KANALEN EILAND
IMPROVING THE LIVEABILITY
BY REDESIGNING THE ‘STEMPEL’
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Before you lies my graduation thesis with the title: ‘Kanaleneiland; improving the liveability by redesigning the “Stempel”’. This thesis is a result of my work in my graduation year for the Urban Regeneration studio in the Urbanism track at the Faculty of Architecture at the Delft University of Technology.

For the work on my graduation project and with my thesis I got a lot of support from different people who I want to thank for that. First my two mentors who stimulated me and kept me enthusiastic about the project, supported me when I struggled and pulled me back on track when I was in danger of making hasty decisions. Secondly my parents who always showed interest in what I was doing, offered a helping hand numerous times and gave me the extra push to get these results. Finally my friends who provided a listening ear when i needed it and continuously showed enthusiasm when I talked about my project and always tried to lend a helping hand. Without all of you the thesis would not have come out as it is now. Therefore thank you.
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In this thesis a design is presented for the deprived neighbourhood Kanaleneiland in Utrecht. Many of the problems in the neighbourhood can be traced down to one of the aspects in liveability. The focus in this thesis is put on the regulation of privacy, the legibleness and human scale of places. The motivation behind the focus on these aspects is the interest in to what extent it is possible to change human behaviour through urban design. In addition regeneration of urban tissue, especially in deprived neighbourhoods, will be one of the most important jobs for the urban planners in the coming decades. It will be a challenging assignment; it could be compared with the RMIT track, but than for the urban tissue. A keen eye for detail is needed and one must know a lot about the history of the place to make a good regeneration design.

Especially in Kanaleneiland-Noord there is an interesting assignment for the urban planner. A lot of different aspects come together in this neighbourhood, which makes the problem so complex. The modernist layout combined with the different cultures and the economic vulnerability make this project challenging to work on. Besides that, it is a very realistic assignment and currently a hot topic in the Dutch society; the social relevance is high. The modernist neighbourhoods clearly do not function well. Because the residents in such an area often have a lower socio-economic status they have fewer choices in the housing market or the living environment. Besides that, the chance that they will be unemployed is higher, which put them in need for benefits from the government or, even worse, leads them to participating in unlawful actions. These outcomes cost the state a lot of money. With only a small improvement of the living conditions of the residents a lot of money can be saved.

It is relevant for scientific reasons as well, because we do not know very well to what extent it is possible to influence behaviour with urban design; what elements will increase the control over one’s environment and which elements will reduce this control. What effects does transition space have on the person and their perceived control over their privacy? With this project it is tried to contribute a bit to these questions so that in the future neighbourhoods will be designed with more care for the residents’ needs.

In this thesis the neighbourhood Kanaleneiland-Noord will first be introduced; the context of the area will be

Kanaleneiland-Noord & the city centre
(source: Google Maps, 2014)
discussed first. In this chapter the location of the neighbourhood will be shown, after this the kind of people living in the neighbourhood and the different actors involved are mentioned.

The second chapter will go into the history of the neighbourhood. What was the ideology for the neighbourhood and how did Kanaleneiland end up as the most notorious neighbourhood in Utrecht. Finally the strategies from municipality and housing corporation in the past decades are discussed.

In the following chapter the first problem analysis will be carried out. Here one can find the different methods that will be used for the research and design on the neighbourhood and the chapter is concluded with the main research question and sub-questions.

After the statement of the research question the conducted research will be elaborated on. First the outcome of the analysis will be shown and in the following chapter the findings from the literature studies will be discussed.

The next chapter will show the concept and the design principles derived from the different sources of research. The link with the design will be made in this chapter as well. The following chapter contains the numerous precedents that have elements which are used in the new design for Kanaleneiland; these precedents are the examples for the desired urban plan.

After the precedents are shown the design process is discussed. This process was very important in the creation of the final design. Many different solutions are brought together and rated on their effect on the overall plan. Some solutions did not have the desired effect and were discarded. Other solutions proved to be good and were used in later designs where in combination with other design solutions they strengthen the overall plan. Eventually the final design is derived and this is included at the end of this chapter, together with an explanation of the different aspects and the combined effects.

The thesis will conclude with the conclusions derived from the whole process and a reflection on the process.
THE NEIGHBOURHOOD IN CONTEXT
The neighbourhood Kanaleneiland has been built between 1957 and 1964 as an extension of the city of Utrecht (Agricola et al., 1997). It was part of a bigger extension plan with the same name: Kanaleneiland. The neighbourhood Transwijk is also part of this plan. Together with Diechtersbuurt and Rivierenbuurt it belongs to the south-western district of the city (Gemeente Utrecht, s.d.). The neighbourhood got its name from the two canals that circumscribe the area; the Merwedekanaal and the Amsterdam-Rijnkanaal. On the east, along the Merwedekanaal, there is a strip of industrial buildings, which runs from the Jaarbeurs all the way south where the two canals join again. West of this strip the neighbourhood Transwijk is located. The largest city park of Utrecht can be found in this area, together with several sports clubs. Transwijk can again be divided in Transwijk-Noord and Transwijk-Zuid. All the way to the west, bordering the Amsterdam-Rijnkanaal, the sub-neighbourhood Kanaleneiland can be found. Kanaleneiland can also be divided in three separate areas. In the south there is another industrial zone, connecting with the industrial strip running along the Merwedekanaal. More to the north there is the residential area Kanaleneiland-Zuid and even more to the north the second residential area Kanaleneiland-Noord is positioned. Kanaleneiland-Noord will be the subject of the research and design assignment elaborated in this thesis.

Kanaleneiland was meant to function as an individual village close to the city of Utrecht, with a lot of facilities in the neighbourhood itself. This can still be seen today. There is a large mix of different facilities in the buildings. The biggest part of the buildings is for living-purposes. It is a mix of apartment buildings, row-houses and high-rise. Besides these buildings there are a lot of buildings that accommodate for societal functions like schools and mosques scattered all over the neighbourhood. Among them there is also a library and a youth centre. There is also a lot of room for shopping, with a large shopping centre and some small local shopping areas through the neighbourhood. Offices can mostly be found on the edges of the area and connected to the larger roads entering Kanaleneiland-Noord. A hospital also used to be in the upper corner of the area, it moved last year to a new location to the nearby neighbourhood Leidsche Rijn. There are plans to house students in the old building.
The Amsterdam-Rijnkanaal forms the western border, while other sides of the neighbourhood are defined by several roads. The Dominee Martin Luther Kinglaan lies in the north, which leads from the city centre, via de Meernbrug to the highway A2 and the new Vinex-neighbourhood Leidsche Rijn. The Beneluxlaan lies to the east of the area; this is a big multiple lane road with a tramline running through the middle. The Beneluxlaan can be seen as an inner ring road for the city of Utrecht. The tramline leads from the centre of the city to the south to Nieuwegein, a new town mainly created from the 1960s. In the south there is the Churchilllaan; this road is the border between the northern and southern part of Kanaleneiland. The road also leads from the city centre via the Prins Clausbrug to the highway A2, Leidsche Rijn, and the future business area Papendorp.

The neighbourhood mainly consists of apartment buildings, with some single-family houses in between. This can also be seen in the data (Gemeente Utrecht, 2013). 2,458 of the 3,269 households live in apartments. Only 593 households live in single family houses. There are 16 duplex dwellings in the area and from 202 units the typology of the house is unknown.
When Kanaleneiland was built it was meant to house 30,000 people (sub-neighbourhoods Transwijk and Kanaleneiland combined) (Van der Stad, 1961). Today 22,493 people live in the two neighbourhoods, thereof 15,886 live in Kanaleneiland. Kanaleneiland-Noord houses 7,554 of these residents (Gemeente Utrecht, 2013). The neighbourhood contains a large share of young inhabitants; 26.4 per cent of the residents is younger than 18 years old. Furthermore, the neighbourhood consists for the most part of non-western immigrants, with almost 40 per cent Moroccans, and close to 20 per cent Turks. Other immigrants have no significant share in the demographics. 24.1 per cent of the residents are autochthon.

A lot of information can be derived from the statistics on households (Ibid.). 50 per cent of the households in Kanaleneiland consist of single person households; this group is formed by students, starters, elderly, and singles. 15 per cent are couples without children, probably starters, elderly, or intentionally childless. Families with two adults make up for 25.8 per cent of the total households and families with one adult for 7.1 per cent. 2.3 per cent is identified as ‘other’ (numbers may not add up precisely to 100%, this is probably a mistake in rounding off). The head of the households are in 35.3 per cent of the cases younger than 30 years old. 44.7 per cent is between the age of 30 and 54, and the remaining 19.9 per cent is older than 54. The different datasets can be combined; through this it is possible to get a more accurate household division.

Taking all the childless couples, 40.7 per cent of them are younger than 30 years old, these are probably starters. 25.8% of this group is between the age of 30 and 54, these are the intentionally childless couples. The last 33.5 per cent is older than 54 years, this is the group of elderly couples.

The same can be done with the couple with children. Within this group 5.8 per cent of the heads of the households are younger than 30 years old, the young families. 79.1 per cent of the group has a head of the household between the age 30 and 54, and 15.1 per cent of the group has a head of the household older than 54 years.
There is no specific data on the division in age of the single parent families; therefore the same ratio is taken as for the families. With all this elaborated data it was eventually possible to determine the range in age for the single person households too. The total percentages of each group is worked out in the chart on the former page.
There are numerous actors involved in Kanaleneiland, which affect through or will be affected by the proposed changes. Some are formal actors, like the municipality and the housing corporations, others are informal actors, like the residents of the neighbourhood. Furthermore, it is interesting to know where the different actors put their focus on, the social or financial aspects of the neighbourhood.

Central government
This formal actor has had an active role from 2007 until 2012. Former minister Vogelaar put Kanaleneiland on the list of deprived neighbourhoods, resulting in extra attention and money for the neighbourhood. This shows a strong focus on the social aspects in the neighbourhood. Although the intentions were good, a report from the Sociaal en Cultureel Planbureau (SCP) concluded that these measures led to no significant changes in the areas, therefore the input of money stopped in 2012 (Permentier et al., 2013). The central government has not given much attention to Kanaleneiland ever since.

Municipality
They focus mainly on the outdoor space and maintenance of green in the neighbourhood (Nuwenhuis, 2013). The municipality puts a lot of effort in the improvement of the neighbourhood, with varying success. Due to the financial crisis the projects focus on small scale, like repaving the sidewalk and maintaining the green areas. No larger projects are planned. The primary focus of this formal actor lies on the social aspects. However, due to the financial crisis they are forced to put more focus on the financial side; this is at the cost of the social needs as can be read in the following chapters.

Housing corporations
This is a formal actor as well. There are two corporations active in Kanaleneiland-Noord: Mitros and Portaal. The former owns the most property in the area. They focus on the buildings and the space directly adjoined to these buildings. The corporations put a lot of effort in improving the neighbourhood but the larger plans fail due to lack of financial means. These plans are then downscaled until they have a minimal effect on improving the liveability in the neighbourhood. Besides, the corporations propose a lot of small projects to improve the neighbourhood with varying success. The focus is exactly the same as with the municipality, originally social based but due to the crisis shifted to financial.
Residents
The residents are the (unintentional) victims in the plans of housing corporations and municipality. They are forced to move outside the neighbourhood in anticipation of the demolishing of the apartment buildings, sometimes they cannot come back because new developments will be too expensive for them. Many plans did not take place due to a lack of finances; however, the families cannot come back to their house. The constant uncertainty and the lack of maintenance in the neighbourhood reduce the trust and cooperation with the official agencies. This informal actor clearly focusus on the social aspects. They want good and affordable housing, which they do not get at the moment.

Shopkeepers
This actor can be seen as part formal and part informal. The larger stores are better organised and have less affiliation with the neighbourhood. They are more focused on the financial side. They want good accessibility to their shops and enough space for the shoppers to park their cars. The smaller local shop keepers have a much more social focus. They have a stronger connection with the residents, for they themselves often live in the neighbourhood. They want a nice neighbourhood where people like to come and enjoy themselves. Shop keepers exert semi-formal control over the surroundings. Large projects could lower the clientele of all the shop keepers, because it could affect the accessibility of the shops or (temporarily) reduce the number of residents in the neighbourhood. Especially for local shop owners it can be a problem because they usually have less financial buffers.

Shoppers
Shoppers are informal actors. However, some are more social focused and others more financial. The shoppers living inside the neighbourhood want a nice place to hang around and meet people while shoppers from outside the area just want cheap groceries. They want to have good access to the shopping mall in the south-east of the neighbourhood. They also need sufficient parking spots. In the current situation there are long queues of cars arriving and leaving the shopping mall. This causes nuisance with the residents; the shoppers usually do not take notice of this nuisance. For daily shopping the residents can go to smaller shops in the neighbourhood.
Visitors of the mosque
These informal actors come from inside and outside the neighbourhood. They have no distinct opinion on the social or financial aspects. For the neighbourhood it would be good if there were more parking spots, because many of them come by car. Currently many cars are parked on sidewalks.

Police
This is a formal actor and are mainly focused on the social aspects. They want a safe neighbourhood. According to them this can be achieved by giving the opportunity for informal control. However, it must also be possible to survey the neighbourhood easily for them, to provide the formal control.

Pupils (primary school)
These are mostly young kids from inside Kanaleneiland, they need a safe and quiet place to study. Schools and libraries should be easy and safe to reach. The places where they have to learn should get a prominent position inside the neighbourhood, and the surroundings should stimulate the kids to develop themselves. This is an informal actor with a clear focus on the social side.

Youth on the street
These youngsters hang around on the street because they cannot come inside; in other cultures this is often seen as the domain of the women and they need their private time as well. These young boys often hang around in the public domain and this can cause friction. People from (mostly) outside the area quickly feel threatened by these boys. However, these boys only see these places in their neighbourhood as part of their territory. They have the right to be there as long as they do not provoke anyone. This informal actor is primarily focused on the social aspects. They want I space for themselves where they are not hindered by others.

Investors
With the financial crisis this formal actor is holding back on investments, especially in these kinds of areas where the reputation of the neighbourhood is low. They prefer projects that promote gentrification, because the returns of their investments will be higher. They are strongly financially focused, maybe even too much. They are often more interested in the money they can make than in the social aspects in the neighbourhood. This should change when the intention is to improve Kanaleneiland.
THE NEIGHBOURHOOD IN HISTORY
After the Second World War the housing shortage was enormous in the Netherlands. The housing stock needed to be extended quickly to meet the rising demand. Everywhere in the country extension plans for cities were made. The rediscovery of low- and high-rise apartment buildings was widely used. This went together with the modernist ideology which came into vogue again in Europe after the Second World War.

Modernism had been an important but short movement in Europe before (Wagenaar, 2011). This was picked up in the United States after the First World War. The modernistic ideology focussed on the future and away from the past. Proponents believe in the manipulability of society. In the urban planning profession this was explained as ‘social determinism’: a direct link between the alteration of the environment and the resulting behaviour and opinions of its users.

Modernism also expressed itself in the aversion to the city. The big city was seen as chaotic; the human being would become uprooted and lonely in such environment. The solution was to go back to regional living; neighbourhoods should become separated entities, with their own facilities and clear boundaries. This way the urban planner would be able to bring order in the shapelessness of the big city. Bos (1946) would later use the expression ‘Wijkgedachte’ to formulate his answer against the chaotic city. He was of the opinion that the rational division of neighbourhoods in the city would promote the feeling of living in a community and even democratise society as a whole. In 1928 the Congrès International d’Architecture Moderne (CIAM) was founded; they could be seen as the most notable proponents of the modernistic ideology. In 1933 they already defined the future modernistic city to be a garden city with stacked building typologies (Fuchs, 1999). The space that would remain with these typologies would benefit the residents. Furthermore, the architects and urban planners of CIAM advocated a division of living, working, recreation and traffic (Wagenaar, 2011; Wassenberg & Van Kempen, 2004), making plans even more rational and jointed. Moreover, much emphasis was put on three aspects: space, light and air; the neighbourhoods designed according to modernistic ideology can often still be characterised by green space and open car parks between the complexes (Wassenberg, 1993). However, there are few private outdoor spaces in these areas. Standardisation and repetition are words that...
best described the building configurations in the neighbourhoods.

After the Second World War the modernistic ideology resurfaces in Europe. The housing shortage was enormous, to provide shelter for all the inhabitants this problem needed to be tackled quickly. Building materials like wood and bricks were scares after the war, resulting in an increased use of concrete in the building production. The benefits of this were the possibility to use unskilled labour and new building possibilities provided by newly invented industrial modular systems. Through this it became possible to finally materialise the Modernist ideology.

The modernist neighbourhoods in the Netherlands were built from the 1950s until the beginning of the 1970s; during this period different types of neighbourhoods were erected (ibid.). Directly after the Second World War the building of low-rise and mid-rise had the upper hand. Apartment buildings with three to four storeys for families were positioned in a strict grid with semi-private space between the buildings. These are the first projects where the ‘Wijkgedachte’ principle is widely used. From the 1960s on, neighbourhoods with much more varying building heights were built. Housing manufacturers experimented with prefab concrete elements that could be put together at the building site. Together with the standardised building systems the ‘Stempel’ became a much used structuring principle in these neighbourhoods. The urban planners created more space between the buildings, which resulted in wide green traffic routes. The division between functions became more apparent as well. In the early sixties the housing shortage appeared to be much higher than calculated up to that time. Production needed to be faster and much more extensive. The responsible minister of that time tries to promote building methods with low need for working power. High-rise proved to be a very efficient method and from the second half of the 1960s high-rise neighbourhoods sprouted everywhere in the country. This trend remained for only a short time. Ten years later people began to see the problems with the modernist planning and as reaction neighbourhoods were planned on a small scale.
blocks himself. He was no proponent of the high-rise typology, but the cost and the ability to live quietly in the city were the major factors in favour of constructing low- and high-rise in Kanaleneiland.

