|RE|INFRASTRUCTURED

URBAN REGENERATION BY INTEGRATING INFRASTRUCTURAL RESIDUAL SPACE
Thesis
|Re|Infrastructured
Urban regeneration by restructuring residue space of Rotterdam
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Infrastructural residual space; Urban Regeneration; Rotterdam; Integration;
"...ONE PERSON’S INFRASTRUCTURE IS ANOTHER’S DIFFICULTY...” Graham and Marvin 2001, p.11
This report functions as my master thesis. By this I hope to graduate as an urban designer and planner within the Studio Urban Regeneration of the Delft University of Technology. The thesis regards the infrastructural residual space, a space residual to infrastructural development, of the A20 and the Rotterdam railroads. The development of the area, located within social economic weak districts, hold possibilities to regenerate its adjacent neighbourhoods. The goal of this thesis is to find spatial strategies and design interventions that treat the development integrated within the city of Rotterdam.

Within this (underappreciated) section, I wish to thank the many people that supported, motivated and inspired me during this project. Most present are my mentors: ir. J. A. Westrik (John), showing me that urban design is not just about solving problems but about holding ambitions and big visions. Dr. ir. P. L. M. Stouten (Paul), helping me realize that the theory of urban design is more than just words. And ir. M. van Ruiven (Mattijs), who gave me insight in the practise of urban design, relating the value of a good idea. Second I wish to thank my friends and family who gave me the social support during a project that asked a lot of me. And finally I wish to give a special thanks to my fellow students graduating within the studio, making the long working days fun to participate.

Rotterdam, June 2012
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CHAPTER 1

“Most forms of writing require some form of introduction. Commonly, the introduction consists of one introductory paragraph. In longer works or for complex topics, the introduction might be several paragraphs or even longer”

http://www.whitesmoke.com

1.1 Introduction

This chapter functions as the introduction to my graduation project. The course of this project is based upon an academic framework dealing with a proper understanding and underpinning of the problem, sequential research questions and a clear methodology.

Fascination

In the report “Prachtig compact NL” (Beautiful compact Holland) (Werkgroep Binnenstedelijk Bouwen, 2010) spatial advisers of Nirov, the chief government architect (Rijksbouwmeester) and planners investigate the opportunities, the urgency, threats and advantages of intensifying urban areas. It motivates urban compaction by the relative low transport-related energy consumption in places of high urban density. In this report a special interest is depicted, that focuses on urban compactness in relation to infrastructure. One of the four opportunities (places) the report depicts for further densification within the city borders are the un(der)used strips of lands near infrastructure. The report states that high urban compactness near big scale infrastructures should not only be plausible, but should get a higher priority in planning policies. Before, these plots where often ignored and seen as unusable and deteriorated residual spaces. But, with the condition that the physical problems (such as noise, not legally but physically) is well resolved there are great opportunities. Local governments already have been looking for possibilities of intensifying their urban areas near infrastructure (Heijns, 2005). In studies like “Verborgen ruimtes in Amsterdam” (Hidden spaces in Amsterdam) and “Handreiking optimalisering grondgebruik” (Guide optimization land use) areas are investigated near railroads and highways that, social or economic, contribute little to its surrounding context. Within these studies the focus of restructuring these areas seems disconnected from the city that surrounds it.

Motivation

Throughout the last 7,000 years of urban history, infrastructural connections have been inextricably interwoven with the life of the city (Soja, 2000 in Graham and Marvin, 2001). But development in the last century changed this (Graham and Marvin, 2001), advances like:
- The intensity, power, speed and reach of the connection;
- The pervasiveness of reliance on urban life based on material and technological networks and motilities they support
- The scale of technologically mediated urban life;
- The duplicating, extending variety and density of networks infrastructures;
- The speed of sophistication of more powerful and advanced infrastructure.

These developments tend to be supported by the face of globalization and the growth of transnational thinking. In many cases major urban monopolies are gradually being opened up towards a sector of private interest groups competitively driven by profit. The result is that the sector of infrastructure is now one of the most important sector regarding international flows of finance, capital, technology and expertise. This resulted in the construction of customized and highly capable infrastructural networks for highly valued spaces, neglecting the remaining portions of national or urban territories (ibid.) Which one can see in the construction implemented in harbours, because of their high economic value for a city or even a country, the planning of its infrastructure has been given priority over a residential neighbourhood. Meyer (1999) described this as a conflict in urban planning between environments with different scale. Regional infrastructure versus local oriented neighbourhood. Van de Hoeven (2001, cited in Heijns, 2005) noted that infrastructure given for these high value spaces have few intersections with the local oriented infrastructure and these infrastructures have a low frequency of overpasses or underpasses. Even when there are, the traversing roads are often designed with relative high and steep altitudes and often form a socially unsafe experience, creating an uncomfortable experience for road users like cyclist and pedestrians (Van der Hoeven, 2001).

In the Netherlands during the decades after the Second World War (mainly sixties), compartmentalizing (tunnelvisie) within the worlds of infrastructure placement and urban design, created big scale infrastructure which lay isolated within the city and in the landscape (Meyer, 1998). This initially by technical and practical reasons, but the thinking of the modernistic movement helped visualizing the infrastructure as an autonomic technical system within the city. The placement and design was initially not seen as a task for urban designers but was left to civil technical divisions within the government (ibid.). Through the conflict by planning environments/intensity belonging to different scale levels, spaces are created which were left out of the planning or design (Meyer, 1999). Within this graduation thesis these spaces are referred as Infrastructural residual space, left over space from the development of infrastructure.
Problem field: Infrastructural residual space
Infrastructural residual spaces emerge as a second nature of great urban development where spatial configurations such as railways, highways, ports, canals, informational networks and state institutions were given - by definition given- priority over other developments within their context to enable an optimized circulation of capital (Graham and Marvin, 2001). By these (prioritized) spatial configurations, or more precisely the design of them, the spaces function disconnected from the surrounding urban fabric (Trancik, 1986). These spaces, where the overall continuity seems to be disrupted are embedded within every city (Loukaitou-Sideris, 1996). And however scholars like Graham and Marvin, Trancik and Loukaitou-Sideris motivate these spaces by its infrastructure, they omit the contribution of the political urban planning culture. During innovation of the last century these systems have evolved into "highly complex and vulnerable technology: noise, air pollution, and traffic sprawl affect rich and poor alike, even if not to the same extent" (Sieverts, 2003, 151). By its complexity the community opinion is left out, at best, to be collected as raw data for expert analysis (Andrew, 2011). Infrastructure was suddenly no longer seen as an integral facet of the urban area, but as a threat. The highway and the bridge were now a symbol of nuisance, noise and smell and were in the grip of "negative planning". Infrastructure was suddenly no longer seen as an integral part of the urban area, but as a threat. The highway and the bridge were now a symbol of nuisance, noise and smell and were in the grip of "negative planning". Infrastructure has not been "underused spaces to vital, attractive well connected urban spaces" (Andrew, 2011) describes research findings concerning connectivity and social-economic fragmentation within cities by infrastructure. In the article Connectivity and Vulnerability: Gender and Local Politics of Infrastructure, Andrew (2011) describes the vulnerability of immigrant women in poorly connected (residential) areas (by prioritized physical infrastructure). The author motivates that these spaces are disconnected from the social infrastructure. This infrastructure is needed to function at a group level, the interactive aspect of organisation or society, as it resides in symbolism and interactions, not in individuals or things. It is therefore less tangible and thus more difficult to measure than physical infrastructure (Flora and Flora 1993). These spaces present often formidable obstacles for social gathering, local and extra-local mobility, circulation of information and the distribution of resources (Boudreau & Burke-Wood, 2011). As a result, the level of involvement of the (direct) community regarding the area is relative low compared to other areas. Mainly dealing with positive development, urban planners, designers and policy makers (often) neglect these areas and focus on areas where development / improvement is generally recognized (Vanstiphout, 2002). As a result, in a market driven urbanisation and the difficult regulations regarding traffic pollution, these area fall "victim" to small scale development controlled by private initiatives without a comprehensive plan (Heijns, 2005).

Relevance
The relevance of this project can be divided in a societal and in an academic aspect. The societal aspect has two sides. During the last century cities and its infrastructure has grown more and more closer to each other and the growth has become more intense. Where at the beginning of the 19th century only 19% of the world inhabitants lived in cities, now 70-80% of the European and North American population lives in cities (UN-Habitat 2006). And accordingly to the World Resources Institute (1996) this ratio will increase in 2020 to 89%. Another the other side our urban functions (e.g. living, working, shopping) within our society are becoming dynamic through the city, we work in one part of the city, have our recreation in another and sleep in a third (Hamers, 2011). For an attractive urban environment, spaces between these city parts need to be well designed and connected elements. These open undefined, underused residual spaces which are already located adjacent to spatial barriers (infrastructure and industrial sites) could strengthen the city fragmentation, where linkage of neighbourhoods between each other and between urban qualities can play a vital role for social benefits (Vrom 2009; NeT-TOPIC 2009). This thesis gives an insight in possible means in counteracting this fragmentation. On an academic level the research of open underused spaces within the fabric of Dutch and Belgian cities is theoretically weak (Groth and Corijн, 2005). This is very strange in a country where the spatial policies have been characterized by urban compaction, intensification and infill for many years (Heijns, 2005). This thesis contributes in two ways to this matter. Firstly, this thesis gives in insight in the development that creates these open and underused spaces within cities. Secondly it will give spatial conditions that can transform open underused spaces to vital, attractive well connected urban environments.
1.2 Motivating the location

Rotterdam

After the Second World War global restructuring processes upon the Randstad differed from city to city: Amsterdam developed towards financial sector; Utrecht more a service-oriented economy and Schiphol together with the harbour of Rotterdam developed more for logistical reasons (Stouten, 2010). By this, the harbour and its continuous growth have played a dominant role in the reconstruction of Rotterdam. To feed the logistic needs of the continuous growing harbour, infrastructure was given priority over other development (Meyer, 1999). During the seventies these infrastructures were already perceived as a threat and the wrapping already started (Vanstiphout, 2002). Today, Rotterdam is struggling with the image of a city which has a poor living environment. By mainly the internationalization of economic processes, cities search for competitiveness and a consequent emphasis on local economic development (Strange, 1997). Rotterdam is facing this by two focuses, creating attractiveness living environments and strengthens the economic position (Rotterdam, 2007)

Vreelust-Blijdorp area

The Vreelust-Blijdorp area (fig.1.01) is an infrastructural residual space by two big scale infrastructures: the railways between Schiedam, Rotterdam Central and Rotterdam Alexander and the Highway A13. The area holds a great amount of diverse functions. However by design or by substantial these functions do not directly contribute to the adjacent parts of the city. As Vanstiphout (2002) noted that the gross of these functions near big scale infrastructures (highways) support the bypassing car-user and not to the local inhabitants of the city. During the years before the war city architects, like Witteveen and Van den Broek were intensely involved in making plans for the area. However by the priority placement of the train tracks, which was not in the design, the plans were not fully build (Vanstiphout, 2005). And during the years, little by little, the area was filled up by small development, with the final bit the new entrance of the Zoo's.
1.3 Problem statement

New national and international, economic and social forces have played an important role in the shaping of the characteristics of contemporary cities (Baum, 2006). The combination of these forces: the transformation of the welfare state; the changes in the economic structure (e.g. division of labour) and the changes in demographic structures gives the concern for segregation and social exclusion (ibid.). Making the individual more disadvantaged while others more advantaged, resulting in unequal access to resources and life chances. Within the past and especially in the present the public space within cities have hold the possibilities to counter social exclusion and segregation, making the urban environment vital, attractive and open for social interaction (Carr, 1992; Németh, 2011).

However,
As a result of irregular development between urban expansion and infrastructure we find open spaces without clear (social) meaning or function along the embankments and ramps of big scale infrastructures near residential neighbourhoods (Loukaitou-Sideris, 1996; Trancik, 1986; Frijters et al, 2004; Kilicaslan, 2006; Meyer, 1996). Through insensitive situating of arteries, bridges, highway ramps and strips the developed neighbourhoods function fragmented within the city (Winterbottom, 2000). These open spaces, disconnected from the urban fabric, work as gaps within the city, especially near infrastructure (Trancik, 1986). By the poor spatial organisation of space or the social control of space, social exclusion can occur in inner or peripheral urban areas (Madaniour, 2001).

And,
Rotterdam and its development are characterized by large scale infrastructures, like highways, railroads and airport. This as an effect of its continuously growing harbour (Meyer, 1999). Meyer (1999) noted the difficulties (from an urban planning perspective) in situating these infrastructures with respect to urban settlements. These large scale infrastructures are seen as a paradox: a source of inconvenience, barriers within the framework of the city but the city cannot operate without them.

But,
Because these spaces hold a nature which is spatially and programmatically disconnected from the urban fabric, it can be argued that these spaces should not be seen as unwanted side-effects of urban expansion but as parts in the city waiting for possible future developments (Loukaitou-Sideris, 1996; Frijters, et al., 2004). These open spaces hold good possibilities for urban regeneration, improving the quality of life by urban design (Trancik, 1986).
1.4 Goals and research questions

Main objective
The goal of this thesis is to develop design interventions and spatial strategies that will integrate the infrastructural residual space of Vreelust-Blijdorp within the urban fabric of Rotterdam (by improving its vitality, connectivity and attractiveness). Where this integration can offer urban regeneration, by linking economic and social benefits of the development for residents in adjacent areas. This will contain: an urban design (master plan) regarding the Vreelust-Blijdorp area and urban pre-conditions for developing this area to vital, attractive and well connected area. By developing these, a perspective is formed for future (inner urban) transformations in relation with big scale infrastructure, that can contribute to the development of the policies concerning with urban compactness. The main research question of this thesis is:

“What spatial strategy and urban design intervention offer urban regeneration by the integration of the Vreelust-Blijdorp area within Rotterdam?”

Further Objectives
Lefebvre argues that within history space has been shaped to that meets its intertwined requirements for economic and social production (Lefebvre, 1991). While these spaces exist within cities, they differ from the fact that they were not fundamentally or intrinsically developed by and for people or for social reasons, but are the residual of modern city life, especially in high-density metropolitan cities that typically display qualities like rapid urbanization, large scale, internal migration, globalization, social polarization, etc (Marker, 2006). And although the search for residual-free development appears to be natural in this context, this thesis disputes it. This because two notions, the first by Berger (2006) motivating that by the complexity and diverse demands within a contemporary city growth always goes together with some manifestation of residually. The second envisions the city as an organic manifestation, were a fit that is to precise takes away its chance to evolve and makes a city to predictable (Montgomery, 1998).

As a result that improvement by the generic spatial conditions cannot be (properly) implemented without looking at the area; this thesis gives an analysis regarding the urban qualities and activities of the Vreelust-Blijdorp area. This also includes an analysis of the area by the spatial conditions regarding vitality, attractiveness and connectivity. Sub research question two:

“Referring to attractiveness, connectivity and vitality: what urban qualities and activities regarding the Vreelust-Blijdorp area can aid integration within Rotterdam?”

And finally this thesis will give a possible implementation of both theories and analysis into the Vreelust-Blijdorp area. Were the spatial conditions are translated into design starting points, motivating both improvement (vital, attractive and well connected) of the area well as urban regeneration of the adjacent areas. The fourth and final sub research question is:

“How can the spatial condition be translated into a design for the Vreelust-Blijdorp area?”

One of the main goals in this thesis is set at creating spatial strategies and urban design interventions that will integrate an urban area by improving the vitality, attractiveness and connectivity. In order to grasp these themes useable in urban design and strategies, an overview is given on spatial conditions that describe the themes. To find ways for integrating the Vreelust-Blijdorp area, a selection is made for spatial conditions on a supra-local (neighbourhood) scale. Beside finding spatial strategies and design intervention this thesis uses the spatial conditions in the analysis regarding the Vreelust-Blijdorp area. By this a general image is sketched on the infrastructural residual space. The first sub-research question is:

“What spatial conditions stimulate integration within the urban fabric by improving vitality, attractiveness and connectivity?”
1.5 Methodology

This thesis is divided within four main topics: theoretical framework, analysis, design and evaluation. Within the first three topics I will discuss the three sub-research questions and in the final topic the main research question will be answered, by dealing with the answers abstracted by the sub-research questions.

Sub-research question 1
The first research question (“Which spatial conditions motivate integration within the urban fabric by improving vitality, attractiveness and connectivity?”) requires a literature underpinning. Within academic literature, spatial conditions are abstracted from urban design theories regarding a “sense of place”. These theories promote the integration of space within the city life which they depict by vital, attractive and well connected. These conditions include a trichotomy of the activity, form and image of a city and its city life.


Sub-research question 2
The second research question (“Referring to attractiveness, connectivity and vitality: what urban qualities and activities regarding the Vreelust-Blijdorp area can aid integration within Rotterdam?”) distinct itself from the previous one, as for this a spatial analysis is given. This spatial analysis is made on topics regarding previous, current and future (spatial) development regarding the Vreelust-Blijdorp area. Within the analysis themes are discussed like: historical development, the (semi-)metropolitan position, social/economic position, green structures, city structure and adjacent neighbourhood’s structures.

Sub-research question 3
The end of the thesis, both literature and analysis from previously discussed sub-research question are used to answer the fourth research question. (“How can the spatial condition be translated into a design for the Vreelust-Blijdorp area?”). The question will be answered by research by design; this implies a constant ongoing plan-cycle. Four steps are constantly cycled through: analysis, design, evaluation and strategy. By previous done research can fuel a rough design, by evaluating this, a preliminary strategy can be formed which requires new analysis. By this the next round can begin. This will be done by a constant positioning, planning, sketching, analysing and a constant evaluation look, goals and research can be respected throughout the process.

The structure of this thesis
As a result of the research questions, a line up of the coming four chapters can be depicted. Keeping aside the first chapter, the introduction, the second chapter refers to the theoretical framework regarding the first sub-research questions. Dealing with a literature research a sum-up is formed dealing with spatial conditions for vital, attractive and well connected places. Within the third chapter the theoretical development, (represented in chapter 2) is tested by spatial analysis against development in Rotterdam and the Vreelust-Blijdorp area. In the fourth chapter identifies itself as the design chapter of in this graduation project, condition will be transformed to a design, ending a general master plan and reference as zoom- ins of specific areas. Figure 1.02 shows the structure of this study.
Main research question
What spatial strategy and urban design intervention offer urban regeneration for the integration of the Vreelust-Blijdorp area within Rotterdam?

**SUB RESEARCH QUESTIONS**

**THEORY**

Sub-research question
"Which spatial conditions motivate integration within the urban fabric by improving vitality, attractiveness and connectivity?"

Method: Literature study

**ANALYSIS**

Sub-research question
"Refering to attractiveness, connectivity and vitality: what urban qualities and activities regarding the Vreelust-Blijdorp area can aid integration within Rotterdam?"

Method: Spatial analysis

**DESIGN**

Sub-research question
"How can the spatial condition be translated into a design for the Vreelust-Blijdorp area?"

Method: Research by design

**END PRODUCTS**

**THESES**

Theoretical Framework
- List of social/economic
- Spatial condition for urban vitality, connectivity and attractiveness.

**ANALYSIS**

- History,
- Position
- Adjacent structures
- Green structures
- City structures

**DESIGN**

Spatial strategy
Design (Masterplan)

**EVALUATION**

Urban Preconditions for urban regeneration in infrastructural residual space

FIG. 1.02 | METHODOLOGY SCHEME
Source: Author
THEORETICAL FRAMEWORK
CHAPTER 2

“Fundamentally, using the details from your collected current literature, you write about the thoughts and suggestions that already exist and either back up or refute your thesis. … didn’t your professor give you a book? “

ziz
http://www.bagoor.org/

2.1 Introduction

In order to understand the meaning of Urban Regeneration at the current day, this chapter will give an overview of academic literature describing the development of it. This will mainly focus on the post (second) war period, as the war started rapid changes in the way we build. Also this chapter will give an overview of academic literature that describes conditions regarding vital, attractive and well-connected urban areas. By this the means are given to research and design infrastructural residual spaces.

2.2 Urban regeneration

Through the world history, from the earliest settlement to the modern world metropolis, urban regeneration has been an enduring theme in its development (Barnett, 1986). After the Second World War many central cities in advanced industrial nations - mainly European cities - where dealing with war-destruction, economic decline, environmental destruction and social abandonment, this gave emphasis on urban regeneration (Li, 2003). Urban regeneration after the Second World War can roughly be divided into three stages. From the fifties to the seventies it was mainly characterized by solving physical problems: roads, housing, and water protection. It included more financing and rules supplied by the national government, and program implementation by state or municipal government (Gale, 1984). Planners and politicians thought by physical renovation to solve flaws in social urban life. Moreover, they sought ways to unite the diverse elements or problems of the city behind a program of physical defaults, discarding social and political division with a rhetoric promise of a better future. But over the year's residents recognized the dismal and disruptive consequences of these governmental renewal programs. And these well-mean plans to update the central cities failed to produce the expected results. From the seventies to the nineties it was characterized by the combination of physical renovation and human rehabilitation. As a result of the previous stage many believed that alone urban reconstruction was not the answer. New programs for human renewal where added. With this stage, the focus was laid more on the people living in the cities rather than the problems of physical decay, decay in environments or the relationship between economic regeneration and social/physical rehabilitation (Rosenthal, 1980 cited in Li, 2003). Although these urban renewal policies modernized the physical structure and environmental problems, the concerning social and economic problems persisted (Stouten and Hulsbergen, 2001). At the start of the nineties, local authorities recognized that in previous stages, they were not primary in reaching the goal of urban renewal. A moving focus of urban revitalisation was detected, changing from areas of industrial production to areas of leisure and consumption. The concept of urban regeneration is now not just a problem of physical or environmental decay or the social side effects of economic regeneration (ibid). A shift in focus was detected. By urban regeneration we should meet the social objectives of people by improving their quality in life and enhancing the image of the city (Mir, 1986). Characterization of the 'success' or 'failure' of places plays a central role in shaping the patterns of future rounds of investment and disinvestment, thereby perpetuating and exacerbating existing inequalities (Massey, 1995).

