Stationshus

A Scandinavian influenced approach and design for a strategic multi-modal intervention in Rotterdam South

Thesis

Wouter Hagers
b1302841

Dual Graduation A+U
Faculty of Architecture
TU Delft
2013

Keywords:
Accessibility, Kulturhus, Social inclusion, TOD, Railway station, Place-node model

Stationshus

A Scandinavian influenced approach and design for a strategic multi-modal intervention in Rotterdam South

Thesis

Wouter Hagers
b1302841

Dual Graduation A+U
Faculty of Architecture
TU Delft
2013

Wouter
HAGERS

THESIS

TUTORS:

IR. L.P.J. VAN DEN BURG
DR. IR. F.D. VAN DER HOEVEN
IR. W.W.L.M. WILMS FLOET
IR. H. MIHL
DR. IR. A. STRAUB

Acknowledgement

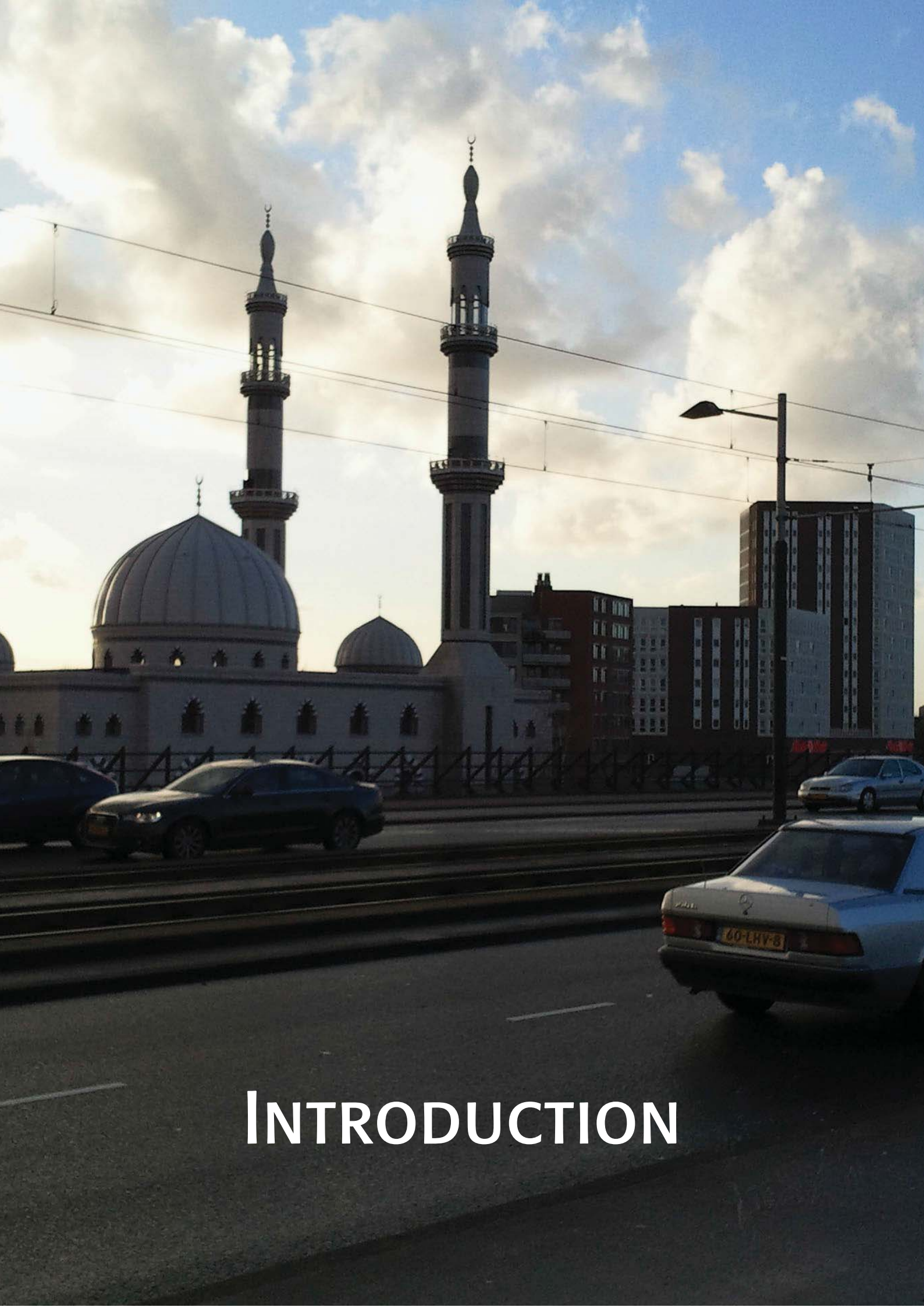
Travelling and visiting places is one of the most effective ways to learn about the functioning of urban and architectural models in practice. Fortunately I like these types of excursions a lot, which has helped me a great deal in the decisions I made and the understanding of my graduation project. I was able to use my train experience of 'training' all around the Netherlands and the rest of Europe, Siberia, Mongolia, China and Japan amongst others to understand the importance of designing stations and Transit Oriented Developments. The kulturhuzen of which I knew much less, enabled me to gain new knowledge by visiting and speaking to people at kulturhuzen in Zwolle, Wijhe and Olst. And also during a trip and visit to Sweden were I met the Program Director of Kulturhuset in Stockholm and spoke with researchers at the KTH. I also visited Culturum in Nyköping and a range of problem neighbourhoods in the Swedish context. Similarily I made visits all over the Netherlands (thanks to my OV-studentenkaart) to relevant projects and to speak with specialists on stations, the municipality of Rotterdam and kulturhuzer, that have all helped me a great deal. But I also want to thank my Parents Steven and Ellen that have made it possible for me with their help to create this project.

Wouter Hagers,
Delft
September 2013

Abstract

A new meeting place in Rotterdam South in the form of an intercity railway station housed under one roof with a kulturhus, the Swedish concept of a cultural centre, will act as the main catalyst for various problem neighbourhoods in Rotterdam South. This area, containing Feijenoord, Hillesluis and Afrikaanderwijk, has faced many social and spatial problems in the last thirty years (Fortuin & De Zeeuw 2003; Tempelman 2011), while previous regeneration attempts have not been able to achieve the desired improvement. Instead of the previous regeneration of dwellings, a new and different strategy is applied to ameliorate social justice.
The most important goals of the design project are to improve the connection of Rotterdam South with the national railway network and to stimulate social equality by creating a meeting point. Thereby the building that houses these activities needs to be absorbed by its context to become a fully-grown and lively part of the city. The public space needs to be inviting to attract people into this meeting place on South, so the building can function as a catalyst for redevelopment and improvement of the problem neighbourhoods on South.
The approach of the graduation project is to start with mobility on the large and small scales by optimising and creating new infrastructure, while breaking through barriers and adding facilities that inhabitants can use to develop themselves. This is to handover a base for social contact, development and education in this area of Rotterdam. According to the successful Swedish approach, this is done in the form of a kulturhus. This thesis is mend to give a more detailed theoretical background for the strategy and design choices made during the project, thereby focussing on the theoretical background of kulturhuser and transit-oriented developments. Hereby local planning traditions have been taken into consideration during the development of a strategy. Further analytical research to the phenomena of transit-oriented developments in relation to the place-node model of Bertolini (Bertolini & Spit 1998) and the origin of kultuhuser is offered, added by approaches for sustainable urban development by Jan Gehl (2010) and the theory on how to connect a station to its context (Brouwer 2010). The latter two can also be described as pedestrian-oriented development.
A lot of the strategies studied for the Rotterdam approach in the project have been developed in or have been in use for a long time in Scandinavia. The Nordic countries therefore have been a major inspiration for many of the strategic choices that were made. The strategy and design however are adapted to or influenced by the Dutch situation and the vision of the author.
This thesis will act as explanation and therefore as a major element of the dual graduation, Architecture and Urbanism, project in Rotterdam South. The strategic interventions are also envisioned as a generic approach for other areas that suffer from similar problems. The possibility to create a catalyst designed to connect to existing infrastructures and connect socially isolated urban areas, with the aim of increasing opportunities. In the reflection the main conclusions of the project and research are presented in the light of where these can add to the common body of knowledge in these fields.

Content



Introduction

Introduction

From a very young age countries from all over the world interested me as I used to look in the Grote Bosatlas, a big atlas covering the whole world with geographic and thematic maps. Some of these were more interesting to me than others, but it triggered my tendency to look across borders to find new ideas and applications.
The Netherlands is very affluent country, were many people live happily and under good circumstances. When taking living conditions and the organization around it into account, the country serves as a very good example to most other countries in the world. But there are also problems in the Netherlands, these may be relatively small when compared to many other countries, but there is work needed to improve the situation further. The only region that performs even better in this field is Scandinavia where living conditions are largely comparable or even slightly better than in the Netherlands. This has awoken my instigation to look in these countries for their solutions for the same problems and that could mean also something when implemented in the Dutch situation.

'In the last thirty years or so, urbanists and architects, too, have tended to neglect networked infrastructures and the flows and mobilities that they support. They have tended to focus overwhelmingly on the designed spaces within building envelopes, rather than the networked infrastructures that knit buildings together, binding and configuring the broader spaces of metropolitan life.'
(Graham and Marvin, 2001: 18)

This quote by Graham and Marvin on the other hand has been another major inspiration for this project. As an urbanist and architect the integration within the city is a major topic. The approach based on improving accessibility, mainly by successful transit, is very dependent on the right translation of the functionality into an integrated design that knits the fields of architecture and urbanism together and makes the station part of the city.

The location Rotterdam South is an area facing many social problems and can be seen as the biggest problem area in the Netherlands. This project tries to improve the social situation by a large spatial intervention, connected to the design of the principal building within this design. Aim of the developments is to trigger the current inhabitants to use the new improvement to increase their opportunities for jobs and education, while on the other hand entrepreneurs and businesses are triggered to settle in the area.

The Dutch often describe themselves as a small country with tolerant attitudes and a high standard of living. Although the own identity is a source of pride for the Dutch, we sometimes might feel overshadowed by the large nearby countries in Europe, mainly England, Germany and France. Together with the United States a lot of inspiration is taken from these countries, which is visible in for example culture and lifestyle, economy and products. In this respect the Netherlands is similar to many other smaller European Union countries, with less than twenty million inhabitants. To give a counterweight some countries choose to cooperate in organizations such as the Benelux, Nordic Council, or Visegrád Group. On a world scale problems known in the Netherlands are relatively small and social equality is pursued in most aspects of society. Albeit continued work is needed to give equal chances to everyone, especially those in 'problem neighbourhoods' of large cities like the South of Rotterdam, because when nothing is done, problems will keep on gravitating and that can ultimately lead to no-go areas, where the government has lost control of the situation.

The architectural and urban project focusses on one area in the South of Rotterdam, were a new development will act as a catalyst for further grow. The form and function of this self-designated catalyst is free, but as there is currently not a standardized strategy in the Netherlands for these kinds of projects, own initiative was needed to find a solution. Ideas were drawn from transport-oriented development strategies and inspiration for cultural activities were based on the principle of a kulturhus, introduced from Scandinavia in the eastern part of the country.

Connections and the easy accessibility of functions are two of the main advantages of living in the city. Between 1850 and 1950 there was the emergence and growth of public transportation. After the War cars became more prominent and public transportation declined in many western countries. Since the introduction of new modes of public transport in the 1980s, public transport has made a revival. The continuous growth of the past 30 years can be seen as a Renaissance, and mass-transit has become an

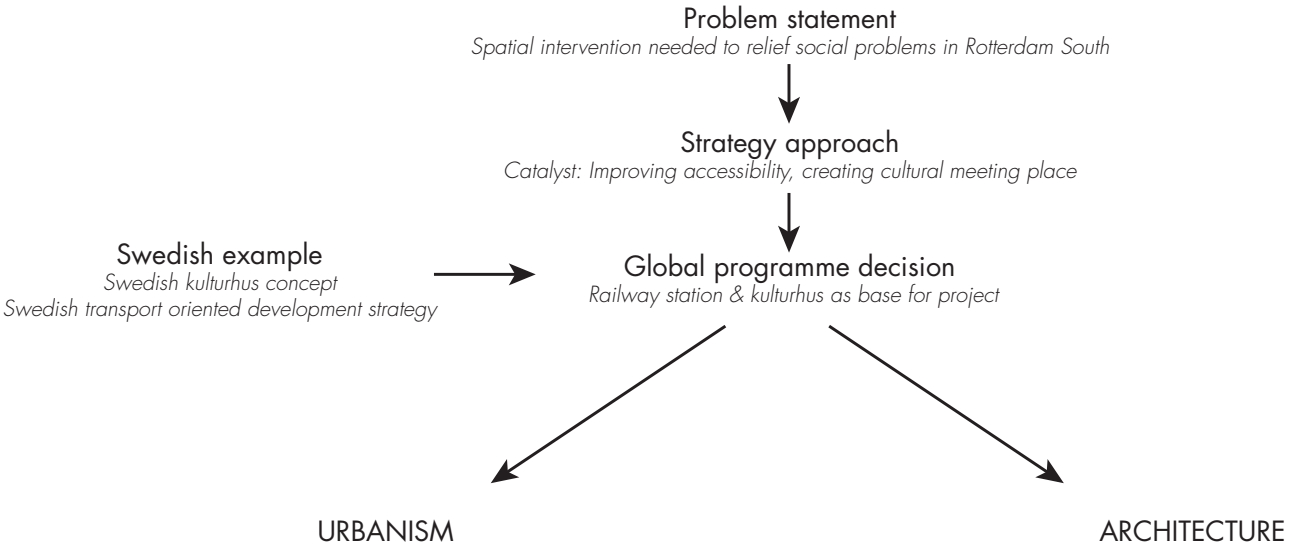
indispensable part of contemporary metropolises and the networks between them (Bertolini and Spit, 1998; Priemus et al., 1999). In Scandinavia urban planning has been centred around public transportation developments since the 1940s, which makes it a laboratory on the field of early transit-oriented developments (TODs).

The concept of cultural houses was taken to the Netherlands in 2000, when the first kulturhus was built in Overijssel. From there it spread to Gelderland and the province of Utrecht, where they are called 'cultuurhuis'. The kulturhuzen in these areas cooperate, but it is characteristic that the same concept under different names is also spreading to other parts of the Netherlands, an example is the May 2013 opened 'Multi-functioneel Centrum' (MFC) De Statie in Sas van Gent, Zeeland, which perfectly fits the concept of kulturhus used in the eastern part of the Netherlands. It makes the situation complex and unclear, as there is no official Dutch term to coin all these types of cultural houses. In this thesis the term kulturhus (Dutch plural: kulturhuzen; Swedish plural: kulturhuser) will be used for clarity.

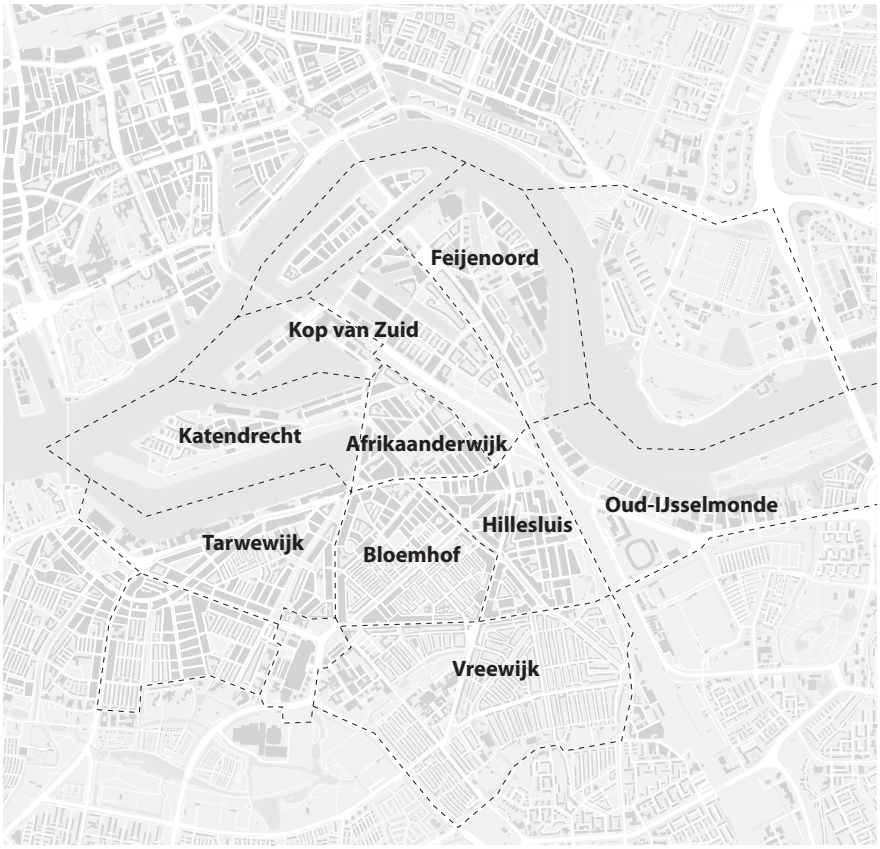
Structure

The project combines two graduation tracks, one in Urbanism and one in Architecture, and that is reflected in the structure of this thesis. The start of the project is from a common problem statement that concerns the social problems found in Rotterdam and the spatial intervention that will positively influences these areas.

From this starting point the strategic approach means the direction in which is sought to achieve a positive influence in this area. The strategy is mostly the result of the personal vision of the author and visions to introduce a catalyst that will act as starting point for further improvements. The infill of this catalyst is decided to by the vision of the author and supported by literature research and realised examples, most notably from Sweden. Two important studies done before the start and during the beginning of the project were a review paper, 'Activating medium-sized station areas in the Randstad' (Hagers 2012a) and the history study 'De groei van het station' (Hagers 2012b), a comparison between two important railway in the Netherlands and England.
The eventual choice for the strategic approach also mend the defining of a global programme with the most important functions for the catalyst building. The focus on better accessibility by public transport was an important prerequisite to improve the chances of inhabitants and to reduce the social isolation of Rotterdam South. The second function was found in the kulturhus concept that functions as a meeting place and as a place to educate or develop oneself, with the inclusion of a library and sports hall for example.



Project structure



From these first steps the project can be split into an urbanism part and architectural part. Both have their own section within this thesis and in these respective sections the detailed analyses and designs will come forward.

The neighbourhoods in Rotterdam South, in and around the project location.

Southern Scandinavia

The choice was made to look further than just the borders of the Netherlands to find solutions for the problems faced by Rotterdam South. It was decided to focus on Scandinavia and Sweden in particular. Mainly because the large European countries face even bigger problems than the Netherlands with their run down suburbs or banlieues and because Scandinavia has a standard of living comparable with or even slightly higher than the Netherlands. Personally I sometimes like to view the Benelux countries as Southern Scandinavia, because of the cultural ties and similarities, although a lot of them are fairly unknown to many because of the usual focus on the influential countries Germany, France and the UK.

To explain this similarity with Scandinavia, but also to point out some of the key differences, a range of geographic, economic and cultural facts are put in the following tables.

	Country	Inhabitants *(2013)*	Surface *km²*	Density *inh/km²*	Urbanization *%*	Forest *%*
Nordic	Norway	5 063 700	323,782	16	79.4	29.0
	Denmark	5 605 900	43,089	130	86.9	12.0
	Sweden	9 573 500	410,314	23	85.2	74.9
	Finland	5 432 300	303,893	18	83.7	69.0
Benelux	Netherlands	16 787 500	33,783	497	83.2	8.8
	Belgium	11 150 600	30,528	365	97.5	21.7
	Luxembourg	537 000	2,586	208	85.4	33.6
	Nordic Council*	**25 675 400**	**1 081,078**	**24**	**83.1**	**57.0**
	Benelux	**28 475 100**	**66,897**	**426**	**89.8**	**15.6**

**Without Iceland*

Comparison between Nordic and Benelux countries.

The geographic circumstances are very different between Scandinavia and the Benelux. Whereas the first has a much colder climate with sparsely populated areas and large forests, mainly in Sweden and Finland, the latter is very densely populated and has an area roughly 17 times smaller than Scandinavia. On the other hand Denmark and the southern parts of Sweden and Norway are much more densely populated than barren north and it forms in this sense a transition to the even denser Western Europe.

The differences in urbanization grade are not very large between the two regions and with population sizes between five and 17 million people; all except Luxembourg can be viewed as medium size countries in Europe.

	Country	GDP per capita (IMF 2012)	world	GDP PPP per capita (IMF 2012)	world	HDI development (2013)	world	Gini equality (CIA)	world	Competative Global index (2012-13)		Innovation Global index (INSEAD)	
Nordic	Norway	99 462	3	55 009	4	0.955	1	25.0	5	5.27	15	56.4	14
	Denmark	56 202	6	37 657	21	0.901	15	24.8	4	5.29	12	59.9	7
	Sweden	55 158	7	41 194	15	0.916	7	23.0	1	5.53	4	64.7	2
	Finland	46 098	15	36 395	23	0.892	21	26.8	11	5.55	3	61.7	4
Benelux	Netherlands	46 142	14	42 194	12	0.921	4	30.9	26	5.50	5	60.5	6
	Belgium	43 686	18	37 883	20	0.897	17	28.0	16	5.21	17	54.2	20
	Luxembourg	107 206	1	79 785	2	0.875	26	26.0	6	5.09	22	57.6	11

Comparison between Nordic and Benelux countries.

Both Scandinavia and the Benelux form two of the wealthiest regions of the world with highly developed welfare states and very high GDP (Gross Domestic Product) per capita. Even when it is corrected to purchasing power (PPP) all countries are still in the worldwide top 25. This lower score is mainly because prices are also among the highest in the world and several mini-states give a somewhat distorted view. The Netherlands scores on average very high and consistent, even without topping the world in one of the indicators mentioned in these tables. But the scores in some of the most important indices are higher than most Scandinavian and Benelux companions. The Human Development Index (HDI) takes health, knowledge and economy into account, which makes it an important indicator for the development of the country. On the other side of the spectrum it is visible that equality in income distribution is the lowest of all the mentioned countries.
Sweden like the Netherlands scores on average very well, just behind Norway, which is not a European Union member. Sweden is especially very innovative and scores also well in the environment performance index. Two indicators that make the country interesting for research as new and sustainable techniques are more likely to be deployed then in the Benelux.

	Country	Press freedom index 2012		Gender gab percentage 2012		Education index 2007		Globalization index 2010		Environment Performance index 2012		Quality-of-life index 2005		LPI Legatum 2012
Nordic	Norway	6.52	3	0.8403	3	0.989	7	83.53	20	69.92	3	8.051	3	***1***
	Denmark	7.08	6	0.7777	7	0.993	1	89.68	6	63.61	21	7.797	9	***2***
	Sweden	9.23	10	0.8159	4	0.974	18	89.75	5	68.82	10	7.937	5	***3***
	Finland	6.38	1	0.8451	2	0.993	1	87.31	9	64.44	19	7.618	12	***7***
Benelux	Netherlands	6.48	2	0.7659	11	0.985	9	91.90	3	65.65	16	7.433	16	***8***
	Belgium	12.94	21	0.7652	12	0.974	18	92.95	1	63.02	24	7.095	24	***17***
	Luxembourg	6.68	4	0.7439	17	0.975	15	85.84	14	69.20	4	8.015	4	***11***

Comparison between Nordic and Benelux countries.

Important characteristics of both Nordic and Benelux countries in which they also rank amongst the highest in the world are freedom (of press), good education, a small gender gap, that is the smallest in Scandinavia and a high globalization rate, that is the highest in the Benelux. And finally the seven countries also form the top seven in the world when it comes to giving development aid. Overall the Legatum Prosparity Index (LPI) tries to map the best countries, accounting 89 different variables ranging from politics to economics and safety to health. The classical Scandinavia forms the top 3 of the world, while all countries are among the best 17. The ratings of Belgium are often a bit lower than those of the Netherlands and Luxembourg, it has to be noted that there are significant differences within Belgium. Flanders the northern Dutch-speaking region is more developed than the French-speaking part of the country, which lowers most indices.
The term Nordic model is often used to describe the mentioned characteristics for the Scandinavian countries. Although the Benelux is not taken as a part of this their policies are closely related to the Nordic model and all form part of the covering Rhenish model.

Cultural similarities are much more difficult to catch in numbers. Politically the organization of the

states is very similar, except Finland all countries are constitutional monarchies and all have multi-party parliaments. Almost all political parties have matches or very similar likes in all countries, which makes politics easy understandable with just a little foreknowledge. The same can also be said about the language, all countries speak Germanic languages that are closely related. Norwegians can communicate in their own language with both Swedes and Danes for example. Exception is Finnish that is totally unrelated, but Swedish is spoken along the Finnish coast. In the Benelux also French is spoken in southern Belgium and Luxembourg. Intensive trade with the Baltic Sea region from the Hanseatic League era led also to Dutch influences in historic architectural styles and urban planning, hence the canals in Gothenburg. Dutch entrepreneurs founded some Swedish cities and a Dutch noble family even delivered two prime ministers.

	Country	Charity *percentage of GDP April 2010*		Coffee *kg consumption*	*world*
Nordic	Norway	1,06 %	*2*	9.9	*2*
	Denmark	0,88 %	*4*	8.7	*4*
	Sweden	1,45 %	*1*	8.2	*6*
	Finland	0,54 %	*7*	12.0	*1*
Benelux	Netherlands	0,82 %	*5*	8.4	*5*
	Belgium	0,55 %	*6*	6.8	*8*
	Luxembourg	1,04 %	*3*	-	-

Similarities between Nordic and Benelux countries.

When it comes to media and literature there is a great popularity of Scandinavian writers and series in the Benelux. Just as musicians from Sweden, or DJs from the Netherlands. The countries are also the birthplace of some of the most influential brands across the globe like; Heineken, Shell, Philips, Unilever, ING (Netherlands), InBev, Dexia (Belgium), AcelorMittal (Luxembourg); IKEA, Volvo, Ericsson, Securitas, H&M, Vattenfall (Sweden), Statoil (Norway), Maersk (Denmark) and Nokia (Finland).
But also in small everyday life similarities are visible, such as the importance of time. There is a strong coffee culture as both Scandinavia and the Benelux form the top 10 in worldwide coffee consumption. Swedes identify 'fika', a coffee break, as an important cultural trait, but this phenomenon is, from own experience, just as common in TU Delft's faculty of Architecture or so on the same account for the whole of the Netherlands. And while Dutch people always try to feed unaware foreigners 'drop', liquorice, the same candy is called 'lakrits' and readily available in Sweden.

With this broad comparison not only the term Southern Scandinavia is illustrated, but also it gives a deeper insight in the close cultures ties between the Benelux and northern Europe. People are often unaware of this close contact, as they presume that their habits or products are local, because they are so common. This shows that both regions have many common interests and should be able to learn from one another, because lifestyle and culture are relatively closely related.

Relation between Urbanism and Architecture

Urbanism and architecture are related fields of study that are combined in this project. Although both are stemming from a family of planning the field, that could be seen as a gradual gradient of fields ranging from social geography towards planning, urban planning and urban design into architecture and eventually building technology and civil engineering. Both traditions have a different approach to the subjects they study and the focus that is made. Where architecture has a traditional focus on the form and composition within the building and the context that defines the location, urbanism can be divided in urban planning and urban design. Here strategies and approach form an important influence on the design, where guidelines should built a frame in which another designer can realize the definite form.

These two fields might be expected to compete with each other, but are still closely related. For me this cooperation between closely related fields is seen as an advantage from which the eventual intervention can profit. Strategic decisions made in the urban planning phase of the project can directly influence the organization of the building in the architectonic design. While features of the architectonic design can form new opportunities in the approach for the urban design and can create special spaces that add to the quality and liveliness of the city.

In my personal view the functioning in both urbanism and architecture projects is decisive to value a project. A building cannot be a good building if the functioning or internal organization is a mess or hindering people in their everyday activities. Even though the form, materialization or other elements of the design are very fine. On the other hand a certain quality of composition, detailing, materialisation or

expression is needed to accompany the function and organization of the building. Summarized as that just a good internal organization is not enough to create a well functioning or good building.
A cause of this view can be the perceived perception of form and style that are subjective. On function however someone can be judged on far more tangible affairs that are far less subjective for most. Thereby it is a good trait as an architect to look through form and style, if they are for instance not fitting with personal taste, to see the qualities of a building or project. Function however can be experienced through (everyday) use. When living or working in a building people can be made happier when it fits their needs and requirements. This might seem very naive and idealistic, but it is the job of an architect in the first place to achieve the needs of the client. In historical times designs were made to perfect the form and composition of a building, but with today's market influenced economy and efficient use of space, this is not feasible anymore and an architect has to comply to the demands of the client. This by the way is similar for the urbanist.

The challenge
The traditional meeting places in the city are changing and activities are moved towards other locations, like outlet centres, shopping malls and business areas on the edges of traditional cities. Also activities in the city itself are moving to other points, especially those connected with public transportation. Railway stations are the city squares of the future (Sanders et al. 1999; Bertolini & Dijst 2003) and keep the activities and attractiveness within the city.
Rotterdam South lacks a clear centre and orientation of the urban area. This part of the city is to dependant on the northern shore for its cultural facilities, big city activities and connections towards other regions. The new Intercity station and kulturhus in Rotterdam, as is planned in this project realises a central point in the neighbourhood that at the same time functions as a connection between existing neighbourhoods and that forms a recognizable building where people can meet each other. Densification is made possible, that fits in the policies and increasing use of Transit-Oriented Developments (TOD) in the Netherlands, as happens in Stedenbaan (Balz 2008), or that has successfully been done in Japan and Sweden for over 50 years (Bertolini & Spit 1998; Priemus et al. 1999; Van der Velde 1999). Its combination with a kulturhus, a place that stimulates social inclusion in problem neighbourhoods, from a proven concept developed in Sweden and recently introduced in the Netherlands.
But then the question remains, how these disciplines are related to each other?

When on a certain day the handsome Hermaphroditus son of Hermes, messenger of the Olympic gods and god of commerce, and Aphrodite, goddess of love and beauty, was spotted naked bathing in a pool by the nymph Salmacis. She immediately fell in love with him, but her attempts to seduce him did not succeed. In a supreme effort the desperate Salmacis threw herself on to him, pleading the gods that nothing should ever part them again. Her request was granted and their bodies fused together and formed a new being of two sexes.
Greek mythology provides an illustrious array of stories that can be used to illustrate contemporary events. The way of combining functions and the close connection with urbanism fits in the thinking of the Hybrid Buildings department. The combination with urbanism on such a vital spot in the city, where spatial problems are eminent, could lead to a "Hybrid City" environment. A place where two different disciplines cooperate, or even merge like Hermaphroditus and Salmacis, to relieve social and spatial problems, in a combined strategy and design approach.

Because the two disciplines are combined in the project, and sometimes even very interwoven with each other, the borders are blended. To what extent is it necessary to define the exact borders of each discipline in this project? Even in this thesis it is sometimes difficult to categorize elements of this project. When for example the outer facade of the building is taken, it is part of both an architectural solution for the execution of the bearing construction and outer facade of the building, while it also functions as the border of a square and thus defines the character and the possible use of this public space. For me it is important to see both elements of its use and to keep developing both during the whole process, although half of it concentrates on architecture and half of it on urbanism. This is the advantage of designing both the main building of the urban plan and its context that defines its position in the city.

In this process the urbanism discipline is leading in regard to the strategy and approach of the project area and even functioning of the main building. For the design the architectural discipline is the most important input that shapes buildings and public spaces. Therefore the urbanism part of the project is the most important in the beginning of the process, as it defines the basis of the project. Architecture then comes in to shape the way the form and style of the project is made, focussing thereby also on smaller details.

Finally the urban design is made in respect to the structures set up in the previous two steps to come to a master plan.

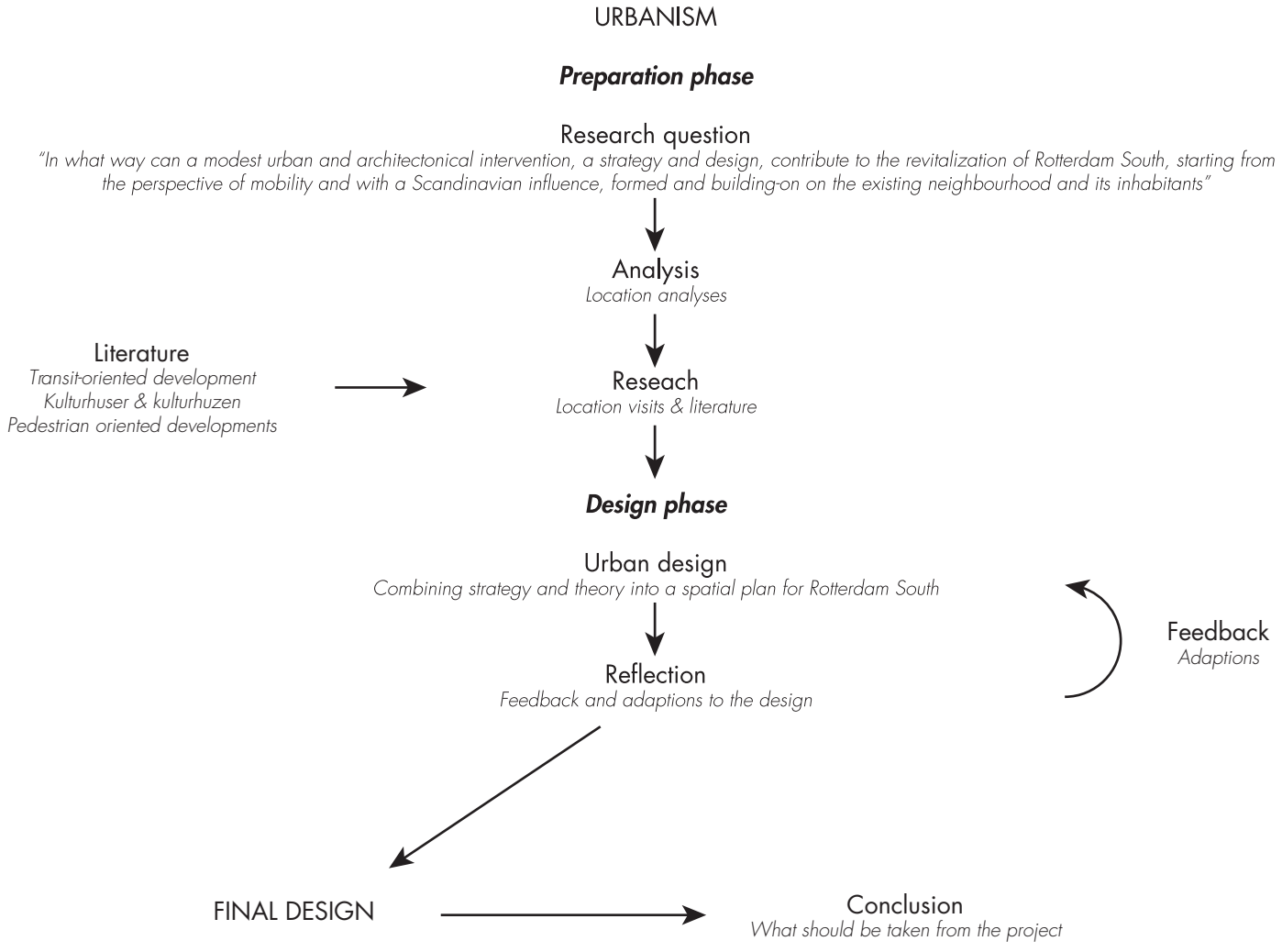
Urbanism

Research method

Problem statement

Problem statement
Grand scale urban renewal in the 1980s has not delivered the desired results in many of the current problem neighbourhoods. Although the quality of the dwelling stock has improved, the social situation has not improved similarly. There is a need for new strategies to deal with the social problems faced by neighbourhoods, like high unemployment rates, high levels of social welfare dependence, crime and housing value. People tend to move out of the problem neighbourhoods when they have the chance.
The forty problem neighbourhoods as identified by former minister Vogelaar in 2007, are located in cities all over the Netherlands. But these are particularly concentration within the area of Rotterdam and to be precise in the southern district of Feijenoord. Although policies have changed with a new cabinet, it is characteristic that Rotterdam South is the only area left that receives national funding and attention. In this sense Rotterdam South can be called the biggest problem area in the Netherlands.
This project develops a new strategy to relief the social problems found in this area, in an effort to increase living standards. The strategy is not only concerning policies and recommendations, but comes up with an urban and architectural intervention. The design for this intervention is an important part of the research and also serves as a reflection on the strategy. From here further recommendations can be made for the use of this strategy in a more generic situation, in other locations dealing with the same problems as Rotterdam South.

Problem field
The chosen strategy focusses mainly on the improvement of social justice by creating chances through improving accessibility and making room for personal development. There is currently in the Netherlands no policy for combining urban (re)developments with infrastructural needs and possibilities. It is seen



Project structure of the urbanism part of the project.

as the task of the government to organize mobility, while offices, dwellings and other functions can be developed at fairly random locations by private developers. In the past decade this has led to high vacancy and inefficient development, as mobility factors are not taken properly into account. In this instance the designed intervention will serve as a catalyst for urban renewal.

Research question
This leads to the main research question of the project:
"In what way can a modest urban and architectonical intervention, a strategy and design, contribute to the revitalization of Rotterdam South, starting from the perspective of mobility and with a Scandinavian influence, formed and building-on on the existing neighbourhood and its inhabitants."

The research question describes a range of criteria that will be worked out into a strategy and design of the project that ranges from urban planning to architecture. Thereby the existing context will continue to have a central role in the development and the project will deal with respect to current inhabitants and buildings found in this area. Thereby the project tries to find answers for current social and spatial problems in Rotterdam South, that are reflected into a clear strategy for a transit oriented approach for urban renewal. The Swedish or Scandinavian influence is found in the field of analyses, TOD, personal development in the form of kulturhus and design aspects of the public space.

Aim
The aim of the project is to come to a strategy and design for an intervention in a large problematic area of Rotterdam South. With the help of this applied project and the consequential experiences it is hoped that in the end a more generic strategy can be described for similar problem areas elsewhere in the world. Literature is used to find theoretical substantiation for the measures proposed for the design and to place the project in the field of practice, from where it can build to become an addition to this same field of practice. This process could be viewed as research by design and eventually lead to new conclusions.

Urban renewal

In order to come up with a new strategy for urban renewal, it is important to have an idea of what happened in the past and where it did not live up to the expectations.
Urban renewal is a very broad notion and gives possibilities to venture in many different directions. Quickly summarized, historical urban renewal was aimed at improving the quality of dwellings. This happened mainly in the 1960s to 1980s; currently many of these neighbourhoods have evolved to become known as 'krachtwijken' (problem neighbourhoods) anyway. Apparently the improvement of quality did not prevent this deterioration process, so other strategies for dealing with urban renewal need to be examined.

Historical urban renewal strategies
Urban renewal has been taking place in the Netherlands since the 1950s. In the 1950s and 60s the strategy was characterized by demolishing large areas in old neighbourhoods, after which large interventions for (car) traffic or businesses were realised. In the 1970s "stadsvernieuwing" (renewal of the city) was introduced, which instead of developing new structures used the existing urban fabric. First a lot of low quality housing was demolished, peaking in 1971 with 18.950 withdrawn dwellings decreasing to 10.120 in 1985 (KEI 2011). The KEI-website also states that inhabitants became more involved, and building concentrated on current population of these neighbourhoods. But in spite of creating better quality dwellings it did not result in improving the social inclusion in the neighbourhood. From the 1990s on the traditional form of urban renewal suffered so much critique that new strategies had to be developed.

The Dutch situation is different from the Swedish situation. Because the Swedish neutrality was honoured during the Second World War, there was not much war damage. There was however an urgent need for the realisation of many dwellings, as the population had grown significantly in a short period of time. The cities had not grown similarly and living conditions in Stockholm were appalling with overpopulation being a major problem (Legeby 2013). This led to the creation of the "miljonprogrammet". Earlier on progressive urban experiments with garden cities and early modern neighbourhoods were realised, but from 1965 to 1975 a million dwellings were built in Sweden, or about 25% of the total housing stock. Most of these dwellings were built in new modernistic neighbourhoods, leading to green neighbourhood communities with apartment blocks being well connected to public transport. The general quality of building was high, as there were no shortages of building material (Pekelsma 2009), although the architecture is now

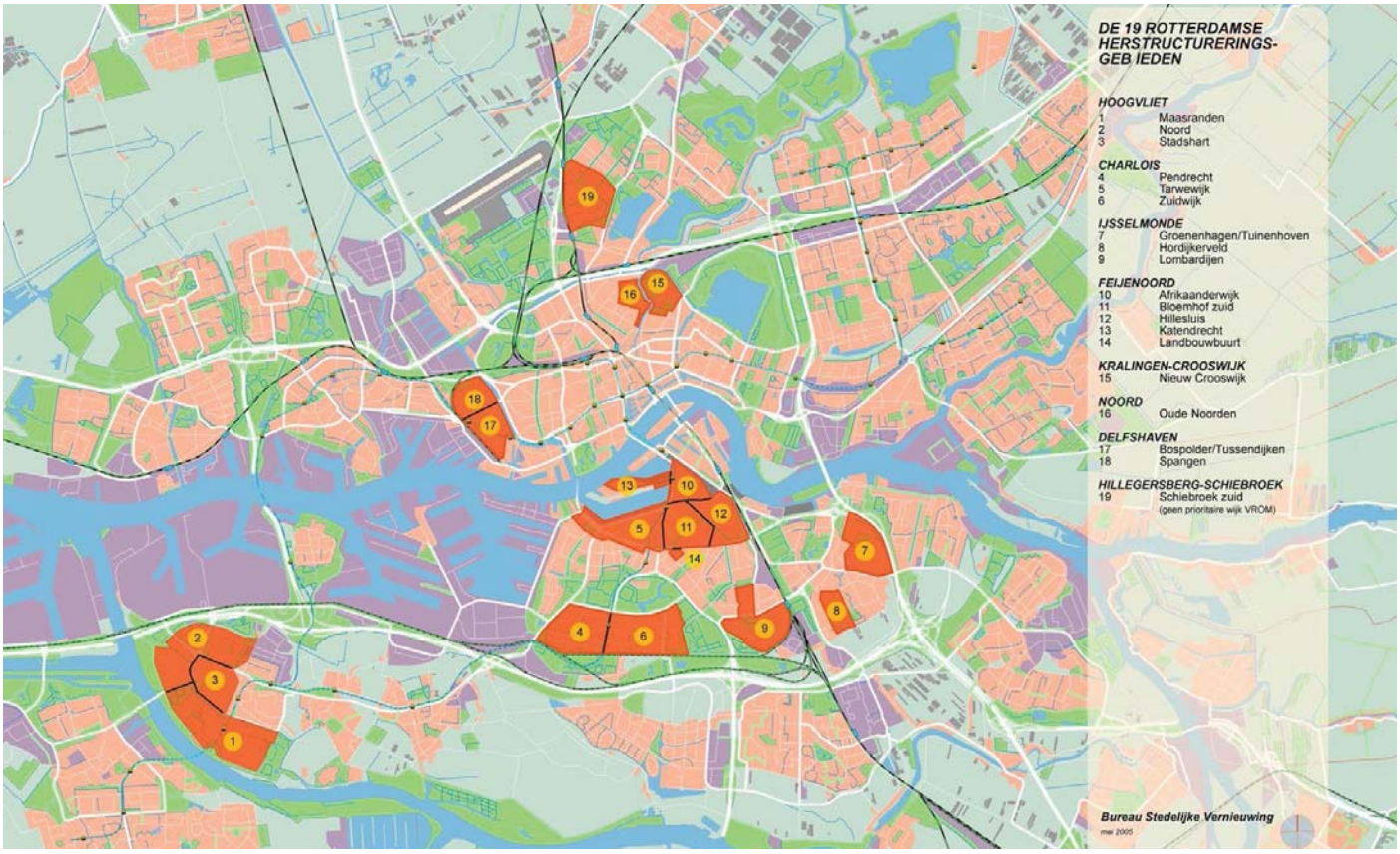
perceived as old-fashioned.

Contemporary urban renewal
From the recent past it seemed inevitable that policies on urban renewal had to change. Except that many professionals, policy makers and inhabitants were not happy with the strategy of mainly building higher quality dwellings in the problematic neighbourhoods, the insights of the way the government deals with land use planning also changed. Following Meuwese (2012) the policy was aimed at attracting more autochthones and wealthier people into problem neighbourhoods, but this deemed unsuccessful. Currently the focus has shifted to people being able to climb the social ladder in their own neighbourhood, instead of moving out (Meuwese 2012; Bol & Söderhelm 2013).

Spit and Zoete (2009) argue that till the 1960s "blauwdrukplanning" (blue print planning), a very rigid way of planning, was the norm in the Netherlands. This then shifted into "procesplanning" (process planning), in which a master plan formed the backbone of the process. At the end of the 1980s people thought that spatial planning was a finished process, but an urge for more flexibility was needed after the end of economic growth in that period. This resulted eventually in open planning which is a denominator for a range of interactive policies based on communicative planning.
Ekkers (2006) adds that the government has become willing to accept market forces in disciplines, such as spatial planning, that used to be dominated by quasi-governmental enterprises.
This change can be described as the evolvement from top-down towards bottom-up planning, in which listening to the inhabitants has become a priority.