These building styles were also implemented in Utrecht, where large pieces of farmland were converted to Modernistic neighbourhoods. Kanaleneiland, built between 1957 and 1971, was one of these building projects; the neighbourhood can be seen as a mix between the first and second neighbourhood type. The name Kanaleneiland is derived from the two canals which circumscribe the area on the west side of the city; the Merwedekanaal and the newly dug Amsterdam-Rijnkanaal.

Urban planners C.M. van der Stad and R.H. Fledderus had a great hand in the planning of this new neighbourhood (Breeman, 2013). Van der Stad, together with G.T. Rietveld, used the ‘Stempelbouw’ principle in other modernist Dutch neighbourhoods before Kanaleneiland. A ‘Stempel’ (Stamp) in urban planning is a pattern of buildings within a block which can be repeated endlessly in adjacent blocks. One of the first Dutch example of ‘Stempelbouw’ was Pendrecht, designed by Stam-Breese (Kegel, 1996). Van der Stad applied this principle in Tolsteeg/Hoograven, and worked it out in Kanaleneiland; both these projects refer very much to Pendrecht. Fledderus managed the design process in Kanaleneiland and designed some apartment
THE RISE AND DOWNFALL OF KANALENEILAND

In the beginning Kanaleneiland was seen as a beautiful example of modernist architecture. The buildings were equipped with many modern facilities like water heating, antenna television and a bathroom (Mitros, s.d.). People from all classes came to live in the neighbourhood and with the many rose bushes it was popularly called ‘Rozeneiland’ (Island of roses) (Breeman, 2013).

However, in the decades after the Second World War three revolutions were going on in the Netherlands, which directly and indirectly had a huge impact on the neighbourhood (Hofland, 2004).

First there is the demographic revolution: after the Second World War the Dutch accepted large groups of immigrant workers. This was needed to extend the working force with the rise of the prosperity. The Netherlands changed into a multicultural society in a process which is on-going up to this day. Even though the multicultural society is a fact for several decades, there is still a lot of friction between the different cultures.

The second revolution has a socio-political character. Up to the end of the 1950s the Dutch society was divided in multiple ‘Zuilen’; groups with differing religious beliefs and/or political views. The ‘Zuilen’ with most adherents were the Protestants, Catholics, and Socialists, but there were many more of those groups. Between 1960 and 1970 the traditional religious and socio-political barriers in the Dutch society were vanishing very quickly. The strong social bonds which existed among the members of each group slowly disappeared, which led to less social control between people in general, and thus in the neighbourhood as well. This revolution went hand in hand with democratization and individualisation of the society. People wanted more personal freedom and space. Another consequence for the neighbourhood was that many societal buildings originally designed for specific classes were not needed anymore.

Thirdly there was the economic revolution. The prosperity in the Netherlands grew in an enormous rate from the 1970s. The focus shifted from a social-oriented to a market-oriented society. The consumer society becomes reality and the free market system is an important concept herein. The social solidarity eroded in a society which put continually more emphasis on making profit. For the living environment this revolution becomes especially apparent when the housing corporations are privatised

Immigrant workers
(source: Martens, s.d.)
in 1995. This results in a necessary focus on profitable projects in their complete portfolio instead of looking for the optimal solution in every single neighbourhood. With the greater prosperity the desires of individual residents changed as well; people wanted more private space and the number of cars per household grew quickly.

Due to these revolutions the positive image that people had with Kanaleneiland faded over the years. The facilities in the houses of Kanaleneiland were quickly out-dated and could not satisfy the new demands of the residents anymore. Moreover, through the absence of more spacious single-family houses with private gardens the neighbourhood failed to meet the desires of the economic strong middle class. Those who could afford it left the neighbourhood, leaving behind the socially and economically weaker households who could not afford better housing. Other lower socio-economic households filled the gap the middle class left behind. This resulted in a very monotonous composition of households in the neighbourhood with significantly less prospects in society. The accumulation of these households eventually led to higher unemployment and crime rates, and deterioration in the neighbourhood. The neighbourhood got the reputation of a deprived neighbourhood soon after and is even described as the most notorious neighbourhood in Utrecht.

In 2007 minister Ella Vogelaar (Home, Neighbourhoods and Integration) published a list with 40 neighbourhoods which should get extra attention. (Algemene Rekenkamer, 2008) Kanaleneiland was one of those neighbourhoods. One billion euro was put in these neighbourhoods to give them an extra boost. However, a rapport from the ‘Sociaal en Cultureel Planbureau’ (SCP) showed that there was no significant improvement compared to other deprived neighbourhoods which did not make the list (Permentier, Kullberg, & Van Noije, 2013). This will not say that the whole program had failed, the neighbourhoods did improve and maybe the program also had a positive effect on other deprived neighbourhoods. On the other hand, the participation in de ‘Vogelaarwijken’ was even lower than that of other deprived neighbourhoods. The overall idea was that the spent money was too much compared to the returns.
In the last decades numerous projects have been started to improve the status of the neighbourhood Kanaleneiland as a deprived neighbourhood, on bottom-up and top-down. From bottom-up there are several project groups and institutions founded by the residents themselves, from top-down more formal institutions like the housing corporations, the municipality and even the national government make an effort to improve the neighbourhood. In this chapter the top-down strategies will be mentioned in more detail, because those plans focus more on improving the whole neighbourhood permanently, where bottom-up initiatives work on a smaller scale and more sporadic. This does not say anything on the effect of the different strategies for the neighbourhood.

The housing corporation has done the most to improve the liveability in the neighbourhood. From the 1980s, when it became apparent that houses in Kanaleneiland were not meeting the new demands, the corporations have put much effort in large maintenance projects (Agricola, Ouwehand, & Te Velde, 1997). With the addition of more modern facilities the corporation tried to promote comfortable living in the neighbourhood. This strategy worked pretty well, also because the central government subsidised the costs for these maintenance projects. However, these projects were mainly focussed on the buildings and not so much on the public space in the neighbourhood. Besides, in 1992 the government stopped the subsidy for these kind of projects and the housing corporations had to come up with other strategies.

Their new strategy focussed on differentiation of the housing typologies in the neighbourhood (ibid.). However, the plans that were presented in the following years were more focussed on gentrification. This can be seen as a more extreme form of differentiation, where the value of the land is exploited to a maximum by demolishing cheap houses and rebuilding more expensive dwellings. Current inhabitants with less means are often driven away.

The housing corporations in Kanaleneiland gave Kolpron in 1994 the assignment to develop a vision for the future of Kanaleneiland (ibid.). They proposed to demolish one third of the housing stock to make room for more expansive single-family houses and apartments. Another one third of the stock should be renovated and sold and the last part should be renovated and
rented. This massive demolition project would go hand in hand with changing the main structure in the neighbourhood. The involved parties eventually could not get a closing budget, which resulted in a partial implementation of the plan. Apartment buildings were repainted, only some apartments were renovated and a part of the housing stock was sold, no buildings were demolished.

In 2006 a new plan was presented by Mecanoo (Mecanoo architecten, s.d.). They suggested demolishing 500 dwellings along the Bevrijdingslaan, to anticipate on the potential of Kanaleneiland when it becomes a link between the city centre and Leidsche Rijn. The available space is planned to be filled in with 1,300 new dwellings mainly for the higher incomes. The promise of the municipality and housing corporations that all current residents could find a place in the new plan is doubtful. Furthermore, this plan is also delayed. The first building is realised, but due to the new financial crisis and with that disappointing sales, the project does not raise enough money to go on at the moment.

In addition, both plans for demolishing a part of the neighbourhood have led to the neglect in maintenance for these particular building blocks. Even after almost 20 years the only improvement has been the repainting of the apartment buildings. Moreover, several families have already been relocated to prepare the apartment buildings for demolition. Even though this still has not happened the families cannot come back to their own neighbourhood. This greatly affects the amount of trust and cooperation from the residents in a negative way.

The last plan came from the designers contest Europan (Vos & Europan Nederland, 2010). Urban planners could enter the design contest for the redesign of Kanaleneiland. The first place in the contest had a much more careful approach to the neighbourhood. There would be no demolishing of buildings, only the front would be expanded. This would create room for a lift shaft and make the dwellings more spacious. A point of critique on this plan could be that it still does not focus enough on the needs of the current residents, the new apartments are meant for a housing career in the neighbourhood. However, these dwellings would become too expensive for the current residents. The price winning project should be implemented in the neighbourhood, but this has not happened yet.
Impression new development Kanaleneiland
(source: Mecanoo, s.d.)
From the previous chapter it became clear that there is friction between the resident of the neighbourhood and the responsible agencies; like the active housing corporations and the municipality. The corporations have tried to improve the liveability in the neighbourhood with large new development projects, which could not go through due to an unfavourable financial climate. The uncertainty for the residents resulted in damaged relations. What problems are to be found in the neighbourhood that brought the agencies to the conclusion that new housing development was needed? This information is obtained through different methods in the research process. All the used methods will be discussed in the following paragraph; the results of these methods are shown further in this and other chapters. This chapter will conclude with the main research question and sub-research questions.

Methodology
A lot of methods need to be used to find out what is going wrong in the neighbourhood and how this could be solved. The different methods can be combined to analyse all the information and find an answer to the main research question. With the insights from the analysis a concept will be derived, which will be the leading idea to improve Kanaleneiland. With this concept design experiments can be conducted. Constant feedback from the concept and the analysis is needed to derive to a good design. The following methods were used:

• Data gathering
Data on the neighbourhood can give a first clear overview on what are the problems in a neighbourhood. This data is in the Netherlands often easily accessible at municipalities and other agencies. To gather the data for Kanaleneiland visits were made to the archive and information was obtained from the website of the municipality and housing corporations. The findings are shown in the following paragraph.

• Interviews
There are a lot of institutes working in the neighbourhood. All have their own view and goal. There are the more informal clubs which focus on the kids in the streets. On the other side we have the formal institutions like the housing corporations and the municipality. The last two have been interviewed and an interview with the spokesman of the tenants represents a more informal group: the residents. The outcome
of the interviews is discussed in one of the following paragraphs.

- Literature research
  With a theoretical framework it is possible to create a solid base for further analysis. Questions not specifically related to Kanaleneiland will be answered this way. For example, there is already written a lot about what problems arise in deprived neighbourhoods in general and what aspects have an influence on the perception of social cohesion and control. Another source for literature studies are case studies done on other neighbourhoods comparable to Kanaleneiland. Pendrecht was the example for this neighbourhood, this would be a good start for further research. The findings from this method are presented in the chapter ‘Theoretical framework’.

- Mapping
  What are the conditions in Kanaleneiland, which strengths and weaknesses can be denominated and what are the opportunities and threats? To see what is really going on in the neighbourhood the mapping method must be combined with the above-mentioned literature studies about deprived neighbourhoods and social cohesion. The results will be elaborated on in the ‘Analytical framework’ chapter.

- Design experiments
  After information is gathered through the above mentioned methods it will be possible to experiment with the outcomes; this is called research by design. Through this he right solutions is sought by designing crucial parts of the project. This could be a crossing where many functions meet. Or a unique solution for a problem. The acquired information from the literature research, mapping and case studies/precedents will function as the criterion to choose the right design solutions. This method is shown in the chapter ‘Research by design; Final design’.

Now that the methodology is presented the first results from these studies is shown in the following paragraphs, followed by the research questions.

Data from the municipality
The data on Kanaleneiland-Noord gives an insight on the perception of the neighbourhood by its residents. There is data on general appraisal of the neighbourhood, cleanliness, housing quality, social matters, nuisance and participation. The scores for

Top right
General appraisal
(source: Gemeente Utrecht, 2013)

Bottom right
Cleanliness
(source: Gemeente Utrecht, 2013)
Kanaleneiland are overall significantly lower than the average in Utrecht.

The grade for general appraisal of the neighbourhood is a 4.9 on a scale of 10 (Gemeente Utrecht, 2013). Residents in Kanaleneiland are much more negative about their neighbourhood than people in other neighbourhoods in Utrecht. They tend to perceive the neighbourhood as unpleasant and do not feel at home. Moreover, they feel not attached to the neighbourhood and experience nuisance from other residents. All the scores are more negative than in general for the city of Utrecht. The biggest problem might even be that these scores all have gone down if it is compared to the scores in 2008. This happened while all the scores for the city became more positive. The residents do have less negative expectations for the future than they had in 2008.

If we look to the cleanliness the neighbourhood also scores worse than the average, a grade of 5.1 compared to a 6.8 in average for the city (ibid.). They experience the green and the streets as less well maintained. More than half of the residents have a problem with the amount of trash in the area, where 29 per cent is the average in Utrecht. Also the amount of vandalism and plastering is mentioned significantly more as
a nuisance than on average. A lot of these scores also became worse compared to the score from 2008.

Almost a quarter of the residents are unsatisfied with the dwelling (ibid.). Many think the surface area is too small; others are unsatisfied with the maintenance of the houses. The grade for housing is a 6.6, this is not very bad, but it can become a lot higher with the right measures. On average in the city, the grade for housing is a 7.6. The notion that the surface of a dwelling is too little can be understood when one takes a closer look at the dwellings. More than 92 per cent of the households live in dwellings smaller than 100 square meters and almost 50% lives in houses smaller than 65 square meters. Many of these houses are in fact only around 40 square meters. When one realises that almost one third of the households are families the problem becomes apparent. Besides the relative small units 75 per cent of the households live in apartment units or flats. Children should not live in elevated apartment units. This influences their possibilities to play and develop themselves significantly (Newman, 1972, cited in van Dorst, 2005a).

The satisfaction with the facilities is pretty good overall (Gemeente Utrecht, 2013). The satisfaction with commerce functions and facilities for young people are even higher than average in Utrecht. The satisfaction with play equipment, facilities for elderly and elementary schooling is not significantly lower than in the whole city.

The grade for social cohesion in the neighbourhood is a 4.6, compared to a 5.8 in Utrecht overall. This number also went down in the last five years. Besides, 19 per cent stated that there were not enough social contacts in the neighbourhood and over 17 per cent even felt socially isolated. More than 27 per cent of the interviewees also mentioned that there was not enough room for residential activities. Another worrisome fact is that more than a quarter of the residents have felt discriminated in the past year. The participation in the neighbourhood is low as well. Around 72 per cent of the residents feels responsible for the neighbourhood. This looks like a high score but the average in Utrecht is 86 per cent, the score Kanaleneiland got is the lowest of all the neighbourhoods in Utrecht. The same counts for the percentage active in the neighbourhood; this is 32 per cent.

When looking at the opinions on nuisance in the neighbourhood the data
Subwijk: Kanaleneiland

<table>
<thead>
<tr>
<th></th>
<th>Subwijk Kanaleneiland</th>
<th>Utrecht</th>
</tr>
</thead>
<tbody>
<tr>
<td>% tevreden met winkels in de buurt</td>
<td>86.6</td>
<td>70.7</td>
</tr>
<tr>
<td>% tevreden met speelgelegenheid in de buurt</td>
<td>56.1</td>
<td>57.6</td>
</tr>
<tr>
<td>% tevreden met jongerenvoorzieningen in de buurt</td>
<td>31.4</td>
<td>23.6</td>
</tr>
<tr>
<td>% tevreden met ouderenvoorzieningen in de buurt</td>
<td>28.3</td>
<td>30</td>
</tr>
<tr>
<td>% tevreden met basisonderwijs in de buurt</td>
<td>57.3</td>
<td>60.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Subwijk Kanaleneiland</th>
<th>Utrecht</th>
</tr>
</thead>
<tbody>
<tr>
<td>% er zijn geen problemen in mijn buurt</td>
<td>15.9</td>
<td>19.2</td>
</tr>
<tr>
<td>% criminaliteit en drugsoverlast</td>
<td>41.3</td>
<td>17.5</td>
</tr>
<tr>
<td>% jeugdproblematiek</td>
<td>31.5</td>
<td>15.4</td>
</tr>
<tr>
<td>% overige overlast (excl. verkeersoverlast)</td>
<td>15.5</td>
<td>16.8</td>
</tr>
<tr>
<td>% problematiek bevolkingssamenstelling</td>
<td>10.4</td>
<td>4.5</td>
</tr>
<tr>
<td>% problematiek openbare ruimte</td>
<td>26.5</td>
<td>23.3</td>
</tr>
<tr>
<td>% verpaupering/verloederings wijken</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>% onderhoud/kwaliteit openbaar vervoer</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>% onvoldoende/kwaliteit openbaar groen</td>
<td>5.1</td>
<td>7.6</td>
</tr>
<tr>
<td>% onvoldoende/kwaliteit speelgelegenheid</td>
<td>4.9</td>
<td>2.2</td>
</tr>
<tr>
<td>% verkeersproblematiek in ruime zin (incl. verkeersoverlast)</td>
<td>18.3</td>
<td>34.8</td>
</tr>
<tr>
<td>% verkeerde stedebouwkundige plannen</td>
<td>0.6</td>
<td>1</td>
</tr>
<tr>
<td>% woningproblematiek</td>
<td>8.4</td>
<td>4.6</td>
</tr>
<tr>
<td>% fietsen</td>
<td>0.9</td>
<td>7.4</td>
</tr>
<tr>
<td>% winkels</td>
<td>1.1</td>
<td>4.9</td>
</tr>
<tr>
<td>% werkloosheid/ärbeitslosigkeit/armoede</td>
<td>0</td>
<td>0.2</td>
</tr>
<tr>
<td>% onvoldoende/kwaliteit overige voorzieningen</td>
<td>4.1</td>
<td>5.1</td>
</tr>
<tr>
<td>% overige problemen</td>
<td>7.3</td>
<td>5.2</td>
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</tbody>
</table>
shows that especially drug and crime related nuisance is high in Kanaleneiland-Noord (ibid.). Nuisance from young people is also a lot higher than on average in Utrecht. People have trouble with the population mix in the area; which can be a cause for the many complains about racism in the neighbourhood. Problems with traffic are less mentioned in the neighbourhood.

The interviews
Three interviews have been administered with different actors.

