital were built between 1867 and 1870 by the architects H.F.G.N. Camp and J. van Lokhorst from the Office of the Chief Government Architect.
6. See map from 1850.
7. Around 1880, the HIJSM replaced the first generation of stations in Haarlem, Leiden and Delft by more representative buildings, which had to build trust with the traveller.
8. The Leiden-Woerden railway line was operated by another company than the HIJSM, namely the Nederlandse Rijn Spoorweg Maatschappij ('Dutch Rhine Railway Company').
9. The first social residential building project of the Leidsche Bouwvereniging NV ('Leiden Building Association') founded in 1878 by an enlightened professor was located on the Rijnsburgersingel, east of the Stationsweg. The location of the second project was firstly determined by making use of the historical Haverzaklaan and secondly by the city limits of Leiden, which ran right through this area. In 1886, in a second phase, the area was further built up with small back-to-back houses on narrow streets and around a small square.
10. H. Kleibrink, *Leiden buiten de Singels ('Leiden outside the canals')*. Leiden 1977, p. 30.
11. History of the *Pesthuis ('House of the plague')*:
1657-1780 Used as a house of the plague
1781-1822 Military hospital
1822-1890 Provincial correctional military prison
1890-1910 State labour institution for women
1910-1927 Approved school for boys
1927-1937 Approved school for psychopaths
1937-1941 Garrison workplace
1943/1956-1984 Military museum
1998-present Part of the National Museum of Natural History
12. The Boerhaave hospital with 150 beds on the canal was too small as well being too dark and prone to infection. The new hospital with a capacity of 600 beds was designed by the chief government architect J.A.W. Vrijman and his office employees G. Westerhout, G.C. Breemer and J.M. de Groot. As well, this university hospital did not have a happy history. During the design process, the professors could not come to an agreement about the designs. Construction stagnated because of the recession of WW I and a clash within the Public Works service due to corruption. The costs exceeded three times the budget. The pavilion system led to a division that was too large between specialities. Running the hospital and the building remained very inefficient.
13. C.J.D. Waal, 'Het uitbreidingsplan van 1933' ('Expansion plan of 1933'), in *Leidsch jaarboekje ('Leiden yearbook')*, vol. 75, 1983, pp. 217-244.
14. In the 1930s, part of a garden city neighbourhood was built in the Morskwartier northwest of the railway, in the area of the concrete block factory. In 1951, a neighbourhood exclusively built of prefabricated duplexes, and in the second half of the 1960s, a neighbourhood with high-rise flats rhythmically placed beside each other, square to the railway.
15. Engineer J.C.H. Drost, '1958 Structuurplan voor de Leidse agglomeratie' ('1958 Structure plan for the Leiden agglomeration'), *Tijdschrift voor Volkshuisvesting en Stedebouw ('Magazine for social housing and city planning')*. November 1959, p. 247.
16. H.S. Yap, *De stad als uitdaging. Politiek, planning en praktijk van de stedebouw.* ('*The city as a challenge. Politics, planning and practice of the city development'*). Rotterdam 2000, p 75.
17. Now that the NS wants to couple access to stations with tickets, the *raison d'être* of this station is threatened!

Bibliography

A.A., *Leiden Centraal. Op stap met de architecten van nieuw Leiden ('Leiden central station. Setting off with the architects of the new Leiden')*. Leiden 2001.
A.A., *Een nieuwe sleutel tot Leiden. Ideeenschets voor de development van de environment van het N.S. station te Leiden ('A new key to Leiden. Draft ideas for the development of the environment of the train station in Leiden')*. Leiden (Kamer van Koophandel) 1986.
Blok, N., et al., *Vier eeuwen geschiedenis in steen. Universitaire gebouwen in Leiden ('Four centuries of history in stone. University buildings in Leiden')*. Leiden 2005.
Blok, P.J., *Geschiedenis eener Hollandsche stad ('History of a Dutch city')*. The Hague 1918.
Blom, J.C.H., *De geschiedenis van een Hollandse stad.* Vol. 4: *Leiden vanaf 1896. ('History of a Dutch city'* Vol. 4: *Leiden as of 1896')*. Leiden 2004.
Douma, C., *Stationsarchitectuur in Nederland, 1938-1998 ('Station architecture in the Netherlands, 1938-1998.')*. Zutphen 1998.
Dröge, J., E. de Regt and P. Vlaardingerbroek, *Architectuur & monumentengids Leiden ('Architecture and monument guide of Leiden')*. Leiden 1999.
Jongsma, M.W., *325 Jaar Academisch Ziekenhuis Leiden ('325 years of the Leiden academic hospital')*. Lochem 1963.
Goudriaan, B., *Leiden in WO II, van dag tot dag ('Leiden in WW II, from day to day')*. Leiden 1995.
Hooidonk, H. van, *Leiden in bewogen jaren. Het Leidse stadsbeeld tussen 1930 en 1945 ('Leiden in eventful years. The cityscape of Leiden between 1930 and 1945')*. Leiden 1985.
Jonge, H.L. de, and S. de Lange, *Benarde Veste. Leidse stadsuitbreidingen door de eeuwen heen ('Distressed Bastion. Leiden city expansions throughout the centuries')*. Leiden 1997.
Moerman, I.W.L., *Niet gebouwd Leiden ('Unbuilt Leiden')*. Utrecht 1987.
Nijhof, P., *Stationswijken in Nederland ('Station areas in the Netherlands')*. Ph.D thesis in social geography, Amsterdam 1973.
Nijland, J., *Presentatie development stationsgebied ('Presentation of the station area development')*. Leiden 2006.
Romers, H., *De Spoorwegarchitectuur in Nederland 1841-1938 ('Railway architecture in the Netherlands 1841-1938')*. Zutphen 1981.
Scheffer, C., and A.F.J. Niemeijer, *Architectuur en stedebouw in Zuid-Holland ('Architecture and city planning in South Holland')*. Zwolle 1996.
Smit, C., *Strijd om kwaliteit, de geschiedenis van de volkshuisvesting in de regio Leiden ('Battle for quality, the history of social housing in the region of Leiden')*. Leidse Historische Reeks ('Leiden historical series') No. 18, Leiden 2006.
Vermeulen, F., *Het Leiden Centraal Project: de historie van een bestuurlijke LAT relatie ('The Leiden central station project: the history of an administrative long-distance relationship')*. City of Leiden, Building and Living department, Projectburo LCP, Leiden 1994.
Wiersinga, J., *Lijnen in het landschap ('Lines in the landscape')*. Leiden 1995.

Delft's railway zone

Willemijn Wilms Floet and Leen van Duin

At the moment, the reconstruction of railway station areas is a matter of topical interest, both in large and smaller cities. Due to their central location and high level of facilities, railway station areas are highly rated by city councillors and real estate developers. The expansion and reorganisation of public transport (tram, underground, RandstadRail, high-speed line) in Amsterdam and Rotterdam set off rigorous reorganisation of railway station areas. In Utrecht and The Hague, the reorganisation of public areas surrounding the railway stations is linked to a significant expansion of real estate. In large cities, there is a tendency to disentangle transport flows, privatise the station building and improve the connection between the station square and the city centre. In smaller cities, such as Arnhem, Breda and Delft, the problematic nature of the station as a well-organised and efficient transport junction is indeed an issue. However, newer railway stations display a different tendency: they become part of a large, multi-functional complex, a hybrid structure that identifies the station area.

Delft will be the first smaller Dutch city where the train will go underground. In that context, it could be ahead of similar cities. At the start of the *Spoorzone Delft* project (5 October 2005), Mrs Peijs, the Dutch Secretary of State for Transport, expressed the wish for several cities to follow the Delft example.[1]
According to plans, starting in 2012, the railway will pass through Delft underground and a completely new station area will be ready in 2020. The tunnel is the solution for various technical railway issues[2] and also provides the opportunity to create a new city area in Delft's geographic centre, with 1,500 residences and 50,000 m^2 of office space right next to the historical city centre. The aim is to build an area with an allure and atmosphere similar to Delft's city centre.[3]
In 1999, Delft took on Joan Busquets, the internationally renowned Spanish urban planner to draw up a master plan and supervise its realisation. In the mean time, the zoning plan was defined. The call for tenders relating to the tunnel is in progress. Together, the city of Delft and the NS (Dutch Railways) will realise a combination of a station and a municipal office building, intended to serve as the primary element and catalyst for urban developments. The multiple study assignment (in compliance with European tender legislation) given to five architectural firms[4] has not yet resulted in a winner.
Two designs were initially in the running. The first was a large urban brick building with an 'archetypical' railway station front and windmill towers on its corners (Soeters). This design is supported by the Delft population. The other design consisted of five strip-like glass parts above a transparent hall (Uyttenhaak). The latter design incorporated the themes from Busquets plan (intertwining directions and the park on top of the tunnel) well, and was thus supported by the local council.
All participating architecture firms for various reasons contested the tender. In response all firms were asked to elaborate on their design. This round was won by Mecanoo, with a blue tiled valted station hall. From the outside the building looks like a glass monolith, which mass would adapt to the context. Had the process evolved according to plan, restricting conditions could have been formulated for the tunnel, based on the design. This is no longer feasable. The tunnel design will instead be a restricting condition for the building.

Delft consists of a collection of independent areas, each with their own spatial structure. Their identity depends on the zoning plan and contemporary views on architecture and urban development, at the time of their establishment.[5] The new railway station area will not be any different. Historical traces will be wiped and a fresh start will be made. The available area provides the opportunity for interaction between the large-scale character of present-day society and the fine-mesh, historical urban fabric. It enables a web of new relationships, and finally, new forms of public areas featuring innovative architecture.

Busquets sees the railway station area as a literal link in Delft's heart and chose the morphological characteristics and the lost history of the city wall as a starting point. Such a story easily convinces a large audience. The personal translation of historical characteristics to the actual, present situation however, should be the topic of a professional discussion. This article aims to give the initial impetus for this. To this end, the development of the railway zone will be described in three consecutive periods: 1840-1910, 1910-1940 and 1940-1970, based on map and literature studies. Then, we will further discuss Busquets' plan and add some comments.

1840-1910
In 1841, railway engineer F.W. Conrad projected the railway line along Delft at a distance of 500 metres west of the city, in the municipality of Hof van Delft. He imagined a monumental station quarter, similar to the one planned with the Hollands Spoor station in The Hague. Delft's city council did not want to compete with a neighbouring municipality, and saw, as industrialisation rose, new opportunities to overcome the economic malaise, and therefore felt that the railway should be located as closely as possible to the existing city. There was space available along the old city ramparts, which had lost their defence purpose.[6] The entrance to Delft from the Buitenwatersloot was safe and made a great impression, by way of a bastion entirely surrounded by water and the symmetrical Waterslootse Poort (gate) accessible by small bridges. The Delft city archives have kept a draft from 1846, placing the station on top of the bastion, but this solution turned out to be unfeasible. Later, the Waterslootse Poort was demolished and the water surrounding the bastion was partially filled. The station was established in the southwest angle of the intersection.[7] The situation is comparable with that of Leiden and Gouda, where the station was also established adjacent to a separate square, next to an important arterial road. A mere bridge connected the station square with Delft's city centre. Buildings could only be found along the Buikwatersloot. The rest of the area southwest of the railway line was used as a bleachery or ornamental garden, or had an agricultural purpose. The first train ran in 1847.

Around 1880, the railway company HIJSM replaced the small, romantic and rurally situated stations on the Amsterdam-Rotterdam railway line with larger buildings bearing a more monumental appearance, and this was also done with Delft station.[8] The long, stationary trains blocked the line to the Buitenwatersloot and there was no space available to expand the railway yard. The station was moved 250 metres to the south, to a street opposite the Rijksconstructie warehouses.[9] In order to get this complex within the city side, a twist was made in the railway line. Today, this twist is a problem because it limits the speed of trains passing through. The new station from 1885, designed by C.B. Posthumus Meyjes, was again isolated from the historical city. The line ran from the quay along the Houttuinen[10] and the Waterslootsepoort bridge. The station tower's asymmetrical position indicated directions to and from the city centre. From the beginning, the western platform was opened up by a small tunnel, which also provided a passage to the Westerkwartier area.
Water continued to play an important role around the railway. At the same period, on the west side of the railway near the old station, a railway harbour was built.[11] Due to its limited capacity and congestion, the harbour lost the competition to the inland port in The Hague. To enable ships to pass through, the northern area of the Houttuinen was elevated by 3,5 metres with the construction of the new station. From 1912, on the west side of the track, ran the steam tram line Delft-Westland, from the goods yard behind the station through what is now called the Westlandseweg. This tram was mainly used for transporting goods.
As of 1880, speculators developed the first area after the railway, the workers' neighbourhood Westerkwartier.[12] With the help of the enlightened industrialist Van Marken the well-known workers' neighbourhood Agnetapark was established on the west side of the track in 1895.
The Spoorsingel section between the Spoorhaven and the Laan van Overvest was built in the period between 1880 and 1910. Most properties are manors, which can also be seen on the outskirts of the historic canals. The residences on the Spoorsingel had a less uniform architecture and fewer storeys. Businesses were often housed on the ground floor. As well, different properties of other dates can be found. The Spoorsingel was planted with trees. A remarkable feature was the gate of wooden posts along the railway track. Between 1880 and 1905, a local train also ran on the existing track, with stops at 't Haantje, Agnetapark, the bridge near the Schoolstraat and the Binnenwatersloot/old station.