Density

Compared to other countries post war urban regeneration in the Netherlands has more been characterized by its population density. Even today, apart from the city-state of Hong Kong, the Netherlands is one of the most densely populated and urbanised countries in the world. In the early 1960's expectation was that around the year 2000 the population would reach 20 million people, compared to the 12 million at that time. With the existing house shortage, as a result of the war in mind, this became the highest priority within Dutch policies (Faludi, 2002). Additionally between the 1960's and 1970's the mentality of the Dutch, which have been family centred with strict habits, began to embrace a more liberal lifestyle. Young people leaving their parental household early and laying claim to an own independent house. Also an increase in the number of divorcees was detected. Even through today these trends fuel the housing need in the Netherlands. Looking at the Dutch housing need and the estimated density of development yet to come, the Dutch government reflected on what to do in the future, keeping in mind the preserving of the landscape and preventing slumps. The first Dutch response to this was to impose effective limits to the growth of rural settlements within commuting distance of major population centres (New town). By a lot of funding, within 20 years 500.000 people moved towards these areas, preventing an invasion of the landscape. But also at the same time a multibillion government program was started for the renovation of degraded living quarters in the old cities. Although it was not until the mid 80's that a focus was laid upon the sense of densifying within the city, compact city. The underlying idea is to intensify the use of land within existing settlements. A motion for redevelopment of urban wasteland and concentrate development on agricultural land adjacent to the old built-up areas is shown (Van der Valk, 2002). Compact city was used in the fourth spatial planning policies, dealing with the spatial (quality within cities) and economic strength of the Netherlands. At the 1990 alarming environmental problems caused a clear and careful thinking, what spatial development is/can contribute to reduce the environmental impact. The most important relationship was research in reducing travel demand, mainly looking inside the city for areas to developed and secondly on the edges of them, also known these days as Vinex. With urban expansion had to be worked from the outset to good public transport.

Developed over more than 50 years the Dutch planning has evolved a special relationship with its density and the additional housing needs within/around cities to prevent invasion of its landscape. And although the focus on the densifying within the city is fairly late, it is giving a strong support for dealing urban regeneration, which focuses strengthening within a city.
Infrastructure after the Second World War

On a national level, post war infrastructural development in the Netherlands focussed mainly on the national road network. With the exception of the flevopolder the Dutch railroad network (as known today) was greatly completed before 1920 (www.spoorweggeschiedenis.nl, n.d.). After the 1920 its development greatly consisted out of the transformation from coal to electric supported train tracks.

Before the Second World War, the Dutch government completed a small part of the national road plan, formed in 1927 (fig. 2.01). These roads, consisted out of concrete slabs and bricks, where: RW 12 (The Hague to Utrecht), RW 13 (The Hague to Rotterdam) and RW 4 (from The Hague to Sassenheim). By the war damage and the reconstruction of the country the government was forced to prioritize within the budget of the national expenses. And after 1953 a great amount of the national budget went to the Delta projects. By this the design of national roads during the sixties was to fit a specific goal: the completion of an efficient and safe road network that will benefit the economic and motivate car mobility (RWS, n.d.). It was with the new law "wet uitkering wegen"(road allowance law) in 1966 that road taxes and government contribution provided a recognizable income in the national road fund. This accelerated the construction national roads greatly. At this time technology provided the means to create suspensions and tunnelling of the highways. The ring road of Rotterdam is an example of a project with many height differences. This project consist out of Brienenoordbrug (1965) the Benelux tunnel (1967), Giessenbrug (1970) and a Fly-over through the Spaanse Polder of more than 1 kilometre. By this they hoped to strengthen the flow through of passing traffic.

Not just by the financing but also by the standardized production road construction reached a high tempo. In a short time the national road network expanded from just 500 km in 1960 and 2000 km in 1980, today it is counted at 2500 km (Rws.nl, n.d.).

During the seventies, a concern for environment created a strong protest movement against new road projects. Together with a government looking in cutting back its expenses, many projects (like the A3 and the A11) were cancelled. Other projects were completed, many years behind its original planning, with compensation of eco bridges. Within this movement a concern for the residential environment emerged. In 1979 the first law was made protecting local residents for the car noise. As a reaction to the protesting, participation of concerning parties got a structured place within the planning of roads.

Also within this time period another infrastructural development shaped the city how we live: the metro. By its high velocity and reliability its implementation is perfect for fast growing cities. In 1968 was Rotterdam the first city in the Netherlands to implement this. Its current (public) transportation system was not able to coop between the north and south during rush-hours. The first metro was constructed between central station and Zuidplein. By the need for space and intense shipping route the north part was constructed underground and underwater. However to save building cost and time, the south was completed as elevated (Dekker, 1966). An uprising in 1974 in Amsterdam changed the planning culture. Residents fought the coming of an underground metro which required a lot of housing-demolishment for it construction. This together with the oil crises in the seventies motivated that the greater part of the Rotterdam metro network is completed above ground. Today Rotterdam holds 47 metro stations above ground and only 16 stations underground.
Urban Regeneration in the Netherlands

Within the period from the war and the end of the 1960, the focus was laid upon the restructuring of the Dutch city centres. Improving the car accessibility, too and from its city centres, by traffic corridors also declaring existing housing stock redundant in order to implement offices, shops, roads and luxury housing (Stouten, 2010). Other old houses which couldn’t play a beneficial role in the improvement of the urban centres were left outside of this renewal. As the result of the rebuilding ambition and the relatively low income until 1954, investments in a consumption-based housing market were hard to find. Social housing took an important share within the market and the expenditure of the government.

In the 1960’s in the Netherlands and other countries in the west of Europe two trends were experienced: a combination of standardized quality and an increase in housing production. With an enormous increase in building costs and the need for rapid production, an industrialisation was set in motion within the Dutch housing production. Housing problems within older parts of the city were taken care with by demolishment. Demolishment was only sporadically followed by new construction (Van der Schaar et al, 1996). Inhabitants from demolished areas ended up in new urban extensions, existing parts of the city or a next area waiting to be demolished. Within this concept little or none concern was given to the inhabitants. And which little concern given to them, only dealt with the motion to get the inhabitants as quickly out of the area as possible. Besides other financial arrangements regarding “clearance area” (saneringswijk) and improvement of the urban environment, the national government compensated for 80% of the acquisition costs at in municipal reconstruction and clearing plans (ibid).

At the beginning of the 1970s the mindset of the Dutch changed. Critic was expressed to the industrialisation of housing production which neglected the value of the existing city. Also suburbanization and the rapid growth of companies had created gaps within the inner cities (life). Motivating even more people to leave the city, who were replaced by immigrant workers. A concept, called urban renewal, motivated intervention on a small scale, with the priority not for the economic environment but for the residential environment and with the least contamination with the existing social and urban structure (Vermeijden, 1996). Social or economic weak resident (income or political power) now played the main role in new plans for urban transformation.

Van der Werf (1997) describes this as follows:

The demands of the residents from this early period are summarized in the slogan “Building for the neighbourhood” and “Control in our own neighbourhood.” These new homes or improvements for the present residents, to maximize social opportunities for appreciation of the neighbourhood and society to control for the residents. Leading concepts: innovation, choice, social development, grassroots democracy and equal opportunities”. (Translated from Dutch)

By this the focus within urban development policies changed towards the residential environment. The main goal is to solve the great inequalities of decaying pre-war residential areas by improving the existing housing stock and not by demolishment. Residents were now involved during the process of development. Urban renewal was placed in a social context, in which the new building had to connect to the existing buildings, social structures and respected the residing residents. In order to motivate that present residents keep living in the same area, funding was linked to rehabilitated buildings or new building placed on demolished ones (in individual rent subsidy and object subsidies for new construction). Van der Schaar et al. (1996) depicted them in three categories.

1) Grants for the ‘big’ urban renewal addressing an area
2) Grants for home improvements
3) Process grants for amongst: preparation costs, temporary housing and moving costs.

They key notion within “Building for the neighbourhood” are amongst others, provide new housing to keep existing residents within the neighbourhood, appreciate the social cohesion and utilize the possibilities within the society. The greater part of this movement focussed arrears in pre-war neighbourhoods. Instead of large scale demolishment, the renewal is done by improving mainly the existing social housing stock. Demolished housed dropped from 18,590 in 1971 to 10,200 in 1985. The economic crises at the beginning of the eighties strengthen the vision reducing and reusing.

At the beginning of the 1990s critic towards this concept consisted mainly out of the fact that despite better housing the communal quality of the neighbourhood did not (noticeably) improve (Kei-centrum, 2012). As a result the urban renewal areas kept their position at the bottom of the market. This by a set of different reasons. Firstly the classical urban renewal approach was focus on existing low income groups and as the high income groups couldn’t find a suitable housing, a flow emerged of high income inhabitants moving out of the city. Additionally the support fell for (many) facilities. A second reason, the urban renewal practices which focussed on the practical use, neglected the small scale existing urban structure, resulting in public space and adjacent buildings of poor experience (Vermeijden, 1996). Finally, despite physical, morphological changes social problems within the area remained. Urban renewal originated from physical improvement, this focussed on solving inequalities in pre- and post war areas. The social structure and cultural elements where ignored. These were placed secondary within the production and renovation of houses and facilities. Problems like unemployment, vandalism, crime and social tensions between groups (age, race, and ethics) remained. And an awareness of the ‘classic’ urban renewal with its accent on the stones and houses fall short.
In the 1990 within west-European countries a political movement for privatisation could be depicted, focusing on the denationalisation of provisions such as postal service, national airlines, power/water supply, public transport, telecommunications and health care. (Stouten, 2011). Social-liberal thinking is depicted, which joins the aim of materialistic equality with liberal views concerning state, individual citizen and private initiative. Were improving the socio-economic weak is seen in one view with strengthening the economic values of a city. Also, in 1990 and 1992 a comprehensive evaluation by the government takes place regarding the policy for urban renewal in the future (Beleid voor Stadsvernieuwing in de Toekomst: BELSTATO) (Schuiling, 2007). A review of the results between 1980 and 1990 is assessed and a new aim is set. As a result of national budget cuts the definition of urban renewal (which is too wide) should be redefined. The goal is set to deal with the arrears (achterstanden) within cities dating before 1971. But the approach is still remedial, planned and designed as a quick fix for the area. During this period the Dutch economy experience problems resulting in high unemployment in cities. The government is not willing and not capable to finance the urban renewal policies alone and seeks out the housing cooperation’s. These are little interested in problematic area in cities and prefer the redevelopment sites in the fringe of the cities. In 1997 a review is made at the BELSTATO, showing half of the arrears set in 1990 were achieved (Schuiling, 2007). With the end in sight the government decreased the funding. But an inventory of post war neighbourhoods (Heerma, 1990 cited in Schuiling, 2007) showed that two (big) extra funding was required, one of 1 billion Euros and another of 0.6 billion Euros. By this, the funding became more constrict, resulting in the investment Budget Urban Renewal (Dutch: Investeringsbudget Stedelijke Vernieuwing: ISV). By this municipalities were expected to give a concrete, measurable plan for multiple years. The policies shifted from dealing with arrears to creating and maintain vital cities and neighbourhoods. Improvement in building technology (between 1985 and 2000) resulted in a percentage drop of buildings in poor and an increase of buildings of excellence state (Van der Schaar, 2006). Yet still there are chances within post-war area, although the residential zoning remain and most of the time the urban structure is unaltered, the concept is used of ‘Restructuring’. Within this the focus is not at the arrears of the technical defects of building, but with the expected problems functional or market use or existing problem dealing with the residential environment or the composition of residents. The term used in the approach is liveability and will function as the guideline in many policies of housing cooperation’s. The intervention shifts from remedial to preventive, making it also harder to convince others of the general use of it. The letdown of prior housing improvement dealing individual single building complex caused a scope widening dealing with the whole neighbourhood. The new urban regeneration contained approaches originated from various urban renewal projects (Stouten, 2004). The Urban Regeneration is summed up by Robberts (2004, cited in Stouten, 2010) as follows:

“Comprehensive and integrated vision and action aimed at the resolution of urban problems and seeking to bring about a lasting improvement in the economic, physical, social and environmental condition of an area that has been subjected to change”

Within this definition a wider perspective, then just urban regeneration in general, can be considered: as the development of a vision and an approach to an area in a complex urban context with a variety of spatial scales, sectors, actors and disciplines, needs updating. Urban regeneration is seen as the art of (re)creating a city on the existing city by mutation and sedimentation of the existing urban fabric.
From Regeneration to Renaissance

As a result of the pressure for preserving the landscape, urban regeneration has focussed itself on inner urban areas. During all the stages of urban regeneration (from 1945) trends were depicted where the people are moving out of the city’s core, a pressure to preserve the landscape and a change to more market driven development has asked the urban regeneration agenda to create complete urban areas to work and live. At the end of the 1990s a concept called urban renaissance was depicted. A concept promoting urban life and urban working and by this reducing the need to travel and using land more efficient. Rogers (1999) describes urban renaissance as ‘...a vision of well designed, compact and connected cities supporting a diverse range of uses - where people live, work and enjoy leisure time at close quarters - in a sustainable urban environment well integrated with public transport and adaptable to change’. Behind the urban renaissance concept lies the ideas of improving the urban environment (especially in urban centres), making cities attractive for residents, visitors and businesses, preventing urban sprawl, protecting the countryside from development pressure, preventing large-scale functional separation, and strengthening the economic potential and competitiveness of cities (Stead and Hoppenbrouwer, 2004). Urban renaissance calls for urban intensification or densification and the need to develop of housing on brownfield’s, so as to create compact or ecological city (Jenks et al, 1996). Within this concept two key words are well represented: Urban vitality and mixed use development. Where urban regeneration was evolved into a complex and comprehensive method providing lasting improvement for economic, physical, social and environmental problems. Urban renaissance transform these aspects to goals targeting “urban malaise”: the non-specific ill-image of uneasiness, discomfort or even a sense of dead within a city (fig.2.03). A combination of problems regarding, regarding design excellence, social wellbeing, environmental responsibility and good government.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Signs of urban renaissance</th>
<th>Signs of urban malaise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental responsibility</td>
<td>Short home-to-work travel distances</td>
<td>Long-distance commuting often by car</td>
</tr>
<tr>
<td></td>
<td>House built at higher densities (terraces and town houses)</td>
<td>Low density housing (doubled and semi-detached)</td>
</tr>
<tr>
<td></td>
<td>Ready available public transport</td>
<td>Lack or absence of public transport</td>
</tr>
<tr>
<td></td>
<td>Good pedestrian and cycle mobility</td>
<td>Reliance on car-borne travel</td>
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<tr>
<td></td>
<td>High rates of brownfield land release and reduced urban sprawl</td>
<td>Urban sprawl and continued greenfield allocation</td>
</tr>
<tr>
<td></td>
<td>Reduced residential and business parking standards</td>
<td>High parking standards</td>
</tr>
<tr>
<td></td>
<td>Concentrated employment activity</td>
<td>Dispersed employment activities</td>
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<tr>
<td></td>
<td>Uses mixed and well integrated</td>
<td>Zoned development and single use residential areas</td>
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<td></td>
<td>Key built and natural assets conserved</td>
<td>Declining built and natural environment</td>
</tr>
<tr>
<td></td>
<td>Low levels of pollution</td>
<td>Increasing energy use and pollution</td>
</tr>
<tr>
<td></td>
<td>Well-integrated natural and built environment</td>
<td>Poorly integrated natural and built environment</td>
</tr>
</tbody>
</table>

| Social wellbeing | Availability of high-quality social and health facilities | Lack of social and health facilities |
|                  | Availability of good-quality schooling and training | Poor-quality schooling, low exam results and unskilled population |
|                  | Well-developed cultural sector and activities | Limited cultural investments or activity |
|                  | A tolerant, socially and ethnically mixed population | Segregated and gated communities, and racial intolerance |
|                  | Good access to urban leisure activities | Low levels of social deprivation |
|                  | High participation in public life and well-developed voluntary sector | No sense of civic duty |
|                  | Low crime rates and fear of crime | High crime rates and fear of crime |
|                  | Positive perceptions about (and more) urban living | Strong desire to escape from urban environments |
|                  | A sense of civic duty | A sense of civic duty |

| Good governance | Clean, efficient and well-used modes of public transport | Dirty, unreliable and poorly used modes of transport |
|                 | A disenfranchised and active local population | A disenfranchised local population |
|                 | A shared vision - public/private and community | No shared vision or no vision at all |
|                 | A clean, well-maintained and managed public realm | Liter and vandalism and little sign of urban management |
|                 | A responsive public sector | A detached and unresponsive public sector |
|                 | Readily available and skilled public sector advice and action | A detached public sector |
|                 | Inter-agency coordination and cooperation | Inter-agency coordination and cooperation |
|                 | Design award schemes in operation | Design award schemes in operation |

Source: Imrie and Raco, 2003
Urban regeneration in Rotterdam

This section will deal with urban renewal and regeneration of Rotterdam between 1946 until onwards. During this period a sub-division can be detected.

1945-1974

During the second world war an area of 260 ha was destroyed, and while after the war the housing shortage was impressive (78,000 homeless and 20,000 people was forced to share accommodation) building housing took second place. Priority was given to the reconstruction of the harbour and of the industrial areas, followed by rebuilding offices and shops (Stouten, 2010). And while even the plan for reconstruction was completed in 1941, the implementation was slow as a result of the building material shortage, labour force and fuel (McCarthy, 1998). Even knowing this, the "Basic plan" was put forward, portraying an image of a new city centre, new functions and an expanded road network. However the assumption was made that people would rather live in the suburbs, the number of housing was restricted. However the port was given priority and the plan was delayed. In the 1950’s development was crippled again, construction cost have significantly risen after the war, this caused that developments too focused in the economic city centre. However, by the post-war population boom and migrant workers an urge for housing emerged. And other inner-city and port projects were near completion (Hajer, 1993). Between 1950 and 1965 a substantial amount of money for new extensions at the fringe of the city was invested (Stouten, 2010). And extensions like Hoogvliet, Pendrecht, Zuidwijk, Lombardijen and Groot IJsselmonde were made. Later on the focus shifted for reconstructing urban areas in the city centre. This gave room for wealthy inhabitants to move to better housing outside the city, leaving the area to be filled in by the socio-economic weak inhabitants. Two tents marked this period, firstly the city centre was seen as the centre of the agglomeration and accessibility by car and public transport should be improved. And secondly the harbour close to the city began to move by function west, towards the North Sea. The technological development for mass production (shipping containers) meant the lost of traditional employment within the city (Harms, 2003; Stouten, 2003). Also a ring of older residential districts around the city centre had continued to decline. However Rotterdam did not approach this by demolishment and rebuilding, but the problem was seen as concentrated ‘anti-social individuals’ and the lack of accessibility to the city centre. And (new) harbour and industry were given priority in the building development. However, in 1969 proposals for the replacement of 30,000 homes by an extension to the business district prompted local opposition (Hajer, 1993), which was also demonstrated in other areas in the 1970s. While in the early 1970’s spatial planning was focussed on the urban extension of ‘growth centres’ amongst them, however a ring of older residential districts around the city centre had continued to decline. Result of a great amount of lobbying, the developing motion of politics turned towards residential areas.

1974 - 1993

Within Dutch cities, especially in Rotterdam, the protest where more forceful and had a bigger impact then in other countries in Europe. In 1974 a number of Social Democratic politicians (PvdA) were elected for Rotterdam, who wished to re-orientate the city’s business-led approach to development towards an approach that prioritized urban neighbourhoods (McCarthy, 1998). This focus on the low income and vulnerable inhabitants, the principles underlying this strategy, under the definition Building for the neighbourhood (Bouwen voor de buurt) (Stouten, 2010):
1) Building for the neighbourhood, focussing on the needs of the population in areas of urban renewal. Within this concept attention will be given, beside physical and technical improvement, to the social process.
2) Decentralisation and democratism, implying that the municipality should take input and participation from residents in account when making decisions at urban renewal.
3) Socialisation of the housing provision, creating area based housing associations, in order to control the maintenance.