First the municipality of Utrecht was interviewed, represented by F. Nuwenhuis. The history, and current strengths and weaknesses of the neighbourhood were elaborated on, as well as the management of the municipality. The municipality takes care of the public space around the building blocks and area development for the whole neighbourhood (Nuwenhuis, 2013). Nuwenhuis named the lack in diversity in ethnicity and housing types as two of the larger weaknesses in Kanaleneiland. Also the barriers around the neighbourhood were seen as a problem; these prevented people from easily visiting Kanaleneiland from neighbouring areas or other way around. Finally he mentioned the mess in the streets and the image of the neighbourhood as negative points. The latter is not correct according to Nuwenhuis, the neighbourhood is much better than many people think or hear. As positive points Nuwenhuis mentioned parking, which is better than in most other urban neighbourhoods. The neighbourhood was in fact designed for the car (Kuipers, 2002). He also saw the inner courts as positive, because people had lots of private space this way. The layout of the open space was good as well. As points of improvement he mentioned a better handling of garbage and the extension of the number of housing types, he mentioned ‘kluswoningen’ as a good solution. Finally he mentioned the open space, the streets and playground as important focal points.

Secondly the housing corporation Mitros was visited for an interview; they were represented by M. Hendriks. The strengths, weaknesses and current problems in Kanaleneiland were discussed, plus the policy of the housing corporation. Hendriks was more negative about the neighbourhood than Nuwenhuis. She mentioned vandalism and intimidation as big negative points. The number of parking spots was also too little in the area. Hendriks did mention the problems with housing and garbage. Furthermore,
she mentioned the lack of informal control and eyes on the street. As a last point she acknowledged the uncertainty with the residents, due to the lack of communication on new developments. As positive points she mainly brought up the favourable location; near the water en between the city centre and large new neighbourhoods. As points of improvement she mentioned the importance to focus on the children. Specific focal points are the eyes on the street and the parking problem.

The last interviewed actors are the residents. This group was represented by the spokesman of over 400 tenants in the neighbourhood: mister Noradin. As with the other actors the situation in the neighbourhood was discussed, with its strengths and weaknesses and his idea on what should be done in Kanaleneiland. Noradin confirmed that the uncertainty with the residents caused a lot of frustrations. The residents also see the need to increase the number of parking spots and improve the playgrounds in the neighbourhood. The general maintenance of the dwellings is insufficient, as well as the surface areas in the houses. A last negative point is the bad image the neighbourhood has. As positive points Noradin also mentioned the position of the neighbourhood close to the centre and the highway. The number of community centres was also good and places like the Annansipark and ARKzone had a lot of potential. As points of improvement Noradin mentioned the need for elevators for the buildings, more parking spots and better places to play for the children. He was also positive about the idea to make the inner courts more public. The last point of advice was to improve the appearance of the buildings.

**Problem statement**

Kanaleneiland-Noord is seen as a deprived neighbourhood. People associate it with criminality and poverty and the residents have in average a lower income and are more often unemployed than in the rest of Utrecht (Gemeente Utrecht, 2013). Numerous projects have been carried out to improve the image of the neighbourhood but often with little success. At this moment the problems on the surface appear to be the number of parking spots and the space between the building blocks. When one goes into the neighbourhood and looks with a professional's eye other aspects attract the attention. The inactivity on the ground floor, the monotony and large scale of the design, transition between private and public
space and the illegibility of the open space are very apparent. Many of these problems come together in the concept of liveability. Liveability is the umbrella term for many more aspects that determine the quality of a neighbourhood; some of these other aspects are the vitality and nuisance in the neighbourhood. The concept of liveability can be seen as the extent to what an environment is fit for its users; this is in this case the extent to what the neighbourhood is fit for its residents to enjoy living in. When we want to improve the neighbourhood we need to improve the overall liveability in the neighbourhood. This brings us to the research questions stated in the next subchapter.
<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
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<tbody>
<tr>
<td>Cohesion among themself</td>
<td><strong>No informal control</strong></td>
</tr>
<tr>
<td>Amsterdam-Rijn Kanaal</td>
<td>Vandalism</td>
</tr>
<tr>
<td>Close to the highway</td>
<td>Parking</td>
</tr>
<tr>
<td>Close to the city centre</td>
<td>Surface area of houses</td>
</tr>
<tr>
<td><strong>Annansipark</strong></td>
<td><strong>Amount of open space</strong></td>
</tr>
<tr>
<td><strong>Structure neighbourhood (Modernistic)</strong></td>
<td>Dirty</td>
</tr>
<tr>
<td><strong>ARKzone</strong></td>
<td>Low quality playgrounds</td>
</tr>
<tr>
<td>Identity on larger scale</td>
<td>Criminality</td>
</tr>
<tr>
<td><strong>Monotonous design</strong></td>
<td><strong>Monotonous housing typology</strong></td>
</tr>
<tr>
<td><strong>Monotonous housing typology</strong></td>
<td><strong>No clear barriers in the neighbourhood</strong></td>
</tr>
<tr>
<td><strong>No investments</strong></td>
<td>Barriers to other neighbourhoods</td>
</tr>
<tr>
<td><strong>Worse image</strong></td>
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<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Leidsche Rijn and city centre</td>
<td><strong>No maintenance</strong></td>
</tr>
<tr>
<td><strong>Use of inner courts</strong></td>
<td><strong>No investments</strong></td>
</tr>
<tr>
<td>Appealing for students &amp; starters</td>
<td><strong>Gentrification</strong></td>
</tr>
<tr>
<td><strong>Increase housing typology</strong></td>
<td><strong>No trust in agencies</strong></td>
</tr>
<tr>
<td>Confined housing career</td>
<td><strong>Worse image</strong></td>
</tr>
<tr>
<td><strong>Monotonous structure</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Well defined spaces</strong></td>
<td></td>
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</table>
From the problem analysis and the information gathered from the interviews and data we can derive a research question which corresponds to the problems in the neighbourhood and the personal fascination with which this project is started. This question will form the backbone for the research and the following design process. The main research question for this project is:

“How can we improve the liveability in the post-war modernist neighbourhood Kanaleneiland-Noord by redesigning / redefining the outdoor space?”

The concept ‘liveability’ contains many different aspects and can be interpreted in various ways. The definition of this concept will be narrowed down in the ‘Theoretical framework’ chapter. With adding the definition of post-war modernist neighbourhood to the question it is clear to what extent the research is narrowed down. Moreover, the combination of redesigning / redefining insinuates that a whole new design is not often the answer. The solution can also be found in making a new hierarchy with some small changes to the urban fabric. Finally the notion of outdoor space is used; through this it is made clear that the focus does not only lie on the public space, but on the private outdoor space as well.

Sub questions
Following this main question there are some sub-questions that will help in answering the main research question. These questions are grouped by theme: The sub questions will be answered in the analysis, theoretical framework and design chapters. The main research question will eventually be answered in the conclusion at the end of this thesis. The first sub-questions concern the concept of ‘liveability’ and what people’s opinion is on the concept:

What do we understand with the concept ‘liveability’?

What aspects belong to the concept ‘liveability’?

What are the opinions of different theoreticians about liveability and the corresponding aspects?

How can the opinions of these different aspects be materialised in a design?

Next some questions about the post-war deprived neighbourhood Kanaleneiland-Noord are put forward. These question are mainly answered in the previous chapters.
about the context and the history of Kanaleneiland.

Is it possible to denominate mutual problems for different deprived neighbourhoods?

What problems can be found in Kanaleneiland-Noord?

When and how did these problems surface in the neighbourhood?

What problems in the neighbourhood could be traced back to the modernistic planning ideology?

What were/are the strategies to counteract the problems in Kanaleneiland-Noord?

There is a clear distinction between a strategy where redesign the space has the upper hand and a strategy where redefinition of the space is more important. There are some sub-questions that can help to find the right combination between the two strategies:

Is it necessary to demolish anything for the new design? What is the impact of a plan where only the strategy of redefinition of space is used?

Is it possible to demolish everything and start over; as a ‘tabula rasa’?

To what extent is it possible to objectively find the right combination between redesign and redefinition of the outdoor space?

Finally there are some sub-questions on the definition of outdoor space as well. These questions will be answered in the ‘Theoretical framework’ and the ‘Design process’ chapter.

What kinds of outdoor space can we denominate concerning the possible acquired privacy in these spaces?

How can the transition between the different outdoor spaces be designed?

Is it possible to distinguish different outdoor spaces without physical borders between them?

It is the intention to answer all these questions in this thesis. The main research question will be answered in the end at the ‘Conclusion’ chapter. The ‘Reflection’ chapter will elaborate on to what extend the questions are answered in the thesis.
مرحبا
ANALYTICAL FRAMEWORK
In the analytical framework a start will be made to answer the research questions mentioned in the previous chapter. These analysis will give the first information about the possibilities in the redefinition or redesign of the outdoor space. The problems in the current situation concerning these topics will be brought to light. In the chapter ‘Research by design’ the possible solutions to these problems will be worked out; at that moment the information from the analytical framework can be combined with the knowledge gained from the theoretical framework.

The analysis is divided in four parts. These parts represent the different scales which will be analysed in the thesis:

- the city;
- the neighbourhood;
- the block (or ‘Stempel’);
- the building.

These scales are chosen because it is reckoned that these scales have an influence on the overall liveability in Kanaleneiland-Noord; in each of these scales there are activities from residents or visitors. The choice for these scales is not backed up by theory, but chosen intuitively. At the most the choice for the neighbourhood and block scale could be derived from the historical analysis. The block has always proven to be an important element in the creation of Kanaleneiland and this had a strong influence on the overall neighbourhood.

The largest scale is that of the city; the connection to important (activity) nodes must be analysed on this scale. People tend to like a neighbourhood better when they can easily connect to other places from the neighbourhood. Scales larger than the city scale are not taken into account. The residents of Kanaleneiland-Noord will not have that strong connections with activities in the region or in the country.

On scales lower than the city scale the resident will get more and more influence and needs to be more involved in the planning on these scales. On the neighbourhood scale the connectivity in and going out of the area will be one of the focal points. On the scale of the ‘Stempel’ and the building it is important to focus on the materialisation, the possibility to regulate privacy by the residents and on the scale of the plan. The experience of the residents with the space is very important.

The scales will be separately discussed in this chapter, starting with the highest
scale and going to the lowest. The findings of the analysis will be presented in the text and shown in schemes and other drawings. The analysis are performed by visits to the site, sometimes accompanied by a professional neighbourhood manager from the housing corporation Mitros. The notable discrepancies are mapped or recorded through photographs and writing. People in the neighbourhood are questioned on their opinion on the neighbourhood. However, the questionnaires had little effect, people did not want to talk much to strangers.
On the level of the city the connection to the surroundings is very important. In neighbourhoods where one can easily get to (activity) nodes on a higher scale are generally more preferred than neighbourhoods where this lacks. The location to the west of the city centre and along the Amsterdam-Rijnkanaal is good.

The location is somewhat distant from the city centre, but this will decrease with the development of the station area, with new metropolitan functions like cinemas, restaurants and theatres. The closer positioning to the city centre can be very beneficial for Kanaleneiland-Noord. The position between the city centre and the new large expansion neighbourhood Leidsche Rijn can also contribute to a more positive image for the neighbourhood. The area will be relatively close to the city centre compared to the new neighbourhood.

However, there are also several borders when people would want to go from Kanaleneiland-Noord to the city centre. Especially for slow traffic like cyclists this could prove to be a problem. The borders to the centre are formed by the large building configurations, like the strip along the small Merwedekanaal owned, inter alia, by the military and the large complex of the Jaarbeurshallen on the other side of this canal. The Merwedekanaal itself and the train track form elongated barriers which cyclist can only cross at a few points. The cycle paths are not very efficient; there are only few possible routes and there are some dangerous crossings along the way. Furthermore are most of these paths not very attractive. Cyclists often have to cycle directly next to the cars and there is almost no route specifically allocated for cyclists. The best route is the most northern route, with only little car traffic and one can ride in a continuous manner towards the centre. Only at the beginning this path is ill designed, because of this it is not being used to its full potential.

The public transport is very well organised, with a tram line and several bus lines towards the city centre going through or around the neighbourhood. In less than 10 minutes one can be in the centre by public transport.

It is not useful to try to get to the centre by car, especially with the plans of the municipality to allow fewer cars in the centre (Milieucentrum Utrecht, s.d.). Therefore only the connection to the highway is analysed. This connection is very good. Residents can reach the highway A2 within five minutes.
Top left
Extension of the city centre
(source: by author)

Bottom left
Dangerous crossings for cyclists
(source: by author)

Top right
Public transport connections
(source: by author)

Bottom right
Connection to highway
(source: by author)
When looking at the neighbourhood it becomes quickly apparent what the physical problems are in the neighbourhood. These problems have to do with the larger structure of the road network in and around the neighbourhood, but also with the configuration of buildings and the materialisation and use of the open space.

Kanaleneiland was designed so it could function as a detached village. All the facilities could be found in the neighbourhood and it is detached from the nearby neighbourhoods through busy roads. It becomes clear what the impact is of the large roads that circumscribe the neighbourhood when the place is visited. Transwijk is positioned directly to the west of Kanaleneiland, on the other side of the Beneluxlaan. This road however is so wide and busy that it becomes very hard to see the connection of these two neighbourhoods. These two neighbourhoods were part of the same plan and were much better connected in the first decades the plan was realised. According to a spokesman from the municipality the maximum permeability is reached at this moment, a better connection with Transwijk is not feasible (Nuwenhuis, 2013). Also the connection with Kanaleneiland-Zuid is hardly recognizable anymore. Here the slope to the Prins Clausbrug takes away every notion of the two neighbourhoods belonging together. The connection to the north is not much better. The slope to the Meernbrug takes away all possibilities to connect to the northern part by car. When one wants to go by bike he gets blocked by the private parking lot of the tennis club. There is no convenient way to reach the neighbourhood that lies behind these tennis fields.

If one looks at a map of Utrecht it becomes clear in what ways the modernist architecture is different than the architecture before the war. The typology of the buildings is the most striking difference. Where the older neighbourhoods all have closed building blocks, Kanaleneiland consist of different lengthy buildings standing alone in the open space. Because the buildings seem to be exposed on both sides the possibility to regulate one’s privacy is much less than with the closed building blocks. Also the fact that the building blocks in Kanaleneiland-Noord have four dwellings stacked on top of each other decreases the ability to control the privacy of the residents (Gifford, 2007; Kearns, Whitley, Mason, & Bond, 2012; McCarthy & Saegert, 1979). The building is no longer in the possession of
one household, but of several. Since the construction of Kanaleneiland in the 1960s not a lot has changed. Only a few buildings have been added, mostly free standing societal buildings, like mosques or schools, and office buildings. Little housing blocks have been replaced in the last 50 years. Only in the last decade a larger area with societal buildings like schools and a church has been demolished to make room for new single-family houses and a large school complex. The different schools were meant for the different religious and socio-political groups. When the barriers between these groups vanished in the 1960s, a large amount of these buildings were not necessary anymore. The amount of religious people has been decreasing as well, which explains the demolishing of the church. Housing blocks have replaced these public facilities, blurring the traditional function of the green slabs between the living quarters.

The structure is typical for modernist neighbourhoods with streets running parallel and perpendicular to each other. However, the designers did not go completely through with this rational grid; there are several exceptions in the grid. Some exceptions could not be averted due to the connection to other roads and existing buildings. The road near the hospital is a good example. The hospital was already built before the neighbourhood, the designers could not keep the rational grid here; this is why the only road with a curve is located at this spot. The rational character of the neighbourhood is very apparent in the monotonous design of the buildings as well. The rational configuration and the similarities between the different buildings are very big. This makes the place on the one hand very complex, because it becomes harder to find your way when all the buildings look the same. On the other hand, it gives the place a very dull appearance for exactly the same reason.

In the public space there is not a lot of usable green. All the street profiles have a very paved appearance and the green beds are almost always not accessible to use. Only the grass fields along the canal and at the Annansipark can be used for recreational purposes; you see that these places are used significantly more than other spaces. On the inside of every housing block there are private gardens or a small public grass field. The overall image of Kanaleneiland is a paved image. Large parts of the neighbourhood are covered with concrete tiles and asphalt. There are several trees in each street, but they seem to be placed at
Top
Public green Kanaleneiland
(source: by author)

Bottom
Private green Kanaleneiland
(source: by author)
Huge open space, no human scale
(source: by author)
random along the road to give it a more appealing look. However, the quality is so low that it has almost no significant impact on the appraisal of the area. The only large green public areas are the Annansipark in the centre of the neighbourhood and the green promenade at the ARK-zone along the canal. These are the good examples of the use of green in public space. Other green slabs are merely for filling in space between buildings and the public road. In these places the green has a very low quality.

Location visits and the maps assume the existence of a main route through the area. This is a road in the middle of the neighbourhood with a strip of green between the two lanes. The bus drives on this road and all the side streets are connected to it. However, when looking at an analysis from López et al. (2012) on the neighbourhood with Space Syntax it becomes clear that this ‘main route’ is not well connected to the bigger roads around the area. The roads around the shopping centre are better connected. These roads are only used by traffic going to and from the parking lot at the shopping centre. This traffic flow has no connection with the neighbourhood at all.

Kanaleneiland is a neighbourhood where many cases of burglary occur (López et al., 2012). This is the most in the upper and the lower part of the neighbourhood. These locations are less well visible from connected streets. Visibility is very important in the prevention of crime and this could very well be the reason for the acts of crime to particularly happen here.