Of morphological interest are the developments on the Phoenixstraat, which formed the passage behind the city wall in the historical city. As of 1700, this wall no longer was a direct line of defence. Since then, several garden houses were built between the wall and the water. Directly behind the city wall, stables and staff houses for the large monumental manors on the Oude Delft were built. When the city ramparts were levelled in 1863, a number of garden houses were replaced around 1865 with more substantial housing, built by order of persons and institutions wanting to present themselves near the railway.[13] A number of lots on the Oude Delft were split, causing the Phoenixstraat to change from a rear side into a front side.[14] This process continued after the construction of the railway viaduct in 1965. Both characteristics are still noticeable in current buildings.

The transformation from rear to front side also took place at the Westvest, where several monumental buildings for the Technische Hogeschool and a grammar school were built, between 1865 and 1890.[15] In other Dutch cities, such as Amsterdam, Haarlem and Leiden, larger programmes as detached housing were built along the city centre stroll route, taking the place of the former line of defence. In the case of Delft, the western city wall was intended for the

railway, however, the lots within the building blocks were so spacious that there was room for larger programmes and public purposes, such as educational housing, the land registry and the police. The Westvest had the appearance of a boulevard with trees.

1910-1940

The first expansion planned by the city of Delft – resulting from the 'Woningwet' ('Housing law') of 1901 – was a zone around the existing city.[16] Because the area west of the railway belonged to the Hof van Delft municipality, construction was started at the east and southeast side of the city. Due to flourishing industry, the population of Delft increased by 25% between 1920 and 1940. The incorporation of the Hof van Delft and Vrijenban municipalities in 1921 provided the opportunity to also expand to the west, at the other side of the railway.
In the 1930s, the last remaining open area along the Spoorsingel was built on, between the Laan van Overvest and the Ruys de Beerenbrouckstraat. This urban garden area, with the Hof van Delftlaan in the middle, displays per street unity in housing typology and cityscape. Residences along the Spoorsingel consist of typical upstairs and ground-floor flats from the 1930s, which fit in unobtrusively into existing properties. Although these houses are slightly higher than the ones in the residential streets of the area, they most definitely do not possess the expression one would expect near the railway.

In the expansion plans of the 1920s and 1930s, the regional scale also became important[17]. Besides new areas in the zone around the city centre, large infrastructural elements were also planned, such as the A13 national road in combination with a non-implemented canal on the east side and possibly the secondary road on the west side.
These north-south oriented infrastructural elements, including the existing railway, defined the structure of all large-scale expansion areas after WW II. The way in which the new infrastructure connected to the existing city through residential areas was an important topic of discussion. The first plans for expansion areas were no longer based on geography, but on urban development insights of that time.
The 1921 proposal to fill the Oude Delft in order to run the Delft-The Hague steam tram line on top of it resulted in so much protest that it was moved to the Phoenixstraat in 1929. To this end, the old city walls north of the De Roos windmill were elevated and a part of the bank housing of the Westsingelgracht was demolished.
As of 1929, the city of Delft repeatedly tried to gather financial means to even the barrier between the western residential areas and the historical city. They thought about tunnels underneath the railway, but also of elevating the yard. Time and time again, however, this proved to be unfeasible.

1940-1970

Right after WW II, new initiatives were taken. The NS wanted to expand the timetable and the yard. The city fostered the wish to solve the waiting time and traffic jams at railway crossings. In 1953, this resulted in the specific 'Spoorwegplan gemeente Delft' ('Delft railway plan').
Before discussing the 1953 railway plan in further detail, here is an interesting, visionary plan, developed by Herman Rosse during the war period. The plan was published as a book, entitled *Delft Kunststad* ('Delft, city of arts'), on the occasion of the city's 700th birthday.[18] Rosse's thesis was that modern [motorised] traffic measures should leave the old city aside. 'Because the dimensions of roads needed for actual traffic in cities need to be increased with the area required for parking cars, one arrives at a scale of roads that once and for all disrupts the old, existing road pattern and its cityscape.
The compromise proposals, now being put forward under the banner of reconstruction for several cities by urban development engineers cannot be considered as progressive solutions from a traffic point of view.'[19]
Rosse already advocated a pedestrian city centre, thriving on tourism. According to Rosse, the intact historical centre of Delft should become an open-air museum. Other attractions could be added, such as an architectural museum, museums about craftsmanship and famous Delft painters, also new student facilities. The ring road could provide for modern times.
The section of the ring road between the Schoolstraat and the old station, centrally located, as compared to the old city and the new western expansion areas, was proposed as a super modern shopping boulevard, with large glass warehouses, cinemas and ice-cream parlours, covered by a wide porch roof. The train (four tracks) was located on an overhead rail, integrated in the cross-section of the shopping centre, together with a tram line and a service road. Near the Binnenwatersloot/Buitenwatersloot junction, from a historic point of view the most important entrance to Delft, with the monumental Waterslootse Poort, Rosse placed a complex of important public facilities: the municipal secretariat, police, fire brigade, post office and the station. Pedestrian tunnels in east-west direction were planned at regular distances. Levelling out the railway bend – also important, regarding recent tunnel plans – was the decisive argument for Rosse to demolish buildings on the Spoorsingel. At the same time, he created space for a wide shopping boulevard. The station was furnished with small shops, intended to increase the comfort of passengers.
In practice however, Rosse's plan was completely ignored. Only the newspaper *Delftsche Courant* briefly paid attention to it. There was no role of importance in municipal plan creation. In 1948, Rosse left for the United States and Delft had taken on S.J. van Emben, an urban development consultant who was not afraid of large-scale interventions in the historical city centre, although he tried to present them as imperceptible as possible, as can be seen in the 1956 Komplan ('centre area plan') for Delft's city centre. The city centre would be crossed both in a north-south and east-west direction. This plan also fully incorporated the results of the above-mentioned 'Spoorwegplan Gemeente 1953' ('Municipal railway plan, 1953'). From south to north, it addressed the operations listed below:
1. The Irene tunnel underneath the railway was intended as an east-west city centre route alternative on a regional scale. This new road ran along the city centre's south side and opened new city expansions in Delft-Zuid on the west side of the railway, which got started in the 1960s.
2. The second operation, connecting to the Irene tunnel, regarded the expansion of the railway yard.
3. Finally, the third operation consisted of elevating the railway above the water near the Binnenwatersloot/Buitenwatersloot, with a connecting overhead rail up to the underpass of the Ruys de Beerenbrouckstraat.

In a letter to the municipal executive, Mr C. Smits, a resident of Delft, asked whether a tunnel had been considered instead of a crossing.[20] He anticipated a harmful effect to the cityscape and feared the noise a crossing would cause. 'When something good can be established for the future, money is of marginal importance'. On behalf of the municipal executive, the public works manager answered that an 'underground' was not feasible (a section of 2.5 km at a depth of 9 metres was required for this, with railway connections to the Gistfabriek, Calvé and the Westland tram), not counting the costs. In his informative dissertation on design problems confronting station and railway designers, railway architect and engineer H.G.J. Schelling clarified the cost motive: 'An elevated railway requires an elevation of approximately 4,50 metres, while a lowered track requires digging approximately 6,50 metres'. Nevertheless, railways situated higher than surrounding city areas remain a separate cityscape element, causing them to be less satisfactory from an urban development point of view.[20]
The NS CEO, engineer J. Lohmann, discussed plan creation at the opening of the overhead rail near Binnenwatersloot on 13 July 1965. At first, the intention was to raise a 'soil track' between Binnenwatersloot and the Wateringse Vest. However, construction of the required retaining walls would be more expensive than constructing a viaduct. 'Delft got itself a crossing, which, aesthetically speaking, is a true asset for the city. It has a free height across its entire length; the Spoorsingel has been significantly widened and the residents have a large number of covered parking spaces at their disposal. To me, this can be appreciated as an additional plus point. From this, one can see how unexpectedly public and private transport intertwine (…). A railway with a station located on the edge of town or outside of it, cannot perform its public transport functions as well as a city with a station near the city centre, enabling a connection with local public transport and where possible, switching to and from private transport means. This is a clue to project future residential areas as closely as possible near, or preferably, on both sides of existing railway lines. A notion such as the 'bandstad' fits in this view and with that Delft-Zuid station, which we aim to create within short term, to benefit the inhabitants of the new local residence areas.'[21]

Between 1953 and 1967, work was carried out to even the barrier function of the railway in the city. Between 1956 and 1960 the Westlandweg was routed underneath the railway through the Irene tunnel. Near the station, two blocks of the Rijksconstructie warehouses were demolished to make way for a station square/bus station and a bridge across the Westvest. The railway was elevated in a northern direction: between 1962 and 1965, the railway viaduct at the Buitenwatersloot was built and finished between 1960 and 1967. For this purpose, the canal in the Phoenixstraat had to be temporarily filled. The canal, however, was never dug again. Except for the Bagijnetoren and the De Roos windmill, all buildings on the west side of the Phoenixstraat were demolished. The operation to connect the Bagijnhof, Prinsenhof and the Hoogheemraadschap with the Phoenixstraat dates from this period. As mentioned above, this was a new step in the process of transforming the historical city's rear side into the front side of a new city boulevard. The area behind the station and the yard were further completed with four storeys dwelling blocks and a complex of secondary schools.

2006-2030

The Irene tunnel and the railway viaduct never managed to solve the railway issues in a satisfactory manner. These infrastructural elements showed technical flaws (see note 1) and looked shabby. Only when the funfair (one week in September) is in town, the weekly market is held there, giving the area a lively appearance.
As a result of the NS plans to use four tracks on the Amsterdam-Rotterdam route (*Rail 21*) and the *Ontwikkelingsvisie Delft 1993* (A vision on developing Delft), the city of Delft commissioned the young urban planning firm Palmboom & van den Bout to examine

the possibility of a railway tunnel. Their plan involved a spacious entrance to the city from the station by way of a water square with a view on the Oude Kerk ('Old Church') tower. The modern housing typology was linked to the tunnel. Despite its appreciation of the plan, the city decided to call upon an international celebrity, Spanish urban development expert Joan Busquets, as its strategy to get its tunnel.

The plan area of the Delft railway zone is 40 acres in size. The railway tunnel will be 2,300 metres long and will run between the DSM/Gist- en Spiritusfabriek (yeast and methylated spirits factory) and the Abtswoudseweg. Busquets' plan, just like Delft's historical city centre, is structured by linear elements in the north-south axis, from east to west, the city boulevard Phoenixstraat/Westvest (with canal), a city park on top of the railway tunnel (which tunnel owner ProRail prohibits being built upon, due to calamity risks), the Coenderstraat (which will open up the station area), alternated with residential zones.

Other important elements of the plan involve the reconstruction of the bastion at the historically significant transition between the Binnenwatersloot and Buitenwatersloot, the Stationsplein (the station square, with a public transport junction, the old station (national monument) plus a very large combined station and municipal office building), the Wetslandweg, transformed into a *parkway* (was a tunnel, will become ground level) and the buildings on the tunnel mouths. The property zones are subdivided in trapezium-shaped building blocks, adopting (formal, imperceptible) directions from the existing neighbouring housing on the map. The proposal suggests a mix of residences, offices, small-scale businesses and facilities.[22] The idea is to provide the building blocks with publicly accessible yards, which connect at the proper height with the environment: low near the city centre, high near Delft-Zuid. It is striking that the housing typology or block size for high buildings does not differ from the lower ones. To realise diversity in character, rules have been established that force variation in construction height within the blocks.

A topic of discussion with the materialisation of Busquets' *master plan* was the position of the station: as closely as possible to the Binnenwatersloot, the old entrance to the historical city centre, or near the Westlandseweg, as closely as possible to the most important passenger destination, the Delft University of Technology, but then maybe too close to the Delft-Zuid station. The result was a compromise: the station would be located halfway, next to the old station. Another topic was of an economical nature and concerned the length of the tunnel. Since real estate yields higher revenue, a longer tunnel route was chosen (2,300 metres instead of 1,900).

Conclusion

Of course, comments can be made on Busquets' plan. The aim to provide the new station area with a diversity similar to the environment of Delft's city centre, cannot really be literally translated into the density that contemporary project developers have in mind. Street profiles, construction heights and regulations, which for that purpose are now stated in the zoning plan, have not been tested beforehand. For the time being, a cityscape quality plan is missing. Why should the area not be allowed to have its own identity? The plan is marketed with words that do not cover the overtones. No link has been established between the urban development plan and certain type of housing typology.[23]

The explicitly mentioned east-west connections from Busquets' plan connect directions in the city map, but have no meaning in an environmental sense: sight lines arrive at small alleys; physically the streets run dead on water.

The city treats the Phoenixstraat and the station area as two separate parts. The location that historically was the most important junction, the intersection of Binnenwatersloot/Buitenwatersloot - Phoenixstraat/Westvest is not being paid enough attention. The properties along the Spoorsingel and the Westerkwartier are the first generation of buildings established in that area and will soon be in need of major repairs, maybe even replacement. Does the new urban development structure require a new housing typology? The impact of the new railway zone on neighbouring properties has not been examined.

According to Busquets' plan, the Phoenixstraat/Westvest has to once again become a city boulevard, keeping in mind the historical city canal, the bastion and the plan for Delft's south east side, which Zocher drafted in 1837. Plan elaboration mainly focuses on infrastructure: the boulevard, 40 metres wide, has been planned to the maximum extent, with separate lanes for cars, buses, trams, cyclists and pedestrians. The canal has been moved to the Spoorsingel side. The identity of the space available to the public, the boulevard or the infrastructure experience as an aesthetic motive, have hardly been examined. Whether the tunnel could give cause to new housing, either on top or attached to it, could also be asked. Further research into the opportunities that tunnelling the railway provides for the Phoenixstraat and the Spoorsingel is advisable, now more than ever.