In each affected district an urban renewal organization was set up involving local residents with the aims of creating affordable housing, resulting in the creation of a series of government-funded “renewal areas”. Consequently, by the end of the 1980s more than 25,000 homes have been modernised (Rotterdam City Information Centre, 1997) the urban renewal was no longer seen as an urban planning and technical issue but rather as a social issue. This was not longer primarily related in demolition but in maintaining and improving older neighbourhoods. Homes were researched and in 1976 the new targets were more or less generally accepted (Fels, 2007). Summarized these objectives were:
- Maintaining of residential function in neighbourhoods
- Possible preservation of existing housing, only secondarily demolishment and rebuilding;
- Build for the present residents;
- Affordable housing
- Involvement and active participation by residents;
- Attention to the environment and liveability of the neighbourhood;
- Small scale interventions.

Within the project for “building for the neighbourhood” a mode could be depicted with its own condition; building for a social housing neighbourhood, with low rents and collective services; building for a balanced populated neighbourhood (age, race, age, nationally, ethnicity) or building neighbourhood with a respectable image. Building for the neighbourhood dealt with four significantly limits: organisational, legal, financial and housing distributional rules (Stouten, 2010). By this urban renewal became significantly more complex than new development outside the city.
Theoretical Framework

From the 1990

Already seen in the 1980, a series of cultural and recreational facilities were being developed intended to enhance the appeal of the city of Rotterdam. A plan developed in the 1985 changed the focus from economic regeneration of the city centre to housing implementation of the city centre (McCarthy, 1998). This plan also included a significantly amount of office space per annum. With the “Kop van Zuid”. This area had been used for port-related uses that had recently become obsolete, as in many other contexts (Hoyle, 1994) they project implied a key-project with the crucial role for the municipality. It implied the connecting of quarters, where the municipality provided the infrastructure. A new Erasmus Bridge, a new metro station and a linkage to the international rail network. While private parties would invest in the buildings. A private- Public Partnership. As a result of perceived weak trust in previous physical and economic renewal (mainly changing it for the worst) a new approach was conducted. The approach aimed to provide social benefits for the residents of the quarters adjacent to the project by attempting to link the economic and social welfare benefits of development projects (Hajer, 1993). Organization was set up to create or strengthen the local economy and not just the national.

Conclusion

By economic ambition, increase in building cost or the government plans (growth centres), the rebuilding of the residential climate within the city of Rotterdam was not treated significant for a long time. Priority of the urban regeneration was given to economic strengths like the harbour and offices. It was decades later that housing was given priority, which was mainly focussed on the low income group. By this demolishment and rebuilding chances were created for well-income group to move out of the city, resulting in the lack of support of urban facilities. This urban renewal had changed the image of the city in a dramatic manner, the city continued to suffer from a high level of unemployment (McCarthy, 1998). It was only until the late 1980s that urban regeneration projects were applied to improve the image of Rotterdam. During this process of reconstruction, it is clear that a critical factor has been the active role of the municipality in the application of development and regeneration policy. But even during ‘city marketing’ a clear economic tone can be detected. Today the image of the residential area of Rotterdam is weak holding many low incomes (fig2.04 and 2.05).

[FIG. 2.04] HOUSEHOLDS WITH LOW INCOME PER MUNICIPALITY
Source: CBS, 2011

[FIG. 2.05] ECONOMIC VITALITEITSWEB AND BUSINESS CLIMATE
Source: CBS, 2011
2.2 The definition of place and space

As said in the introduction this chapter will also give an overview of conditions that motivate attractive, vital and well connected urban areas. Although these three give natural aspects for the success of urban areas, they lack the societal or anthropological underpinning. In order to give an clear and structured path within the literature this section give the social meaning of an (urban) area: consisting of the definition of place and of space. Also a step towards the failure of (urban) areas is elaborated.

**Definition of Space and Place**

Geiryn (2000) gives a comprehensive definition. By him a place holds four necessary and sufficient features. Geographic location: place should be located somewhere. Material form: place should consist of physical elements. Investment with meaning and value, place only exist if it identified interpreted, resembled, narrated, perceived, felt and understood by people. Space is what place becomes when the unique gathering of things, meanings and value are picked out (Gieryn, 2000). Roughly a space can be described as a place filled in with activities, people, objects and representation. Auge (1995) supports this by calling space "frequent place", an intersection of moving bodies. Although this definition doesn't describe what type of bodies and which speed, Auge gives an example of a street that is a place (geographical defined by town planners) what is transformed into a space by pedestrians. When places become spaces, Auge (1995) describes how we need to consume experiences, how we are collapsing time and space. One can say in order for place become space, we must experience it (mainly good experiences count). By this Auge gives another version of space: Non-place. By the speed at which distance is travelled and the relative ease at which we move from place to place, we tend to lose the experience -value and meaning - to events of visiting the place. When a place has characteristics like identity, social relation and history. Non-places have no identity and are difficult to define in social or historical themes. Important here is to link the experience we have to the speed and distance we take. By this here a small step can be made towards infrastructure. As infrastructure has become more advanced (power/speed/reach.duplexing) and we as a society tend to rely on it more (sophisticated/further reaching) (Graham and Marvin, 2004). The elements of gathering of bodies eludes a place, where the architect Stefano Boeri describes his "lost space", as a space that house a continuous flow of people but where no "live" is and people have no name for the space, the space is in a constant state of semantic uncertainty. Because they contain many possible meanings but never a clear and real meaning (Boeri 1994).Within this thesis the term disconnected spaces is used as a space disconnected from the elements that make space. Because of the different personal valuation of space or thought of how spaces should work, theories behind these disconnected spaces is sequential diverse. But roughly most scholars motivate that a succesfull place, holding the many interactions or "gatherings of bodies" also known as space.
2.3 Conditions for vital, attractive and well connected place

The framework for place (or space)

Within the theory the positions regarding the spatial condition for vital, attractive and well connected urban places are divided and (mainly) diffuse. However before the terms: vital, attractive and well connected are discussed, a framework is given regarding the aspects (from an urbanism point of view) of space. Montgomery (1998) gives a trichotomy (fig. 2.06 and 2.07) based upon (already at the time) famous urban theorists: Cullen (1995), Alexander (1979), Lynch (1960) and Jacobs (1961). Where Cullen (1995) motivates physically space: design in urban form, ornaments, buildings openings and gateways. Alexander (1979) and Lynch (1960) motivate urban space by a personal (cognitive) mental image: feeling safe, comfortable, quiet or threatening. The final sport within the trichotomy would be filled in by Jacobs (1961). She argues that the activities within an urban space produce and mirror the quality to what it is. She added four conditions for activities: mixture of the primary use, intensity (of the space), permeability of urban form and the mixture within buildings (types, ages, size, conditions).

Activity

Activity means the state or quality of being active. The concept is linked to the two separate but related concepts of vitality and diversity. Vitality is described by Jacobs (1961) as the amount of people in and around the streets and by diversity a notion is made for a diverse mix between users and uses (Montgomery, 1998). A successful urban environment should provide space for social, economic and cultural transactions, and in a diverse as possible way (Webber, 1964). In order for an urban space to be successful not just the amount of activities is important but also a scattering of them during different time periods of the day. By planning diverse cultural events and celebrations within different time periods the presence of people can be generated (Montgomery, 1998). Mainly Jacobs (1961) motivate two principles within the urban fabric that assist this mindset: a complex diversity on the primary use within an area (mixed-use) and a large amount of inhabitants within a close proximity (density). Enough urban population, in a relative close proximity ensure a fundamental basis for overall (economic) activities in an urban area (Montgomery, 1998). Within her book Jacobs (1961) relates the success and failure with density in urban areas by other areas which are in her eyes successful (or not). She motives a set of densities, inspired by existing urban areas, related to the buildings, the mixture, type, height, etc. However in regard to density she neglects the urban layout or design of these areas. In wondering if these spaces are a success, for a living environment, it cannot be answered without looking into urban layout and design. Jacobs (1961) also motivates the mix of the primary uses to generate diversity within the use of a city, however in reality this is not always essentially given. Montgomery (1998:105) gives an example

“A development site which has offices in one part, a drive-in restaurant in another and a retail warehouse on yet another might well be described as mixed use, but in the absence of self-generating secondary diversity, shared facilities and streets, the mixture is one of oil and water”

Image

The individual image of a space is a set of feelings and impressions generated by that space (Spencer and Dixon, 1983). According to Lynch (1981), this individual image contributes to the imaginable ability of an urban environment (how well we imagine spaces). Sequentially this is related to the legibility of urban environments (legibility of an urban environment implies the grade of recognisability of city elements, like edges, paths, nodes, districts, into a coherent pattern). Visitors will orientate through the city using landmarks and anchor points. However, the long term residents produce a more complex image using landmarks, path, everyday activities and personal association (Montgomery, 1998). Activities at the urban space regarding the user can create virtual connections, strengthen the image one has with the urban...
environment. Good urban areas represent over time a sense of identity by the people who use them; it gives a personal sense at the user, which identifies him or her with the place (ibid). Were concepts like (psychological) access motivated a sense of belonging or a feeling of involvement. It should be well noted that features concerning form can influence the image and will have affect on different aspects of vitality, intensity and activity of an urban area. Additionally besides the contribution of the city - landmarks, statues or place names - public space itself is a powerful contributor to the legibility of an urban environment. By it proportion, sequences and the way they are interconnected with the cultural importance, they can generate strong symbolic meaning that affect the life in the city (Montgomery, 1998).

**Form**

Within an (successful) urban environment fulfilment is found for the needs of its inhabitants and visitors (Lynch, 1981). For this a careful fit of the urban form should be applied, while maximizing the potential scope for these activities. For this maximizing, terms as connectivity and accessibility within the urban form are of high importance. Connectivity is regarded as the (physical) link between areas or within smaller parts of the area. Alexander (1979) motivated the quality of an urban form where buildings and spaces are well integrated within a system of interlocking connections. Accessibility within an urban area would motivate the difficulty or easiness for any type of person (age, background, race, illness) to gain access to activities, resources, services and information that they need (Montgomery, 1998). Montgomery ends this thought that the form of a good urban place should fit the concept of image and activity. But he continued that, paradoxically this fit cannot be too precise. If a city is merely planned, it opposes everything what a living thing is. As a city grows lives evolves every day. By this trichotomy an insight is given how terms as vitality, connectivity and attractiveness are positioned within the concept of place. Although presented separately it is impossible to continue with these spatial conditions by this division. Sequentially a list can be detected that motivates vitality, attractiveness and connectivity in urban spaces:

- Density
- Accessibility/ Connectivity
- Activities
- Public space
- Mixture of use
- Comfort and Safety
2.4 Spatial condition for vital, attractive and well connected places

Within this section the spatial conditions are explained by the thought how it can improve an area by its vitality, attractiveness and connectivity.

**Density**

One of the conditions that provide a self-sustaining diversity - the mixture of uses and activities - that supports the vitality in urban areas is density. By this, the aspect diversity in everyday (urban) life can be stimulated - public contact, transactions, street life (Jacobs, 1961; Montgomery, 1998). This urban life and conveniences is the product of residents within a close proximity. By high density within a close proximity, a support can be generated for the presence and the use for people in the public realm. On the other hand, emptiness in urban life and urban fabric can generate an area which people avoid or hurry through (Gehl, 2011).

Although within this line of thought, the motion to increase density without restrain or the idea that there is an optimum density is false. (Successful) increasing or decreasing density is related to the physical/programmatically manifestation of it within its context. Every place has its unique characteristics regarding activities, connectivity and location. By inadequate density the use of public spaces and other urban functions (shops, stores, schools, gyms, etc) will not be supported by a lack of economic vitality. "Overcrowding" by density can cause standardized buildings, regimented layout, overstressed public space and large development footprint (fig2.08). Also high urban density with radical openness can create spaces between buildings without vitality (Jacobs 1961; Trancik 1986; Groth and Corijn, 2005). In figure 2.08 is an urban area within Amsterdam holding high density in comparison to radical open spaces. To generate vitality during different parts of the day, diversity within the urban density is motivated. By this diversity (age, race, health, background) a diverse set of users for the public realm, during different timeslots of the day can be generated (Montgomery, 1998). As one of the important aspects in extending this presence and the use of the public realm, diversity within the housing typology is motivated. A diversity size, configuration, luxury standard, private/public spaces, rent/private houses promotes diversity within the residents of area: age, job, income, culture. By this, different needs and uses for the public realms during different parts of the day are placed within the area.

![FIG. 2.08] THE BIJL MER: HIGH DENSITY, OPENNESS, NO VITALITY
Accessibility/Connectivity

In order to generate people in parts of a city, accessibility is motivated as one of the main conditions to create a diverse set of people that can use elements (squares, parks and streets) within the area. According to Lau and Chui (2003) accessibility is described as “the freedom or ability of people to achieve their basic needs in order to sustain their quality of life.” Where Bertolini (1999) motive accessible spaces, as spaces where different people have the possibility to come and do many different things. A more overarching definition is given by Harnik (2003) the possibility for any number of diverse people (age, race, health, ethics) to gain their activities, resources, services and/or information. Within accessibility there are two aspects: physical and social. Where physical accessibility describes the physical setting within an environment that influence accessibility; street elevations, width of street, barriers, the distance between spaces, etc. Social (or psychological) accessibility is more represented in the comfort within the urban fabric.

Important for accessibility is the condition of connectivity. This condition is mainly expressed by links between locations, which within an area or between areas will form a network (Salingaros, 2003) where the relative friction between the links within a network can illustrate the accessibility (Rodrique, 2010). Connectivity can be seen as full accessibility - no friction between any links within a network. Connectivity can be expressed in distance (meters or time) but also in cost or energy (fig 2.09).

The network within an urban area is not a stand-alone concept. Within the “The Image of the City” Lynch (1960) motivated paths, as one of the five physical elements that make a city. These may be streets, walkways, trams, canals or railways. Another element that Lynch uses that can be placed within a network, the points or centralities where one user can reside.

Salingaros (2000) motivated his network fairly similar as an “Urban Web” consisting of three principles: nodes, connections and hierarchy. Where Salingaros sees the (urban) nodes as bundles of concentrated human activities. One can think of homes, offices, shops, restaurants, churches, etc. By the connections between these nodes flows within the web exist. Flows from work to home or from train station to shopping street. Depending on the means of transport the connection can only be a certain distance. It is very well possible to have multiple connections between the nodes. Without restrains the connections within an urban web will function on several different scales, creating a hierarchy within the connections. A well functioning urban web will follow a strict order of ranges within the hierarchy. Starting at the smallest scale (footpath) and then moving to roads, increasing every step within capacity.
Public space

Public space within a city can be seen as the most direct condition when it comes to improving the vitality and attractiveness within an urban area (Carr, 1992; Németh, 2011). For it holds the terrain to encourage social interactions during different periods of time of the day (Montgomery, 1995). It holds different points of attractions for the urban area (Pasaogullari and Doratli, 2004). The public realm, but mainly the public space, can increase the social cohesion and improve the confidence of people. The public realm can function more than just places for recreation: it holds the possibilities to integrate green into communities with its health and environmental benefits (Braza, 2003). Goodman and Freund (1968) motivated the vital importance in our environment, providing the positive functions beside recreation, protection of physical resources and it effects a wide range economic development and social interactions. Langdon (1994) points out the gathering functions for neighbourhoods, giving social benefits to the community.

Within this age of modern technologies concerning telecommunication and information the concept of “real” public space is disputable. Where in the past people would go out on the streets for social contact and news, a contemporary image can be seen where people are living in relative close proximity but little social context will emerge from the sharing the (same) urban fabric. However, by this modern telecommunication, social transactions (friendship, relationships and shared interest) are occurring regardless of the geography of individuals (Thompson, 2002). And the result is still that social activities and events are planned, organised and supported in urban public spaces. Public spaces are changing to spaces that are not (primary) used anymore for the quest of Intel, spaces are to be used more direct (ibid.). Within the public space users will find, do and meet what or who they prior settled out to face.

“The Internet is great, but it ain’t the Piazza Navona (Sorkin, 2001 cited in Trip, 2007)”

Within the field of urban design, it is hard to find an absolute set of criterion for vital and attractive urban spaces. This not by the lack of criteria but by the abundance of it. Countless scholars and practitioners have written about the factors that influence the success of public spaces (Jacobs, 1961; Gemzøe, 2006; Montgomery, 1998; Trip, 2007; and many more) each holding his/her own (bias) set of criterion holding, originated from diverse disciplines dealing with public space. But all motivate the importance of accessible green and sense of safety and comfort within the public space.

Despite new technological development it is likely that some consistence for the success of public spaces remain. For the most public spaces within cities, people are willing to walk between 10 to 20 minutes maximum to get there (Whyte, 1988). While the majority regular/daily users of public spaces are only willing to walk between 3 to 5 minutes of their home or workplace (Thompson, 2002).

Recently the underlying idea of public spaces has shifted from isolated spaces within an urban fabric to interlinking of these public spaces, also called “open spaces networks” (Thompson, 2002) or “public space network” (Pinto et al, 2010). Where it is more referred to an integrated network of public space, integrating the parts/function of the city. Rogers (1999) contributed a more extensive elaboration: “to achieve urban integration means thinking of urban open space not as an isolated unit—be it a street, park or square—but as a vital part of urban landscape with its own specific set of functions. Public space should be conceived of as an outdoor room within a neighbourhood, somewhere to relax, and enjoy the urban experience, a venue for a range of different activities, from outdoor eating to street entertainment; from sport and play areas to a venue for civic or political functions; and most importantly of all a place for walking or sitting-out. Public spaces work best when they establish a direct relationship between the space and the people who live and work around it” (p. 57).

It should be noted that public space, if applied oversized, generic or duplicated of other nearby spaces, can lose its urban vitality (Ferrer, n.d.). By this the activities or the intensity of these activities will be spread out too far and will not produce the social or economic interaction during different timeslots of the day.
Mixture of use

One of the conditions that Jacobs (1961) motivate to generate activities that support urban vitality is the mixture of uses. One variety of use within an area can attract people to this area, but even by one successful use the area will not be attractive during different times of the day and the vitality would still be considered weak (Montgomery, 1998). By the addition of an extra use a stronger and longer present of people can be generated. And properly implemented different uses can strengthen the accessibility along streets (Hansen, 1959). However the mixture of uses is not a complete answer for social and economic transactions (or other benefits), forces are detected which treat the uses within a city fragmented (Grant cited Hoppenbrouwer and Louw, 2005). And therefore within this principle the distance and the complementary between these uses are important for its success.

Jacobs (1961:161-164) motivates the mixture of a primary use with a second diversity. By the primary use, functions are meant that generate large numbers of people into the area, like residences, major employment or service functions. Whereas the secondary diversity are functions that are the response to the primary use, to serve the people which the primary use attracts (Montgomery, 1998). By these function people are motivated to stay longer in the area and a different set people can also be attracted (shops, gyms, bars or other small scale facilities. This idea is not without faults; too much diversity the social and economic structure can become unclear and weak. Or it can create a tremendous increase on the urban stress, Also, by non-design reasons; some uses do not hold the possibility to mix. As example, it is generally not possible to mix heavy industry with housing (Angotti & Hanhardt, 2001), but is should be noted that these days industry is becoming more clean and less noisy then it predecessors.

Within the concept of mixed use, the geographical scale is mentioned as an important factor in its success. Where one can think mixing use within a building-complex (Coupland, 1997), the street (Montgomery, 1998), the neighbourhood scale (Jacobs, 1961) or more on a district scale (Grant, 2001). There are various geographical scales on which uses can be mixed. However uses can also be mixed in time. Urban spaces, streets or buildings can hold mixtures of uses which within a sequence can follow up each other. For example a school can additionally hold uses that function at night or a square can function as a market during the weekends. The success of mixed use is complicated. With great “distance” between uses the experience is unlikely to be experienced as a mixed use, with too little “distance” between uses nearby areas can be rendered without a secondary use. Although at first sight the success is linked with the density -the amount of residents in nearby vicinity- supporting the uses, but more elaborated steps reveals that it is the intensity that can support these uses (Montgomery, 1998). Where city centres the experience requires a continuous flow of diverse uses, while within the neighbourhoods a spread of uses is revealed. And although Rowley (1996) motivate four intensity areas to be where mixed can be found and may be motivated, city/town centre, inner urban, sub urban and green fields, he omits the position within the urban network. The position of an area within the urban network affects the intensity of it uses (KEI, 2012).

By the mixture of uses within the urban fabric, an increase of the diversity of users is motivated. This by encouraging a compatible mix which does not conflict by itself, and generates urban synergy - working together to generate urban vitality (Grant, 2002). Saltingaros (2003) states that there is not logic in the connection between uses that holds the same function and characteristics. Even this compatible mix has multiple layers to it. Although within a shopping street uses can be considered the same, the diversity in the set of shops will create the urban synergy. Hoppenbrouwer and Louw (2005) motivate four scales and four dimensions were the application of the mixture of uses is applicable on. The scale refers to spatial aspect of mixed, building, block, district and city. Three of the four dimensions can also be related to the spatial implication of mixed use, by the fourth time is implied.
The outdoor activities

Urban vitality within the public realm is supported by outdoor activities. By this all ingredients of city life are combined: public contact, public social life, watching people, promenading, transacting, natural surveillance and culture (Montgomery, 2010). By outdoor activities possibilities are created for people to meet others, seeing friends or enjoy the company of a stranger.