Finally the best spots in the neighbourhood are the ARK-zone promenade along the canal, Annansipark with the playground in the middle of the neighbourhood connected to the school building, and the car-free streets in the newly built housing blocks behind the school complex. In these places people walk around and sojourn, kids play and one has a good overview on what is happening in this space. These spaces are also closely connected to the buildings with a societal function. The importance of these buildings could go well together with the possible buzz in these spaces.
The modernist lay-out of Kanaleneiland-Noord makes that there are a lot of (almost) identical blocks. Most of the times, the ‘Stempels’ offer the same facilities; parking lots, some green slabs and a playground. The configuration is such that the blocks sort of circumscribe an inner court. However, due to the building configuration these inner courts are not entirely closed off. In these inner courts the private gardens for the residents on the first floor are situated. However, to reach the garden someone first has to enter the apartment on the first floor to subsequently get down their private stairs to the garden on ground floor. In many cases there is not even an emergency exit in the back of the garden. The gardens make up for the lack of green space in the open space, but as mentioned only for the residents of the first floor. Often the gardens are 15 meters deep, but they are seldom used. One of the reasons is the lack of feeling of being private in those gardens. The residents of the top three floors can all see what is happening in the garden and even throw their own garbage in it. In some ‘Stempels’ there is an urban garden. This is done because the gardens were not used. It is not known what effect these gardens have on the residents, but the places still look unused. The only thing that could be seen in these places was garbage. In addition, some of the buildings blocks have a sort of public space within the block. These spaces are publicly accessible, but these places are tucked away and no-one seems to use them. Even older kids will not use it because of the possibility to exert surveillance from the dwellings on these spaces. The green on the other side of the block has a low quality. It usually consists of small pieces of grass between the building and the pavement. The bushes are removed in the area because they were hard to clean (Hendriks, 2014). There are some trees along the sidewalk which provide shade in the summer and demarcate the playground.

There are parking facilities in between the housing blocks, but there are too few spots for all the cars. This results in a lot of cars getting parked on the sidewalk. This makes both the sidewalk and the road smaller for passers-by; the street will be less easy to survey which makes the possibility to exert social control is much lower.

The playgrounds between the building blocks have a decent quality. There are several objects for kids to play with. During the summer these playground all get used regularly; in the winter almost all of these places are empty. Only a few playgrounds still attract kids during the colder months.
These are the central playground at the Annansipark and the playgrounds in the streets which end in a cul-de-sac. There is a lot of space which is not used at all in many playgrounds. Moreover, the playground in general has a very stony appearance. These points could be enhanced in the future. It is important that the kids in the neighbourhood get something to say about the refurbishment of their playgrounds.

Photos Kanaleneiland-Noord
(source: by author)
Impressions street profile
(source: by author)
On a section it becomes more clear what types of space there are between the buildings. The space behind the buildings inside the block is often for private use. However, these spaces do not seem to be used very often. It is more used as a place to store the garbage. The balconies look out over this space, and give the opportunity for surveillance. There is more potential to the inside space of the block, but the private ownership does not work, probably because people cannot be private in these places, while this is one of the principal ideas of private back gardens.

As mentioned before, the space in front of the blocks is used a bit more. During the colder months however, these spaces also look dull and abandoned. This is also the place where the car dominates the picture of the street, because of the many cars parked on the sidewalks; places not meant to park on. The space between the building fronts is larger than that between the buildings backs. However, the roads and car traffic take up a lot of space in front of the buildings. By redefining the functions of each space a more clear hierarchy could be made and both spaces could be used more to their potential.

The buildings in Kanaleneiland-Noord do not differ much through the neighbourhood. There are primarily two-room apartments; some of them are combined to a four-room apartment. There are some bigger apartments on the lower floors with six rooms. Overall these apartments are experienced as being too small; a apartment with 5 bedrooms only has a living room of 20 square meters. A lot of people also live in the social rental housing while they have enough money to rent in the private rental sector (Hendriks, 2014).

Moreover, the plinth of the building is for many buildings closed; on ground level there is almost no interaction possible between people in the building and people outside. The entrance to the building flows directly into the public space. There is almost no transition between private and public space; only the staircase which connects all the dwellings is semi-private space, but there is no possibility for social contact in this space. The row-houses often have a small garden in front of the house, but these are generally badly maintained. This could be caused by the number of passer-by in the street or the profile and detailing of this street, which make the gardens not a private enough area to dwell in and to maintain.
Garbage disposal in back yards
(source: by author)
Inactive ground floor
(source: by author)
THEORETICAL FRAMEWORK
In the theoretical framework the concept ‘liveability’ will be discussed. What is liveability, what aspects determine the liveability in a neighbourhood and how can these aspects be improved? An answer to these questions is needed to come to an answer for the main research question.

Liveability can be divided in three parts, which all emphasize another part of the relation between the human being and the living environment. Many aspects are of influence in determining the liveability of a neighbourhood. In this research it is chosen to look more closely to the vitality in a neighbourhood. According to Jacobs this can be divided in legibility and human scale. Other problems that derived from the analysis and have to do with the liveability are the possibility to regulate the privacy. This has a close connection with vitality as well. Without the possibility to regulate one’s privacy people tend to withdraw from the public domain. Therefore there will be no vitality in the area. This means privacy regulation is more important than vitality in a neighbourhood.

The way to improve the privacy regulation in an area is by creating territories in the area. This way people are able to close spaces of from others and experience privacy when they want to. However Alexander states that simply making territories in a space is not desirable. A better solution is ‘privacy zoning’ where the legibility is an important factor which makes it clear for people which zone or territory they enter. Here we see the strong connection between territories and especially privacy zoning and legibility, which is a part of vitality as well.

With the different possibilities presented in this chapter the design process is started. Different solutions will be brought together and assessed on their effect on the overall plan and the other aspects of liveability.
To improve the satisfaction with the neighbourhood, it has to meet the right demands of the residents. All these demands determine the liveability of the neighbourhood. Some of these demands are very obvious and will be mentioned by the residents itself, like the number of parking places and the amount of green in a neighbourhood. Other aspects can be less clearly defined, especially by residents with no knowledge on urban social phenomena. They will sense that something is not right but cannot denominate the exact cause. A good example is the amount of control a person has over the regulation of privacy. When this is too little he will feel stressed and will possibly withdraw from the public space. The resident will not name the lack of control as the problem, because he does not recognise this as the cause. This is where the urban planner enters the scene. The urban planner can recognise the different aspects of liveability and improve the neighbourhood with a strategic design.

After this the concept of vitality will be more elaborated on. This is one of the aspects of liveability and is chosen mainly because of the relation with privacy and control. According to Jacobs two things are important for vitality: the relation between building and public space, and the legibility. These concepts will be discussed as well. After each chapter an assessment on the meaning of all these terms for the improvement of Kanaleneiland will be given.

**Satisfaction versus reputation**
First it is important to recognise the difference between subjective assessments and objective characteristics of the neighbourhood. The former explains the neighbourhood satisfaction and the latter is important to determine the neighbourhood’s reputation (Permentier, Bolt, & Van Ham, 2011). The satisfaction with the neighbourhood can explain the residential mobility and the neighbourhood stability. However, this is subject to selection effects and dissonance reduction. People are likely to move to a better neighbourhood when they have the financial means. When residents do not have a choice to go to a better neighbourhood they tend to like their own neighbourhood better. There is also a difference in satisfaction in
the different stages of life. For instance, a higher income and age correlate with a higher satisfaction with the neighbourhood. This probably has to do with the increased possibilities when people get older and have earned more.

Residents’ perception of neighbourhood reputation is affected by the view of other city residents. Residents often have a more shallow view on other neighbourhoods; they are not interested in the details. Socio-economic status and ethnic composition are the main characteristics to have impact on neighbourhood reputation. Crime and distance to the city centre also affect perceived reputation in a negative way (distanced neighbourhoods are less well-known). If we look at personal and household characteristics, men are overall more concerned to derive status from their home than women. Age, income, job-status and owner occupation also have a positive effect on the status residents attribute to their home (they more often think that reputation is important).

Neighbourhood satisfaction and reputation are somewhat interrelated as well; there is a positive correlation of 0.584 between neighbourhood satisfaction and perceived reputation; this is very modest (ibid.). In the following paragraph we will mainly focus on the satisfaction with a neighbourhood.

Types of liveability
The term ‘liveability’ originates from the biological research field. It describes to what extent the environment is fit for the adaptive repertoire of an organism (Veenhoven, 2000). The conditions for the match between surroundings and organism are very strict. When temperature of humidity gets below a certain point an organism cannot survive. For spatial planning or district management liveability is less strictly demarcated. Within these two professions liveability deals more with the quality of the surroundings and is in this way more subjective. A liveable area in spatial planning foremost indicates the presence of recreational facilities; in district management it indicates the absence of nuisance.

Veenhoven (ibid.) defines two parts of liveability from the biological point of view. Firstly there is the presumed liveability; hereby we know more or less what the optimal conditions are for an organism. It is hypothetical, which explains the use of the
word ‘presumed’. The second class is the apparent liveability. This is the real match between the organism and the environment. It is the best but also the most hard way to assess the liveability. This type of liveability can only be measured subsequently, for example in the time an organism thrived in an environment. For people it is the amount of time they feel happy in a neighbourhood. This classification could also be used for the human living environment (Van Dorst, 2005a, 2005b, 2012). Van Dorst adds a third concept besides the presumed and apparent liveability; perceived liveability. He defines liveability as the human perception in relation to the environment.

In his focus on the living environment of people he sees presumed liveability as the extent to what the physical environment contributes to the well-being of humans by supporting certain forms of human behaviour. Aspects like parking, green space, criminality and population are widely used to assess the presumed liveability of neighbourhoods. These aspects consist of objective measurable data. The use of objective characteristics is why this part of the concept liveability is widely used by agencies such as the municipality (Van Dorst, 2005a); this confirms the statement of Permentier et al. (2011) that this is used for the neighbourhood’s reputation. However these aspects also partly determine the satisfaction of the residents. They use it for their political slogans, with which they can score easily on the political agenda. Nieboer (2005) shows us a good example; he states that European renewal programs used the concept widely in 1997 to define the technical qualities of the housing stock, attractive, pleasant-to-live residential neighbourhoods, social cohesion and social security. Liveability contains so many aspects here that the concept loses a bit of its strength. Veenhoven warns that an excessive use of the concept liveability in other contexts than biology can lead to the loss of its significance; that it becomes a container notion.

For the apparent liveability Van Dorst uses Veenhovens definition: the real match between person and his living environment. He agrees with Veenhoven that it is the best method, but also very hard to measure for humans, because of their possibility to adapt to different environments. He states that this form of liveability will only be measurable at the end of a person’s life.

The last form is perceived liveability; this is about the appreciation of a person for his living environment. The perceived liveability
Fig. 8.2 Perceived liveability – the appraisal of the individual for his or her habitat

Fig. 8.3 Apparent liveability – the perfect match between species and habitat

Fig. 8.4 Presumed liveability is emphasising the presumed conditions for liveability
The apparent liveability is seen as the most accurate type to assess for the real liveability. However, this is hardly usable because of the fact that the effects are only measurable a person has inhabited the space. When one only looks at the characteristics of the neighbourhood, he is not possible to assess accurately for the overall liveability. The presumed liveability should be assessed in relation with the needs and perception of the residents, the perceived liveability. It is hard to match these two types of liveability due to subjectivity and thus complexity of the last type of liveability.

Van Dorst (2005a) also denominates some conditions for the presumed liveability in relation with the physical environment. This relation brings forth a certain amount of basic needs; without these basic needs a neighbourhood is unliveable, an environment which satisfies these needs will give a higher general satisfaction to its residents. The first basic needs are health and security. These needs, together with the basic human needs are also mentioned by Maslow (1943) and are strongly related to the environmental issue (Van Dorst, 2005b). Next comes material prosperity, income equality and equality in happiness; the individual compares himself not only influenced by the characteristics of the environment, also the characteristics of the person and the social-cultural context is important (Gifford, 1997, cited in Van Dorst, 2005a). As the word says, it is more about the perception by people than about hard data (Montgomery, 1998); it could also be seen as the image people have on a neighbourhood. Perceived liveability is added as a type of liveability in the psychological and sociological sciences, because the criterions are mainly subjective and humans are the only species that can convey their opinion on these criterions to each other. The perceived liveability is much more indirectly related to the surrounding elements in a neighbourhood. There are other aspects in the assessment of this type of liveability than for the presumed liveability. According to Van de Wardt & De Jong (1997, cited in Van Dorst, 2005a) these aspects are a well maintained neighbourhood, green and space, absence of nuisance, and a homogeneous composition of residents. For the ‘GrootSteden Beleid’ project some other aspects were found that influenced the perceived liveability. These were the percentage of unemployed in the neighbourhood, quality of social relations, perceived amount of crime against property, and the evaluation of the dwelling.

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The last basic need is contact with natural environment; this can reduce stress and seems to be positively related to the physical well-being of residents (Evans, 2003; Gifford, 2007; Huang, 2006; Van Dorst, 2012).

What does this mean for Kanaleneiland? Looking at the presumed liveability in a neighbourhood is a great starting point. When a neighbourhood does not function well, the presumed liveability criteria are fairly easy to assess and one can act quickly on them with visible improvements. However, by improving only the presumed liveability one cannot improve a neighbourhood; the complexity in the relation between surroundings and human behaviour is too great to only measure aspects from the presumed liveability (Alexander, 1965), as will be shown in a later chapter. The aspects for the presumed liveability contain namely the environmental characteristics and these should obviously be good in any neighbourhood; but it is not enough to only improve these. It is the perception of the residents that should be taken into account as well; this has much more to do with personal characteristics and the social-cultural context. Therefore the perceived liveability...
should be studied thoroughly. This is much harder because the information is less easy to measure in concrete units. When one really wants to improve the neighbourhood he should pay attention to the characteristics that are important for the creation of a liveable neighbourhood as given by Van Dorst (2005a).

The first scale is health and security, which is not self-evident in the neighbourhood. The perception of safety is sufficient, but data shows there is still a lot of crime in the area, especially car theft and burglary. The second scale is material prosperity and income equality. Here, the benefits of a homogeneous group are again emphasised, this time it has an economic character. The economic situation of the residents in Kanaleneiland is more homogeneous than the ethnic composition; there are fewer problems in this respect. The third scale focuses on the social relations, again it is stated that weak relations are preferred; this is the bridging capital as mentioned in the former chapter. Control is the fourth scale and this has not been mentioned before. Residents in Kanaleneiland should get more control over their social interaction and over their environment. This can be done by creating different zones in which a person can choose the amount of privacy he desires; this will be discussed in the following chapters. The last scale is the contact with nature. Kanaleneiland has a very stony appearance and many natural sites do not have the quality to attract people to it. This should be improved in the future plans.
A part of the criteria for the assessment of liveability are already mentioned in the former paragraph. Van Dorst cites many other authors who listed a lot of those criteria. For the presumed liveability these are parking facilities, green and water in the neighbourhood, population density, vitality, criminality, social security etcetera. For the perceived liveability it was more about the perception of the residents: nuisance, maintenance, quality of social relations and the evaluation of the dwelling. Other authors do not directly mention liveability, but their criteria for a good neighbourhood are in one way or another similar to the criteria from the above mentioned three types of liveability.

Taylor (1982) states six functions that may be seen in a neighbourhood. These functions are social interaction, social control, the sense of security and ease, organisational ties, collective identity and sense of place, and socialisation. All these functions are positively correlated with each other and the physical characteristics can promote or hinder these functions. Evidence suggests that when the neighbourhood satisfies the needs of functions the attachment to the neighbourhood is strengthened (ibid.). However, when the neighbourhood is not designed accordingly, these functions can have a negative effect; social isolation instead of interaction, non-participation instead of organization ties, alienation instead of collective identity, or delinquency instead of socialization. Taylor assumes there is a correlation in these negative effects. Therefore, the design of the neighbourhood is important for the social well-being of its residents.

According to Dekker & Bolt (2005) social cohesion is an important factor in successful neighbourhoods; this can help enhance the liveability and tolerance between different groups (Van Dorst, 2005a). There are five dimensions of social cohesion: social networks, common values, place attachment and identity, social order and control, and social solidarity (Bolt & Torrance, 2005; Dekker & Bolt, 2005). The first three are important on the neighbourhood scale. Furthermore, a connection with the neighbourhood functions from Taylor (1982) can be recognised; social interaction, collective identity and sense of place are comparable to the social networks, common values, and place attachment and identity aspects respectively. They state that difference in socio-economic status does not
lead to difference in social cohesion on these three dimensions.

The first dimension, social networks, refers to the ties between persons in the city or neighbourhood (Dekker & Bolt, 2005). There are two sorts of social contacts, bonding capital and bridging capital. The first represents strong connections, also described as qualitative connections; like close friendships. One tends to be more on the same level/opinion with these kinds of connections and one has time to maintain only a few of those connections. Because of this one does not get a lot of other opinions on societal matters and does not broaden his view on wider society that much. Bridging capital is the opposite; these represent weak ties among people. It is possible to have a lot of weak connections, because they cost less energy to maintain. These could also be called the quantitative connections because one gets different opinions from a lot of people, which gives a broad view on the wider society. Connections in the neighbourhood are ideally superficial and therefore can be described as typical bridging capital. People need both kinds of capital to be certain of a strong social network. There are a lot of factors that determine the development of social networks. Dekker & Bolt (ibid.) cite Fischer who found that education is the most important factor (seconded by Nieboer (2005)). Furthermore, income, home ownership, length of residence, age, being a woman or having children have a positive effect on social networking. Bolt & Torrance (2005) found that low education, income, high age and having young children are positively related with focus on the neighbourhood. A homogeneous neighbourhood is also positively related with connections in the neighbourhood. In general, a higher education results in more connections outside the neighbourhood and a longer stay in a neighbourhood results in more connections within that neighbourhood. So people who rise on the socioeconomic ladder and buy a bigger house in the same neighbourhood will have stronger social contacts in the neighbourhood than people who come from outside the neighbourhood. Social networks also have negative points. These are the exclusion of outsiders, excessive claims on members, restriction of individual freedom and downwards levelling.

The second dimension is common values. This has to do with how people react on deviant behaviour; a group of people tends to have a common set of values. Also with this dimension there are a few
mixed neighbourhood than native Dutch residents and western immigrants. This means that striving for a social mix appears to be counter-intuitive to strengthening social cohesion. Having children also has a negative effect on place attachment and identity. The last characteristic could be biased because the research was done in poor neighbourhoods where the living environment was considered not suitable for children.