Notes

1. "Delft gets its well-deserved makeover. I hope many more cities will follow. The fact is that many other municipalities in the Netherlands are burdened with a railway axis that ruins livability. Maybe not all of them on a Delft scale, but serious enough to want to do something about it. Examples include Utrecht, Hilversum, Gouda and Amersfoort. For all of them, the railway blocks environmental development and causes a lot of traffic jams. Railway crossings are local traffic jam hotspots of the highest order. In my opinion, this is sufficient reason for action. I believe that the century of the city centre has arrived. If it were up to me, Delft will be the first in a long queue of urban metamorphoses, as cities are where the action is, they are the 'money making machines' of our economy. They are areas where people go out, shop and work." Source (in Dutch): http://www.verkeerenwaterstaat.nl/actueel/toespraken/toespraakarchief/toespraak_van_de_minister_van_verkeer_en_waterstaat__karla_peijs__bij_de_start_van_het_project_spoor3044.aspx?dossierURI=tcm:195-19871-4
2. The railway tunnel will solve the following 'technical' issues: remedy the lack of space for a fourth track, required to enable intercity trains to pass local ones; take the twist that currently limits the speed of through trains out of the line; stop train noise from the overhead rail for neighbouring properties; remedy the flooding of the platform tunnel; reduce pollution and remove socially unsafe locations under the railway crossover.
3. See *Bestemmingsplan Spoorzone Delft ('Delft railway zoning plan')*, 2006.
4. OMA quickly returned the assignment. The other firms are Mecanoo, Uyttenhaak, Kraaivanger Urbis and Soeters-van Eldonk-Ponec.
5.. Delft consists of: the mediaeval city centre, the Westerkwartier/Olofsbuurt (late 19the century), luxury manors along the city canals, the Wip-polder (early 20the century), the garden city area Hof van Delft (1930s), the Bomenwijk (four storeys 'strokenbouw' flats from the 1950s), the high-rise flat areas Voorhof and Buitenhof (1960s) and the cosy residential area Tanthof (1970s). Industrial areas are located both on the northern and southern side of the city, between the Schie (the historical water connection with Delfshaven) and the railway. The TU/TNO (Technological University, Netherlands Organization for Applied Scientific Research TNO) area from the 1960s is located south of the historical city and eastward of the industrial zones. Recent housing expansions are located in municipalities neighbouring Delft (Emerald in Delfgauw and the Hoornse Kwadrant in Den Hoorn). Recent large-scale construction projects involve reorganisations of old industrial areas in the residential areas in and surrounding the city centre (Zuidpoort area, Braat factory grounds). The transformation of the oldest part of the TU zone and the railway zone is planned. The area between the Schie and the A13, south of the Kruithuisweg will be developed into a 'Technopolis', grounds for companies linked to the TU.
6. Railway lines were placed in old rampart areas in the following cities: Delft 1847, Breda 1863, Harlingen 1863, Roermond 1865, Middelburg and Vlissingen 1872, Delfzijl 1884, Geertruidenberg 1886, Coevorden 1905. Source: R. Dijksterhuis, *Spoorwegtracering en stedenbouw in Nederland ('Railway paths and urban planning in the Netherlands')*. PhD thesis, TU Delft, 1984, p. 119.
7. For documentation on old Delft stations see L. van Duin and W. Wilms Floet, 'Spoorzone Delft' ('Delft railway zone'), *Over-Holland* 2, p .95.
8. Ibid.
9. Since 1615, a facility operated by the municipality for storage of construction materials; from 1800 till 1924 a property used for production of various military needs. Afterwards, it became a police garage; currently, it serves as a small-scale ~~industrial estate~~multi business complex.
10. The building block at the Houttuinen had several transport related purposes, such as transport companies for horses, boats and cars.
11. This harbour was used for transferring coal, straw and glass for the Westland and the import of raw materials, intended for the Gistfabriek (yeast factory) and the Calvé factory.
12. The street layout was designed by municipal architect De Bruyn Kops, the neighbourhood built by contractors and developers.
13. Just like the Braat brothers who erected a machine factory that could be split into two residences effortlessly. See J.W.L. Hilkhuijsen and others, *De Stad Delft. Cultuur en maatschappij van 1813 tot 1914 ('The city of Delft. Culture and society from 1813 to 1914')*. Delft, 1992, pp. 129-130.
14. A fine example is the student union society. The 'Jeneverkerkje', a church that burned down in 1876, located directly on the canal, on the corner of Phoenixstraat and the Binnenwatersloot, was replaced by the current monumental building on the city side of the Phoenixstraat.
15. At that time known as Polytechnische School and Stedelijk Gymnasium.
16. A plan from 1908 and 1915, drafted by municipal architect M.A.C. Hartman, of which the southern part, the Wip-polder, was implemented.
17. Plans concerning Delft: 1921 engineer M.J.W. Roegholt; 1921 municipal panel, with H.P. Berlage as consultant, professor S.G. Everts, professor J.A.G. van der Steur, engineer M.J.W. Roegholt and others; 1922 and 1928 J. de Booij Jr. (Phoenixstraat boulevard

with tram line); 1931 J. de Booij Jr. (with overhead railway proposal).
18. Herman Rosse's (1887-1965) career spanned the United States, where Rosse gained critical acclaim designing theatre settings, and the Netherlands, where he was involved with the design of the Vredespaleis (Peace Palace) in The Hague and the Dutch pavilion at the World Fair in New York in 1939. From 1933, Rosse was a professor of Applied Arts at the Architecture Faculty of the Hogeschool Delft. In 1945, he published a reconstruction plan for Scheveningen, in 1946 his plan 'Delft Kunststad' ('Delft, city of art'). W.G. Hammond, *Herman Rosse, Designs for Theatre*, internet catalogue for the exhibition at Chapin Library, Williamstown, Massachusetts, May-September 2005.
19. H. Rosse, *Delft Kunststad. Restauratieplan voor de zeven eeuwen oude Prinsenstad. Een ontwerp van prof. Herman Rosse. ('Delft, city of arts. Restoration plan for the seven-centuries-old Prinsenstad. A design by professor Herman Rosse'),* Delft 1946, p. 93.
20 Delft city archives, city executive archive, railway file, letter C. Smits, dated 19 November 1953.
20. Engineer H.G.J. Schelling, 'Nieuwere spoorwegstations' ('Newer railway stations'), *De ingenieur*, 20 March 1953, pp. 53-66.
21. Spoor-Nieuws-Dienst, N.V. Nederlandse Spoorwegen, Utrecht, public relations department. The first idea of the designers of Spoorwegbouw, a subsidiary company of the NS.
22. The 'Spoorzone Delft' ('Delft railway zone') plan comprises 1,500 residences and 50,000 m2 of office space, including the municipal city office and facilities. *Bestemmingsplan Spoorzone Delft ('Delft railway zoning plan')*, 2006.
23. Alleys of eight metres in width with five construction layers are too wide for their name, for example.

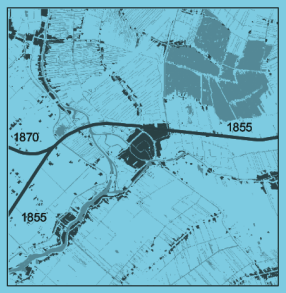
Bibliography

Geurtsen, R., *Locatie Zuidpoort Delft. Stadsmorfologische atlas ('Location Zuidpoort Delft. Urban morphological atlas')*. Delft 1988.

Hoogenberk, E.J., and B.D. Verbrugge, *Bedreigde gebouwen. Bouwen, breken en behouden in Delft 1840-1940 ('Threatened buildings. Building, demolishing and preserving')*. Delft 1982.

Verbrugge, B.D., *Het aanzien van de Westrand ('A look at the Westrand')*. Delft 1985.

Vlis, I. van der, *De Delftse Stationsbuurt. Wonen, leven en werken naast het spoor ('The Delft station area. Residing, living and working next to the railway')*. Delft 2004.



Gouda's railway zone

Olivier van der Bogt

Introduction

Contrary to other cities in the Randstad, Gouda lies within the boundaries of the Groene Hart ('Green Heart', a rural area surrounded by urban ones). Here, Gouda traditionally fulfils an important role as regional centre. In this capacity, however, the city has some serious competition. In the last 40 years, a number of cities of a similar size have emerged in the region. Gouda's biggest competition as a regional centre comes from the big cities, however. Since being connected to the railway network in 1855, travel times have been reduced, as a result of the introduction of quicker means of transport, making cities as Rotterdam and Utrecht increasingly more accessible.
In the mid-1990s, the city formulated design plans for four strategic locations, which provided access to the city centre of Gouda. At these four points, Gouda would present itself with gate buildings to the surrounding area. In the 1990s, these locations were still the primary places at the edge of the old city,[1] but they no longer had the appeal they once had as an entrance to the city. Moreover, they had major problems due to the increasing amount of traffic.
One of the four plans concerned the entrance on the north side of the city centre with the redevelopment of the railway zone. In 1997, an ambitious plan by architect Pi de Bruijn was drawn up for this area in the *Masterplan Railway Zone*. The most important objectives of the *Masterplan* were strengthening Gouda's existing regional position, improve the accessibility of the city centre and the station, provide a better connection between the northern and southern parts of the city and make use of empty spaces in the middle in the city.[2]
Many of the problems that lie at the basis of the objectives of the *Masterplan* are the result of traffic-related interventions from the past. This is true not only for the railway zone, but for the entire city. Of all the factors that have determined the existence of Gouda, traffic engineering is without a doubt the most important factor.[3] Not only does Gouda owe its existence to a favourable location when it comes to traffic engineering,[4] but the radical changes that Gouda has undergone in the last century as an industry city, market place and centre of culture and administration are also the result of changes related to traffic engineering.
Gouda's spatial structure is influenced to a large extent by changes in traffic flows. From the very beginning, Gouda had turned to the Hollandse IJssel ('Holland IJssel'), where people were always dependent on transport over water. This natural boundary on the south side of the city was also the most important historical entrance to the city. With the construction of the railway line in 1855, followed by the construction of the motorway, this situation has changed in a relatively short period. Since the beginning of the twentieth century, the most important through connections are found on the north side of the city. Due to this, the orientation of the city centre has in fact turned 180°. While the old city centre still points to the South spatially, the most important accesses are now on the north side.
Prior to the construction of the railway in 1855, Gouda had developed within a fixed boundary for five centuries.[5] The expansion of the city outside the ramparts was without a doubt the most important physical change as of the end of the nineteenth century. Then, for more than a century, the railway became the northern boundary of Gouda. Only after 1965 did this change with the construction of a new district between the railway and the motorway. New neighbourhoods were built, but significant interventions to connect the two districts failed to occur. The two districts remained physically separated, which also had a major impact on the accessibility of Gouda's city centre. Under the motto 'De verbindende schakel' ('The connecting link'), the execution of the *Masterplan* started this year, a plan which has drastically changed over the past 10 years. The *Masterplan* primarily focuses on the north side of the station, which will be developed first. Here, in 2015 a new urban centre will be erected. The idea is that the new municipal office buildings, the *Huis van de Stad ('House of the city')*, will function as a booster. The important interventions, which had to establish a connection between the two districts were either removed from the plans or postponed. And it seems that history is going to repeat itself. It is the question whether the objectives formulated will be achieved with the execution of the current plans.

The arrival of the rail

The years before the arrival of the railroad were a dark period in Gouda's existence. Between 1820 and 1850, the most important sectors of industry were reduced to poverty at an unprecedented pace and brought with it high unemployment among the working population of Gouda. The depression had hit all of the Netherlands, but the situation in Gouda was so bad that the Dutch word 'Gouwenaar' (a resident of Gouda) was used as a synonym for beggar throughout the entire region.[6]
In 1855, Gouda was connected to the railway network by a junction of the Rijnspoorweg. The Zuidplas polder was milled dry between 1836 and 1839, which made the construction of the railway connection between Utrecht and Rotterdam possible. The path followed at a considerable distance the course of the Hollandse IJssel and passed Gouda on the north side. Fifteen years later, Gouda was linked to The Hague, while the railway connection with Amsterdam was possible through the line through Breukelen and Harmelen. In Gouda, people tried to optimally profit from the central location on the railway junction between the four big cities. As early as 1874, a request to be included in the expansion plan of the railway for an Alphen-Gouda-Schoonhoven-Gorinchem line had been submitted.[7] The plan for this line existed already as of 1869 and was meant to connect the Langstraat, an industrial area in the province of Brabant, to the Utrecht-Rotterdam line. Lack of capital and unwillingness of cities to contribute financially to the line were a few reasons why it took so long before something was actually built.[8] It took 40 years before a Gouda-Schoonhoven tram line was established and another 60 years before the line Alphen aan den Rijn-Gouda was established. In 1882, a steam tram connection between Gouda and Bodegraven was started, which was turned into a service with horse drawn tram 10 years later and finally stopped in 1917. As of 1883, one could reach Oudewater from Gouda by steam tram, but in 1907 this line was stopped as well.[9]
The location chosen for the station in 1855 was not within the Gouda city limits, but was still part of Broek, now Waddinxveen. On the vicinity map of Gouda from 1828, the station and the rail are drawn over the original situation. A mill marked the triangular area within which the station was projected. The station was not built directly on an existing connection, but located east of the Kleiweg.[10]
As compared to the first draft maps of 1828 with the map of Van Deventer from 1560, it was clear that the city limits had remained unchanged for 250 years.[11] The railway line passed the city not directly on the moats, but at the level of the watercourse, which was about 150 metres from the moats.[12]
The first 15 years, the influence of the rail on the development of Gouda was very limited. Initially, no direct link with the city was made.[13] Not only the link to the railway network, but also the introduction of the steam engine had provided Gouda with new industries in the mean time. Work opportunities had increased because of this, which meant an end to poverty. And so the popula-

tion grew. The structure within the moats was no longer able to accommodate the bigger factories and the growing population. For the first time in five centuries, the city needed to expand on a large scale. Since the demolition of the city walls in 1811, there was already talk of building some residential housing outside the moats, although only along the access roads and in a zone that had always been used for development and commercial activities which within the walls were not really possible or forbidden.[14] As of 1870, major expansions were also done outside these areas. On the important waterways in the southwest, an industrial neighbourhood with factories and workers' residences were built. More small-scale commercial activities established themselves on the Karnemelksloot in the northeast. In the same period, the tracks had doubled, the link with Amsterdam had become possible and a station with an underpass and restoration following the design of architect W.A. van Erkel was completed. In 1873, the Crabethstraat was built as a main connection between the station and the moats. This street with middle-class homes ran in the axis of the monumental station towards the watercourse to then veer off towards the Kattensingel. Interestingly enough, no connection was made between this main street and one of the four important accesses to the city; the Crabethstraat came to a dead end on the moat. A foot-passenger ferry over the Kattensingel ensured the connection to the city centre.[15] The Crabethpark was built in 1883 on the wedge-shaped part formed by the rails, the Crabethstraat and the Jan Verzwollewetering. Contrary to the major expansions in the southwest, where the workers had established themselves in the area of the factories between the station and the Kattensingel, a neighbourhood for the bourgeoisie with manors and villas was built. With the construction of the wedge-shaped but much bigger Van Bergen IJzendoornpark in 1890, this neighbourhood had an even more elitist character.[16] Yet a large part of the bourgeoisie working in Gouda preferred to live in the larger cities thanks to the good rail connections.[17] The parks ensured not only a pleasant living environment, but also played an important role as a recreational area for the entire population of Gouda. With the levelling of the ramparts in 1811, there was in fact no space kept free for large public gardens on the canals in Gouda, contrary to many other cities.