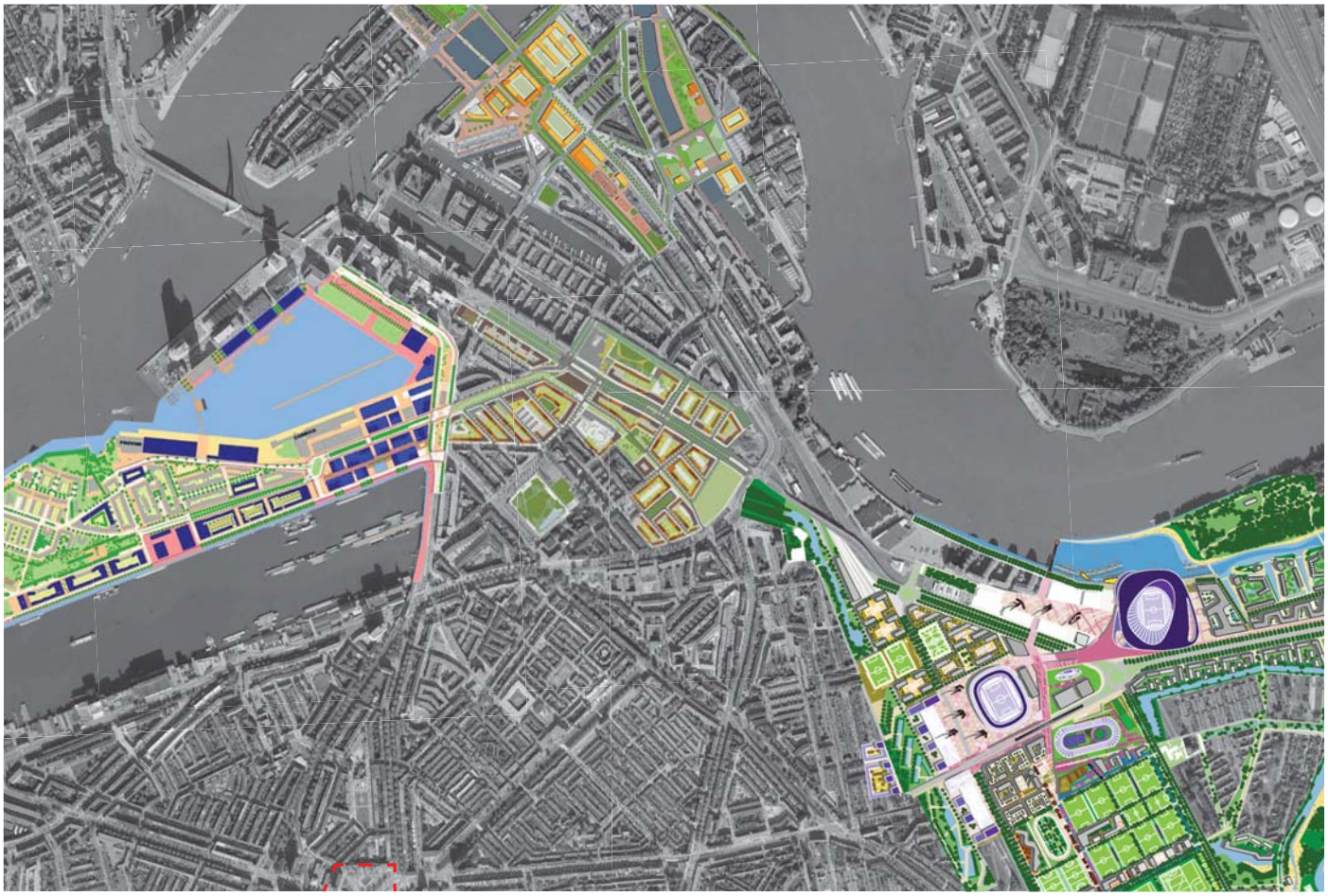
The mentioned changes in urban and spatial planning have resulted in the current vision that plans and planning need to be flexible and so to even survive periods of economic downturn or changes in political climate. As the process of large interventions can take over twenty years it is very probable that several of these kinds of hurdles might occur during the execution of a plan. The communication between the involved actors is vital for the implementation of plans. Also because of the involvement of market parties and inhabitants, more actors became involved in the process, making it more complex. Adjusting and being aware of all interests is essential in a successful planning process.

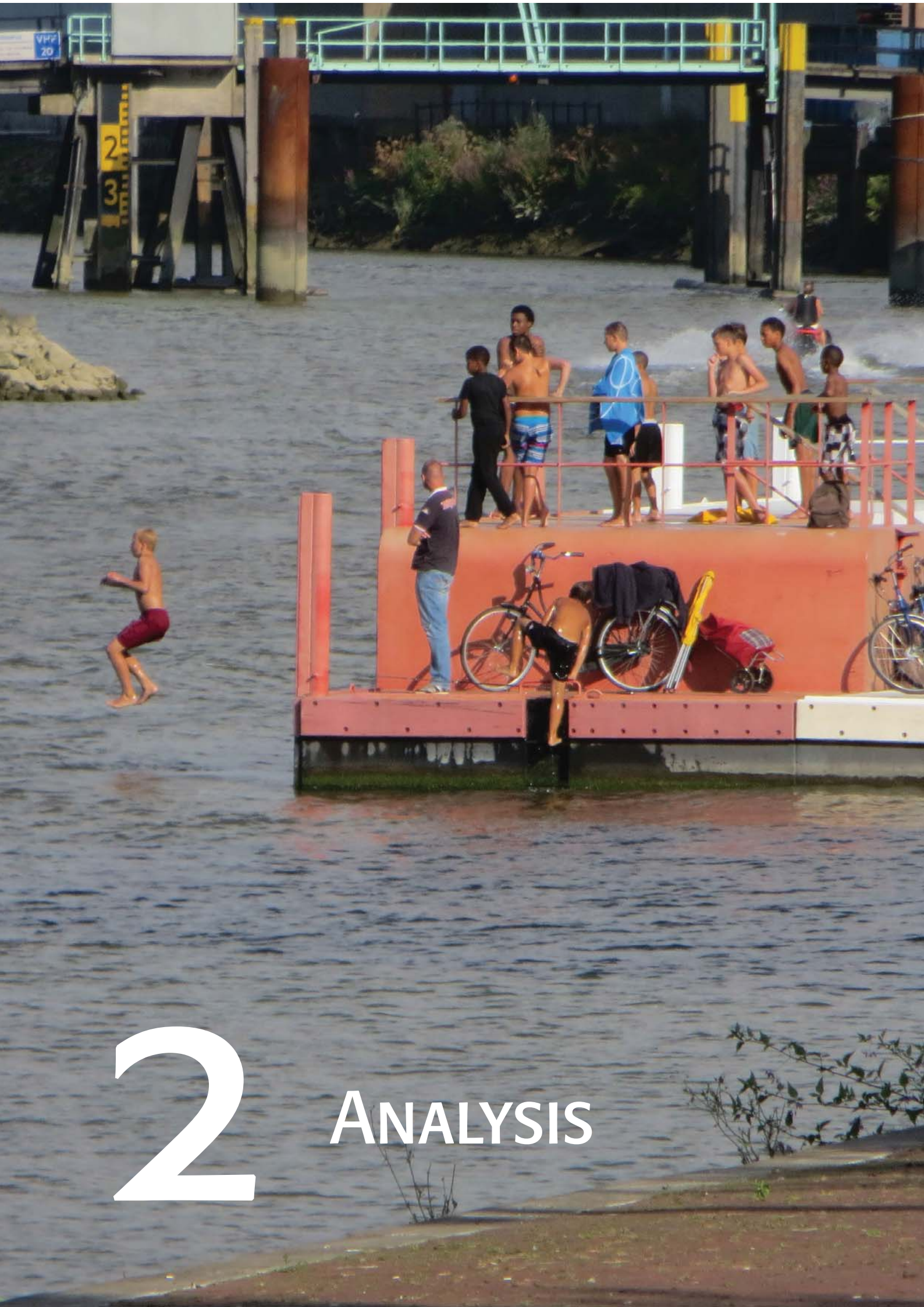
Regardless of all interests of market parties a vision or strategy is still needed by the municipality or land use planning organisation, as it will likely act as the bearer of the intervention.
Inspiration for probable solutions can come from Sweden, as similar social problems are found in Dutch and Swedish problem neighbourhoods. Comparison of improvement strategies brings up new ideas to define an applied strategy for Rotterdam South.



The urban renewal neighbourhoods in Rotterdam.
Source: Bureau Stedelijke Vernieuwing

Redevelopment plans in Rotterdam South of Katendrecht, Feijenoord, Parkstad and Stadionpark. Some of the projects are still under discussion and unsure of being realized.





2 Analysis

Location analysis

Social problems of Rotterdam South

Rotterdam South covers an area of about forty square kilometres, without the extensive harbour areas, with about 230 thousand inhabitants, roughly comparable to Eindhoven by inhabitants, but on an area only half the size. The area represents about one-third of Rotterdam and is located on the south bank of the river Nieuwe Maas, part of the Rhine delta. The southern part of Rotterdam developed quickly when the port started to grow at the turn of the 20th century and was known as an area of hard working port labourers.

	Land area (km^2) *CBS (2012)*	Population *CBS (2012)*	Density (inh/km^2) *CBS (2012)*	Households near social minimum (%) *CBS (2011)*
Rotterdam	208,80	616 260	2 952	17
Rotterdam South	*39,57*	*229 730*	*5 806*	19
Feijenoord	*6,62*	*72 480*	*10 946*	25

Demography of selected parts of Rotterdam.

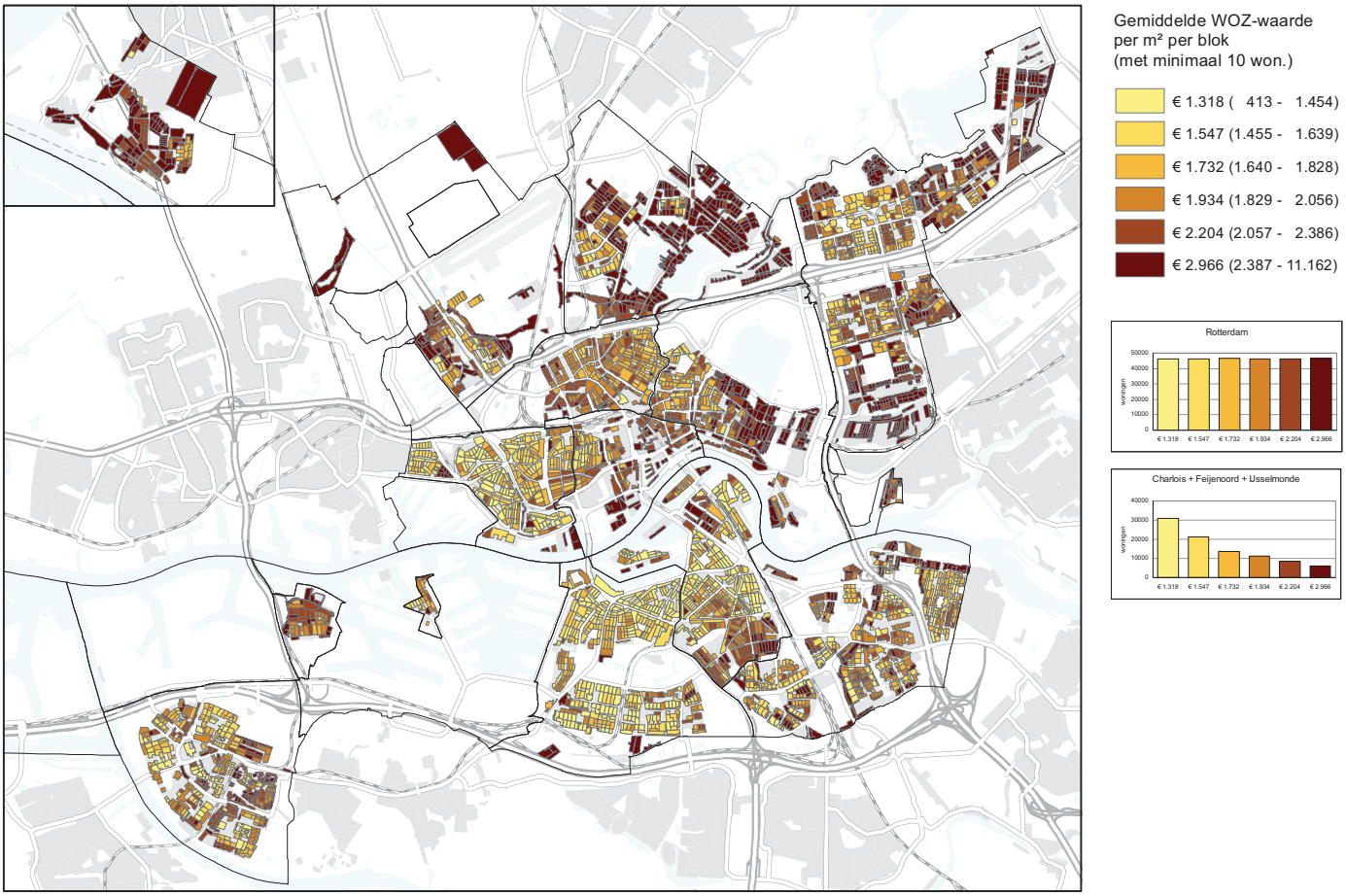
The project focus is on the sub-municipality of Feijenoord and a part of Charlois. Most neighbourhoods in this area are now known as problem neighbourhoods and face several types of problems, notably Afrikaanderwijk, Bloemhof, Hillesluis and Feijenoord. It is a very densely populated area with houses mainly built between 1900 and 1930, with some older and newer stretches. Urban renewal created large scale changes and new dwellings in the 1970s and 1980s. Although famous football club Feyenoord comes from the area, South has a less reputation within Rotterdam (Fortuin & De Zeeuw 2003). While within the Netherlands the area is seen as the biggest problem neighbourhood of the Netherlands, it is the only neighbourhood receiving national investments as of 2013 (Tempelman 2011; Bol & Söderhelm 2013). Despite the negative image some famous urban and architectural projects, the Kiefhoek and garden city Vreewijk, have been realized near the project location.

Character

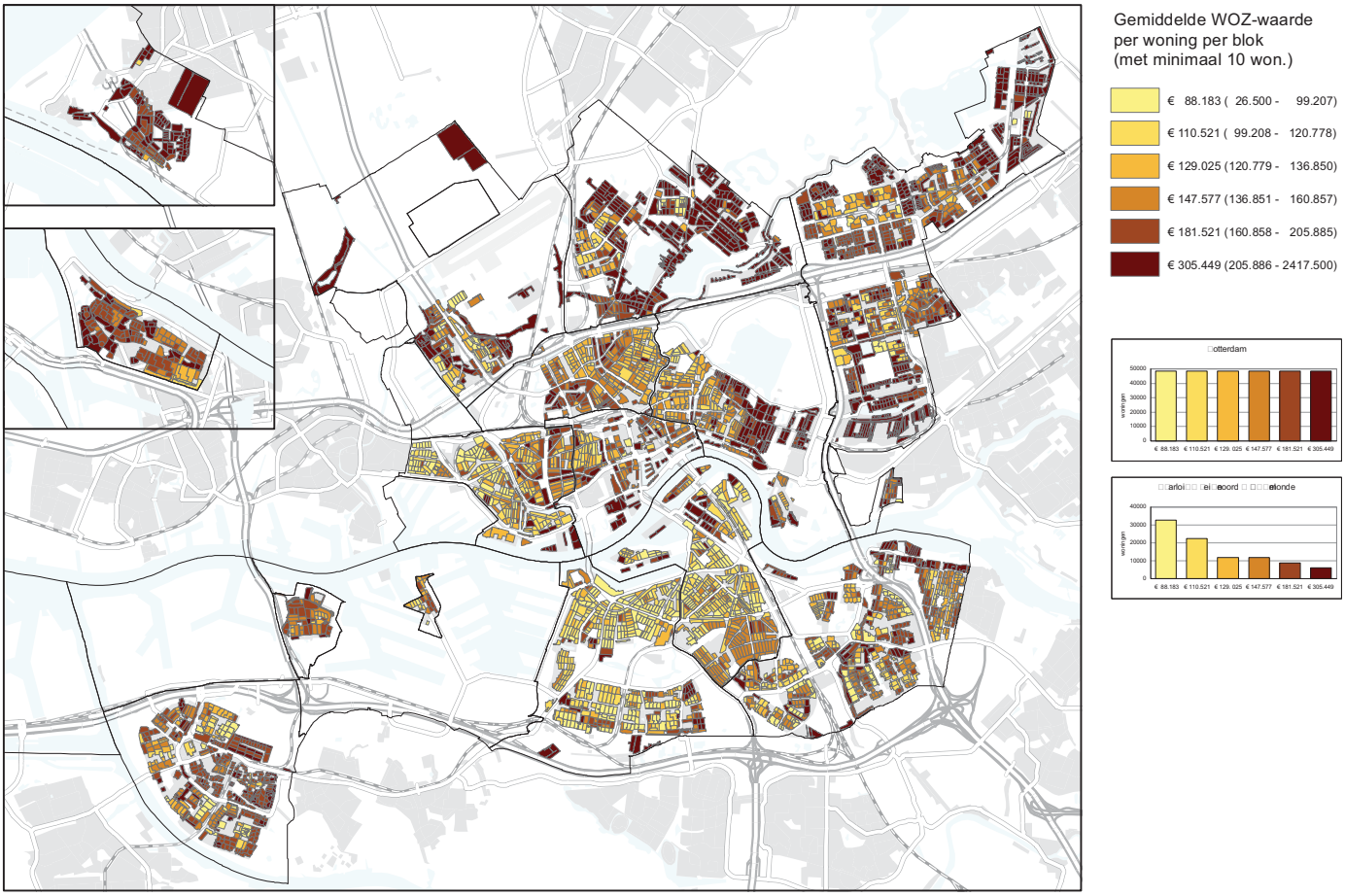
From location visits an impression of the character of the neighbourhood was made that could give a more personal feeling and opinion of the area, which later on could be used for the design tasks. Hidden problems behind front doors, or the closing of the Islamic Ibn Ghaldoun school (located in Hillesluis) after widespread exam fraud in 2013, do not become visible during short-term visits. The most important social impressions were:

- The Beijerlandselaan is a very international shopping street with many Turkish, Caribbean, Chinese, North African, Bulgarian and Polish shops.
- The main roads and especially the viaduct across the railway are very busy, with many cars speeding. Overall traffic is chaotic, with the design not accommodated for the way people are using it.
- In front of the mosque a new axis and square has been created, but its use is very limited. The location at the edge of the neighbourhood does not help to make it a lively place.
- There is a large diversity in character of neighbourhoods. With differences in population demographics and building styles. Feyenoord, Afrikaanderwijk and Hillesluis can easily be distinguished from each other.
- Probably because of the bad image the expectations were not very high from the beginning, but the atmosphere was not as bad as expected when visiting, than it seemed from stories and news articles.

To be informed more about the general problems in Dutch neighbourhoods a walk through the similar Transvaal neighbourhood in The Hague was made, under the guidance of municipality delegate for Transvaal/Schilderswijk/Station/Rivierenbuurt Meuwese (2012). According to Meuwese the core of the problem in these kind of neighbourhoods is especially the combination of several smaller issues, mainly high unemployment, high criminality, low education, few chances and low housing and spatial quality. The combination makes it problematic to overcome all problems, while people tend to move away when things get better. Providing better and more diverse living opportunities for these people is the key to improve the neighbourhood. Bol and Söderhelm (2013) of the Department of Urbanism and Housing (DSV) in Rotterdam, confirm the problem field as sketched by Meuwese in The Hague.



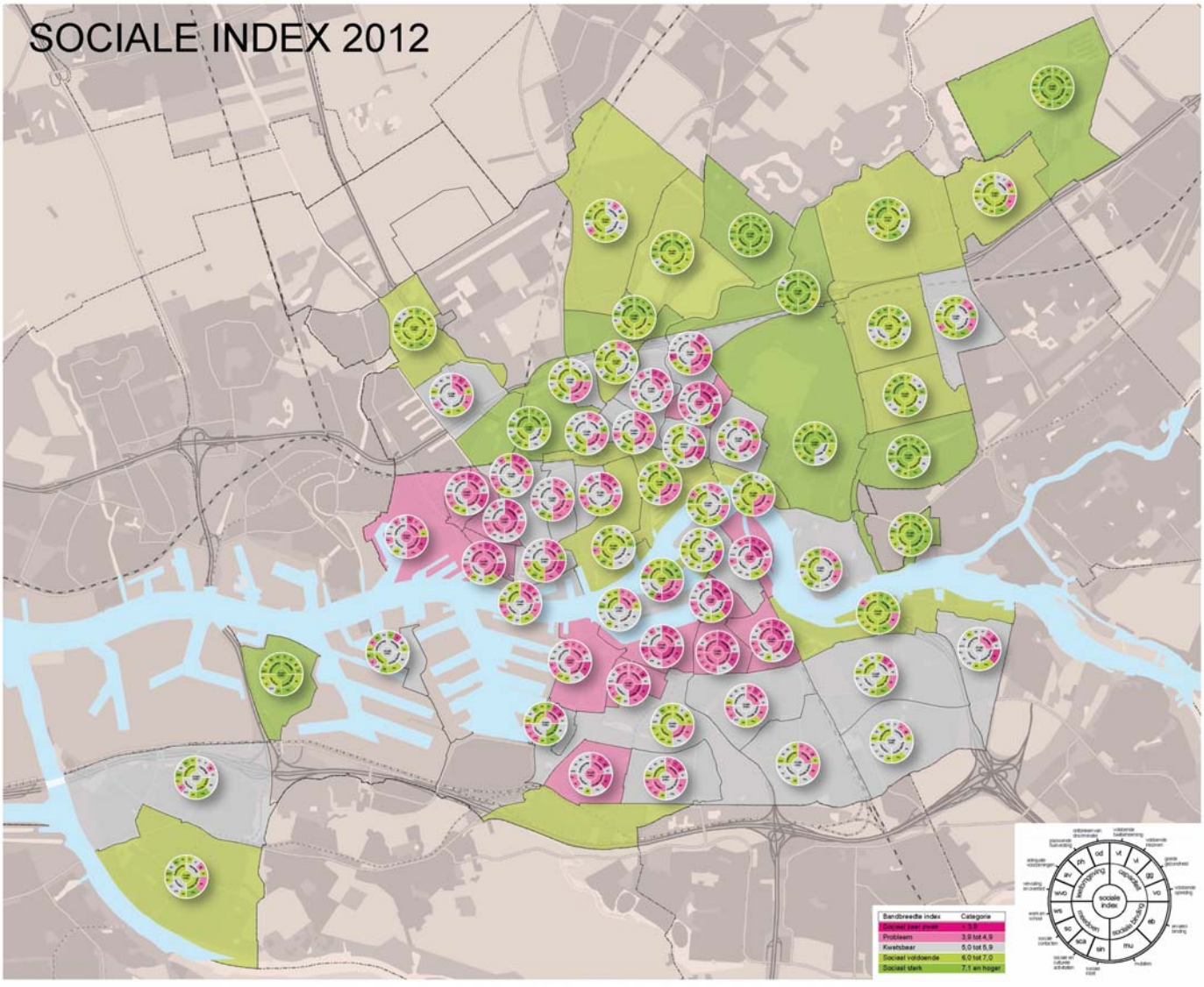
Average WOZ-value per square meter per block (above) and average WOZ-value per dwelling per block (below).
Source: COZ, adaption SO Rotterdam



Geographic differences
To illustrate the on-going social situation a few maps are lighted out, from which the most troubled areas in Rotterdam are pointed out, because they score the worst on these subjects.
Two maps indicate the WOZ-value of housing in Rotterdam by block. WOZ stands for 'wet waardering ontroerende zaken', and is used to valuate real estate for tax purposes in the Netherlands. The first map shows the average dwelling price in a block of houses, the second map shows the average WOZ-value per square metre (COS 2013).

The average dwelling-value is overall seen correlated with the average square metre price, meaning that where square metre prices are low, the total WOZ-value of the dwelling is also low. Some exceptions can be seen in the western part of the city, where square metre prices are not very high, but dwelling size is large, resulting in more expensive houses. On South the opposite happens, in the core of this area most housing prices are (very) low, but Vreewijk and Bloemhof as popular neighbourhoods have higher square metre values, meaning that the average dwelling size is small.
When looking at the overall picture the district of Feijenoord has the lowest housing values of Rotterdam and together with the western part of the city the lowest square metre values.

The social index (COS 2012) is another important indicator for the social situation in Rotterdam. In fourteen subjects, divided in four sectors, scores are given to compare and value living standards per neighbourhood. Again the South and Western parts of the city score least and are rated as problem neighbourhoods. The neighbourhoods of the project area score the least in the sector capacity, especially in understanding of language and sufficient income. Other large problems are the bonding with the neighbourhood and suitable housing, while also participation in work, school and social contacts is a



Social index of Rotterdam per neighbourhood.
Source: COZ, adaption SO Rotterdam

weak point. The social index is an important tool to make social exclusion visible and indicate issues for improvement.

A final indicator of illustrating social problems is the safety index. Every two years the situation is monitored by inhabitants that fill in questionnaires, reporting on safety, nuisances and vandalism in their neighbourhood. From the Rapportage Veiligheidsindex (2012) an overall improvement over the last few years in Rotterdam is visible. A reduction in the number of problematic areas has taken place. Where in 2008 still an unsafe neighbourhood was found in the city (Oude Westen), now only two problem neighbourhoods remain, Hillesluis and Bloemhof, both located in the project area.

Conclusion
The main conclusion that can be drawn from the analysis of social problems in Rotterdam South is that most neighbourhoods achieve well under the city average. This is expressed, amongst other dwelling values, in high unemployment and social welfare rates. These problems lead to social exclusion within the neighbourhoods. Direct measures to relief these problems are hard to find, as the source of the problems is the result of a long list of troubles and disadvantaged elements in the spatial and social structures of the neighbourhoods. From the view of a designer some spatial interventions can improve some of these underlying sources for the problems, but it is an illusion to think all the social problems could be solved right away.

Spatial problems of Rotterdam South

In the light of an architectural and urban intervention on Rotterdam South the spatial problems give more reason to define an approach. During the location visits, also a few major spatial problems were spotted.

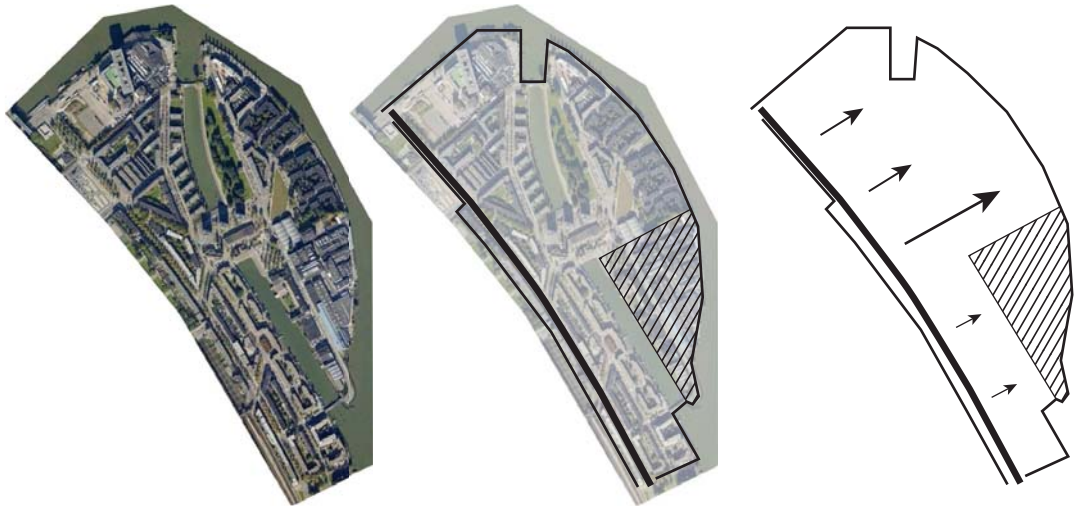
- The core of the neighbourhoods is hard to access by public transport, because the Zuid railway station is really a neighbourhood station, with bad connections across the railway line and not even a place to store bikes.
- Except the railway line large viaducts and broad roads form barriers between neighbourhoods and make it unpleasant to walk.
- Contact with the river is obstructed or blocked in many places; there are no indications of the close proximity of the river to the location.
- There is a lot of unused space near well-trafficked road intersections, ideal places for development that are now greenfield land.

The location visits proved to be base for further research into the selected neighbourhoods around the intervention location.
Even in morphological maps the open structure, or lack of structure, is one of the most striking elements in Rotterdam South. The otherwise very dense built-up area in the neighbourhoods is bordered by the Rotterdam – Breda railway line, a large open space, where a former tram depot was located and historic harbour area that await redevelopment. The neighbourhoods form isolated communities within this structure. Building blocks are interrupted and public buildings are positioned isolated without a connection to the daily urban life.

Current situation of morphology (left) and structure (right) in Rotterdam South.

Spatial analyses of neighbourhoods in Rotterdam South. From satalite to schematic drawing.

Hillesluis



Feijenoord

Afrikaanderwijk

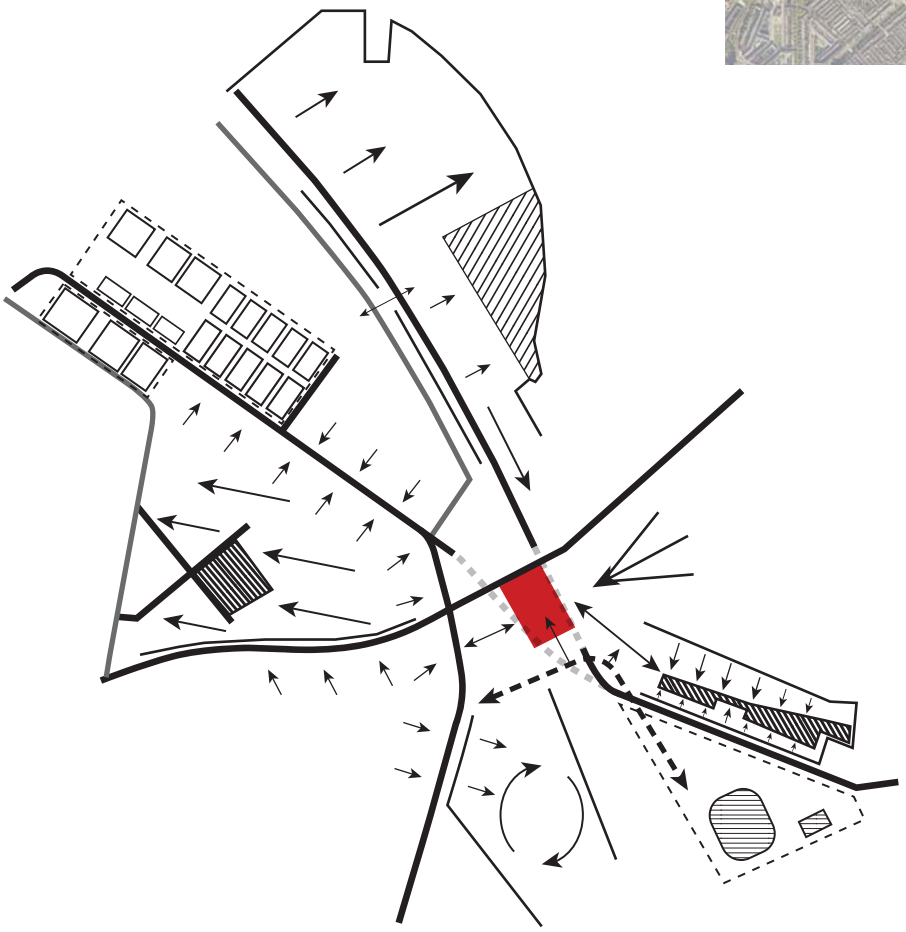
De Veranda

Kop van Zuid

When zooming in to a more detailed neighbourhood scale, as was done in the schematic drawings, organization and barriers become visible. The schemes include Hillesluis, Feijenoord, Afrikaanderwijk, De Veranda-Kuip area and Kop van Zuid.

All neighbourhoods have a different organization and orientation, which is shortly described below. Hillesluis has the Beijerlandselaan or Boulevard Zuid running through its heart, an important shopping street with many multi-cultural businesses that cuts the neighbourhood in two. The western side is very fine meshed structure with many connections to the Putselaan, Beijerlandselaan and Hillevliet, on the edges of this part of the neighbourhood. The eastern part however is hardly connected to the Beijerlandselaan and the railway line forms an impenetrable border on the eastern side, closing of the Hillesluis from the river. This part of the neighbourhood is strongly inside focussed, almost functioning like a large courtyard. Currently a project under construction creates a new pedestrian connection to the Beijerlandselaan.
Feijenoord has a very isolated position sandwiched between the railway tracks and river. Although it is connected to the Zuid railway station, other connections to the city require detours and stretches outside built-up area. As a consequence the orientation of the neighbourhood is towards the river, instead of the rest of Rotterdam.
The Afrikaanderwijk borders Hillesluis at the green Putselaan. The main orientation of the neighbourhood on the other hand is towards the main square, market and shopping areas that run from the core to the west, where the metro and Maashaven are located. The dykes that protect against floods mean that there are barriers and a height difference on the west, north and especially the eastern side of the neighbourhood.
De Veranda is a new development project on the river edge with large apartments, above large-scale entertainment and wholesale enterprises. These form two squares for parking and effectively close the area off from the adjacent area around De Kuip and the Top sport centre. At the moment this area is very isolated from other living areas and while the river shore has a lot of potential, it dead-ends on both sides of the neighbourhood.
The Kop van Zuid is a redevelopment of historical harbour and industrial areas into a new city district with eye-catching architecture. The highest buildings in the Netherlands are located at the northern end of the Laan op Zuid, the main axis that connects the centre of Rotterdam, over the iconic Erasmus Bridge, to South. The southern part of this axis is part of the Parkstad urban plan, but as one part of this plan has been approved, lay some stretches of the boulevard still open for development. The blocks in the Kop van Zuid connect barely to surrounding neighbourhoods, in part as old harbour basins form barriers. But are also quite individualistic in design. Plinths try to bring life to the Laan op Zuid, but as long as the axis is only partly filled, liveliness is lagging behind.

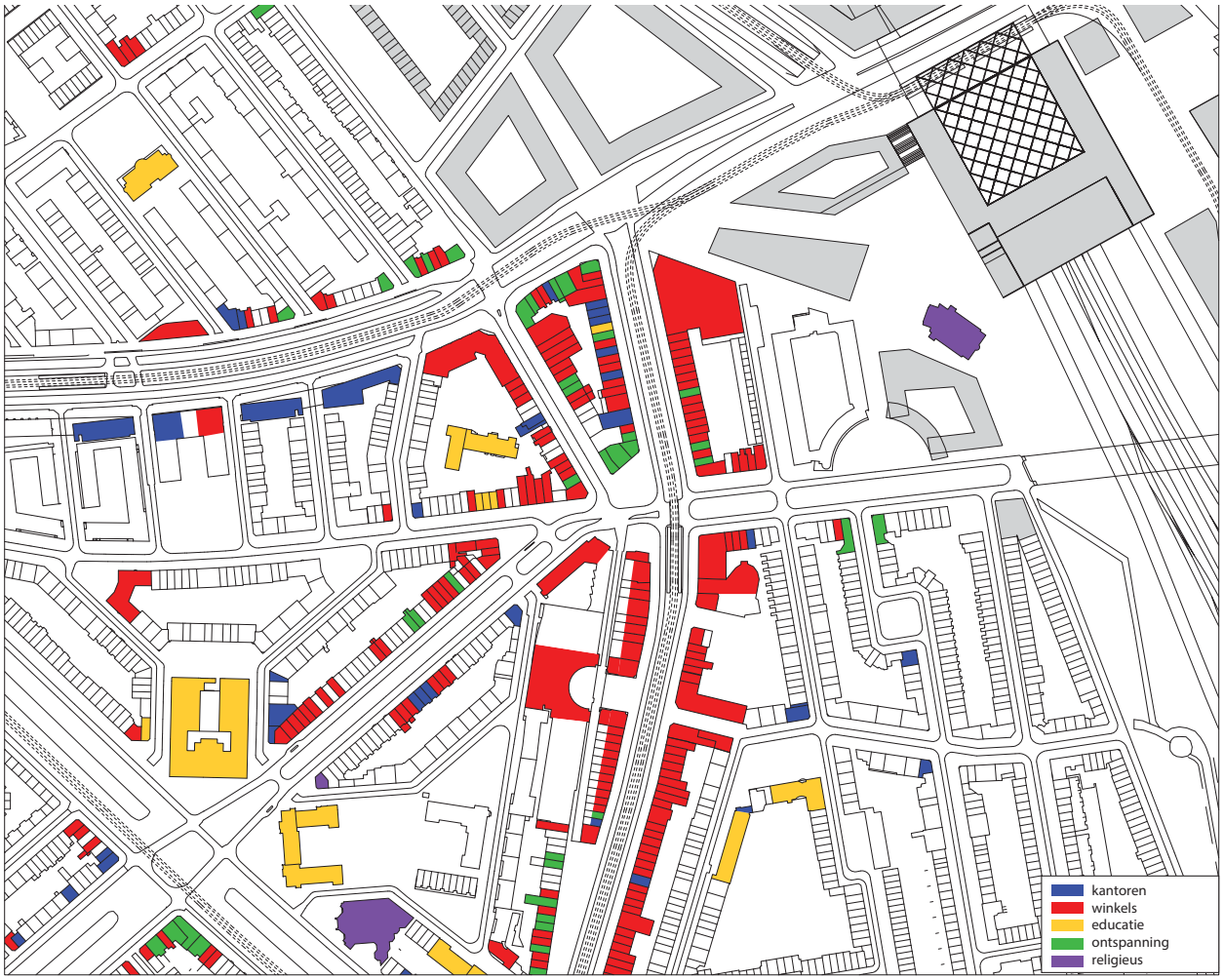
Topographic combination of the schemes.



When the individual schemes are combined in the topographic map of South, two things stand out. One

The desired schematic structure of the project area after the interventions.

Analysis of active plinths (above) and specified to the type of activity (below) in the project area.



is large open gab at the southern end of the Laan op Zuid. The other is the strange place where barriers fence neighbourhoods off from neighbouring areas. It seems that barriers are formed almost on purpose to shut the neighbourhood off of other influences. The western part of Hillesluis for example opens up towards all sides, but it seems as if the Afrikaanderwijk and eastern part of Hillesluis reject these efforts. The Putse- and Beijerlandselaan do not form so much of a barrier by itself, but by sparingly connecting to these streets and orientating to other directions a sharp contrast is formed.

Activities
Spatial barriers hinder use, but in many cases people will find a way to make use of situation in order to continue their activities. The neighbourhoods in the location are mainly living areas, but local and sometimes even above local activities are placed in the plinths along the main streets in the district. The centrality map shows the main concentrations of activities in Rotterdam. The city centre is the most activity dense area, while the south of Rotterdam is much less covered. There is also not a main concentration of activities, which means that several sub-centres compete for activities of a bigger scale. The main areas for these types of functions on South are at Zuidplein and Ahoy, around the Wilhelminapier and near De Kuip and Beijerlandselaan. None of these areas are connected to a railway station, while the metro connects toward Rotterdam above the river and not to the surrounding neighbourhoods. The lack of a distinct centre makes the potential location of a new IC-station a likely candidate to become the main or shared sub-centre of South.

The close proximity of the planned railway station to the Beijerlandselaan, Kuip and Laan op Zuid brings development potentials for new activities with high accessibility. These can hook up with the existing activities taking place in these areas. The plinth maps show the locations of active plinths in the station area or and give specification of the sort of activities taking place.
The Beijerlandselaan is mainly a shopping street, with importance for Hillesluis, Bloemhof and Vreewijk. Activities in the neighbourhood itself are more local and involve mostly small eateries, specialized shops and offices. Most of these activities are found in the "open" western half of Hillesluis. Noticeable is also the Essalam mosque that lies just outside the built-up area of Hillesluis that faces the building with its back. The square in front of the building is neither taken into the urban fabric, and future use of this public square would require changes in the adjacent buildings.

The character of plinths and activities east of the location is focused on entertainment, sports and recreation, with large sports complexes, a large cinema and a golf shop. This is complemented with wholesale shops and furniture stores.
Along the Laan op Zuid plinths are flexible to be rented to a wide range of shops and businesses, but because of the limited liveliness and economic crisis few shops and eateries are located in this area.

Summary of focus points

- Uninviting public space

Rotterdam is less bike-oriented than student cities like Delft, Utrecht or Amsterdam. Cars have a more prominent place in the city, also because of the modern style in which the city was redeveloped after the war. In the project area cars queue in on the Beijerlandselaan, Putselaan and Laan op Zuid during rush hour and shopping times. The urban space is not attracting people to use other modes of transport that also contribute to a livelier city, such as Jane Jacobs (1961) and Jan Gehl (2010) envision it. A livelier city could improve interaction and involvement in the neighbourhood, while better connections increase the range of people, increasing their opportunities for work and education.
On a smaller scale barriers are formed by neighbourhoods to areas that try to open up towards those same neighbourhoods.

- Amenities are placed in-between neighbourhoods

In Rotterdam South most activities on a scale higher than local are placed in between neighbourhoods. Most neighbourhoods are very much turned inwards, which makes these usually important or beneficial activities hard to reach, especially for vulnerable groups, such as children, elderly, handicapped and also sometimes women. From the analysis it is visible that especially metro and railway stations are not part of the neighbourhood, but placed in between. Commercial centres such as Zuidplein or the Beijerlandselaan,

that has very few side streets on a neighbourhood level, form barriers or are independent areas. And the new mosque is facing the back of Hillesluis. One of the exceptions to the placement of important function outside the neighbourhood is the Afrikaandermarkt and the connecting shopping streets that focuses towards the Maashaven. The market is in this way barrier-free to visit, which might explain the success of it. Most of these functions are located on important roads that connect different parts of Rotterdam. This way the function tries to reach people from all surrounding neighbourhoods, only the neighbourhoods are not cooperating as they are turned inside. The only way to improve this would be to focus the neighbourhoods more towards the main axes that now form borders.
However sometimes it also has advantages to place buildings outside living areas, especially in the case of the Feyenoord stadium or Ahoy and the large crowds that are drawn to it during match days or concerts.

- Public Transport connections

The accessibility of Rotterdam South by public transport is much less compared to the northern river shore. Existing railway stations are eccentric and serve only small parts of Rotterdam South, sometimes even only during events. Public transport mostly connects parts of Rotterdam South with the city centre, like the metro, railway and most tramlines. High quality connections ("hoogwaardig openbaar vervoer" or "HOV" in Dutch) between the neighbourhoods are almost non-existent. There is not even a tram connection from Zuidplein that connects to the metro.
There are however potentials to improve these connections with fairly few interventions. An IC-station would serve many trains going across the national network, for example Lelystad, Amsterdam, The Hague and all the way to Venlo and Vlissingen, to name but a few. Tram tracks are currently located on the Putselaan and running a tram on this stretch of route would connect the eastern part of South directly with the metro network. The Waterbus passing by on its way to Dordecht could get a connection to the national rail network, when a stop is made near a potential IC-station.

- Third city bridge

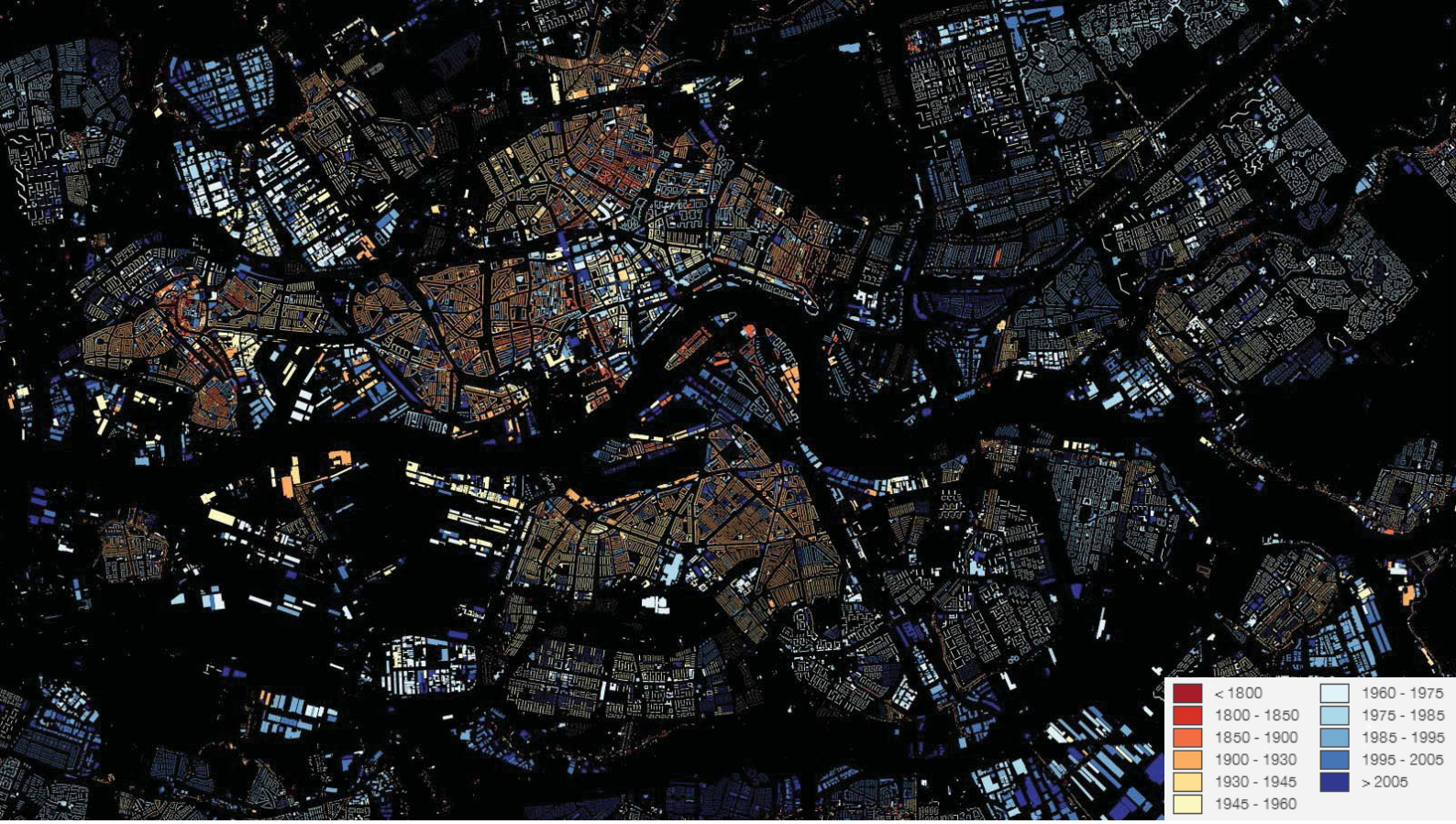
Closely connected to the substandard connections between neighbourhoods is the lack of a third city bridge. A third city bridge would connect the Erasmus University with Rotterdam South, where many students live. Thereby it could relief the congested metro trains running between Kralingse Zoom - Beurs and between Beurs - Zuidplein. A planned metro line is also high on the wishing list of the municipality (Bol & Söderhelm 2013), but light-rail could be a temporary option that fits better in the current budgets. Except connecting the university the city integration would be amplified, creating more balance in the internal relations. Finally the design of the bridge has an iconic value and is a part of city marketing, which could not be explained clearer as seen with the Erasmus Bridge two kilometres away.
Fortuin and De Zeeuw (2003) write that a bridge has effects on the concentration and spread of people in the city and in the social structure. They continue that in this respect the "village-like" social structure on South can be connected with the present infrastructure, that now isolates communities. 'Infrastructure can break or make communities. […] Urbanity exists by the grace of plurality and stratification, and in that sense a bridge will make the city more interesting (complex)' (Fortuin and De Zeeuw 2003: 4).

- Riverfront development

The current riverfront is very fragmented, with some areas having been beautified recently, while other parts are dilapidated or even inaccessible. Rotterdam as a port city heavily relies on the river. De Veranda has discovered the qualities of dwellings near the water, but is an isolated island in a further industrial and greenfield context. Large Home Depot stores shield parts of the river from inhabitants and passers-by. While the railway barrier also keeps away people searching for the river. A continuous development can upgrade the spatial qualities of the river and create good living conditions that can connect to form a larger network with the developed parts of Feijenoord and Kop van Zuid.