Dekker & Bolt (2005) have researched the relation between the three dimensions. They concluded that aspects of social networks were generally positively correlated with other aspects of social networks and with place attachment and identity. With aspects from common values they found no significant correlations, only chatting with neighbours correlates negatively with the acceptance of force. The aspects from common values do not correlate with other aspects of common values and the acceptance of deviant behaviour has a positive correlation with social belonging but negative correlation with spatial-emotional belonging. This means when someone feels like he is part of the group there is a tendency that he will more often accept deviant behaviour, but less often the use of characteristics which influence the tolerance of deviant behaviour. For example, a high education gives results in more acceptance of deviant behaviour because one should be more able to read between the lines. However, a uniform conclusion on this point could not be reached in others studies. Owning a home would lower the tolerance, probably because they invest more in their surroundings to maintain the value of their houses. Besides that, ethnic minorities tend to be less tolerant to deviant behaviour than native Dutch residents. Older people are also less tolerant to deviant behaviour.

Place attachment and identity is the third dimension. This leads to the feeling of security, builds self-esteem and self-image, provides a bond between people, cultures and experiences and maintains group identity. Attachment and identity can also be divided in two aspects, social belonging and spatial-emotional belonging. The first expresses the social significance one attaches to neighbourhood, and the second expresses a symbolic value given to the place. A homogeneous composition of residents, high income, owner occupation and length of residents all have a positive effect on attachment and identity. Ethnic minorities are more comfortable living in a homogeneous composition of residents, high income, owner occupation and length of residents all have a positive effect on attachment and identity. Ethnic minorities are more comfortable living in a
What can this mean for Kanaleneiland? For Kanaleneiland it is important that especially the place attachment and identity is improved. Through the correlation with the other two dimensions this will influence several other aspects of social cohesion in the neighbourhood. Moreover, more place attachment and identity leads directly to the building of self-esteem and self-image; this way people can empower themselves. The focus on the spatial-emotional belonging is hereby a good starting point. This has to do with creating meaningful and legible places; which is very important to make the neighbourhood more liveable. More on legibility and meaningful places will be discussed in the following chapters. From the social networks dimension it was advisable to strive for an ethnical homogeneous neighbourhood. This is not possible in Kanaleneiland without having to move 60 per cent of the residents. Kanaleneiland is a multicultural neighbourhood and will be so in the future. No agencies should actively try to change this. Also, a heterogeneous neighbourhood is also better for more bridging capital because there are more different opinions. Finally it is important to focus on education and to try to keep people in the neighbourhood. There should be a
possibility for a moderate housing career within the neighbourhood. This implies for instance more single-family housing.

Hoogland (2000) gives us some other concrete options for achieving social cohesion. She cites several other authors who found these options in research or from practice. Firstly, the number of dwellings and the number of floors per block should be restricted (Howley, 2009; Howley, Scott, & Redmond, 2009). This way the number of residents that share one entrance stays relatively low. Secondly, the orientation and constellation of the buildings is important; dwellings facing each other further social cohesion. A third point is the homogeneity in building materials, which makes it clear what buildings belong to the settlement and what buildings do not. A low frequency of traffic is the fourth point. With less traffic in the street, more people will be on the street (Van Dorst, 2012). Furthermore there must be room for play and green spaces must be allotted into private gardens. The final point is letting walking paths to different amenities cross so that people can encounter one another.

Playing chess in the public space
(source: Partensky, 2009)
Altman defines privacy as the “selective control of access to the self or to one’s group” (1975, p. 18). It is possible to derive some reasoning of Altman from this definition. Firstly he talks about ‘the self or one’s group’; indicating that one can be private as a person, but that a group can be private as well. Next, he uses the word access; this can be divided as physical access, where someone can walk up to the person or group and talk to them. On the other hand access has to do with the access to information of a person, for example on the internet. Finally Altman mentions ‘selective control’. This means the person or a group must be able to regulate the accessibility for physical contact or information. Westin names four different types of privacy (ibid.). The first is solitude, where a person is all alone; there is no interference by other persons. This is the most extreme condition of privacy. The second type is intimacy, small groups that withdraw for the public space experience this kind of privacy. Reserve is the third type of privacy; this is achieved when someone is deliberately ignoring other people when he does not want to be disturbed. The last type of privacy is anonymity; when a person goes up in the crowd. This way the person is hardly recognisable as an individual. The feeling of responsibility can decrease and the possibility of socially undesirable behaviour increases in these kinds of situations.

The desired amount of privacy can vary per person and in time and is dependant on personal threats, social influences, physical environment and culture (Gifford, 1997, cited in van Dorst, 2005a). Therefore the regulation of privacy does not only mean being on your own; when the person feels the need for much physical contact it still has to do with the regulation of privacy. When there is a mismatch between the desired and the acquired amount of privacy there is a problem. If a person has less contact than desired he will feel lonely or isolated. When a person acquires more contact than desired he will feel social pressure; this is called crowding (this will be discussed more thoroughly in the appendix); the feeling of isolation or crowding often is the cause of the impossibility to regulate one’s privacy (Gifford, 2007; Sherrod, 1974). Altman made a scheme to make it clear. The need for privacy must be met by the living environment. The physical environment must give a person or group the possibility to regulate their privacy. This can be very complex, for different people in the neighbourhood have a different
need for privacy on different moments. It is even harder because the social and physical environment do not fully correspond with each other (Van Dorst, 2005a). It is important that an urban planner takes this into account and creates different places which support different privacy levels. This can be done by arrangement in territories. This means that it is necessary to work through different scales when designing for privacy regulation.

Control in the living environment is about the control of the social and physical environment (Van Dorst, 2005a). Control is in this respect the choice to interact with fellow residents and the possibility to interfere in the physical surroundings when one wants. Habraken (1998) defines the latter as ‘control of form’. This way, residents can personalise their living environment and regulate their privacy. Control over the surroundings is more than only changing what you want. It is also about the possibility to be involved in the neighbourhood. Legibility will also make it easier to control an area; when it is clear for whom the area is meant people will also act accordingly. Legibility gives meaning to a place in this case. With the control over the regulation of privacy the possibility to withdraw from more public spaces is meant.

When a person can choose when to be alone and when to be in company of others he will also appreciate the situation more. This will also indirectly improve the tolerance towards others.

Control is easier when the space is more private; the privacy can be pretty well controlled in one’s own house. This area is also completely owned by the resident. In public space this control is very hard; this space is shared with other people who might have other ideas about the use of that place. It is important that the control over who you meet and who you ignore is maintained in this area.

There are two ways to exert control over an environment, formal and informal. Formal control is done by police and camera surveillance. Although this type of control can be effective, it is costly. Moreover, it does not improve the vitality in the neighbourhood. When the right physical conditions are apparent people will feel more assured to exercise control themselves, this will improve the social cohesion and indirectly the liveability in the neighbourhood. However it is impossible to force people to exert control; this should come forth from a design that offers the possibility to do so.
Vitality is chosen to be more elaborated on due to its relation with privacy and control. There can only be liveliness when people can control their privacy by voluntarily withdrawing from crowded places or, on the contrary, looking for it (Van Dorst, 2005a). Vitality is about the amount of people and activities in a public space, but also about legibility of space and the relation between the building and the public space; the latter can also be phrased as the human scale. The different definitions will be discussed in this chapter and some concepts that define vitality will also be elaborated.

Van de Wardt & De Jong (1997, cited in Van Dorst, 2005a) do not associate vitality with perceived liveability in the neighbourhood. In the doctorate thesis of Van Dorst it is characterised as being part of the presumed liveability. Therefore would be less important in the assessment for the overall liveability than other aspects, which are categorised as a part of the perceived liveability. In my opinion, this is questionable. The legibility of space and the human scale are typical factors that can only be perceived by the users of an area. They are very subjective, like other aspects that are assessed for the perceived liveability, where aspects that are accounted to the presumed liveability consist of more objective data. Moreover, Lynch (1960) states that the legibility of the city influences the imageability; the image of the city was seen as a part of the perceived liveability. This strengthens the claim that vitality is part of the perceived liveability.

Many authors also name vitality or liveliness as an important part to improve the liveability. Lynch (1965) names vitality in his five points for a good city form. He explained vitality as the extent to what the city fulfils the needs of its inhabitants within a safe environment. He claims there are five types of performance dimensions that fall under vitality. The first is sustenance and is about the adequacy of water, air, food etcetera. The second type is safety: absence of hazards and diseases. Thirdly he names consonance, which implies the extent to what the environment is fit for people to live. The fourth point is to what extent the environment is fit for the organisms that are economically useful to man. The last point is the presence of future stability. However, these points are much more general and come closer to Van Dorst’s (2005a) and Veenhoven’s (2000) definition of liveability than on actual vitality, the latter must be seen as a part of liveability.
Montgomery (1998) states that it is vitality that, together with diversity, distinguishes successful urban areas from the others. In his definition vitality is indicated by the number of people in and around the street during the day. Also the number of facilities and events are important in promoting an active street life. The diversity in primary land uses and activity creates the long term vitality that is needed. With this statement he refers to Jacobs (1961), who was the first to stress the importance of these concepts vitality and diversity. Jacobs concluded that the relation between the street and the building and the legibility of a place are the most important for a vital area. Gehl (2011) also stresses the importance of people walking in the public space for a lively city. The presence of social and cultural opportunities and attractions is essential in this respect. However, all these authors focussed in their claims for more diversity on the busy main streets in a neighbourhood. They emphasised the importance of a high number of people at all times. This is a reasonable demand for an area in the heart of New York, but for a small neighbourhood in Utrecht it is not realisable. There are too few people in total to make the places buzzing with life all day and night. Moreover, in a more quiet living area people probably do not even want such a lot of activity at night.

This does not mean that a neighbourhood like Kanaleneiland cannot be seen as vital. The two conditions, legibility and the relation between building and street do still apply to these areas. It is important to scale the demand for people down; inner courts with three people can already feel vital when the purpose of an area is to be more tranquil. Jacobs’ diversity is less needed in more quiet neighbourhoods. It can even be better to have a homogenous composition of residents in this case, like Van de Wardt & De Jong found in their research.

Human scale
Montgomery (1998) sees the scale of an urban environment as a combination of the ratio of building height to street width, relative distance, permeability and the sense of grandeur or intimacy of space. For the relation between street and building there are no strict guidelines. It is more important that the ratio feels right. Higher buildings do require wider streets, this way the amount of light and ventilation on street level will still be adequate. In the USA they created a zoning law, after too many skyscrapers caused the liveability on the street to decrease.
difficult to have the human scale and the car scale go together in the same place.

Another important part in designing for the human scale is the distance to facilities. Facilities that one needs daily are ideally within 10 minutes walking distance from the dwelling of a person (Montgomery, 1998). The number of intersections is important as well; this is called the permeability of an area. The permeability should be high, so people have several choices when walking to their destination (Jacobs, 1961). It is possible to have too many intersections, resulting in a confusing image of the street; the legibility will decrease this way. Permeability can also be applied for the ability to cross a street safely on several points.

Legibility

Lynch (1965) sees legibility as a part of sensibility, another one of his five points for good city form. The sensibility of a settlement is the clarity with which it can be perceived and identified. Legibility is the specific part of sensibility that focuses on the communication through symbolic physical features. These symbols are a combination of the form of the environment and the human process of perception and cognition. Again the terms ‘perceive’ and ‘perception’
surface in this definition which suggests the relation with the perceived liveability. Lynch (1960) uses a more basic definition when he describes legibility as the clarity of the cityscape. He calls it the ease with which different parts of the city can be recognised and organised into a coherent pattern. He states that structuring and identifying the environment are vital abilities for all mobile animals. For humans it is also important in the appreciation of a place. It has to do with the input from all the senses. Van Dorst (2005a) comes close to Lynch with his definition. He states that legibility of the urban environment is determined by “the extent to which the observer can univocally interpret his surroundings in which his perceptions are in accordance with his existing cognitions.”(p. 82) He also refers to Jacobs’ notion for the need for legibility and a human scale. He sees legibility in this context as the distinction between public and private zones. He continues with the notion that legibility gives meaning to an environment. With this notion he again connects with Lynch who uses sensibility in this respect; with sensibility a person tries to give meaning to a place.

Carr (1992) also emphasises the need for meaningful places. People need links to the physical world. These links are formed by the physical space and the activities therein. These experiences form links between a place and the life of the individual, a group or a whole culture and make a place meaningful. Hereby, legibility is also important; a place can only become meaningful when it is legible. According to Carr, legibility is the ability of a place to communicate that it is open to the user and to communicate what is possible in that place.

Kaplan (1987) agrees on of the importance of legibility in a neighbourhood. However, he was of the opinion that only the concept of legibility was not sufficient to understand the vitality in an area. There were other notions important in the appreciation of public space. The other concepts were coherence (which has been mentioned before in this thesis), mystery and complexity; together with legibility they could indicate the quality of an open space. The four concepts could be classified in different combinations. Coherence and legibility stand for the possibility to ‘understand’ the area; mystery and complexity stand for the opportunity to explore an area. The matrix formed by the four concepts shows that legibility cannot be seen as a dichotomy; a place cannot be
Coherence and complexity have in common that both are the result of the information that is immediately available at a first glance on the scene. Is it easy to understand what is happening in the scene or not? Legibility is important when the person walks deeper into the scene. Is he able to predict and maintain his orientation in the scene? When a place is more mysterious more information of the scene is promised when one walks deeper into the scene. This can make a person curious and want to know more about the place. The desired ratio between legibility and mystery can vary per person, place, time and through different scales. So can a person who knows a place very well handle a bit more excitement, which is provided by a higher level of complexity. When someone is lost he needs point to recognise where he is, the place must be coherent. With respect to the different scales, an area can be recognisable on a map but also when someone is standing in the street. As a last point it is important to notice that too much coherence again leads to complexity. When the building façades or the overall structure of an area is too much coherent, people will still become lost, because they are not able to orientate themselves. This is not the case with complexity, legibility or mystery. When people were shown photos of different physical surroundings they tended to like the surroundings that had meaning to people and surroundings that evoked curiosity better. An area has meaning when it has a coherent lay-out; it must be legible. From this it is defensible that people want a legible neighbourhood with some places that evoke curiosity. He continues with the notion that legibility is not enough for a place to be meaningful, the place should also resonate with people’s lives so that it evokes patterns that create a bond with the particular space.

Carr (1992) mentions discovery as one of the five needs in public space. He also refers to Lynch who states the desire for stimulation. Discovery is the opportunity to observe different things people are doing in public place. Diversity in the physical design is very important when one wants to stimulate people.
Raster with openings

An exception

Different layers

Straight lines crossing at different angles

Raster with openings
TERRITORIES

To regulate the privacy of a resident it is necessary that the physical environment gives the opportunity to do so. In the last chapter the importance to control the physical surroundings was mentioned to do so. This could be done by personalising space. Control and the personalisation of space is part of territorial behaviour. The following chapter will discuss the possibilities with territories, but also the difficulties in forming territories. Finally a form of territorial control by Van Dorst is given as a possible solution to overcome the difficulties.

Appropriation of space
The need to control one’s environment can be enhanced by the creation of territories. Territories give a person the ability to defend the space against unwanted intrusion (Habraken, 1998). The most basic form of a territory is the act of occupancy. This could be seen as someone’s personal space; there is no physical space involved in this notion yet. The personal space is controlled by gestures and through (body) language. Physical territories are an extension of personal space. However, this cannot be controlled solely with gestures. Artefacts or tokens are needed to make clear what the boundaries are for these territories. The tokens should be recognisable as territorial signs. Moreover, the borders of a territory should be backed up by real control; borders are constantly tested and when there is no real control the territory is not recognised as such. A territory can include several other territories, forming a nested system. In nested territories one needs to cross more boundaries to come to the public space. It is also said that these territories have a higher territorial depth; in theory this territorial depth can go on indefinitely. The concept of territorial depth makes the notions private space, semi-private space and public space very dynamic. This has to do with the size of the group that constantly changes through these different territorial depths. A territory with a lower depth will become the semi-private space for the users of a deeper territory. The group sees this deeper territory as the private space of one other group, while this territory can again be divided in other territories. The territory one level above it will feel as public space, while if all the groups from the deeper territory form one group this territory will again feel as semi-public space. Privateness and publicness are no static conditions.

Privacy zones dependant of scale
(source: Van Dorst, 2005a)
Schaal 1:1 1:10.000

Prive  Publiek
Altman gives another definition of territoriality:

“territorial behaviour is an interpersonal boundary regulation mechanism that involves personalisation or marking of a place or object and thus communicating that it is ‘owned’ by a person or group. Personalisation and ownership are designed to regulate social interaction and to help satisfy various social and physical motives. Defence responses may sometimes occur when territorial boundaries are violated.” (Altman, 1975, p. 107)

Altman describes three different types of physical territories: primary, secondary and public territories. The first is easy recognisable; these are the private spaces like a house. The territory is exclusively used by one person or one group; in this case the physical and legal borders match. Because the borders are clear the possibility to exert control over one's privacy is also much easier. The borders for the other two territories are less clear (Van Dorst, 2005c). The secondary territory is less central and exclusive. This kind of territories has a simultaneous blend between public or semi-public availability and control by regular occupants. Altman states that the secondary territory forms the bridge between the primary and public territories. In public territories almost anyone has free access. Public territories can also (temporarily) change in secondary territories for big events or protests. In this case the public space is taken over by a group of users.

When territories are not well legible and not enough privacy is provided people will withdraw or exclude themselves from the public space (Altman, 1975). Hoogland (2000) makes the connection with anti-social behaviour. She says that when there is no transition in territories or when they are not legible, it can cause social disruption and poor group functioning; this may result in vandalism and crime. She is strongly referring to the ideas of Newman (1996). From research on crime in urban low-cost housing developments he found that the impossibility to personalise and control the secondary territory led to the loss of this layer (Altman, 1975); the primary territory directly led to the public territory. Newman’s proposals were to restructure the physical lay-out of public space; this would allow residents to control their living environment. This included the creation of sub-neighbourhoods in an area, creating separate semi-private entrances, using symbolic territorial markers as hedges.
and walls, and making different stairways accessible for smaller groups. These are solutions that foremost divide different areas and groups from each other. He claims that this approach has the ability to bring people of different income and race together in a mutual beneficial union (Newman, 1996). In his findings he demonstrates the connection between the number of residents on one entrance and the informal upkeep and control of the semi-private spaces. Yancey (1971) was of the opinion that semi-private space or ‘defensible space’ was the element that reduced crime, because it was a place that enhanced the feeling of community. Elsinga & Wassenberg (Elsinga & Wassenberg, 1991) were also of the opinion that people should be able to close off semi-private spaces to prevent crime and crowding.