Expansion plans after 1901

Influenced by the population growth and the 'Woningwet' ('Housing law') of 1901, expansion plans for Gouda were made as of 1903. The first version was not approved, but in 1909 followed the first approved plan. To improve the passage of inland navigation, the Nieuwe Gouwe had been dug. After the construction of the rail, this was the second largest transformation of the landscape outside the canals. The approved expansion plan, influenced by the city garden movement and C. Sitte, could be seen, anticipated in a formal design with a surrounding watercourse of the Nieuwe Gouwe up to the Hollandse IJssel and a smaller expansion southwest of the city centre between the Hollandse IJssel and the Kromme Gouwe.[18] Besides new neighbourhoods north of the rail, the plan also contained the existing built-up areas outside the moats, which again were not systematically realised, such as the area between the Karnemelksloot and the rail to Utrecht. In this area, a street opening to the station was proposed, which was never executed.[19] Finally, just a part of the plan on the east side of the city was realised. Further urbanisation mostly took place in the south and southwest.

In an expansion plan from 1925 that was not realised either, the expansion north of the rail, contrary to the preceding plan, would fall within the Gouda city limits. Besides a few building blocks and a villa neighbourhood on the park on the station side, mostly industry was planned, focused on the Nieuwe Gouwe. The plan also included a new junction of the railway line along the Gouwe canal, including a new railway harbour. A link between the transport of goods over water and over rail was never built in Gouda.

Prior to the connections in the region, transport over water had initially seemed indispensable. The arrival of the railway line had brought about little change to this. Only in 1914 could a local railway link between Gouda and Schoonhoven be used and no earlier than 1926 was this railway line extended to Boskoop and Alphen aan den Rijn. This railway connection was opened in 1934 while the line to Schoonhoven had already stopped in 1938.[20] The railway did not play a significant role in the development of Gouda. The local railway through the Krimpenerwaard to Schoonhoven and through Boskoop to Alphen aan den Rijn could probably have played a much more significant role if it had been built earlier. Then, Gouda could have had a better link with the surrounding countryside, so that it could have exerted its regional function properly.[21] Around 1920, the lines were in fact barely opened when the bus and the lorry were introduced. With the arrival of transport over road, local railway lines as well as inland navigation were dealt a huge blow. Only the transport of bulk goods per ship remained.

Expansions north of the railway did not occur. The main reasons for this are the development of industry, soil conditions and the railway as a barrier. The biggest expansions took place in a westerly direction, where in 1936 the Gouwe canal was opened – once again a large, traffic engineering related intervention – and the most important industry continued to develop itself. Major technical problems were anticipated with the construction of the new neighbourhoods in the North because of the soil conditions of the Bloemendaal polder, where the soil consisted of 75 to 80% water. Already in 1939, the bad connection with the other part of the city was cited as a significant hindrance in the development of neighbourhoods north of the railway. One could only reach the north side along a narrow railway underpass at the Spoorstraat[22] and via a few unmonitored pedestrian underpasses.[23] For this reason, the railway underpass was replaced by a railway tunnel just before the war, which sustained heavy damages from bombing.

Gouda after WW II

After the war, both important through connections, the railway line and the motorway which was opened in 1947, could be found on the north side of the city. The motorway was built at a good distance from Gouda and was connected with the city centre by a new road, which followed the railway from the West. This road was then connected at the site of the renovated tunnel to a new junction with the historical strips. The tunnel under the railway was became the most important and by far the busiest access to the city centre. In the report about the industrial development of South Holland cities written in 1947 in collaboration with the architectural firm Verhagen, Kuiper, Gouwetor en de Ranitz,[24] it was already suggested that "the new tunnel was again too modest in its proportions. The meeting point tunnel, Kleiweg, Kattensingel, (…) would mean one big traffic puzzle, not only because of the large number of streets that lead to this point and the size and variation of the traffic to be handled, but as a result of the little available space, the steepness of the street surface and the fact that the Kleiwegbrug ('Kleiweg bridge') was a moveable bridge." In the same report, a number of drastic measures were suggested to keep the city centre liveable and accessible despite the growing traffic pressure. The railway tunnel at the station should be closed to through traffic. Instead of this, the traffic should be led into the city via two new routes. The biggest part of the traffic should reach the city centre via het Bolwerk, along the Kromme Gouwe under the railway bridge at the site of the Nieuwe Gouwe. In the East, the roads from Reeuwijk and Bodegraven should be connected to the city centre via a new tunnel, opening streets and a new bridge over the Blekerssingel.

Traffic engineering advice from the report that was actually carried out, was moving the bus station from the market place to the station square. Gouda played an important role as regional centre for passenger traffic by bus, as many regional lines converged in Gouda.

During the war, a large part of the station was bombed. Architect S. Van Ravensteijn completed a new station in 1948 that was in fact a renovation of the leftover ground floor layer of the station from 1878. Inspired by squares in Rome, Van Ravensteijn also redesigned the entire station square. An important element was the new bus station, the first covered bus station of the Netherlands. To create a symmetrical square, the architect placed the bus station on the east side and a new bike park on the west side of the renovated station building. The entirety was based on a Roman/Baroque example and decorated with statues.

An important step in the difficult process of the connection with the city centre was made by the construction of the Vredebest. This direct connection between the station and the Kleiwegbrug, which was visible as a landscape related structure in the field maps of 1828, was finally realised in 1948. Besides this there was also the recommendation of making the Vredebest and the Bergen IJzendoornpark more accessible to pedestrians from the rest of the city by constructing a pedestrian bridge over the Kattensingel at the location of the Crabethstraat.[25]

In 1954, the filling in of the area northeast of the rail that still fell within the city limits finally began. However, in the plans, the construction of the motorway led to a very ambitious plan. As of the moment of commissioning, Gouda negotiated with the neighbouring municipality about acquiring the remaining area in the Bloemendaal polder between the new motorway and the railway.[26] The reason to build residences here was not only to reduce the lack of residences in Gouda, but also to help reduce the residential need of the region[27]. The government wanted to stop unrestrained growth of the cities in the Groene Hart. Gouda was therefore point out as a growth centre, just like Alphen aan den Rijn, for example. The Kuipers, De Ranitz, Van der Ree en Van Tol office was hired to draw up a zoning plan. A new neighbourhood centre was to be built, but the city centre would keep playing a central role in this zoning plan. People believed that a number of urban functions were no longer suitable for the city centre. In the new plan, they were given a central position intended just north of the station. The station, which for more than a century was located on the edge of the city, was now all of a sudden in the centre of the urban area. Besides schools and a hospital, a number of residential flats were built, which marked the new centre area. The new centre had a very open and green character thanks to the typical 1960s housing development north of the railway and the nineteenth-century parks in the station area on the south side.

Around 1956, the first draft of this zoning plan was published. It differed greatly on quite a number of points from what the definite plan would be, but it did show a number

of clear basic assumptions. The new neighbourhoods followed the existing directions in the polder parcelling and the plan was characterised by a clear green and water structure. A broad green strip, which ran from the Reeuwijkse plassen to the Nieuwe Gouwe, separated the new neighbourhoods from the new facilities centre. As a result a large part of the railway west of the station would remain unbuilt.
The zoning plan also concentrated on the connection between the motorway, the new expansions and the city centre. For this purpose, an additional tunnel west of the station was planned, which rendered a new North-South connection possible. In the final version of the zoning plan, a new railway tunnel was also proposed in the west, near the Nieuwe Gouwe.
The construction of the new centre quickly got underway, but only in 1964 was the rest of the ground acquired. It appeared that it was terribly difficult to make the ground ready for building, so that the execution of the zoning plan was first started in 1968.[28] Just one year later, the city hired a number of young urban planners. The structure study *Gouda 2000* was published in which the zoning plan at that time was drastically adapted on a number of points. The housing development structure and the traffic structure were modified. Also in this plan, a new railway tunnel west of the station remained an important link. However, the plans for a tunnel near the Nieuwe Gouwe were scrapped. This tunnel was not really necessary now that the exit of the motorway was moved to the east. More importantly, the number of residents of the northern neighbourhoods was adjusted. In the new plans the number of inhabitants of these neighbourhoods as compared to the first plan was reduced by half, thus generating less traffic. Even though the new western railway tunnel remained on the draft, this connection was not realised. The idea was to make the western tunnel part of a route that crossed through the city centre. In the policy note *Gouda 2000* and the accompanying *Structuurschets binnenstad* ('Structural draft of the city centre') of 1969, the traffic engineering related restructuring took on proportions that did not respect the ones of the old city centre.[29] A response to these proposals was never given. Plans from the 1970s to arrive at a 'protected site' showed that the support for the execution of the plans from the 1960s had entirely disappeared. The green strip around the centre was built up. That was not the case for the area on the south side of the rail, which was mainly filled with sports facilities. A planned doubling of the rail and the construction of a new railway bridge were probably the most important reasons for this. Initially, a large part of the railway zone fell in a wide green boundary between the two districts. In the last quarter of the twentieth century, this area became increasingly more built up with businesses and educational institutions. This also happened in the nineteenth-century station area, where the Crabethpark in 1977 had to make way for the office building of the Goudse Verzekeringen. In 1984, Van Ravensteijn's station building was replaced by a station designed by the architect M.W. Markenhof. The population protested against the demolition of the old station, but the city council voted in favour on condition that no additional offices above the station would be added. As well, the sculptures from Van Ravensteijn's design had to be included in the new station.[30] Markenhof had designed a station with arch barrels, diagonal to the tracks. A few years earlier, the same architect had already realised an extended passenger tunnel to the rear of the station, where he also designed a modest entrance with ticket counters to give the new neighbourhoods access to the station.

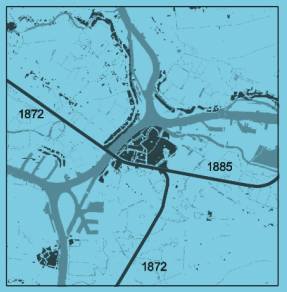
The missing link

A new station as an important link between the two districts formed the axis of the *Masterplan* for the railway zone in 1997. The proposal was not so much to build a new station building, but to build a covered square with shops under the railway. Together with the transformation of the areas on both sides of the railway, the spatial connection between the two districts and between the station and the city centre could be achieved. This proposal, after the many proposals for new traffic engineering related connections in the past, was the only real initiative to break the barrier of the railway and achieve a spatial connection. However, the NS believed that a new and bigger station was unnecessary.
In the current plans, the existing station will be renovated. Despite the fact that the station is entirely focused on the city centre, the bus station will be moved to the north side of the railway where the end station of the new regional light rail connection will also be built. On the north side of the railway and the station, a new urban area with offices, houses, shops, a campus and leisure facilities will also be built, according to the current plans. The most important goal of this transformation is strengthening the regional position. Given the fact that other centres in the region, such as Alphen aan den Rijn and Rotterdam, are also planning similar urban programmes, it is doubtful whether the competitive position of Gouda will improve with the planned transformation. It is precisely by strengthening the old city centre that Gouda should not only be able to distinguish itself from competitors such as Alphen aan den Rijn, but also from Rotterdam. As long as interventions are done which give up the railway as a spatial and physical barrier are not done, the current developments on the north side of the rail will more likely have an adverse effect on the development of the city centre. If historical centres such as the one in Gouda want to keep their place in urban life, then they have to above all be accessible. The old city is more than ever a city of visitors, who want to be greeted properly.
In Gouda one seems to focus too much on the central location at the important through connections than the quality and accessibility of the city centre. Many of the problems with Gouda's function as regional centre and in the area of spatial development of the city and the city centre in particular, are in fact precisely the result of the through connections which have been built over the past 150 years. In the spatial development strategy for Rotterdam[31] published in 2007, two important traffic engineering related projects are mentioned for the period after 2020. The report is counting on the doubling of the rail between Rotterdam and Gouda and on a possible connection of Rotterdam on the eastern path of the HSL ('High-Speed Line').[32] It is obvious that these interventions, which will be of major importance for Rotterdam, will bring along a considerable expansion of the existing rail lines through Gouda. Perhaps in the light of this development, it is understandable that Gouda has refrained from interventions under the railway to connect the two districts, and as of 2015, two city centres. If the number of tracks is expanded, this kind of connection will be increasingly difficult to execute and will also increase train traffic noise significantly. Gouda's missing link is not 'the city under the rail', but 'the rail under the city'.