“On successful city streets, people must appear at different times. This is time considered on a small scale, at different times throughout the day” (Jacobs, 1961, p. 152)

Places with rather few activities for extended segments of time, undermine the notion of urban vitality. By this absence the area can, especially in the darker hours of the day, give a feeling of unsafeness or insecurity. The perceptible safety produced by people on the streets, referred by Jacobs (1961) as “natural” surveillance or the “eyes on the street”, is hard to replace by physical and technological surveillance devices. Simply said, by the sight of others, people feel comforted: to be seen by others allies can generate the assistance or reduce the danger in threatening situations (Luymes and Tamminga, 2010). Within this there are two sides, social and physical. The flow of people on the streets should be a steady flow, holding a high degree of visibility and a mixture of age groups and types of activities. But also the physical environment, the relationship with the buildings. With this it refers to the distance/barriers between street and building, the size of the sidewalk and the transparency within the facade.

Gehl (2011) motivated three types of activities and their relationship with the physical environment. He divided the activities by necessary, optional and social. Where the necessary activities are seen as more or less compulsory: going to work/school, go shopping, and waiting for someone/somthing. These imply activities, were the persons involved are to a certain degree required to participate. Optional activities on the other hand contain activities that are more seen as liberal. These activities will only occur if the participators hold a motivation and the time and place is there. Activities that can be seen as recreation: doing sports, going to the park, gardening. The third is not linked to its participators obligation or motivation but are activity of social interactions. E.g. children at play, greetings, conversations but most overarching and passive is simply seeing and hearing each other. Social activities can be seen resultant of other activities (necessary or optional), as they mainly evolve from these activities. Social activities occur sporadic as the result of people sharing the same space. These people come to be in the space by necessary or optional activities.

These activities hold a relationship with the quality of the physical environment. High physical environments can motivate more and longer optional activities. However by improving the physical environment necessary qualities remain unchanged. By the increase of optional activities the amount and time of the social activities is probable to rise (fig 2.10).

[FIG. 2.10] ACTIVITIES AND THE PHYSICAL ENVIRONMENT, BY GEHL
Source: http://www.rudi.net/books/3610 (accessed: 25 April 2012)
Safety and comfort

Comfort and safety are represented as evident and overarching terms when it comes to conditions of attractive places. Carmona, et al. (2003) describes the connection between the time people are staying in an area and the sense in comfort and safety they (physical and social experience). By reducing or limiting the discomfort and unsafeness within this environment walking, bicycling and the use public transport can be promoted. By this more people would be motivated to use the public space and urban facilities for a longer time, creating were Jacobs (1961) would referred to as “urban ballet” - A vital use of the urban area.

The sense of comfort within an urban environment is referred to the perception of well being while visiting and moving around in it (Reiter and De Herde, 2003). By this, the perception is a reduction of the actual environment, where the human mind filters the environment to a few elements and memorizing even less. Comfort can be divided within three aspects, the environmental (weather, pollution), the physical (benches, paths, etc) and the social (character and ambience) (Carmona, et al. 2003). Safety can be seen as the physical and metaphorical distance from danger. “...a deep and pervasive need that extends to people’s experiences in public places, it is a sense of security. A dealing that one’s person and possessions are not vulnerable” (Car, et al.1992:97). By imposing safety restrictions into the use and restriction of an area, this undermines comfort. For success a balance between the two is necessary.

Within design guidelines for successful public spaces, Gehl (2011) gives a more elaborated look on the terms comfort and safety (referred by Gehl as “protection”). Although many conditions are similar to prior discussed theory, Gehl looks more to the physical design implementation. Gehl motive an improvement for the pedestrian and bicycle urban landscape. By improving the facilities for pedestrian and bicyclist but mainly the route to and through an urban area can attract people to come to them more frequent and for a longer time. By this the vitality and the safety can be improved (Gehl, 2011)

| FIG. 2.10 GUIDELINES: PEDESTRIAN AND BICYCLE URBANSCAPE |
| Source: Gemzøe, 2006 |

| PROTECTION |
| 1. Protection against Traffic & Accidents |
| - traffic accidents |
| - fear of traffic |
| - other accidents |
| 2. Protection against crime |
| - living in / used |
| - streetlife |
| - streetwatchers |
| - overlapping functions - in space & time |
| 3. Protection against unpleasant sense experiences |
| - wind / draft |
| - rain / snow |
| - cold / heat |
| - pollution |
| - dust, glare, noise |

| COMFORT |
| 4. Possibilities for WALKING |
| - room for walking |
| - interesting layout of streets |
| - interesting facades |
| - no obstacles |
| - good surfaces |
| 5. Possibilities for STANDING / STAYING |
| - attractive edges |
| - defined spots for staying |
| - supports for staying |
| 6. Possibilities for SITTING |
| - zones for sitting |
| - maximizing advantages primary and secondary sitting possibilities |
| - benches for resting |

| SEE |
| 7. Possibilities to SEE |
| - seeing distances |
| - unhindered views |
| - interesting views |
| - lighting (when dark) |
| 8. Possibilities for HEARING / TALKING |
| - low noise level |
| - bench arrangements |
| - “talkscapes” |

| ENJOYMENT |
| 10. Scale |
| - dimensioning of buildings & space in observance of the important human dimensions related to senses, movements, size & behaviour |
| 11. Possibilities for enjoying positive aspects of climate |
| - sun / shade |
| - warmth / coolness |
| - breeze / ventilation |

| 12. Aesthetic quality / positive sense experiences |
| - good design & good detailing |
| - views / vistas |
| - trees, plants, water |
2.5 Theoretical spatial conditions for research and design

In this section, spatial conditions are transformed into criteria for the spatial analysis regarding the area. By this analysis additional starting points for the (re)design of the area can be formulated. If possible this section will give insight how these condition can be implemented within the design. Before this, already an overlapping of concepts is depicted within the spatial conditions. Concepts or aspects of concepts reoccur within different conditions. These conditions are not to be seen separately, as one is linked to the other. By one condition it is not possible to generate vitality, attractively or connectivity. Only by a comprehensive assemble of these spatial conditions a view can be shed upon the functioning of an integrated city. For successful urban areas: each should reinforce the other (Montgomery, 1998)

**Spatial criteria for vital, attractive and well connected urban areas**

**Activity**

By urban activities people can be attracted to parts of the city, giving possible social and economic impulse to the area. By this, the urban vitality and attractiveness of an area can be improved, for as long as the activity exists. These social activities can complement on the integration within the city life. The experience of the social activities can promote the arising of urban experiences capable of regenerating a site or even minimize the phenomena of fragmentation (Pinto et al, 2010). Within these activities the research will look at the diversity and complementary for the activities, these are two important components for a self-sustaining urban vitality (during different parts of the day). Within the diversity and complementary the time it is ongoing throughout the day, night and weekend be looked into. Also this research will look into the link of activities with the quality of the physical environment. By a greater quality the more social activities can happen (Gehl, 2010)

**Public space**

High quality public spaces can function as major attraction points within an urban area. These spaces are not only spaces for recreation, social interaction or relaxing, they are points that make the area understand and recognizable. Public space has the possibility to promote territorial cohesion without losing elements like: local centrality, environmental quality or a sense in citizenship (Borja, 2003 cited in Pinto et al, 2010). These days a focus can be found towards the public realm, authors consider that the “city is the public space” (Pinto et al, 2010). By this thesis will extend to the public realm (streets, corners, etc). Within the criteria for public space there is an abundance of author motivating success of the public on an architectural level or smaller. Only a few depict authors deal with public space on the scale of similar to Vreelust-Blijdorp area. Trip (2007) motivates accessibility, scale, the aesthetics of the borders and safety for good public space.

**Density**

Although Jacobs (1961) motivates that an area becomes lively with a good balance between density and diversity of functions, she provides no standard for it. And density too high can cause radical open space form spaces without meaning between the buildings. And too low will create (too) little support for urban functions. Therefore the density within this project is not only related to the houses per hectare but also the FSI (Floor Space Index: floors in proportion to the ground). Two of the most characterizing types of diversity for the use of neighbourhoods are age and gender (Garcia-Ramon et al, 2004). However within the actions of an urban designer is not possible to design areas to attract a special gender. There for will only look into the age diversity of the adjacent neighbourhoods.

**Mixture of use**

By a mixture of use a self-sustaining diversity can be generated, that will support urban vitality during different parts of the day (Montgomery, 1998). Depending on the scale and complementary it can generate a flow of people towards an area (Hansen, 1959). By the mixture of uses the area can become more safe, attractive and vibrant (Coupland, 1997). This thesis will research the primary use -the use which can generate large amounts of people- and the secondary diversity -uses serving the primary one- of the Vreelust-Blijdorp area.

**Accessibility and connectivity**

Within European peripheral cities infrastructural has resulted in urban fragmentation (NeT-TOPIC 2009). Creating areas which are hard to access and difficult to navigate within. This thesis researches the connectivity and accessibility of the Vreelust-Blijdorp area in relationship to its adjacent surrounding urban fabric. By this a focus is made on the urban nodes, the connections and the hierarchy of these connections.

**Comfort and safety**

Even when cities plan integrated, lively, attractive and safe districts or neighbourhoods, they appear to fail as they neglect the comfort and safety of the pedestrian and bicyclist experience between the buildings (Gehl, 2011). Although within this thesis comfort and safety is described versatile (environment, physical or social), the greater range the implementation does not directly concern itself with the integration of an urban area. By focussing this research on the comfort and safety of the pedestrian and bicycle experience the vitality and attractively is linked to a mode of connectivity.

“People hurry through the spaces, if they venture outside at all, and a general emptiness becomes almost automatic.” (Gehl, 2011:108).
"The separation of an intellectual or material whole into its constituent parts for individual study"

http://www.thefreedictionary.com

3.1 Introduction

Within the prior chapter, spatial conditions are described for vital, attractive and well connected urban areas. These conditions were transformed into criteria’s for analysing. By this analysis an image can be given of the occurrence and functioning of the infrastructural residual space. However these criteria’s refers to the integration by vitality, attractiveness and connectivity within its adjacent neighbourhoods. Prior before this the spatial analysis, this chapter will discuss the position of the Vreelust-Blijdorp area though different scales. At the end this chapter will end with a three part conclusion. The first part concludes the effects of the spatial effects of urban renewal of Rotterdam after the Second World War. By the second urban qualities and condition are given that can be adapter in the urban regeneration process of Vreelust-Blijdorp and Rotterdam. The third parts depicts an image (based upon the analysis) how infrastructural residual space is positioned in its urban context.

Rotterdam

Rotterdam (Fig. 3.02) makes together with The Hague the south wing of the Randstad (the economic engine and the social, cultural and political heart of the Netherlands). Rotterdam has obtained the role of one of the two main ports of the Randstad (next to Shiphol). As a part of the south wing of the Randstad Rotterdam is related to the future competitiveness of the Randstad (Rotterdam, 2007). The main port of Rotterdam is located at the junction of two strong spatial-economic networks. The Randstad, consisting of Amsterdam, The Hague, Utrecht and Rotterdam itself. And the Rijn-Schelde delta, which extends all the way to Antwerp. As a result of the relative new HSL (High Speed Train) connection, travellers can be within 30 minutes from Rotterdam to Antwerp or Amsterdam. This gives Rotterdam a central role in the upcoming sector of business services and knowledge-intensive companies and institutions (Rotterdam, 2007). The municipal area of Rotterdam (Rijnmond area) is the most urbanized area of the whole of Holland, where it holds 1.2 million inhabitants and the city is itself house almost 600.000 people (Rotterdam, 2010). The harbour of Rotterdam was until 2004 the biggest harbour in the world, now it is still the biggest and most important harbour in Europe. In 2010 the harbour of Rotterdam has a cargo throughput of about 430 million tons and is directly or indirectly is responsible for 286.000 jobs in Holland (Havenbedrijf Rotterdam, 2010). The harbour started in 1250 and grew until a massive complex reaching from the centre of Rotterdam until the estuary of the Meuse (fig.3.01). Additionally the bombing in the Second World War and the massive economic growth after, caused a shift in the economic gravity of harbour. Moving the social and economic centre of the harbour more toward the sea, leaving behind its infrastructure.
Rotterdam and infrastructure

As noted earlier within this thesis, the role of the harbour has affected the post war urban regeneration within Rotterdam more than other Dutch cities. Economic prosperity of big scale infrastructure was given priority over residential and recreational goals. However, the motion to modernise the infrastructure originated prior for the war. When city architect Witteveen started at Rotterdam (1924) he depicted a street life with “pedestrian flows of the working class”, horse carriages, carts, busy tram traffic and an up rise in the car use for the prosperous ones (bike use would rise in the decennia yet to come) (Mens, 2007). Public transport was slow, irregular and expensive. Canals intersected the city, causing lot of delays with their drawbridges. As a result that the workers walked between home and work, the working-class districts were placed nearby the harbour and the factories. Within the 20 years, Witteveen modernised Rotterdam in the sense of connectivity. Cars raised itself over the train, tram, horse and carriage. Public transport shifts its focus from the prosperous citizens to the public masses. Also the bike became the most popular way of travelling within the city.

By these large interventions Witteveen wanted to update the city, for the society of tomorrow. Where cohesion, in the sense of linkage, hold great importance.

Today the city region of Rotterdam holds noticeably more infrastructure then other cities in the Randstad (Fig 3.03). Opposite to the desire of Witteveen, the image that is depicted amongst urban planners is a city of fragmentation. Palmboom (1987) gave in “Verstedelijkd Landschap Rotterdam” (Urbanized landscape Rotterdam) a distinct conclusion, he sketched Rotterdam without its infrastructure and its industry (fig 3.04). By this subtraction a structure of islands are depicted, holding a fragmentation amongst its neighbourhoods, parks and public spaces. This fragmentation extends to within the island, while preserving the original structure of dikes and canals, each neighbourhood holds an autonomous network of streets (fig 3.05).
The Vreelust-Blijdorp area
This graduation project focuses on the Vreelust-Blijdorp area. This is one of the areas where big scale infrastructure affects highly on the residential environment of Rotterdam. Development of the area dated back at the beginning of the 1930’s. As the expansion of Rotterdam South started the search for expansion possibilities for Rotterdam to the North, the municipality asked in 1920 the architect Kromhout. In his plan infrastructure and the urban fabric was blended together. He depicted a grand park and a symmetrical scheme for the buildings (fig 3.06). However the municipality of Rotterdam withdrew the financial support for the project. The architect Witteveen and his team developed in 1929 a plan, what was based on the principles of Kromhout. Where the neighbourhoods of Klein polder, Blijdorp, Bergpolder flow cohesive, all the way until the Spaanse Polder (fig 3.07 & 3.08). However Witteveen did not succeed in moving the existing Railroads. By this, the expansion was never fully realised and although roads like the Gordelweg and Stadshouderweg function perfectly for traffic, the area was never integrated in the life of the city (Vanstiphout, 2005).

Today the area lies as a gap within the urban fabric; it doesn't hold the city planned as by Witteveen. Within the absence of building blocks, streets and squares we find allotments, sport fields and industries. During time expansions of Rotterdam have surrounded the area and it lies as a gap within the city. By shortcoming of this expansion Blijdorp never grew to its full potential (ibid.).
3.2 The position of the Vreelust-Blijdorp area

Historic position

To protect the land of Schieland and Delft land against wild tides of the North Sea, a dike near the estuary, of the Meuse, was constructed during the 12th century. Around halfway in the 13th century a second dike was added at the crossing of the river the Rotte and the Meuse. Soon after, a settlement is formed which drives of fishery. At the end of the thirteen and the beginning of the fourteen century the first harbours for trade was realised, like the "Oude Haven" of Rotterdam, and the "Voorhaven" of Schiedam. This made economic growth and urban expansion possible. After a few decades the neighbouring city of Delft motivated their own trade route and constructed their own channel. As a result Delfshaven was established at the river estuary of the Delfshavense Schie and Meuse (fig. 3.09).

Around 1840 we already see the triangular shapes of Rotterdam and Delfshaven and the circular fortification of Schiedam. On the map (fig.3.10) we can see the construction/reservation for the train track between Schiedam and Rotterdam, called "de oude lijn" (the old line), which was completed around 1847. As we also can see that both the river de Delfshavense Schie and the train track are the first two dividing elements in the landscape of the project site.

In the period after 1850, the industrialization along the Meuse River was triggered, and the cities of Rotterdam, Schiedam and Delfshaven experienced big economic growth and vast urban expansion. This urban expansion settled along the inland rivers (fig. 3.11). Where we already can see the train track as a barrier stopping the development inland development of Delfshaven.
The amount of people who wanted to work in the harbours of Rotterdam and Schiedam grew to more than a thousand each month (Steenhuis et al., 2009). As a result of the ambition to grow, the new Mathenesse harbour was constructed, along with its corresponding infrastructure. We can already see the round train junction in the project site connecting the harbour to the city. We also see a train connection along the north-west side of Rotterdam for the connection to Utrecht (Fig 3.12). This as a result of the peat tracks at the east of Rotterdam, around the north and west was more plausible at that time.

Around 1940, omitting the destruction of the war, we see a lot of urban expansion as a result of the growth of the harbour. The expansion of 10 neighbourhoods designed by P. Verhagen are for the greater part realised. The neighbourhood of Spangen is one of these. Being build touching the railroad, all major facilities are located at the centre of the neighbourhood. As a result of the bombing, the water lock at the end of the Delfshavense Schie was not operational and a water connection is dug between the Rotte and the Delfshavense Schie (Fig 3.13).

After the war, the reconstruction of Rotterdam contained economic strengthening of the Spaanse polder and infrastructural works for the entire. By the priority of the reconstruction, laws and policies at Spaanse Polder regarding environment, noise and pollution were eased to hold more industry (Crimson, 1998). We see bays dug out of the Delfshavense Schie (Fig 3.14). This gives the project site already its characteristics as industrial area.
Within the last decade we can depict that Rotterdam is becoming denser, and more dynamic. The Erasmus Bridge is, symbolic and physical, linking the north and south of Rotterdam. And the industry of the Spaanse polder is completely silted up.

**Conclusion**

Surely but slowly, over the better course of a little bit more than one and a half centuries we see that development adjacent to the residual space has stopped at its borders. As a result the site has evolved outside a clear framework of city planners, to an agglomeration of unclear, unused, unstructured part of the city which does not hold the vitality or energy that a part of the city should have. We see entanglements of infrastructure: water, road and rail go over and under each other. And the chaos it residual produced, by its laws and policies, a site that has evolved into a collection of a set of vastly different functions: industry, allotments, parks, sports, offices, Zoo, etc.
**ANALYSIS**

**Social/economic position**

**Randstad**

Within Holland the Randstad is the only urban area which can function on a metropolitan scale, and compete with other regions in Europe. The four provinces of the Randstad are responsible for nearly half of the Dutch economy and hold 3.8 million jobs (www.regio-randstad.nl). The project site is located inside the Randstad and more specifically in the south wing of it. On this scale it depicts an economic and urban vitality strong area. Within visions, policies and urban plans a coalescing (Dutch: samenvoegen) and strengthening of the Randstad is upheld by coherency and cooperation of both great urban areas of the south wing, Rotterdam and Den Haag, is motivated (Vrom, 2009). The research area is located between Rotterdam and Den Haag (fig. 3.17).

**South wing (highways)**

The south wing of the Randstad is a strong on the world-oriented region with a substantial contribution to the economy of the Netherlands and the international business climate of the Randstad. The South Wing, with 3.2 million inhabitants is one of the most densely populated regions of Europe (www.zuidvleugel.nl). Within this region a system of highways can be depicted to carry its economic strength. And although a process of over 50 years and 300 million euro more than anticipated the new extension of the A4 Highway (fig 3.18:1) is to start in 2012 (A4middendelfland.nl, 2012). Another developing in this system of highways is the A13/A16 detour (fig.3.18:2). Providing a better flow for trucks in the horticulture (Dutch; Tuinbouwsector) and de-stressing the inner highways: A13 and A16 (www.rijkswaterstaat.nl, 2011). The third and final development in this system is the Blankenburgtunnel (fig.3.18:3), a tunnel under the Meuse, providing more flow from Den Hague with it small surrounding villages to the south of Holland and Belgium.