- Integration

Education level and bonding with the neighbourhood have very much to do with integration in society. Although integration can be considered as a social problem, spatial characteristics also have an effect. From the social monitor came forward that language understanding was a weak point in every of the involved neighbourhoods, just as experienced bonding. When someone lives in an attractive living



Age of buildings in the Rotterdam metropolitan area.
Source: Waagsociety CitySDK, data from BAG.

environment, it is much easier to bond with it and feel at home. Educational functions, focused on people of all ages, like evening schools, libraries and other cultural activities can attract people to society improve social contact and language understanding. The governmental institutions that are now located in these areas are ample and do not reach the right target groups. More actors are keen to attract a wider range of people, while willing actors in the neighbourhood have a place at the fringe. The mosque is the main example, as it is would like to become a mediator for social improvement, not only for Muslims but also for everyone in the neighbourhood (Tamimi Arab 2013). Better spatial integrations for these types of initiatives are likely to deliver better results.

Other station areas

Netherlands
The station area in Rotterdam is not the first station in the Netherlands that has an important function, while it is not in the main centre of a large city. In the following list an inventory was made to analyse the station areas found in the Netherlands in the sub-centres of large cities and in mid-sized cities comparable to the situation of the new Zuid station. This means that some of the main railway stations in the Netherlands are not included in this list. From the functions within the station area the character and striking features become clear, while the daily number of passengers give an indication of the size of the station, although this is also influenced by the position in the network.
The research needed for creating this list has as a positive side effect, that it was able to show many precedents and examples for creating a similar station area.

Most station areas have one or a few functions with a regional significance, such as stadiums, large shopping malls or outlet centres, important educational institutions. Most of the time these facilities have a positive influence on the number of passengers and the scale and attractivity of the station. Following the node-place model of Bertolini (1998) some of the nodes can be called strongly underused. The potential of using Duivendrecht as a place for example, is much bigger than that might be expected from a large node within the urban area of Amsterdam. In countries like Japan where private operators run railway lines and develop the areas around their stations to attract ridership, similar functions are strategically spread along the line (Hagers 2012a). As an example entertainment functions are positioned within suburban areas to create a reversed rush hour and fill the near empty trains, running in the opposite direction of the rush hour flows.

Railway Station	Passengers (2009)	Station area
Rotterdam Zuid	Ca. 17.000 – 35.000	*Cinema, Stadium, Top sport hall, Mosque; Police, Outlet Centre*
Alkmaar	21.402	*Residential areas, Offices, Justice court*
Almere Centrum	19.769	*City centre, Shopping area, Office towers*
Amersfoort	63.185	*Offices, Residential areas, the "Rijtuigenloods"*
Amsterdam Amstel	25.014	*Headquarters, University, Residential areas*
Amsterdam Bijlmer-Arena	19.562	*Stadium, ArenA Boulevard, Shopping area, HMH, Ziggodome, ROC School*
Amsterdam Lelylaan	11.036	*Residential areas, Fashion centre, Schools*
Amsterdam Sloterdijk	53.850	*Offices, Schools*
Amsterdam Zuid	36.376	*Office area Zuidas*
Arnhem	53.099	*Inner city, Park, Residential areas, Offices*
Breda	28.143	*Park, Residential areas, Inner city*
Delft	26.091	*Inner city, Residential areas, School*
Den Bosch	58.611	*Inner city, Justice court, Verkade Fabriek, Education, Offices, Residential areas*
Den Haag HS	48.762	*Hogeschool Campus, Student towers, Mega stores, Residential area*
Den Haag L.v. NOI	12.830	*Ministry, Offices, Residential areas*
Dordrecht	27.012	*School, Park, Residential areas, Inner city*
Duivendrecht	16.479	*Church, Golf course, Meadows, Village (strongly under used node)*
Ede-Wageningen	18.778	*Barracks, Enka-area (redevelopment), Residential areas*
Eindhoven	67.682	*Inner city, University Campus, Offices*
Gouda	30.886	*City hall, Park, Residential areas, Inner city*
Hengelo	16.911	*City centre, Offices, ROC School*
Hilversum	23.227	*City centre, Residential areas*
Hoofddorp	12.508	*Offices, Hotels for Schiphol (bad integration)*
Hoorn	14.578	*Inner city, Hospital, ROC, Supermarket, Parking*
Leiden	75.029	*Inner city, Hospital, University, Offices (successful integration)*
Lelystad	11.037	*City centre, City hall, Wholesale businesses, Hospital*
Rotterdam Alexander	16.116	*Woonboulevard Alexandrium, Offices, District hall*
Rotterdam Blaak	14.662	*Market (hall), Extraordinary architecture, Shopping area, City centre*
Rotterdam Lombardijen	6.595	*Hospital, Residential areas*
Schiedam Centrum	16.208	*School, Offices, Residential areas*
Sittard	11.748	*Headquarters DSM, Residential areas, Theatre, Prison*
Tilburg	33.455	*City centre, Residential towers, Offices*
Utrecht CS	228.787	*City hall, Covered shopping centre, City fairs, Offices, Inner city*
Zaandam	16.843	*City hall, Cinema, Hotel, Canal, City Centre (transition zone)*
Zwolle	47.477	*Residential areas, Government, Offices, Swimming pool*

Analysis of activities in station areas, in Dutch mid-sized railway stations and cities.

In the Netherlands most of the functions have been developed over the years by growth or in structure visions. From the list however stations attract more ridership when there is a mix of functions, preferably with some special attractions that are not found in other parts of the same urban area. Further the city centres still attract many people.

Rotterdam

When these 'special' attractions in the greater Rotterdam area are mapped together with the main public transportation networks it becomes visible that there is a clear correlation between the objects, stemming from the need to connect important functions. In the places where the railways were unable to connect important hospitals, parks, historical centres and other amenities, the metro was constructed. This is especially clear southwest of the city centre, Rotterdam South and in Blijdorp. Almost every railway station has one or more characteristic amenities within its station area. Central Station and Blaak connect to the city centre; Alexander has the large mall and outlet centres while it forms the main node in the eastern part of the city. Schiedam is close to its historical inner city, while station Lombardijen is next to the Maasstad Hospital and metro station Zuidplein is important to reach Ahoy and the large shopping centre. Only the current Rotterdam Noord and Zuid stations are not near a similar function. While some of the least connected areas, de Kuip and the Veranda, are very close to the railway, but have no continuous operating station. The proposed relocation and upgrade of Rotterdam Zuid, will make these areas within reach of the new station and has the potential to attract extra travellers outside the crowded rush hours.

Main activity centres in the Rotterdam metropolitan area and their position to public transportation (rail, metro and boat).

Comparison with visited Swedish neighbourhoods

In addition to the comparison with station areas in the Netherlands, comparisons can be drawn with the Swedish neighbourhoods. To see if there are possibilities for Rotterdam to learn from the Swedish situation.

Structure of Stockholm

Stockholm is an interesting case study as the city has had a transport oriented developing strategy from a very early stage. In this sense only cities in Japan and Copenhagen have similar long running experience in TOD-planning (Bertolini & Spit 1998; Hall 2008).

The Stockholm metropolitan area is comparable to Rotterdam in size and the way it is organized in municipalities and districts (Dutch: stadsdelen, or Swedish: stadsdelområde). Some areas not part of the municipality function de-facto as part of the city like Huddinge, Solna and Nacka similar to Schiedam, Spijkenisse and Capelle aan de IJssel in Rotterdam. Visible in the table is that Stockholm has a higher density than Rotterdam, although it has to be noted that the port of Rotterdam is virtually uninhabited and also taken with the area of the municipality. On the other hand is Rotterdam part of a large urban field with several other metropolitan areas accessible within an hour by train or car, while Stockholm is a centralised metropolis in a further less populated region.

	Rotterdam	**Stockholm**	**Stadsregio Rotterdam**	**Stockholms tätort**	**Metropoolregio Rotterdam-Den Haag**	**Stockholms län**
	Municipality		*Urban area*		*Metropolitan area*	
Area (km²)	206	188	595	382	997	6 519
Population	616 528	871 952	1 218 214	1 372 565	2 261 844	2 119 760
Density (inh/km²)	*2986*	*4638*	*2049*	*3597*	*2268*	*325*

Comparison of the urban areas of Rotterdam and Stockholm.

Stockholm is divided by Lake Mälaren, where it meets with the Baltic Sea, very similar to the Meuse River flowing through Rotterdam. The city was founded in the 13th century and grew quickly through its strategic position on the island where Gamla Stan formed the historical core of the city. Population increased during the Swedish Golden age from around ten thousand in 1600 to 60 thousand in 1700, but then stagnated because of deceases and wars. During the industrial revolution from the second half of the 19th century the population exploded and in 1950 Stockholm had 750 thousand inhabitants.
There was a need for expansion and new transportation systems to house all the new residents. Like most Dutch cities the built-up area of Stockholm in 1860 was equal to the area that now is called the city centre. The city expanded with large esplanades following a plan of Albert Lindhagen and during the beginning of the 20th century large garden cities were built. In the years before the Second World War major infrastructural changes had to be made, such as the preparation of the city for cars and in 1933 a tram tunnel or premetro was put in use. In 1950 this tunnel was transformed to the first metro line in Stockholm. During the end of the 1930s functionalism rose to prominence and pioneering neighbourhood units, inspired Clarence A. Perry (Legeby 2013) and by German Siedlungen, were built, among which Årsta (1943) is the most well-known example.
In the following two important trends are visible, a large growth in population of about 60 percent in 25 years. At the same time suburbanisation shifted many people from the inner city to live in outskirts and dormitory suburbs (Stockholmskällan 1965). The quick expansion of the city meant that housing shortages became even graver than they were before and the city traffic problems had to be solved. Also the metro network expanded quickly after several extensions to the first (Green) line, the second (Red) line was opened in 1964, while the third (Blue) line opened in 1975. To alleviate the housing shortages the "miljonprogrammet" built more than one million dwellings in Sweden between 1965 and 1975, in Stockholm mostly along the expanding metro lines in the form of modern neighbourhood communities, like Tensta (1970). Although well connected to public transport, these neighbourhoods are isolated from the rest of the city.
Some of these neighbourhoods have become problem areas, where also the 2013 riots took place. Different from the Dutch situation building quality is generally high in these areas, but forced dispersal policies concentrated underprivileged people in these neighbourhoods, while they are spatially segregated from job opportunities (Legeby 2013). In her studies Legeby tries to research and display how urban form influences spatial advantages in Swedish problem neighbourhoods, which could lead to new policies that could effectively fight segregation (Legeby 2010; Legeby & Marcus 2011).

During a study trip to Stockholm some of the mentioned neighbourhood units were visited and analysed to see if lessons could be learned from the spatial approach and early form of transit oriented design. The analytical maps offer a view of the strategic format of these neighbourhoods in Stockholm and Södertälje.

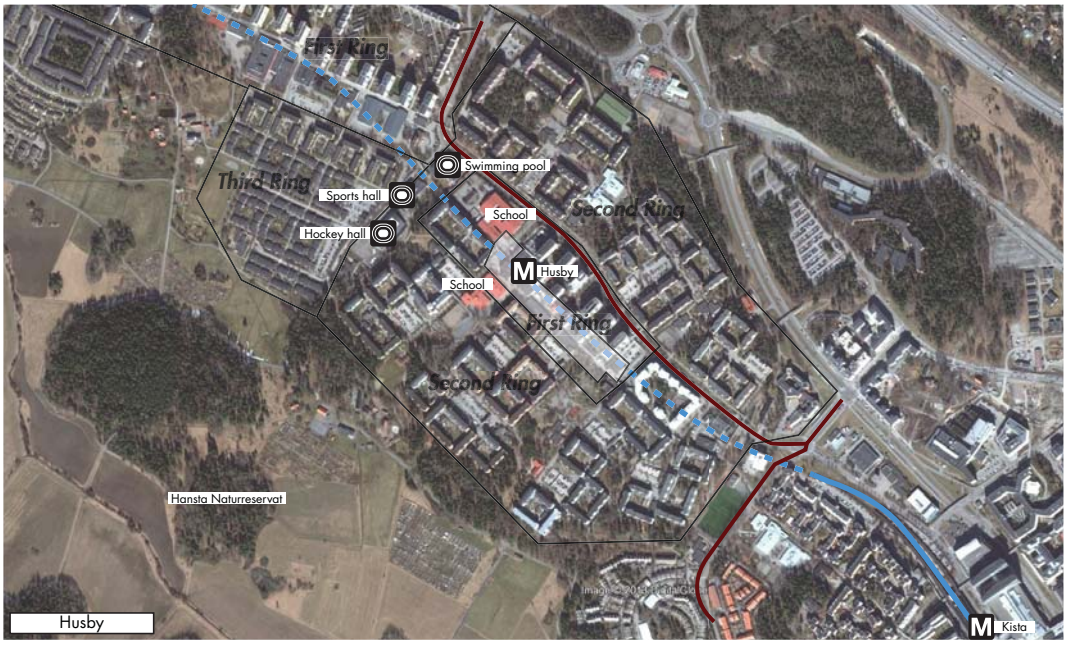
Common layout
The neighbourhood units are set-up in a very similar way. The larger neighbourhoods that are reached by the Tunnelbane have stations in the heart of the neighbourhood, where the centre is developed around.

Analysis of typical Swedish neighbourhood units, as they were developed from the 1940s, oriented on public transportation.

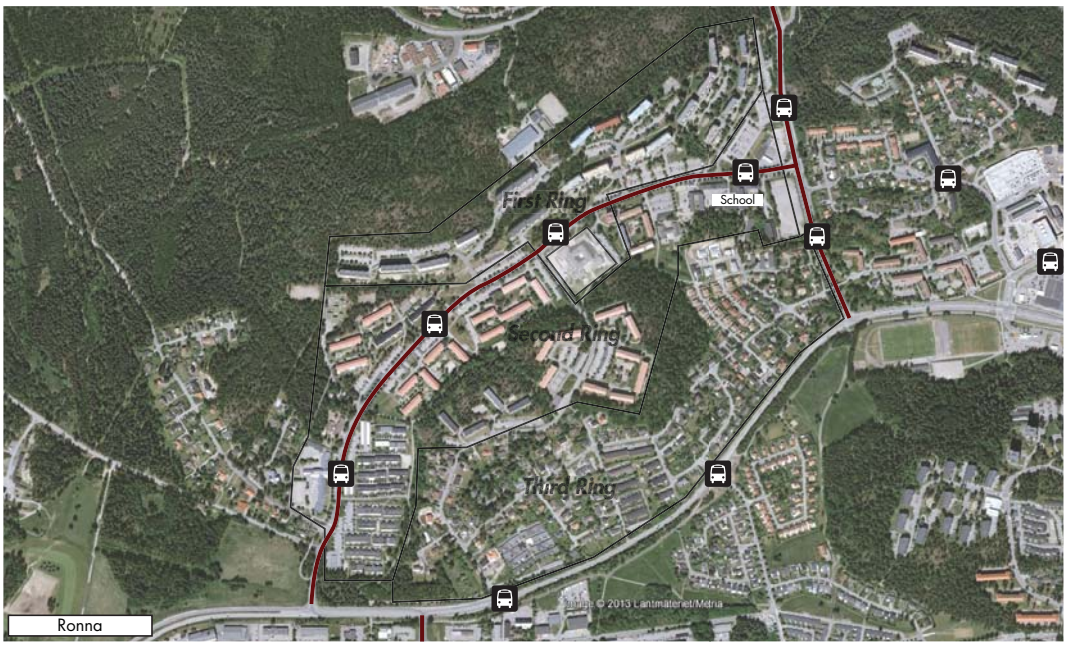
Stockholm: Neighbourhood units in Stockholm. Årsta was one of the most influential urban developements in Sweden.

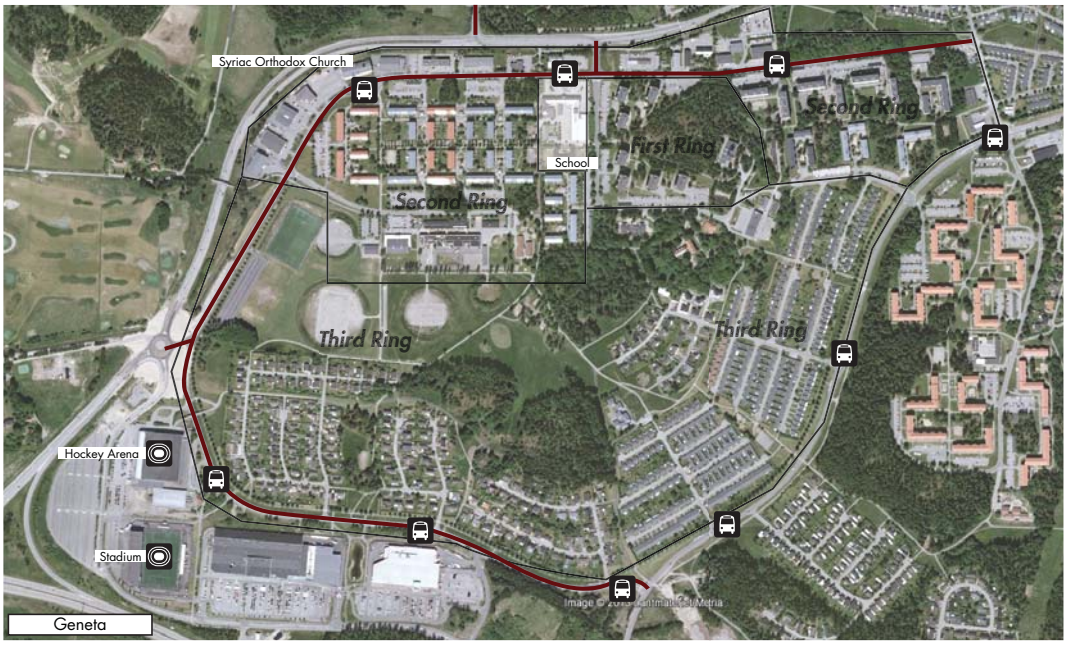
Vällingby is the best known, so-called ABC-stad.

Kista, Tensta and Husby are neighbourhoods were the 2013 riots in Stockholm took place. Tensta and Husby were built as a part of the miljonprogrammet, inspired by neighbourhoods as Årsta and Vällingby.



Södertälje: Spatially isolated neighbourhoods Ronna and Geneta. High percentages of foreigners live here when they arrive in Sweden. Geneta houses the largest Assyrian or Syriac community in Europe.





Usually the station has two exits about 200 metres from each other, spanning the main axis of the centre. Usually a square is provided nearby where most cultural and commercial activities are situated. Vällingby (1954) was an important symbol of the Swedish welfare state, being one of the first ABC-städer, cities for "*Arbete Bostad och Centrum*" ("Work Live and Centre"). Although the original goal of the ABC City concept failed it remained a popular neighbourhood, which has been very clearly designed with separated sectors within the centre (Downie Jr. 1972). The central metro station connects to the north with a covered shopping street that culminates in a large department store, while to the south a square houses the cultural activities in the neighbourhood, like the library, cinema, recreation centre and church.
The smaller neighbourhoods not located on a metro line or in Södertälje have a neighbourhood square, built as the inner part of a building block. It is accessible from the main road by gates within the buildings surrounding the square, but leads to a separation between the "quiet" urban meeting place and the "busy" roads with most neighbourhood traffic.

The neighbourhoods typically have three so-called rings radiating from the centre (Legeby 2013). In the first ring high-rise apartment with high density are placed, that are usually very close to the metro or main public transport station. In the second ring mid-rise apartments of three to five layers are placed. In the third ring near the edge of the neighbourhood single family houses in rows are found that are a bit more spacious, but also further away and less connected to other areas within the city. Many neighbourhood units are relatively isolated from the rest of the town including each other; therefore green edges often border the outer built-up areas. Many of the green zones are part of the finger structure of natural areas that penetrate several kilometres into the city.

A very modernistic treat that all the visited neighbourhoods share, is the separation of traffic. None of the neighbourhood centres is cut in half by a road, the few roads that do pass the central area are doing so on a lowered, separated level. The important roads within the neighbourhood do pass by closely and have easy accessible bus stops, close to the central square.

The barrier free neighbourhood communities are expected to offer ideal living conditions. Yet the use of public space is less than expected in these problem neighbourhoods, argue Legeby and Marcus (2011). Södertälje alone received more Iraqi refugees after the Second Gulf War then the US and Canada together. Newcomers have more trouble entering the Swedish society, as they are concentrated in a few socially segregated communities. The results of the research in Södertälje 'highlight how segregation in public space – including impaired accessibility to a range of resources such as places of work and contact with other people – is a very strong feature of excluded areas and is strongly disadvantageous for newcomers' (Legeby & Marcus 2011: 155). This pleads for good connections to work, education and urban life to ameliorate social justice.

Conclusion
The transport-oriented developments that have shaped cities in Sweden are an important factor in the relative quality of problem neighbourhoods, when compared to some of the Banlieus in France or UK suburbs. Connections are very important, as it creates more social justice (Harvey, 1973) and in Scandinavia urban planning has been successfully centred on transportation since the end of the Second World War (Hall, 2008). This means that improving accessibility could be an important starting point for the revitalisation of a neighbourhood.
The problems faced in Sweden are less visible from the outside; such as in the Dutch problem areas where building quality often is a main concern. The reason that problems occur in the Swedish situation are related to country wide policies in which integration onto the job market is problematic for foreigners, as non-European degrees are not transferrable and that the people that do attain social growth move out of the neighbourhoods (Pekelsma 2009). She explains that policies now focus on attaining integration through jobs; people need to be guided into jobs as a social framework. But many Swedish neighbourhoods are isolated from the rest of the city and not all have been developed as TOD, that entangles job opportunities, as is shown in the studies of Legeby (2010) that reflect that social inclusion is directly influenced by the spatial integration of an area.


Urban fragments of the square in front of the folkets hus in Årsta. Note the coloured façades as an important element of the architectural design, as an effort to stimulate social contact (Ferring 2006).


The commercial centre of Vällingby (left), neighbouring the culture square (right).


Urban fragment of Tensta after the riots, just out of the picture is a burning mark on the ashpalt (left). Right the large Syriac orthodox church of Geneta.

3 Transport

Transportation theory

Transit-Oriented Design

TOD is a very broad concept that shapes to the local or national planning traditions. The term originally stems from the United States, but is now used all around the world to describe local variants of the phenomenon. This means that TOD in the United States can occur in different forms or a different scale than what we are used to in the Netherlands or to what people in Japan are used to. Developments in Dutch station areas would be described as TOD in the United States, because the integration of transit systems in urban development is far greater in the Netherlands than in North America.

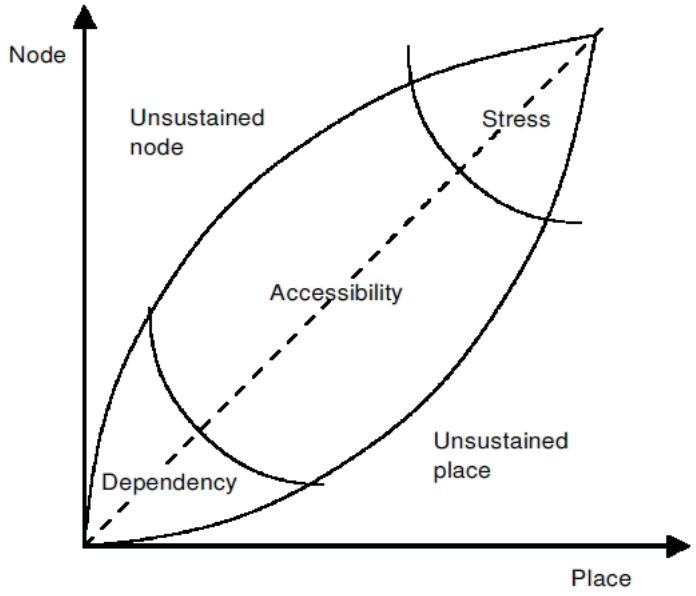
What is TOD?

TOD concentrated on development in station areas of railway, subway or other public transit stations. 'Transit Oriented Development (TOD) requires a commitment to centres and to transit as its core ingredients together' (Curtis et al. 2009: 13). It can be interpreted as the American or international version of the planning forms already in use in Japan and several European countries. The essence of TOD is creating a sustainable development, by combining transportation nodes with centrality development and the planning, financing and exploitation of the (to be) realised projects. This all is aimed at reducing car dependence, congestion, improving space utilisation and creating a base for future investment (Curtis et al. 2009). Bertolini and Spit (1998) note that all three aspects of the planning triangle need to be taken in account to redevelop station areas. Context for the planning systems and policies or worldwide developments, process for actors and organizations and object variables for the node and place dimensions.

An explanation of TOD would not be complete without mentioning the Japanese situation, as this country is the front runner in the world in the integration of public transit in daily life 'that goes substantially further than in the Netherlands' (Van de Velde 1999 in Priemus et al. 1999). Also Bertolini and Spit (1998) are considering Japan as an important learning ground for turning stations into places to be, instead of places to pass. Transport companies exploit besides public transportation services also real estate developments along public transportation lines, these real estate developments range from offices, dwellings and department stores to complete new neighbourhoods and even theme parks, complete sports centres and museums. As such it can be viewed as the ultimate form of TOD. The quality of transportation and real estate are bonded closely together and can be seen as a key factor of the success of public transportation in Japan, with a market share three times higher than in the Netherlands. Priemus et al. (1999) argue that a Dutch implementation could lay in consortia between real estate developers and public transport companies that can develop similar projects near existing transportation lines. The central city should direct the process on a regional level, while the province should administrate on the interregional level. Experiences from Japan show the importance of the relation between exploiting public transport, real estate development and real estate management.

Node and place

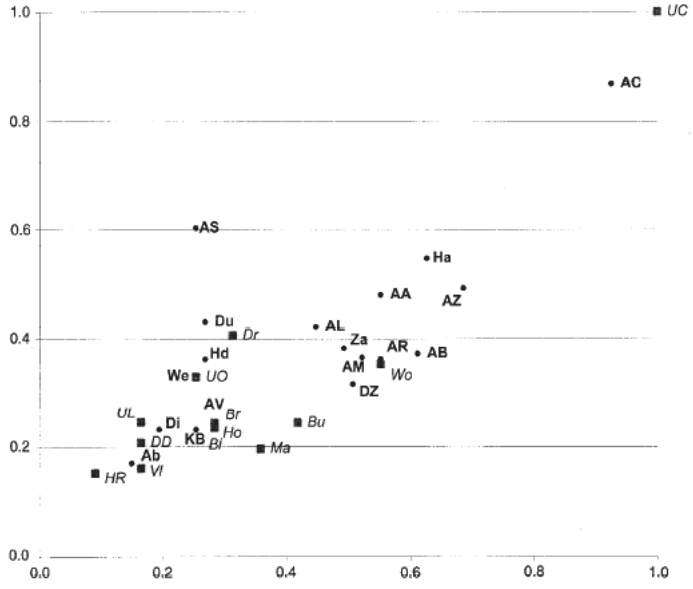
The realisation of TOD is closely embedded with the node-place model developed by Bertolini (1999). Station areas, or "mobility environments" (Bertolini & Deist 2003), must be viewed as both nodes in the network and places in the city and the complex node-place interactions form the core issues of railway station redevelopment, Bertolini and Spit argue (1998). 'Taking a dual node-place perspective, we see that both positive and negative interrelations may exist between the two domains […] on the one hand, a high level of accessibility may provide the critical mass of demand for the development of particular activities. In turn, a high density of activities may induce the necessary support for the development of transportation networks' (Bertolini & Spit 1998: 9). In the optimal station area both activities and connectivity are in balance. When density is too high and there is no space or potential to improve transport links, the area is an unsustained place. While in other examples, like Amsterdam Sloterdijk or Duivendrecht, the connections to the network are very good, but the potential of accessibility is not converted in the realisation of activities, making the place strongly node. From the same figure Utrecht Centraal scores very high on both perspectives, although there is still a balance, the station area is stressed. The lack of medium scoring stations in its region leads to less support for urban development (Bertolini 1999), deconcentration and thus relieving Utrecht CS, while concentrating on secondary centres might be a solution for this situation. Rotterdam, although not part of Bertolini's research, sees secondary urban centres in the east and west (Alexander, Blaak and Schiedam), but is momentarily lacking a balanced station area of size on South.



Place-node model of Bertolini.
Source: Bertolini (1999)

The node-place model helps in defining the characteristics of the station area. Jane Jacobs (1961) defines density, a mix of functions and housing prices and a fine-meshed structure as important conditions for the place value, the attractiveness of a place. It can be seen as an addition and elaboration to the theory of place making in the node-place model.
Only where is the border of such a mobility environment? In the United States the catchment area of a station is taken as half a mile, or 800 m, circle around the station, or the distance one can walk in ten minutes with an average speed of about 5 km/h (Guerra & Cervero 2013). In the article they conclude that when the distance to the station is closer the patronage will increase. Taking half a mile as catchment area is neither particularly well, nor particularly bad suited to predict ridership. Bertolini and Spit (1998) reference to Munck Mortier (1996) for a walking radius of 500 m, but agree that a time criterion embraces the user's perspective, which is an essential element. In the Netherlands also a popular cycling culture increases the distances people can cover in the same amount of time, which increases the reach of stations. Finally the physical barriers influence relative distance as well. Van den Boomen and Venhoeven (2012) name distances in use of 800 m in North Holland, while 1200 m is used in South Holland. With distances ranging between 500-1200 metres, an average of 800 m could be taken as reference for the catchment area of TOD in Dutch railway stations.

TOD in context of urban renewal
Similar to the size of the catchment area of a station, is that not distance but travelled time is guiding in the accessibility of a place. As to understand the importance of a good integration between the city



Amsterdam agglomeration		Utrecht agglomeration	
station area	abbreviation	station area	abbreviation
Amsterdam Amstel	AA	Bilthoven	*Bi*
Amsterdam Bijlmer	AB	Breukelen	*Br*
Amsterdam CS	AC	Bunnik	*Bu*
Amsterdam Lelylaan	AL	Den Dolder	*DD*
Amsterdam Muiderpoort	AM	Driebergen-Zeist	*Dr*
Amsterdam RAI	AR	Hollandse Rading	*HR*
Amsterdam Sloterdijk	AS	Houten	*Ho*
Amsterdam Vlughtlaan	AV	Maarssen	*Ma*
Amsterdam Zuid/WTC	AZ	Utrecht CS	*UC*
Abcoude	Ab	Utrecht Lunetten	*UL*
Diemen	Di	Utrecht Overvecht	*UO*
Diemen-Zuid	DZ	Vleuten	*Vl*
Duivendrecht	Du	Woerden	*Wo*
Haarlem	Ha		
Hoofddorp	Hd		
Koog Bloemwijk	KB		
Weesp	We		
Zaandam	Za		

Study of place-node values of station areas in the Noordvleugel of the Randstad.
Source: Bertolini (1999)

and its stations, as is found in TOD. The Breever-law defines this phenomenon as the travelling time an individual is prepared to travel every day for a fixed activity. In the Netherlands the maximum travelling time for such an activity is 45 minutes (Bach et al. 2000). This means that when local connections to the stations, the "feeding", is improved people will have large range of finding jobs, education and other primary needs. The connection with urban regeneration is exemplified when quoting Meyer (as in Harvey 1973: 62): 'Improvement in the long distance, high performance suburban to downtown system will tend to primarily benefit higher income groups. To the extent that the development of these systems is subsidized from public funds, the implicit income transfer probably would be regressive. By contrast expenditures aimed at improving conventional short-haul central city transit will almost certainly benefit mostly low- to middle-income groups. '

Stating that connectivity improves chances for job opportunities, education and health care (Harvey, 1973), means that improving connectivity positively influences social conditions. In order to improve the neighbourhoods of Rotterdam South with mainly low- and middle-income groups residing there means that better connections within the city will have to be applied, rather than connections with out-laying suburbs such as Barendrecht or Ridderkerk, that will benefit mostly higher-income groups.

Dutch urban planning

The Dutch are famous for their history of urban planning. In the English language the saying "God created the world, but the Dutch created the Netherlands" reminds us of the long history of creating land for habitation and agriculture that runs from the first dykes that were constructed over a thousand years ago. Another famous example of Dutch urban planning is the layout of Amsterdam as the most outstanding of all Dutch renaissance cities. But also in modern times governments are interested in the structured Dutch approach on city building. In the last few years however, there has been an urge for a less restricting approach for new urban development. On the contrary to countries like Belgium where there is a search for methods to structure and regulate new urban developments, the Netherlands are looking to new methods to release rules and to lure more private developers into the building market. This differs much from the formal top-down perspective that originally was practiced (Spit & Zoete 2009). Spit and Zoete describe the development of policy instruments for guiding spatial planning, that have changed over time from the classical system in which law dictates the measures that need to be taken (described as whip (Dut.: zweep)) to the modern financial stimulus (carrot (Dut.: peen)) in the seventies and eighties. This has eventually been developed in the current and most common post-modern system, where the plan, story and arguments need to lead to changes in policy (lecture (Dut.: preek)). This shift has made planning more complex and has also caused a change in the traditional top-down planning into a bottom-up approach, that is more market oriented at the same time. Generally the lecture approach is used in about eighty per cent of the cases and only when the projected aims are not feasible with this system there is a fall back to the other systems (Spit & Zoete 2009).

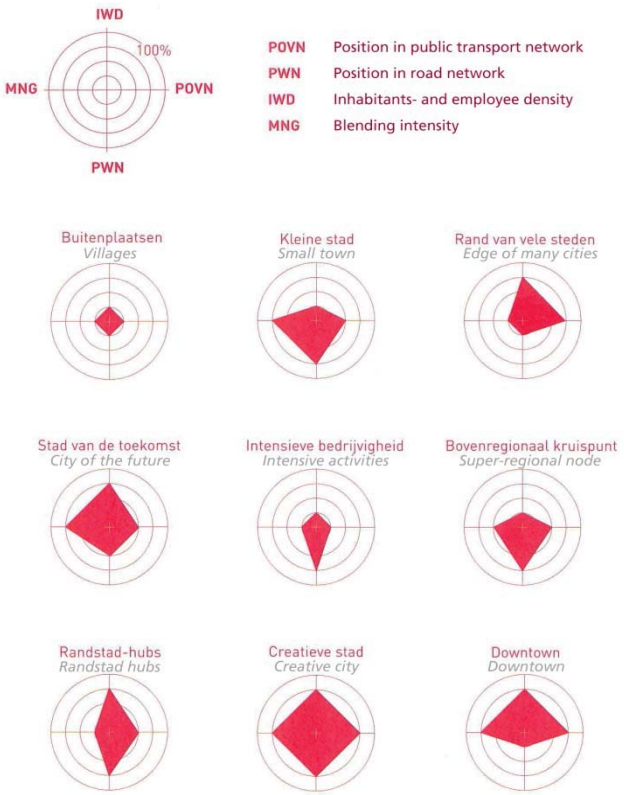
The way in which these systems can be steered and the resulting influence differ a lot between municipalities and other governmental organs. Spit and Zoete (2009) show four different roles of public administration, which differ significantly from each other. These roles can be typified as laissez faire, laissez aller, with few interventions of the government. Communication and influencing is guiding by means of communication with actors. Competition focuses on market forces that create chances by following the economic currents without a strict frame. Identity as a guidance finally is done by a guiding model that sometimes has to move against the natural developments to protect identity. The way that a municipality chooses to deal with urban planning affects the measures that need to be taken to come to the desired result.

Taking the Dutch urban planning principles as a background, to understand transportation planning in the Netherlands, brings us to Priemus et al. (1999) saying that in the Netherlands the relation between real estate and public transport is weak, except when building offices. But offices only bring one type of new traveller, the commuter that travels during the already congested periods of the day. Commuters are forming more than half of the total of passengers in public transport (Priemus et al. 1999; Nes 2002). 'A sensible, differentiated approach (dwellings, shops, recreation) could just attract these costumers that are needed the most: travels that sit in empty trains during the off-peak or in the opposite direction of the peak hour' (Priemus et al. 1999: 46).

A large deficiency in the Dutch urban planning system has been the lack of combining new urban extensions with existing infrastructure (Van den Boomen & Venhoeven 2012). Investors are looking for spots to build new dwellings, offices or business parks in the cheapest possible way to make quick profits. Empty fields of typical Dutch landscape, often near motorways, are easy targets for new extensions as the price of land is relatively low and municipalities are keen to speculate with ground. Van den Boomen and Venhoeven argue that the property developers do not feel responsible for the infrastructure as they find that this is primarily a task of the government. The government is forced in this way to come up with, often very expensive, solutions to disclose these areas. Especially in the case of public transport it may take a long time before new connections are made and a realistic alternative for the car is given, often much to the frustration of the first inhabitants in these new urban areas, which were lured with stories that do not live up to the expectations.
The strive of Van den Boomen and Venhoeven to develop along existing corridors is supported by Garvelink, director at engineering firm Holland Railconsult, and De Vos (1999) in Priemus et al. (1999). They add that real estate can be developed in every form and that as a result public transportation corridors need to be the starting point of new developments, as the corridor is a durable element that will be used for over a hundred years, giving structure to the developments.

Early Dutch TOD
In spite of the critique on Dutch transportation planning, there have been early examples in the Netherlands of what now can be called transit-oriented developments.
The increase in scale of stations in the Netherlands is going on from about the end of the 1960s start of the 1970s. 'A striking example of that time was Hoog Catharijne in Utrecht that with its covered pedestrian routes guaranteed a modern and pleasant climate between the inner city, the shopping mall and the station. The number of train passengers rose enormously as a result of the shops and the Jaarbeurs around the station Utrecht' (Sanders et al. 1999: 19). After Hoog Catharijne densification in station areas continued, but mostly concentrated on medium-size stations. 'Den Bosch, Groningen, Leeuwarden, Rotterdam CS and Alexander and Amersfoort are for the present the front runners of recently realised densification near stations' (Sanders et al. 1999: 36). In a time of a possible railway renaissance (Bertolini & Spit 1998) there is an increasing need to develop similar strategies on all levels, including the small "feeding" stations and large "connecting" nodes.

Stedenbaan
StedenbaanPlus is the answer of the province of South-Holland for this increasing need for a strategic TOD suitable in the Dutch situation. A regional transportation network is created on the base of existing rail lines, where it combines with real estate development, or in other words forms centralities in station areas.
Balz (2008: 98) formulates this as; 'The Stedenbaan programme consists of a combination of two strategies; a high-frequent, metro-like transportation service on the current rail network [...] and a regionally adjusted urbanization programme that presumes inner-city developments of the areas around stations.' The aim of the total project is to create a metropolitan network in South Holland with real estate developments in relation with stations of public transportation. The development objectives are not equal for all stations, but depend on location within the network and the metropolitan area. Nine development typologies for Stedenbaan stations have been created, as is shown in the scheme (Balz 2008). The connectivity and density of development are main influences in the definition of a Stedenbaan station. The figure shows that automotive accessibility



Station characteristics of nine types of Stedenbaan-project stations.
Source: adapted from Balz (2008)

downtown is low and less important than good connections to public transportation networks and density of activities, while intensive business activities mainly take place in low-density areas along motorways.

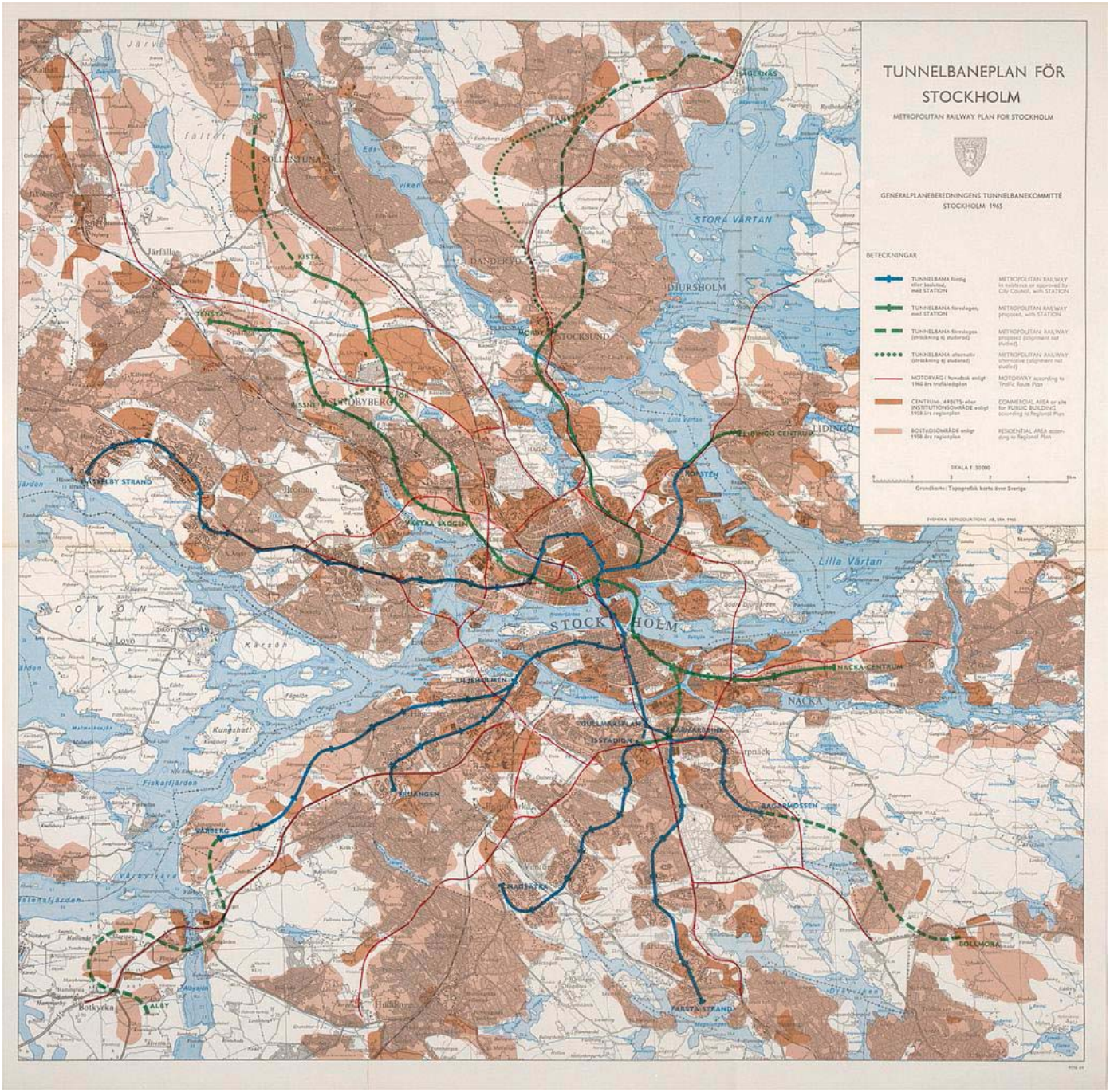
Swedish urban planning

Scandinavia, and especially Stockholm and Copenhagen, have a long tradition of implementing transit-oriented developments. Stockholm is seen as a classic example of TOD and has in many ways 'literally anticipated the principles being propagated in much of the recent literature. […] The Stockholm model is highly successful in terms of public transport use. With a public transport share of 28% of all trips and of 44% of home to work trips (2006) the Stockholm region is one of Europe's most public transport oriented metropolises' (Bertolini in Bruisma et al. 2008: 47).

The Stockholm metropolitan area is a centralized urban area in which strong public transport networks converge in the very centre of the city where T-centralen, the central railway station and the main bus terminal are located next to and above each other, where they form an excellent place and node (Bertolini & Spit 1998). The three metro or Tunnelbane lines all meet in T-centralen before radiating out across the metropolitan area and branch into mostly new developed neighbourhood communities from the miljonprogrammet. From the 1950s urban development has been focussed on transportation, with developments in well-served areas while the less served areas are left open and green (Hall 2008). The metro stations in these neighbourhoods are centrally located; the neighbourhoods were developed around the stations, and well connected to both the national rail and local bus and tram networks. The outer laying suburbs and new towns also have a work function that leads to an efficient bi-directional use of transport networks at all times (Bertolini in Bruisma et al. 2008).
There are two main sources of tension in the successful system. The urban system of the metropolitan area is growing beyond the reach of the current metro system. Metro systems generally work up to about 20 kilometres from the city centre, after that commuting times become too long and other faster systems are needed (Hall 2008). Citybanan, a six-kilometre tunnel underneath the centre of Stockholm for commuter trains (pendeltåg), is constructed to increase capacity and speed for trains that reach further into the region, with distances up to about 50 km. The second development is an increasing demand for trips between suburbs. The current centralized metro network requires all trips to go through the centre of the city, putting extra pressure on the already heavily used parts of the system. Tangential ring lines would be a solution to deal with the growing demand, but metro lines are expensive and the total demand in the first years is not high enough to justify the costs of constructing an inflexible high-capacity system. Light rail (Tvärbanan) is chosen as (a temporary) solution to meet the demand of inter-suburban travel, but does not yet cater the new town.
To make an even more efficient use of the existing facilities, focus shifts from building new urban areas to densification around current metro stations, or "building the city inward" (Bertolini in Bruisma et al. 2008). With a shift into a more poly-nuclear structure of the metropolitan area, these changes will have to coordinate a continued success of the development pattern.

Policies

Bertolini & Spit (1998) argue that the Stockholm policies are quite unique, with a strong role for the central city in the metropolitan region and the national railway company (SJ). Although not uncommon in the European situation, the SJ is one of the front-runners in the redevelopment of real estate around stations and in central locations, after its privatisation in 1988. Also the public housing sector is a main developer of the largely public lands around stations and along corridors (Bertolini in Bruisma et al. 2008). But Bertolini & Spit (1998) show that in times of crisis the SJ and municipality had to be more proactive, taking initiative back from the market, but still were the most confident in the future of all property developers. The activities of SJ do not concentrate on Stockholm alone, but there are initiatives around 50 stations throughout Sweden.
'The Swedish approach to market organization of the railways business appears to be particularly successful, at least relative to that adopted by many other countries in Europe' (Bertolini & Spit 1998: 140). The SJ property division was one of the four divisions in which the company was split and its property philosophy focuses on the development of travel centres. A travel centre is not just a railway station, but also a node with a surrounding area and corresponding developments. It should act as a commercial centre and to make that successful the convenience of travelling by train needs to be enhanced with amenities and similar appealing image. Summarizing it means that SJ real estate is at least partly responsible for the creation of the place values in station areas.



'Tunnelbaneplan för Stockholm', metro plan for Stockholm from 1965.
Source: Stockholms Stadskällan

The result is a development pattern with many similarities to Tokyo, although this pattern is developed through a market-led system. The reason of the success of these various development systems lays following Bertolini in the consistent application of it in the past 60 years.

An ideal vision

Not every approach of dealing with redevelopment in station areas can be transferred from one country to another. Local policies and laws may hinder or prevent measures to come to a successful development. And an important question is; when is a station area development successful? The aim of TODs is to reduce congestion on roads for a better and more sustainable environment and to create lively places that make interesting cities. Stats cannot reflect physical thoughts of perception of an area, but are useful in measuring the utilization. In particular average passenger numbers and the modal share percentage reflect popularity and when taken over a period of time the development and change can be monitored. When it comes to ridership and modal share of transit, Japan is unequalled in the world, but Switzerland and metropolitan areas like Stockholm or Copenhagen also score very well.