Notes

1. Two of these points, the IJsselfront and the Bolwerk, are connected with the course of the river Gouwe through Gouda and had a special significance for navigation. The two other points are at the crossings of two old peat reclamation strips, the Kleiweg and the Lange Tiendeweg, with the canals. Besides these differences there is also somesort of a ranking order: the IJsselfront was without a doubt the front door to Gouda, the three other accesses were back doors and drew as such more peripheral, urban destinations to them.
2. www.spoorzonegouda.nl
3. In a social geographical study by H.F. Wessels (see note 6), four factors are mentioned which determined the existence of Gouda: Gouda as centre of traffic, as industry city, as market place and as cultural and administrative centre.
4. In the first half of the thirteenth century, a North-South connection was made between the Hollandse IJssel and the Oude Rijn ('Old Rhine') by the reclamations in the area north of Gouda. Due to this, Gouda had a key position in the third inland navigation route between the North Germany Hanseatic cities and Flanders. The two older inland navigation routes were outside the sphere of influence of the County of Holland.
5. Between 1350 and 1354, due to the construction of the ramparts, Gouda reached a size that remained unchanged until the end of the nineteenth century. Even today, the historical core of Gouda, in the midst of its twentieth- century expansions, is still bordered by the canals (Turfsingel, Kattensingel, Blekerssingel and Fluwelensingel), which were built in the mid-fourteenth century.
6. H.F. Wessels, *Gouda; Proeve ener stadsmonographie ('Gouda, urban monograph essay')*. Utrecht, Kemink en Zoon, 1939, p. 7.
7. J. Schouten, *Gouda; Vroeger en nu ('Gouda, then and now')*. Bussum, Fibula-van Dishoeck, 1969, pp. 81-82.
8. B. Bakker and H. Bemelmans, *Gouda in bedrijf ('Gouda in action')*. Alphen aan den Rijn, Repro-Holland BV, 1987, pp. 24-25.
9. Schouten (note 7), pp. 81-82.
10. See note 2.
11. Outside the ramparts, where the station was supposed to be built, there is also a mill.
12. The Jan Verzwollewetering is clearly visible on the map by Van Deventer. Since the fourteenth century, this moat forms the boundary of the so-called 'fringe belt'.
13. There was an obvious direct connection via a straight road along a junction of the watercourse to the Kleibrug over the canal.
14. W. Denslagen, *Gouda. De Nederlandse monumenten van geschiedenis en kunst ('Gouda. Dutch monuments of history and art')*. Zwolle, Waanders, 2001.
15. The choice of this intervention is unclear. Perhaps it had to do with the difficulties in expropriating the ground at the most logical connecting point, at the site of the current Vredebest; it could also be that the preference out of aesthetical considerations went to a connection perpendicular to the axis of the monumental station building.
16. Bakker and Bemelmans (note 8), p. 26.
17. Wessels (note 6), pp. 10-11.
18. C. Scheffer and. A.F.J. Niemeijer, *Architectuur en stedebouw in Zuid-Holland 1850-1945 ('Architecture and urban planning in South Holland 1850-1945')*. Zwolle, Waanders, 1996, p. 41.
19. Ibid, p. 40.
20. Schouten (note 7), pp. 81-82.
21. Wessels (note 6), p. 5.
22. Since the construction of the railway, the Kleiweg between the railway and the canals is called Spoorstraat.
23. Wessels (note 6), p. 10.
24. Reports about the industrial development of a number of South Holland cities: *Gouda. Deel I.*. Report, presented to the city council by the Instituut Stad en Landschap van Zuid-Holland ('City and Landscape Institute of South Holland') and the Economisch-Technologisch Instituut voor Zuid-Holland ('Economic and Technological Institute for South Holland') in consultation with the architectural firm Verhagen, Kuiper, Gouwetor en de Ranitz. Economisch-Technologisch Instituut voor Zuid-Holland en Instituut Stad and Landschap voor Zuid-Holland, Rotter-

dam, 1947, p. 122.
25. The plans to connect the Crabethstraat with the city centre by way of a bicycle and pedestrian bridge still exist.
26. Denslagen (note 14), pp. 458-459.
27. Ibid, p. 458.
28. Ibid, pp. 458-459.
29. In this plan, the Raam is part of the improved access as of the A12 motorway north of Gouda to an expansion area on the south side over the Gouwe in the Krimpenerwaard.
30. C. Douma, *Stationsarchitectuur in Nederland 1938-1998*. Zutphen (Walburg Pers) 1998, p. 208
31. *Stadsvisie Rotterdam. Ruimtelijke ontwikkelingsstrategie 2030 ('City vision of Rotterdam. Urban development strategy 2030')*. Rotterdam, DS+V, 2007, p. 113.
32. Possible High-Speed Line from Amsterdam through Utrecht to Germany.



Dordrecht's railway zone

Esther Gramsbergen

Dordrecht and the Drechtsteden (Drecht cities)

South of Rotterdam, the strongly urbanised area around Dordrecht forms the southern edge of the Randstad Holland. The area consists of a collection of urban cores at the river banks of the Oude Maas, Beneden Merwede and Noord, also called the Drechtsteden ('Drecht cities'). The total population of the agglomeration is about 260,000 inhabitants.[1] Located in the area's centre is Dordrecht's historical city centre, at the north-western point of the Dordrecht island. The Dordrecht island is triangular, surrounded by the Beneden Merwede, Nieuwe Merwede and Dordste Kil rivers.[2] During the twentieth century, the island became a part of the city of Dordrecht. The city expanded across the island. Currently, a total of about 119,000 people live on the island.[3]
Dordrecht's historical city centre, with its well-preserved medieval townscape, has a rich past. For a long time, Dordrecht was the first city of the Holland district, a position Dordrecht owed to its intensive trading activities. The city originated at a select strategic location, near the most important waterways in the West-Holland delta.[4]
In 1299, Dordrecht was already awarded the staple right by Jan II, Earl of Holland, enabling Dordrecht to develop into the central market of the Maas area.[5] During the seventeenth century, Rotterdam took over Dordrecht's role as the most important city of South-Holland.[6]
Today, Dordrecht is also an important traffic junction. Not only do large waterways converge here, but land transport between Dutch and Flemish cities is also routed over the Dordrecht island.[7] The area is crisscrossed by the busiest railway line in the Netherlands, the Rotterdam-Antwerp motorway and busy sea routes. The transport sector is one of the cornerstones of the local economy.
During the twentieth century, the railways, motorways and waterways have become physical barriers in the expanding city area. The railway line that was established at the edge of Dordrecht in 1872 now runs right through the city. Also, rivers that originally ran around the city are now within the city area, due to the explosive growth of the suburbs, Zwijndrecht and Papendrecht.
The most important urban development issue raised is the relation between Dordrecht's city centre and the city expansions. This question can be split into two subquestions: first, the relationship between Dordrecht's city centre and the suburbs across the Oude Maas and Beneden Merwede rivers, especially Zwijndrecht and Papendrecht. Second, the relationship between Dordrecht's city centre and the city expansions on the Dordrecht island themselves, which is largely defined by the presence of a railway zone between the city centre and the expansion areas.
Within the framework of the Drechtoevers Masterplan, it is striking that the city of Dordrecht mainly aims at improving the former relation, lacking a coherent vision of the spatial issues of the Dordrecht island. Generally, the city limits itself to the socio-economical issues of the suburbs south of the railway zone and focuses on urban densification around the railway zone.[8]
The Drechtoevers Masterplan was launched in 1994 and is still the most important guideline for the urban development of the Drecht cities. The guiding principle is reorganising the industry properties at the river banks into compact urban areas, which together will form a new urban heart within the Drecht cities. From the start, the area around the railway bridge, city bridge and tunnel between Zwijndrecht and Dordrecht was considered an important *pilot*. Due to being well opened by railway and motorway, this zone could develop into a business centre surpassing the region.[9]
These ideas have crystallized in the Railway Masterplan Drecht cities, 'Maasterras'. The plan area broadly covers the area between the train stations of Zwijndrecht and Dordrecht. Plan designs show that the project main point focuses on Zwijndrecht; the Dordrecht side only involves a small area around the exit of the city bridge. As such, the plan has a small impact on the relationships between the island areas.[10]

In this article, the relationship between Dordrecht's city centre, the railway zone and the southern expansion areas will be discussed in more detail. Starting with the construction of the southern expansion areas in the 1920s, this relationship has been a problematic one, as the railway crossings were barriers for commuter traffic.[11] Within the framework of the development and reorganisation plans, several architects and urban developers have dealt with these issues. Based on a number of design proposals, the stock of ideas on the relation between the city centre, the railway zone and the expansion areas will be outlined. Using historical maps, a reconstruction will be made on how the area actually developed over the past 125 years.[12] Finally, the initial impetus towards a different approach on the Dordrecht railway zone is given in this article.

The arrival of the railway

The position of the Dordrecht railway zone was strongly influenced by the city's specific geographical location and its related spatial development. In his *Atlas Maior* from 1665, Joan Blaeu expressively summarises these Dordrecht features: "It is very conveniently situated, especially for trade thanks to the concourse of Meuse, Waal, Linge and Merwede. Longer than it is wide, the outline of the city is like that of a great boat. What makes it strong, is not so much the circuit of its walls as its situation and the nature of the place, which is inherently defensible."[13]
Determining factor for Dordrecht's development is the fact that, for a long time, the city lacked surrounding land, from the Sint-Elizabeth flood in 1421 till the first impolderings on the southern side in 1603.[14] Only during the seventeenth century did the city gain possession of a once again boat-shaped piece of land outside the city wall, 'De Stadts Gront'.[15] Tirion's map from 1742 shows that the parcel of land bordering the city wall was amply used for 'city' activities, as bleacheries and vegetable gardens could be found here. The area also accomodated housing activities linked to the timber trade. The area was geographically parcelled in tangents and radians; the radians coinciding with polder embankments or exit roads, the tangents consisted of pathways and ditches. Due to advanced military technology, the city walls lost their function at the beginning of the nineteenth century. In the 1930s, Dordrecht was granted permission to demolish the city walls and city gates. The impact of this operation is shown clearly on A.A. Nunnink's map from 1849. Typical urban fringe belt elements take possession of 'De Stads Gront'; urban functions requiring a lot of available space were moved from the city centre to its outskirts.[16] Living in the countryside became fashionable for wealthy Dordrecht residents; country estates were established here and there.[17]
At the time of the railway advent, it logically also takes place in the fringe belt.[18] Van Elk's map from 1894 clearly shows how the railway was built and how it affected the city. The track choice for the Rotterdam-Dordrecht-Antwerp railway line was determined by the most suitable locations for the two required railway bridges, the Zwijndrecht-Dordrecht bridge across the Oude Maas and the Willemsdorp-Moerdijk bridge across the Hollands Diep.[19] The Zwijndrecht-Dordrecht railway bridge was constructed in such a way that the important harbours at the Dordrecht waterfront were spared. The bridge was built in an industrial area with windmills and lumber ports south of the Kalkhaven

(Kalk harbour), dug in 1655.[20] The railway line ran along the 'Stads Gront', on the city limit between Dordrecht and Dubbeldam. The station was built at the edge of the Weizigt country estate.[21] After the station, the railway line made a sharp turn southward and then coursed straight ahead to Willemsdorp and the Moerdijk bridge.[22] The location of the station is striking, between the city's two main exit roads, the Spuistraat and the Blekersdijk.[23] In most Dutch cities, such as Leiden and Gouda, stations were placed right next to the main exit roads.[24] All in all, the station ended up in the middle of a pasture, which forced the city to build a new access road from the station to the city. This road, named 'station avenue' in the municipal plans, was completed in 1872, constituting – for the first time since time immemorial – a new element in the city's street pattern.[25]

More than any other Dutch city, Dordrecht shows the transformation of city territory outside the city wall into a nineteenth-century city area. The area's urbanisation reluctantly started after the city walls were demolished. Due to the construction of railway line and the station, the development of the area accelerated at the end of the nineteenth century.[26] The area is known as the 'nineteenth-century shell', although its form and structure originated in the seventeenth century. It has been a dynamic area ever since, characterised by functional and formal diversity.[27]

Southern city expansions

When the 'Woningwet' ('Housing Law') came into effect in 1902, all cities with a population exceeding 10,000 inhabitants were obliged to draft development plans. At that time, Dordrecht had about 38,500 inhabitants. In order to enable future city expansions, municipal land of Dubbeldam located south of the railway line was joined with Dordrecht.[28] The city's development plans aimed at the newly acquired areas south of the station. It is important to know that the nineteenth-century shell had not been built up to maximum capacity at that time.[29]

In the years after the introduction of the Housing Law, Dordrecht leaped over the railway line and the first residential areas south of the station were built. The coloured cadastral map from 1923 shows that these neighbourhoods were located next to two important exit roads, the Spuistraat-Krispijnseweg and the Bleekersdijk-Dubbeldamseweg. The area in between, made up of the Weizigt estate and pastureland, was not built on at that time. From this side, the station, 50 years after it was built, was still entirely free, an important consequence being that the station could not be reached directly from the south. In all cases, the station route ran through the railway crossings on the Spuistraat and Bleekersdijk.