**South wing (Train)**

Also on the scale of the south wing to support the economy and its inhabitants a railway system can be depicted. Were current plans to improve the connection between recreation, working and living are already been set into motion. The StedenbaanPlus, a plan to improve the link between different modes of public transport (tram, bus, train), increase the frequently and to create more train stations (www.zuidvleugel.nl). The area is located along one oldest train tracks (the old line) and the main (train) artery between the cities Hoofddorp, Leiden, Den Hague, Rotterdam, Ridderkerk and Dordrecht. And within the report “Regionale verkenning Stedenbaan” (Bestuurlijk Platform Zuidvleugel, 2007) the area was already motivated for a new train station, but as a result of budget cuts it was waived off.
**South wing (knowledge-axis)**

In the South wing there is a concentration of expertise hot spots, knowledge intensive businesses and knowledge workers around the so-called knowledge-axis. Roughly runs this ‘axis’ along major infrastructure bundles from Leiden past Delft via The Hague to Rotterdam (www.zuidvleugel.nl). There are also strong relationships with the hydro engineering culture in the three Drechtsteden. Within the axis new developing are taking place to strengthen this. Dohmen (2011) state that universities of Leiden, Rotterdam and Delft are making plans in coalescing with each other. Other developing is focus to strengthen this axis, making it more durable and diverse (Zuidvleugel). And the Vreelust-Blijdorp area is positioned, next to this infrastructure, in the middle of it (fig.3.20).

**District (liveability)**

On the district scale it position the area is located within a social and/or economic weak area. The liveability give an indication of this, by an average of six values - housing stock, public space, urban facilities, population composition, social cohesion and safety. Neighbourhoods as Spangen, Nieuwe Westen, Oud-Mathenesse and Kleinpolder are illustrated as negative or moderate (fig.3.21). On a more elaborated look we can see that these neighbourhoods hold an income that is around the 5000 less than the average (fig.3.22). While Blijdorp (in the green) has an income that is around 5000 above this average.

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Average income (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oud Mathenesse</td>
<td>23 800</td>
</tr>
<tr>
<td>Wit Dorp</td>
<td>20 100</td>
</tr>
<tr>
<td>Nieuw Westen</td>
<td>23 500</td>
</tr>
<tr>
<td>Blijdorp</td>
<td>35 000</td>
</tr>
<tr>
<td>Spangen</td>
<td>21 500</td>
</tr>
<tr>
<td>Klein Polder</td>
<td>23 800</td>
</tr>
<tr>
<td><strong>National average</strong></td>
<td><strong>29 300</strong></td>
</tr>
</tbody>
</table>
3.3 Adjacent or influencing structures

Public transport structure

The last decades the mobility of people has increased enormously and is ever increasing. This is mainly due to the economic development of the Western world. These days - within our ever mobile growing society - the environments which we experience as we travel is becoming more and more important (Bertolini and Dijst, 2003). The linkage with public transportation can provide connection to social and economic resources, located relatively far. And in comparison to road-traffic, public transportation is more reliable and efficient in rush-hours (Montgomery, 1998). Also, with social-economic weak neighbourhoods in mind, public transportation offers an alternative far distance transport to residents without a car.

Within the Rotterdam region there are several public transportation networks active, the three networks that function on this region are the train, the metro and the tram. Figure 3.23 shows the transportation hubs within the city of Rotterdam, and the range radiuses they hold in relation to their travelling distance. Also the urban density is depicting within the urban fabric. Within the radiuses almost no coverage is shown regarding the research area. By train this lies just outside the reaches of both Rotterdam Central and Schiedam Central. At the most south part, the area gets a little coverage by the transportation node of Marconiplein. Here the metro and trams holds stops. Noticeable is that for the trams visiting, trams 21, 23, 8 and 4 the later 2 do not continue but turn backwards. By this a motion for further expansion can be depicted, increasing the capacity of Marconiplein.

The public transportation coverage for the area is poor. By it the area, its uses and its users relay mainly on one type of networks of transportation. This is the car road. By not holding the possibility to switch different networks it misses out on well needed vitality.
FIG. 3.23 PUBLIC TRANSPORT NODES
Source: Author, based upon www.bereikbaarheidskaart.nl and Ret.nl
The road structure

Between the numerous amounts of car roads, there is only one car structure that works on a city level and plays a remarkable roll for the area. This is the inner urban ring road, a ring road of high capacity that lies secondary to the city ring highway called the “Ruit” (Diamond) (fig. 3.24). This ring road functions as a connector to various recreational and sport facilities for the north part of Rotterdam. Along this road, various functions can be found, like: “Dakpark” (shopping mall in combination with a park), several sporting fields, two metropolitan parks, a water boulevard downtown, and a canal holding many water recreation facilities (rowing clubs, small harbours). From far, this road structure can be seen as a circular system, but focusing to the research area, there is a distortion. Within the area, the roads diverge from his circular motion and turn to the Beukelsbrug. By this, it flows into the neighbourhood of Nieuwe Westen. In for travellers to use this road as a ring road, they have to face the entanglement of the Beukelsbrug. By its confusing layout of flyovers and stops, it can be very confusing. A smaller but similar experience can be expected for the flyover at the crossing of the Horvatweg and the Tjalklaan. By which users miss the expected linkage to the highway or into Rotterdam (Marconiplein). The ring road that runs through this area lacks the physical coherency to function as a unified ring structure. By this, a chance is missed in a connectivity to be a part of the city.
FIG. 3.24 | AN INNER URBAN RING ROAD DEPICTED WITHIN THE NORTH OF ROTTERDAM
Source: Author, based upon www.bereikbaarheidskaart.nl and Ret.nl
Green structures

On a different type of structure we can see that the area plays an important role into the green structure of Rotterdam. The green structure of Rotterdam consists of Parkway’s. Implemented by the American example, a green road emphasizing the ongoing flow and sometime conjoining with adjacent parks. These parkways designed by Witteveen run from the Delftlands, outside the city, too the meander (rivierbocht) of the Meuse, at the city centre. These linear structures from north to south provide the initial green and water into the city (the Rotte, the Delfshavense Schie, Burgemeester Oudlaan, etc) (fig. 3.23). This can also be seen at the south part of Rotterdam. On a smaller scale a second set of linear structure can be found. These are canals, green boulevards, branches of canals, or other smaller green structure that interconnect between parkways (fig. 3.24). By this a green grid like structure can be found that is originated on the meander of the Meuse.

The project site is located between three of the north-south structures (3.22). The most present: the Schie of Delfshaven, Second: the structure Vroozenpark-Zoo-Heemraadsingel-River park and the newest one and not so depict able at first: Malingeweg-Tjalka-Dakpark. All three have a different configuration and functions. The Schie really function as a canal providing a lot of water into the city which carry boat transport for the Spaanse Polder, but mainly holds recreation and relaxation purposes, most experience able for the pedestrians. The Zoo structure works mainly on an ecological basis, bringing biodiversity into the city. The Tjaklaan structure is more experienced by car-users, as for it is a car road with green/trees adjacent to it. Within the project site we can see a couple secondary structures: The Spaansebocht-park in Spangen and the Essenburgsingel in Nieuwe Westen.

Once reaching the area these structures do not hold the consistent function or configuration. Normally the parkway for the car users has a configuration of active building along the road. But within the area it experience openness. The second parkway, the nice walk along the Schie becomes a walk along the infrastructure entanglement of the Beukelsbrug. Only the ecological parkway works consistent as a result of allotment in the north of the project area. On a closer look, the secondary structure stopped prematurely as a result of the infrastructural knot by the Beukelsbrige.
FIG 3.27 POSITIONING OF THE RESEARCH AREA WITHIN THE GREEN STRUCTURE OF ROTTERDAM

Source: Author
(Vital) adjacent structures
As earlier depicted in the historical analysis, development has stopped at border of the infrastructure. As a result of this there are certain structures to be found within the adjacent neighbourhoods. Within the neighbourhood they functions as meeting places for the whole neighbourhood but reaching the infrastructure the structure or the experience of it suddenly end or dries up.

The Burgemeester de Josselin de Jonglaan
Within the Overschie, the Burgemeester de Josselin de Jonglaan is one of the greater village streets. It runs from the old centre of Overschie in the north past the commercial centre of Klein polder to the highway (fig 3.28). The structure holds shops, public squares, schools, restaurants, church and many more (fig 3.29 & 3.30). However when the structure reaches the highway it shifts from shopping streets to a street without any context (fig.3.31). Only unused plots of lands on both sides with two trees, running to a gas-station.

[FIG. 3.28] STRUCTURE WITHIN THE NETWORK
Source: Author

[FIG. 3.29] HIGHLIGHTED STRUCTURE
Source: Author

[FIG. 3.30] ACTIVE STREET
Source: Google.maps.nl

[FIG. 3.31] ACTIVITIES DRY UP NEAR THE HIGHWAY
Source: Google.maps.nl
**The Franselaan**

This street is on the longest horizontal streets that function as the main connector of the whole neighbourhood (fig. 3.32). This street runs from the train station of Schiedam also to the Tjalklaan, we see a busy street at the beginning of the Franselaan with many shops, a school and restaurants well mixed with residential(fig.3.33 & 3.34). But close we get to the Tjaklaan we see a drying up of the shops and more interruption of the faces of the streets (fig.3.35).
Stadshouderweg/Bergselaan

The construction: Stadshouderweg continuing in the Bergselaan form a great connector for the north part of the city (fig 3.36). This construction holds a lot of connections with other great streets, going to the city centre, small canals, and other shopping streets. This structure holds a mix of shops and housings, but also schools, supermarkets, churches and a metro station (fig 3.37). Although the streets still functions on as a car street, the spacious layout makes it pleasant for pedestrians and bicycles (fig 3.38). However this stops when it continue under the train tracks, turning into an inner urban highway (fig 3.39).
**Industrieweg at the Spaanse polder**

In the Spaanse Polder, the Industrieweg connects besides the greater parts of the roads also three sectors of industries within the industry area. At the north the food sector, at the middle the transport-construction and at the south the design sector with Van Nelle. This street holds a diverse set of economic activities during the day but during the night it is abandoned. The street suddenly stops hitting the train track at the south. A detour has to be made to connect to the urban fabric of area like Spangen or Oud-Mathenesse.

**FIG. 3.41** [ACTIVE ECONOMIC STRONG STREET](Source: Google.maps.nl)

**FIG. 3.42** [DEAD AT THE TRAINTRACKS](Source: Google.maps.nl)

**FIG. 3.43** [HIGHLIGHTED STRUCTURE](Source: Author)

**FIG. 3.40** [STRUCTURE WITHIN THE NETWORK](Source: Author)
The Hoekersingel
The Hoekersingel at the west of the infrastructural residual space is a green blue residential small river (Dutch: singel). It runs from the historical city centre all the way until the edge of the Tjalklaan. Along the water you find squares and residential facilities like school, library and community centres. It provides diversity, recreation and other places for social interaction (fig.3.45). But coming to the residual space we can see that the small river suddenly stops by a building (fig.3.47). After the building we find a busy road (Tjalklaan) without any pedestrian friendly crossing. After the road a barren waste land begins quickly transforming into the sport field of Vreelust.
**The Green ring**

Between the neighbourhood of Blijdorp and the highway runs the Gordelkanaal with its green embankment. This green runs along the “back” of Rotterdam north, although 20 meters wide the structure holds many possibilities to relax and also many faculties for recreation. Harbours, sport club and allotment. The structure originates from the Kralingse Plas. However, after crossing the train tracks the green changes from open to a narrow green corridor without any experience of the water. And no facility that serves the visitor.
3.4 Spatial analysis Vreelust-Blijdorp area

The public realm

“...public realm, the network of spaces and corners where the public are free to go, to meet and gather, and simply to watch one another” (Montgomery, 1998:109)

The public realm of the Vreelust-Blijdorp area positions itself mainly as residual of infrastructure and residual of allotment complexes, industrial sites and sport fields. Within the public realm there are three main places recognized public spaces that can facilitate the gathering of large amounts of people. The Roel Langerak Park, a park between the Beukelsbrige and the entrance of the Blijdorp Zoo. The Oranjeplein, a small square located between Spangen, the railroad and the Schie. And the Spaansebocht, a park located between Spangen and the Schie. Also a small fallow land along the Tjalklaan can be seen. However this area does not hold any facilities for people to gather.

Through this area there are two main canals, the Schie and the Gordelkanaal. However within the experience of the public realm this is hard to find. Industry sites, sheds, dense green or a harbour prevents any contact with the water (fig.3.53). The only experience the public realm has with the water is behind the prison. This along a bike path, without a sidewalk, with poor green and no place for gathering (fig.3.52).
FIG. 3.53 ACCESIBLE PUBLIC REALM WITHIN THE VREELUST-BLIJDORP AREA
Source: Author
Within the public realm (fig 3.53) the car is positioned most dominant. The public realm orients itself on three roads, the Tjalklaan (fig. 3.54-3.55), the Horvatweg (fig. 3.56-3.57) and the Abraham van Stolkweg (which continues as the Kanaalweg) (fig. 3.58-3.59). These roads and its surrounding public realm function isolated within the area. It holds no active borders or the possibility to stop and gather people. The pedestrian experience is pushed aside for the car; some parts hold poor or no sidewalks. Although holding a certain romanticism value, the dense green along the roads prevents any connection (physical and visual) to them. The green, bushes, trees and fallow grass can be considered non active for any users.
FIG. 3.54 | NO ACTIVE BORDER AT THE ABRAHAM V. STOLKWEG
Source: Maps.google.com

FIG. 3.55 | NO PEDESTRIAN PATH AT THE ABRAHAM V. STOLKWEG
Source: Author

FIG. 3.56 | NO ACTIVE BORDER ALONG THE HORVATWEG
Source: Author

FIG. 3.57 | NO HUMAN SCALE ALONG THE HORVATWEG
Source: Author

FIG. 3.58 | NO ACTIVE BORDER ALONG THE TJALKLAAN
Source: Maps.google.com

FIG. 3.59 | NO HUMAN SCALE ALONG THE TJALKLAAN
Source: Author (edited image: www.maps.google.com)
The public spaces

Good public spaces are where celebrations are held, social and economic exchanges take place, people meet and cultures mix (PPS, 2010). Within the public realm of the area there are three public spaces that can facilitate the gathering of larger amount of people. The Roel Langerak Park, the Oranjeplein and the SPAANSEBOCHT Park.

The Oranjeplein

The Oranjeplein, also known as “lokatie Schieoevers” is a square located between the neighbourhood of Spangen, the Schie and the Beukelsbrige. (fig 3.63-2.64) The square (45x100m) serves a residential function with equipment like basketball field, skate elements and playgrounds. When oriented in the middle of space the scale is fairly good. (fig 3.61) The surrounding architecture consists out of four stories tall building blocks makes it pleasant to be. Also adjacent an elementary school is positioned. Although the surrounding architecture holds no semi-place, it is believable that by its size and the adjacent residents this square can be experienced as safe. The square is placed well accessible in the main structure of Spangen. On a smaller scale fences make it hard for wheelchairs to get access, this is probably to protect playing children from cars.

The Roel Langerak Park

The park is located between the entrance of Blijdorp Zoo and the infrastructural entanglement of the Beukelsbrige. By this the both accesses to the park are hidden and unclear. The park itself is 18,3 ha big and holds equipment for educational and recreational activities, like an athletic track, a disc golf course and an educational nature playground. Although the size of the park all the equipment are located in the south part of the park. The size of the open space at the north is quite big (fig 3.62). The design of the park holds little interruptions. Adjacent to the public space there is no buildings and it is surrounded by allotment complexes and sporting fields (fig 3.65-3.66).

The SPAANSEBOCHT

The SPAANSEBOCHT is a circular park (30x650m) located between the railroad of the Merwe Harbour and the neighbourhood of Spangen. Today the park functions as an extension of the new “Dakpark”, a shopping boulevard with a park on its roof. But it ends at the Beukelsbrige (fig 3.67-3.68). At the neighbourhood side every 125-150 meter a well accessible street connects it to area of Spangen. At the side with the elevated train tracks only every 350 meter an opening is detected. The architecture at the neighbourhood side consists out of four stories tall building blocks with balconies. Holding many possibilities for natural surveillance. By it slim and linear shape the scale experienced in the park can be considered cosy (fig 3.68).
**Connectivity**

“A city’s life comes from its connectivity” (Dupuy, 1991).

Salingaros (2003) motivated a small scale urban network to solve the fracturing of cities, by factors, amongst others, infrastructure. The elements within this urban network would be urban nodes, connections between the nodes and the hierarchy amongst these connections. Figure 3.72 shows the hierarchy of roads within the project area. A distinction is made between roads of different scales, roads that function as a connector between districts, neighbourhoods and the streets itself. Already it can be seen that there is no small scale network to be detected within the Blijdorpse Polder or Vreelust. Although within the Spaanse Polder there is an urban network, close to a small scale, it does not match the size of vital residential neighbourhoods.

The Vreelust-Blijdorp area holds several nodes where human activities can gather. The biggest is the Blijdorp Zoo, more precise the new entrance of Blijdorp (fig 3.70). The Zoo handles 1.5 million visitors per year (www.blijdorp.nl). It attracts people from all over the country. Another node within this area is the Mevlana Mosque (fig 3.69), a regular meeting point for Muslims living in the area. Although located within the Industrial area the Van Nelle factory facilitates beside many workers every day also workshops, presentations and events (fig 3.71). At Vreelust we can find a set of indoor and sport facilities, this includes a day care centre, schools, a swimming complex and a social service building. And as final within the area one can consider the sporting fields also as human activities can gather.

Within the hierarchy and the nodes we can see that the greater part of these nodes as located on district transcending and ongoing connections. These connections go from different parts deep in the city, through the area and continue to other parts of the city. In the first place these depict connectivity on a scale best suited for the high speed vehicles, like cars trucks and motorcycles. On a smaller scale we see that the nodes lack a small scale network with the adjacent build-up area. By this connectivity on a smaller velocity holds a poor condition. The time people would have to walk from their house or work to these nodes is long. This holds a barrier for the use of these nodes. But also it is a barrier for these nodes to use its direct vicinity.
FIG. 3.72 HIERARCHY OF THE ROADS AND THE NODES.
Source: Author
Density

The characteristic of the Vreelust-Blijdorp area is that it holds almost no residents. The residents that do live within the area reside on live on floating houses. The Vreelust-Blijdorp area is divided within three smaller legal parts, for legislation and research. The FSI (Floor Space Ratio), density and population structure of the area is compared to surrounding neighbourhoods to depict (rapid) shift, what people experience when visiting this area.

Compared to its surrounding context (fig. 3.73) the area holds very low value when it comes to density. In some way this is to be expected from a big scale industrial area, like the Spaanse Polder. But it is unusual for areas like the Blijdorpse Polder or Vreelust, which is an inner urban area part (that doesn't fully function as a park) of the second largest city of the Netherlands. The presence of people on the streets is harder to find, as residents are not the first use to attract large amounts of people. However areas like Spangen and Oud Mathenesse hold exceptionally high densities even considering it is an inner urban area.

Between the FSI we can see that the build up of the Spaanse polder matches the big single floor warehouses and magazines. But the areas as Vreelust and Blijdorpse Polder hold in comparison the lowest score, where Overschie comes close with its post war architecture.

As a result of the little amount of residents the configuration of the population within the Vreelust-Blijdorp area is not considered relevant. However within its surrounding context the effects of the infrastructural residual space can be depicted.

Within the surrounding population there is no even distribution. In the neighbourhoods adjacent to the area the age group of 25 till 44 or 45 till 64 is a dominated group. The elderly (older then 64) or children (0-24) are poorly represented. Only within Spangen it seems noticeable. The age groups 24-44 and 45-64 implies the working class. People who would leave in the morning for work, only to come back just before the night. Creating a gap within the presence of activities during the day, this could/should be filled up by elderly or the children.

<table>
<thead>
<tr>
<th>Area</th>
<th>Density (PD/sqkm)</th>
<th>FSI</th>
<th>0-14</th>
<th>15-24</th>
<th>25-44</th>
<th>45-64</th>
<th>&gt;64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oud Mathenesse*</td>
<td>16,635</td>
<td>0.867885102</td>
<td>14%</td>
<td>16%</td>
<td>39%</td>
<td>19%</td>
<td>11%</td>
</tr>
<tr>
<td>Vreelust</td>
<td>-</td>
<td>0.508943747</td>
<td>17%</td>
<td>16%</td>
<td>25%</td>
<td>34%</td>
<td>8%</td>
</tr>
<tr>
<td>Wit Dorp</td>
<td>13,492</td>
<td>0.685439741</td>
<td>20%</td>
<td>18%</td>
<td>34%</td>
<td>22%</td>
<td>7%</td>
</tr>
<tr>
<td>Nieuw Westen</td>
<td>15,468</td>
<td>0.212221044</td>
<td>10%</td>
<td>12%</td>
<td>48%</td>
<td>25%</td>
<td>6%</td>
</tr>
<tr>
<td>Blijdorpse Polder</td>
<td>123</td>
<td>0.526322291</td>
<td>5%</td>
<td>14%</td>
<td>31%</td>
<td>35%</td>
<td>14%</td>
</tr>
<tr>
<td>Blijdorp</td>
<td>5,872</td>
<td>0.545732615</td>
<td>10%</td>
<td>10%</td>
<td>46%</td>
<td>20%</td>
<td>13%</td>
</tr>
<tr>
<td>Spangen</td>
<td>16,942</td>
<td>0.880050537</td>
<td>23%</td>
<td>18%</td>
<td>33%</td>
<td>21%</td>
<td>6%</td>
</tr>
<tr>
<td>Spaanse Polder</td>
<td>79</td>
<td>0.37525548</td>
<td>16%</td>
<td>13%</td>
<td>28%</td>
<td>24%</td>
<td>19%</td>
</tr>
<tr>
<td>Klein Polder</td>
<td>5,797</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The area of Oud Mathenesse has been regarded without the Vreelust sport area

Source: Author
FIG. 3.74 THE BUILDING STRUCTURE
Source: Author
Activities
The activities within this area characterize themselves that, by the placement, they do not hold economic and social benefits for the adjacent area. Although by origin they function well within a city. They hold a target group with a global/big range, mainly car users and not local oriented pedestrians and bicyclist. Activities that are regarded of low qualities are used to wrap the infrastructure. Where along the highway the industry of the Spaanse Polder is placed and along the Railroad the allotments are located. The activities that are seen, work at the district level, parks and sport fields are located between the two. And the activities meant for neighbourhoods can be found sporadically where the neighbourhood touches the area.