Making use of existing infrastructures
In the previous part almost all attention went to the development of transit for TOD, because public transportation planning has long been neglected in favour of individual motorized transportation. A 100% transit modal share however is impossible and although efforts should try to push down car use a good interaction between the networks is needed to come to an efficient use of infrastructures (Van den Boomen and Venhoeven 2012). The Netherlands with very dense infrastructures has a lot of opportunities to develop in areas where several of these networks node together or form a corridor. In this way maximum use is made of existing infrastructure and with strategic planning expensive measures can be prevented. Rigid planning in the Netherlands however sometimes prevents desired developments from coming into existence. Nostalgic or historical grown perceptions of special characters, separate municipalities and urban areas have prevented high-potential developments around strategic locations. Described by Van den Boomen and Venhoeven (2012: 180) as 'when a place becomes better accessible, it will draw automatically businesses and dwellings. Except in the Netherlands where sometimes this natural development is consciously opposed.'

Four main tasks – sustainability, mobility, economic competitiveness and urban quality – lay at the foundation for successful planning. These tasks have to be approached from the network, corridor and node, that all can act on different scales, from local to (inter)national. Priemus and Konings (1999) ascertain an illogical structure on these scales in the Netherlands, where there are unclear differences between infrastructures on local, regional and national level. This means that local traffic flows may hinder people travelling on a national network making it vulnerable to service interruptions.
To make more efficient use of infrastructure a reversed rush hour and outside peak periods needs to be stimulated, in hand with a clearer distinction between local, regional and national infrastructure. By building theme parks, recreational facilities and other amenities at the suburban ends of infrastructure lines, people are transported over the line during the whole day, stimulating efficiency and revenue (Priemus & Konings 1999; Bertolini & Spit 1998; Van den Boomen & Venhoeven 2012). Sometimes not even new real estate is needed to provide these services as also nature is a form of recreation, which often is hard to access with public transport in the Netherlands.
People should have the option of going by transit, even in areas of shrinkage or of low densities. By strategic nodes and the concentration of amenities in these areas, the critical mass to support these activities and public transportation can be met. This way elderly or children that are not able to drive are not excluded from society, while more people feed the network and are drawn to interesting station areas.

Van den Boomen and Venhoeven point also to a critical note of strong growth of cycling and public transportation use. When they state that the large flows of people, especially on bikes, hinder people in the historical inner cities and threat to discourage pedestrians in way cars did in the 1960s. While at the same time cars also have many benefits. For a liveable city good connections are needed between modalities, that eventually may result in a modal merge, the fusion of modalities, even seen as necessary by Ford CEO, Bill Ford (Van den Boomen & Venhoeven 2012). As reply to this critique, new designs on larger scales, scales unknown up to now for these types of modalities, need to be realised to deal with the growing demand. Examples could be the large bicycle parking places in Amsterdam or all around Apeldoorn, but also stations in Asia or the rest of Europe are of a much bigger scale than Dutch examples, although passenger flows are comparable (Van der Bijl & Hendriks 2010). When the cars were introduced nobody could have guessed about the large cloverleaf junctions and other car infrastructures that are now realised all over the world.

Policies
The trouble of realising developments also has to do with governmental policies. Decentralisation of the spatial planning has significantly reduced the legal measures available to influence development (Van den Boomen & Venhoeven 2012). They point to Swiss policies where cantons only allow new building projects when it is combined with enhancement of public transport. In the Netherlands Vinex- and ABC-policies could not live up to the expectations. Local and regional governments need to prove that their plans are not already provided in other areas or if transformation and restructuring are possible. Only when all these criteria are not fulfilled new construction is an option on a multi-modal accessed location. But Van den Boomen and Venhoeven see considerable difficulty in maintaining these policies.
The control of land use remains a problematic point in Dutch TOD-planning. The many municipalities and relatively small power of urban areas lead to disputes in the way developments need to be made. The dissertation of Chorus (2012) led participants from the Randstad and Tokyo come up with a corridor

design. In the resulting discussion changes in inter-municipal coordination and distribution of needs and permits followed the question, who was responsible for land distribution. The two main lessons the Dutch took home where that density could be further optimized and that a framework, similar to a simple structure vision, has to organize densities on the level of the corridor.

Corridor planning
In the Netherlands a shift is needed to think in networks and especially corridors as coherent entities for planning. Nodes should not be seen as a separate project within a city, but as the starting point of corridor connections to other cities. The infrastructures connecting these cities, often motorways are often combined or located near railroads, offer chances for the development of housing, jobs or recreation areas. Van den Boomen & Venhoeven point to the corridor Utrecht-Amsterdam, with in particular station Duivendrecht, where sheep are grazing next to one of the biggest infrastructure nodes in the country. But also further along the line (parts are protected as the Green Hart) housing or jobs could be realized in the area between the railway, A2 motorway and Amsterdam-Rhine Canal, instead of large scale neighbourhoods as Leidsche Rijn that have to be connected almost from scratch to the existing infrastructure nodes.

Corridor Rotterdam-Breda
The corridor Rotterdam – Breda (part of it could also be designated as the corridor The Hague – Dordrecht) can be turned into the leading example of corridor planning in the Netherlands. The project location Rotterdam South sits near the northern end of this corridor and is also part of Stedenbaan. The corridor houses water ways, the A16 motorway, the classic railroad to Breda and the new HSL Zuid. The desired differentiation in scales becomes clear in this corridor. Within Rotterdam local metro and tramlines are connected to and in between the stations Centraal, Blaak, Lombardijen and also in the planned Zuid. On the classic line regional trains and national Intercities connect to stations, until Dordrecht the four-tracked line separates the different types of trains. The international high-speed trains (HST) have a special line where speeds of 300 km/h can be attained. On this biggest scale only the start and finish point of the corridor are connected, leading to short travel times between all places along the corridor. Except redevelopments that lead to higher densities and more amenities, potential for new stations and developments is found next to the natural Biesbosch area, for recreation, or to connect to Moerdijk, where a large industrial zone is strategically located.

Because of the differences in scale of the different networks a hierarchy of nodes is generated. Rotterdam Centraal and Breda are both of international importances, while Dordrecht, Rotterdam Blaak and Zuid have regional importance and smaller nodes as Zwijndrecht or Lage Zwaluwe function on a local level. The emergence of high-speed rail reduces the importance of some historical important nodes, while it brings chances for new developments on other locations. The Swedish X2000, just like the TGV and Shinkansen, 'appears to be essentially a catalyst of development when other conditions are in place. Those conditions include lively local economies and property markets, availability of land or buildings, excellent connection to local and regional transport networks, and strong public investment and leadership' (Bertolini & Spit 1998: 41). That only the high-speed trains themselves are not enough becomes visible with the failed stations Le Creusot, Vendôme or Macon in France. To come to a successful TOD complementary measures need to bring in.

Network vision
The merging of the metropolitan areas of Rotterdam and The Hague in 2012 into the Rotterdam-Den Haag Metropolitan Area has influenced the scale on which we need to think about infrastructure networks. The scaling up of the agglomeration will make connections between the two cores more important in the future, as cooperation between organizations within the cities and the exchange of commuters is likely to increase. The distances increase and traditional ways of urban transport are no longer sufficient when distances grow over 20 kilometers. Already 'during the 1990s both Copenhagen and Stockholm pioneered a new concept in transport planning as a basis for long-term development: the regional metro.' (Hall, 2008: 176). A project like RandstadRail is based on those Scandinavian projects and improves the accessibility from The Hague to Rotterdam and Zoetermeer. Within just a few years RandstadRail is deemed a success (Bol & Söderhelm 2013), with above expected results, showing the need of good connections between metropolitan cores on a lower than national level. Sometimes small interventions can have a big consequence on the network scale; this level of thinking is therefor always necessary in the planning process of new TODs.

Conclusion

The Netherlands can gain a lot in combining urban planning with current infrastructures to come to a more efficient use. Densification is not a goal on itself, but dwellings and amenities need to be placed in areas where they contribute to a region that is accessible by car, bike and public transport (Van den Boomen & Venhoeven 2012). The resulting nodes can be judged in the way it succeeds to attract also non-travelers. Thereby the development of real estate is an important business for rail companies. Even in hard economic times the location qualities of their property can be a decisive advantage to prevent vacancy. The railway companies in the Netherlands, in cooperation with local governments, could make a bigger effort to develop their own real estate to increase the place values of their stations.


TEATERBAREN
café · bar · restaurang
STADSTEATERN
WEST SIDE STORY
KULTURHUSET
HUVUDENTRÉ

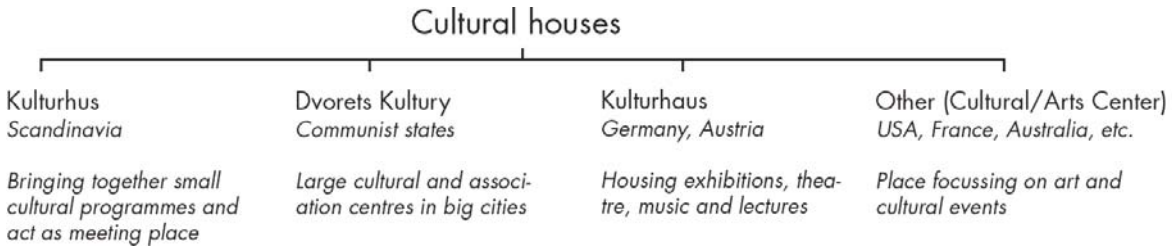
4 Kulturhus

Kulturhus theory

The kulturhus, house of culture, forms the second core element of the programme. The concept of a kulturhus is more than just a building. Just as important is the cooperation between the functions that are housed within the building; this is what makes a kulturhus a special concept. The architect can influence the organisation by creating a healthy environment in which cooperation and functioning of programme elements stands central. Because this building concept is fairly new in the Netherlands and unknown to a large group of people, an introduction is given on the concept. Further Research was done to the way kulturhuser are conceived taking into account programmatic structures, urban context and architecture.

Origin

Kulturhuser (Swedish plural) is the most common name for buildings that house different cultural affairs, like libraries, theatres and exhibitions. Löfgren (2004) states that the term originated in the 1960s to reflect the idea of a cultural centre and to expand the concept of culture. The buildings are comparable with the cultural palaces (*dvorets kultury* or *dom kultury*) that were built in the former Soviet Union and other communist states in Eastern Europe, Asia and Latin America. Usually these buildings were of a bigger scale, containing large dancing halls, cinemas and areas for hobby and sports. The Kulturhaus found in Germany and Austria focuses on just four activities; exhibitions, theatre, music and lectures. The Scandinavian kulturhuser have a larger range in scales and focus on a broader field of activities as there can be commercial and educational spaces available combined even with offices or dwellings. Another important trait of Scandinavian kulturhuser is that they present themselves as one institution rather than separate functions clustered together.



Different concepts of cultural houses in the world.

In Scandinavia a range of other names is also in use for smaller, often closely related buildings. Sometimes these focus on specific target groups, examples are; 'folkets hus' (people's house) or 'medborgarhus' (citizens house), Grafe (2010) explains this difference just as an ideological twist, or 'kulturmagasinet' (the cultural warehouse) and 'ungdomshus' (youth house). They are mainly found in Sweden and Norway, but also Finland and Denmark house some kulturhuser.
Although debate is on the exact origin of the first kulturhus, it is accepted that they have come forward out of the change in lifestyle initiated by the Modernist movement (Legeby 2013). Legeby argues that the Modernist movement strived to let everyone become equal within the Swedish society, without differentiation in class or gender. This was the birth of the Swedish welfare state, in which differences between people were as small as possible, in contrary to class societies, something that is much more visible in for instance England.

The first kulturhus in Sweden is in Skövde and was built in 1964, but could be considered to be an enlargement of the folkets hus concept (Grafe 2010). But multifunctional buildings were for a longer time. The town hall in Säynätsalo (now Jyväskylä) of Alvar Aalto in Finland could be considered a kulturhus, when looking only at the building form. This building was already built in 1951. Generally the Kulturhuset in Stockholm is considered one of the first kulturhuser following the contemporary concept and it also functions as the main inspiration and example for most other kulturhuser, not just in Sweden, but also the Centre Pompidou in Paris was modelled after this concept. The success of Kulturhuset in Stockholm probably paved the way for the construction of many of the kulturhuser now found all over Sweden.

Principle

The kulturhus can be seen as an important meeting place (Röhlcke 2013; Ferring 2013), it has primarily the function to be a place where several cultural activities within a town or neighbourhood are brought together. Clustering these functions has several advantages. First the separate functions within the kulturhus, don't need their own separate buildings and maintenance staff, while the flexible spaces in

a kulturhus can be used during a larger part of the day. These help to reduce the costs for the separate facilities and can eventually keep neighbourhood functions alive in smaller communities like small or shrinking villages and neighbourhoods.
Second is the possibility for functions to cooperate, share spaces and use the appeal of other functions to attract new users for their own activities. It has to be noted that cooperation is essential for the functioning of a kulturhus and that this largely depends on the willingness of the separate organisations to present themselves as one entity (Röhlcke 2013).
Third is the functioning of the kulturhus as meeting place within the neighbourhood or in the case of the Stockholm Kulturhuset even for the whole city. A central meeting point within an area stimulates social integration of newcomers and interaction between residents. An advantage of a kulturhus over a square or park as meeting place is that it is protected from weather influences and thus can function during the whole year no-matter what condition.
Forth is the activities that are associated with a kulturhus are useful for people to educate themselves. In the library young people can read or study, while theatre or music helps to express feelings and to develop oneself or sports that keep people moving and improves health. All these types of activities need to be easy accessible as they can reach a very broad group of people, a sample of society, and especially people that otherwise are hard to reach (Röhlcke 2013).

When most cultural functions of a neighbourhood are concentrated in just one building, it can lead to some negative effects. A downside may lead to the closing of existent cultural functions that may keep the neighbourhood together on a very small scale. Especially in fragile areas with social problems a disruption in the placement of public functions may have negative impacts. However, on the other hand the concentration of public functions within a new and modern accommodation can attract new users with an improved profile.

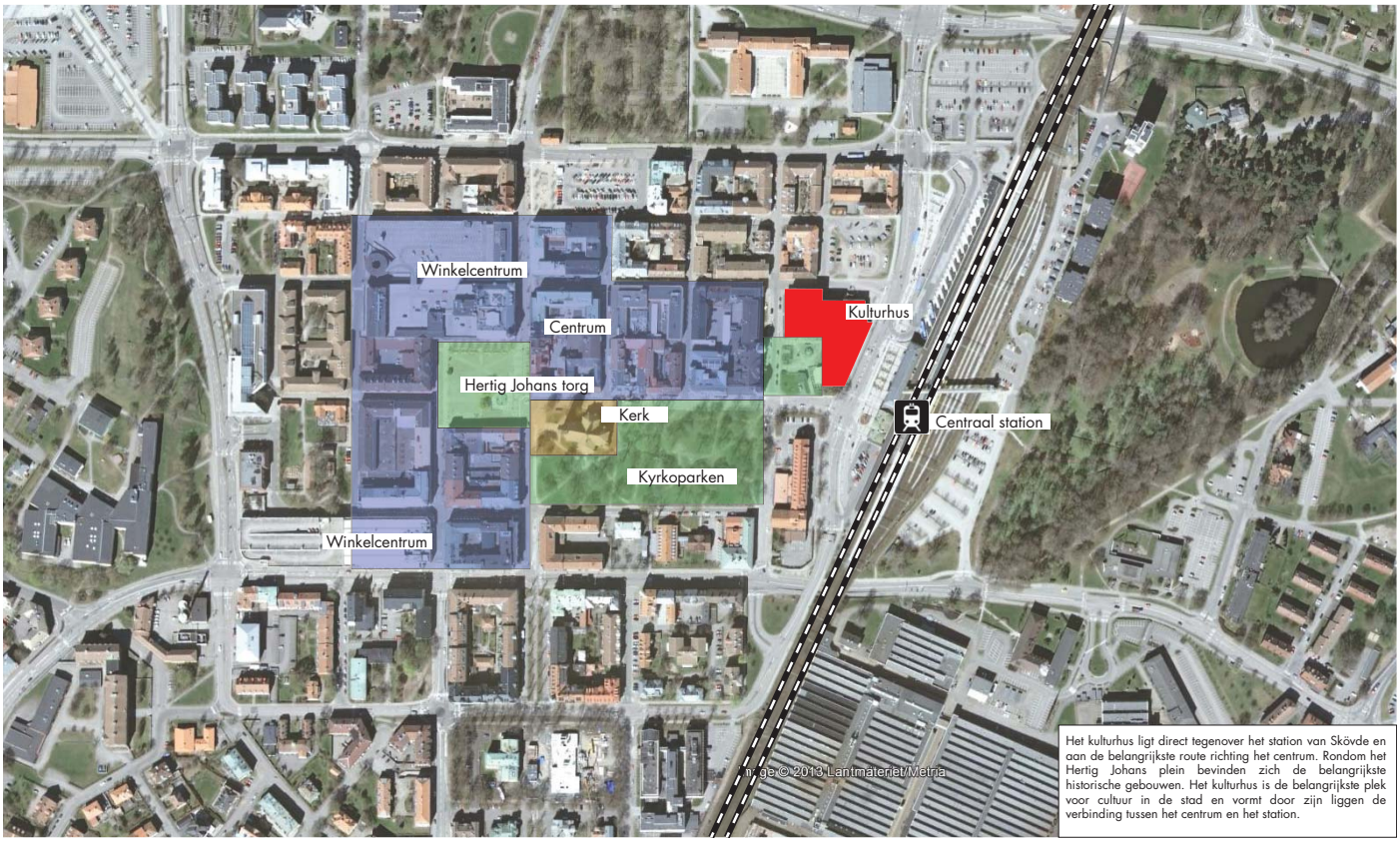
Swedish kulturhuser

The concept of the kulturhus is often credited to Sweden, because the concept and implementation of Peter Celsing's design in Kulturhuset Stockholm makes other cities look in envy to the success it has generated (Bol & Söderhelm 2013; Röhlcke 2013). The building has a good reputation among practitioners around the world. But a wide range of kulturhuser has been built and is being planned in Sweden today. Today the kulturhus has become an important building in most Swedish cities, ranging from small cities like Varberg, with less than 30 thousand inhabitants, to Stockholm with over a million.

Apart from architect Peter Celsing, two others may be accredited with the realization of this concept: Social Democrat politician Hjalmar Mehr and Pontus Hultén director of Moderna Museet (Legeby 2013; Grafe 2010). Hultén later moved to Paris to become the first director of Centre Pompidou. In the same period Kulturhuset in Stockholm opened a culture policy was defined in *kulturpropositionen 1974* (Grafe 2010). In the previous years, the realization of the Third system, the socialist welfare state as a medium between Communism and Capitalism, was high on the priorities of the political agenda. A new man had to be created that could live in a modern society, that was democratic and with social equality for everyone. The role of the kulturhus in this society 'was viewed, hailed by some and denounced by others, as the "real flagship" of the cultural consensus of the long 1970s which started with the protest against the war in Vietnam' (Arvidsson in Grafe 2010: 390). Grafe writes that people were now seen as active participators in culture, as a process of encounter, interaction and exchange, which was materialized in the Kulturhus. The new institutional concept was unique in the combination of concreteness and radicality, working as an "allaktivitetshus" (house for all activities) and as "kulturellt vardagsrum" (cultural living room).
The report Ny kulturpolitik further specified the aims for the cultural policies, Kulturhuset was already finished by then, but it defined more or less guidelines that shaped other kulturhuser. Summarized the cultural policy should promote freedom, contact between people, decentralisation of cultural activities, counteract the negative influences of commercialism in society, take into account the needs and experiences of disadvantaged groups and promote the exchange of culture across borders (Frenander 2001). It was mainly meant to improve social equality in society and help disadvantaged people by means of culture.

To get a better understanding of the diversity found in contemporary kulturhuser and the position they take in the Swedish city, an inventory was made of kulturhuser in diverse places all over Sweden. Analytical maps provide understanding the location, positioning and function of the building within the city.

The position of Kulturhuset in Stockholm within the city.



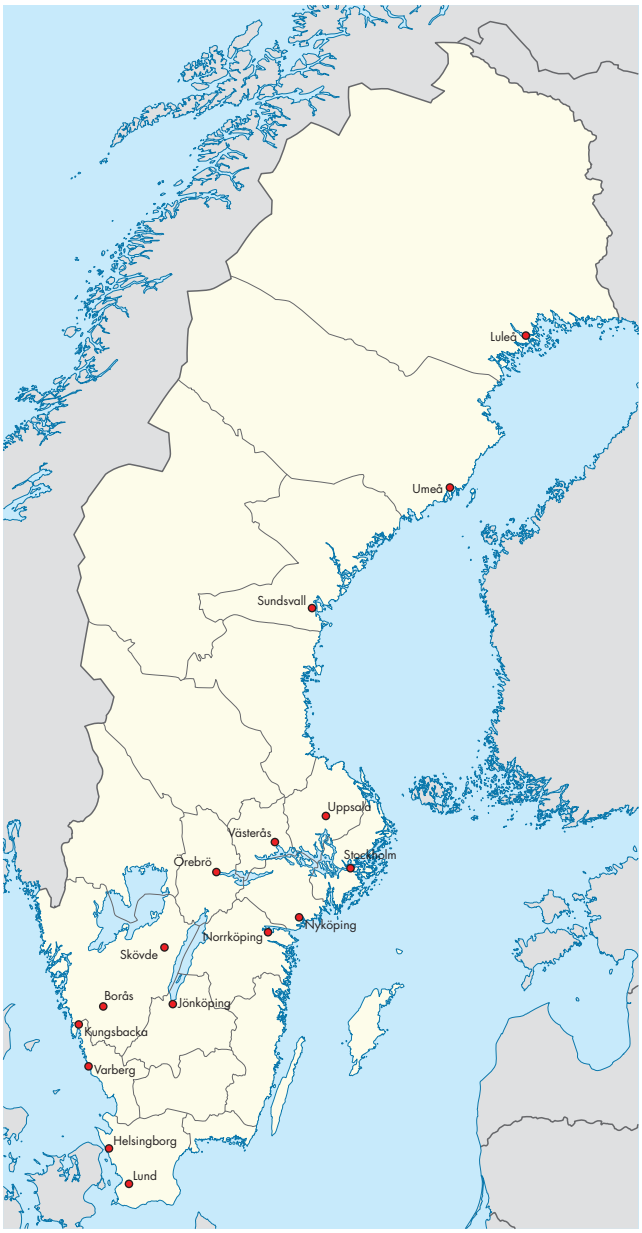
The position of Kulturhuset in Skövde within the city.

Jönköping
Inhabitants: 89 396
Region: Småland (south)

Kulturhus i Jönköping
Year opening: 1982
Building type: former industrial building
Main activities: theatre, cinema, room renting, night bar, refectory
Location description: non-commercial meeting place in an old factory district were matches were made. Located near the railway station and lake Vättern.

Spira Kulturhus
Year opening: 2011
Building type: new
Main activities: theatre, concert hall, conference rooms, bar and restaurant
Location description: On a landmark position at lake Munksjön, a ten minute walk from the travel centre.

Analysed kulturhuser in Sweden.



Kulturhuset, Stockholm

The demolition of the historical northern part of Stockholm in the 1950s and 1960s upset many residents and shocked tourists that wondered if the city was bombed (Löfgren 2004). Although many saw the demolishing of the historic quarters as a big loss, it also gave chances for new developments. The new city that emerged was largely commercially oriented. As a statement against the abundance of business activities, the city politicians planned a culture centre at Sergels torg to counteract this capitalist invasion. On a side note, there is a cultural difference between the Netherlands and Sweden in how people regard activities. From speaking with Swedes the distinction made between commercial and culture activities is very clear, while in the Netherlands this difference is often unnoticed or unimportant in regard to functioning of areas or building programmes. An architectural competition was used to select the right building that could offer resistance in 1965. Peter Celsing made the winning design, inspired by Moderna Museet, but when this institution pulled back, changes in the programme were made, creating more space for culture besides exhibitions (Röhlcke 2013). The temporary housing of the Riksdag, the Swedish Parliament, made the building even the stronghold for democracy in a commercial environment (Löfgren 2004).

Celsing's vision was to create a cultural living room for the city, or outlined as 'a department store

Västerås
Inhabitants: 110 877
Region: Västmanland (middle)

Culturen
Year opening: 2000
Building type: transformation; industrial hall
Main activities: library, theatre, cinema, rooms
Location description: In an old industrial area, right outside the historic city.

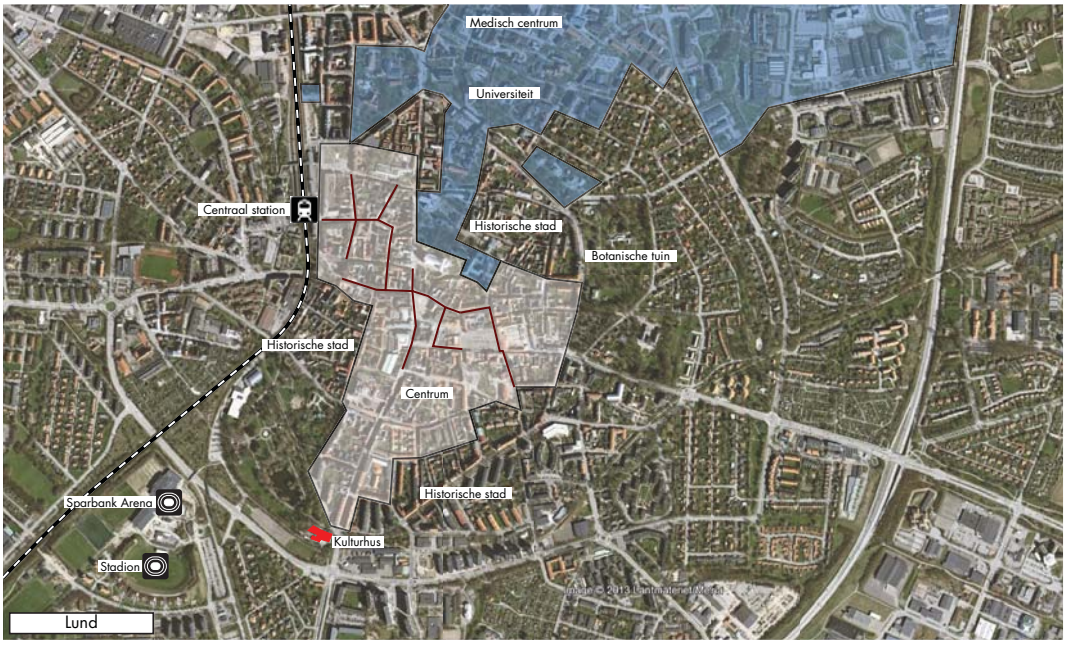
Växhuset
Year opening: 1996
Building type: transformation; school
Main activities: bar, cultural events, conferences, fairs,
Location description: Just within the old city centre close to the commercial and transportation centres.

for culture right in the very centre of the city' (Hedqvist in Löfgren 2004: 10). The building programme houses activities for people of all ages, and because of the openness of the building a yearly three million visitors enter the building. Visiting five libraries, Lava a room specially created for teenagers, controversial exhibitions that are housed in the building, the adjacent Stadsteater that was incorporated in 2013 and some of the different bars and lounges spread across the building.
The location at Sergels torg, at the exit of the city's centralized public transit system, T-centralen metro station, where all Stockholm's metro lines converge and connected to the central train and bus station, has helped it to become a meeting place of people all over Stockholm (Röhlcke 2013).

The architecture of the building is horizontally oriented with a long façade at Sergels torg and includes a lot of glass in the façade. Being created in the beginning of the 1970s the challenge is to improve the quality of the facades to fulfil current sustainability requirements, without changing the character of the building. At the ground level, four different entrances connect to the surrounding shopping areas and public transport, making the building very accessible and hard to monitor at the same time. Later installed escalators connect the different levels of the building, taking over the use from the monumental spiral stairs.
The controversy of demolishing the historical neighbourhoods around Sergels torg and the outspoken modern architecture of the building on its prominent location, have caused it to be voted as one of the ugliest buildings in the city (Röhlcke 2013). The building however remains popular in use among citizens and tourists.
Röhlcke tells that Kulturhuset is also supervising activities abroad that were set up after the Swedish model. In Finland the Lava project, for teenagers, is introduced in neighbourhoods and in Nairobi, Kenya, a kulturhus is developed next to the central station, after a ten year try-out culture centre in an industrial zone was successful despite its poor location and small size.

Skövde

Another noticeable kulturhus that claims to be even older than Kulturhuset in Stockholm and to be the first "real" kulturhus in Sweden (Skövde kommun 2013) is located in Skövde, in the central part of the country. Opened in 1964, it is said to be one of the most easy accessible kulturhuser in Sweden, that houses exposition rooms, an art museum, library, theatre and cinema under one roof. It reflects the time spirit of the 1960s, in which the concept of a *"kulturens vardagsrum som är till för alla medborgare"* (a cultural living room that is for all citizens) (Skövde kommun 2013) fits as the Swedish answer to Capitalism and Communism.
The location of the kulturhus facing the station on the main street towards the central square, makes the



Lund
Inhabitants: 82 800
Region: Skåne (south)

Kulturmejeriet
Year opening: 1987
Building type: historical, old diary (1896)
Main activities: cinema, theatre company, bar and restaurant, concert stages
Location description: Between two town parks, Högevalls and Lunds stadparks, just south of the town centre and historical innercity.

Helsingborg
Inhabitants: 97 122
Region: Skåne (south)

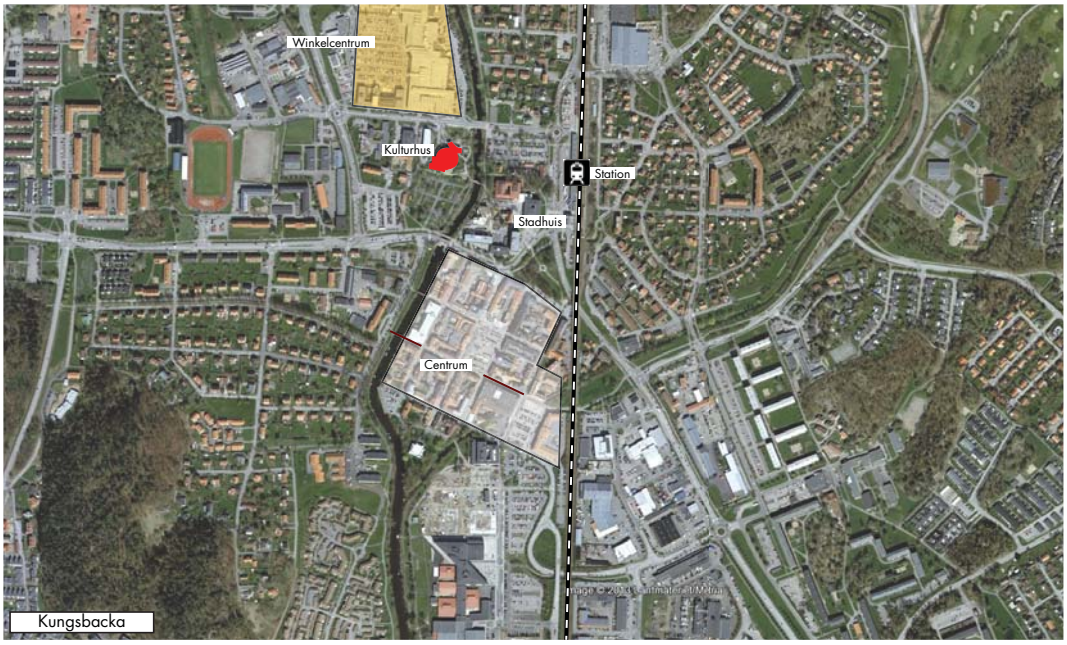
Dunkers Kulturhus
Year opening: 2002
Building type: new
Main activities: library, youth centre, art centre, repetition rooms, bar and restaurant
Location description: In a recently developed port area, just west of the historic inner city and north of the main passenger port and station, it has become part of the city centre.

Varberg
Inhabitants: 27 206
Region: Halland (southwest)

Kulturhuset Komedianten
Year opening: 2012
Building type: extension of library
Main activities: library, art gallery, small theatre, coupling with old theatre
Location description: One block away from the station, on the edge of the city centre, the kulturhus was built from the old library and adjacent to the old theatre, both are incorporated into the new building.

Kungsbacka
Inhabitants: 19 057
Region: Halland (southwest)

Kulturhus Fyren
Year opening: 1994
Building type: new
Main activities: library, art gallery, culture school, cafe
Location description: Between the city centre and the large Kungsmässen shopping mall, in the same area as the town hall and railway station.

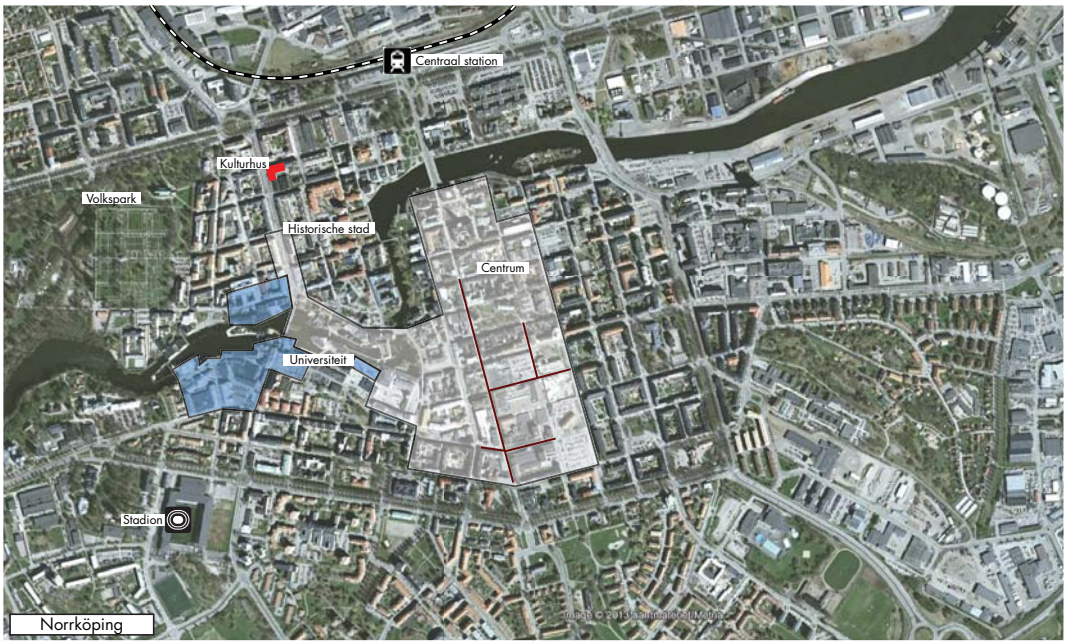


Borås
Inhabitants: 66 273
Region: Västergötland (west)

Kulturhuset Borås
Year opening: 1975
Building type: new
Main activities: library, theatre, museum, foyer, grand cafe
Location description: Located a little outside the city centre and outside the inner-city ring road in a cluster with other large communal buildings such as the church, grammar school and cultural school.

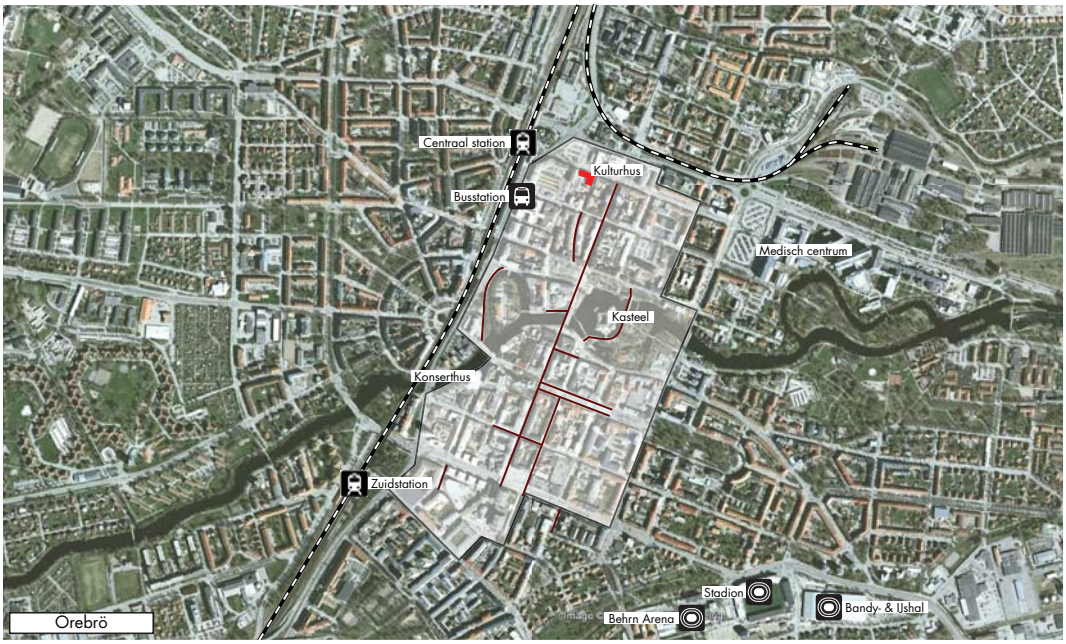
Norrköping
Inhabitants: 87 247
Region: Östergötland (southeast)

Norrköpings Kulturhus Kulturkammeren
Year opening: 1993
Building type: historical
Main activities: concert hall, foyer, salon, repetition rooms
Location description: In the dense inner city between the railway station, city centre and campus area of the university, the former industrial district along the river.



Nyköping
Inhabitants: 29 891
Region: Södermanland (east)

Culturum
Year opening: 1989
Building type: new
Main activities: library, concert hall
Location description: Within the city centre near the banks of the river, connecting both sides of the historical Nyköping.



Örebrö
Inhabitants: 107 038
Region: Närke (middle)

Kulturhuset Örebrö
Year opening: 1928 (as folkets hus)
Building type: historical
Main activities: theatre, art exhibition, concert halls, fairs, conference centre, youth centre, cafetaria
Location description: In the northern part of the city centre, hundred meters from the central station. Part of the main route between the station and southern part of the city. The main pedestrian street of Örebrö.

Uppsala
Inhabitants: 140 454
Region: Uppland (east)

Kulturhuset Grand
Year opening: 1936
Building type: historical, old cinema
Main activities: youth centre, concert hall, bar
Location description: Located in the University quarter bordering the city centre in an older neighbourhood. Part of the streetfaçades.

Sundsvall
Inhabitants: 50 712
Region: Västernorrland (north)

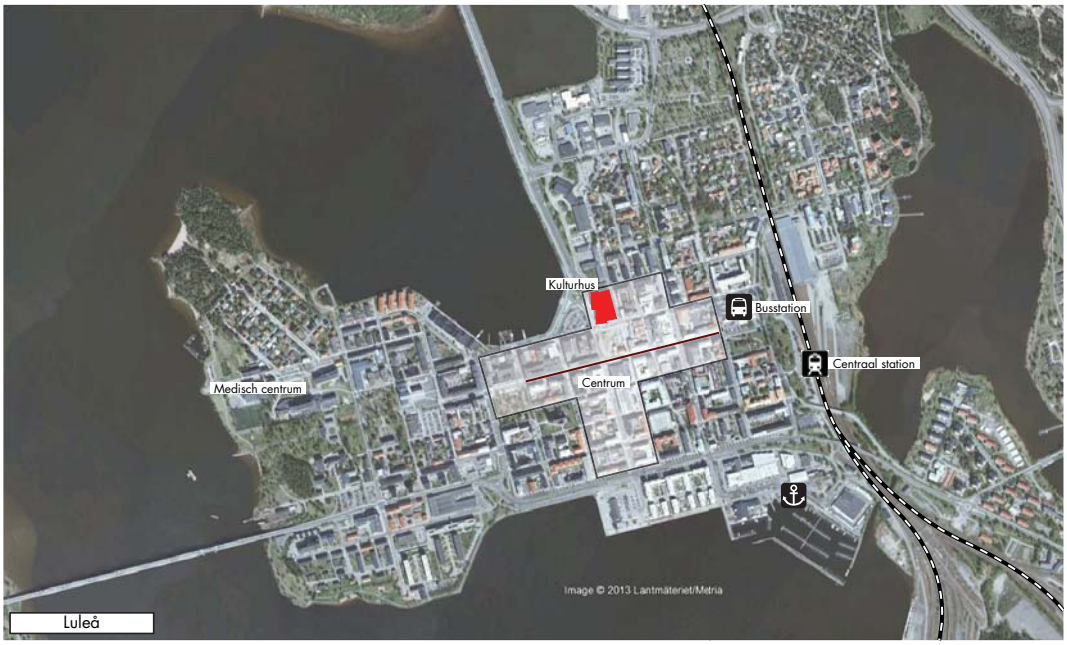
Kulturhuset Sundsvall
Year opening: 1986
Building type: transformation; warehouse
Main activities: library, museum, boutique, bar, archives, education guidance centre, consumer association, climate advise
Location description: In the outer edge of the city centre on a pedestrian shopping street and next to the bus station. Near the river, bay and on the innercity ring.

Umeå
Inhabitants: 79 579
Region: Västerbotten (north)

Kulturväven
Year opening: 2014
Building type: new
Main activities: library, museum, cultural node
Location description: On a prominent place along the river in the city centre and near the new arts campus also on the riverfront. On the main axis towards the railway station straight through the centre.

Luleå
Inhabitants: 46 607
Region: Norrbotten (north)

Kulturens hus Luleå
Year opening: 2007
Building type: new
Main activities: city library, art gallery, concert halls, multifunctional foyers, bar and restaurant
Location description: on the edge of the centre one block away from the main street. Located on a sight location near the waters of the Botnic Gulf.



building easy accessible for everyone. But architectonically the Skövde kulturhus forms an opposite to Kulturhuset in Stockholm, with a closed and monumental form. Architect Hans-Erland Heineman wanted to create a multi-functional kulturhus that could break the borders between the different arts and turn display rooms into activity environments (Skövde kommun 2013).

The position of the kulturhus in the Swedish city

By comparing all the different kulturhuser in Sweden commonalities are found that can typify kulturhuser in three different categories: New kulturhuser, redeveloped kulturhuser and historic cultural institutions.

A treat all kulturhuser share is their location within the central part of the city. This does not mean necessarily that they are found in the historical centre of the city, because the kulturhus concept and building type were developed long after the historical towns expanded out of their original city borders. Because most kulturhuser have a fairly large and distinct programme, it is hard to fit them in monumental or historical inner city buildings. As a consequence most are founded in new or redeveloped buildings, with the new buildings being built in well accessible places near the city centre, were space was available. Redeveloped kulturhuser are often in former industrial areas on the edges of the city centre.
Like Dutch cities, the historical cores of Swedish cities still often form the city centre. Railway stations were built on the edges of those cores, where after urban expansion these became surrounded with newer neighbourhoods.

1. New kulturhuser

New kulturhuser are purpose built, often on plots in the centre that were undeveloped or cleared after demolishment of previous buildings. As a result they are often found in redeveloped areas, if possible near railway stations, like in Stockholm, Kungsbacka and Skövde, or on landmark locations with good visibility characteristics near the water, for example in Jönköping, Umeå and Helsingborg, or near the town's central square or shopping street, as in Nyköping or Luleå.
An early example of a first category kulturhus is located in Borås and can be considered less successful. The large building complex was opened in 1975 just outside the city centre in a cluster of older public buildings. The eccentric location made it more difficult for the building to function as a meeting place and to attract impulsive visits of passers-by. Later kulturhuser were placed at better accessible locations that could attract a wider range of people in its public.

2. Redeveloped kulturhuser

Redeveloped kulturhuser are situated in historical buildings that were built with a different function than a kulturhus. Industrial heritage sites offer spacious buildings often near city centres, making them suitable for redevelopment into kulturhuser, like in Sundsvall, kulturhuset Västerås or kulturhus Jönköping. Although a non-purpose built kulturhus has often more difficulty in functioning and is not preferred by users in the field (Röhlcke 2013), diverse results are possible and good prospects are offered to propel redevelopment areas.
The history of redeveloping of historic industrial buildings is fairly short. The first kulturhus that made use of a redeveloped building is located in Jönköping. After long debates of building a kulturhus that did not deliver any results, a group of 200 young people occupied a fire station (Järhult 2007). Eventually they were allowed to settle in the old match factory near the railway station where the kulturhus was founded in 1982. Also in other cities old factories became focal points for developing kulturhuser, often located near the old harbour or railway yards, but in close distance of the city centre and in Sundsvall even close to the main pedestrian streets.

3. Historic cultural institutions

The third category involves historical buildings with a cultural function, like a cinema, that were expanded to house additional functions. Because of limited space around the former mono-functional buildings this type of kulturhus tends to be smaller. The location is often less ideal as cinemas, libraries and similar functions had a less prominent place in the city. Examples of extended cultural buildings are found in Örebrö, Uppsala and Nörrköping. They are located in (side) streets on the outer edge of the city centre and have a more limited programme than kulturhuser from the first two categories. Unlike most other kulturhuser a library often is not taken into the programme if it was not the original function of the building.

Mixes and special cases
Some of the kulturhuser can be classified in more than one category. Varberg is one of these kulturhuser, as it fits in both the second and third category. It developed from the extension of an existing library, thereby incorporating the adjacent theatre. This strategic move meant that a large, relative to the size of the town, cultural institute is now located between the railway station and town centre.
Lund and Uppsala as the two most famous Swedish university towns have relatively small kulturhuser that were developed from other historical buildings. In the case of Uppsala a cinema was extended, while Lund's kulturhus is located in an old diary factory on the edge of the historical centre, after it was abandoned for almost 20 years. The universities in both towns occupy a large area of the city and traditionally had many activities organized by and for students, leading to less initiative to realise a kulturhus in these cities. Although less university focused Nörrköping and Umeå were in similar situations with the latter only receiving its kulturhus in 2014.

Function in the city
The function of the kulturhus as a meeting place becomes clear from the analytical maps as almost all kulturhuser are located in and around the historical centers of the respective cities. Making them accessible for pedestrians, cyclists and often also for travelers of train and other public transport. Ideal are the locations near railway stations on important connecting streets towards the inner city. Kulturhuset in Stockholm and Skövde fulfill this location preference perfectly, probably explaining the success of the new building concept and acting as catalysts for later developments of kulturhuser in other parts of Sweden. Other kulturhuser were also built to function as a catalyst for urban redevelopment areas and gentrification. Helsingborg is the best example of this, where Dunkers Kulturhus is located in the newly developed former port area, on a large square opposite the historical inner city, thereby effectively expanding the city centre.
When reflecting on the main aims from the 1974 kulturpropositionen (Frenander 2001) a number of the aims is being reflected in the development of the kulturhuser. The kulturhuser brought culture closer to people in a wide range of cities all over Sweden. Acting as meeting places they promote contact between people. The possibility of housing (controversial) exhibitions but also to house clubs and associations added to the personal freedom of people and more social equality. The kulturhus is able to form a counterweight against commercial areas in especially redevelopment areas, but is more a building that can exist in harmony with other public buildings, generating activities in the city. The final point of cultural exchange across language and national borders is something that has occurred, but not necessarily on a big scale. In practice it seems difficult to house different functions under one roof and to present them as one organization (Röhlcke 2013), something that is also visible in the Netherlands. The spread abroad of the concepts found in kulturhuser however, may be seen as an acclamation of success.
Frenander (2001) writes that the government's goal of kulturpropositionen was never to regulate culture, but to support and stimulate cultural activities directly. The kulturhuser have made a large contribution in bringing these aims into practice.