In 1915, the city council requested Amsterdam architect Van der Pek to draft a coherent development plan, incorporating the existing residential areas. The Van der Pek plan remained the leading principle for developments in the area south of the railway line until 1932. The most characteristic plan feature was the transformation of the Weizigt estate into a city park. In the plan, it was the central space around which the various areas were grouped. The plan's main structure was further shaped by old exit roads and embankments.[30]

Population growth in the area south of the railway line, combined with increased railway traffic again started causing problems in the 1920s. The inhabitants of the suburbs mostly worked in the nineteenth-century shell and the old city centre. The railway crossings near the Spuistraat and Bleekerdijk had become commuter traffic obstacles. A first attempt to solve this increasing problem was the 1927 construction of an overhead bridge for cyclists and pedestrians, across the railway line near the Spuistraat.[31]

A new phase in the city's development began in 1939, when the Zwijndrecht-Dordrecht road bridge was built, as a part of the through passage from Rotterdam to Breda. Until then, the thoroughfare used the Zwijndrechtse Veer to subsequently leave the city at the south-west side, through the city centre and the nineteenth-century shell.[32]

The topographical map from 1939 shows the bridge, appearing south of the existing railway bridge. The grounds formerly housing the railway harbour and the Papengat were used to create a spacious entrance.[33] From this national road, an entrance to the city was created. Through a system of avenues and green traffic squares traffic was routed to the railway crossing near Spuistraat/Krispijnseweg. In 1937, this busy crossing was replaced by a tunnel, designed by Sybold van Ravenstein.

From this access road, car traffic was spread over two ring roads. In the nineteenth-century shell, the Burgemeester de Raedtsingel was extended from the Oude Maas to the Staart, the eastern point of the city. In the southern city expansion, both exit roads, the Krispijnseweg and Dubbeldamseweg, were mutually connected by extending the Brouwersdijk. Both ring roads were beautifully planted, forming a clearly recognisable 'green traffic structure'. Existing green areas, such as Merwedepark, the Weizigt estate and the public cemetery were incorporated into this structure.

The traffic plan intentions are very well expressed in the Dordrecht city map from 1957 because the greenbelts are depicted with great precision. The two ring roads can be considered twentieth-century counterparts of the old city's moon-shaped harbours. Dordrecht's typical shell structure again became the guiding principle for the city's development.[34] The visual relationship between the southern city expansion and the historical city was further enhanced by laying out two, long green belts, the Viottakade and Nassaulaan, which, just like the old Krispijnseweg, offered a view of the tower of the Grote Kerk (main Parish Church).[35]

'Groot–Dordrecht'

After WW II, the city of Dordrecht contemplated further development. Not only did plans have to be made for new expansion areas, but housing improvement for the city centre had to be dealt with as well.[36] In August 1949, the Van Tijen en Maaskant office was assigned to draft an expansion and reorganization plan, with engineer Wissing as the designer in charge. Between 1951 and 1953, he drafted a masterplan in which he indicated the location of the new housing areas and also proposed a modified traffic structure. Later, this masterplan was further elaborated into several constituent plans.

One of the sub-plans involved the housing improvement plan for the city centre from 1954. In his book *Metamorfosen ('Metamorphoses')*, Kees van Rouw meticulously describes the various phases of the city centre housing improvement plan and the way Van Embden got involved.[37] Within the context of this article the way in which both Wissing and Van Embden linked the city centre issues to regional developments is of interest.

In the explanation of the 1953 masterplan, Wissing described the city centre situation as follows: "we consider the situation in the city centre to be more or less alarming. Cut off by the river as it is in the east and north, and southwards in significant extent by the railway, it leads but a languishing life, generating a dead and run-down impression. In our opinion, this is caused by insufficient traffic opportunities, as the ferries largely lost their function due to the completion of the bridges across the Noord and Dordtse Kil. We believe that strong measures to remedy this shortcoming must be taken soon."[38]

In a similar fashion, Van Embden expressed his view on the city centre's future: "Within this large, new entity [the 'Drecht city'], the old city centre of Dordrecht will be located much more centrally than when looking at the city formation south of the Merwede; the unfavourable edge-location of the old Dordrecht city centre should therefore be automatically corrected by the growth of Zwijndrecht and Papendrecht. All this however, will only really mean something with the establishment of proper bank connections between the old city and the new neighbourhoods on the other side. These new bank connections are being studied."[39]

The new bank connections that Van Embden referred to were never implemented, but it is clear that the ideas from that time are the foundation for the current Drechtoevers Masterplan.[40] Contrary to Wissing, who remained responsible for the development plans, Van Embden did not tackle the issue of the connection between the city centre and the new housing areas on the Dordrecht island.[41]

As obviously pointed out by the previously mentioned quote, Wissing saw the railway line as an important barrier between the city centre and the expansion areas. Did he also provide solutions in his masterplan? The plan's striking feature is the further extension of the typical Dordrecht structure of radial and tangential roads. Between the urban residential areas south of the railway, Oud-Krispijn and Nieuw-Krispijn and the new 'garden suburbs', Wissing planned a green belt with a ring road. The new areas are separated by green wedges, and connected by a second ring road, running right through the areas. The most important radians, which comprised the main structure of Krispijn since the 1930s, the Nassauweg, Krispijnseweg and Viottakade, are extended to the new areas, providing a direct connection with the city centre.[42] The city's main entrance remains the national road exit built in 1939, which directly connected to the Krispijnse tunnel on one side, and with the new ring road on the other, through the Viottakade.

The importance of the radians for Wissing is shown by his proposal for a tunnel underneath the station and through Weizigt park to directly connect the Nassaukade with the new station boulevard.[43] This tunnel would relieve the Krispijnse tunnel. The proposal, rigorous as it was effective, was never implemented, because no agreement could be reached with the NS ('Dutch Railway company'). This is not very surprising, since the NS had planned to move the yard in order to remove the sharp southward bend. This was also the reason why the Nassaukade was built around 1950 with an extra central reserve with ponds. The new yard could then run through Weizigt park and the filled Nassau pond.[44]

A tunnel again?

In spite of all plans, there have not been many changes in the connections between the southern expansion areas and the city centre since the construction of the Krispijnse tunnel. Granted, the city's entrance was moved by building the Drecht tunnel in the A16 and a new exit for this motorway in 1977, relieving the Krispijnse tunnel. Since then, traffic has been routed to the bank of the Oude Maas through the Laan der Verenigde Naties, the ring road between Krispijn and the garden suburbs. From there, one enters the city near the former railway harbour, underneath the ramp of the railway.

This complicated access has a number of negative consequences for Dordrecht. First, one of the garden suburbs planned by Wissing, Wieldrecht, has become isolated from Oud-Krispijn. The Viottakade did not

become the important access road to Wieldrecht that Wissing had in mind. Second, the Zwijndrecht bridge lost its function as an important traffic bridge and has become a misplaced object; even as a bridge for slow traffic, it is barely of use.[45] Third, the Dordrecht station has become very hard to reach for car traffic. Finally, the city entrance could be mentioned, once so carefully architecturally designed, replaced by a 'secret' route through an industrial estate. These developments have added to the existing issues concerning the isolated position of the southern expansion areas. The current socio-economical problems in these areas could very well be related.[46] All kinds of urban aesthetics problems and difficulties of a socio-economical and safety nature revolve around the railway zone.[47]

Conclusion

A number of important conclusions can be drawn from the preceding. Positioning the railway yard at the edge of the 'Stads Gront' enhanced the already existing structure of tangents and radians; the road parallel to the railway became the most important tangent. During the twentieth century, several designers used this structure as a starting point for development plans, the strength of their ideas being the fact that development of this structure organised the relation between Dordrecht, Zwijndrecht and Papendrecht (the Drecht cities union), as well the relation between Dordrecht and the southern city expansions, into a network of mutual connections. Yet the plans were nicer than reality. The radians were severely obstructed by tunnels that were too narrow or busy railway crossings. The bridges to Zwijndrecht and Dordrecht were not built at their planned locations.

However, these plans did lead to the railway zone becoming an important link in Dordrecht's spatial structure, and so it would be a good idea for Dordrecht to look at the area's issues and opportunities within this larger context. The location of the Dordrecht railway zone is unique, with one part bordering on the Oude Maas and the other on Weizigt park. Using the 'Delft scenario' as a comparison, tunnelling the railway yard in Dordrecht clearly provides opportunities that could dramatically improve the city's structure. Weizigt park could become a centrally located city park, serving as a link between the city centre and the expansion areas.

An underground station could be built near one of the radians in such a way that it could be easily reached from the city centre as well as the southern expansion areas. Moving the station towards the Oude Maas would provide a good opportunity to newly shape the city's entrance and improve station accessibility for car traffic as well. It would also allow an opportunity to connect the station to a water taxi or *fast ferry* stop.[48] Reconsidering the position of the Zwijndrecht-Dordrecht city bridge will also become possible when the railway bridge loses its function due to the tunnel. A properly functioning Zwijndrecht-Dordrecht connection for local traffic would bring the Drecht cities' ideal to form one Drecht city along the banks of the Oude Maas, Beneden Merwede and Noord within reach. Simply redeveloping the river banks, the leading principle of the Drechtoevers Masterplan, is insufficient[49], something urban planners Van Buuren, Wissing and Van Embden knew very well.[50]

Notes

1. The Drechtsteden (Drecht cities) association represents the following seven cities: Zwijndrecht, Papendrecht, Sliedrecht, Hendrik-Ido-Ambacht, Alblasserdam, Binnenmaas and Dordrecht.
See www.Drechtsteden.nl
2. W. van Wijk (ed.), *Dordrecht van stad tot eiland ('Dordrecht, from city to island')*. Serie Eilandverkenningen (Island exploration series), Dordrecht, De Bengel bookstore / city archives, 2003, p. 57.
3. Of the 119,000 inhabitants of the Dordrecht island, 16,000 of them live in the city's centre. Half of them reside in the historical part, the other half in the nineteenth-century shell. Source: Gemeentelijke Basisadministratie (municipal records), www.digitalealmanakken.nl
4. H. Sarfatij, 'Dordrecht van streekdorp tot eerste stad van *Holland' ('Dordrecht: from regional village to Holland's first city')*, in *Verborgen steden. Stadsarcheologie in Nederland ('Hidden cities. City archaeology in the Netherlands')*. Amsterdam, 1990.
5. J.P. Sigmond, *Nederlandse zeehavens tussen 1500 en 1800 ('Dutch sea harbours between 1500 and 1800')*. Amsterdam, 1989, pp. 34-35.
6. Ibid. pp. 74-79.
7. The first land connection between The Hague and Breda, the 'Groote weg 1e klasse, no. 7', was established by order of Lodewijk Napoleon. The road was finished in 1821, incorporating ferry connections between Zwijndrecht and Dordrecht, and Willemsdorp and Moerdijk. In 1872, the Rotterdam-Antwerp railway more or less followed the same route. Railway bridges were built between Zwijndrecht and Dordrecht and near Moerdijk, at the narrowest section of the Hollands Diep river.
8. Since 2004, within the framework of the Grotestedenbeleid ('large cities policy'), the city and housing corporations work together on improving the areas south of the railway: Oud-Krispijn, Nieuw-Krispijn, Wielwijk and Crabbehof. Under the name 'Dordrecht-west op stoom' ('West Dordrecht powered by steam'), plans have been developed to improve livability in these areas, aiming to prevent a selective efflux of high and influx of low incomes by increasing the level of facilities and the quality of available housing.
See http://cms.dordrecht.nl
9. *Masterplan Drechtoevers, Een Kwaliteitssprong ('Masterplan Drecht banks, A leap ahead in quality')*. **Dordrecht, Project department Drecht banks**, 1994.
10. The Maasterras ('Maas terrace') Masterplan was formulated at the beginning of 2004 by architectural firm Khandekar from Benthuizen. The city councils defined it in 2005. The last developments also involve the area around the Dordrecht train station, i.e. developing a better rear station exit at the Van Baerle Plantsoen.
See http://cms.dordrecht.nl
11. J.J.B. Jansen Manenschijn, *Dordrecht Weerzien ('Seeing Dordrecht again')*. **Dordrecht**, 1988, pp. 116-117.
12. The following city maps have been used for research purposes: the Tirion map from 1742, A.A. Nunnink's map from 1849, Van Elk's map from 1894, the cadastral map from 1923, the topographical map from 1939, the Dordrecht city map from 1956, the topographical map from 2000.
13. Joan Blaeu, *Atlas Maior of 1665. De Lage Landen ('The Low Countries')*. Reprint of the original publication, Cologne, Taschen, 2006, p. 186. Although the city's hinterland increased in size during the 17th century due to impolderings, the image of Dordrecht as an important trading centre surrounded entirely by water dominated until the 19th century. The city's spatial structure at that time was characterised by curved, linear housing structures, alternated with narrow, moon-shaped harbour basins. The main public buildings and spaces were located along and across the harbours.
14. There are numerous maps and paintings reminiscent of this period, portraying the city as an island. For example, the Dordrecht panorama from 1560 by Anthonis van den Wijngaerde and the city map and view on Dordrecht from 1572 by G. Braun and F. Hogenberg. See also Van Wijk (ed.), *Dordrecht van stad tot eiland ('Dordrecht, from city to island'*; note 2), pp. 24-25, 95.
15. The term 'De Stadts Gront' is used on Mattheus van Nispen's map from 1673. See: W. van Wijk (ed.), *Dordt in de kaart gekeken ('Dordrecht mapped out')*. Zwolle, 1995, p. 113.
16. For example, 's Landswerf, 's Landsmagazijn and the parade ground. In his article 'An historico-geographical perspective on urban fringe-belt phenomena', B. von der Dollen explicitly refers to these kind of buildings as *urban fringe elements*. In T.R. Slater (ed.), *The Built Form of Western Cities. Essays for M.R.G. Conzen on the occasion of his eightieth birthday*. Leicester, 1990. He writes:
"Room at the fringe is also available for other administrative and public buildings, such as government buildings, the armoury and barracks, as well as for new transportation structures, the railway in particular." (p. 320).
17. M. van Baarsel and E. Van Heiningen, *Dordrecht van buitenhuizen en lusthoven naar stadsparken. ('Dordrecht, from manors and pleasure gardens to city parks')*, Serie Eilandverkenningen ('Island exploration series'). Dordrecht, De Bengel bookstore/ city archives, 2004. See also M. van Baarsel, *Buitenplaatsen op het eiland van Dordrecht ('Country estates on the Dordrecht island')*, in Van Wijk (note 15), pp. 111-140.
18. See note 16.
19. P. Kooij and V. Sleebe, *Geschiedenis van Dordrecht 1813 tot 2000 ('History of Dordrecht; 1813-2000)*. Hilversum, 2000, p. 387.
20. At the same time as the railway, the railway harbour was built parallel to the railway track. Its purpose was to relieve the Kalkhaven north of the railway bridge, the latter being too small. Furthermore, an increase in harbour activities was anticipated because of the arrival of the railway, goods could be transferred in Dordrecht, from ships to trains and vice versa. This expectation was not fulfilled. Nobody could foresee that the entrances of both harbours were located too close to the moving part of the bridge, which severely impeded shipping traffic. Therefore, the decision was taken in 1912 to build a new sea harbour at the Mallegat, at a significant distance south of the city; the current Wilhelmina harbour. In 1916, this area was opened by an industrial railway. Also today, this railway runs along the Oude Maas river. Between the railway bridge and the Mallegat, the embankment of the Oude Maas developed into an industrial estate. The railway harbour itself was filled and used as a shunting yard. See P. Sigmond, *De Havens van Dordrecht ('The harbours of Dordrecht')*, in Van Wijk (note 15), pp. 77-78.
21. The Weizigt estate was located on territory of the municipality of Dubbeldam. To make building the station possible, it was in part compulsorily acquired and added to the city of Dordrecht. See B. Lamberts and A.F.J. Niemeijer, *Dordrecht architectuur en stedenbouw 1850-1940 ('Dordrecht, architecture and urban development 1850-1940')*. Zwolle, 2002, p. 20.
22. A few years after the completion of the Rotterdam-Antwerp railway, the Rotterdam-Dordrecht-Gorinchem-Elst railway was built. This line did not turn after the station, but ran ahead in an eastern direction and turned northwards after having reached Dubbeldam, to cross the Merwede river near Baanhoek (Sliedrecht).
23. The station, 108 metres in length, was built parallel to the railway. It was built as a second-class station. The design is probably by K.H. van Brederode, who designed many stations for the HIJSM. See Lamberts and Niemeijer (note 21), page 51.
24. The city council of Dordrecht wanted to build the station close to the Spuistraat in order to guarantee a good connection