Gehl (2010) motivated roughly three types of activities: necessary activities, optional activities, and social activities. Where social activities occur as a result of the first two. The necessary activities imply working activities, in the Spaanse Polder and the school/office complex at Vreelust. The optional activities are many within this area, implies more on a recreational basis. The allotments, the sport fields, the Zoo, the Harbour, etc. These activities people would participate if they have the time, motivation and probably if it is nice weather. By implying this idea on the project area a division rises. Adjacent to the highway the necessary activities occur: the industry areas, the municipal yard and the hardware store. On the other side of the division the optional activities are placed along the railroad. Looking back on the relationship between the type of activities and the quality of the spatial environment, the highway is seen more as a negative contributor than the railroads.

Activities during the day consist mainly of working activities, the industries in the Spaanse Polder and a school/office complex at Vreelust. But also recreation and education facilities are open in the south part of the Roel Langerak Park. Although the Blijdorp Zoo is open only a small amount of visitors are expected. Like prior mentioned the greater part of these activities are located near the highway. The night activities are the sport facilities within the area. Soccer, tennis clubs are open for training and additional matches. We can see five parts spread out over the area (mainly active at night). Within the weekends the greater part of the area is active, the Zoo, sport fields, the parks, the harbour and the allotments complexes. Except for the industrial area of the Spaanse Polder.
FIG. 3.79 ACTIVITIES WITHIN THE PROJECT AREA
Source: Author
Mixture of uses
The primary uses of the Vreelust-Blijdorp area depict consist mainly out of two groups (fig. 3.80). The first is the recreation uses, allotments, sport fields, sports harbour can be found. And even the Zoo can be considered as recreation. The second group holds are the work places within the area. There are offices, industries and retail. By these primary uses a large amount of people can be attracted to this area. The secondary diversity to serve the primary function is hard to find. We can only see the hotel holding conference rooms and restaurants as a secondary diversity to the Zoo itself. And sporadically some small snack bars at the Spaanse Polder. A special function in this area can be considered is the Van Nelle, which holds a lot of cultural activities. The uses within the area are strict split into large mono-functional parts. We can see this with the industries of the Spaanse Polder, the recreation part holding the Zoo. And a service blob at Vreelust, with its adjacent sport field, Vreelust can be considered as an area with a mixture on a relative small scale.
FIG. 3.80 LAND USE IN THE AREA
Source: Author

Legend
- Recreation
- Facilities
- Work
Comfort and safety (pedestrian)

Housing facilities for pedestrian and bicycles within an area can motivate people that are more perceivable to come to and go through the area. Which in turn can improve the vitality and social safety; this sequentially can make it more attractive and motive even more people to use this area. This analysis will look in the networks that facilitate a comfortable and safe access for pedestrians and bicycle within the Vreelust-Blijdorp area.

The pedestrian aspect the urban landscape look fragmented, there are gaps to be found within the overall continuity of the sidewalks (fig. 3.83)). At certain point within the network the sidewalk stops and pedestrian are forced to continue on the bicycle path or the car-road itself. At “better” point the sidewalks continue on the other side of the road. The gaps at the Abraham van Stolkweg and along the prison. On the second look the large graining of the network produces gaps in the overall coverage of the area. Certain parts of the area are not supported by the pedestrian network. Although connected by car roads the part and its activity is by definition easy accessible for pedestrians. Mainly these activities hold by definition non-local users. And as last, looking at the pedestrian network that is free of interference of cars there are three parts: the Roel Langerak Park, The Spaansebocht Park and a small open field along the Tjalklaan. Although these pedestrian experience hold great value (comfort and safety), the Roel Langerak Park and along the Tjalklaan cannot be seen as a route which people would use in order to travel through the area. They are chaotic and end in locations of little social value. The Roel Langerak Park end at the parking lot of Blijdorp and the small area along the Tjalklaan.
FIG. 3.83 PEDESTRIAN NETWORK WITHIN THE PROJECT AREA
Source: Author
**Comfort and safety (bicycle)**

The bicycle network depicts itself by the similar, even larger graining of the pedestrian network (fig. 3.84). But in comparison to the pedestrian the higher speed of the bicycle can make the bicycle experience acceptable. This would still leave certain parts of the area less accessible by bicycle. The bicycle within this area functions more for a passing use then really getting to a certain activity within the area. We can see many neighbourhood transcending connections running through the area. The path between the Shie and the prison is the one that excels in this. As for this is a nation bike path connecting running from the rural area of the Delft land through the city. Many of these paths lie separated from the road, this provides a better quality (comfort and safety). Only a small part of in the Spaanse Polder holds bicycle paths that merge with the car road. Although said that these paths hold a passing though function, these neighbourhood transcending parks do not hold any continuity to function as them. Within the area many of these neighbourhoods transcending paths that “curve” of it direct connections optimal directions. Within the network it lacks straight lines that benefit the comfort of the bicyclist.
FIG. 3.83  BICYCLE NETWORK WITHIN THE PROJECT AREA
Source: Author
3.5 Conclusion analysis

After the Second World War, the urban renewal policies of Rotterdam were focused on its harbour and its economic strengths. To strengthen the harbour, big scale infrastructure (that supports the economic viability of harbour) was placed manifold. During this period the construction of infrastructure neglected it surrounding and was constructed as autonomous in its context. This to serve the passing traffic or to build as quickly and economical as possible. By this the residential environment was treated inferior. Today, within the Randstad, Rotterdam is not only the city that holds the most big-scale infrastructure but also rates the lowest in the quality of living. By its infrastructure, the neighbourhoods function separated, from other neighbourhoods or from urban qualities like parks.

The areas of Vreelust and the Blijdorpse Polder are one of these areas that function as the infrastructural barrier, separating urban qualities and neighbourhoods. It is the space residual to the infrastructures of the A20 and the railroads. During history the infrastructure has obstructed the development of the area as a comprehensive and integral part of Rotterdam. And now, it is encircled by neighbourhoods which hold autonomous structures. Between the neighbourhoods; Oud-Mathenesse, Witte Dorp, Spangen, Nieuwe Westen, Blijdorp and Overschie. One the missed chances was by a half finished expansion of Witteveen of Rotterdam north (Blijdorp) at the end of the 1930’s. Although on a large scale the area seems to be in the structures of new development, the reality is that the area or its improvement is not included within any of these big scale developments. On a smaller scale the neighbourhoods with an autonomous structure hold social and economic weaknesses. As a result of the large scale development the area holds good chance for development or even can be expected to be developed in the future. Looking at the adjacent social/economic weak neighbourhoods, this development should be shaped to not just to transform the area but also to be an impulse to improve its adjacent neighbourhoods. By this motion for an integrated development, this thesis implicates the term “urban Regeneration”.

In order to form this area and its development as an integrated part of Rotterdam, two parts are seen within the strategy. The first relates to the integration within the city-scale structures and second to make the area attractive, vital and well connected on a neighbourhood scale. On a city scale the area positions itself on or nearby several city structures. The area is located along an inner urban ring road, which works fragmented inside the area(fig 3.85). The area is located along metropolitan public transportation systems, which hold no reach into the area (fig 3.87). And the area lies between three city green structures, which work inconsistent inside the area (fig 3.84). Also in adjacent neighbourhoods vital structures are depicted that flow in the direction of the area but do not reach it (fig 3.86). By restructuring the area to accommodate these city structures the area can already become a part of the city in a physical way.

On a more neighbourhood level we can see that the area is weak in regards to vitality, attractiveness and connectivity. The area seems to work mainly on a car level, where the pedestrian and bicyclist are treated inferior and it discourages people to come together. Its accessible public realm omits the quality of the water and forces the pedestrian to walk along busy roads. Where even some of these roads lack the sidewalk for pedestrians and mainly hold no borders that serve any pedestrians need. This is supported by the activities; although they are popular by the adjacent neighbourhoods, by their large graining they produce long parts of street without interactive facades. By this users are discouraging to slow down and stay in the area for a longer time then is needed. And although there are nodes for meeting in this area, they are only supported by a large scale network, supporting mainly the car. A small scale network with gradual steps and preferable a slow speed (pedestrian and bicyclist) network is missing. Within the public realm, the entanglement of the Beukelsbrug functions as an obstruction of this. The urban fabric in the area, with the exception of the Spaanse polder can be considered chaotic and sporadic. In comparison to its adjacent neighbourhoods the urban fabric is greatly less dens than its adjacent neighbourhoods. This urban fabric deprives this area of active guidance in use of the area for slow modes traffic. These findings underpin, the statement prior given in the first chapter of this thesis, Vanstiphout (2002) stated that these areas and its development are to serve the car user; its needs and its orientation. Within a (high) dense urban area, where the supporting transportation is mainly all types except the car, this creates gaps within its serving the needs for its direct adjacent neighbourhoods. This step can be seen as one of the larger contributing factors in the degradation of neighbourhoods (Stouten, 2010). Compared to neighbourhoods surrounded and well integrated within other neighbourhoods the use of urban qualities and facilities can transcend the neighbourhood.

Also within the first chapter another statement was made by Heijns (2005) stating that these areas have been developed outside the reach of urban planners and designers. By this the area was developed without the concern of a clear spatial organization/composition or spatial perspective. This is reflected at the program features (referring to the functions) and conditional features. Programmatically the area holds many functions that can be used to support the liveability (vitality, attractively and connectivity) of the area as well as the adjacent neighbourhoods. A park, a mosque, allotments, sport fields/clubs, van Nelle and many more functions can be seen as element that can motivate people to come to the area, have a good time and get access to many social and economic resources. However conditional features to support this, a small scale network, an attractive public realm, a well mixture of uses, a clear structure within the urban fabric, are lacking. At a point of abstraction we sporadically see a certain value (quality) planned for this area, but its implementation lacked the design to ensure it.
By this we can see the hurdles that have to be overcome to improve the vitality, attractively and connectivity of this area. The most potent, the accessibility and experience of the water within the area. By this the urban quality already present can be experience for its users(fig 3.88). Also a hurdle is the big scale network that is only suited for cars (fig 3.85). By a small scale network activities within the area can be more permeable (fig 3.85). The current chaotic urban fabric forces the user to be guided by unattractive and non-active green borders or fences. By increasing the density, guidance can be given to this inner urban public realm.
**FIG. 3.88** PUBLIC REALM OMITS THE WATERFRONT  
Source: Author

**FIG. 3.89** CHAOTIC AND INCONSISTENT URBAN FABRIC  
Source: Author

**FIG. 3.91** NON PERMEABLE OUTDOOR ACTIVITIES  
Source: Author

**FIG. 3.92** BIG SCALE NETWORK MAINLY SUITED TO SERVE THE CAR  
Source: Author
DESIGN
CHAPTER 4

“A specification of an object, manifested by an agent, intended to accomplish goals, in a particular environment, using a set of primitive components, satisfying a set of requirements, subject to constraints”

http://en.wikipedia.org

Wikipedia (n.d.) Design, [online]
4.1 Introduction

This chapter explains the translation of the theory and analysis into a design for the Vreelust-Blijdorp area, which guide the development as an integrated part within the city of Rotterdam. This chapter shows step by step how the design is shaped and by which criteria this is done. First starting point are formulated to which the design process is guided, then the exploration show the possible implementation of these points, by which an urban structure is proposed and from there on this chapter will elaborate on the layout of this urban fabric.

4.2 Design Starting Points

As stated within the conclusion of the prior chapter, there are two parts seen in the spatial strategy, for integrating the Vreelust-Blijdorp area. The first dealing with the structures on a city level and the second dealing with the neighbourhood layout. This chapter starts with the strategy on a city level. By the analysis four default where detected that within design can support the integration of this area; the redesign of the Gordel road, the link and role to the green structures, implementing of public transportation systems and extending vital public structures into the area.

City: The Gordelweg

Within the area the construction of the Tjalklaan, the Horvateweg and the Abraham van Stolkweg function within a grander road structure. The inner ring road of north Rotterdam, this structure follows parallel to the highways and the river and connects Rotterdam and Schiedam. It holds many functions in regards of green or recreational uses. But within the area if functions fragmented and confusing. Looking from the west the Beukelsbrug compels the road system to bended opposite of its direction, to find itself in sucked into an infrastructural entanglement. More west the fly-over with the Tjalklaan makes it impossible to go the highway or south into the city. Restructuring this road system holds two benefits. First the new road can function as a back bone for this development, making the area more accessible for the rest of the city. Second the infrastructural entanglement at the Beukelsbrug can be resolved, creating more “room” for new possibilities.

City: Link and role to the green structures.

Within the green structure of the city, the area positions itself on three parkways which each hold individual purpose and physical conditions. The three parkways considering this area: the ecological parkway of the Heemraadsingel; the car parkway of the Tjalklaan and pedestrian parkway of the Schie. Within the area two parkways work inconsistent. The car parkway that hold an urban configuration with adjacent buildings, experience open green fields within the area. The pedestrian experience of walking and relaxing along the Schie become an infrastructure chaos. Continuing the experience and function of these parkways can be seen as a vital step in the integration of this area. This integration can be seen on many ways as mentally, physically and ecologically if form a coherent part within the green structure.

City: Public transportation network

Although located along a metropolitan public transportation system it is not supported by it. By this a threshold is detected that discourage people to use this area; this includes the use of the social and economic resources as well as the use of this area as a transfer zone to a different type of transport. By implementing public transportation, not only the threshold of this area is reduced for a wider range of people, other adjacent neighbourhoods can benefit. As public transportation nodes transcend the boundaries of the project area.

City: Extending structures and elements

During history, the development adjacent to the area has stopped at the infrastructure. This resulted in structures that can be considered vital within adjacent areas that stop or dry up reaching the area. These structures hold urban qualities that gather a lot of people. Extending these types of spaces is one of the most effective ways to integrate an area within the urban fabric (Su, 2004). Also found within the area there are elements that have the quality to attract people, by extending these as structures to outside the area the same effects can happen.

Neighbourhood: Urban fabric

The current urban fabric is chaotic and sporadic, by this the area lack the active guidance within the public realm. Its users have to rely on unattractive and non-active green borders, fences or ditches. By this social safety and social activity in the area are discourage. Proposing an urban fabric that will guide its users in an active and social safe way can make the area attractive, vital and in a certain way more connected, on this level of the building typology.

Neighbourhood: Accessible and active river front

The development within the Vreelust-Blijdorp area had evolved around its road structure and not around its urban qualities. One of these is the water within the area. There are two canals that run through this area, the Schie and the Goredelkanaal but these are poorly accessible and are not part of the experience in area. Transforming the embankments along the canals to active parts within the public realm two user groups can be attracted. The first are the users of the public space which gather and use it for long periods of time. The second are the users who travel through the area, as for them the water is a continuing element and connects several adjacent neighbourhoods.

Neighbourhood: Mixing within the urban assemble

The current situation holds clusters of outdoor activities that are not permeable. Because of its size they functions as large gaps of vitality within the urban fabric, effecting the social safety and attractiveness of the area. However essential these outdoor activities hold a quality of attracting people to this area. By mixing the outdoor activities within the assemble of the building blocks, the default can be countered and an extra value can be gained in terms of vitality by the mixing of uses.
FIG. 4.01 | RESTRUCTURING OF THE GORDELWEG
Source: Author

FIG. 4.02 | LINK AND ROLE WITH THE GREENSTRUCTURES
Source: Author

FIG. 4.03 | IMPLEMENT PUBLIC TRANSPORTATION
Source: Author

FIG. 4.04 | EXTENDING STRUCTURES
Source: Author

FIG. 4.05 | RIVER ACCESSIBLE AND ACTIVE
Source: Author

FIG. 4.06 | MIXING ACTIVITIES WITH GUIDING URBAN FABRIC
Source: Author
4.3 Design explorations

Within this section an exploration is made in regards to the design starting points of the city level spatial strategy. This exploration regards: The redesign of the Gordelweg and the placement of the transportation hubs. However first an exploration is made in the adaptation of the regional road system in order for the area to be a part of future development.

Exploration: Regional road structure
With the placement of the new A13/16 expansion, the A4 connection and the Blankenburg tunnel (fig. 4.05) the inner urban area of Rotterdam seems to be neglected, especially the Vreelust-Blijdorp area. A connection between the A13/16 expansion and the A4 would provide an alternative route for the noisy and polluting passing through traffic. This traffic mainly consists of trucks from the horticulture and the harbour to the west that are meant for parts of north and east of Holland (mainly the Randstad). By the exploration four versions emerged. The first consists of a short by pass through the industrial area of the Spaanse Polder. (fig. 4.08) This would create a fairly easy construction, as it would be the demolishment of industry buildings. It keeps the greater part of the new connection through the city. The second explores the connection through the Beatrix Park, the city park of Schiedam (fig. 4.09). This has high social value and is still located within the city, also in this version the connection with the infrastructural junction is hard to make. The third version places the connection along the border of the build up area of Schiedam (fig. 4.10). This version is most discussed in policies; the main obstruction given is that the road would block the link to the landscape for the inhabitants of Schiedam. This can be solved by placing the road semisunken with “green-crossovers”. The fourth version shows a similar connection except this extends itself all the way to the Blankenburgtunnel (fig. 4.11). By this a stronger connection is made between the harbour and the city and more traffic is eluded to outside of the residential environment of Rotterdam.

This exploration shows it is possible by the connection to motivate noisy and polluting traffic to the outside of the city. This will be beneficial for the development of the Vreelust-Blijdorp area. Most probable within the exploration are the third and the fourth version. Where the implementation between these would just be a matter of time. As a result of this connection a downgrading of the existing highway, the A13 would envision the improvement of the residential environment.
FIG. 4.07 | NEW REGIONAL ROAD DEVELOPMENTS
Source: Author

FIG. 4.08 | FIRST EXPLORATION, THROUGH THE SPAANSE POLDER
Source: Author

FIG. 4.09 | SECOND EXPLORATION, THROUGH THE BEATRIXPARK
Source: Author

FIG. 4.10 | THIRD EXPLORATION, ALONG SCHIEDAM
Source: Author

FIG. 4.11 | FOURTH EXPLORATION, EXTEND TO THE TUNNEL
Source: Author
**Exploration: The Gordelweg**

The primary exploration is made for the redesign of the Gordelweg, by this the entanglement of the Beukelsbrug can be resolved and a clear structure can be given to the area.

The first exploration (fig.4.12) shows the road parallel to the existing highway. The road is placed along the Gordelkanaal and will hold a bridge just north of the Van Nelle factory. This version has the disadvantage to block the waterfront to users that want to experience the water. Also the connection to the existing road structure at the west would be hard to make.

The Second version (fig.4.13) follows the existing Abraham van Stolkweg and would hold a bridge just south of the Van Nelle (factory) connected to the Schuttervaerweg. This version would hold a better possibility for a train station as the road, which goes all around the city, is placed near the train tracks. However the greater part of the existing road is still located along the water. And just before the bridge, the angle between the road and the water provide an area which is difficult for development.

The third version (fig.4.14) shows the road through the middle of the area, holding the bridge and the possible train connection the same as the second version. By this version the experience of the waterfront is not necessarily blocked and the area just before the bridge can be easily adapted to an urban fabric. The road passes between the new expansion of the Zoo and its parking lot; this could form a barrier for the visitors of the Zoo. But a small scale design like a tunnel or changing the side of the entrance can solve this.
FIG. 4.12 VERSION 1: ROAD PARALLEL TO THE HIGHWAY
Source: Author

FIG. 4.13 VERSION 2: USING EXISTING ROADS
Source: Author

FIG. 4.14 VERSION 3: ROAD IN THE MIDDLE
Source: Author
**Exploration: The train station**

In order to generate more urban vitality, the connection of the area to different types of networks is motivated. This by implementing public transportation hubs. This exploration will look into the placement of the train station as it will forms the hub that will link the area to the greater public network. Within prior planning policies, “Ruimte en lijn” (Atelier Zuidvleugel) the station was already envisioned, but for practical reasons this line was not pursued. This section will give an insight if the train station is to be realised. A preset within this exploration is that the train station is to be realised along the Gordelweg, by this the train station is well connected within the network of Rotterdam. The exploration researches the impact it has on a 1200m radius, same range used in the prior mentioned report, as it probably depicts the maximum walking distance of a train-user. This exploration continues by assessing the three step structure linked to the trains ration. Consisting of the main, secondary and tertiary road that embedded the train station.