Dutch kulturhuzen
In the Netherlands the concept of kulturhus has been introduced in the year 2000, when Sluziger kulturhus in Zwartsluis, Overijssel opened in November of that year. The name kulturhus was borrowed from Swedish just as the organizational form. It has to be noted however that the name kulturhus has the same meaning and spelling in the Dutch low Saxon (Nedersaksisch) dialects of Overijssel and Gelderland, where it was first introduced.

Kulturhuzen (Dutch plural) in the Netherlands are as of 2013 concentrated in three provinces, namely Overijssel, Gelderland and Utrecht. Most kulturhuzen are located in villages, with more and more neighbourhoods of larger towns starting to develop kulturhuzen too. Examples are Zwolle, Utrecht and Hengelo, but also these kulturhuzen focus just on a small area within the city. There is no example of a building that could be compared to Kulturhuset in Stockholm that functions as one of the main meeting points within the city and where for example the central library and main theatre are housed.
At the moment the closest example of a similar building could be Cultureel Centrum Rozet in Arhnem, opened in September 2013, although formally this is not a kulturhus. The building concept is to continue the street within building, with the main library being housed in the complex, complemented by a range of other cultural and commercial functions. There is however not an umbrella organization that acts as the main spokesperson for all activities in the building.

Related buildings
In the Netherlands a range of multifunctional buildings exists that are in some form related to kulturhuzen. All these buildings are seen as part of the collective category "Multifunctionele accommodatie" (MFA: multifunctional accommodation). Buildings like health centres, community centres, "brede scholen" (broad schools) and kulturhuzen are found under this conception. The brede school, where the main function is the school, is most closely related to a kulturhus where the library takes this function. Clusters for sports, health or care are more distantly related, but are found in all parts of the country.
All MFAs share two common characteristics, the function as meeting point within the neighbourhood and the multiple use of the accommodation (MFA-kaart 2013). There are however large discrepancies in quality between the individual projects. Unlike in Sweden there are no collective policies or common standards that range further than multifunctional use and being a meeting place.
A strong element of the kulturhuzen is that this concept is more than a grouping of organizations under one roof. In well-functioning kulturhus, organizations work together and present themselves as a single institution. From location visits and talks with employees in Zwolle, Wijhe and Olst, all in the Overijssel province, and for that matter also in Stockholm, this organizational construction policy came forward as the main reason a kulturhus can be successful. Efficient sharing of space can only be organized with good communication and functions can improve each other's image by presenting the kulturhus as one organization.

Implementation
A kulturhus were this organizational structure was implemented with success is the Holstohus in Olst and part of Kulturhus Olst-Wijhe. Opened in 2005 as part of the renovation of the village centre, it has become a leading example for new initiatives of kulturhuzen in the Netherlands, being selected in the MFA kopgroep 2008 (MFA-kaart 2013). The location within the village centre on the location of an old school, made it easy accessible from both the railway station and by road (Buitenkamp & Potman 2005). The main activities in the kulturhus are government services, touristic information by the VVV, a library, social and cultural activities and the rental of rooms and a hall for all kinds of courses and meetings.

Buitenkamp and Potman write that the idea behind the Kulturhusconcept is a combination of social amenities, information and (business) services that are brought together under one roof. The participating institutions share one building and cooperation between the participants is an important element. They acknowledge that the kulturhus improves the liveability in small urban cores and villages and that in practice the kulturhus functions as an important meeting place. It illustrates the qualities of the concept to function as a catalyst for redevelopment and an impulse for social equality.
Although, for the moment, the concept is embraced by smaller villages in the less populated eastern parts of the country, it is not yet seen as a concept that could be implemented on a larger scale in the bigger cities of the Netherlands. In this sense the building is seen as a neighbourhood function, contrary to the Swedish kulturhus that functions on a citywide scale. The folkets hus however as more or less the same function in the neighbourhood that the Dutch kulturhus fulfils.

Functioning
The activities planned in kulturhuzen are very diverse and differ not much from other Dutch MFAs. Where in Sweden exhibitions or galleries are often part of the kulturhus, following the ideas of personal freedom and exchange of art and culture across borders, kulturhuzen in the Netherlands often are focused more on renting spaces to fixed cultural institutions and social activities like sports. Kulturhuzen have a somewhat informal character, because they are aimed at decreasing the barrier to enter, but it is also a side effect of the use of the same spaces in several ways, for instance a school cafeteria that is also used as a theatre.

Architecturally every kulturhus gives its own insight to the form of the building. As most kulturhuzen in the Netherlands are located in villages and new Vinex neighbourhoods, most feature modern glass facades or are built in a more traditional style.
In Zwolle Cultuurhuis Stadshagen sits on the end of the main neighbourhood shopping axis, on the water shore. Transparent facades offer a view inside from the pedestrian areas and the building is divided in two sections around a central atrium. Through split-levels the division in functions become clearer.
In Olst on the other hand the kulturhus was shaped as a modern version of a traditional farmhouse, scaled up to the needs of todays activities. Here the facades feature the closed walls out of bricks and with some wood details. A light hall organizes the building internally and gives access to the different institutions on

all levels. On the ground level these form a soft border extending their furniture into the common hall, giving it an intimate atmosphere.

Within the Dutch language area more traditions exist. Although not taken into account within this research a mention of the Flemish 'cultuurcentra' (cultural centres) has to be made. For over half a century a large network of these cultuurcentra are found all over Flandres, but unlike kulturhuzen they focus mainly on getting the local inhabitants acquainted with culture. The cultuurcentrum is therefore more similar to the German Kulturhaus and not with the kulturhuser of Scandinavia that have a much broader objective.

Kulturhus Culturum in Nyköping.

Kulturhus Holstohus in Olst.

Strategy

Policy

Creating chances is the key for the policy aim that steers the spatial interventions required to achieve the social improvement in the neighbourhoods of Rotterdam South. From the analysis of the main social and spatial problems there has been concluded that there is social exclusion in the south of Rotterdam. It means that people in these neighbourhoods have less opportunities to access amenities, but also that social standards are lower as a consequence of the physical characteristics of the area. To come to more social justice and social inclusion accessibility needs to be at least one of the main focus points, if not the main focus (Farrington & Farrington 2005).

In contemporary planning the infrastructure networks have to get a prominent role, something that did not happen until recent times: 'Most social analyses of cities still address urban sociologies economic development, governance and politics, urban cultures and identities, and urban ecologies and environments, without seriously exploring the roles of networked infrastructures in mediating all' (Graham and Marvin 2001: 19). Infrastructure networks have grown out to systems that cannot be denied anymore and need a professional embedding in their related contexts.

Farrington & Farrington are very clear that accessibility is a strong idea that is a necessity for the social justice project. "Accessibility is fundamentally about the life opportunities open to people. It is not a sufficient condition for social inclusion and social justice, but it is a necessary one" (Farrington & Farrington 2005: 10-11). This is in line with the notion that investing in transportation will only be helpful when it is complemented by other investments in the neighbourhood (Knowles et al. 2008). Policies in other fields need not to be forgotten, but become fruitless if there is no attention to sufficient accessibility.
Because accessibility is such an important element in coming towards social inclusion, it has become the main focus point in this project's effort to improve chances, and so to improve social inclusion. It is however not the only intervention suggested in this project.

Another factor in the efforts for social justice and social inclusion is that people have sufficient income. The chances for job opportunities increase by good education, knowledge of the language and social contacts. The project neighbourhoods in Rotterdam South all lack these matters. The kulturhus, as social meeting point (Röhlcke 2013), can be seen as a way to work on these aspects. A library, and rooms for lectures and evening schools educate people and improve language skills. By means of being part of a club or association, playing sports or just by meeting someone in a bar, social contacts can be made. Thereby increasing living quality as well as bonding with the neighbourhood. Kulturpropositionen of 1974 describe many of these phenomena, found as weak points in Rotterdam South, as action points to improve social inclusion (Frenander 2001). Culture in Sweden was, and still is seen as an important tool of freedom and contact between people, in which the kulturhus is the ideal place to reach communities.

The implementation of the planned interventions on South goes through a process of open planning as described by Spit and Zoete (2009). This form of planning adds flexibility to the measures and deals with the shift towards an increase use of bottom-up processes in spatial planning. It opens up the chances for market forces to participate in the process.
To realize the project agreements have to be made between parties that define strategy and financing. Although the urbanist or the architect is not in the position to determine policies, the recommendation would be to actively involve transit operators, mainly national railway company NS and potentially RET, in the process. The Japanese (Priemus et al. 1999) and Swedish policies (Bertolini & Spit 1998) regarding the development in station areas could be taken as principles for this situation, maybe even in the form of a pilot project adapted to the Dutch situation. Including NS Stations, the real estate company of NS, in the project would secure good scheduled services to the station, as their own investments bring in new travelers.

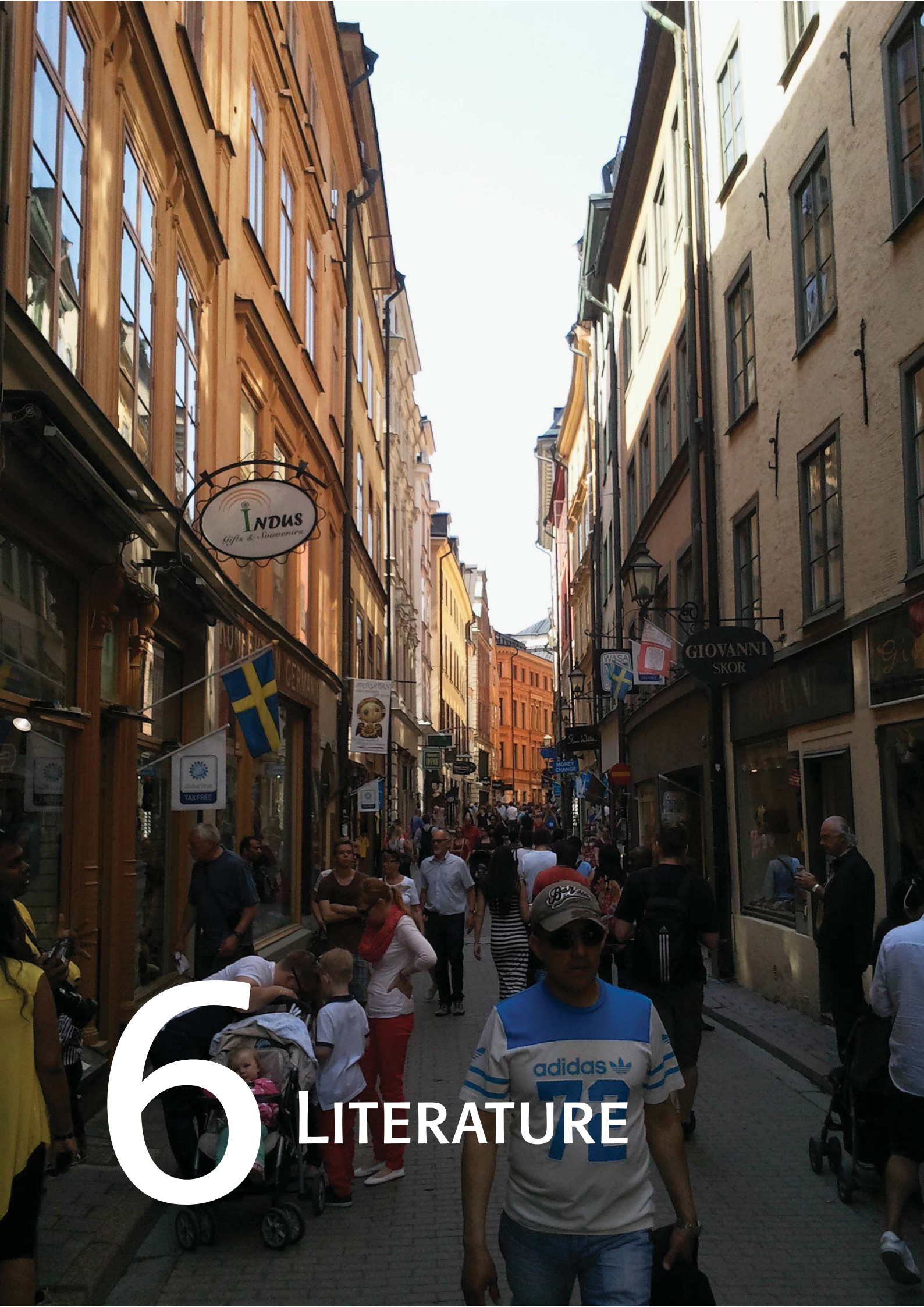
Spatial interventions

The spatial interventions in the project offer an alternative for the traditional urban renewal. One of the main objectives of the project is to create an urban centre in Rotterdam South, to which the whole area has a clear orientation. The designation of three main axes through the city, two leading from the centre of the city southward across the different city bridges and one on a proposed new axis that can be formed by

building a new Third City Bridge, will bring the project location to the heart of Rotterdam South. Sanders et al. (1999) and Bertolini & Dijst (2003) call railway stations the urban squares of the future, as shifts in consuming patterns and Internet cause people behave differently in the city. An important urban centre in the Netherlands without a railway station is almost unthinkable, and may face an (increasingly) downturn in the future when current trends continue. The car is becoming less popular under young people and the future lays in the connection of modalities (Van den Boomen & Venhoeven 2012).

The choice of improving social inclusion by public transport has a few reasons. Public transport is more sustainable and efficient than car mobility, so that a larger urban density can be upheld. The associated thoughts are making the city more attractive, because more functions can be supported and because of more liveliness, city life can flourish. Currently the district of Feijenoord is among the most densely populated areas in the Netherlands. But because of limited amenities to house a vibrant city life and a relatively isolated position this attractive city has not blossomed. The creation of an IC-station in the neighbourhood and an improved structure in the neighbourhoods, finishing current patterns and breaking away barriers, will trigger the potentials that are present in the district.
In the urban situation of the project location the railway forms a great barrier between two sides of Rotterdam and the river. The construction of a station not only makes effective use of the railway corridor, without the need of extra investments to open up far away grass lands (Van den Boomen & Venhoeven 2012). But it also provides new connections across the railway line that improves the structure of the neighbourhoods.

The combination of a railway station and kulturhus into a stationshus is a consequence of the advantages both functions have on each other. The kulturhus can be described as a meeting point in the city. Effective meeting points are well accessible from the surrounding areas, but also from further away if it wishes to function on a higher scale. The kulturhus in the project aims at people within the Feijenoord district of Rotterdam South, but people out of other parts of Rotterdam South or the rest of the city are more than welcome. On the other hand a railway station could profit from extra activities. NS-Poort is the most important factor in the revenues made by NS, through sales and exploitation in railway stations (Van de Lune 2013). The opening of a library in station of Haarlem has generated a lot of positive feedback, as passengers can improve their travel quality by quickly lending a book before they enter the train. The stationshus concept offers similar services and leaves room the exploitation of commercial activities that can be run by NS-Poort.



6 LITERATURE

Other literature

In this chapter some literature will come forward that was influential for the design process, but that was not mentioned in the previous theory chapters. The focus is on creating a connection between a station and the urban centre that it connects and on the design approach of urban environments by the Scandinavian (Danish) architect and urbanist Jan Gehl.
Jane Jacobs' work was an inspiration for both of the authors who are discussed. They continue her studies, by further studies and effects on present day sustainable cities. Together their theories and suggestions could be described as pedestrian-oriented developments (POD).

Connecting railway stations to urban centres

Fixing the link

Fixing the link is the title of Brouwer's (2010) manual made for NS Poort (NS Stations since 2012). Brouwer writes that the cause for the handbook is the often broken link between city centres and their station in the Netherlands. Rising numbers of passengers, as well as increasing visits to inner cities make the connections between station and centre more and more important. For visitors this connection is the first impression of the city, a good first impression leads to a longer stay and more spending (Van der Spek in Brouwer 2010). Brouwer created a method to define the quality of a link, by valuing spatial elements of this route. The elements and scores are inspired by the ideas of Jane Jacobs (1961).

Criteria

Twelve criteria divided in four categories are taken into account by Brouwer.

- Liveliness: The mix of functions, with use during the whole day and visual contact between people and architecture.
- Human scale: The length of blocks and houses in relation to the total length of the connection.
- Readability: The orientation and straightforwardness of the link, plus the quality of routing signage along the way.
- Safety and comfort: Pedestrian priority and the contact between building and street and the state of maintenance of the public space.

Active plinths are very important in the run-up streets, 90 per cent activity is a minimum. The found types of functions can be categorized as residences, offices, shops, leisure and education. Residences play an important role, as they are lively during the whole day, something that can be further stimulated by the use of terraces, benches, shops and other activities outside office hours.
Short distances of the link are preferred, just as in the width of building blocks and houses. Turns in the route make it harder to find the right way and to stay oriented, if they occur clear signs and maps should mark the right directions. Recognizable objects along the way are important to remind the right route. Even when the route is straight, barriers like roads and chaotic squares can trouble unfamiliar visitors on their way to the centre.
Finally public space is more attractive when it is clean, well maintained and when there is social control preferably from apartments above plinths.

Implementation

The ideas of fixing the link played an important role in the design of the connection between the stationshus and the Beijerlandselaan. In the first place two existing building blocks, one of which is very new, blocked the shortest route from the building to the shopping street, seen as the urban centre that needs to be connected well to the station. Two routes were considered, one connecting to the Slaghekstraat and the neighbourhood before turning to the Beijerlandselaan, the second connecting towards the northwest directly to the crossing of the Beijerlandselaan and Putselaan. Eventually the latter was chosen because of a shorter distance and no angular turns. The facade of one of the blocks bordering this route had to be replaced to create a situation in which this block could border the square and walking route. Also the decision to connect the Laan op Zuid directly with the Beijerlandselaan, made this viewpoint stronger.
An arcade along the northern facade of the route houses an active plinth with diverse functions. Above the plinth residences provide social control and liveliness during day and night. The mosque functions also as a recognizable object along the route, while the square provides a public space with quality and chances

for activities. There are no intermediate streets that have to been crossed.

In all the route scores high, with as main critique the long length of the building blocks and the inactive plinth of the Mediamarkt. This is compensated by the arcade filled with commercial units and terraces on the square. Strong points of the route are the direct connection and short length of only 200 metres.

Jan Gehl

Scandinavian approach to urban design

The Scandinavian influence on the project has also an influence on the urban design and the future use of it. Jan Gehl, a Danish architect and urban designer, has progressive ideas on urban design that should bring sustainable cities closer. Gehl incorporated ideas of sociology, psychology, architecture and urbanism in his theories, added with own experiences from Denmark. Just as Jane Jacobs, Gehl (2010) advocates the use of human scale in architecture and urbanism. 'Fifty years ago she said – go out there and see what works and what doesn't work, and learn from reality. Look out of your windows, spend time in the streets and squares and see how people actually use spaces, learn from that, and use it' (Gehl in Anderson-Oliver 2013).

Anderson-Oliver (2013) describes some of Gehl's successful implementations of his theories that advocate walking and cycling. After Gehl worked in Melbourne in 1993 a main recommendation was to dine outside like in Paris' boulevards. First ridiculed, Melbourne now has the highest number of street furniture per capita in the world and the numbers of pedestrians in the city have doubled.
Other successful projects were realised on Times Square in New York, where a part of the street was given back to pedestrians. An in Amman, Jordan, where a whole car-free pedestrian strategy was realized in the city (Anderson-Oliver 2013).

Cities for people (Gehl 2010)

Human Dimension

There is a trend of creating dynamic, mixed-use urban areas. High car-use is negative as cars compete for space, 'the sustainable city is strengthened generally when a large part of the transport system is "green mobility", by foot, bike or public transport […] The attractiveness of public transport is boosted when users feel safe and can comfortably walk and bike to and from buses, light rail and trains' (Gehl 2010: 7).
The continuing growth of cities and urban areas lead to the need for a new planning dimension, of which the main aims are:

- A lively city
- A safe city
- A sustainable city
- A healthy city

There is a demand for better urban quality, therefor a cohesive city is needed where people are invited to walk and use "green transportation", and this also benefits health. Pedestrian oriented developments have been monitored and found incredibly successful in Copenhagen. The cities pedestrian zones rose by a factor seven between 1968 and 2005 and also bicycling have become the most use mode of transport in the city. Similar effects were noted in Melbourne and Århus. Improving pedestrian quality on all kinds of scales or contexts increases use, comfort, staying activities and can affect using patterns throughout the city. Example measures can be broadening pavements or opening old waterways.
Gehl argues that the city's greatest attraction is the people and a lively city is about activities. There are two sorts of activities, necessary and optional, especially the latter can benefit from quality in the public space.

Lively city

'In modern city planning key words to encourage life in the city are compact, direct and logical routes; modest space dimensions; and a clear hierarchy' (Gehl 2010; 67) that defines the most important spaces. Density is not a prerequisite for a lively city, a combination of good inviting city space and a critical mass of users are. An overkill in the number of city spaces leads to an overall impoverishment of space and use.

Ways to improve the quality of space is to set higher buildings further back, to allow transmission of light, or to encourage people to move slower, this generates more activity than high numbers of people. Edges, particularly the lower floors (plinths) of buildings, form an important asset for quality in city life. Edges define space and act as exchange, staying or experience zone, good rhythms are essential with vertically articulated facades making distances seem shorter and more interesting, the opposite applies for horizontal articulation. Studies show that soft edges, like balconies, small front gardens and arcades, support most activities and communication.

Safe city
Just like Van den Boomen and Venhoeven (2012) Gehl argues that in modern planning a better balance is sought between the types of traffic, in which Gehl argues that pedestrians need to get priority. In Venice the transfer from rapid to slow traffic happens at the city limit, rather than at the front door, this has protected the city quality for centuries.
Life in the streets has a crime-preventing effect; it evolves around contact with the street, strengthened by mixing functions, having a clear structure to distinguish places. Towers have less contact and should therefore not be placed prominently on the street.

Sustainable city
In the USA transport accounts for 28% of the carbon emissions, TOD and more importance for bicycling and pedestrian traffic are important steps towards a greater sustainability, as they use less space and resources. The quality of the journey to the station has a direct effect on the efficiency and quality of public transport systems. A slightly different form is social sustainability, which means that people that do not own cars should have access to the amenities of the city.

Healthy city
Over time daily physical activity has decreased with people in cars, elevators and behind computers that reduce the need of movement, while eating habits have deteriorated. The objective is to introduce exercise again as a natural part of daily life. By making it pleasant and safe to walk or bike around, throughout the day and night. Cities have to encourage people to walk or jog as a part of their daily routine.

The city at eye-level
Visibility of humans is oriented down and suitable to recognize each other up to a length of 100 m. distance and This has influenced the size of squares, old squares in Europe are rarely larger than 10,000 m^2 and most are between 6 - 8,000 m^2, with a common length of about 80 to 90 m. The human orientation makes buildings higher than five stories to loose contact with the city. Lack of understanding and respect of the human scale, starting from modernism in the 1930s, has let to large scale and a shattered city. The so-called Brasilia Syndrome, called after Brazil's capital, in which planning has only been concentrated on the two biggest scales and the contact with the city on eye level has been lost.

Walking is the best way to absorb a city, while 100 km/h cities like Dubai are architecturally impoverished, uninteresting and tiring when walking through them. Cities with small spaces and short distances correspond to a warm, intense city experience regardless of the weather. A distance of about 500 meters is about the average distance people are willing to walk; this is reflected in the size of city centres, which is typically around 1 km^2. To avoid annoyances, sidewalks should be uninterrupted and cars from side streets must yield to invite pedestrians. In many cities around the world this waiting time can be between 15% and 50% on a one-kilometre walk. In Copenhagen's Strøget walking street, this has been reduced to 0 - 3% of the walking time and also avoids waves, large concentrations of people that have waited for a traffic light.

There is a difference between cities in developing and developed countries, in the former most activities are necessary while in the latter there are far more optional activities in the streets. The edge effect is when people stay a while at a place, usually at the edges of the place, on steps, against columns or walls or at furniture of facade details, but not all facades are suitable; closed, smooth facades without detail are no potential staying zones. An attractive microclimate is needed with back coverage and low levels of noise combined with a good view. This leads also to seating, primary seating with arms and backs, like benches and chairs, and less formal secondary seating. A good combination of both attracts people from all ages. City space needs to give opportunities for senior citizens and children to walk and play. In

historical cities no designated playing grounds were needed as children play on elements that are around, simple solutions often convince the best.
Finally this can be complemented with sidewalk cafes; in the last twenty years there has been a massive growth of this phenomena, originally from the Mediterranean countries. Now this concept has spread across the world, these staying activities are necessary for a city to create a good city.

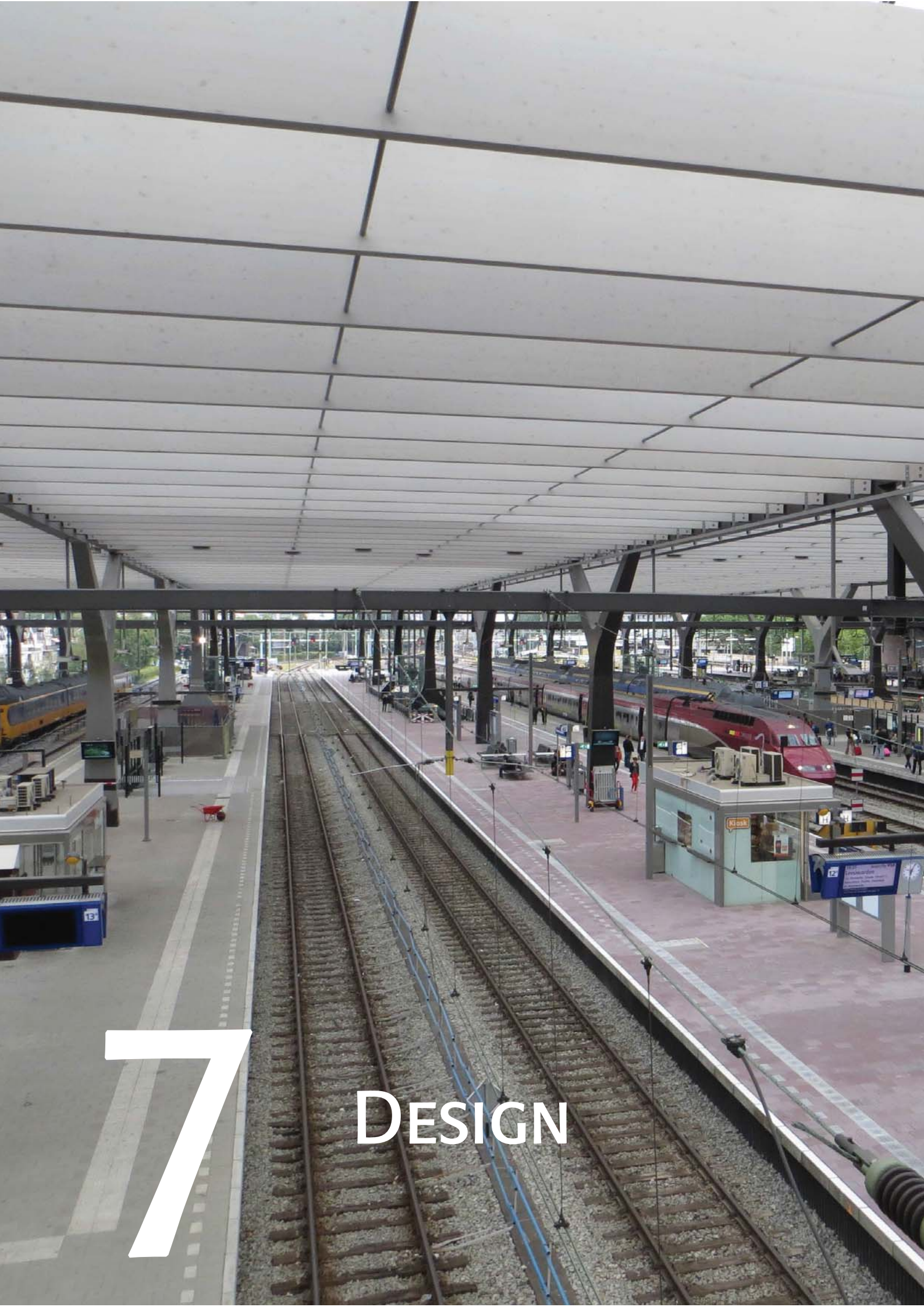
Microclimate can be influenced, as it does not only depend on air temperature or wind. The wind is influenced by urban landscape, many trees and low-rise buildings reduce wind speeds, opposite to tall buildings that increase wind speed and reduce growing opportunities for plants. Regions have adapted to the regional climate, in Scandinavia for example buildings are close together and have inclining roofs, many trees make the streets almost free of wind, creating a microclimate similar to a latitude of 1000 km south. In Oslo screens, hedges and landscaping make it possible to sit outside for ten months a year.

Concluding
Gehl in fact argues that by 'reducing the capacity of urban spaces', a very functionalistic coining for a more social phenomena, a more lively city is formed. This is done by limiting size and speed of the public space, to make people stay longer in a certain space that will increase activities. The edges and height of buildings, as well as landscaping and pedestrian oriented improvements, are important to maintain contact with the street and make the city a more lively, safe, sustainable and healthy place.

Influence on design

The ideas of Jan Gehl (2010) have influenced the design of different elements in this project to secure the quality of urban space, to create a sustainable and lively city. Especially guidelines on how to make soft edged and the way a public space can be designed, taking the human scale into account. Some of the important influences on the design are mentioned below, but in the Design chapter a more extensive elaboration of the design is given.

The approach and strategy of the Rotterdam South project take sustainability as a starting point for measures that improve accessibility and social equality. The parts of the city that will connect to catalyst building are just as important as the building itself, to achieve the desired results. Limiting the size of public space was an important tool, to increase activity density. Although the available spaces and current building blocks were placed in a way that would support large urban squares. By creating separations between areas, human scale was brought back in the design, that offered a diverse public space with mixed functions, soft plinths in the form of arcades and covered open spaces underneath buildings and a clear structure. Distinguished characters, made by the furnishing, materialisation and landscaping of the public space, give all sides of the intervention building a clear orientation and is in this way recognizable for people. All the different characters are mainly pedestrian oriented and encourage people to walk between the different facilities of the centre area, like the Beijerlandselaan shopping street, the station and kulturhus and river quays.
Safety in problem neighbourhoods is often felt as a major problem for pleasant activities that makes the urban area appealing. Over the whole of the project area people are living in the new developed buildings, often above active plinths. This increases social control and the feeling of safety in the neighbourhood.



7 Design

Design

Introduction

Although there is a large range of examples for kulturhuzen in the Netherlands, the concept is quite unknown with the general public and its use has been limited to villages and neighbourhoods in the Netherlands. A recognizable symbolic example like Kulturhuset in Stockholm is still missing. The new kulturhus in Rotterdam has the chance to profile itself as the face for kulturhuzen in the Netherlands, because of its well accessible location in a large city. The development of the urban area around the station and kulturhus is very important to make the building function as a meeting place, and thus to become successful.

Quick glance of design

The combined station and kulturhus take a central place in the design. A central hall acts as the main organizing element within the building and makes travellers and visitors easy find the platforms, entrances, kulturhus and shops. It also causes the building to become more than just a station and a collection of cultural functions, it will act as the central building in neighbourhood life, being a meeting point as well as a place of travel, education and recreation.

The building is placed upon the existing tracks of the railway Rotterdam – Breda, and the end point of main axis that is formed by the Laan op Zuid. Two important roads connect in the same area. The already mentioned Laan op Zuid directly connects the location to the centre of Rotterdam with the other ends connecting to the A16 motorway and shopping street Beijerlandselaan. At the same time the Putselaan makes an important east-west connection within Rotterdam South and is continuing into a third city bridge across the Maas river. The crossing of the two roads is placed a little away from the stationshus, to shelter the entrances from too much traffic and related noise and other hindrances. This also allows the creation of one main artery through the four neighbourhoods in the area were most functions and activities are concentrated. By connecting the Beijerlandselaan with the Laan op Zuid a single continuing structure is formed that gives easy access to all inhabitants in the area and forms a recognizable element within Rotterdam South.

Around the stationshus building an array of public spaces develop with specific characters. On the west side, towards the neighbourhood, a square connects the building to the Beijerlandselaan. The existing mosque also gets its main entrance on the square, through which it is absorbed into the urban fabric, unlike its current isolated position. The north entrance to the end of the Laan op Zuid is directly on the access road to the city bridge and the trams stop underneath a large canopy. The Laan op Zuid does not carry traffic on this southern extent, but is a small park and pedestrian connection to the station and for the surrounding buildings. The riverfront in the east gets an important role in the new urban situation, because it is opened up and connected to the neighbourhoods behind the railway, and use is increased with a small harbour and a stop of the Waterbus, creating an extra modality for the already multi-modal node of trains, trams, bicycles and cars.

A tunnel under the railway connects the Laan op Zuid and the motorway and resurfaces next to the Kuip and the indoor sports centre. Both are in walking distance from the station and a special route gives large amounts of visitors direct access to the stadium from the platforms in the south. When there are no events the route can also be used as a neighbourhood connection for slow traffic across the railway.

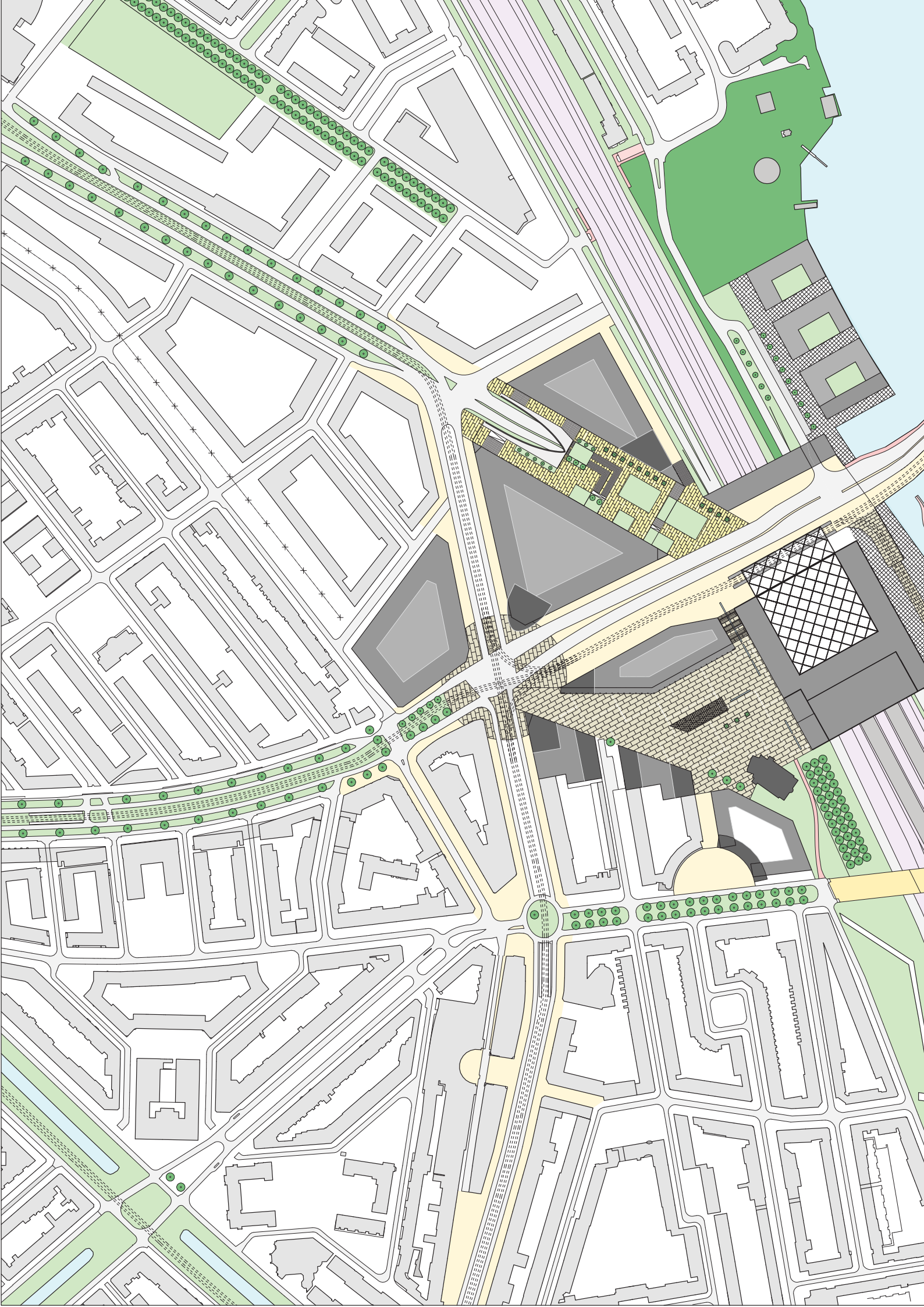
Main goals of design

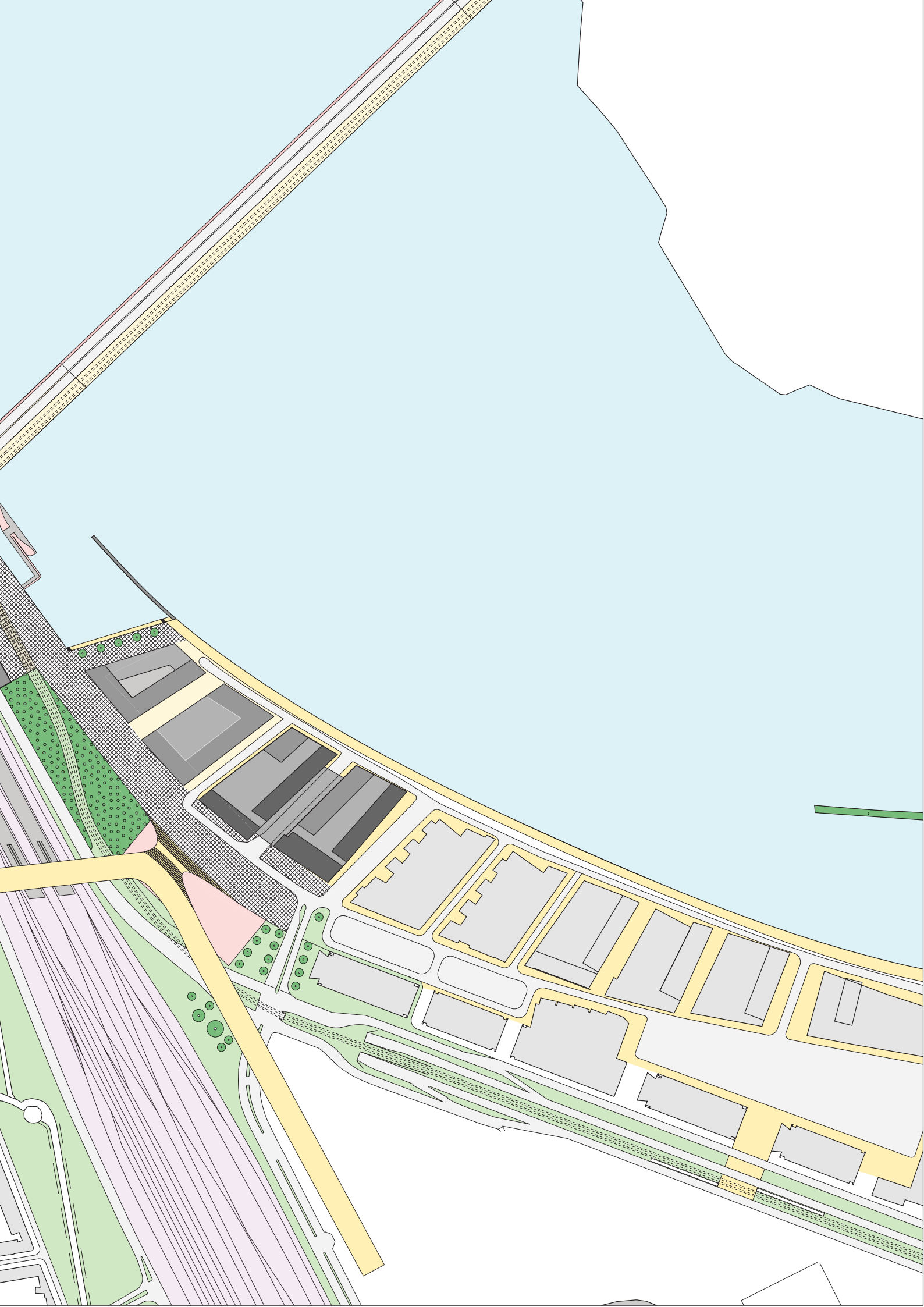
The most important goals of this project are to improve the connection of Rotterdam South with the national railway network and to stimulate social equality by creating a meeting point. The building that houses these activities needs to be absorbed by its context to become a full grown and lively part of the city. The public space needs to be inviting to attract people into this meeting place on South, so the building can function as a catalyst for redevelopment and improvement of the problem neighbourhoods on South.