Habraken, Newman and Elsinga & Wassenberg show a very black-and-white notion on the division between territory and public space. In the territorial organisation within a city block they consider the space that cannot be closed off as public space. In theory this is correct, but in the real world there is a much more subtle distinction in the experience of non-private space, as Alexander will explain in the next chapter.
The notion of Habraken and Newman assume that the living environment is built up according to a strict hierarchy. With their territory they want to close off one area from another. Alexander (1965) states that it is not so easy to just close off different areas from others. He sees that the structure of the city is much too complex and one cannot close off one place from another just like that. It will become clear in an example. In a street we can find all sorts of objects and activities going. The activities and objects can be categorised; with other objects and activities they form a pattern which together represent one kind of behaviour; objects and activities can belong to more than one pattern, when for example an object has multiple purposes. All these different patterns have a relation with other patterns because of the different objects they contain. One could say all objects and activities are connected in multiple ways to all other objects and activities. The structure that is derived from this scene is called a semilattice. This semilattice shows clearly the complexity in a scene. Many designers deal with such a situation like it had a structure of a tree. With this approach objects are categorised in such a way that there is no overlap between different objects or activities. Patterns can only be divided in smaller parts which make no relation with other patterns; one could see the branch of a tree in this structure. Designers do this because they cannot comprehend the complexity of real life, they only take small parts and alter that without seeing the full consequences for the bigger system. Alexander also gives a quick example to show the complexity of a semilattice: a tree structure with 20 elements can at most contain 19 subsets; a semilattice of 20 elements can contain more than 1,000,000 subsets.

The fact that designers do not design from a semilattice structure is the result of a person’s inability to perceive such complex structures. The human mind is made to form accessible and logical structures. It helps people make quick decisions which was and is still very important in our evolution process. However, for the complex relations within a city it does not suffice. Alexander actually says that the city is too complex to understand fully by us humans; the only thing a designer can do is take this into account and make the best out of it. This is exactly what the critique from Alexander towards Habraken and Newman is. With their ideas on territories it looks like they do not seem to take this complex
reality into account at all. They draw a circle, everything within that circle belongs together and everything outside that circle does not belong to it. In the real world that is an unrealistic notion. Many territories should not have that concrete divisions.
Van Dorst (2012) states that borders help to define different types of shared territories, give control to owners, and make the territories legible for visitors and by-passers. On the level of the house recognizing the borders of territories is easy through the walls. In the neighbourhood this is a lot more difficult because these boundaries are a lot less clear; a boundary can consist of a single element like a sign to let people know they enter a new municipality (Habraken, 1998). The territory as an intervention can be seen as being too blunt. A gradual transition from private to public can give the resident just as much control over their need for privacy and has less impact on the complex structures in the environment. Van Dorst (2005a) proposes a system of zones that all have a different meaning in accord with social interaction. This zoning needs to be physically legible and culturally accepted in order to create clarity for all users. He calls this system privacy zoning and sees it as the materialisation of control over the social environment and social interaction (Van Dorst, 2005c).

Not all places must be closed off, as long as it is clear for every person who controls the space and what rules there are in that space. The fact that it needs to be culturally accepted is the point where it differs with the notion of territories; the strength of this principle. However, this is also exactly the point what makes implementation pretty hard. One cannot force someone to accept a zone as it is possible to force a physical barrier onto someone. There has to be a social code among the residents to make them able to control their privacy. The ability to change one’s direct physical environment is a powerful tool to put more emphasis on this point.

Another point that makes territorial behaviour on the neighbourhood scale more problematic is that the social and physical environments are not one-to-one related (Van Dorst, 2005b). This means that people’s social networks can run through the boundaries of territories. The complexity of this principle makes it that a simple division in primary, secondary and public territories is not enough anymore.

The power of privacy zoning lies in the subtle difference between functions of different zones for making social contact. This can be in the degree to which the initiative lies with the resident or the visitor of an area. This means that great care should be put in the balance of putting up boundaries when designing semi-private zones (Hoogland,
2000); these boundaries can neither be too hard, nor be too ambiguous. Gehl (2011) gives three housing characteristics to soften the edges. Firstly there needs to be easy access in and out the building. Secondly, there must be good lingering areas directly in front of the building. The last point is that there need to be something to do, something to work with, directly in front of the house. The quality of semi-private spaces needs to be good, or they will not be used at all (Van Dorst, 2005a). Only when these aspects are met do these semi-private zones have the right to exist. This is important because most of the lengthy activities in the neighbourhood take place in semi-public space (Gehl, 2011).

The creation of privacy zones can be difficult. Space has different meanings for a different audience. Cultural differences can make it hard to understand and recognise territories set by other cultures. This is often a topic of discussion. Also the scale on which a territory is seen can give it another meaning. A space can feel as public for an individual, while this same place is seen as semiprivate for a group; the high-rise deck access is a good example here.
CONCEPT

With all the information gained from the analysis and the theory it is clear that there are many problems in the neighbourhood. The solution for most of those problems can be traced back to improving the liveability. In this chapter the concept for the overall plan will be given. This concept is more of a symbolic idea what the neighbourhood should become. After this concept four more concrete design principles are given. These principles have a relation with the aspects of liveability.

Concept
When Kanaleneiland was built, it was an example for other neighbourhoods. This was how the new city should look like, with a lot of green, space and light. Kanaleneiland had modern facilities for its time and people liked to live in this neighbourhood. Nowadays the wishes from residents in the Netherlands have changed a lot, Kanaleneiland could not meet the requirements anymore and the well-to-do left the area. The place that was popularly called ‘Rozeneiland’ (Island of roses) lost its charm and ended up as the worst neighbourhood in Utrecht.

Nowadays Kanaleneiland shows signs of improvement again. Although there are still a lot of problems. It is not possible to go back to the days that Rozeneiland was the most beautiful neighbourhood in the city. However, it is possible to give the residents a stronger position in society, to give them more self-confidence, to make them more proud of their neighbourhood. With attractiveness, history, and the focus on the wishes of the residents Kanaleneiland-Noord can become a nice neighbourhood to live in, where a lot is going on and people would like to go to. Kanaleneiland should become ‘Rozeneiland’ again, not the Rozeneiland from the 1960s, but a new and modern Rozeneiland, with the emphasis on the residents themselves. With a design for the human scale, where legibility and control over privacy are the essential points.
With the concept there are also some more specific design principles. These principles focus on the various points which were discussed in the analytical and theoretical framework. The goal with this principles is to create beneficial conditions to improve the regulation of privacy, legibility and the feeling for the human scale in the neighbourhood.

Clear zoning
The transition between the private domain and the public domain must be gradual and clear to everybody. Strict territories which close of different spaces are not preferable. The border between the zones must be made clear through more symbolic signs like difference in materialisation or borders which can easily be crossed; it is about privacy zoning. It is important to note that in the public domain there can be numerous zones that have a different meaning concerning the use and amount of privacy it provides; it is not only about the transition between private and public space. When the transition between the different zones is designed correctly it will improve the possibility to regulate the privacy and the legibility of a place significantly.

Mystery versus legibility
It is important that there is a good ratio between the legibility of a place and the mystery. A legible and coherent place result in people being able to understand more easily what is going on in the place and how they should behave in such a place. It gives people also the opportunity to make connections to different places and this way make those places meaningful for them. On the other hand it is necessary for places to be a little bit complex or contain some mystery. The most important is that the ratio between the two concepts is good. When the coherence in a place is too high everything looks the same. This will make the place dull and confusing at the same time; dull because there are little visual stimuli for the people using the space and confusing because it is hard to find one's way when everything looks the same. Too much complexity on the other hand can also be confusing and frustrating, because of too much stimuli and no possibility to make sense of a place.

With a good ratio between the two concepts people will have places to discover and which can evoke curiosity in them, while they still can find their way around the neighbourhood.
Connectivity
The last design principle is connectivity. Especially on the higher scales the connections between different important activity nodes, like the city centre or the neighbourhood park, should be optimal. When the connections are good it will be easy and pleasurable to make use of these connections. This will eventually result in more people making use of the available space, meeting each other on different locations in the neighbourhood and making more use of alternative ways of travel than the car. When people decide to walk or cycle more instead of using the car they will voluntarily expose themselves to possible social contact with other residents. On all scales it will improve the overall satisfaction with the area.

The human scale
From the Second World War the car became a more dominant element in the street. The modernistic architecture supported this with its large buildings and wide streets. The neighbourhoods were designed for the use of the car. This resulted in neighbourhoods which were less fit for the human being. When traveling in a car it is not possible to take in a lot of details from your surroundings. This could even be dangerous because one can get distracted. So the design for the car resulted, inter alia, in less detailing in the façades of the buildings. All these factors together made the neighbourhood less attractive for people to walk around. This is one of the reasons that the public space is less used in these neighbourhoods. To reverse this much more emphasis should lie on the design for the human being; make a place where the pedestrian will feel at ease. This can be achieved through many design solutions, like making the buildings less tall or make it less noticeable that the buildings are that tall. Also the public space should be much more intimate. At the moment public spaces often have a width of 40 metres, while many theoreticians nowadays advice to keep the public spaces small so they will look vital even when there are few people using them.
Architecture & nature
There must be a division between architecture and nature. In Kanaleneiland architecture and nature are very opposed to each other, and of the two architecture had clearly the upper hand. The architecture in Kanaleneiland is very strict, orthographic and monotonous. Nature on the other hand is flowing, informal and dynamic. These would soothe the strictness of the architecture a lot. Nature must not be seen as the counterpart of architecture. It is a part of architecture, but it is a part that gives a counter reaction to the architecture. With the soothing effects of nature the strictness and monotony in the architecture is no problem anymore. It can even be seen as a beautiful ensemble, where in every place another part of the whole plan is conceived by the user. These different images that are created this way create a certain mystery in the plan, while the strictness of the architecture still keeps it legible.
PRECEDEXTS
Now that the concept and design principles for the new design of Kanaleneiland-Noord are given it is possible to look at other projects. Projects where solutions for similar problems are given, sometimes the solution is good. However there are also some examples of bad solutions in this chapter.

Four other neighbourhoods are discussed in this chapter. First the original plan for Pendrecht will be shown; this neighbourhood was built around the same time as Kanaleneiland, Pendrecht even was an example for the urban planners responsible for Kanaleneiland. Some of the problems in Pendrecht are the same as those in Kanaleneiland. However the solution for these problems are not well thought through and can be seen as too blunt.

The second plan is Lafayette Park in Detroit. Especially the green environment in which the buildings are positioned is very striking and can serve as an example for the use of green inside the block. The big difference between this Lafayette Park and the new design for Kanaleneiland is the focus on green or building layer. Lafayette is clearly focussed on the green and the buildings are placed afterwards. In the new plan for Kanaleneiland the building layer will be dominant and the green will have a more secondary role. This does not mean the green is not important in the new design, in contrast between the buildings the green has a very prominent secondary role.

The third plan is the GWL-terrein in Amsterdam. The lay-out of the open space and the positioning of the buildings in this open space can serve as an example for Kanaleneiland. Moreover, the strategy to distinguish different green zones in order for everybody to be able to experience green is very useful. Another aspect that could be used in Kanaleneiland is the realised contrast between the inside and outside of the neighbourhood; this is very well designed.

Finally there is the Zaanhof in the Spaarndammerbuurt, Amsterdam. The different atmospheres inside and outside the block are very well designed, as well as the legibility of the different privacy zones inside the block. This is very useful in the design for Kanaleneiland.
Pendrecht is one of the first neighbourhoods built after the Second World War in Rotterdam. Between 1949 and 1952 this new neighbourhood was erected under the supervision of architect L. Stam-Breese. She was, like many other architects and urban planners in that time, heavily influenced by the modernistic ideals from CIAM and the theory of the Wijkgedacht developed by Bos (1946). Stam-Breese was the first to design the building block as a social unit; the parcelling principle derived from this is also known as ‘Stempelbouw’. Furthermore, Stam-Breese focussed on other, in that time extraordinary aspects like the notion that there were more social domains than only the street, the detachment of house and garden, and attention to urban green and recreational facilities (Kegel, 1996).

The neighbourhood is planned according to the classical cross pattern; there are four living quarters, the centre is characterised by the highrise and the neighbourhood’s shopping centre. However, with the development of the ‘Stempelbouw’ this plan moves away from this classical planning principle. The terrain was raised and because of this the old parcelling pattern was not visible and used anymore (Komossa, Meyer, Risselada, Thomaes, & Jutten, 2005). The different housing areas were connected through the large green Zuiderpark area. This park contained several public and semi-public functions, like allotment gardens and playgrounds. There are no parks in the neighbourhood itself. The structuring green elements here are the banks along the river and canals. In the district there are no structuring green elements. Only with trees a distinction is made between different types of streets (Kegel, 1996).

There are several typologies in Pendrecht positioned in a ‘Stempel’ (Te Velde, 1998); the flats with a walkway have four floors. Opposite to these flats stand the apartment buildings with a staircase, these have three floors. Perpendicular to both flats are some rows of single-family houses, varying from one to two building layers. The neighbourhood is put up very spacious. There are only 87 houses per hectare, in spite of the many apartment buildings in the area. Pendrecht is the first neighbourhood designed according to the ‘Stempelbouw’ principle. The formation of one block can be repeated endlessly. The blocks consist of two longitudinal apartment buildings, one with an elevated walkway the other with different
entrance halls. Three small rows of single-family houses are placed in a right angle to these apartment buildings. The space between the buildings is semi-public. This is very characteristic for the neighbourhoods designed according to the ‘Wijkgedachte’ and this could also be found in Kanaleneiland, before the spaces were privatised. In these semi-private zones different elements like little squares, seats and walking paths are placed; only the trees are placed more freely in these places (Komossa et al., 2005).

The last decade the neighbourhood has changed a lot. Pendrecht had become an underprivileged neighbourhood, just as Kanaleneiland. The facilities the dwellings have to offer do not fit the needs of the current residents (Te Velde, 1998). The residents with low incomes cannot inhabit new developed housing and the old houses do not meet their needs. The solution for them is the differentiation of the existing building stock. With this strategy, different houses will be combined to form more spacious dwellings. Lifts are added to the apartment buildings to make them more accessible for the elderly. Differentiation is still very expensive, but the ground does not have to be bought again and the old body of the building already exists as well. This could be the crucial difference in cost between new development and differentiation.

However, besides the plan for differentiation of the buildings a lot of apartment buildings were demolished and replaced with new development plans. The overall morphology is kept with this transformation, but many apartment buildings are replaced by newly developed single-family houses. This has lowered the population density in the area a lot and has wiped away the modernistic appearance almost completely. This is a shame because although the modernistic ideology did not work in general, the morphology of this style was very typical. They could have refurbished the area with more care for its history.

This is a lesson for Kanaleneiland-Noord. It is necessary to change the typology of the buildings but the historical value the neighbourhood has must not be negated. It is possible to improve the neighbourhood while keeping more or less the existing configuration of buildings. Other strategies like the placement of elevators is probably necessary in Kanaleneiland as well.

Original plan for Pendrecht
(source: Strabrecht, s.d.)
The Lafayette park in Detroit is partly designed by the architect Ludwig Mies van der Rohe (Aubert, Cavar, & Chandani, 2012). Mies van der Rohe was also known for his modernistic design ideas and this neighbourhood can be seen as one of the better executions of the modernistic ideology. The neighbourhood used to be a slum called ‘Black Bottom’. In the 1940s the neighbourhood was razed and only in the mid-1950s a new plan was developed. The developer Greenwald brought in Ludwig Mies van der Rohe, who on his account sought the cooperation from Hilberseimer and landscape architect Caldwell. Hilberseimer came with the idea to create a superblock which would contain housing, a large park and several public and recreational facilities. In the plan there was room for many smaller ‘townhouses’ and three large high-rise blocks. The superblock is not as we in the Netherlands often define it, this was more one neighbourhood with few streets going into the area. These streets ended in a cul-de-sac where the cars could be parked. The smaller townhouses were grouped together to form a small block. The buildings stand in a sea of green and trees. There is no official private outdoor space in these buildings, but the plot of green in front of the house gives the feeling of a private garden and serves as a great buffer. The backs of the houses face circumscribe a small public green area. However, the size of it creates a very private or communal sphere. The parking spaces for the cars are kept out of sight by a very subtle zoning in the design. From the front door one first encounters a green slab, the public green field that feels as being private. After this a footpath connects the houses. There is another piece of green between the footpath and the actual parking lot. This parking lot lies a bit deeper that the rest of the plan, which together with the bushy green plots blocks the view to the cars. The different housing blocks boarder a larger park within the neighbourhood. Because the park is only accessible through the lanes in the housing area the park feels much more private.

What is very striking in this neighbourhood is the social code most of the residents have adopted. In this neighbourhood it is considered very normal to let people look inside of the house. The modernistic construction gave residents the opportunity to totally change the indoor space to their liking. The residents our proud of the interior design of their houses and like to show it to other residents and visitors of the neighbourhood.
The GWL-terrein is an old industrial site where a water treatment plant used to be. Until 1994 this was in use; the aged equipment was not useable anymore and a new installation was realised in the industrial zone directly to the west of the old plant. The site was during its use as water treatment facility a very green and open site, which stood in strong contrast to the bordering neighbourhood Staatsliedenbuurt, with its narrow streets. This contrast is also used in the new development of the area. In the area a number of apartment buildings and maisonettes were constructed with much space between the buildings. The buildings stand free in the open space. The distinction between front and back of the building is not immediately clear (Komossa et al., 2005). The buildings are placed like a draughts pattern. This adds to the very open character of the neighbourhood and is also beneficial for the amount of exposure to the sun. The urban planner Christiaanse formulated also some rules which the buildings needed to meet. For example, the use of an elevated walkway was prohibited. The apartments should as much as possible have an entrance on the ground floor. This would give the feeling of more activity on the ground floor.