The first exploration (fig.4.15) places the train station between the neighbourhoods of Oud-Mathenesse and Spangen and it is oriented on the Industrieweg which is one of the ending structures stopping at the infrastructure. It shows the Industrieweg and the Spaanseweg as the main vertical connector and the Schuttervaerrweg as the horizontal connector. By this placement great connectivity is provided to the neighbourhoods of Spangen and Oud-Mathenesse as well as the Industrial area of the Spaanse Polder.

A second exploration (fig.4.16) shows the station between the Nieuwe Westen and the train tracks. This spot has a lot of space for its development, and within the last century there were plans to place the central station of Rotterdam at this spot. However the urban fabric shows that the connectivity is gravely limited by the existing urban fabric and the river.

The third placement (fig.4.17) is between the neighbourhood of Spangen and the Van Nelle factory. By this the Schuttervaerrweg will function as the main connector. By this only a superficial part of Spangen is connected and though the Spaanse Polder is by this connected they remain

Within this exploration the canal, the Schie, has come out as the big obstacle for connectivity of placing a train station. If the train station is placed along the embankment it mainly serves on side of the canal. Also within the exploration one can see the absence of a small scale network that can support this.

By an extra exploration of the tram and metro network, an added value is found to place the train station at the Industrieweg. By this the travellers of the train can continue on a different public transportation network (and vice versa). The placement along the river and close to build up area would make the connection more difficult. (fig 4.18 & 4.19)
FIG. 4.15 STATION AT THE INDUSTRIEWEG
Source: Author

FIG. 4.16 STATION AT NIEUWE WESTEN
Source: Author

FIG. 4.17 STATION AT VAN NELLE
Source: Author

FIG. 4.18 OLD PUBLIC TRANSPORTATION NETWORK
Source: Author

FIG. 4.19 NEW PUBLIC TRANSPORTATION NETWORK
Source: Author
4.4 Urban structure

The Gordelweg
By the new placement of the new inner urban ring road, the road omits the water front and is placed within the middle of the project area. By this two urban qualities are realized. First, the road functions and is seen as one continuous road, the second is the resolving of the entanglement of the Beukelsbrug. By this vitality on the road can be depicted, as because of it better functioning as a city structure more (car) users are using this structure. By this they omit the busy, congested city centre. Sequentially a more attractive direct adjacent area can be imagined as the cluttering of infrastructure is replaced with an optimal form (fig.4.20).

The new public transportation system
The new train station is placed along the Industrieweg in the Spaanse Polder, as it provide the most connectivity and a certain quality can be given as it is one of the structure argued to extend within the project area. Within this new transportation system the train station is supported by the connectivity of the metro of Rotterdam. By extending the metro tunnel, which now arise from Marconiplein and flying over the Tjalklaan and the Horvatweg several qualities can be gained. Amongst it is the improvement of the direct adjacent area, in the sense of view, noise and pollution. Also the new train station is supported by the extending of the existing tram system. Tram four and eight are now ending at Marconiplein, extending this hold several advantages. One can think about the possible transformation of the remaining Spaanse Polder into residential neighbourhood. On a different thought the tram can be the first start of extending the public transportation system of Rotterdam to its airport. Which now is only easy accessible by car (edbr, 2008). Another tram extension within the proposed public transportation system is the new tram 11 line. The first tramline of Rotterdam, completed in 1917 provided public access to the Zoo of Rotterdam. However by the upcoming of the metro it lost function in 1967. Extending this into the area can also be one of the first steps in fulfilling the ambition of the municipality of Rotterdam, connecting Overschie to the city by a tramline. Also this can provide a new stop at the entrance of the Zoo. (fig 4.21)

Extending neighbourhood structures
By creating structures that extend into or out of the area, it can become embedded with the life of the city (fig 4.22). As a result of the vital ending structures in adjacent neighbourhoods and the elements within the area seven main structures are formed. The first is the green public space around 20 meters in with, along the waterfront (fig 4.22:1). This is formed by the extension of green along the same canal in the neighbourhood of Blijdorp. By the second extension, the experience of the inner city highway is transformed to the continuing of the city boulevard of the Stadshouderweg (fig 4.22:2). An additional result and chance to this, is that the road loses its feature as an infrastructural barrier. The third structure is formed be extending and connecting the exiting water surfaces in the project area (fig 4.22:3). The water of the harbour, the Roel Langerak Park and the Heemraadsingel, linked together form and strong water structure inside the city, holding many opportunities for recreational and living. This additionally gives a possible solution for the water storage problems that Rotterdam need to take. By extending the shopping street of Kleinpolder along to the Aelbrechtkade in Nieuwe Westen a fourth structure is formed (fig 4.22:4). By this the centre of Kleinpolder is connected to a street holding offices and shops that run into all the way into the historical centre of Delfshaven. The fifth structure (fig 4.22:5) is an extension of the green public space along the Schie, this runs green public space runs across Delfshaven en now extended end at the Van Nelle factory. This can be seen as a pedestrian entrance to the area. The sixth structure (fig 4.22:6) arises from the connection between Van Nelle and Sparta stadium. By this two urban nodes that hold many visitors are connected. This street can become a vital structure between Spangen and in the future developed part of the Spaanse Polder. The seventh and final structure (fig 4.22:7) is formed by connecting two vital structures within two adjacent neighbourhoods. The first is the Industrieweg of the Spaanse Polder the second is the shopping street (Fanselaan) of Oud-Mathenesse. By this connection the shopping street is linked with the train station and the main street of the Spaanse Polder. By extending these structures into the area an urban fabric is formed by which physical integration of the project area with its adjacent neighbourhoods can be seen. Whereas prior these structures were vital for the neighbourhood they were placed in, now they provide access from these neighbourhoods into the project area.

Accessible waterfront
Within the area the public realm omits the urban quality of the water. By reshaping the existing Roel Langerakpark to a park adjacent to the Schie, not only its direct context is improved as an accessible waterfront, it can work as a link between the neighbourhoods of Nieuwe Westen and Klien polder. By this park a green and attractive recreation element is placed through the area that can attract large amount of people and serve as a recreational “backbone”for this part of the area. Besides making the waterfront of the Gordelkanaal accessible, a quality is made by implementing a green embankment along within the harbour inlet of the Spaanse Polder. (fig4.23)

Link and role of the green structures
Although within the prior design elaboration of the accessible waterfront a first step is formed of strengthening and connecting the green within the area. A more developed look should be given in order to integrate the area within the city green structure. For the primary structures two additions are implemented. The Tjalklaan (west) is to be guided by the closeness of buildings, also providing a sound barrier for the busy road. At the west, the ecological parkway is to be strengthen by open green fields. However in order to fully integrate the area within the green structure secondary green links are placed. The hoekersingel is extended and connected to the Spaanse bocht park, which extend to the Schie. The Essenburgsingel is to be strengthened. As final link between parkways a green strip is placed along the railroad, to serve between the Tjalklaan and Schie.
FIG. 4.20  REDESIGN OF THE GORDELWEG
Source: Author

FIG. 4.21  IMPLEMENTATION OF PUBLIC TRANSPORTATION SYSTEMS
Source: Author

FIG. 4.22  EXTENDING ADJACENT STRUCTURES
Source: Author

FIG. 4.23  RESHAPING THE ROEL LANGERAK PARK FOR ACCESSIBLE WATERFRONT
Source: Author

FIG. 4.24  ADAPTING TO THE CITY GREENSTRUCTURE
Source: Author
FIG. 4.25 MERGING OF THE DESIGN ELABORATIONS
Source: Author
Urban structure: public space, water, roads
The main urban structure is formulated by the merging of the design elaboration. By the downgrading of the A20, two flyovers are downgraded to equal crossings, the Tjalklaan and the new Stadshouderweg (fig 4.26:1-2). But also two new crossing are implemented. First with the Industrieweg (fig 4.26:3) holding the function of train station. And the second with the new road along the Schie (fig 4.26:4). All four of these provide linear access to the deep into the city. The new restructured inner urban ring road serves as a secondary circular road, linking these flows of traffic to the edge of the city centre and Schiedam. Within the area several buildings are to be preserved, for as they hold an urban qualities that are of historical or social value. Amongst these is the Van Nelle, The Zoo, its hotel, the mosque and several stores in the Spaanse polder as they hold commercial value.

Within the urban fabric and by its context five unique major divisions are depicted, each holding its own relation with the new urban structure and its context. This plays an important role in the search for its applicable urban fabric. The first division is Vreelust (at south west), defined by Spangen, Oud Mathenesse and the train tracks. The second is north of that, the Spaanse Polder as a result of its existing industrial urban fabric. Third is the urban fabric responding to the new Roel Langerak Park. The fourth is the new active recreational and residential water at the Blijdorp Zoo. And finale between the train tracks, the city boulevard and the Gordelkanaal an division is located next to the Vroezenpark.
Clusters within the urban fabric
This section will give a more elaborated vision of the divisions and by doing so motivate conditions by which the proposed urban typology should respect.

Division one: Vreelust
Within the new urban structure Vreelust (fig. 4.27) is located between the Tjalklaan, The train tracks with the new train station and the Spaansebocht Park. The Hoekerersingel is extended through the area connecting the Spaansebocht Park which extends to the Schie Parkway. In the middle of the division, the Industrieweg flow into the Franselaan while it branches of into Spangen at the Bilderdijkstraat. Along the Tjalklaan builds must guide the car users. Spangen and Oud-Mathenesse hold high density looking at urban fabric and population. The current Vreelust is a chaotic cluster of occasional green, sport fields and buildings. In order to strengthen the urban structure between these inner urban areas a building typology should be implemented which give spatial guidance to its public space for the visitors while providing secluded area for its inhabitants.

Division two: Spaanse Polder
Besides that the development of the Spaanse polder will be based upon transforming its existing urban fabric it is located along several strong elements of the new urban structure (fig. 4.28). These include the train tracks (with station), the new downgraded highway, a public accessible harbour inlet, several existing buildings and a reshaped inner urban ring road with a green strip along side it. Remarkable is the amount if infrastructure and other elements that provide stress for its users. By this an urban typology should be search which has proven successful for industrial transformations. These often include large size a building that is in a certain way is permeable and will offer inside large size of semi-public space for its residents.

Division three: Roel Langerakpark
This division is formed by its adjacent park (along the Schie), the downgraded highway, grand water surfaces at the west and the build up of the neighbourhood of Nieuwe Westen (fig. 4.29). This division is pierced by smaller structures: the Gordelkanaal, the reshaped inner urban ring road and the train tracks with a secondary green strip. Although other elements are present the greater quality that can carrier this development is the urban park and waters. Within the typology a focus must be made in order to guarantee this quality. By this, the typology should achieve a relationship with the park and water. This implies a typology that is permeable of the park and water users and yet provides clear borders that defines and strengthens is. Within this view and experience of the water and park is important.
**Division four: The Blijdorp Zoo**

By expanding the surface water of the harbour, Roel Langerakpark and the Essenburgsingel and new division is formed (fig. 4.30). By its context this division holds an isolated image, the division is surrounded by elements which hold poor permeability. This is seen in large scale elements like the Zoo, the canal or the down graded highway but also the urban fabric of Nieuwe Westen does not hold any great continuing public streets toward the division. By this, the urban structure is defined by the (yet to be develop) urban fabric of the third division of Roel Langerakpark. Also by its disconnected position within the city high density can not be seen as a plausible soluition. The search for the characterised typology would be focused on low density typology in combination with water.

**Division five: Vroezenpark**

The Vroezenpark division places itself along several “urban” and several “nature” elements. Within the urban element there are the train tracks and the new city Boulevard. And within the nature elements there are the Schie with its green embankment and the Vroezenpark (part of the ecological parkway) (fig. 4.31). This division is therefore in a struggle, the urban structure motivates open and green fields but the urban stress should be avoided to guarantee spatial quality within the residential environment. The proposed typology set out to find open urban fabric that provides certain seclusion or barriers against the urban stress.
4.5 Research urban typologies

This section will give an analysis of several urban typologies. Within this a search is made in the elaboration of the dimensions regarding the urban fabric to be applied in the five divisions.

Amsterdam-south of Berlage

This first urban typology in the analysis that is chosen is known as Amsterdam South. This is a famous urban fabric as it designed by H.P. Berlage. The typology is a triangle shaped assembles between two diverging city lines, a busy street and a green boulevard. By its composition both lines are guided by 4 to 5 storeys tall building blocks around 300 meters long. Within the urban fabric three roads merge and the urban fabric is divided into three parts. All three parts have their own open (public) space. In the “tip” part two linear building blocks a triangle open space is form. This open public space is more accessible as one side lies open along a continuing road. In the two other part the two open spaces is formed by the enclosure of two building. By the deformation within the buildings a zig zag within the open space is formed which it secluded and yet a certain flow remains within the open space. This is reflected within the internal circulation, where the open space at the tip functions as the centre. Where view, walk and road lines come together. This is strengthening by a 12 storeys tall building. The whole internal circulation is guided by 4 to 5 story tall buildings.

Size urban block: 45x300m
Residential per hectare: 334
Storeys: 4-5
Year of construction: 1927-1929
Urban design: H.P. Berlage

![Urban Fabric in Context](Source: Author)

![Internal Routing Urban Fabric](Source: Author)

![Characteristice Building in Assamble](Source: Google.maps.com)

![Ariall Urban Fabric](Source: http://daviddekool.nl)
Stadstuinen (Kop van Zuid)

A recent development in Rotterdam is the transformation of its inner city harbour to an extension of its city centre. A part of these development is the “Stadstuinen” is a mix use urban assemble located along one of the main connecting streets between north and south of Rotterdam. This typology depicts itself as a typology that holds a strong relationship with the busy street. Eight storeys tall building with shops at the ground floor provide a monumental experience from the streets. Forming a barrier to provide seclusion for its inside inhabitants. A rectangle shaped grid provides the inhabitants to choose easily between the intensity of the streets, the tranquility of the park in the middle or the water at the back. Within the north south connection of the grid three storeys tall housing provide the guidance on a human scale. While along the urban park four storey tall apartments provide intensity to the public space. Within north south connections of the grid they are very few connections for cars to the shopping street making these connections oriented for its inhabitants. The open green public space within the fabric is placed central within the grid.

Size urban block: 55x118m
Residential per hectare: 123
Storeys: 4-8
Year of construction: 2000-2001
Urban design: DS+V

[FIG. 4.38] URBAN FABRIC IN CONTEXT
Source: Author

[FIG. 4.39] INTERNAL ROUTING URBAN FABRIC
Source: Author

[FIG. 4.40] CHARACTERISTICE BUILDING IN ASSAMBLE
Source: www.kcap.eu/nl/

[FIG. 4.41] ARIAL URBAN FABRIC
Source: Bing.maps.com
[FIG. 4.42] URBAN FABRIC IN ITS LARGER CONTEXT
Source: author

[FIG. 4.43] DIMENSION PLACED ALONG SIDE ITS CONTEXT WITHIN AN AXOMETRIC
Source: author
Within the north of Rotterdam the urban fabric of Blijdorp (the neighbourhood) holds a strong accessible relationship with its adjacent urban park, while maintaining a physical strong border of the park. Besides the urban park, the assemble is also located between a canal, a busy city road and different part of its neighbourhood. By a rectangular grid that is placed right angled upon the park easy access is given for the whole neighbourhood to it. Within the urban fabric the building block are placed to serve these connections and to minimize the stress from the traffic of the city road. Within the grid a green strip that runs to the canal provide an extra quality to the interior of the fabric. This green strip is within the building height accentuated, where as the whole neighbourhood consist of four story tall urban blocks, along the green strip it is heightened to five. This is similar to the blocks along the city road, as to form a barrier for noise and stress.

Size urban block: 44x94m  
Residential per hectare: 101  
Storeys: 3-5  
Year of construction: 1934-1935  
Urban design: Witteveen
FIG. 4.48 URBAN FABRIC IN ITS LARGER CONTEXT
Source: author

FIG. 4.49 DIMENSION PLACED ALONG SIDE ITS CONTEXT WITHIN AN AXOMETRIC
Source: author
Java islands
A successful urban typology within the urban environment which holds a relationship with the water is Java islands. By the harbour transformation within the urban area of Amsterdam this strip of land was to be developed as a residential environment. This urban fabric consists out of large buildings blocks, around 90 by 135 meters which is placed perpendicular (right angled) on the water front. By this the street network encircles one building block at a time. By their great size the interior of the buildings hold large public spaces that give the secluded room for its residents.

Size urban block: 90x135m
Residential per hectare: 108
Storeys: 5-10
Year of construction: 1934-1935
Urban design: S. Soeters
[FIG. 4.53] ARIAL URBAN FABRIC
Source: Bing.maps.com

[FIG. 4.55] DIMENSION PLACED ALONG SIDE ITS CONTEXT WITHIN AN AXOMETRIC
Source: author
GWL Amsterdam

The first characteristic of this typology is the eight storey tall wall-like building wrapped around the north and west edge of the site. It functions as a barrier between the adjacent industry or the busy road and the interior of the site. Its apartments are oriented away from the industries and road and face the interior of the fabric. Within the interior of the site multiple buildings are placed that are significantly smaller, these only contain five stories. These are oriented with their short side toward the east side of the site, which faces a less intense car road then the one at the north. The smaller buildings are placed within an open setting with a distance around 25 meters between each building. The internal circulation does not allow any car users within the interior of the fabric. The internal circulation depicts only pedestrian paths inside the fabric. This is within two directions: the first horizontal (east-west) and the second vertically (north-east). The vertical pedestrian paths are straight and function as the extension of the adjacent streets. The vertical however flow in a curved manner and graceful connects several vital spot within the fabric. This include several exist and a restaurant and or social centre. Along the lesser intense road a staggering of buildings providing squares on which urban functions are positioned. But within the fabric this stage ration results in gardens, allotments and other green.

Size urban block: 18x30m (small) 13x325m
Residential per hectare: 93
Storeys: 5 (small) 10 (big)
Year of construction: 1993-1998
Urban design: KCAP
FIG. 4.60 URBAN FABRIC IN ITS LARGER CONTEXT
Source: author

FIG. 4.70 DIMENSION PLACED ALONG SIDE ITS CONTEXT WITHIN AN AXOMETRIC
Source: author
4.6 Implementation of the urban typology

Cluster 1: Vreelust

The main urban structure (fig.4.72:A) of the Vreelust division constrains four main elements. The Tjalklaan, a busy streets functioning as the main connector to or from the highway. The Spaanse Bocht Park, an urban park that function as a secondary line within connecting two parkways. And elevated rail road, where upon the new train station is located and the extension of the Hoekersingel which can also be seen as a secondary line as it flows mergers with the Spaanse botch park. Within the implementation of the urban typology a spatial guidance by building is of both Spaansebocht park and Tjalklaan is requested. This is respect by the first line of typology placement (fig.4.72:B). Along the Tjalklaan a six storey tall facade is created. By which the first ground parking is placed to provide extra height by which extra seclusion and additionally upon the extend garage a roof garden is formed (fig.4.71:A). At the top of the building a roof terrace is formed to block more stress from the street and give the resident an open space away from the street. The Spaansebocht park and the Hoekersingel hold five storey urban typology that hold at the ground level a public function (fig.4.71:B). Above this the residents enjoy the view of the park by extra balconies or a roof terrace facing towards the park. A small stair would provide access to the garden at the back of public function. This wall is taken open for the secondary line (fig.4.72:B). Along this line urban buildings from five storeys tall are placed. At the ground level this holds public functions, by this the residential layers are lifter up from the busy streets (fig.4.72:D). Also facade of the public function is placed laid back by the main facade. By this the residential facades hold a more omitting position for the stress of the street. After this accents are formed that serve the (desirable) intensity of its direct urban elements (fig.4.72:E). By lying back of the typology nearby the train station a square is formed to serve the flow of the station. Nearby Marconiplein and Sparta stadium small clusters of typology are shaped into single blocks that can serve the intensity. By the last step an inner circulation (fig.4.72:F) is placed within the buildings that is continuous and hold the (new) urban blocks of Marconiplein as an icon (fig.4.71:D).
Cluster 2: Spaanse Polder

The division Spaanse Polder is similar located along a strong urban structure (fig.4.74:A) where spatial guidance and secluded interiors are important for its success. Amongst these we can see the train tracks, the Tjalklaan, the downgraded highway and a green public harbour inlet (part of the new park). The relationship with the urban fabric is directly motivated by the first line within the urban typology (fig.4.74:B). That facilities seven storey tall building (fig.4.73:A) that facilitates parking, public functions and high density. By the urban fabric further away from the train station these public function will be transformed to two or three stories of offices (fig.4.73:B). As a result of the Industrieweg and the new structure between the Van Nelle and Sparta stadium opening will be made for traffic and view lines (fig.4.74:C). These structures will be spatially guided by similar building, as the train station requires/motivates a high density in its adjacent surroundings (fig.4.74:D). However, parking does not need to be facilitated within the ground level as it doesn’t motivate heightening by non-residential program (fig.4.73:C). The stress is remarkably lower within these secondary lines. And a quality can be made for the public functions that can use this secluded space to its advantage (restaurants, schools daycares, etc). Within the primary line an offset can be made to facilitate the flow out of the train station (fig.4.74:E). The urban typology is competed by two sets of buildings (fig.4.74:F). The first a modern (present day version of a three storey tall row-house (fig.4.73:D). By this a residential parking is placed at the ground floor together with a roof garden on top. And a compact garden is placed at the front, which plays a contribution to green within the street view. At the green open spaces at the secluded parts, the typology is completed by 4 storey tall apartment blocks that holds a view of the green space or the green gardens described by the first set of buildings (fig.4.73:E). Additionally single buildings blocks are place to support the secondary green structures.