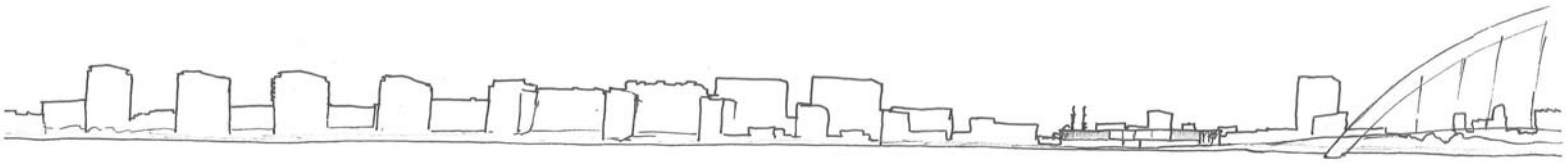
Urban function

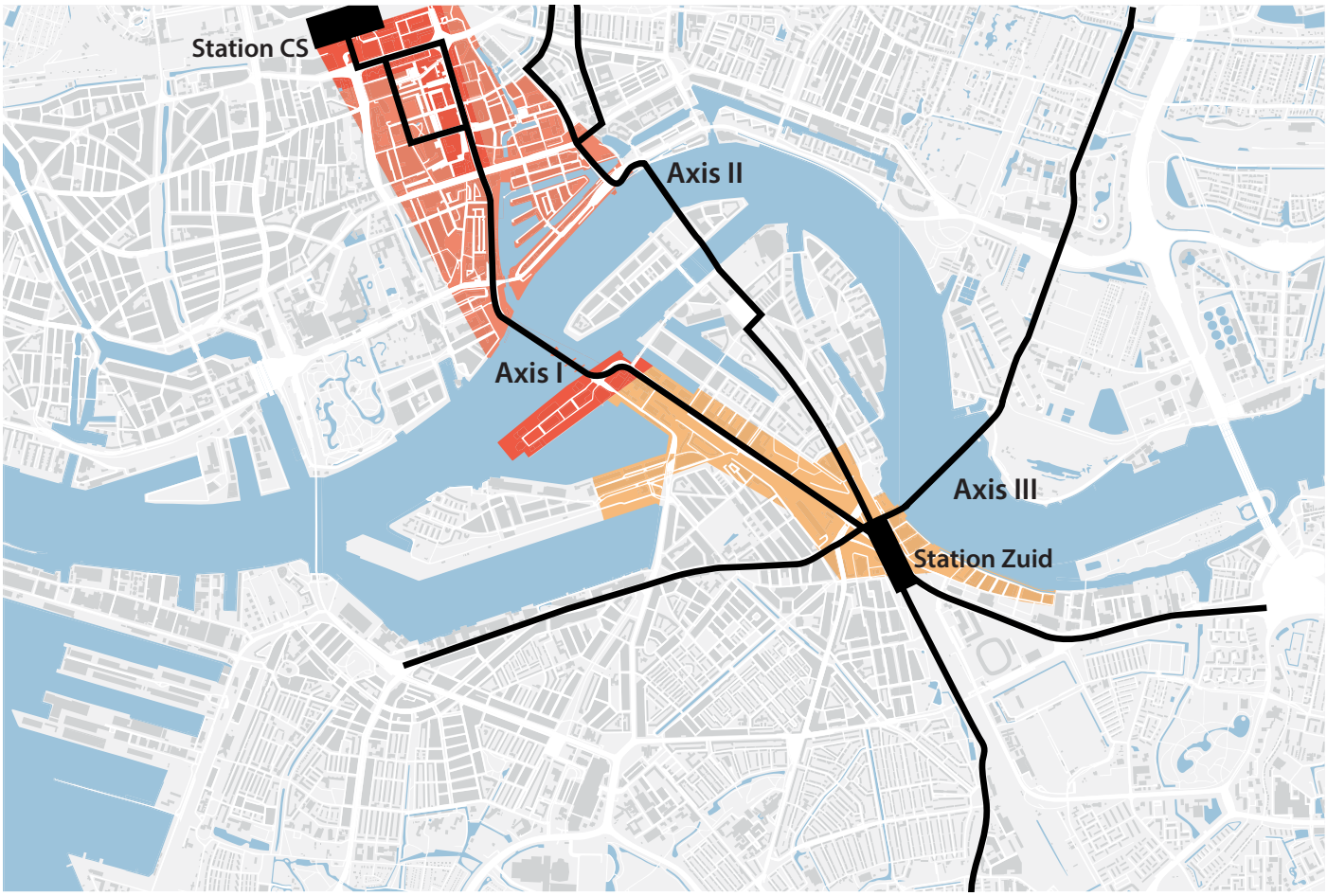
Railway station

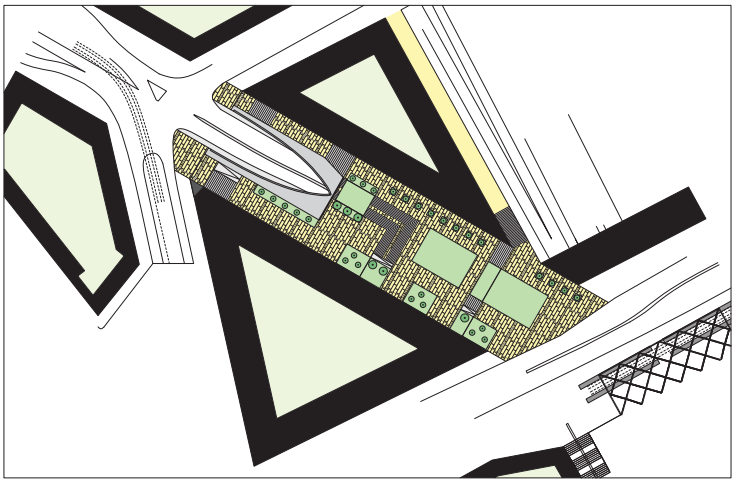
Priemus et al. (1999) identify that there is an important difference between two forms of public transport; "feeding" and "connecting" transportation. Both have a different impact on the urban environment, as the feeding-net largely has to adapt to the existing urban context, while connecting transport has

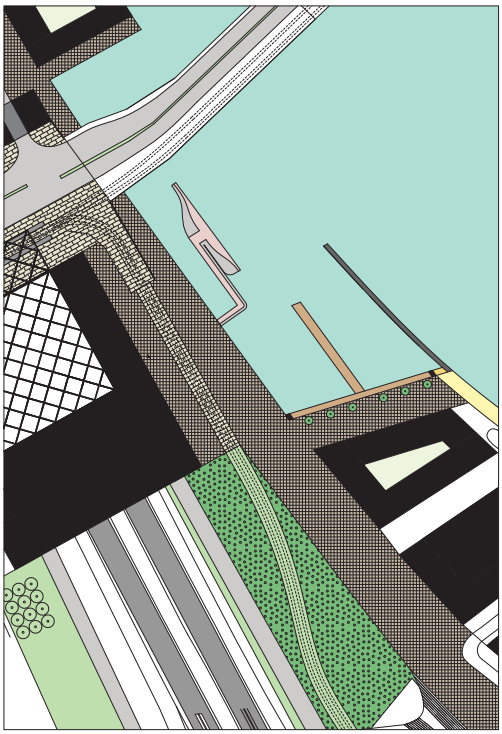


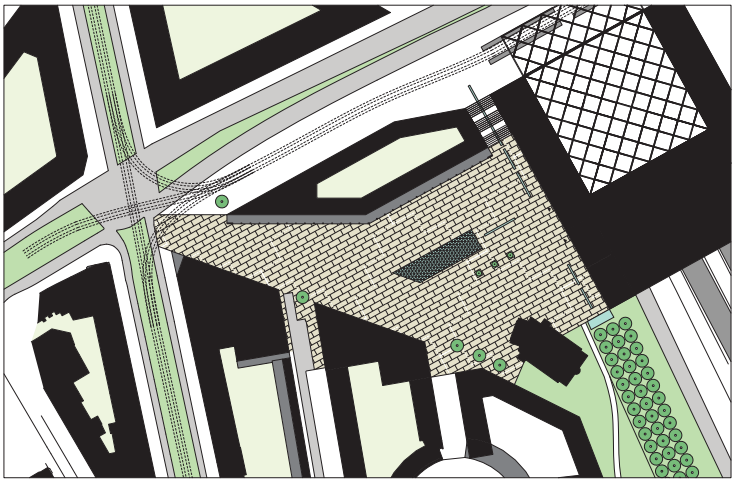




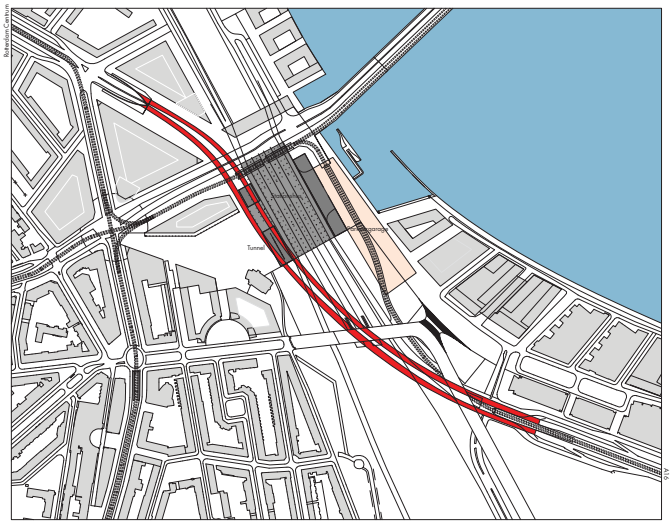

Station CS
Axis II
Axis I
Axis III
Station Zuid

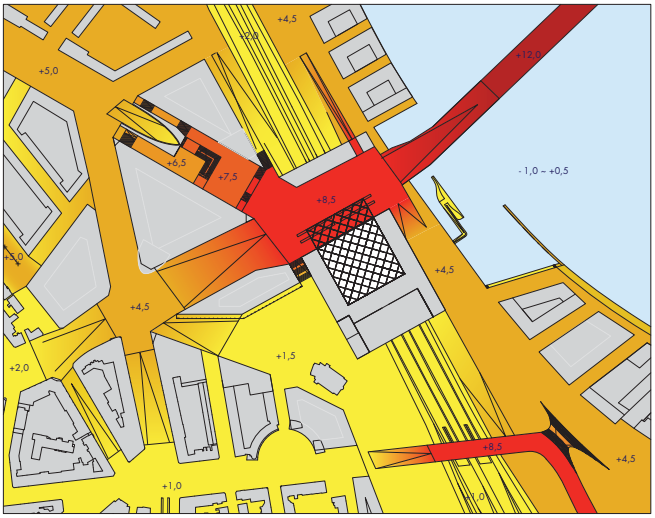






The project intervention (last page).
The skyline seen from De Esch (left above and middle), the main axes through the city (left below). Different characters of urban squares around the stationshus (above), position of the tunnel under the project location (left below) and the heights in on the location (right below).





infrastructural consequences that can have a leading effect on the urban situation. It is good to think about this difference as it has spatial effects on the design of a station area. In the case of the project the IC-station Rotterdam Zuid will function as both a feeder station, because of its connection to densely populated neighbourhoods on the one hand. But it also functions as a connecting station, being an inter-modal hub that transfers people from train to tram or boat to reach further away destinations, such as the Erasmus University, Krimpen aan de IJssel and Ridderkerk.

The railway line forms part of a corridor on a regional, national and international level. Stopping services run along with intercity trains that both stop at the new station. The HSL only stops at the Central station, but the point where the actual high-speed line starts now, lies just south of Rotterdam Lombardijen. The project reserves two new outer tracks that lead through the station without platforms. This will make it easy to extend the HSL Zuid by about 3.5 kilometres of 200 or 220 km/h running instead of the current 140 km/h. This will save about 30 seconds to one minute (less acceleration time needed), but more importantly reduces the chances of interference during interruptions on one of the lines.

Kulturhus
The main role of the kulturhus is to function as a central meeting point for people in Rotterdam South. But why would someone go to this building? The reason the kulturhus was chosen as important social function in this vulnerable area the chances culture and social life offer to develop oneself. The kulturhus reduces social injustice because people can educate themselves or be educated in the library or during evening schools that will be housed in the available rooms. This can also happen by visiting lectures, playing sports or become part of an association or club. All these possibilities are now offered on a location close to the neighbourhoods where the need for these kinds of activities is the most. From the social monitor of Rotterdam it was concluded that the affected neighbourhoods score bad in categories like jobs and education, social contacts, language understanding and bonding with the neighbourhood. The kulturhus is an effective measure to tackle these types of problems. An easy accessible kulturhus, located near the main living areas of the targeted users, gets people to come and meet others in these areas, improving social contact and (hopefully) also the understanding of Dutch during the contact between different multi-cultural groups. A library and lecture halls, but also the railway station that is located in the same building open new opportunities for learning and brings educational facilities and jobs closer as more distance can be travelled in a shorter time. Eventually if the use of the concept as a social meeting place is successful the building will earn a place in the neighbourhood that improves the bonding for people that have positive associations with the building, because they meet their friends for instance.
The fascinating story of Nina Röhlcke (2013), Head of Production at Kulturhuset Stockholm, has been a major inspiration. Röhlcke says that she originally came from Germany to live in Sweden when she was 12 years old. She felt like a stranger in a new country of which she did not really speak the language yet and in which she knew but few people. But in Kulturhuset she felt at home, she could read books all day in the library and learn the language in this way. She states the kulturhus played an important role for her integration into the Swedish society.

Other public buildings
The station and kulturhus are not the only public buildings in the area. The mosque, at the moment facing the back of eastern Hillesluis, will receive a dominating position on the western square, together with the eye-catching facade of the stationshus. The board of the mosque has repeatedly stated that it is willing to play an important role within the problem neighbourhoods of Rotterdam South (Tamimi Arab 2013). The new square offers possibilities for festivities, markets, fairs and other activities that can be organized jointly with the mosque and other willing actors, such as commercial units in the plinths of the square, neighbourhood organizations or the kulturhus and its associates.

De Kuip and De Veranda area are not really located on the design location, but the project connects the activities that take place in these areas with the new station and existing neighbourhoods. The scale of the facilities in its turn also has considerable influence on its environment. During matches or concerts in the stadium large flows of people will be transported to the stadium from the railway station and tram stops. A special route constructed across the platforms, railway tracks and surrounding roads and scaled for large peak flows, will lead them without barriers towards the stadium. When there are no events this route acts as a quiet esplanade where pedestrians and cyclists and potentially also skaters and skate boarders will find a place to cross the rail or play around. Broad stairs connect the route to the street leading from the station to De Veranda, and can be used to sit in the morning and afternoon sun during the shopping in

weekends. Under the stadium route bicycle storage is situated. While west of the tracks the esplanade becomes part of the Slaghekstraat, that connects the eastern and western parts of Hillesluis as the second most important street in the neighbourhood after the Beijerlandselaan, being greener and more quiet than that shopping street.

The shopping street Beijerlandselaan, also known as Boulevard Zuid since the 1960s, has a long history as shopping area in Rotterdam South. Starting as a popular street where young people came to parade, it deteriorated together with the surrounding neighbourhoods. A recent investment plan however has renewed the canopies of the shopping street and renovated public space. The new developments have broken the negative spiral of the shopping street and with this project the street will profile itself as the multicultural heart of Rotterdam, where products (and people) from all over the world can be found. The only recent improvements and limited size of the buildings have kept a lot of chain stores out, which leads to the unique character for the Netherlands of this shopping street. Gentrification, caused by the interventions done in the project, may lead to store chains buying original stores and merging them into larger shops of well-known chains, thereby losing the special international character of the shopping area and transforming it to the similar shops found all over the Netherlands.
To deal with this threat and to save the multi-cultural character of the shops in the Beijerlandselaan, a solution was found in the new connection to the Laan op Zuid. In this new extension of the Boulevard Zuid larger shop sizes are offered giving the store chains the chance to open shops in South, while protecting the diverse character of the Beijerlandselaan and Groene Hilledijk. This division in roles also fits the character of the streets, the Laan op Zuid and new connection are more formal with modern buildings that fit large shops, while the southern part is historical with many shops only found here.

Public space
The public space has an important role in connecting the different parts of the neighbourhoods together and to make the connection with the new developments. The design of the public space is an important factor in recognizing the location in the plan. From every wind direction, seen from the station, the urban space has a different character, which helps people to orient themselves. The characters are further explained in this chapter.

The third city bridge can also be considered to be a part of the urban space in the project area. It creates a new connection between the two shores of Rotterdam and can be seen as an iconic gate to Rotterdam South. The bridge greatly reduces travel times between Rotterdam South and the university. Currently a trip by bike takes about 45 minutes between Hillesluis and the university. With the new bridge distance is shortened to three kilometres and less than 15 minutes biking. The tramline over the bridge that will connect to the current line in De Esch and the Erasmus University will also relief the metros between Kralingse Zoom - Beurs and Beurs - Zuidplein. These lines are currently running to capacity, with a crowded change at station Beurs. The new light-rail connections offer a shorter trip between Kralingse Zoom and Rotterdam South without transfers, freeing up capacity in the metros for other passengers.

Characters

The stationshus building is the central chain in connecting three very different areas together, that all have their own architecture, scale and atmosphere. The central building needs to connect them in its own style as a central meeting point. The different entrances to the building are all adapted to the local context, and so different characters are created. The following paragraphs illustrate the taken measures.

1. West: Neighbourhood square
The square located west of the stationshus is dominated by both the stationshus building and the Essalam mosque. It functions as the main entrance to the railway station when coming from Hillesluis and Bloemhof, but is also the most important connection to the Beijerlandselaan. It is modelled to fit the scale of these neighbourhoods, consisting mainly out of three to four level housing from the first half of the 20th century, complemented with some urban renewal blocks. Recent developments have created a 50 metre high tower on the northern end of the Beijerlandselaan. Here the square goes over into the central crossing of urban axes that is further described as character 4.
The older housing block with tower, opposite the mosque is unfit to offer a decent facade for the square. On street level only the entrances have found a place in an obscure corner of the building, while balconies

and dwellings begin on a raised level. This results in a closed wall on street level, without any form of activities. It was decided to replace the part of this building block on the side of the square with building similar in style as the adjacent block that houses the Mediamarkt and residential towers. In the plinth a few shops and bars with terraces can find a place.
On the northern side of the square a building block with an arcade houses shops, with similar characteristics as those found on the Beijerlandselaan. On the other side of this block, facing the Putselaan towards the new city bridge a height difference needs to be bridged. This means that the shops on the West square are very deep and on top of it dwellings and gardens are placed.
The main hall of the station is elevated to be placed over the platforms; escalators and stairs give an easy access to the building from this side. The entrance is articulated by an overhanging lecture hall and the main ticket office looks over the square. On the street level an open area with columns gives access to taxis and a kiss-and-ride parking. South of the entrance the entrance to the bicycle garage is found and the concrete base on which the building is placed has a long integrated bench along this further closed facade.

The square itself is a water themed public space. From stairs along the Stationshus rainwater flows down. In the pavement openings with regular intervals are placed to make the water visible that eventually flows into a basin were it is stored and used to fuel a playing fountain in the middle of the square. These fountains are similar to the ones found in the Koopgoot in the centre of Rotterdam and these offer children a place to play with water and take care of a pleasant water spectacle for others that like to jump around less. A secondary function of the water is to remind people of the importance of water, especially in a port city like Rotterdam, located largely below sea level, up to -6,76 NAP. Water is omnipresent in this region and the consequences of large rainstorms are directly visible on the square. It helps to educate people, often not familiar with the Dutch water management, by means of landscape beautification.
The main walking route was envisaged as a direct line, with only a small angular rotation, to guide people directly to the node of the Beijerlandselaan and Putselaan. Diversity in the facades and activities along this part of the route, will concentrate most liveliness in this northern part of the square. The distance of less than 250 metres to the node of the Beijerlandselaan, makes the distance between the station and urban centre of South excellently walkable and much closer than in other Dutch cities (Brouwer 2010).
Another pool of activity is at the entrance of the mosque were people gather before and after services. Purposely the main connecting routes on the square were not exactly guided through this area of the mosque, so it can retain some of its quietness that fits in with a religious building. But it does not mean that all activities are annihilated, a little further terraces bring life and during festivities or special events the square is the place to organize fairs, markets or other activities.

2. North: Central axis
The Laan op Zuid is an important boulevard in Rotterdam, although it was only a relatively recent addition to the city. Taking the place of a marshalling yard for the NS in the 1990s, when De Kop van Zuid was constructed. The building of the Erasmus Bridge meant that the street was connected directly with the centre of Rotterdam through an iconic bridge. From then on an important new connection was created between central Rotterdam and the A16 motorway. To reduce noise and air pollution of through traffic, a tunnel is constructed under the railway station that surfaces near De Kuip. This reduces the amount of cars through the project area and creates room to demolish the current Varkenoordseviaduct and construct the railway station.
The Laan op Zuid bends south just before the tunnel entrance, to connect to the northern extension of the Beijerlandselaan, that becomes a through street. Above the tunnel entrance the axis of the Laan op Zuid is finished and people will have a view of the large canopy of the stationshus at the very end of this axis. On a bigger scale this whole axis connects, although not in a straight line Rotterdam Centraal with Rotterdam Zuid, a distance of about five kilometres straight through the heart of Rotterdam.
The final end of the Laan op Zuid is a pedestrian zone that connects to the tram stop underneath the canopy. The broad profile of the street is maintained and turned into a sub-tropical park landscape.
Palm trees and colourful plants that can grow in the Netherlands, originally from warmer areas, stay a bit smaller keeping the views open to and from the station to the high-rise of De Kop van Zuid and centre of Rotterdam. Maintaining the sight line of the two kilometre long Laan op Zuid. Along this part of the Laan op Zuid entrances to offices and dwellings are located, forming a peaceful zone in an area of busy traffic corridors, shopping streets and public buildings.

3. East: Riverfront

The connection with the river is restored by demolishing the large Home Depot buildings that now close the river off for public access. A new harbour features a stop on the Waterbus, the boat that connects Leuvenhaven in the centre of Rotterdam to Dordrecht and the intermediate towns. It will also increase the space for small boats in Rotterdam that is expected to grow with large-scale developments along the river like De Veranda.
Except connecting to the river, the eastern side of the Stationshus also makes a connection to De Veranda and the more than 2000 dwellings that have been built there already in combination with a large-scale entertainment area.
A broad pedestrian priority street, over destination car traffic, connects to the square and parking areas of De Veranda. The street becomes wider further towards De Veranda, making a slight bend. In this bend a large stair connects to the Stadium route of character 5. The tram also has its route towards IJsselmonde along a part of this street, after which it disappears in a dense bamboo forest that created a separation between the pedestrian areas and busy transport corridors along the rail right-of-way. Another advantage of bamboo as a separator is its presumed absorbing of noise, although this has not yet been scientifically proven. The cobblestone pavement along the street gives the area the character of a port. But the tram tracks are a little raised compared to the cobblestones and are tiled with Flemish brick (Dut.: klinkers) to make them easy identifiable and to attend people of passing trams.

The Stationshus building occupies a central location the harbour, especially well seen from the northern shore of the river and Third City Bridge. From there also the composition of the buildings of De Veranda becomes clear. The Stationshus is a low horizontally oriented building compared to the increasing and decreasing heights of the different apartment buildings, that work to frame the position of the Stationshus at the harbour front.
The other buildings along the harbour face the water and have bars and restaurants with terraces in their plinths. They connect to the river front esplanade that has already been realised in front of the De Veranda development.
The blocks north of the bridge are connected by a pedestrian passage under the Third City Bridge. These blocks are residential and constructed with internal gardens that function as courtyards. The height of the blocks reduces from south to north, when the distance to the bridge becomes bigger. The final block borders the park between the Feijenoord neighbourhood and the project location.

4. Central square: Node
Not directly connected to the Stationshus, the crossing of the Putselaan and Beijerlandselaan is an important place in the project area. Here the main traffic flows meet and direct connections in all wind directions are possible that connect all parts of the city together. The traffic flow has been somewhat reduced by building the tunnel underneath the Stationshus towards the motorway. The central square can be seen as the origin of the new centre of Rotterdam South, from here the railway station is easy accessible, while the shopping streets run north and south, with two different characters. North is the more formal and new boulevard of the Laan op Zuid, lined by large store chains and offices. South smaller shops, often with an international or multi-cultural background, line the streets. The direct connection with the station through the neighbourhood square brings in pedestrians. The pavement material is kept the same as on the neighbourhood square but is only oriented differently, to indicate the difference between the two different spaces.

Most notable of the central square are the buildings that are grouped around this crossing. Roads lead to four different directions and an important pedestrian route adds another break of building block. The recent residential tower above the Mediamarkt, with its sharp pointed facade towards the central square, marks one of these building blocks, together with the historical block to the west of it. The north-western block will get a similar scale, with brick facades, that continue the style of the Beijerlandselaan. The two eastern blocks north of the residential towers are clearly articulated in height. The block with arcades along the station route is ascending towards its narrow facade on the central square, giving the block a bit of a rising triangular shape, although it stays lower than the residential tower opposite to the pedestrian connection. The northeast block articulates its southwest corner with a round or hexagonal tower that creates a counterweight to the residential tower on the other end of the square. The three towers, close together form an ensemble that could be best compared to the Potzdamer Platz in Berlin. Seen from the Putselaan, the Third City Bridge and canopy of the Stationshus are visible and complete the composition of five eye-catching elements in the city.

5. South: Stadium route
The Stadium route can also be seen as a neighbourhood connection across the railway tracks. Together with the Stationshus and ramp of the Third City Bridge, it reduces the barrier of the railway and brings the neighbourhoods west of it closer to the river. The stadium route is designed for peak flows and connects with stairs to the southern end of the railway platforms. In this fashion passengers are better spread across the platform and during events in De Kuip, large flows of supporters can quickly exit the station, without passing through the main hall, reducing the risk of vandalism. Police is able to guide pedestrian flows and materials used on this route are strong and made out of stone-like material or steel, to prevent demolition. The distance of about 500 metres to the stadium is seen as a good way to temper emotions before and after matches. Too short connections lead to congestion, by people waiting for trains, and may spark aggression, while distances longer than 900 metres are hard to secure and less attractive for people to come by public transportation. A long debated new stadium is likely to be built adjacent or on the current Kuip location. But at the time of writing the proposal was once again cancelled, although it seems likely that in the years to come new proposals will be made to replace or renovate De Kuip. A new nearby stadium will also be accessible from the same stadium route, while De Kuip itself is a monument and is not likely to be demolished when a new stadium is built. The old Kuip can than still be used for other large events, such as concerts, meetings or other sports, like field hockey.
The western end of the stadium route flows over into the Slaghekstraat that crosses with the Beijerlandselaan and is an important street in Hillesluis. East a large stair connects the route to the route from the Stationshus towards De Veranda. The southern end of the route exits the project area and a more detailed plan of this part of the route should be made in combination with definite plans for De Kuip and Stadionpark.

Main design elements

- Improve accessibility by public transport.

The most important element of the project is to create more social justice by improving the chances of work and education for people, with sustainable transportation. With the new IC-station the current infrastructure corridor can be used more efficient. A light-rail line across the Third City Bridge to the university makes the South a potential place to develop large-scale student housing. While the combination of these interventions create a node, that is an attractive location for private investments. The station will be a central point in the problem neighbourhoods of Rotterdam South, that is the base for improving spatial qualities in this area.

- Develop TOD on a scale that fits Rotterdam South.

The new railway station and kulturhus provide an excellent start for further developments in a part of Rotterdam where a lot of ground is still empty or only lightly used. Developments around stations are an important strategy to attract new passengers and activities. It would be preferable if public transport companies NS and RET would be involved in the development of real estate in the station area, to secure good service, in a pattern that was successfully implemented in Japan and Sweden. It is however not an objective to create large scale office towers and huge floor space buildings, that take no regard of the context. The neighbourhoods are an important element of the station area and the developments need to be on a scale that can be combined with the existing urban environment.

- Remove some of the barriers between neighbourhoods to make the catalyst easy accessible.

In the neighbourhoods surrounding the Stationshus many vulnerable groups live, many children and other people that have a higher threshold to make fully use of the available amenities. A separation of cars and pedestrians, to make the station area pedestrian friendly is a way to decrease the barrier of visiting the Stationshus. On the other hand is a total separation of traffic not an aim, as the different transport systems need a good integration to optimally function. By separating the new bridge axis from the main pedestrian area cars and trams are still able to reach the front of the Stationshus. The connection to the Laan op Zuid however is located further west, to reduce traffic flow. This way the heart of the pedestrian-friendly neighbourhood centre does not become the main traffic node also.

- Reduce the barrier of the railway tracks and extent the neighbourhood structure.

Another important barrier is formed by the railway tracks and adjoining roads. The neighbourhoods "grow" metaphorically speaking over the railway tracks, with the Stationshus going in front. Also the two other routes, towards the bridge and stadium, ease that barrier and with an office block opposite the canopy of the Stationshus, the railway line becomes virtually invisible. The new connections bring the eastern part of Rotterdam South closer to the neighbourhoods that need an impulse.

- Opening up of the riverfront.

The riverfront is currently missed opportunity in this part of South. Although De Veranda started to develop a new quay, it now is not connected to any other riverfront development or even route. A network of fitness paths will incorporate the quay along the river, giving inhabitants a free and easy opportunity for sports. Currently a 3-5 km jogging route circles through De Kop van Zuid and the Maasboulevard, while the Green Marathon offers a 42 km long route through Rotterdam. These individual initiatives need to be taken as a starting point for a larger network that incorporates the river shores as well and can function as a pillar of Rotterdam Sportstad (Sporting City Rotterdam).
The construction of a harbour offers the possibility to connect the public transport over water with an IC-station and strengthen the connection between both networks.

Urban furnishing

Materials

Facades

There is a very diverse offer of facades in the project area. The major part uses traditional bricks in a range of forms and colours. Totally different is the facade of the Essalam mosque that could have been copied from a mosque in the Middle East. In De Veranda and in some of the other public buildings plate material is used for the facades. The Stationshus tries modestly to introduce an own wooden material that fits in with the different types of facades found in the station area. The wooden lamellae in front of a glass facade can be turned to chance the expression of the facade during the day. The characters surrounding the Stationshus provide the main influence for facade materials in new developed building blocks. The West square is brick with plinths of natural stone, along the Laan op Zuid bricks and plate material is found, with large glass openings, especially in the plinths. East of the tracks De Veranda provides a wide range of coloured bricks and other stone materials, complemented with coloured metal plates for the public functions.

Pavement

Pavement says a lot of the use and character of an area. Using asphalt gives an urban feeling that can accommodate large flows of traffic. Bricks or cobblestones on the other hand create a feeling of quiet living areas or even historical centres or port areas. The pavement is an excellent tool to use to make a further distinction between the different characters found in the plan. Every zone of character in the project will have its own type of pavement as to make it clear to what it belongs and were the zone begins or ends. The types of pavement are chosen to reflect the expression of each character. The formal neighbourhood square with the Stationshus and mosque receives natural stone, in which stainless steel elements for water can be integrated. The eastern entrance to the Stationshus around the port will have cobble stone pavements, with Flemish stone where the tram tracks go. The representative northern entrance and the end of the Laan op Zuid mix light coloured stones with wooden elements. The stadium route is paved with large colourful natural stone.



Infrastructure

Tunnels often have a very functional form that does not reflect the amount of costs and effort that has been put in to construct it. More often tunnel entrances are anonymous holes in the ground or mountain that are intended to let traffic pass by in a quick way. In the past two decades more attention has gone to "snelwegarchitectuur" (motorway architecture), which also includes the design of overpasses, noise barriers and other road elements. Especially a tunnel within the city needs an attractive design to fit into the surroundings. The tunnel at the end of the Laan op Zuid is accessed from the main axis within Rotterdam South, along which some of the most iconic buildings of the city are situated. The boulevard connects to the Erasmus Bridge, the Maastoren and the rest of the Kop van Zuid, while on the other end the new station will be visible, together with new urban developments. Where the tunnel dives under the surface a pedestrian zone with park elements is developed that give access to the surrounding offices, shops and station building. An anonymous hole is not an option in this kind of representative environment. The tunnel entrances will be become a recognizable element in the pedestrian zone that can function as artworks, rather than noisy gates to a traffic artery.

On the contrary bridges have become icons mainly because of their form. The Golden Gate Bridge is world renowned, but also the Erasmus Bridge has improved the image of Rotterdam and has become one of the most recognizable objects in the city. A third city bridge is not likely to rival the Erasmus Bridge as the main symbol of Rotterdam, it is however an important connection for people travelling from the south to the eastern part of the city including the university. For this group of people the bridge will become an iconic landmark that they will see or use every day. A recognizable form will help to strengthen this feeling of connection to their built environment. The design of the bridge will also have to make a differentiation with the other river crossings in Rotterdam, the Van Brienenoord, the Willemsbrug and Erasmus Bridge.

The tram has a vital position in the project, as the new transport node will create the project location as the biggest intersection of tram lines in the south of Rotterdam. Barendrecht, IJsselmonde and the University will all become much quicker accessible by train and other tram routes by changing at the new Rotterdam Zuid station.

The integration of the tram tracks is especially in the eastern part of the plan vital, because here the trams run along an important pedestrian connection between the new Stationshus and the Veranda and stadium areas. Here the trams need to be integrated with the pedestrian flows, but because of safety reasons is it important that the tracks stand out. By heightening the track bed and changing the pavement enough contrast can be given to make people aware of trams passing by. In this sense it will provide more awareness than in the Koopgoot area in the centre of Rotterdam, where trams cross pedestrians without further precautions then alarm bells when trams pass by, people often keep walking on or closely next to the tracks.

In the areas where the trams can run on their own right-of-way there is the chance to create extra green zones. As in other parts of Rotterdam 'green tracks' create extra natural environment in the city. Various examples of new tramways in France and Germany have shown that this greenification of urban transport



routes can be done in an even more extreme way. With more trees and plants along the line, hedges and other barriers are formed to discourage people to cross the tracks in unwanted areas.

Natural

The natural elements in the plan form the most important part of the ecologic structure within the neighbourhood. But trees and other green also have a positive influence on the experience of the neighbourhood from the perspective of the inhabitant and trees filter air locally reducing the impact of air pollution on the small scale. The selection of trees is important as trees also strongly influence the incidence of light. But there are limitations to the choice of plants as climate is decisive in the growth and development of flora and some species are vulnerable for diseases.

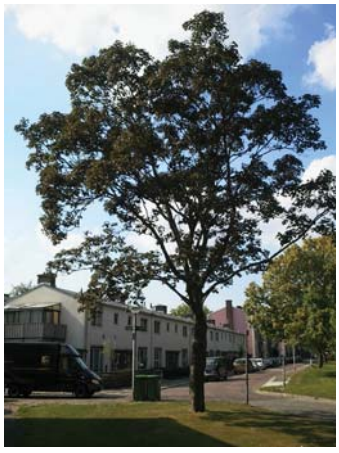
In the selection process climate is very important, as trees need to be able to grow in the climatic circumstances that are offered by the location, even on the local scale. Besides the common climate in Rotterdam sun, light, wind or a sheltered position, influence local climate. Some plants are adjusted to specific needs that can vary much from spot to spot. For a successful plant and tree selection a specialized botanist, experienced landscape architect or horticulturist needs to be consulted. It is possible however to give an indication of the desired flora in the sense of form and expression.

The Rotterdam climate is, just like the rest of the Netherlands, a temperate oceanic climate or Cfb following the Köppen climate classification. The climate in Rotterdam, because of its western position is even more influenced by the North Sea than in the eastern provinces. It is characterised by relatively small differences between extreme temperatures during the year that makes warm summers and winters mild. Important for plants are the hardiness zones that indicate the hardiness of plants. Rotterdam close to the sea is on the border of hardiness zone 8 and 9, with an average lowest year temperature between -6,7 °C and -12,2 °C. This is comparable with the southern part of England and Ireland or northern part of Italy and along the Adriatic Sea. Although summer temperatures vary a lot between these areas a range of sub-tropical plants is hardy enough to withstand the winter lows.

Choice of plants

Because summer temperatures in the Netherlands often do not reach hot or tropical values, the need for shade is less than in hotter climates. Trees therefore preferably leave some light incidence and warmth especially in the spring and autumn months. Part of the amount of shade cast by a tree is genetic and part of the species, but also cultivation plays a role in the way a tree looks after several years.
Each character in the project has its own species of trees that connect to expression of that part of the plan.





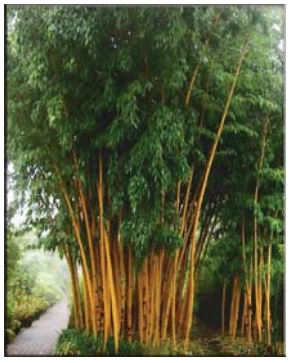

The Netherlands has an international reputation for its colourful flowers. Many Dutch residents however never see colourful seas of flowers. This is mainly restricted to the people that travel between North and South Holland or in the north of the country. While many people love to see flowers, it is often hard to spot some in the living area. The use of flowers and colourful plants in the public space will cause a change in this situation for this area in Rotterdam South.



The varied international background of many inhabitants in Rotterdam South can also be shown in the choice of plants. In the diversity of the types of plants, but also in introducing foreign species, especially sub-tropical plants. Similarly to flowers, many of these plants are colourful and can give people a holiday-like feeling. Reminding them of their original home or holiday destination, while in a relatively simple way a special look is given to the public spaces.



Bamboo has the ability to define spaces. Because of its high density the plant can form true walls that absorb noise and create peaceful and tranquil areas. These characteristics have even let to research into the use of bamboo as noise barrier by the municipality of Amsterdam. Although there are no results yet of this study, the bamboo will be used to mark the border between the railroad tracks with streets at this lowest level underneath the station and the pedestrian street that connects the station with the recreation area in the Veranda neighbourhood. Only the trams penetrate through this bamboo forest that as a massive natural urban volume, will block noise from the trains.


Water

Water is an important theme for the city of Rotterdam. The port extending to the second Maasvlakte, forty kilometres away, is obviously directly related with the water. The Maeslant barrier, the largest moving structure in the world, is located in the municipality and in other parts of the city roofs and squares are constructed to deal with excessive rainstorms. Because large areas of the city are located in polders below sea level, the lowest point in Western Europe is found in Rotterdam's metropolitan area, a lot of effort is done to deal with the water in front and behind the scenes.

But water is not only a threat; it is a vital element of life. It can bring joy, pleasure and health, use for swimming, sailing or just as a nice object, there are hundreds of ways it can be used. For centuries fountains have been constructed in cities, with many new forms and uses in the last decades. To make people aware of the ever-continuing presence of the water it will be brought back into the public space in front of the Stationshus.
The water will be used as an object of pleasure that at the same time has a functional application. Rainwater is discharged above ground and by using the height difference between the bridge landing and the square in front of the Stationshus, a flow is created. During periods of large discharges, for example when it has just rained, more water flows through drains and fountains. In dry periods the amount of water on the square also reduces.

Lighting

The Stationshus as the central building in the neighbourhood with an open character sends this out at night. The building emits lights from its central hall and from the other rooms as well, while this light is dispersed by the lamellae in the facade.
In the public space lighting from the ground is used to create special effects at night. In the West square long light lines mark the routes on the square. The end of the Laan op Zuid features low lanterns and modern street lighting poles, to increase the effect of an urban garden. The Third City Bridge is also illuminated at night as a landmark object in the city.

Phasing

The whole design is an urban project of considerable size. Contemporary projects, realized through open planning aim to be flexible. That means that during the process changes can be made in the design to reflect new ideas or the adapt to the actual situation and functioning of the first elements of the project. For the realisation of the project a few interventions are vital and have to be realised in an early stage to comply with the targets set in the strategy approach. In the first place the Varkenoordseviaduct has to be replaced by a tunnel to create room for the realisation of the Stationshus. The Laan op Zuid will then also be connected to the Beijerlandselaan. The Stationshus, that includes an intercity railway station and kulturhus, is a crucial element of the strategy to increase social justice and inclusion and has a catalyst function for the neighbourhood. Therefore this building needs to be realised in the first phase of the project. The building also improves the connections across the railway, reducing the barrier and improving access to the river and De Veranda.
In a second phase the development of real estate around the kulturhus should be realised. This will mainly be done by market parties, which can use the improved accessibility of the location as merit for their investments. Together with the realisation of housing, commercial space and offices, the public space is furnished. The final implementations of this design are better done just after most building activities have

The West Square with both the prominent mosque and Stationshus building.

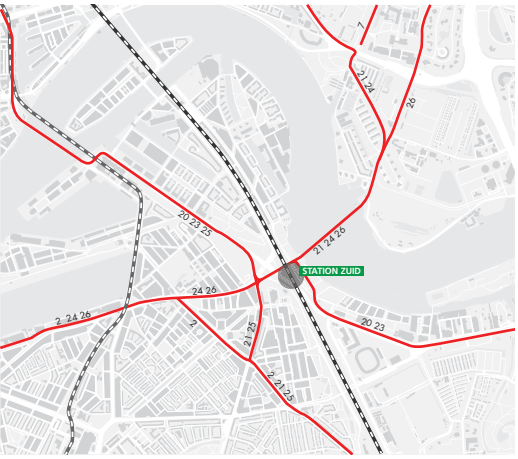
The Erasmus Bridge and towers in the centre of Rotterdam are visible from underneath the canopy of the station.

View on the Station canopy when arriving from the Laan op Zuid axis.

View from the south on the Stadium route. Light from within the building eluminates also the train platforms.

Stairs connecting the Stadium route with De Veranda are also used for leisure.

The new traffic situation in Rotterdam South; left, public transportation; middle, slow traffic; right, main motorized roads.



finished, to prevent damage to pavement and other street furniture.
The Third City Bridge is an important supporting element for the urban project. Yet it has to be funded mainly by local government funding. The talks for a bridge are on going for more than 20 years. Although the bridge improves the catalyst functioning of the strategic plan, it is not a necessity to let the interventions work. Preferably the Third City Bridge would also be constructed in the second phase, but depending on the availability of funds, it can also be delayed until the third phase, when it would be realised at the same time as the stadium route.

Additional suggestions for improvement

In the project some measures have not been proposed or mentioned as they are not feasible at the moment or part of a long-term strategy for the further development of Rotterdam. On the other hand some interesting phenomena were encountered, often small (private) initiatives that could support the urban diversity and liveliness of the city. This chapter shows these phenomena as suggestions for further implementation or reference.

Third metro line

The Third metro line of Rotterdam is an ambition to build a metro line from ABC-line station Kralingse Zoom, via the University to Rotterdam South. In the first phase a connection is made to Zuidplein on lines DE, later extensions through Stadshavens should reach Schiedam or station Marconiplein. There is not a defined route yet, but the place where the line crosses the railway Rotterdam – Breda should get a transfer station. From studies (GoudappelCoffeng 2010) the number of passengers expected on this line are not high enough in the first years to justify a metro line, but the line is able to reduce congestion on the existing stretches of metro between Kralingse Zoom and Zuidplein today. Although a metro would be the preferred option a light-rail connection as is planned in this project, would serve as a temporary measure. When ridership grows, upgrades of the line promote it to metro-standards.
An upgrade would require tunnelling in densely populated Rotterdam South. A study in the beginning of this project would bend the metro line off from the Third City Bridge towards the South with a station at De Kuip, where it would continue underground to the west under the Breeweg and Strevelsweg with a station at Groene Hilledijk to reach Zuidplein.

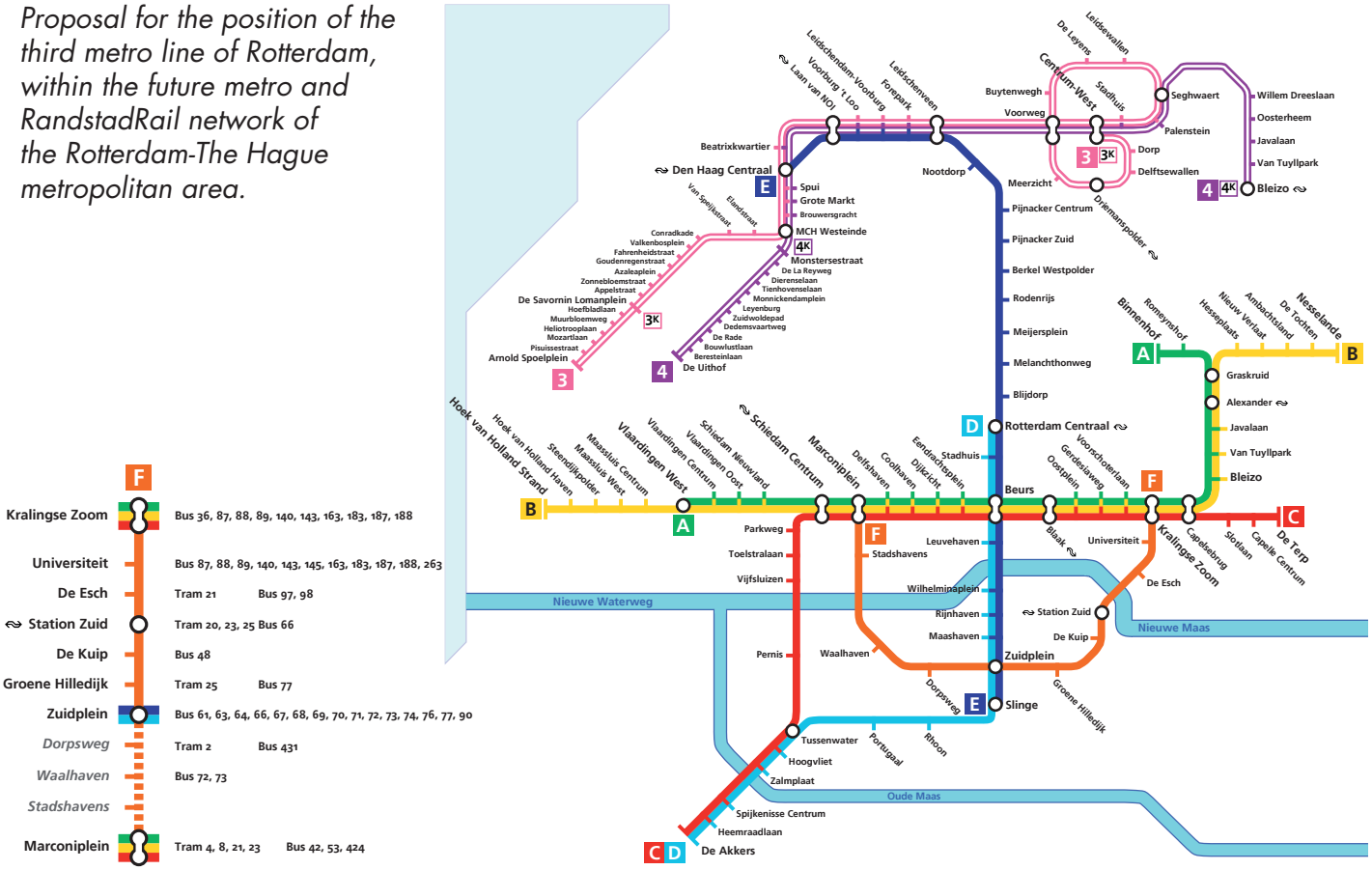
Culture tram

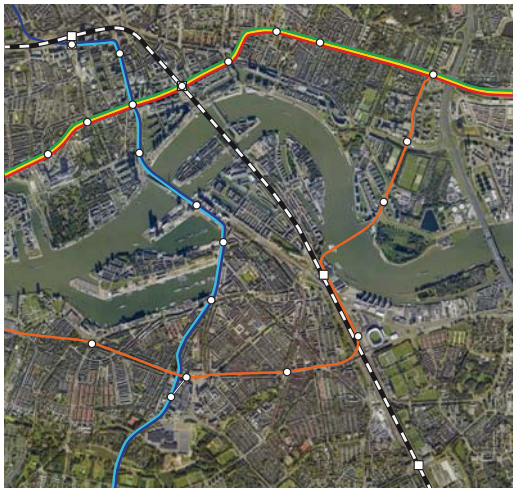
Rotterdam could further boost its cultural offer with a cultural tram. Modelled on the concept of the kultuurirattika or kulturspåra that rode in Helsinki, Finland until 2012. It would function as an extension to the kulturhus and become a moving meeting place that offers experimental cultural events and projects. The culture tram could be built from an old regular tram, to offer space for small music, dance or theatre performances, but also a small library could be included. This to mirror "bibliotheekbussen" (mobile library) in service in many places in the Netherlands, that make it possible for children, elderly and handicapped persons to access library books. The culture tram fits in perfectly with the trams that already stop at the new Rotterdam Zuid station building and could make a round through the city centre and some neighbouring areas on times on certain moments during the week, weekends, festivals and special events.

Places for spontaneous music or culture

In the public space special places for spontaneous cultural expressions could be provided. In some places pianos are placed in busy public areas were people randomly can play. One of the places is Gare de Lyon in Paris, where inside the station hall a piano is placed. The hall itself has very good acoustics, so that travellers can hear the music very clearly. The idea passed on from London was already pianos were installed in railway stations. It also proved popular in France spreading over other French stations. On Youtube films can be found that show this phenomena.
But it is not exclusively on railway stations that public pianos are found. In Lviv, Ukraine a public piano is placed next to the church near the main square of the old town. Astonishing is the quality of play by many of the passers-by, but it is also used as a place to rehearse.
An art project "Play Me, I'm Yours" originated in Sheffield in 2007, and has since travelled around the world with temporary public pianos, visiting Tilburg in 2011.
A problem with public piano or other delicate objects is that the instrument can be vandalized or stolen. Placement and social security are important to keep in mind in this respect.

Proposal for the position of the third metro line of Rotterdam, within the future metro and RandstadRail network of the Rotterdam-The Hague metropolitan area.





Helsinki kultuurirattika (left above). Proposal for the routing of the third metro line of Rotterdam (right above). Pianos in public urban spaces, Lviv, Ukraine (left under) and Paris Gare de Lyon, France (right under).

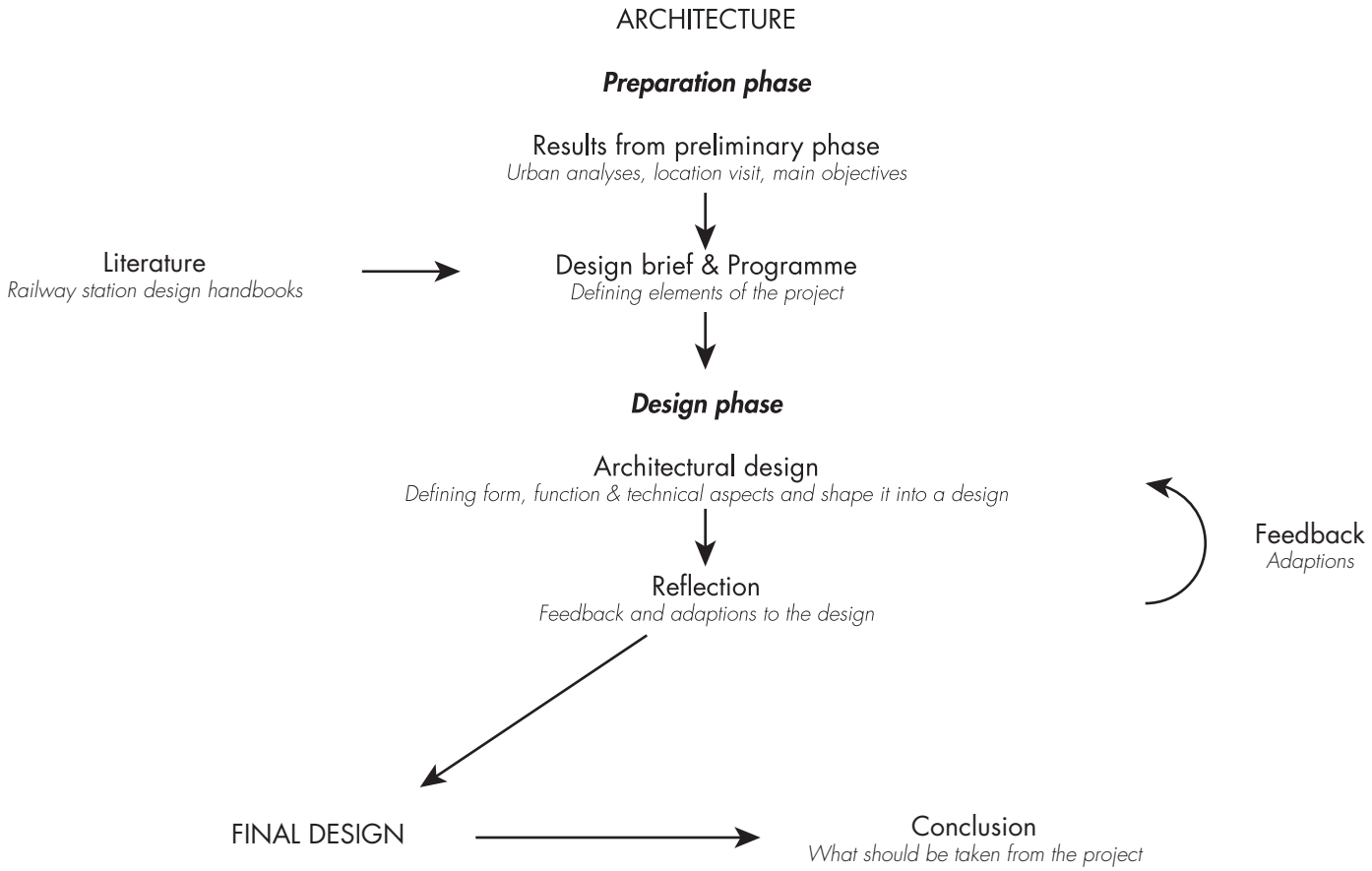
Architecture

Architecture

The Stationshus building is the central element in the urban project. The combination of a large railway station and a kulturhus is an unusual combination, that asks for a new developed design strategy. Especially in the field of railway stations a lot of theory is available and many guidelines are formed by governments and railway infrastructure companies to which station designs need to comply. For kulturhuser however no standards are in use and every kulturhus has its own combination of users and activities that are adapted to the specific situation. The contrast between two types of buildings, the one strictly regulated, the other very free, makes this case even more interesting as these two types meet under one roof.