The GWL-terrein aerial view
(source: KCAP, s.d.)

The neighbourhood is only accessible by bicycle or on foot. Cars are kept out of the area, which gives a very tranquil vibe. The large building blocks in the north and west have multiple functions. Firstly, the required housing density was achieved through this big wall of apartments. Secondly the buildings screen the area from the busy Haarlemmerstraat in the north and the industrial zone in the west. The last point is the screening from the western wind, which is the main direction the wind comes from. Only a few old buildings from the water treatment plant are preserved. Some buildings were classified as monuments; these could not be torn down and therefore got new functions. The iconic water tower is still in use and in the old water pump building is now filled with public functions and small businesses.

There is a lot of open space in the area. This space is filled with semi-private gardens, private gardens and public green. This way everyone has access to green space. Furthermore, water does still play an important role in the area; there are several ditches that demarcate the different zones.
The building block around the Zaanhof in the Spaarndammerbuurt in Amsterdam is well known for the use of the characteristic double building block. In this design different small closed building blocks enclose a small public park. The buildings in the block are positioned very close to each other for Dutch standards; the distance between the buildings is less than 15 meters. With the buildings so closely positioned to each other a relative high density is created with 133 houses per hectare. The main typology in the area is the duplex-house. The buildings on the outside contain five to six floors and are focused on the public street or the railway tracks on the west side of the complex. The buildings on the inner ring have three to four floors and are all focused on the green inner court. The back of the buildings on the two rings face each other; private gardens were placed between the buildings, with only seldom an alley to reach those back gardens.

The inner court is accessible for automobile traffic and slower traffic modes. One gets the feeling of another world when he enters the block. This is due to the gate that must be passed at most entrances. After the gate there is a long small passage, created with the second layer of buildings. This strengthens the feeling that another world is entered. A last aspect that gives this feeling is the change in materialisation. The inside of the block has different lamp posts, pavement and demarcation of the footpath. Moreover, the façades inside the block are all the mostly the same and different than those on the outer ring. This gives a very coherent image. One can drive around the inner court on a one-way road. This gives an extra intimate sphere to the whole block.

The inner court itself is very green, with numerous elements for kids to play with and adults to relax. There is a clear but at the same time kind of mysterious path going through this court, which is only for pedestrians. The inner court is demarcated by small light fences, which have the function to halt any other traffic mode than pedestrians. However, the function of these fences is much more to show residents and visitors the contours of a new zone; this inner court is very public, but it becomes immediately clear that it is meant for the people living around it.

There is also a lot of attention put into the detailing of the housing block. The architectural style that has been used is the Amsterdamse School; this is clearly visible in the expressive brick façades, the entrances...
of the buildings and especially in the gates towards the inner court. This is even more apparent in the building block just south of this block. The buildings do not have a buffer zone between the house and the public space, but this is not necessary. The buildings in the outer ring contribute this way to the urban sphere outside the block; the inner court forms one big semi-private space which makes the need for another buffer in front of the house unnecessary.

This are perfect examples of privacy zoning; the Zaanhof serves as the primary example when making the new design for Kanaleneiland. The legibility of the different zones is made with a keen eye for detail; if only a part of this design could be realised in Kanaleneiland as well it would result in a successful design on the small scale. The challenge to connect this scale to the large neighbourhood and city scale remains after this.
Kanaleneiland should become an exemplary neighbourhood which shows people that it is important to focus more on the social aspects in society instead of primarily focussing on the financial aspects. The past decades there was a big shift towards an market orientated society. This resulted more and more in exploiting the ground for maximum value and the eviction of the households belonging to a lower socio-economic class. In a well-functioning society all inhabitants must be taken into account; households with less income have equal rights of living in the city or close to the city centre as households with a higher income. Municipalities and housing corporations should make a stance for the preservation of households from a lower socio-economic class. These agencies can exert a lot of influence on the process and this way force investors to take less profitable projects which improve the living situation of all people in the city.

Furthermore, the new design could function as an example for other underprivileged neighbourhoods. Every neighbourhood has it specific preconditions but many deprived neighbourhoods show the same problems. With a combination of more drastic measures and small adjustments on the micro scale a lot of problematic aspects in the neighbourhood can be improved. The areas will especially benefit from a focus on the arrangement and interpretation of the open space, the legibility of this space and designing for the human scale. These are common denominators which can be implemented in specific locations on their own way.

In Kanaleneiland, the focus on these aspects will result in a neighbourhood which is meaningful for its inhabitants. People can give an identity to their own housing blocks and the neighbourhood as a whole. They can connect with the open space and recognise it as their own. Through the subtle transition in different zones people can easily control their privacy. They can be alone when they want to and there are clear places where people can meet and socialise with others; these places are more public. This clear and informal hierarchy within the plan gives residents the means to regulate their privacy and through this they will have less feelings of loneliness or crowding. With the new design the possibility to exert informal control is also provided, which will influence the amount of deviant behaviour and any feelings of unsafety in a positive way.
In the last chapter a lot of good and bad examples were given. It is a challenge to translate these strategies to this specific location. From Pendrecht we can learn that the historical value should not be denied, although it has a bad reputation. From Lafayette Park the use of green in the neighbourhood is the primary lesson. In the GWL-terrein the different zones of green and the contrast between inside and outside of the neighbourhood is useful for the new design. Finally the zoning and legibility of the Spaarndammerbuurt is very important for Kanaleneiland.

With this design for Kanaleneiland the area will transform in a green and tranquil neighbourhood. While it is still possible to see the values from the original design; especially when driving between the building blocks the large scale of the buildings and the open space can still be felt. This was also the original intent when the neighbourhood was realised; the focus on the car was very apparent. Inside the blocks a new tranquil and green world arises. It is totally different compared to the old plan, where there was an abundance of space and no feeling for the human scale. This is brought back.

In the following part the different specific design assignments are elaborated on. Similar to the analysis of the neighbourhood this chapter will be divided in different sub-chapters; in every sub-chapter another scale will be discussed. For every scale the goals and focus points will be discussed. After the scale of the block the final design will be discussed in a separate sub-chapter, This is positioned here because the most changes are made on the scale of the block and it is less logical to first discuss the process in the building layer and afterwards go back to the scale of the block to explain the final design.
On the city scale it is important to focus on the connectivity between the neighbourhood and key locations; these are the city centre and the highway. A good connectivity will make an area much more popular and will give residents more travelling opportunities. These connections should be easily and safely accessible. From the analysis it became apparent that the public transport towards the city centre is good and the connection to the highway as well. For slow traffic modes, like cyclists and pedestrians, there is a lot more to be done. There are a couple of routes that could be potential cycle routes towards the city. Most of them are car dominated roads with dangerous crossings for the slower traffic modes. One route could potentially become the primary access road to the city centre for cyclists. This road starts in the top of the neighbourhood along the canal and runs almost unhindered to the centre of Utrecht. The reason to choose this route is because it is already heavily focused on bicycle traffic; there are few busy crossings and little car traffic on the road itself. Almost the whole path is part of the main cycle route from the west of the city to the centre and it is already part of the national cycle network. However, this route is not perfect. It starts in the back of the neighbourhood, which means that many people should take a detour to reach this path. In addition, the starting point of this route is not designed for cyclist. The parking lot for the tennis club on the northern border of Kanaleneiland is recently privatised and closed off for on-going traffic. Cyclists have to take another detour uphill along the Meernbrug to finally connect to the cycle path; this is very inconvenient. To use this route to its full potential the parking lot should be redesigned such that cyclists have a direct connection to the city centre.

Other routes can be used to get to the centre. However, these routes are less attractive and there is a lot more car traffic. To make these routes better two crossings should be redesigned to make them more safe for slow traffic modes; the crossing between the Beneluxlaan and Van Heuven Goedhartlaan, and the roundabout at the Anne Frankplein. A cycle bridge over the Merwedekanaal would be another solution to create a more scenic route to the centre.

Places that should be improved for cycle use (source: by author)
THE NEIGHBOURHOOD

Just as one the city scale improved connectivity is the primary goal for the neighbourhood. To strengthen the neighbourhood it is important to connect the strong areas that already exist; the ARK-zone and the Annansipark in the middle of the area. When these are connected a zone is created where people can be public. The middle of this zone is the playground with the school bordering it. This is the perfect spot for an activity node; a place where informal contact is encouraged (Huang, 2006; Zimring, 1982). Because of its position in the neighbourhood everybody can reach the place very quickly, it is already a small hotspot and it is connected to important societal facilities which can help children to get more involved in these activities. The primary school, which is at the moment positioned at the northern border, should be relocated to this central place. This building should replace the apartment building located there; this apartment building violates the initial modernistic concept. The strip was originally meant as a buffer between the two living areas, only some public functions were allowed. With the removal of the traditional religious and socio-political barriers numerous buildings with a societal function were not needed anymore; these buildings were replaced with apartment buildings like the above-mentioned building. In recognition of the original modernistic plan the function of this building should be changed to a public function, or it should be demolished. The space that comes free next to the Moroccan mosque can be used as a parking lot; this is especially useful during peak hours for the Friday prayer.

Residents mentioned that they missed a café or a coffee house in the central area. There is a need for a traditional coffee house as they are much seen in Arabic countries. These support the identity of many residents in that place. The ARK-zone is a unique location and through this and its spatial quality it will attract a lot of people; especially when it is better connected with the Annansipark. However, for maximal effect the connection from the dwellings directly to the ARK-zone should be good as well. A final focal point is the connection to other neighbourhoods, these need to be enhanced to strengthen the neighbourhood’s position in the city. It will be more inviting for people to visit the area through the extended promenade. The proposal of López et al. (2012) contributes greatly to this plan.
Left
Connecting strong places
(source: by author)

Right
Restoring historic values
(source: by author)
Block versus line
Both the building configuration as the open space are a good starting point to base a design on. Eventually the building configuration is chosen as the leading principle in the design, primarily due to the fact that there was too much open space. This would not give enough preconditions for the rest of the plan to create a coherent design. With the focus on the buildings there were enough preconditions to further the design; the open space reacts in this case on the changes in the building configuration. Now that the leading principle is chosen there was still another choice to be made. Within Kanaleneiland the ‘Stempelbouw’ parcelling principle is used. This could be seen as a continuation of an older parcelling principle: the linear parcelling principle. With the linear configuration of buildings it is possible to give all buildings a good orientation towards the sun. This can be seen in Kanaleneiland, where the long sides of the buildings are facing south to southwest. This also has to do with the position of the Amsterdam-Rijnkanaal. The Stempelbouw principle differs from the linear principle in the positioning of building blocks perpendicular to the apartment buildings. Through this urban planners tried to close off the linear buildings on one side such that a kind of closed block was created. The configuration of building blocks should promote a social unity within these buildings, but this never really happened in Kanaleneiland. Furthermore, the enclosing of the block is poorly done, such that many private gardens directly bordering busy streets.

The linear configuration has the advantage that all the buildings are orientated to a favourable direction. The arrangement of the space around the buildings is a lot harder. Because all the buildings are orientated to one point the backyards cannot connect as they do within a closed building block. So the relation between back and front becomes much more vague. This can result in tension for the whole configuration; every back of a building is also a front of another building and chances are that the front will be busy. People cannot reside quietly in the back when the same street is busy due to the entrance to other buildings. With a linear pattern the space around the buildings is also more or less the same, where a closed building block can facilitate in the creation of two separate worlds. Another problem with the linear configuration in Kanaleneiland is the view from the street. When someone walks...
alongside the block there seem to be endless large building blocks that form a wall. On the other hand when someone walks on the perpendicular street the end of the blocks form protrusions in the street, resulting in a fragmented streetscape; one can get the feeling that the open space flows away in all directions. The permeability is focused on one direction in this case. With the closed building block it is much easier to get a clear demarcation of the street. The building block also makes it much easier to control the public space, because of the clear separation of public and private space.

For Kanaleneiland a combination is chosen between the closed building block and the linear building configuration. Therefore it was necessary to combine the two smaller ‘Stempels’ into one large building block. This results in a large intervention needed in the building block; how can it be justified? The most important reason for this intervention is the focus on the human scale and legibility; with the creation of two different worlds (inside and outside the block) a clearer hierarchy is created in the area. With the creation of the two atmospheres it becomes easy to improve the human scale in these areas. Within the block a more tranquil environment is created where the focus is placed on slow traffic modes and interaction between people. The building block makes the transition between the zones much more subtle, it becomes easier to identify the level of publicness in the different zones. The block cannot be entirely closed off, that would result in too much private space and it would hinder the accessibility for the residents living inside the block. However, through design it is still possible to create a different atmosphere between the inside and the outside of a building block. Moreover, the use of the building block provides the opportunity to create more variation in the open space between the buildings. With a linear orientated typology the spaces between the buildings are harder to differentiate. Another important factor is the improvement of informal control; with the orientation of the building blocks to all directions the possibility for informal control is increased. A last aspect is the ease with which new building volumes can be added within the plan, without causing friction with existing street patterns and other open space. Inside the block the use of the linear building configuration is chosen. There are several reasons to do this; the most important is the preservation of existing buildings. One
cannot destroy all buildings and completely start over, like Kolpron suggested among others. With this design it is tried to preserve as much buildings as possible, especially the apartment buildings which are the strongest indication of the former Modernistic ideology. These buildings also have the advantage that they are orientated towards the sun; this way the benefits from passive solar energy remain very high.

Accessibility
The roads in the neighbourhood should be adjusted. They are in many cases too wided for the amount of traffic that uses it and for this form useless space. Especially the roads bordering the Annansipark are too wide for the needed capacity and serve as a border to this important location. To attract more people to the activity hub these roads should be more permeable. The greater part of the roads in the neighbourhood could be downsized for one-way traffic as well. This way the traffic will be more equally divided through the neighbourhood and there will be more space for a pedestrian friendly design of the street profile. The main road will remain two-way traffic as well as the roads around the shopping centre. The Marshalllaan at the Annansipark will be made inaccessible for regular automobile traffic; only the bus will be able to cross this section. This way the connection between the Annansipark and the ARK-zone will be enhanced.

Parking
The parking norm for the blocks at this moment is around 1 parking spot per 2 households. This is far less than the amount of cars in the neighbourhood. Therefore people tend to park their cars as close to their destination as possible. This results in many cars being illegally parked on the curb, which in turn results in less space for pedestrians on the footpath. Moreover, the overview and the attractiveness of the street decrease. With the new configuration of the building block the space for parking also needs to be adjusted. There are several solutions for parking the car in the neighbourhood: the parking spots could be placed on a couple of central places in the area, just outside the building block or inside the block. It is also important to pay attention to the different possibilities in the placement of the parking spots; cars could either be parked perpendicular or parallel to the road, or one can create separate parking islands. Finally the distribution of parking places for the different buildings should be taken into account; should all people in the

Solutions for parking problem
(source: by author)
block park inside the block or do people in the buildings inside the block park their car in a different place than those living in the buildings on the edges of the block?

- Central places
  When the distance between the home and the car is greater, one will experience more of the neighbourhood, the area will have more meaning for the person. The person will also be seen by much more other people when he walks to or from his car. It becomes more clear who belongs in the neighbourhood and who is a visitor or passer-by. The problem with this alternative is the amount of space that is needed to store all the cars from the neighbourhood in few places. Next to the old hospital there is a lot of space but that is the only serious option to build a large parking garage. This is not sufficient space for the amount of cars that needs to be parked. In addition, the distance to other larger parking areas is too great to be seen as a serious option.

- Outside the block
  Outside the block there are already a lot of parking spaces. To what extent is it possible to places all the parking spots in this space? At the moment there is a maximum of 80 parking spots inside the block, these spots should be repositioned to the outside of the block. However, all the space along the streets is already used for parking purposes. This means that the only useful places to create parking spots are places where there is open space behind the street and existing parking spots. These places are only at the ARK-zone along the canal, the green belt in the north or the strip of green in the middle of the Marhalllaan. In theory there is enough space around the ARK-zone to put a lot of the needed parking space here. However, the ARK-zone is one of the better functioning places in the neighbourhood, also due to the attractive view and the large grass fields, which are perfect for recreational activities. It would harm the plan more than it would do any good.

- Inside the block
  When the exact amount of open space between the buildings was measured it also became clear that there was too much space to transform it all into attractive (semi-)public space. In this case, the parking places for the cars could serve as a demarcation of the public spaces. The number of parking spots inside the block can be increased from 80 to a maximum of 100. The number of
necessary parking spots should be derived from estimations on the amount of elderly and students in the block; relative few people from these household types own a car. The introduction of the greenwheels project could work very well in these areas.
In contrast with the two higher scales where the focus lies on strengthening the connectivity between areas, the block and the building scales focus much more on the human scale and legibility of the design.

**Configuration**

Now we shift the focus from the complete neighbourhood to one of the building blocks. It is not feasible to tear down all the buildings and start all over again. Moreover, this would not give an interesting design assignment. My goal was to save as many existing buildings as possible; according to Jacobs (1961) it is necessary to keep some old buildings. The large longitudinal apartment buildings are preserved as much as possible. These buildings contain the clearest design indications of the original Stempelbouw principle. Many of the single-family houses in the corners of the new block are kept as well; these buildings will form the border between the inside and outside of the block and the shape appears to be the perfect solution for the corner. Through research by design several versions of the block and building configurations are made. The most important designs will be discussed in the following part, together with the reasons to discard or choose it.