FIG. 4.73 URBAN TYPOLOGIES USED WITHIN THE IMPLEMENTATION
Source: Author
FIG. 4.74A CONCERNING URBAN STRUCTURE
Source: Author

FIG. 4.74B RESPONSE TO THE URBAN STRUCTURE
Source: Author

FIG. 4.74C RESPONSE TO SECONDARY LINES
Source: Author

FIG. 4.74D TYPOLOGY ALONG SECONDARY LINES
Source: Author

FIG. 4.74E ACCENTS TO SERVE URBAN ELEMENTS
Source: Author

FIG. 4.74F TERTIARY TYPOLOGY TO SERVE THE INTERNAL CIRCULATION
Source: Author
Cluster 3: Roel Langerak Park

The concerning urban structures that hold a great influence upon the urban typology for the Roel Langerakpark division are the water and the new (restructured) urban park (fig.4.76:A). Also the train tracks, the downgraded highway, green around the Gordelkanaal and urban fabric of Nieuwe Westen. Reacting upon this the first line within the implication of the urban typology (fig.4.75:A) a seven story tall building line is depicted that form four secluded interior areas (fig.4.76:B,C). Between the downgraded highway and the Gordelkanaal, between the Gordelkanaal and the restructured inner urban ring road, between the ring road and the train tracks and between the train tracks and the existing urban fabric of Nieuwe Westen. If placed not along a vital road an extra split level floor can be added upon the seven stories tall buildings by which extra height is added without losing the connection with the street (fig.4.75:B). This floor would probably hold storage function for its residents. The primary line open to support access and view by two things (fig.4.76:C). The first is a set of seen strips that flow from the park into the neighbourhood. Making the neighbourhood permeable and connected to its park. The second a strip of sporting fields place perpendicular (right angled) on the ring road. The placement of sport fields in this position can be motivated by several qualities. Beside the fact that this would place the sportfield integrated permeable within the neighbourhoods and its green strips, a active north south connection is detected that can function as the sport-backbone of the new park. And by this it would be vitality placed along the sport field and yet would not disrupt the continuity within the buildings along it (fig.4.76:E). Along these sport fields an urban typology is placed that can provide a residential quality despite the interference of the sporfields(fig.4.75:C). Residents at the ground level enjoy from its own back garden and residents above that enjoy its roof terrace.
FIG. 4.76A CONCERNING URBAN STRUCTURE
Source: Author

FIG. 4.76B RESPONSE TO THE URBAN STRUCTURE
Source: Author

FIG. 4.76C RESPONSE TO SECONDARY LINES
Source: Author

FIG. 4.76D ACCENTS WITHIN THE URBAN COMPOSITION
Source: Author

FIG. 4.76E RESPONSE TO ACCENTS
Source: Author

FIG. 4.76F TERTIARY TYPOLOGY TO SERVE THE INTERNAL CIRCULATION
Source: Author
Cluster 4: Blijdorp Zoo
As said before the cluster near the Blijdorp Zoo is mainly definable by the Roel Langerakpark cluster. Large scale elements like the Zoo and the buildup in the north of Nieuwe Westen prevent any continuing vital connections to or from this cluster. The effecting urban structure consist out of the new city boulevard and Roel langerakpark cluster. The first respons to this is are six storeys tall L-shaped buildings along the city boulevard. These can function as a border, to guide the city boulevard and provide seclusion for the cluster. Along the Roel langerakpark cluster the buildup is continued into detached urban villa’s. That hold a maximum of three storeys as it provides an open and green setting. The buildings that are placed along the secondary line, the new inner urban ringroad, hold the similar setting as the city boulevard. Also six storey tall buildings should provide guidance to the ringroad and seclusion to the rest of the cluster. To respond to the roellangerakpark cluster the urban villa’s are reorganised along the green strips of its green strips. By this the villa’s are connected to the vitality of its neigborhing cluster. At its length the cluster a pedestrian/bycicle path is made that connects all urban villa’s and make the end each set of villa’s public accesible.
FIG. 4.78A  CONCERNING URBAN STRUCTURE  
Source: Author

FIG. 4.78B  RESPONSE TO THE URBAN STRUCTURE  
Source: Author

FIG. 4.78C  RESPONSE TO SECONDARY LINES  
Source: Author

FIG. 4.78D  ACCENTS FROM OTHER DIVISION  
Source: Author

FIG. 4.78E  PLACEMENT OF PEDESTRIAN PATHS  
Source: Author

FIG. 4.78F  IMPLEMENTATION OF WATER  
Source: Author
Cluster 5: Vroezenpark
The division Vroezenpark hold to type of urban structures which upon the urban typologies has to react. This is the urban structures, holding stress: the train tracks and the downgraded city highway, to a city boulevard. Within the typology this is directly taken care of within the first line. This contains an eight storey tall wall like building that shield the interior of the division and the provide the possibilities to house functions and residential. Along the train tracks the housing is oriented to its interior and along the new city Boulevard the housing hold a through view oriented as well on south as on north. Along the nature structure within the division a different approach is motivated. Single five storey tall housing blocks stands spread out, aligned by pedestrian roads that are connected to the green public space along the Gordelkanaal. This within the rule that every pedestrian path is an offset of 50 meters which holds two rows of single buildings blocks. By this a permeable urban fabric is depicted, not just for pedestrian but where biodiversity can flourish. By the secondary line room is made, as well within the wall like building as within the fabric of single blocks will be opened and several single building blocks. By the single blocks a staggeration along the secondary line will make the experience along this road very diverse. Within the fabric of single blocks a triangle is bit of to provide a centrality along the water. This triangle is oriented upon the current tennis club in the Vroezenpark. By this a passage thought the wall like building provides extra quality, by the linkage of the tennis club and the water. This passage can be constructed the putting back of a part of the wall like building. The last step in implicating the urban typology is rearguing of the single building blocks to form an internal circulation of pedestrian curved paths in the north south directions.
FIG. 4.80A CONCERNING URBAN STRUCTURE
Source: Author

FIG. 4.80D RESPONSE TO SECONDARY LINES
Source: Author

FIG. 4.80B RESPONSE TO THE URBAN STRUCTURE
Source: Author

FIG. 4.80E ACCENTS TO SERVE URBAN ELEMENTS
Source: Author

FIG. 4.80C RESPONSE TO SECONDARY LINES
Source: Author

FIG. 4.80F TERTIARY TYPOLOGY TO SERVE THE INTERNAL CIRCULATION
Source: Author
4.6 Urban design

FIG. 4.81 CURRENT SITUATION
Source: Author
FIG. 4.82 PROPOSED MASTERPLAN
Source: Author
Demolishment

In order for this development to happen a large amount of buildings will have to be demolished. Looking at the area that covers it hold around 1 494 727 square meters. Amongst this a large number of buildings are industrial buildings.

[FIG. 4.83] BUILDINGS AND ROADS TO BE DEMOLISHED
Source: Author
Program

The program can support the integration upon several levels. Within the overall residents are placed. Within its connectivity, urban quality and location the transformation to a residential environment is highly probable. As it is also is one of the last areas within the inner urban area that does not hold the residential function. Within the design, the facilities are place along several streets that connects. Running from neighbourhood to neighbourhood on a north south connections. Within this, strong and long streets support the a mixed use, residents living above a secondary function. these streets connect to other streets with a mixture residents and offices or shops. we can see that in the Franselaan in Schiedam, the Josseling de Jong straat with Aelbrechtskade and Kedichemstraat with Stadhoudersweg. Along new and shorter streets urban facilities that hold a more neighborhood level are placed. All streets holding some amount of facilities are connected to the new inner urban ring road. By this every function holds certain connectivity with the city, as is only takes one turn from the ring road to access these functions. Also by this an intense urban program is added along the ring road and within the area but by the two sided of its connections several targets group can come to this area (from the city or the adjacent neighbourhoods) and yet this would not cause an overcrowdedness within the traffic system.
CONCLUSION
CHAPTER 5

“The proposition arrived at by logical reasoning (such as the proposition that must follow from the
major and minor premises of a syllogism)”

http://www.dictionary30.com

Dictionary30.com (1993) Conclusion Meaning and Example Sentence: Meaning, definition,
5.1 Introduction
This thesis sets out to find spatial strategies and urban design interventions that can urban regeneration by the integration of the infrastructural residual space within its city. The term urban regeneration used within this thesis comes close to the description Hajer (1993) gives. The approach aimed to provide social benefits for the residents of the neighborhoods adjacent to the project area, by attempting to link the economic and social welfare benefits of development projects. The next section sets out to answer the main research questions of this thesis:

"What spatial strategy and urban design intervention offer urban regeneration by the integration of the Vreelust-Blijdorp area within Rotterdam?"
5.2 Reflection of the design

Within this section the design is reflected against same conditions earlier used to explore the project area. By the prior given analysis it was concluded that it functioned as a gap within the urban fabric of Rotterdam. The area main functioning was to serve the car user and its needs, not the pedestrian or the bicyclist. There are hardly any (strong) points where people can gather. By reflecting it next to the current situation, the quality of transforming the area by the spatial strategy and urban design intervention can be assets.

Regeneration within its position

The regeneration of the Vreelust-Blijdorp area within its position can be seen as a missing link in merging several residential environments upon several levels. Upon the level of the Southing it can serve as a first start in the regeneration of the whole Spaanse Polder. As the Spaanse Polder is a large industrial area that is located between the several residential environments, it plays a vital role in the merging and functioning of whole a whole city. This on several levels. Upon the level of the South wing is can function as a merging between the cities regions of The Hague and Rotterdam. Upon the level within the city region of Rotterdam it serves as a merging link between Rotterdam a Schiedam. And on an even smaller level it serves as the link between Overschie and the city centre of Rotterdam.
Regeneration within the Public transportation system.

By the regeneration of the Vreelust/Blijdorp area within the public transportation system improvement are found that not only integrate the project area within the public transportation system. But within the coverage of the new additions of the transportation systems residents outside the projects area are affected. One of the areas that can benefit from this is the neighbourhood of Spangen. Currently by its density and disconnectivity it is a crowded neighbourhood that without the accessibility for its residents to move outside of its boundaries.
**Regeneration within the road structure**

The regeneration of the Vreelust-Blijdorp area within the inner ring road provides not only a linked but a complete ring structure. The regeneration depicts a diversification and an intensification of program along the road. The current situation of industries buildings and sport fields is transformed to a residential working and living environment that hold urban functions which can benefit the whole city. Functions as Blijdorp, the new train station and Van Nelle become located along the road that stands connected with the city. While functions as the Mosque will be neighbourhood oriented. By the restructuring of the ring road a grids is formed that can switch easily between the city (and the region) and its neighbourhoods. Additionally the regeneration also provides a more efficient way to connect the inner urban ring road to the highway.
**Regeneration within the Green structures.**

By the regeneration of the Vreelust-Blijdorp area more continuing and stronger green structures are depicted, they hold the functions and the conditions that support the use by which it functions outside the project area. This is seen as the continuing of the Tjalklaan remains under the guidance buildings. By this not only cars are better guided towards the highway, the buildings provide a better seclusion for the neighbourhood of Spangen. Along the Schie the new Roel Langerakpark does not only provide a continuing of the public space along the Schie but it can function as a transition between for city dwellers and the landscape. Motivating not only the city dwellers to experience the landscape but the inhabitants with the rural area to visit the city. At the north the regeneration of the area not only expand/ strengthen the ecological parkway but a provide a more open and diverse green. In the middle of the project area the water can be seen as a combination of both, recreational public water also part of an ecological connections.

![Diagram of current inconsistent green structures](source: Author)

![Diagram of coherent green structures after design](source: Author)
Connectivity

One of the first remarkable improvements within the connectivity of the design is the flow of the new inner urban ring road. Located more in the middle the ring road still provides the connectivity of the city level to urban nodes working serving a more global user, the zoo and the Van Nelle and the new train station. By this the entanglement of the Beukelsbrug is no more and is replaced by a smaller three-way crossing. Also the connectivity has been improved by the implementation of small scale networks. Within this the design this type of network does not only support the existing urban nodes like the mosque, zoo and the van Nelle, it support is by small scale network that transcend the existing elevated infrastructural barriers. Looking back the connectivity in the area is improved for many users and its activities in the area.

FIG. 4.92 CURRENT LARGE GRAINED URBAN NETWORK
Source: Author

FIG. 4.93 SMALL GRAINED URBAN AFTER DESIGN
Source: Author
**Comfort and safety (bicycle)**

The comfort and safety measured by the bike networks had increased greatly. In comparison to the existing network. The first thing to notice is the amount of bicyclist paths and the smaller graining. By this the functions within the area are now better connected to the adjacent neighbourhoods. Also a more continuity can be seen within the network, for bicyclist passing through. An extra feature of this network is that by the open public space along the water, a possible car-free route along the water can be made. Continuing in the Spaanse botch park, this can become a leisure “back bone” within the network making the car not the only route to explore/ use this area.
Public space
The current situation of the area holds a public realm that is orientated upon the car. Pedestrians are forced to walk along side busy car roads which reduces the quality of the pedestrian experience. Within the pedestrian experience the urban quality of the water is omitted. The proposed pedestrian experience is not only placed along the water, it forms a continuous route throughout the area. By this the pedestrian can always diverge itself to a rout along the water without the hindrance of the car. In comparison the proposed public realm depict itself more permeable. As a result of the extending of structure and creating new structure a grid like public space has formed by which the user hold more alternative routes to its destination.

FIG. 4.96 CURRENT WATER OMMITING PUBLIC REALM
Source: Author

FIG. 4.97 WATER EMBRACING PUBLIC SPACE AFTER DESIGN
Source: Author
**Conclusion**

**Mixture of use**

The current situation depicts itself by two large "blobs" of clustered uses. The first, a work cluster in the industrial areas and the second, a recreational blob between the neighbourhoods and the industry. Sporadically, there are some urban facilities to be found. By this large areas are active for only one part of the day and making it is abandoned for another part. The design shows two principles within the designation of uses. The first is the placement of program on the north-south roads. By this it motivates active streets that functions as connectors between the adjacent residential neighbourhoods. By doing so, a diverse set of program can be imagined linked to the inner urban ring road. By the diverse users, a strengthening of the urban vitality along the ring road can be imagined. Making the Gordelweg the backbone capable to carry this development. Sequentially, the second principle is that every cluster of residents is accompanied by a diversity of functions.

[FIG. 4.98] BIG BLOBS AS DISTRIBUTION OF USES
Source: Author

[FIG. 4.99] FINE GRAINED, BORDER BREAKING DISTRIBUTION OF USES
Source: Author
Density
The current situation depicts a low dense urban fabric. This urban fabric is not capable to actively guide the users and function in the area. This result in many inactive borders in the public realm. The design increases the density. It increased the density in relationship with the new urban structure and the existing context. Even if the urban structure is not illustrated we still can see a certain abstraction of it, just by looking at the buildings. Extensions of green and shopping streets are supported by long buildings. The buildings omit the waterfront.
5.3 Conclusion

The main goal of this thesis is to find spatial strategies and urban design interventions that are support the integration of infrastructural residual space within its city. And by this offering urban regeneration. Infrastructural residual space is space that is residual to the development of infrastructure. By a desire to place the infrastructure as efficient as possible, this meaning the trough flow and the building cost/time, these big scale infrastructures are placed (location and dimension) without any concern to its adjacent context. By the regulation and the dimension of big scale infrastructure make the direct adjacent area difficult to be developing by urban planners and designers. As a result these spaces develop by private initiatives and are developed without the supervision of a spatial organisation or concept. By this the fabric of these spaces is formed that mainly is oriented on the need of the car users. By this, these spaces form obstacle for other modes of transportation, to travel or the gather. Sequentially these spaces hold great obstacles for pedestrian and bicyclist to gather and hold activities.

The infrastructural residual space within this thesis consists of Vreelust and the Blijdorpse Polder, in this thesis “Vreelust-Blijdorp” area called. This is a space residual to the A20 highway and the Railroads. This area forms a gap between the social-economic weak neighbourhoods of Spangen, Oud-Mathenesse, Overschie and Nieuwe Westen. Located within the city, it holds many city elements and structures that run through and by the area. Structures like the inner urban ring road, the green structures, public transportation networks and several local structures in adjacent neighbourhoods. However within the area these structure function fragmented or disconnected and do not function on the level it should. The inner urban ring road does not serve on the level of the city, as within the area it is cut two smaller road that work on the clustering of a neighbourhoods. The city green structures works similar, north they function for its suburbs and in the south it functions for the inner urban areas. The public transportation city within the city does not provide appropriate coverage to some of its most dens neighbourhoods. And main structures within neighbourhoods that should be the vital connecting elements to other parts of the city function on a smaller level as they are indented and stop prematurely. Within this a mismatch is depicted upon the structure and it’s the functioning level. By the placement of regional infrastructure without concern regarding its context, local structures within the city fall victim and have to surrender its quality and its functioning. This extends in the urban fabric of the area. Although it holds features that support urban vitality, the condition in the urban fabric of the Vreelust-Blijdorp area to support this are missing. A neighbourhood oriented mosque is located along roads that run throughout the city. While the Van Nelle is only connected with several neighbourhoods.

For the Vreelust-Blijdorp area this thesis proves a spatial strategy where these mismatches are countered. By down-scaling or up-sizing of it’s concerning structures an environment is formed that support the both regional and local oriented uses. For the Vreelust-Blijdorp this implies making the regional structures function more on a local level. This can be seen by the downgrading of the A20, developing train access by a train station and metro access by a metro station. But this also implies to restructure or extend local structures to function on a regional level. This is formed in the area by restructuring the inner urban ring road, extending the tram system and repairing the missing link between the green structures. Also extending neighbourhood structures to function more on a supra-local level (between neighbourhoods). It should also be noted that it doesn’t need to happen within strong mind focus. By upgrading a certain structure it can also serve as a part of a downgraded regional structure (and vice versa).

Also provides this thesis the urban typologies to be implemented in order to guide the use of this environment. By this thesis a research is done in the dimensions, seclusion of public space, parking, building height and internal circulation of the building assemblies that work consistent with its direct urban structures. This thesis advises six urban typologies that work consistent with it’s the new proposed urban fabric. Amongst them are: Amsterdam zuid, Java eiland, GWL terrein, Blijdorp, Neselanden and Stadstuinen. Each holding its unique role in relationship with the downgraded or up sized structures.

The development of the Vreelust-Blijdorp area according to these conditions provides a more integrated urban area within city of Rotterdam. By its development the area improves significantly in vitality, connectivity and attractions. This is based by six spatial conditions that motive vital, attractive and well connected urban areas within their cities. These conditions contain: public space, connectivity, mixture of uses, density, outdoor activity and comfort and safety. By the development of these conditions not only the area itself holds improvement. By the downgrading or upsizing of the concerning structures the development of this area is directly linked to its adjacent neighbourhoods. As we find within the downgrading of regional structure the arise of function that provide service outside the borders. And we find within the up scaling of local structure more urban qualities in direct contact with the neighbourhoods.
One of the potential report “Tussenland” (Frijters, E. et al. (2004) motivates for urban regeneration of infrastructural residual space is the disconnective character it holds. By this it hold an easy transformation of the area itself. However looking at the Vreelust-Blijdorp area it should be noted that infrastructural residual space within cities offer urban regeneration more than just its disconnective characters. However it should be added that the disconnectivity of these spaces would not be the main reason for transformation but the friction by the different functioning in levels of the concerning structures. By resolving this within this, opportunities can be found that not only serve the area but its adjacent neighbourhoods. But depending on the concerning structure, it can provide urban regeneration even on a metropolitan scale.
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Gemzøe, L. (2006) Quality for people: A set of quality criteria for the design of pedestrian places and networks - with people in mind, Background paper, 7th International Conference on Walking and Liveable Communities, Melbourne, Australia


Hamers, D. (2011) *The fringe in focus – A Mosaic of urban milieus as the basis for regional planning approach to urban development*, Background paper, 5th IFOU, Singapore, Singapore


NeT-TOPIC (2009) *Driving Forces Of Urban Cohesion: Recovering abandoned and obsolete industrial areas and avoiding fragmentation and urban division in peripheral cities of metropolitan areas*, [pdf], Sesto San Giovanni. Available at: http://urbact.eu/fileadmin/Projects/Net_TOPIC/outputs_media/Thematic_Publication_1_-_Sesto_SG_FINAL.pdf


Salingaros, N. A (2003) *Connecting the Fractal City*, Keynote speech, 5th Biennial of towns and town planners in Europe, Barcelona, Spain