Method

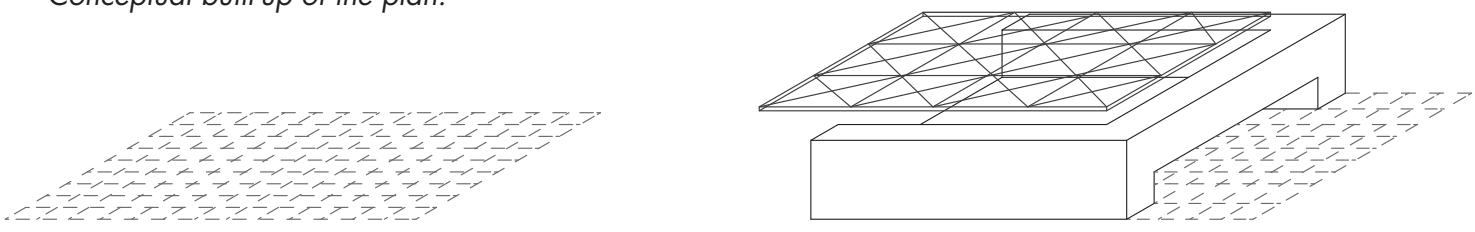
The question in the architectural design revolves mainly in the shaping of form and how it will work in combination with the functions of the building and within the urban context of the location. Important are also the technical aspects that make the building possible to be built and to live in it. How all these aspects come together is seen as the design and the question of the architectural project.



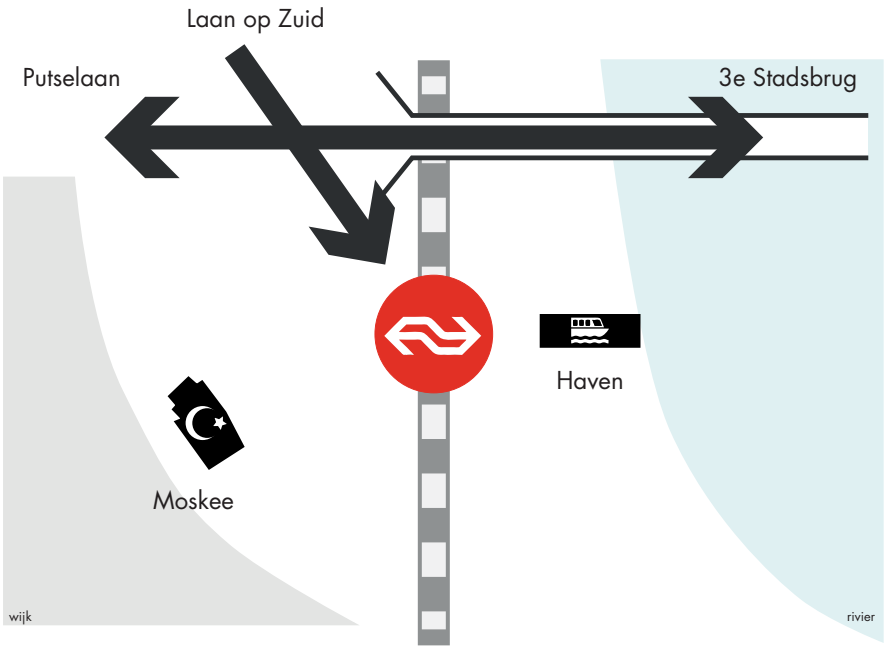
Project structure of the architecture part of the project.

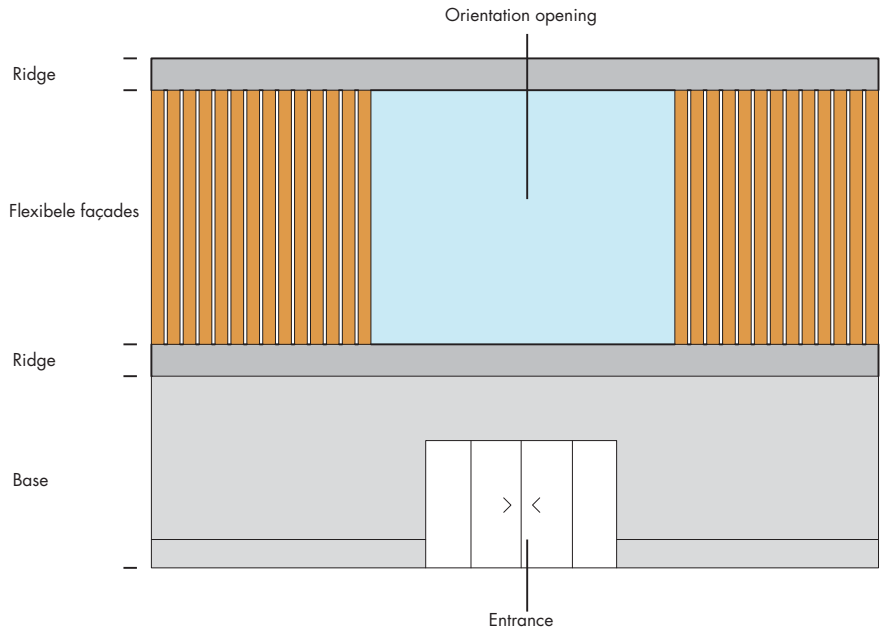
The important first steps of the architectural design were already made in a preliminary phase that encompassed also the base for the urban strategy chosen for this area of Rotterdam South. The decision was to create an intercity railway station and kulturhus, that form the main carrier for the unique development concept of the location. The choice for specifically a station to create a new centrality on South is in line with the visions of NS-Vastgoed, the property division of the Dutch railways, which sees stations as the meeting places of the future. It expects a growing demand for flexible office

Conceptual built-up of the plan.



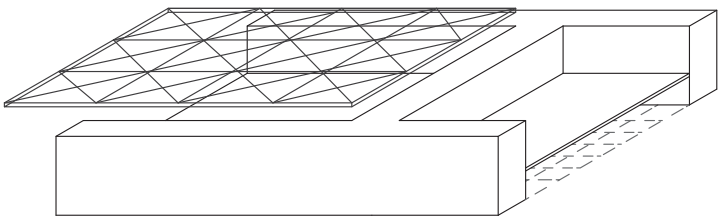
accommodation (Bertolini and Dijst 2003). But as spatial claims are complex and often overlapping with realisation of desired offices, shops and dwellings, which then is combined with the extension of initial and terminal transportation (Sanders et al. 1999). It shows that the assignment does lead to a complicated process with complex programmes, that are defined in the next step and that have guided the functional part of the architectural design. The form of the building is the result of a long design process, which was influence by many factors among which examples of station and cultural buildings throughout the world played an important role. For the technical aspects of the plan, literature specified on railway stations proved to be helpful in shaping spaces up to the standards of safety and use.

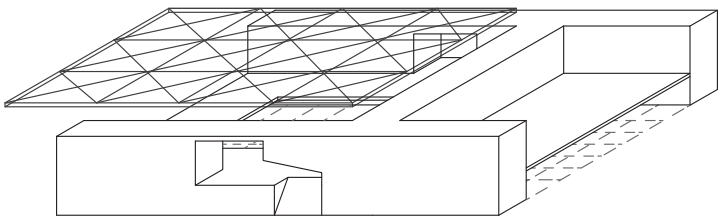


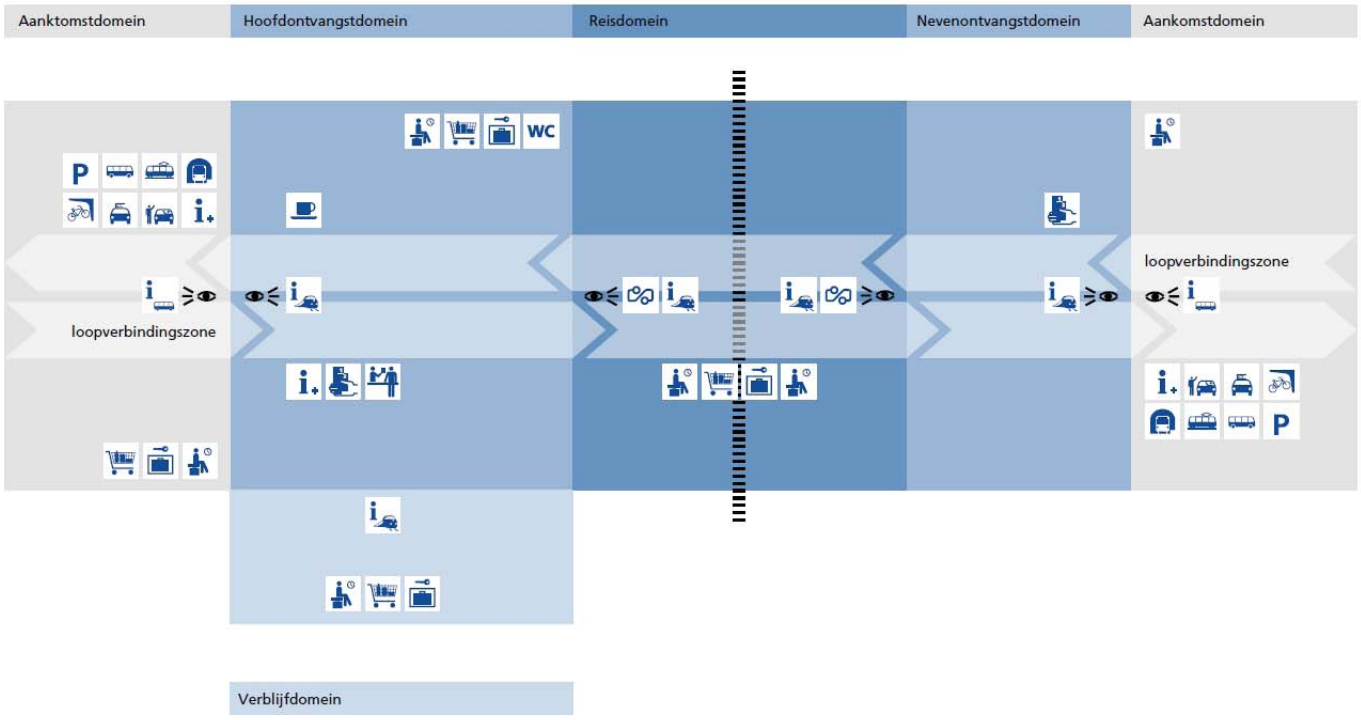


Concepts of location (above) and façade (below).

The actual design process takes all the previously mentioned elements into account and shapes them into a building that satisfies all the aims to make the building function as a railway station and kulturhus integrated into the surrounding neighbourhoods. This is very closely related to the urban form of the station area that was to be developed as well. The relatively undeveloped character of the location gave only few leads to work on for the form of the building. The surrounding buildings however, have a large diversity in style, shape and materialization. The building therefore had to be shaped in a way that it could connect to all these different characters of the surroundings, while maintaining a monumental form that sets it off from the context on the one hand, but stay in scale with the neighbourhood on the other hand.
As most concrete leads from the context, the mosque and Beijerlandselaan, were more closely related to the form of the Stationshus building, this building also had to be a defining object for the urban form. This means that most of the strategic decisions, more related to the urbanism part of the project, had to be done in the first preliminary phase. Then important architectural elements of the design had to be created, before the actual urban design could be formed. In this sense the whole project has integrated both fields of profession very closely and cross-reflection between these three phases were made continuously, although sometimes even unconsciously.





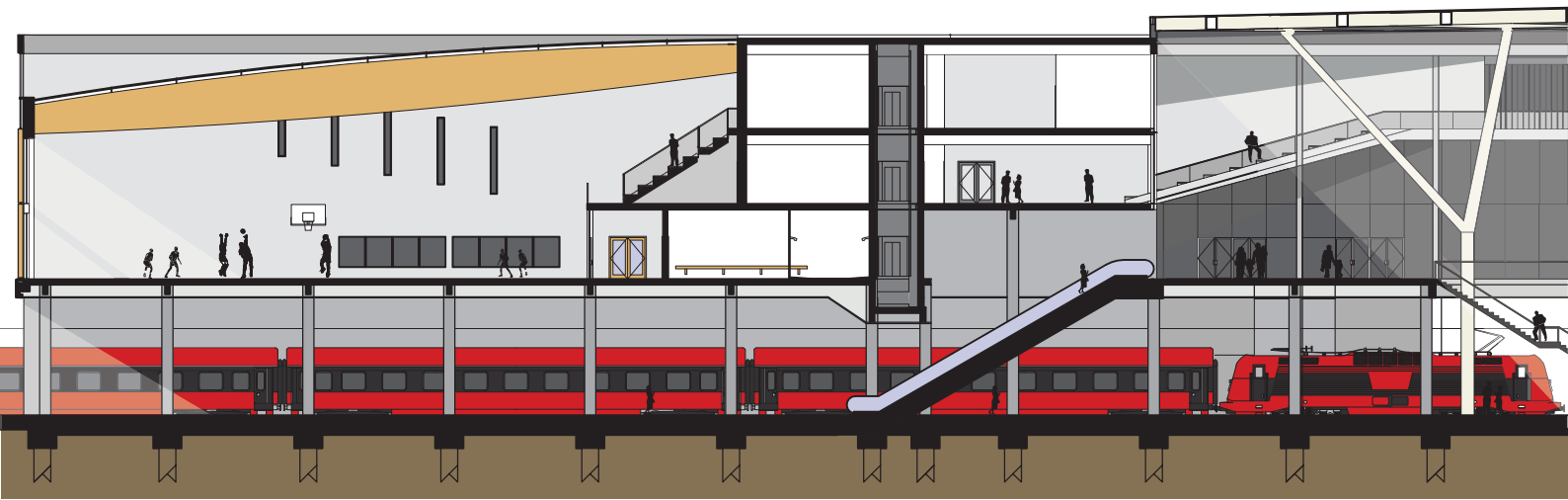


Theory of railway station domains.
Source: Bureau Stationsbouwmeester.

After the whole framework for the design was set up, technical aspects of the plan became more profound. The construction of the building has been an important element that has shaped the building into the final design. Also climatologic considerations shaped the way facades and other visible elements of the building were created. In the end the whole range of the design and planning scope was taken into consideration.

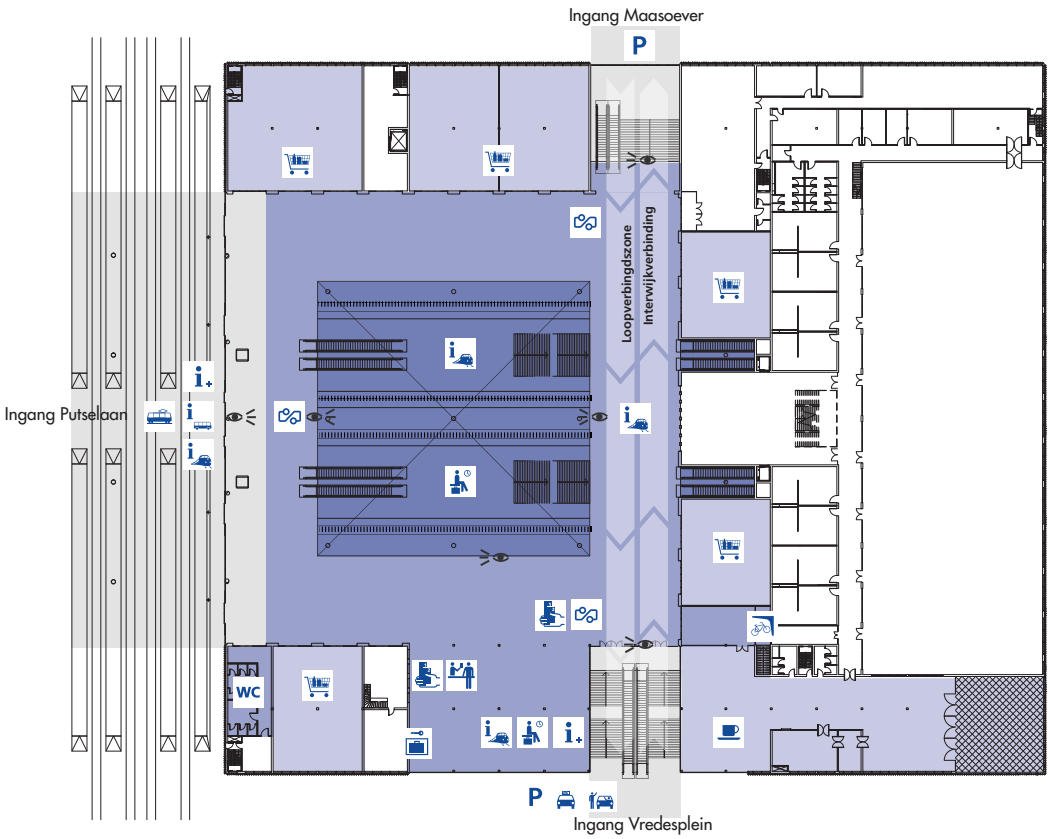
Theory

Architectural
The method and unique combination of elements has been described, but external theory is taken to classify the building in the large range of hybrid buildings that have been realised in the past centuries. Joseph Fenton is one of the designated authors in this respect, as the project is part of the Hybrid buildings chair of the Delft University of Technology. Fenton (1985) describes hybrid buildings as a building type that has become more popular due to the scarcity of space in contemporary cities that has led to higher and more efficient building in which several functions are combined in one structure. He finds empirical evidence for three categories of hybrid buildings; he calls the graft, fabric and monolith.
In the graft hybrid the main functional components are expressed in its volume or elevation, while the Fabric and Monolith feature a continuous building envelope in which the programmatic elements find a place. The main difference between the fabric and monolith is the position the buildings take in their respective contexts. The monolith is a highly present building with a monumental scale; the fabric on the



The domain theory applied to the designed station building of Rotterdam Zuid (right).

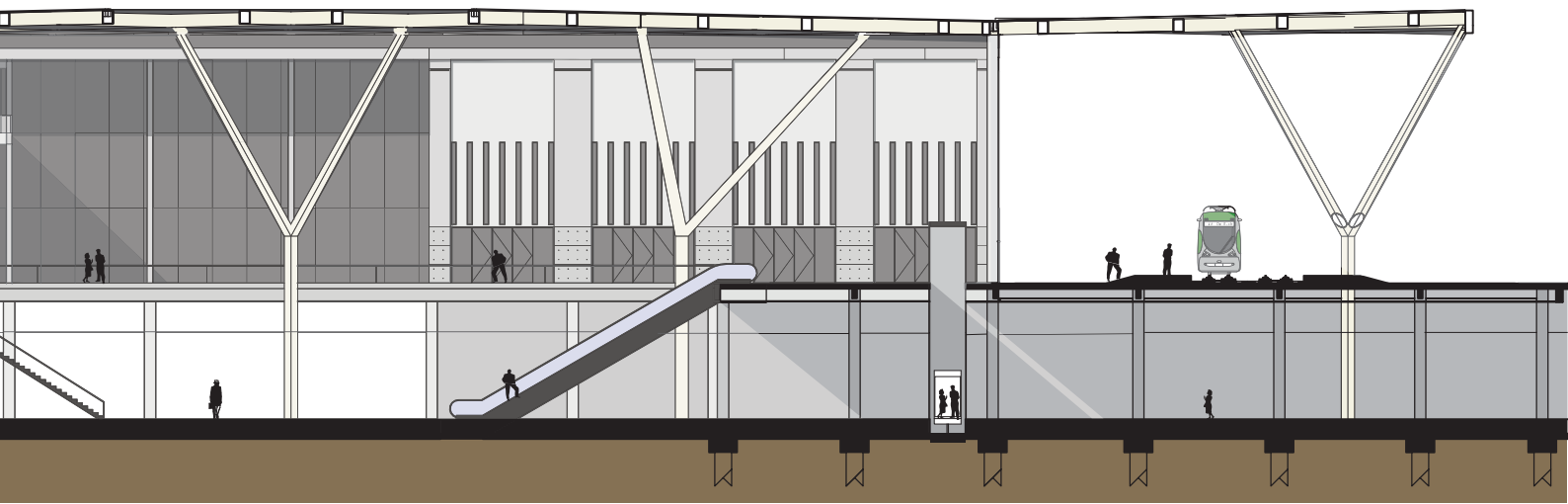
Length section of the Stationshus (below).

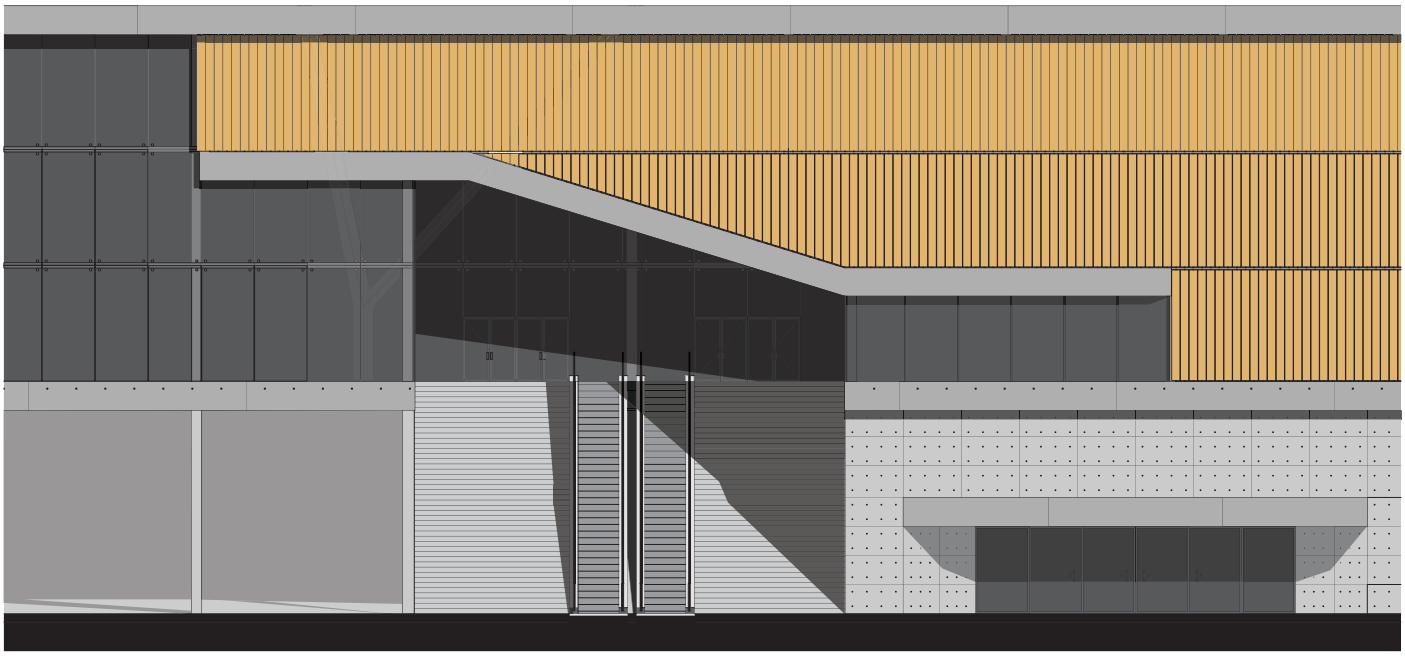


other hand behaves in an inconspicuous way, with an exterior appearance that conforms to the envelope and adjoining building masses. Differentiations in building elements such as material, texture and window sizes, may distinguish programmatic elements. Or as described by Paulina Borsook: 'Fabric hybrids generally conform to their surroundings, and their exteriors may make only modest reference to their internal variety of function' (Borsook 1986: 79).

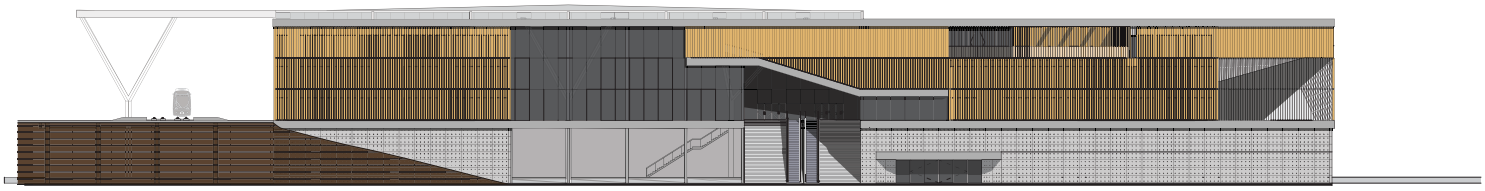
The architectural form of the Stationshus has a building envelope that is built as one mass that has several faces to the surrounding areas. The material and repetition of the facade make the building to fit modestly into its context, while the scale of the building and its activities also give it a monumental size and an outstanding position within the neighbourhoods of this part of Rotterdam South. The internal functioning, with the station hall as the centrepiece of life and as the main distributor, makes the building resembling a city. The transparent roof of the station hall continuous into the canopy that forms a gradual shift from the public space as part of the main axis to the centre of Rotterdam, the Laan op Zuid, to the internal heart of the building.

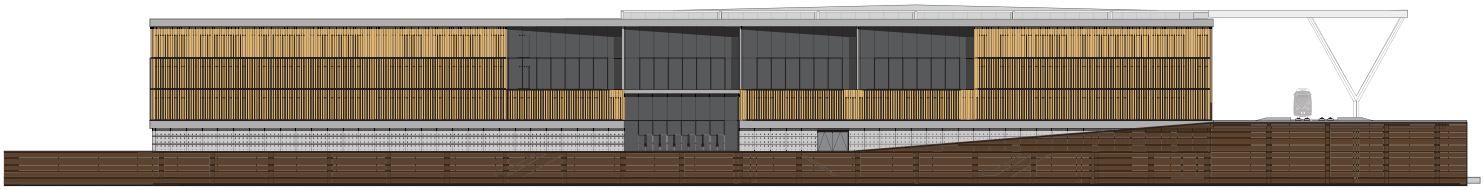
In the description elements of both the monolith and fabric hybrid building appear, although it most closely resembles a monolith. Fenton defines a monolith hybrid as 'inherently products of the industrialised 20th century city. The impact of their monumental scale on the spirit of the city is substantial. These highly present buildings often concentrate an encyclopaedia of metropolitan life within a single building block. Their self-generated symbolism also supersedes the simplistic equation of form and function. In the modern city the monolith hybrid, with its efficient accommodation of the most extreme functions, has displayed greatest versatility (Fenton 1985: 8).'

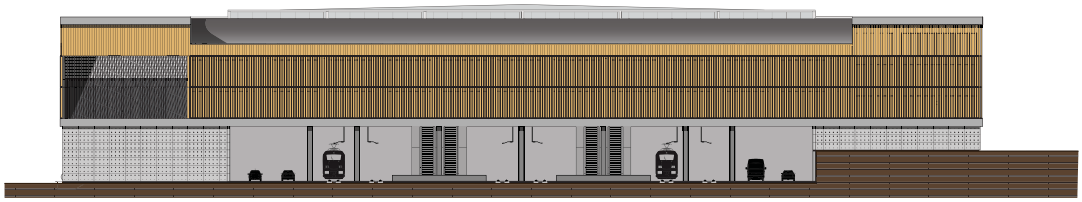




The enlarged façade of the West entrance (above). The outer façades, from top to down, west, east, south and north (below).







Borsook (1986) adds that the scale of a monolith hybrid distinguishes it for the most from fabric hybrids, being resembled in the notion that monoliths refer more to themselves as monumental cities-within-a-city than to the city around them.

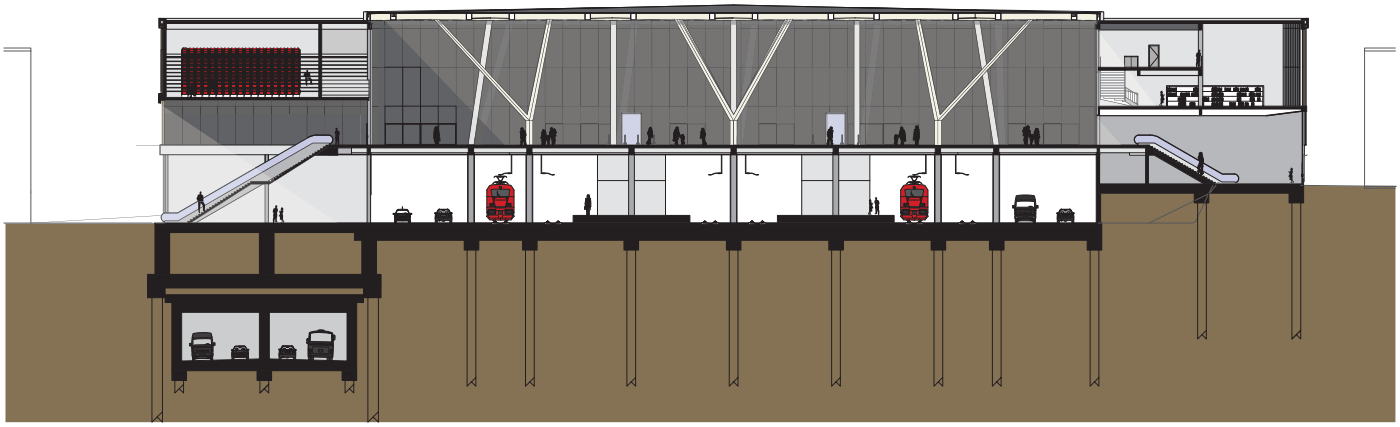
It has been stated that the project building resembles most to a monolith. However, unlike most monolith hybrids, it is closely shaped to its surrounding contexts, rather than creating a shock effect a more modest and gradual change in colours and material is chosen to make the connecting element between the different zones of the project area. But the monolithic character is returned in the monumental place it has in the urban plan at the confluence of the most important axes within Rotterdam and through its size and importance of activities it offers within this part of town. In a few places some influences of the graft were taken into the design as well, mainly to articulate the entrances, such as the diagonal line in the west facade that is part of the inclining auditorium, the canopy of the station hall that is also used as a roof for the trams and the large windows in the library that exhibit the large double height space.
Concluding from the theories of Fenton the building could be defined as a monolith with some fabric characteristics as it comes to the place within its context.

Railway station
The intercity railway station has to comply with the Dutch tradition of railway planning, and it has to fit in the current railway network of the Netherlands. The Dutch railway network is unusual in the sense that on a world scale the network is very dense, but distances between station and cities are small. High-frequency services throughout the network with almost every station being served with at least two trains an hour, make the Dutch trains more similar to metro or commuter rail networks in other parts of the world. Unlike in many countries of the world were people prepare their travel by booking tickets days, weeks or months in advance, the Dutch tradition allows people to decide up to the last instant with which train they will travel. With a project like 'spoorboekloos rijden' this will be stimulated further, but already today people can go to the station on some busy routes to catch a train without being aware of the exact time the trains depart, as their waiting time is short.

This Dutch way of travelling by train is found in only some nearby countries, like Belgium, Switzerland and parts of Germany and England although frequencies are often lower. Further it is generally found around large urban centres in Europe, Asia and a few selected cities in the rest of the world. The high frequencies have also lead to a high efficiency with intensive use. And although stations in the Netherlands transfer as many people as many of the larger stations of France and Germany, they are generally smaller and less monumental than stations in Asia or Europe (Van der Bijl & Hendriks 2010). The number of platforms is limited and sometimes two different trains stop at the same platform, stations in the USA or China have up to 60 tracks. In the Netherlands a more efficient use is made of the platforms as the stations are most of the times an in-between stop of a line running from the periphery to another periphery.

Several handbooks have been written that explain the features of a good design. Both Edwards (1997) and Ross (2000) point out Dutch railway stations, thereby praising their open and light designs. Stations like Leiden, Amsterdam Sloterdijk and Duivendrecht have implemented much glass and steel in their design that has led to a clear orientation within the building for passengers. Important is also the social control and safety because dark spots have been avoided and the long sightlines provide an overview of the

A through section of the station hall, with the tracks and two continuing roads underneath it.



buildings.

"Bureau Spoorbouwmeester" was set up in 2001, in a way similar to the government architect (rijksbouwmeester). The Spoorbouwmeester is appointed every few years and gives independent advise on design in the field of railways. The office also provides information on the way stations in the Netherlands have to be implemented, with guidelines referring to (graphic) design and the theory of domains within a station.
Four different domains can be differentiated following the stationsconcept (Bureau Spoorbouwmeester 2011). The arrival domain, entrance domain, travel domain and staying domain are connected by the walking connection zone. A traveller arrives in front of the station in the arrival domain, where connections are made with other modalities. From there the station building is entered coinciding with the entrance domain, where travel information is given and tickets can be purchased. The travel domain is entered when the platforms are reached from where the trains will leave. With the new OV-chip card this area is secured to paying passengers. Only on the larger stations a staying domain is found, that houses waiting areas and shops were people could wander around until their train leaves. Shops however can also be found in the entrance and travel domain, in the latter usually as a "kiosk".
The division in domains has also been implanted into the design of the Stationshus. Here the station hall forms the entrance domain that connects to all entrances that are part of the arriving domain. The commercial units and kulturhus that are situated around the hall are part of the staying domain. On the lower level the tracks are reached that are part of the travel domain. A large vide in the hall provides clear sightlines and contact between the different domains. Finally a neighbourhood connection for pedestrians is running through the hall and connects the eastern and western entrances of the building, thus connecting the neighbourhood with the river.

Some points of critique on Dutch railway stations are also heard by mainly Dutch authors. NS Stations, the former NS Poort, exploits railway stations in the Netherlands and provides a generic range of store chains that are located in every station. These chains of average middle class quality give the stations a merely plain and mono-oriented character (Van der Bijl & Hendriks 2010).
A historical study to large railway stations (Hagers 2012b) showed that previously stations were inhabited by station restaurants that were unique to every station. Waiting rooms of different classes filled up most of the rest of the station buildings and were extended when the number of connections grew. The difference in classes slowly faded, as the luxurious first class was abolished and the second and third classes moved up one position in the hierarchy in the 1950s. With the increase of rail travel stations have become larger and multifunctional, acting as large-scale shopping centres and transportation hubs. This went at the cost of diversity in especially programming and the infill of functions. In neighbouring countries a much broader segment of the population is approached, with amenities ranging from high-end to budget (Van der Bijl & Hendriks 2010). Van den Boomen and Venhoeven (2012) complain also about the generic infill of store chains and hope for more specialized restaurants in stations. The answer to these complains is found in this project by the kulturhus. This facility has its own character restaurant and library that also can be used by travellers, making the station far from generic.

Kulturhus
The kulturhus has been researched and explained in the urbanism section of this thesis. From the Swedish and Dutch examples lessons have been learned that were applied in the final design of the project building. The programme will continue with the specialized functions of the Stationshus and in the design section the consequences to the form are discussed.

Programme
The functioning of the building has been a very important element of the design, as the building hopes to reach audiences from in- and outside the neighbourhood. The Stationshus is envisioned as a meeting place in the city, where people from the problematic neighbourhoods can also develop themselves personally. The chosen functions within the kulturhus reflect this aim.

The main activities in the kulturhus are the library that is enlarged by a number of lecture rooms that can be used for presentations, evening school or can be rented out for other purposes. A large indoor sports hall complemented with a gymnasium, give people the opportunity to play a range of sports near their homes and work on their physical health. Connected with the sports hall is a bar and restaurant, that has

a double function as a catering option within the station. A kindergarten gives single parent families the possibility to leave their children during the day, while they go to work by train. Finally a neighbourhood service point deals with questions for the municipality and as a place where post and medicines can be handed out.

The activities of the kulturhus are complemented with the programme needed for an Intercity-station where between 33.000 and 38.000 passengers per day are transported (estimation based on Goudappel Coffeng 2010). This includes ticket offices, luggage storage, waiting rooms and commercial units, with enough space for large quantities of people during peak times. The guidelines for the implantation of these types of facilities have been retracted from parties that built and exploit Dutch railways and also include minimum heights of platforms or catenary for example. These parties are ProRail, NS, Bureau Stationsbouwmeester (2011), an interview with Movares architect Tjerk van der Lune (2013) and from UK-authors Ross (2000) and Edwards (1997). The British way of dealing with railways from a functional aspect is very similar to the Dutch approach in this sense, which makes this literature suitable.

Design

Stations can have many qualities in both the architectural and urban field. Except often beautiful and recognizable landmarks as a symbol for the city, stations are important meeting places for large groups of travellers, meaning that there is always activity going on (Ross 2000). This also has meaning for the urban situation, because many people are attracted to the station, it created also opportunities for other activities. All these activities together make the larger stations centres or central points within whole cities, and medium and smaller stations to centres for city districts and neighbourhoods. Ferrarini (2005) even calls the modern stations malls executed as urban galleries, similar to airports. While Sanders et al. (1999) and Bertolini and Dijst (2003) say that stations and surrounding areas have the potential to become the new city squares of the future, the place where new developments can be concentrated.
Architectonically a station, historical or modern, can by its size and monumentality function as a landmark for the city. All over the world architectonically interesting stations have been or are being built.

Personally I think that some of the most interesting elements of stations are the large spaces that can be created with long (horizontal) lines. Other technical elements contain the structures of the roof and building construction, while routing plays a very important role in the functionality of the building. But ‘every station needs to have a clear face to the city, an evident entrance’ (Van der Bijl & Hendriks 2010: 69). This is one of the main elements of the design in this project. A large part of the orientation from within the building, but also from the surrounding comes from the way the facade around the entrance is shaped. Especially in this project this articulation of the entrances is very important, as the station building is accessible from three sides. This unusually high integration with the neighbourhood makes the station only rivalled by underground or terminal stations that can have a similar integration with its context. Uniquely this does not apply to the new Rotterdam Zuid station.

The building therefore has opened up towards the adjacent areas making it accessible from three sides, which is a very uncommon practice for regular station buildings. Especially the northern entrance that connects to the central axis of the Laan op Zuid and the Third City Bridge, is a continuing public space that extends from outside to the station hall and so to the entrances of all activities in the Stationshus. Penetrations of the solid structure that wraps around the rest of the station hall provide orientation between the building and public space around it, while it also improves the incidence of light in these parts of the building.

Structure

An important aspect of the building is that it is built over the existing railway line. The base of the building is therefore a grid that has been laid out to avoid the tracks. The construction of the building lines out to this grid, but it is also guiding the internal structure of the building. Here the station hall part of the building that is built over the railway is open, light and has considerable height. This hall is bordered on three sides by solid concrete volume that is much more closed off and houses most kulturhus activities. The two flanks of this solid building part are elongated further south, through which a new large space, a hall, over the railway comes into existence.

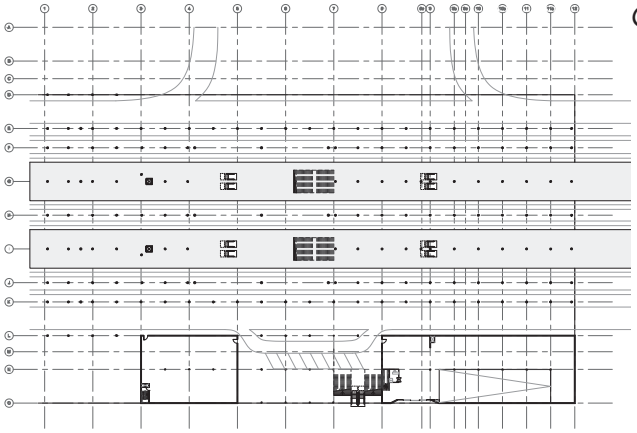
These two different internal structures can be even further lighted out on a smaller scale. Then the open

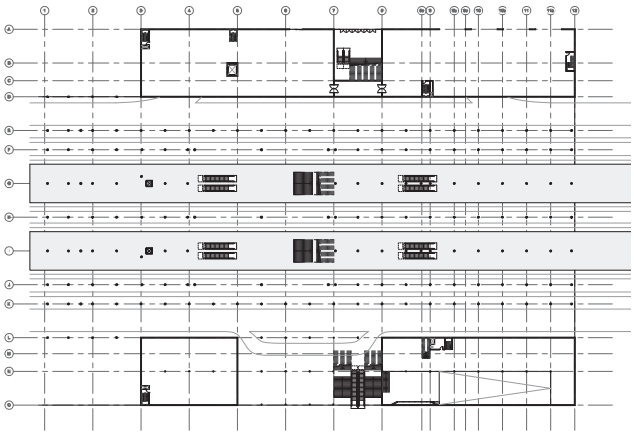
Floor plans of the building, with above the station hall and right the other floors and a detailed section of the west façade.

structure that is situated over the tracks forms two different halls, both with a special light construction and column-free. The roof of the station hall is kept up by nine large tree-like columns that are positioned between the tracks within the void that connects the platforms with the station hall visually. Another light construction type was chosen for the sports hall, that also spans the tracks. Here large laminated beams span the hall, creating space for a very long covered sports and events hall.
The solid structures that flank the open spaces are connected to separate the two different open structures of the building. This building part differs substantially from the light parts by its construction. Concrete walls and lift shafts make the building stable and give the building a uniform appearance. To introduce extra light and to improve orientation within and from outside the building penetrations of the solid structure have been made around the entrances, causing them to be articulated in a special way on each side of the building.