with the city through this street. However, the long ramp needed to get the railway at the proper height to connect to the railway bridge made this impossible. Advancing the station to the Bleekersdijk probably incurred administrative problems because the area east of the Bleekersdijk was Dubbeldam territory. See note 19.
25. Van Wijk (note 15), page. 30. The plan's striking feature was that it provided a road from the station to the edge of the city and that the route was extended through the existing city to the city centre. The station avenue ran straight down from the station to the second canal (Station road). At this point, the road was slightly repositioned towards the west to by-pass an existing estate, followed by a break, to end at the Visch bridge, by way of the Bagijnhof and the Vischstraat. To this end, both existing streets and the bridge were widened. See also M. van Veelen, *Dordrecht aangeland ('Dordrecht comes to land')*, history thesis (unpublished), Architecture Faculty Delft University of Technology, 2005. Due to demolition and construction, a consequence of the station avenue plan, the Vischstraat got a totally different look. Important functions, such as the new post office were established there, causing the core of collective facilities to advance to the land side.
26. For an in-depth comparison of the Tirion, Nunnink and Van Elk maps, see Van Wijk (note 15), pp. 26-33.
27. Due to S.J. van Embden's redevelopment plan from 1962, a radical transformation of the nineteenth-century shell's western part took place. The Spuihaven, the former city canal, was partially filled and transformed into the Spuiboulevard. The station road and its continuation, the Johan de Wittstraat, were widened and streamlined. Near both new access roads, large offices were built. A case in this development is the construction of the Tomado house by H.A. Maaskant in 1961, opposite to the station. See K. Rouw, *Metamorfosen ('Metamorphoses')*. Dordrecht, 1990, pp. 11-32.
28. Due to its small population, the municipality of Dubbeldam was not obliged to draft an development plan. Non-planned neighbourhoods were built on the city's territory, such as the Transvaal area and the Indische buurt. These areas bordered directly at the nineteenth-century shell, at the eastern side of the city. See Lamberts and Niemeijer (note 21), pp. 15-16.
29. The phenomenon of the *fringe-belt* being ignored in times of large urban growth, and new city expansions being established at the city's outskirts, can be clearly recognised in Dordrecht. The *fringe-belt* remains as a 'fossil' in the urban pattern, characterised by different parcel size, mixed functional use and a dynamic character. In the case of Dordrecht, a typical *fringe-belt* can be recognised in the former outskirts, the later nineteenth-century shell.
30. Lamberts and Niemeijer (note 21), pp. 16-17. See also C.G. van Buuren, 'Uitbreidingsplan van Dordrecht' ('Dordrecht development plan'), in *Openbare Werken* ('Public Works'), 1932, no. 9, p. 105. In an explanation of the new development plan for Dordrecht from 1932, C.G van Buuren, General Manager of the building and housing inspection department, characterised the Van der Pek plan as follows: "With van der Pek, as far as aesthetics were concerned, the fact that Dordt (Dordrecht) was an embankment city held a prominent place, and that there was no better way to create a frame for his urban development creation, praiseworthy in itself, than by accepting the inner embankments, which separated the various polders, as the main pattern. Van Buuren, besides being the writer also the designer of the new development plan, set the characterisation of Dordt being a 'belt city' against the characterisation of Dordt as an 'embankment city'. The former characterisation he then used as a starting point for his own design. See also note 35.
31. See note 11.
32. Meant here is the route of the 'Groote Weg 1e klasse, no. 7', built in 1821. See also note 7.
33. The Papengat is a former beam cavity with a windmill pasture. Its location today can be recognised by the twist in the embankment and the area outside the embankment, near the Zwijndrecht road bridge. Van Wijk (note 15), pp. 105-106. See also note 20.
34. This idea without a doubt originates from C.G. van Buuren. In 1925, he was appointed general manager of the Dordrecht's building and housing inspection department. In the 1930s, he was responsible for the revision of Van der Pek's development plan from 1917. In his article 'Uitbreidingsplan van Dordrecht' ('Dordrecht development plan'), in *Openbare Werken ('Public Works')*, 1932, no. 8, pp. 95-98, and no. 9, pp. 105-106, he explained his plans. The plan's starting point was proper processing of traffic, for through as well as local traffic. He developed the notion of Dordrecht as a 'belt city': "In my opinion, it would be more correct to characterise the existing city north of the line, constituted by the Korte Parallelweg, Havenstraat, Burgemeester de Raedtsingel, Toulonsschelaan and the Oranjelaan, by the term 'belt city'. It may be true, that our city, when its genesis is concerned, has got nothing to do with a belt city. For our purpose however, we're not dealing with its history, but with the results of its developments. That result may absolutely be called a belt city, for it is criss-crossed by three water belts and seven traffic belts, whilst the required radian roads are also, and very clearly, recognisable. Therefore, it seems to me that one should use this observation as the fundamental principle for the expansion." See also note 30.
35. These elements were introduced by C.G. van Buuren in his development plan from 1932. Regarding this, van Buuren himself says: "Furthermore, by doing so, automatically creates the opportunity to place public buildings, which, owing to their prominent architecture, can control a spacious environment. With the latter, first of all existing elements were used, by tracing out several prominent wide roads in such a manner, that they provide a view on the tower of the Grote Kerk (main Parish Church), Dordrecht's most distinguishing feature." C. G. van Buuren, 'Uitbreidingsplan van Dordrecht' ('Dordrecht development plan') in *Openbare Werken ('Public Works')*, 1932, no. 9, p. 106. See also note 34.
36. K. Rouw. *Metamorfosen. Dertig jaar stedelijke veranderingen in Dordrecht ('Metamorphoses. Thirty years of urban changes in Dordrecht')*. Dordrecht, Dienst Stadsontwikkeling, 1990, p. 11.
37. Ibid.
38. An explanation of the masterplan for the city of Dordrecht, by Van Tijen and Maaskant/Wissing, see Rouw (note 36), p. 12.
39. S.J. van Embden, 'Het basisplan voor de sanering van Dordrechts binnenstad' ('The basic plan for the reorganisation of Dordrecht's city centre), in *Stedenbouw en Volkshuisvesting ('Urban development and Public Housing')*, May 1959, p. 112. About the location of bank connections, Van Embden wrote in the same article: "To this end, the suggestion is to create a relief or transit area, near the current Spuihaven, which will be partially filled for this purpose. Thus, without having to sacrifice anything, a spacious boulevard can be created, of which the ends principally could be considered as connections for future river crossings or underpasses."
40. The first ideas about collaboration within the Drecht cities association date back to the 1930s and originate from van Buuren. In his article in *Openbare Werken ('Public Works')*, 1932, no. 8, he wrote: "With this, I would like to say least of all, that collaboration between stake holding cities would be undesirable. To the contrary, I consider it to be the primary means to quickly reach the proposed goal to benefit all. The danger of time-consuming annexation, and therefore dangerous postponement, that might affect all those involved, would then in addition be circumvented."(p. 96). In his introduction on the reorganisation of Dordrecht, Wissing also spoke of the importance of collaboration: "All this shows the large, mutual solidarity of all these cities, which meanwhile have decided to draft a joint urban development plan which is already beginning to take shape in the hands of the joint urban development consultants, Messrs de Ranitz, Schut, Pouderoyen, Van Embden and yours truly, assisted by their staff, the technical advisors of the various municipalities and by E.T.I. of South-Holland.' In *Stedenbouw en Volkshuisvesting* ('Urban planning and Public Housing'),(1959, May, p. 106. Both designers considered new bank connections to future belt ways of crucial importance for the future collaborative development of the Drecht city. These ideas were dropped in the Drechtoevers (Drecht banks) Masterplan from 1994. The spatial relationship between the cities involved is elaborated at two levels. First, by introducing new ferry connections for slow traffic: the *fast ferry* and the water taxi. Second, by means of the 'moderate' visual relation intended to connect architectonic projects on both sides of the banks. See: *Masterplan Drechtoevers, Een Kwaliteitssprong ('Drecht banks Masterplan, a quality leap ahead')*, (note 9).
41. Van Embden (note 39), p. 112: "Measures to improve supply routes outside of the city centre belong to the development plans and subplans for existent suburbs."
42. Netherlands Architecture Institute, Wissing archive, R19, work 772, drawing number 7. Wissing built on the development plan of C.G. van Buuren. The green belt between the urban residential areas, Oud-Krispijn and Nieuw-Krispijn, and the new expansions is an element adopted from Van Buuren's plan, and can still be partially recognised in Dordrecht's street map, in the southern part of the route of the Laan der Verenigde Naties, in the east by the route of the N3 ring road. The greenbelt has therefore been largely 'suppered' by infrastructure. See also notes 34 and 35.
43. A model of a study on a tunnel underneath the station exists, from May 1953. See Rouw (note 36), p. 12. As a part of the reorganisation plan, the Stationsweg and the Johan de Wittstraat were widened to become the new 'station boulevard'. See also note 27.
44. Jansen Manenschijn (note 11), p. 178.
45. Within this context it is a striking fact, that, in his development plan from 1932, C.G. van Buuren proposed the city bridge north of the railway bridge, in order to connect directly to the planned beltway, constituted by the Korte Parallelweg, Burgemeester de Raedtsingel and the Oranjelaan. In the end, the city bridge was built 40 metres south of the railway bridge, because of the through traffic towards Moerdijk. See *Openbare Werken ('Public Works')*, 1932, no. 8, p. 93.
46. Map research has shown among other things the disappearance of several sports facilities in the direct vicinity of Oud-Krispijn and Nieuw-Krispijn. These facilities were sacrificed for the sake of the expanding road network. Historical accounts also show the disappearance of several neighbourhood facilities, including the public swimming pool, bathhouse, bandstand and various shops. Jansen Manenschijn (note 11), pp. 159-178. See also note 8.
47. In 2004, the cities of Dordrecht and

Zwijndrecht commissioned research by TNO on the safety of the railway zone. In this study, the conditions enabling construction around the railway were examined. It is clear that this is an extremely important factor in plan creation, since it concerns an important route used to transport hazardous chemicals. See http://cms.dordrecht.nl
48. See note 40.
49. See note 9.
50. See notes 34, 39, 40 and 45.

[Polemen]

Book review

Leslie Kavanaugh

Auke van der Woud
Een Nieuwe Wereld. Het Ontstaan van het Moderne Nederland
Amsterdam (Bert Bakker) 2006.

Recently, Uitgeverij Bert Bakker published the latest study from Auke van der Woud entitled, *Een Nieuwe Wereld. Het Ontstaan van het Moderne Nederland*. Auke van der Woud is a Professor of the History of Architecture and Urbanism at the Rijksuniversiteit Groningen. *Een Nieuwe Wereld* follows three other important works on the development and history of Dutch cities beginning with the publication of his dissertation in 1987, *Het Lege Land: De Ruimtelijke Order van Nederland 1789-1848* (Amsterdam: Meulenhoff, 1987). Then followed *De Bataafse Hut: Denken over het Oudste Nederland 1750-*1850 (Amsterdam/Antwerpen: Meulenhoff 1990/1998); *Waarheid en Karakter: Het Debat over de Bowukunst 1840-1900* (Rotterdam: NAi Uitgevers,1997); and the English translation *The Art of Building: From Classicism to Modernity. The Dutch Architectural Debate 1840-1900* (Aldershot UK/Burlington USA: Ashgate Publishing, 2001). These books show a continued concern from Auke van der Woud with the subjects of the history of architecture and urbanism in the Netherlands in the period between mid-nineteenth century to mid-twentieth century specifically.
The scholarly method used by van der Woud is one of a broad historical stroke punctuated by relevant detail. He evokes Schopenhauers' position in *The World as Will and Representation* that reality is a subjective construction in order to legitimize his methodology. Although Schopenhauers problematic was more epistemological than historical, ever since Foucault, historians must continually ask the question: 'Whose history is it?' The notion of a 'subjective' representation in the hands of van der Woud implies a methodology that uses individual 'subjective' accounts of historical events from sources who were contemporary to the period. Drawing from an impressive array of archival material, van der Woud is able to richly illustrate his broader thesis in an extremely convincing manner. The book collects and addresses sources from various disciplines in order to sketch a more nuance version of historical events. In the *Nieuwe Wereld*, van der Woud first explicates the changes in the broader European history in the vital century between mid-nineteenth and the mid-twentieth centuries in the first chapters of his book, and then goes into detail concerning the specific changes in the Netherlands in the larger second part. The Netherlands both was taken up with these larger historical changes and movements, not the least of which at the beginning of his period of study was the French Revolution and other political and social upheavals, but also the Netherlands shows important deviations from this larger stream of historical time.
Een Nieuwe Wereld begins the research from the historical point of 1848 in the Netherlands. This date of 1848 is a seminal moment in Dutch history in that this was the date of the implementation of a constitutional or parliamentary democracy in the Netherlands. Yet as a part of the larger European history, the mid-nineteenth century was rife with change. In fact, van der Woud describes the state of affairs in this historical period as a '*perpetuum mobile*' – which he defines in this case as a massive desire continually to move and to communicate. This *perpetuum mobile* characterizes, for van der Woud, modern industrialized society. Suddenly, society took on a vibrancy and a possibility never before thinkable. Indeed, society itself was increasingly seen to be malleable and pliable, able to be molded into a perfect or utopian society. Nature itself for the first time was beginning to be seen as something controllable and operable. Everywhere man could with his superior mind, set to work excavating, mining, constructing, and transporting. These new attitudes towards society, man, and nature were just as important in realizing the 'new world' of modern Netherlands, as the laying out of new infrastructures, and the increasing industrialization. Obviously, although the particular innovations of the time period have been studied extensively, van der Woud asks what went before these innovations that made them possible. What was the manner of thinking that was critical in order to realize these new infrastructures, new ways of communicating and relating to the larger world, and new technological innovations?
In *Een Nieuwe Wereld*, van der Woud organizes his thesis around two critical themes: Normalization and the Systematization of Networks. In the second half of the nineteenth century, suddenly the structure of the world was seen as a system, which is to say both an infrastructure network and a biological system under the profound influence of Darwin, a system which was at once manageable and rational. Furthermore, with the ideology of the 'progress' of human society, the future suddenly became thinkable as something 'made' by man, as something to be improved upon in the natural order of things, and as something that could be directed and controlled. Man no longer was merely subject to external powers – either politically, or transcendentally, or naturally. Indeed, a 'New World' suddenly seemed possible.
One of the most important shifts came from the turn from the individual to the collective. Specifically, infrastructure became something massive – mass communication and mass mobility for the masses of man. In the second part of the book, van der Woud gives a brief history of the various transportation and communications infrastructures in the Netherlands – the railroad, alongside of which was laid the telegraph, the telephone, the shipping canals, the connections of paved roads, the energy networks, the systematic postal system, as well as the mass communication media of magazines, newspapers, and periodicals whose dissemination became possible with the transportation infrastructures. Most importantly, the technologies of space and time measurement were critical to the implementation of these new innovations, which is to say regulation of timetables, temporal standards, atlases, water level data such as the AP (*Amsterdams Peil*) used as a standard, the geological map completed in its entirety in 1925, the typographic map (TMK: *De Topographische en Militaire Kaart van het Koningrijk der Nderlanden*) of 1864, as well as many innovations in the recording and the systematization of data begun during the French occupation of the Netherlands. The necessary governmental structures were also decisive to the undertaking of creating a new nation state. The creation of a modern nation would be unthinkable without these technologies of measurement, organization, and infrastructure networks.
The Netherlands became 'a new world' not solely because of the industrial revolution; rather, the Netherlands became a new world of progress and technological advancement because of the preconditions to this revolution – a new way of thinking, organizing, and relating to itself as a new nation state in 1848, and ultimately to the larger world. As such, the thesis of van der Woud in *Een Nieuwe Wereld: Het Ontstaan van het Moderne Nederland* is compelling. In his argument, we see the first fragile beginnings of a nation whose systematic networks would now tie into the global networks. In the nineteenth century, as now, this interrelationship and indeed interdependence of nations in a global environment was not always perceived to be desirable. Yet Auke van der Woud gives an account of this historical phenomenon that if not inevitable, at least is explicable. The only flaw of this book is that it breaks off suddenly with a chapter on the road infrastructure in the Netherlands. And this is perhaps the frustration, and no doubt the beauty of any historical study: to ask the question, 'where does this road lead us now?'

Book review

Endry van Velzen

Like Bijlsma and Jochem Groenland
De tussenmaat. Een handboek voor het collectieve woongebouw ('The intermediate size. A handbook for collective residential building')
Amsterdam (SUN) 2006

Among urban development, architecture and studies

In their recently published book, *De tussenmaat. Een handboek voor het collectieve woongebouw ('The intermediate size. A handbook for collective residential building')*, Like Bijlsma and Jochem Groenland provide a book review of research into the possibilities and significance of the collective residential building in the current practice of urban development. Beside a few programme related texts and a catalogue of precedents, this very pleasant and versatile book contains design studies elaborated as beautiful drawings. The main point of the design studies can be found at the level of the typology and its treatment within urban planning integration.

At first, this publication seems to belong to the tradition of the 'Delft' handbooks on residential building, even though the research of Bijlsma and Groenland was not done at the Delft University of Technology. It resembles handbooks such as the *Atlas van het Hollandse bouwblok ('Atlas of the Dutch Urban Block')* by S. Komossa et al. (Hilversum, Thoth, 2002) or the *Zakboek voor de woonomgeving ('Compendium for the living environment')* by W. Wilms Floet and E. Gramsbergen (Rotterdam, 010, 2001). Just like *De tussenmaat*, both studies only address architecture and urban planning. The *Atlas* uses an urban planning angle, with an emphasis on parcelling, while the *Compendium* goes the opposite way, from an architectonic angle to the building stone of the city. However, the methodology in both studies is the same. On the basis of a few well-reasoned criteria, a series of precedents are lined up. The essential part is the presentation of 'objective' knowledge. The significance of the knowledge for the design (or for design institutes) is not elaborated any further, so that the knowledge comes across as quite 'innocent' and informal.

It is exactly on this point in *De tussenmaat* that another methodology is used. Instead of just giving examples, the authors chose a programme related approach, in which design studies, precedents and opinions complement and reinforce each other. What makes such a broad agenda interesting is that various practices can be connected to each other: urban development, architecture and studies. The knowledge offered is then no longer 'innocent', but contributes to the authors' position and is given meaning as a plea for a trend. By doing so, the authors leave the rippling water of the 'Delft' manuals and set course for a new horizon. In this adventure, however, a few difficult obstacles must be avoided.

Urban development

The first practice the book focuses on is that of urban development, which is strongly influenced by project initiatives from private parties nowadays. This is especially true for intra-urban missions. The intermediate size, that is, the collective residential building, is given a critical role by the authors in this practice.

'What are the implications of the intermediate size in today's Dutch built-up environment? The nucleus can serve as a stepping-stone towards the architectural development or transformation of an area, and also provide an alternative to the vocabulary of urban planning and planned patterns of urban organisation. At the same time, it can allow typological variation to emerge in this country's homogeneous housing environment. Finally, it provides a critical alternative that can respond to current shifts in the meaning of public space' (p. 77)

Even though it is undeniable that project proposals are the vehicle of intra-urban and urban development, it is the question whether these proposals can steer development 'in an architectonic way' as the authors suggest. Project proposals mostly play a role in a 'negotiating urban planning', in which building, programme and exploitation are co-ordinated in an iterative process between public and private parties. Within such a process, the architecture, summarised as an autonomous discipline, must offer as little 'resistance' as possible. It is preferably passive and malleable, so that the negotiation space for the various parties is as large as possible. This process often results in a main planning for the building, without the architectonic effort being explicit. The architecture is then indifferent, an image that is added later on. This practice is contrary to the view of architecture proposed in *De tussenmaat*. And it is the view on architecture in this publication that is striking.

Architecture

The second practice the book addresses is that of architecture. The chosen precedents as well as the design studies are part of a carefully defined yet rich architectonic world. This 'strict' discipline is striking and unusual in the Dutch context of shapelessness and servitude.

'In our view, the permanence of the intermediate-sized housing block is expressed architecturally in the distribution of spaces, the design of the volume and façades, and the relationship to the public domain. As regards the distribution of spaces, we endorse Rossi's notion of 'distributive indifference', according to which utilitarian and entrance areas can be assigned at will; the structure of the buildings is generic, but in architectural terms they are specific – maximum architectural precision makes for maximum distributive freedom and, more generally, for maximum functional freedom. Intermediate-size architecture possesses generic monumentality – a featureless, abstract kind of monumentality that conforms to urban rules. Here we agree with Holl and Grassi's abstract view and part company with Rossi's iconographic approach.' (p. 41).

This positioning has also gained a few connecting factors in the current social context. For example, the discussions about flexibility, durability and urbanity, which someone like Frank Bijdendijk, director of a large housing corporation, has formulated into the idea of 'solids': large, characteristic shells for living and working. One by one, the design studies in *De tussenmaat* lead to intriguing architectonic proposals, which could be an example of such a 'solid'. However, these beautiful designs are presented in a somewhat restrained manner. How are they made? How do they work? What kind of residences and workplaces do they provide? Since the authors mostly address their urban planning application, the emphasis is on the possible instrumentality of the designs, while their intrinsic qualities are not paid enough attention. This is unfortunate, as through the architectonic proposals, a strong view on architectonic composition and design theory can be vaguely seen, which is not mentioned explicitly anywhere in the book. Even though in practice it is often unnecessary or undesirable for building, for architecture studies it would in fact be desirable.

Studies

The third practice this book wants to address is studies. Manuals such as *De tussenmaat* are practical reference books, but it would be a shame if the book were only limited to that use. Also, the architectonic position, as elaborated in the choice of precedents and in the design proposals, is worth studying, despite the implicit theoretical framework. On this point, another recent publication from the same publisher could possibly be complementary. *The Metope and the Triglyph. Nine Lectures in Architecture* by Antonio Monestiroli[1] is a collection of crystal clear discussions about architecture, which together form a theoretical framework in which various aspects of architecture have their place. Monestiroli's main point is that only within the classical experience (ahistorically speaking, including the modern movement) does a theory exist in which designers can work without constantly having to fall back on a personal point of view.

'The system of rational norms on which the theoretical apparatus of classical architecture is based has to do with the three great chapters of architecture: the architecture-city relationship and the question of building typology, the question of construction, and the rules of the language. We can say that classical architectural theory concerns the passages from city to type, from type to construction, and from construction to form.' (*The Metope and the Triglyph*, p. 8)

During the presentation of *De tussenmaat*, the authors showed a series of drawings that were not in the book. Proposals and precedents drawn in the same way were brought together on summary sheets by type. It was surprising how these typological series held up *De tussenmaat* as an *architectonic* study. These series could be the prelude to the elaborations of a theoretical framework for the chosen architectonic position, which then could also be part of a future follow-up study.

Notes

1. Amsterdam (SUN) 2005. A review of this book by François Claessens was published in *OverHolland* 3, 2006

About the authors

Olivier van der Bogt (1975) graduated in 2002 with honourable mention in architecture at the TU Delft. He is now a researcher at the department of architecture of the TU Delft. His research activities include mapping the transformation of Dutch cities, the Randstad and Deltametropolis. Since 2002 he also works for De Nijl Architecten (Rotterdam) as an architect, and since 2005 he is a member of SAAM-Architecten (Rotterdam).

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Henk Engel (1949) graduated as an architect at the Delft University of Technology in 1981. He is at present co-director of the architecture office De Nijl Architecten in Rotterdam, with 3 partners. In 1998 his office had an exhibition on their work in the NAi, which was accompanied by the publication *Als we huizen bouwen, praten en schrijven we* (1998). Engel is an associate professor of Architectural Design in Delft, and teaches at several Academies of Architecture in the Netherlands. He was visiting lecturer in Liverpool, Milan, and Pescara. He wrote extensively on various topics concerning modern and urban architecture, and worked on several exhibitions.

Esther Gramsbergen (1964) graduated in1989 as an architect at the TU Delft. She worked for various architecture offices, amongst which are Karelse van der Meer Architecten (Groningen, Rotterdam) and the ArchitectenCie. (Amsterdam). Since 1999 she works at the faculty of Architecture of the TU Delft as an assistant professor. She is co-author of the *Zakboek voor de woonomgeving* (2001). At the moment her research and teaching focus on typomorphological studies of Dutch cities.

Leslie Kavanaugh (1959) is an architect and a philosopher. She graduated in 1982 in architecture and in 1995 in philosophy at the University of Amsterdam. After working in various architectural firms, she is presently assistant professor of Architecture at the TU Delft. She has recently defended her dissertation in philosophy at the University of Amsterdam, published as: *The Architectonic of Philosophy: Plato, Aristotle, Leibniz* (Amsterdam University Press, 2007).

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