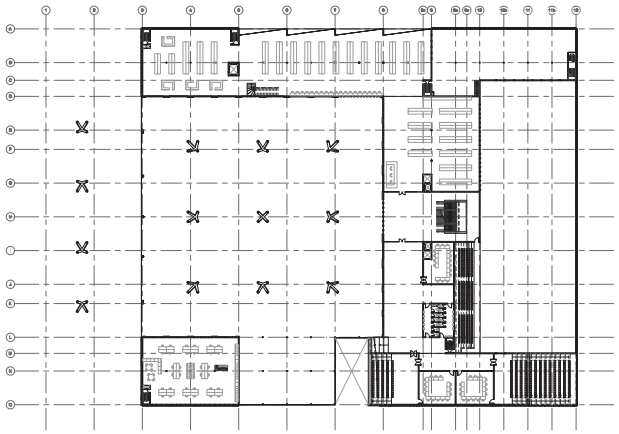
Facade
From the outside the building seems to be placed on a concrete base, that houses complementary functions, such as the installations and bicycle parking. On top of the base a more flexible facade is placed, consisting out of two rims where in between lamellae are placed in front of a glass facade. The lamellae can turn to reflect sunlight or, to improve the incidence of light. The turning mechanism is placed in the top rim and the covering material of the lamellae is replaceable in the form of an easy click-system. It means that when the triplex wood starts to deteriorate it can be replaced by a new strip or even a strip of another material. Around the entrances punctures have been made in the solid volume of the repetitive facade that creates more diversification in the view of the building. In these places the lamellae are left out, but a curtain glass facade is in place.
The facades on the inside of the building, especially when seen from the station hall are different and much more solid and monumental. The same vertical repetition as is made by the lamellae is made through narrow vertical windows that span the height of two floors. At entrances the windows become a

Ground level

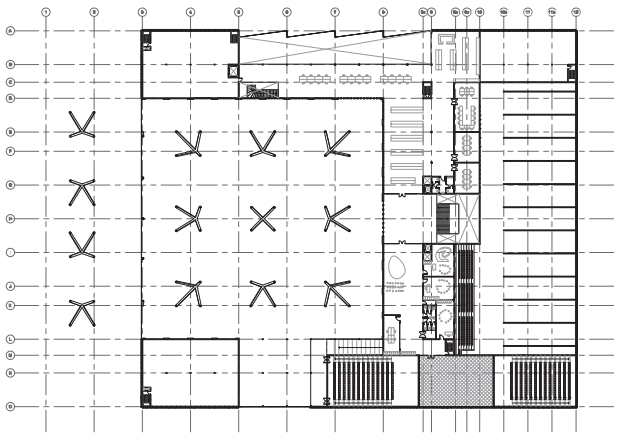




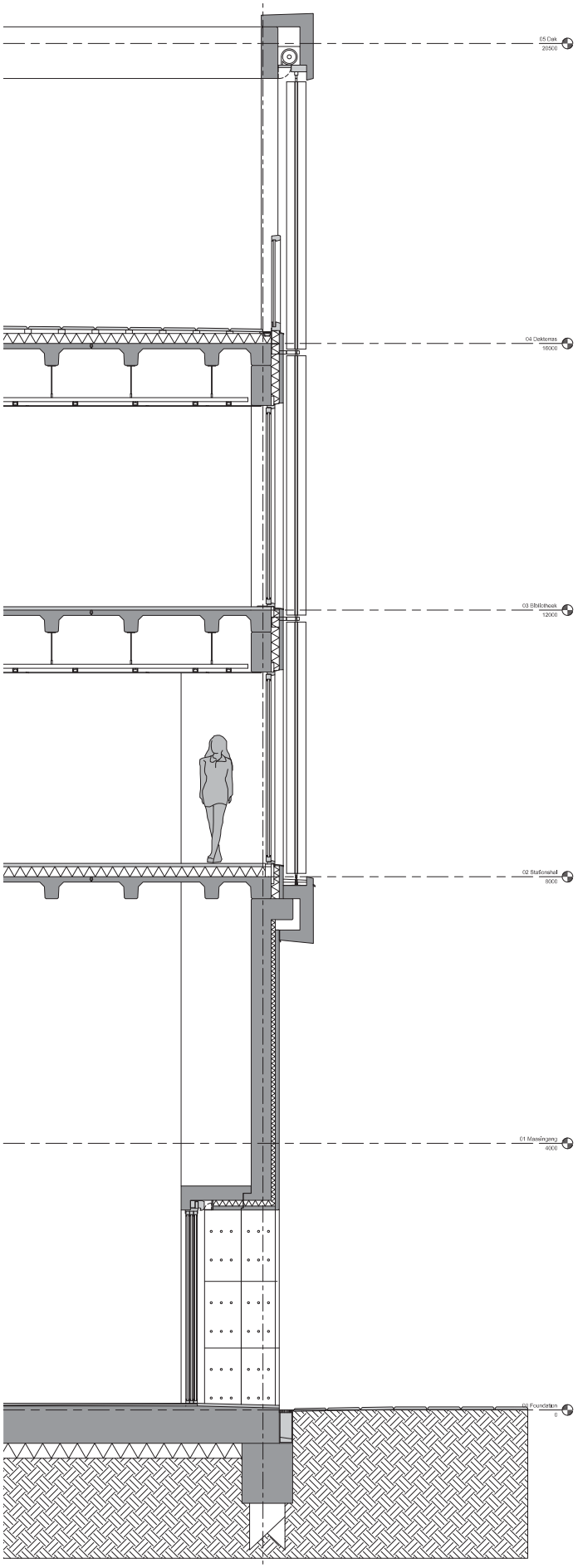
1

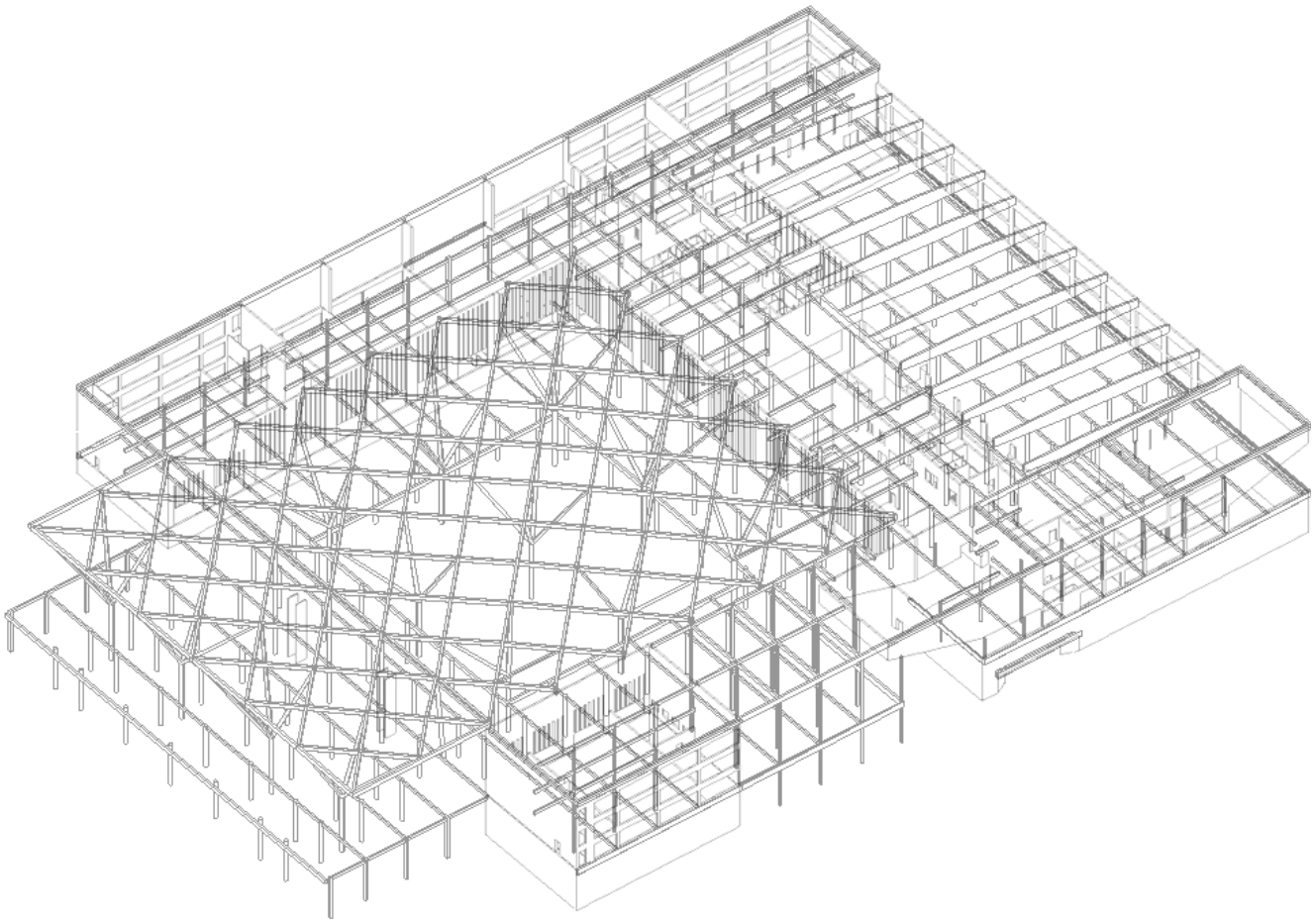


3



4





Construction overview of the Stationshus, visible are the different structures of the building.

bit broader to highlight the importance of the passage. Concrete blocks that are also used in the base of the solid building part are returned in the base of this solid facade. Together with lines that top these inner facades and pilasters with a height-depth-ratio of 1/6 it makes it similar to the composition of a classical Doric temple. Important for the inner facades was to create a tranquillity, but with enough accession of light, without that the 75 metre long facades became boring. Repetition of elements kept the facade austere, while the main focal points remained at the important spaces of the station hall, the entrances, the void to the trains, the waiting and ticket room and the windows of the commercial units. In this way the way finding for travellers remains simple and top priority for a railway station.

Climate
There are different climatic circumstances in the building that go hand-in-hand with the different structures of the building. Several sustainable measures have been taken to regulate climate in the building. A geothermal heat pump (warmte-koudeopslag in Dutch) stores cold water in winter in the ground that is used for cooling in the summer. The opposite process takes place in winter, when stored warm water is used to heat the building. Extra condensing boilers are used to be applied when, more heat is needed than can be drawn from the ground water and city heating systems. Rainwater is stored in the base of the building, to relief pressure from the wet and low-lying soil of Rotterdam and is used to flush toilets. Warmth is also redrawn and reused from ventilation air.

The open station hall is de-facto a covered outside space, where people are sheltered from precipitation, strong winds and, extreme heat and cold. To avoid that floors freeze and get slippery during cold periods in winter, ground water that has been stored during the summer is pumped through the floors. Natural ventilation is used to relief heat of the sun during the summer, for this purpose windows can be opened in the space where the glass roof extends over the solid building volume. Extra fresh air can be brought in mechanically.

The facades are made out of glass but lamellae are used to reduce the incidence of light and warmth. Many of the activities do not really need heating in winter, as many people converge in lecture halls, the

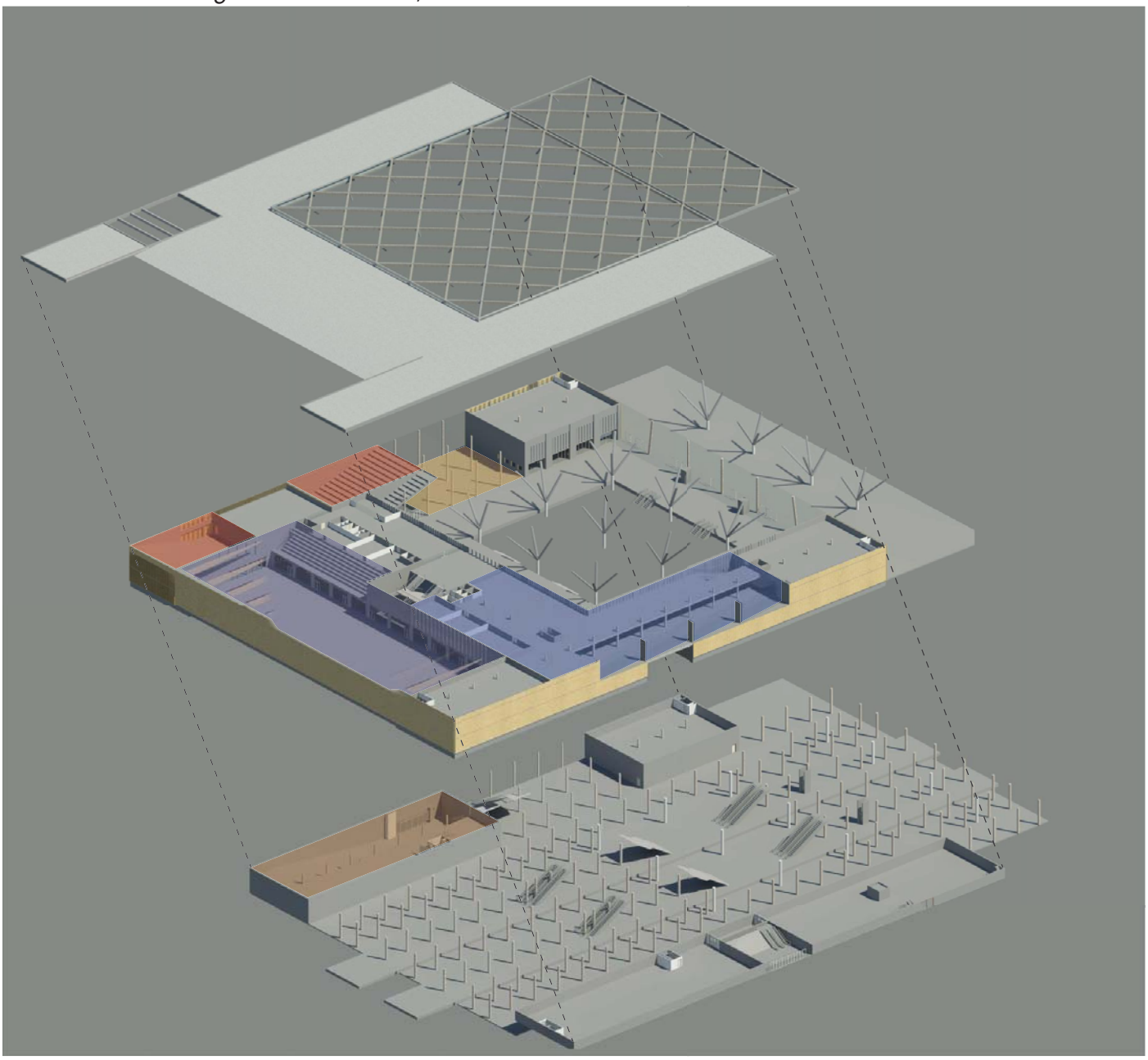
sports hall and library. Ventilation is more important in this respect, the inlets are found in three corners of the solid building mass and include installations that regain the warmth of the exhaust air. Through a network of pipes and shafts, fresh air is distributed form the top floors, where also the installation rooms are situated, through the whole building.

Functioning

The functioning of the building is a very important aspect in the success of the project. The different activities have already been mentioned in previous paragraphs, but the organization is also going following the lines of the two different structures in the building. Summarized it could be said that the railway station is part of the open part and the kulturhus is part of the solid part. Although this is not totally correct, as the sports hall is part of the kulturhus and the ticket and waiting room is in a puncture of the solid building part. The shops in the ticket hall also have a combined function for both the station and kulturhus. These things show that the kulturhus and station are very interwoven inside the building making it a true hybrid building in which both activities complement each other.

The railway station starts from the level of the street, where the platforms are located. Two extra tracks make it quicker for high-speed trains to pass by and reduce the travel time to Breda or Antwerp by one minute. Escalators and stairs reach the station hall through a void, improving the amount of light that reaches the platforms, creating there a safe and clear waiting area for passengers. From the station hall main functions like the ticket and waiting hall, entrance to the kulturhus, the exits from the building and the shops are easy visible and reachable. A large glass facade next to the west entrance, gives a grand

Axonometric drawing of the Stationshus, with the coloured kulturhus functions.

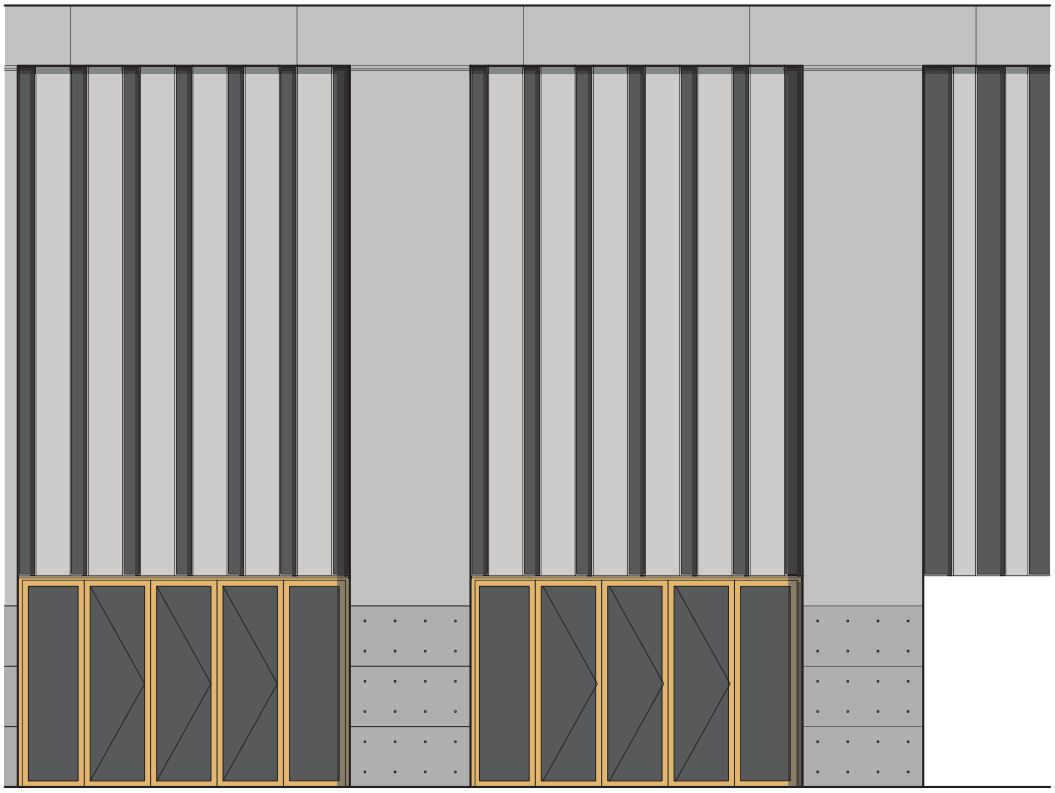


view of the west square and mosque that make the main connection to the neighbourhood and that exhibit the importance of the existing context for this plan. To the north side the tram platforms, just outside the entrance, are directly visible as well as the axis of the Laan op Zuid where the Erasmus Bridge and some of the highest buildings in the city are visible. The glass facade that separates the hall from outside is hardly a barrier, and figuratively sucks the public space into the building.

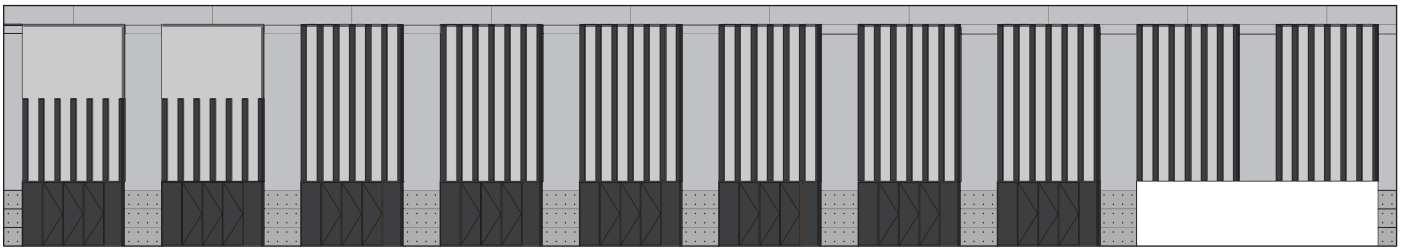
The kulturhus contains a range of activities that are focussed on the people that live in the neighbourhood, but come in also very handy for train travellers, such as the library that can repeat the success of the library in the station of Haarlem. A main entrance to the kulturhus is found in the middle of the neighbourhood connection that goes through the station hall, opposite the tram and northern entrance. From here a staircase of monumental scale can be reached that connects to the library, lecture halls and other instruction rooms, stands for the sports hall and kindergarten. The library wraps itself around the southeastern side of the station hall, and is two stories high. Large windows offer magnificent views over the river and new Third City Bridge, as well as the new port that is in front of the eastern entrance. The library is divided in different sectors, with the rush sector being the most unique and noticeable. Here new and popular books are on display for loan and travellers can quickly come in to grab a book and "rush" back to catch a train. This busy part of the library is at the entrance, thereby sheltering the study places and quieter sections of the library from the noise the quick visitors make.
The sports hall is also accessible from the main kulturhus entrance, but also from the sports bar that doubles as a special station restaurant, with a terrace underneath the second auditorium floor, the other one articulates the west entrance, and views over the neighbourhood square and mosque. From the restaurant the stands are also accessible, creating two entrances and escape routes. A fitness gym complements the sports hall and is accessed by a stair in the hallway that runs parallel to the hall itself. Underneath this gym the municipal service point is located, that is accessed directly from the station hall.

From this description it can be concluded that the station hall has to be viewed as main distribution point of the building and as the "covered city square" that this building forms in Rotterdam South.

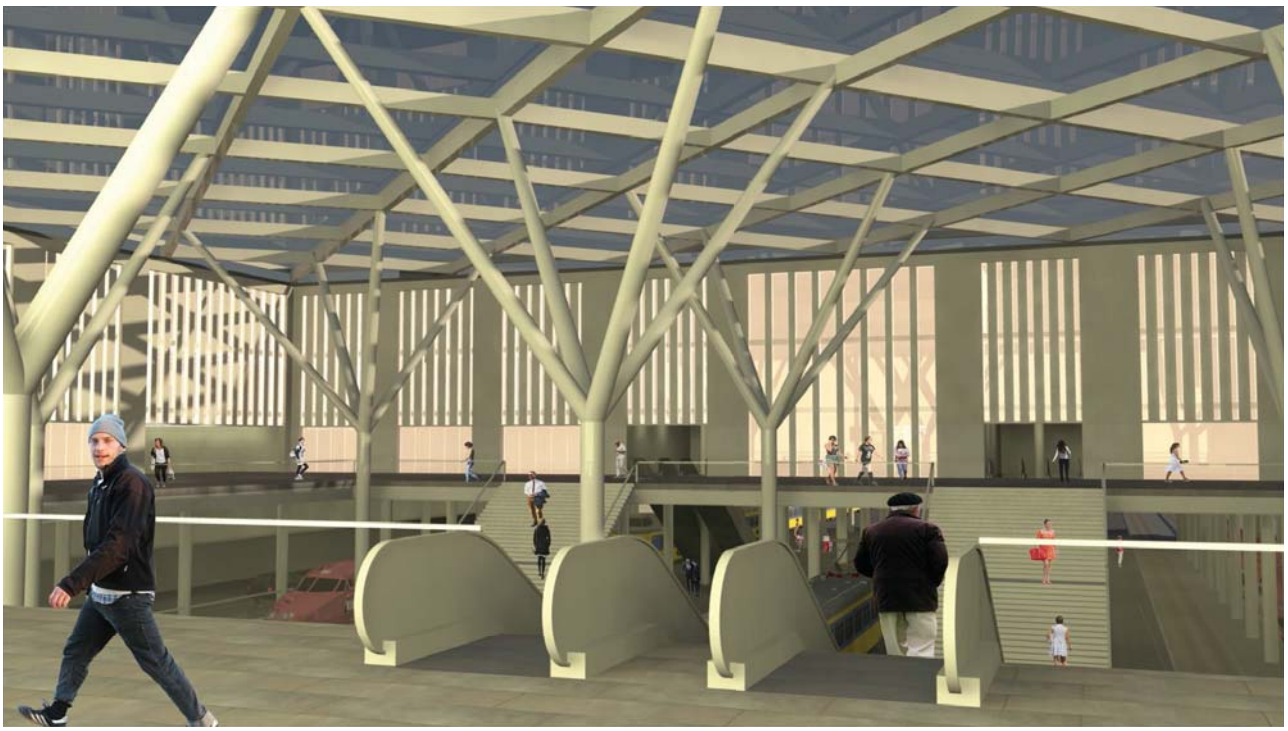
Impression of the station hall.



The inner façades of the station hall.



The same position in the station hall seen by night.



View from the platform, with a departing train.

The platform with much light incedence through the void in the station hall.

The taxi and park & ride facility, seen from the West Square.

The Stationshus seen from the arcade along the northern edge of the West Square.

The ticket and waiting room of the station hall. A minarets of the mosque is also visible through the roof.

The East entrance, with above it the library.

Reflection


ISLENSKA
SUOMALAISIA KIRJOJA
Boktips

Reflection

This project has combined some common strategies, theories and attitudes in an unprecedented way. By studying these varied ideas with some totally different aspects on the edge of a lot of different disciplines, some common characteristics have been found that are very suitable for the development of a new approach for urban renewal. The results coming forward in this final chapter and the design itself can be seen as the answer to and the validation of the research question. Which was: "In what way can a modest urban and architectonical intervention, a strategy and design, contribute to the revitalization of Rotterdam South, starting from the perspective of mobility and with a Scandinavian influence, formed and building-on on the existing neighbourhood and its inhabitants."

What can be learned?

Approach
In the approach an inventory needs to be made of who is involved in the project and to state clear aims about the desired improvements. Urban renewal is not a process that could be guided by one actor, the government or a single cooperation, urban developer or architect. Urban renewal is a long-term process in which quick results are almost impossible.

The main aim for the neighbourhood is to create more social equality. This has to be done through an improvement of education or increased job opportunities. A good accessibility will increase the area in which such improvements can be sought, but it will have to be done in a sustainable way, that can also improve the liveliness in the neighbourhoods.

Everyone could and should contribute in bringing positive changes into the neighbourhood. The more actors are involved the more complex the process becomes, but also the more people are involved and engaged in contributing to the neighbourhood. To avoid several actors to plan for the same solutions regular meetings between all involved actors are useful. In this kind of meeting on-going projects need to be explained and discussed. This also opens the door for cooperation between actors that try to approach the same problems, even if cooperation might be unlikely in the light of the background of the actors, knowledge can be exchanged. The newly built Essalam mosque for example wants to take an important place in the society, not only as a place for Muslims but also as place from where activities can be organized (Tamimi Arab 2013). On the other hand there is hockey club Feijenoord, an initiative to make a sport like hockey, in the Netherlands generally associated with middle class and affluent people, familiar with the less prosperous youth of Rotterdam South. These kinds of initiatives are needed hand-in-hand with other investments to bring more prosperity to the south of Rotterdam. Together with schools, cultural associations and all kinds of other social programs, action needs to be taken from within the neighbourhoods. An environment, that gives room for these kinds of initiatives and to create opportunities for people living in the neighbourhood and for other people to invest in the neighbourhood, can be provided by an urban plan as it is described in this thesis.

When it comes to the relation between architecture and urbanism in this project the line has been drawn between design and strategy. Urbanism is leading in defining a strategy approach for the whole project. It means that the architectural discipline is leading when it comes to the form of the project, the style, shapes, volumes et cetera that give the final spatial characteristics to the design. Urban spaces have been created that are in line with the architectonic ideas of the building.

Strategy
The strategy has to define the methods that will be used to achieve the drawn goals, in a way that fits local circumstances, like urban planning tradition and government policies. In Rotterdam South more social equality is desired in the form of making current places with jobs and education better accessible by public transport.
Because of the large area and number of inhabitants, the solution of an intercity station was chosen. To do this in an efficient and cost-effective way, it was chosen not to implement large-scale new infrastructures in the first place, but to build on current infrastructure, to prepare it for more efficient use. The resulting node also brings improved place values, as can be derived from the model of Bertolini. This of course leads to

the implementation of a transit-oriented development (TOD).

In the current Dutch planning environment open planning is the most abundant form of planning. This means that private sector parties are involved in the development of the plan. The strategies need to attract interest of actors, besides the government, that are willing to invest in the area. The creation of a new node on South combined with spatial alterations in the structure of the city, will offer new possibilities to attract investors. From successful TODs around the world it has shown that the involvement of transit companies in the development of real estate in station areas is a positive trend, to secure ridership.

Increasing mobility needs to be guided into more sustainable ways of transport, with equal chances for everyone in the city. A connection to the existing railway corridor that now divides the neighbourhood will both increase the efficiency of the line and create new connections for the city across the barrier. This catalyst function will create a base for further initiatives aimed at ameliorating social justice in the area.

Only a durable solution is not to guide people to other areas and to seek their luck there alone. Also in the project area itself, measures need to be taken that can prepare people to develop themselves and improve their chances for work. The way people are encouraged tries to focus on culture and social contact. From Swedish example a kulturhus was chosen to act as meeting point and further develop social contact and language skills, added with functions such as a library, and places for education, cultural expression and sports. People get the chance to develop themselves in a healthy way and to get more bonded with the neighbourhood, because of these supporting facilities.

The result of this strategy is the development of a catalyst Stationshus, a combinated building that houses the intercity railway station and kulturhus under one roof.

Design

The design is about the filling in and styling of the strategies chosen for the project, that result in the eventual design. A peculiar trait of this project is the combination of both urbanism and architecture into one design. A thorough integration of these two fields of profession brings many advantages, especially when it comes to functions and use as this is a very important element where, moreover, both fields are interconnected. But there is for example also interaction on the point of context and style of design.

TOD and POD, Transit and Pedestrian-Oriented Developments, are two descriptions that match the profile of the project. TOD is an important part of the strategy of the project and in the design, taken measures are amplified and worked out. POD is much more of a design approach, in which guidelines are sketched of how a lively, sustainable and safe city can be organized and stylized. Although the word POD did not come forward much in this thesis, it is used to describe the theories of making a lively city, including the ideas of Jane Jacobs (1961), Jan Gehl (2010) and Brouwer (2010) and numerous others that want to implement pedestrian friendly zones and routes in cities, trying to define concrete design hints.

The success of a node is determined by the fact if it succeeds to attract also non-travellers. Good pedestrian connections between the neighbourhoods and the main intervention are important to achieve this goal and to allow the Stationshus to succeed. Following from the POD theories a few components are vital to create a lively and safe city. Activity density is an important tool in creating a pleasant atmosphere, where social control maintains security and where the public space invites to be used. The facades form an important element of the design, because soft edges, like plinths contribute very much to the number of activities in a space. In the project arcades were used, because they reference culturally to the context of a mosque and they moreover fitted with the design of the Stationshus. But similarly other solutions, like small gardens, benches et cetera, can be used as well (Gehl 2010). Other important measures to stimulate activity is limiting the size and number of public spaces and offer interesting elements in the city that make the area distinguishable and to slow down people that have time for optional activities.

Architectonically the building is characterized as a monolith hybrid (Fenton 1986), but with a good integration within its context, that is more similar to the fabric hybrid type. Through its scale and position in the neighbourhood the building has a monumental status and with the large public station hall in that organizes the building it functions effectively as a city-within-a-city. This however is with regard to its context and with respect to the existing neighbourhood and its inhabitants. The elevated position of

the building proves its status compared with the existing buildings, but the accessible public hall of the building, especially with the continuation of the station hall towards the Laan op Zuid axis, refrains the building from growing beyond the human scale and the size of the neighbourhood. To properly describe the Stationshus a more nuanced description of the Fenton theory has to be made; it could be called a "fabric monolith" or "social monolith".

The accessible character of the Stationshus in the city is a particular trait of the project, as it opens-up into three directions, that all vary in scale and atmosphere. Most stations are mono or double oriented buildings that connect the centre of a city or a town with the railway network. In the Netherlands almost all stations do have a secondary connection to neighbourhoods that are located on the other side of the tracks. These neighbourhoods are not part of the city centre as the rail proves to be a major obstacle and acts as a physical barrier. This is also reflected in the orientation of the station and the design of the secondary entrance that usually lacks the grandeur of the front side of the station. Usually an anonymous stair gives access to a bridge or tunnel. In better examples a walk through connection gives direct obstacle free access to the main travellers passage. This is increasingly used in renovated train stations like Leiden Centraal, Rotterdam Centraal or Tilburg. The stations that are successfully integrated into public areas like Utrecht Centraal or Schiphol are as a station building itself, not very recognizable. Escalators give access to the tracks from a main hall integrated into a larger (urban or underground) structure. Most of these are part of a world that encompasses more than only the traditional city, for example a large airport or a covered pedestrian network, similar to the underground cities of North America.
The high integration and accessible character of the Stationshus invites inhabitants and visitors into the building, that makes it able to function as meeting point of Rotterdam South. In a way Kulturhuset Stockholm functions for its whole urban area. The use of articulation and differentiation of the building's entrances, with transparent glass helps to reduce the barrier to enter the main hall. When inside this distribution hall all activities of the building are accessible.

Function
Function is a very important part of the design and because of the unprecedented combination of functions in this project a bit more clarification will be given on this subject.
Combining a kulturhus and railway station is unprecedented, but a logical consequence of the factors that built a successful kulturhus. A kulturhus functions as a meeting point where all sorts of activities can be combined, important is a good accessibility from the surrounding living areas, as well as the city as a whole. The preferred location is near a railway or metro station, near an urban centre. As both of these elements often go hand-in-hand it is an obvious choice to place the kulturhus near the railway station. Combining them in the same building leads to cross-pollination.
Stations are more and more becoming places were all activities of the city can take place (Ross 2000), some even conceive them as the urban squares of the future (Sanders et al. 1999; Bertolini & Dijst 2003). These shopping centres with a transportation function can also house more than only commercial activities. Culture for example is a good starting point; a library provides bored travellers with the chance to read a book or a working spot during their wait for a connection. Van den Boomen & Venhoeven (2012) complain about the fact that all stations nowadays have the same programme, a few chain stores, a Starbucks or McDonalds or a snack bar. A few decades ago every station had its own train station restaurant, with an own character. The conductor went for a coffee in Eindhoven, but the fish balls in Amersfoort were better be left untouched (as a random example). By connecting the kulturhus to the main hall of the station, a whole range of new possibilities is created that improves the quality of a trip and distinguishes Rotterdam Zuid from any other station in the Netherlands.

In the urban situation the location of the Stationshus is very central, as the building is used as railway station, meeting point and as walking route between different parts of the neighbourhoods. It can be seen as the cultural heart of South and for pedestrians and transit. While the crossing of the Beijerlandselaan and Putselaan is on a same level the commercial heart of South, with its orientation mainly on shopping and for cars and cyclists. The separation of these two hearts, leads to a connecting route that brings activities in the neighbourhood, as this happens through the Western square. In the Dutch welfare-state this separation is fairly uncommon, but in the Swedish welfare-state this is felt much more, and especially in the 1970s it was seen as the counterweight against the Capitalist and Communist system. Nowadays debates on the political systems are much less on the surface, but the idea of creating a state in which everyone has a right to freedom and be socially included, is a sign of sympathy and hope to those that

struggle in a problematic area such as Rotterdam South.

Feasibility
The current financial crisis makes it difficult to develop large-scale projects by private developers. Another problem is the high building costs of the initial catalyst building, as it is built on top of the railway to Breda that needs to keep functioning during construction. Also some of the other infrastructural interventions are costly, like a tunnel to the A16 and the Third City Bridge. Ground costs are relatively high, because of the urban character of the environment. On the other hand this also brings in high benefits, because the selling price of real estate can be equally high and with the excellent accessibility through the station the location values will only rise. Benefits that is hard to put in numbers, like the costs that can be saved by using existing corridors through more passengers, less congestion on motorways and not having to make connections to remote developments that can be avoided through integration in current systems. Helping a problem neighbourhood is also a necessity to avoid social unrest, while people that participate in society bring in money and are happier, instead of costing welfare money.

The size of the project and the current economic situation make a phased implementation necessary. The railway station and kulturhus as catalyst for further improvement need to be constructed in an early stage of the project and would probably have to be funded by the government that now invests money in Rotterdam South to relief social problems. Actors that are involved in the Stationshus may also participate, especially NS Station, that owns and exploits all stations in the Netherlands, but think of the library, other local government organizations and sports foundations as well that all participate in the kulturhus. Land allocation or the building of housing and offices near the station can earn money back for the municipality that could be used to cover the expenses of the public functions in the project.

Theory
In the process of coming to a strategy and design, a lot of examples and projects were studied from all over the world. Especially in Asia the railway networks are growing quickly, but also in Europe and North America progress is made, while in Africa and South America the new networks are being developed. In this many different theories and approaches became visible. Most of these are adapted to the local situation, but generally the ideas of TOD are found across the world. The place-node model of Bertolini is still a widely influential way of dealing with station areas. An important aspect of this theory, that directly influences the design and strategy of this project, is the range of a station area. Where TOD is a generally accepted notion that differs mostly by local planning traditions and culture literature gives a wide array of distances, ranging from 500 to 1200 m. Every project uses its own influence sphere, while also barriers influence the range (Bertolini & Spit 1999; Van den Boomen & Venhoeven 2012). It seems that this distance is very location specific, and dependent on local culture and activities. For example cities with large cycling cultures, like in the Netherlands or Copenhagen distances can become larger as they are more time than distance related. Also the scale and character of a function are influencing the sphere of influence, for a stadium people are willing to cover a larger distance then for a supermarket or restaurant. Therefore only an indication can be given or the range of a station area, but that has to be adapted to the local situation.

Back to the phenomenon TOD as a whole, it shows that policy is less important, when the aims are clear to come to an efficient transit oriented system. It is striking that in Stockholm, with a large governmental regulated approach, a similar end-result is created as in the market-led Japanese system. The aim of spreading real estate, jobs and other activities across public transport lines is in both situations the same. Through strict planning, by government programmes on the one hand and by company strategies on the other hand, a similar success is made.

Pedestrian-oriented development, or POD, referring in name to its close relative TOD, is a yet little used definition to coin improvements that are meant to increase the comfort of walking through the city in a lively and safe environment. Both notions go hand-in-hand because where TOD is preformed people need to go from the transit station to the developed building or place, usually on foot. TOD functions optimal when pedestrian-friendly environments are created, that make it comfortable and interesting to travel by public transportation. Many theorists that follow the footsteps of Jane Jacobs, have written about attractive cities, that need to be explored on eye-level and need to be designed for a human scale, that

offers attention to the quality, safety, sustainability et cetera, of the public space. These different theories together are best described with one common name or umbrella concept, POD, as they approach the city from the view of a pedestrian.

Currently only little literature is available on kulturhuser or kulturhuzen, maybe because the concept is little known outside Scandinavia, or taken for granted in societies like Sweden, where culture is almost seen as a right of freedom and part of everyday life. The study in this thesis to the position of the kulturhus in the Swedish city therefore provided useful information about the nature of the concept and the differences that could be found. From the analysed cities three types of kulturhuser could be derived: New kulturhuser, redeveloped kulturhuser and historic cultural institutions that were turned into kulturhus. These types bring their own characteristics and history that has also influenced their position in the city. Further research into the use and success of all the kulturhuser would make it possible to develop criteria and recommendations for new kulturhuser. Where they could be developed best and with what type of programme and organizational structure.

Conclusion

The ideas stemming from Jane Jacobs and worked out further by people like Jan Gehl are the base to assess the success of the intervention. Van den Boomen and Venhoeven (2012) argue that the success of a node is defined by if it is able to also attract non-travellers. Offices and schools attract a one-sided group of people and only liveliness during specific peak hours. The mixing of functions introduces people with different motives during different moments of the day; passers-by, inhabitants, commuters, recreational activities, shopping people et cetera. 'A combination of shops, offices, schools, bars, restaurants and parks furthermore provides the possibility to combine different activities, that leads to less moves' (Van den Boomen & Venhoeven 2012). Small nodes attract offices or amenities less easy, but small introductions like a gym, lunchroom or kindergarten, can stimulate liveliness in an area. In larger nodes the risk is that offices expel other more popular activities. Besides that the human scale of the area can help integrating the node with its environment.

The question how to measure the success of the intervention is central as it values the answer to the research question. From the previous attracting also non-travellers makes a node successful, but it can only be measured when the plan is executed. Many arguments could be found to oppose or to support the building of a large intervention in Rotterdam South in this way, but none could give a definitive ruling on the functioning in real-life. A problem that is common for new urban and architectonical ideas, and that has a possibility to fail, like De Bijlmer in Amsterdam that has been destroyed within fifty years. But one thing is clear, and that is that something has to happen to improve the situation of Rotterdam South and that large scale previous interventions have not given the results, improvements, that were hoped for. A new approach, initiating from sustainable mobility aspects and that would be implemented with respect for the existing neighbourhoods and inhabitants on a human scale, could improve this living quality in Rotterdam South. An intervention on this scale however has to be implemented to assess the strategy and to see whether the desired changes can be accomplished. In this thesis numerous precedents have been mentioned to motivate the successes and sketch the complications that are accompanied by related interventions, and that eventually, have led to the final design and recommendations of the project.

Bibliography

Consultant meetings

BOL, P. & SÖDERHELM, C.M. 4 September 2013. *RE: Meeting with Stadsdienst Rotterdam on project within Rotterdam South.* Rotterdam.

FERRING, M. 5 June 2013. *RE: Interview, colour and gentrification in Årsta.*

LEGEBY, A. 30 May 2013. *RE: Meeting influence of urban form on social segregation.* Stockholm.

LUNE, T. VAN DE 5 July 2013. *RE: Meeting with Movares architect of railway stations, to discuss the railway station project.* Delft.

MEUWESE, L. 3 March 2012. *Excursion Transvaal.* Den Haag: Gemeente Den Haag.

RÖHLCKE, N. 30 May 2013. *RE: Meeting Kulturhuset Stockholm.* Stockholm.

WESTRIK, J. 23 February 2012. *RE: Consult meeting Rotterdam South.* Delft.

Literature

ANDERSON-OLIVER, M. 2013. *Cities for People: Jan Gehl* [Online]. Melbourne, Assemble Papers. Available: assemblepapers.com.au [Accessed 18 September 2013].

BACH, B., HOEVEN, F. VAN DER & TU DELFT FACULTEIT DER BOUWKUNDE 2000. *Stedebouwkundig ontwerpen en mobiliteit 2000+ samenhang tussen ontwerpaspecten stedenbouw en het urbanisatie-patroon, vervoer, infrastructuur en verkeer*; dictaat behorende bij Blok Stad, Delft, TU Delft.

BALZ, V. 2008. *Netwerken in zuidelijk Holland 1000 dagen Atelier Zuidvleugel*, Den Haag, Provincie Zuid-Holland.

BENTHEM, J., MEER, E. VAN DER, RUTTE, P., VEEN, J. VAN, VELZEN, K. VAN & VERHEES, F. 2011. Station Centraal. *Symposium Station Centraal.* TU Delft, Delft.

BERTOLINI, L. 1999. Spatial Development Patterns and Public Transport: The Application of an Analytical Model in the Netherlands. *Planning Practice & Research,* Volume 14-2, 199–210.

BERTOLINI, L. & DIJST, M. 2003. Mobility Environments and Network Cities. *Journal of Urban Design,* Volume 8, 27–43.

BERTOLINI, L. & SPIT, T. 1998. *Cities on rails: the redevelopment of railway station areas,* London, Spon.

BIJL, R. VAN DER & HENDRIKS, M. 2010. *Station Centraal: Over het samenbinden van station en stad,* Rotterdam, Uitgeverij 010.

BOOMEN, T. VAN DEN & VENHOEVEN, T. 2012. *De mobiele stad; over de wisselwerking van stad, spoor en snelweg,* Rotterdam, nai010 uitgevers.

BORSOOK, P. 1986. Hybrid Buildings review. *Architectural Record,* July 1986, 79.

BROUWER, I. 2010. *Fixing the link.* NS Poort.

BRUINSMA, F., PELS, E., PRIEMUS, H., RIETVELD, P., WEE, B. (Eds.) 2008. *Railway Development: Impacts on urban dynamics*, Heidelberg, Physica-Verlag HD.

BUITENKAMP, R. & POTMAN, L. 2005. *Holstohus Olst: gebouw vol inspiratie.*

BUREAU SPOORBOUWMEESTER 2011. *Het Stationsconcept.* NS, Prorail & Bureau Spoorbouwmeester. Available: www.bureau-spoorbouwmeester.nl [Accessed 9 March 2013].

CHORUS, P.R.W.E. 2012. *Station area developments in Tokyo and what the Randstad can learn from it,* Amsterdam, UvA-DARE.

CURTIS, C., RENNE, J. L. & BERTOLINI, L. 2009. *Transit oriented development making it happen*, Farnham, Ashgate.

DOWNIE JR., L. 1972. *The Urban Order of the North* [Online]. New York, The Post & the Alicia Patterson Fund. Available: aliciapatterson.org/stories/urban-order-north [Accessed 15 September 2013].

EDWARDS, B. 1997. *The modern station: new approaches to railway architecture*, London, Spon.

EKKERS, P. 2006. *Van volkshuisvesting naar woonbeleid*, Den Haag, Sdu Uitgevers.

FARRINGTON, J. & FARRINGTON, C. 2005. Rural accessibility, social inclusion and social justice towards conceptualisation. *Journal of Transport Geography*, Volume 13, 1-12.

FENTON, J. 1985. *Hyrbid Buidlings,* Pamphlet architecture 11, Princeton Architectural Press.

FERRARINI, A. 2005. *Railway stations from the Gare de l'est to Penn station,* Milano, Electa.

FERRING, M. 2006. *Dionysos på Årsta torg: färgfrågan i svensk efterkrigsarkitektur*, Stockholm, Arkitekturskolan.

FORTUIN, K. & ZEEUW, J.W. DE 2003. *Een stad maakt een brug, de brug maakt de stad,* Verweij-Jonker Instituut & ECORYS.

FRENANDER, A. 2001. Svensk kulturpolitik under 1900-talet, *TijdSchrift voor Skandinavistiek*, Volume 22, nr. 1, 63-88.

GEHL, J. 2010. *Cities for people*, Washington/Covelo/London, Island Press.

GOUDAPPEL COFFENG 2010. *Modelanalyse OV op Zuid: Eindresultaten berekeningen maatregelpakketten.* Rotterdam Vooruit.

GRAFE, C. 2010. *People's Palaces: Architecture, culture and democracy in two European post-war cultural centres,* Amsterdam, Heritage consultants.

GRAHAM, S. & MARVIN, S. 2001. *Splintering urbanism networked infrastructures, technological mobilities and the urban condition*, London, Routledge.

GUERRA, E. & CERVERO, R. 2013. Is a Half-Mile Circle the Right Standard for TODs? *Access* #42, 17-21.
HAGERS, W. 2012. Activating medium-sized station areas in the Randstad. *In:* ROOIJ, R. M. & FERNÁNDEZ MALDONADO, A. M. (eds.) *9th Graduation Lab Urbanism Conference.* Delft.
HAGERS, W. 2012. *De groei van het station: Een vergelijking tussen de ontwikkeling van Engelse en Nederlandse spoorwegstations aan de hand van twee voorbeelden*, TU Delft.
HALL, P. 2008. *Urban and regional planning*, London, Taylor and Francis.
HARVEY, D. 1973. *Social justice and the city*, Athens, Georgia, The University of Georgia Press.
JACOBS, J. 1961. *The dead and life of great American cities*, New York/Toronto, Random House.
JÄRHULT, R. 2007. *Historik: Brandstationsockupationen 1982* [Online]. Available: www.kulturhusetjonkoping.com [Accessed 16 September 2013].
KEI (PLATFORM 31) 2011. *Van sanering naar stadsvernieuwing* [Online]. Rotterdam: KEI kenniscentrum stedelijke vernieuwing. Available: www.kei-centrum.nl [Accessed 20 December 2011].
KNOWLES, R., SHAW, J. & DOCHERTY, I. 2008. *Transport geographies mobilities, flows and spaces*, Oxford, Blackwell.
LEGEBY, A. 2010. From Housing Segregation to Integration in Public Space. *The Journal of Space Syntax,* Volume 1, Issue 1, 92-107.
LEGEBY, A. & MARCUS, L. 2011. Does the Urban Structure of Swedish Cities Inhibit the Sharing of Public Space? *Built Environment,* Volume 37, No 2, 155-169.
LÖFGREN, H. 2004. *De första trettio åren,* Stockholm, Kulturförvaltningen.
MFA-KAART 2013. *MFA kaart* [Online]. De Wijkplaats. http://www.mfakaart.nl [accessed: 26 August 2013]
NES, R. VAN 2002. *Design of multimodal transport networks a hierarchical approach* [Online]. Delft, DUP Science.
PEKELSMA, S. 2009. *"In Zweedse achterstandswijken zie je de problemen niet aan de voorkant."* [Online]. Platform 31 (Nicis Institute). Available: nicis.platform31.nl [Accessed 9 September 2011].
PRIEMUS, H., KONINGS, R., TU DELFT ONDERZOEKSINSTITUUT OTB & TRAIL ONDERZOEKSCHOOL 1999. *Stadsgewestelijk openbaar vervoer sleutel tot de stedelijke vitaliteit,* Delft, Delft University Press.
PRORAIL 2010. *Richtlijn: Ontwerp-, beheerrichtlijnen en afkeurnormen,* voor de transferfunctionaliteit van treinstations in Nederland. Document number: RLN00286.
RAPPORTAGE VEILIGHEIDSINDEX 2012. *Veiligheidsindex 2012: Meting van de veiligheid in Rotterdam*, Gemeente Rotterdam. Available: www.v-index.nl [Accessed 12 September 2013].
ROSS, J. 2000. *Railway stations planning, design and management,* Oxford, Architectural Press.
SANDERS, W., REE, P. VAN DER & HOLLAND RAILCONSULT UTRECHT 1999. *Spoorlandschap een gids voor treinreizigers*, Bussum, Thoth.
SPIT, T. & ZOETE, P. 2009. *Ruimtelijke ordening in Nederland; Een wetenschappelijke introductie in het vakgebied,* Den Haag Sdu Uitgevers bv, Den Haag.
STOCKHOLMSKÄLLAN 1965. *Nu bygger vi ut tunnelbanan,* Stockholms Arkiv, Object:119:1D:293, Generalplaneberedningens tunnelbanekommitté i Stockholm. Available: www.stockholmskallan.se [Accessed 13 September 2013].
SKÖVDE KOMMUN 2013. *Skövde kulturhus.* Available: www.skovde.se/Kultur/Kulturhus/ [Accessed 7 June 2013].
TAMIMI ARAB, P. 2013. *Hoe de Essalam Moskee jongeren steunt* [Online]. Rotterdam, Vers Beton. Available: versbeton.nl [Accessed 19 August 2013].
TEMPELMAN, O. 2011. Oever waar je snel weg wilt. *Volkskrant*, 1 October.

Wouter
HAGERS

THESIS

TUTORS:

IR. L.P.J. VAN DEN BURG
DR. IR. F.D. VAN DER HOEVEN
IR. W.W.L.M. WILMS FLOET
IR. H. MIHL
DR. IR. A. STRAUB