- **The original plan**
  
  This is the existing lay-out. There are a lot of problems with this configuration, as could be read in the former chapters. Therefore a summary will suffice. Maybe the most important problem is the abundance of space. The buildings in the area are pretty big and impermeable. To keep a good ratio between building height and space between the buildings this space must be large as well. This resulted in open spaces of 30 and 40 metres. Alexander (1977) already indicated that 20 metres was the maximum length for a square; the open space in the current situation is therefore too big. At the back of the buildings in the original ‘Stempelbouw’ principle this space is filled in with private gardens. This means that the residents on the first floor have 15 meters deep back gardens. These gardens are hardly used because they are badly accessible and everyone can look into them. Other problems are parking and the appearance of the public space; there are too few parking spaces for the amount of cars that needs to be parked, resulting in a lot of cars being parked on the foot path. The appearance of the area is very stony and of a low quality.
Between the buildings of the older block there is room for one extra housing block for single-family dwellings. With this the public space can be divided better. The newly built dwellings between the apartments result in the need to bring the floors of the apartment buildings on both sides of these single-family houses down. This way, the sun can reach all the back gardens and the human scale is introduced.

The existing apartment buildings come to lay inside the block; with the new configuration they have in many cases a part cut away from the whole building. This is possible due to the construction of the buildings in several sections. With the new openings a route can be created through the block. It also increases the possible variations in the different buildings’ length and height.

The main problem with this configuration is the fact that the space inside the block is not well defined. In the current lay-out this is a problem for the whole neighbourhood, with this new plan the problem is moved from the whole neighbourhood to the inside of the block. Without a clear definition of the spaces within the block there is not much control possible for the people who live there. The space could be better defined by

- Introduction of the block
  With the first real design for the building block the size of the block was enlarged. Two former blocks or ‘Stempels’ will now form one big urban block. This way two atmospheres can be created. Outside the block there are the traffic lanes and the rationally placed streets (which were already there). This is to get efficiently to your destination and support the goal of connectivity. The number of floors on the edges of the block is higher than those inside the block.

  Inside the block the atmosphere is much more tranquil. Cars can only get into the blocks by two access roads on the flanks, these roads only lead to the parking lots in the block. The rest of the block is only accessible by slow traffic modes or emergency services. The configurations of buildings within the block are according to the freestanding linear principle and is inspired on the building configuration in the GWL-terrein in Amsterdam (Komossa et al., 2005). This means that the buildings have their front towards the back of the next building. The apartment buildings next to each other seldom have the same number of floors. This way a playful scene enfolds where one can see many different buildings.

Left
Two ‘Stempels’ become one block
(source: by author)

Right
First design:
Configuration buildings inside block
(source: by author)
Left
Impression first design
(source: by author)

Right
Problems with first design
(source: by author)
placing buildings with the back towards each other so that it is possible to convert some of the open space in the block to private gardens.

• A closed building block within the block. Within this version the buildings inside the block are repositioned in a way that it is possible to easily implement private back gardens. The existing apartment buildings must be preserved as much as possible; this meant that the single-family buildings in the middle should be reoriented. The organisation of the buildings is done in such a manner that there is maximum sun exposure for all the buildings. The consequence of this demand was that the backs of the single family buildings would always be facing the northern apartment block. The rest of the block was not adjusted.

The problem with this configuration was the legibility. Because one part of the buildings had a closed building block typology and other buildings were still standing free in the open space made the whole plan very fragmented. There was no organisation for the inside of the block.
In the third version of the block, the idea of the closed building block inside the larger block was abandoned. In the new plan, the back of the first housing row is facing the front of the following housing row. This could lead to problems with the feeling of privacy, but this is corrected through the design of the spaces between the buildings. The front garden has a depth of two metres and the private back garden a depth of four to six metres. The remaining width of the street is between nine and seven meters. Here one can perfectly fit some green slabs and a path to walk and cycle on.

The apartment buildings on the edges will get up to 6 floors; inside the block, the number of floors will decrease towards the centre. Just south of the centre, the blocks will be 3 floors high, in the centre this will be 2 floors and north of this, the buildings can have a maximum of 4 floors. The configuration is this way to maximise the exposure to the sun. The apartment buildings are still cut through at a certain point, the opening is between 15 and 20 metres wide, which is enough space for a small park or public space (Alexander, 1977). The broad park also forms a connection between the two car parks on the flanks of the block. Cars can still enter the block on two sides. This time, however, the cars will only enter in an opening positioned at the outer edge of the block as possible. This results in the inside feeling even more private, because there is minimal traffic hindering a person from walking through the inner block.

There were however still some problems with the orientation towards the sun and the buildings on the edges of the block. Through the necessity of an elevated walkway in the apartment buildings and the orientation of these walkways to one point in the plan (mirrored in the blocks on the opposite of the main road) there were always walkways falling inside and outside the block. The private gardens needed to be placed under the walkways to minimise looking into the private gardens. The gardens partially inside and partially outside the block would harm the concept of the block as one unit.

Another problem was the orientation of the blocks. The blocks north of the main road are mirrored from the other blocks. This means that the walkways are facing north. Again, the gardens need to be under the walkways. This would result in gardens positioned to the north, which gives no quality.
Left
Section and plan detail final plan; the back of one house faces the front of the other house (source: by author)

Right
Final design for the block (source: by author)
THE FINAL DESIGN

With the final design the last problems were resolved. All the solutions for the different aspects from the previous designs are combined into one strong integral design. The different design aspects take the other aspects and the bigger context into account and even strengthen them such that the overall design is very robust. In this chapter the structuring principle of the different elements in the design will be discussed and shown in detail.

The edge and the block inside
The edge of the block has become much more of a single entity containing the buildings inside it. This is succeeded through demolishing one more unit in the building blocks and extending the buildings that form the wall to the outside. This ring contrasts with the block inside through its building height. Moreover, the open space outside the ring is very different from the open space inside. On the outside there is a much more urban character, which provides the right conditions for the use of this space; in former chapters it was mentioned that the space outside the block was meant for transport, with the urban character this is achieved. Everything looks a bit bigger and the car still had a large share in the use of the space. Inside the block the atmosphere is more tranquil as will be shown further-on in this chapter.

The transition between the outside and the inside of the block is very gradual. The buildings on the northern and southern edge of the block still have a connection with the buildings inside the block. This is achieved by lowering the number of floors of these buildings to four; this is as high as the highest building inside the block. These buildings are given a larger garden as well, comparable with the gardens inside the block; the gardens of the buildings forming the edge are relatively small. Inside the block the number of floors in the buildings vary from two to four floors. The front of one building is facing the back of the opposite building. This means not all buildings are directly orientated to the sun. The solution for this problem is found in small adjustments in the configuration of the blocks and the use of balconies at the south side of the buildings where this is needed (at the north-eastern side of the neighbourhood). This way the private gardens will have more privacy and can be positioned on the south side. Furthermore, people living in apartments can still enjoy having private outdoor space.
Left
Bird eye impression of the inner block
(source: by author)

Right
New configuration in the block
(source: by author)
Decreased number of floors
Private atmosphere
Increased number of floors
Public atmosphere
Demolished buildings
Remaining buildings
Newly built sections
Decreased number of floors
Increased number of floors
Public atmosphere
Private atmosphere
Entrance to the block

The entrances of the block are on the flanks, this way the inside of the block will feel more as one unit and it will result in more privacy in the inner block. There are three entrances per side, two of those are only accessible for slow traffic modes.

Concerning the accessibility for cars two types of solutions are discussed: a dead-end street or an entrance on both sides of the block. The former has the benefit that it is easier to control who enters the block. In the planning of the area it is also easier to take only one entry point into account instead of needing to connect the different ends of the road. A positive point for the latter option is that the road does not have to be as wide as with a single entry road. The road only needs to support one-way traffic, where with a single entry construction two cars need to fit next to each other. A disadvantage of a connection through the block is the possibility for on-going traffic. These passers-by inside their car do not add anything to the vitality of the neighbourhood and only cause nuisance; with only one entrance for cars the block will become much more semi-private domain of the residents. This last reason and the possibility for better control over who enters the block are the reasons to choose for a dead-end street. This means only one of the three entrances per flank is accessible for motorised traffic.

The cars enter the block as close to the edges of the block as possible; again the privacy for the residents in the centre is the primary consideration for this decision.

Parking

When the cars get inside the block there must be space to park them. However, there is more to take into account than only the place to park the cars. For example, how will the cars be parked? This stems from the amount of cars needed to be parked, the available space in the area and the accessibility of the area. The accessibility is already discussed in the last part, so only the need for parking space and the division in space will be elaborated on.

What kind of parking principle is the most beneficial for the block? In a dead-end road the amount of cars that can be parked directly along the street is a less than with an on-going road. Moreover, a line of parked cars can form a barrier between the two sides of the street; this makes the routing within the block and the possibility to survey the street harder. The formation of parking islands seems like a good solution,
Left
Columns at the entrances of the block
(source: by author)

Right
Impression of the entrance to the block
(source: by author)
Left
Entrances of the block by car
(source: by author)

Middle
Streets bordering strong places are quiet
(source: by author)

Right
Impression of the flanks inside the block
(source: by author)
especially because this way the area can be easily divided. In theory it is possible to place seven cars next to each other on an island and still have enough room to walk and drive past it. However, the amount of unused space in the flanks is after this still very big, pedestrians only have small paths to walk on and there is no room for foliage around the parking islands. It is also possible to place four cars next to each other on an island. The space that is acquired from the three removed parking spots can be used to create a buffer between the cars and the footpath. In the longitudinal direction more space is needed to provide parking spots for the same amount of cars; this results in a better demarcation of the high quality spaces.

Public space
The buildings formed the structuring principle for the whole design, but in the open spaces there are other factors important. In contrast with the open space outside the block, which propagates a very urban character; the space inside the block is much more controlled by nature.

The focus on nature in the open space inside the block is a strong counterpart for the buildings. The open space is defined by these buildings as they form the leading principle, but other way around the focus on nature defines the buildings and thus the architecture. Where the architecture is robust, monotonous and very apparent in the neighbourhood, the nature can be seen as soothing, free, lively and informal. This contrast will make the monotony in the architecture much less apparent and will give a more tranquil feeling for the inside of the block. With the informality of the green the residents will have the feeling that the space is more private space meant for them to use. Moreover, natural environments increase the opportunity for social contact (Huang, 2006, Gifford, 2007) and has a positive effect on the well-being of people (Evans, 2003).

The buildings edging the block are tall; the view from outside the block will be quiet impressive, strengthening the urban character. However, it is important to keep the human scale on the inside of the block. A solution to keep the human scale is to reduce the visibility upwards. This way the people in the street will not be overwhelmed by the massiveness of the plan and can focus more on what is directly in their line of sight on the ground floor. Trees can very easily block the view in a gentle way, upwards and downwards into the private gardens. The presence of natural elements will also be a good contrast
to the stony buildings that demarcate the street. The trees cannot be planted directly to the façade of the building; there has to be some space between the two. This gives the possibility for an extra effect, which could also be seen at the old Architecture faculty at the Delft University of Technology. A group of trees prevented people to see the building in its total height. However, when one walked to the entry of the building he walked away from the trees and the impressive building could be seen in its entirety. This strengthened the effect of the height for the building and this can happen with the street profile in Kanaleneiland as well. The trees that will be used are the normal Apple tree and May tree. These trees are already used in the area abundantly and look like a good fit for this place, these trees can sustain on every kind of soil, will only get a height of 8 meters and the foliage of the trees is thick enough to ensure the privacy of the people in the back garden. The amount of bushes will remain low because this impairs the visibility in the street. With this the plan refers greatly to the plan for Lafayette Park, also mentioned in the ‘Precedents’ chapter. The height difference between the houses will attract the attention of the people on the street. The playful contrast between the different buildings will give a more legible and meaningful place.

The centre of the public space inside the block is formed by the corridor between the two flanks. This is a road cut through the buildings and will increase the number of possible routes within the block. This corridor does not directly connect to paths going out of the block, emphasising that this path is mainly for the residents of the block. The corridor is wide enough to make it a high quality recreational space, it will serve as the meeting point for residents in the block. Alexander (1977) stated that the size of a square in neighbourhoods should only be 20 meters across, 400 square meters. Two of these small squares will be implemented on the places where the small access paths from the dwellings cross the corridor. These squares can have different appearances; some examples are a water-square, a small football field or just a green park. Every block has two of those spaces and it is important to make these parks or squares different. This will enhance the legibility in the neighbourhood.

From the flanks of the block to the square in the middle small paths connect

Use trees to increase the humans scale; example: the old Architecture faculty
(source: by author)
Left
Columns inside the block demarcate space
(source: by author)

Right
Impression of passage inside the block
(source: by author)
to the front and back of the houses. These streets will foster the feeling of the inside of the block being an oasis of green; small paths wind between the grass fields and trees. The streets are only accessible for slow traffic modes and emergency personnel, which makes them very quiet. Moreover, because every street has a front of a house facing it there can be enough informal social control. Through privacy zoning the paths through the block will be easily controllable by the residents themselves. Privacy is also provided by the trees covering the back gardens of the residents.

Legibility
The legibility of the space is achieved by the placement of small fences, columns, gates and the amount of informality in the plan.
At the entrances to the block large columns will be placed. These have the height of two floors and give the resident or the visitor a clear message that they enter another space; they are used on the edges and in the middle of the corridor as well. On the edges they support the elevated walkway for the apartment buildings, in the middle they divide the two different squares and serve more as an architectural element that brings coherence in the plan.

From the outside to the inside of the block the lay-out of the open space will become increasingly informal. Where on the outside everything is still very strictly organised through the urban character, with the natural character inside the block the plan will become a lot more informal. At the flanks of the block the curves in the path are still very symmetric, which still gives an orderly appearance. Further inside the block the curving in the road will become more irregular and informal. This increases the feeling of the space being private instead of public (Newman, 1972).

The grass fields around the houses inside the block are irregularly bordered by fences of 40 centimetres high. This will not impair the visibility and will neither be seen as a real physical barrier. The grass fields can be entered on numerous locations through small gates and these fences will not even border the entirety of the fields; different kinds of furniture will be placed on the grass fields to show that one can tread on the grass. Towards the private houses there are no fences between the path and the field, this way it becomes clear that the grass fields are more or less property of the residents. Furthermore, with these fences it becomes clearer what kind of people and what sort of

Three examples of interpretation of the squares (source: NOS, 2009; Bakker, 2011; De Urbanisten, s.d.)
Left
Informal control & privacy regulation
(source: by author)

Right
Impression of the access paths to the dwellings inside the block
(source: by author)
traffic is allowed in these places.

At the entrance of every pedestrian street leading to the houses a small porch will be placed. This obstacle will have a gate which cannot be closed or can be easily surpassed, it is only there to show that people move into a new territory. This porch will this way become the notification of the different routes in the block. Other solutions to show the different privacy zones can be implemented such as a difference in height or materialisation.

There are four different types of pavement used in the design. On the outside of the block there are the regular paving stones, in the more public areas within the block clinkers will be placed; the pavement structure of the access paths to the dwellings will become even more informal. The separate paths to enter the house will have another paving. Within the streets there will be room for the residents to appropriate and change the space to some extent; they can enter the grass fields and personalise these fields to their liking.
THE BUILDING

The focus on the scale of the building lies, just as on the scale of the block, on improving the possibility to regulate privacy and make it legible. The main difference is the transition between private and public, which is in a different way present in the building scale than in the block scale. On the scale of the block one focuses on the public space and in introducing different layers in the amount of publicness per open space. On the scale of the building the transition is the primary assignment; it is about the transition from the private space of the dwelling to the public space, with preferably one or several semi-private spaces between the two zones. The legibility and possibility to regulate privacy is enhanced with a good design for the semi-private space; this is achieved through changing the typology of the apartments and the access to and inside the buildings.

Typology
In Kanaleneiland almost 85 per cent of the dwellings consist of apartments. Only 15 per cent of the houses are single family-houses (Gemeente Utrecht, 2013). These scores are not in accordance with the amount of families living in the neighbourhood, which is over 30 per cent; it is not advisable to place families in apartments above ground level (Newman, 1972, cited in van Dorst, 2005a). This means that there is a need for more single-family houses. It is not feasible to tear down some apartment buildings to make room for single-family houses. This would contradict the intention to maintain the population density. Furthermore, only placing houses between the apartment buildings does not have enough effect to solve the problem. However it is possible to change the typology in the apartment buildings on the ground floor. The larger part of the apartment buildings has little activity on the ground floor. They are used for storage space and the apartments on the first floor sometimes have an internal staircase down to more rooms. The apartments on the first floor can be merged with the ground floor and form a single-family dwelling. This will activate the ground floor of all the buildings in the neighbourhood and with this also the vitality of the area. Another advantage is the direct connection with the private gardens in the back. The dwellings on top will be appointed to students, singles, starters, couples without children and elderly while families have enough space on the ground floor. To show the different typology in the building the ground floor and first

Top
Households in different housing types
(source: by author)

Bottom
Accents in the façade
(source: by author)
floor will have vertical accents in the façade; all the floors on top will have a horizontal accent in the façade, this is already the case in all the apartment buildings through the placement of the windows in the façade. The columns at the edges and in the middle of the block strengthen this image as well. The different accents go well with the form of the trees (vertical at first and horizontal when it reaches a certain height).

The form of the buildings is also taken into account. The first designs of the large block resulted in large buildings with several protrusions and height differences within one building. This made the plan much more complex and less legible. In the final design the form of the buildings will only be derived from two main types: the straight line and the building with one right angle. The two archetypes are reused in their own way. The buildings height stays constant over the length of the whole building; this means there is no jump in the number of floors within one building.

Accessibility
It is important to provide every dwelling with a qualitative semi-private zone between the private domain of the dwelling and the public space. For the single-family houses with an entrance on the ground floor this zone will be different than those of the apartments.

The single-family houses will all get a private front and back garden. The garden in the front is two metres deep and the gardens in the back are in most cases even four to six metres deep. This makes the transition between private and public space more subtle. The access from the public street towards the gardens is thought through as well. The front garden faces the back garden of the opposite dwelling. The access path to the front garden is not directly in line with the access path to the back garden. This way one does not immediately face the neighbour from across when exiting the house; residents can choose themselves if they want to make contact with those neighbours or not. On the other hand, the access paths of two neighbouring houses are joined in one path. This is done for two reasons: primarily this can enhance the contact with the direct neighbours, although this is not forced upon residents. The second reason has to do with the appearance of the public space; with this joined access path there is more space for green in the area, which enhances the image of a green oasis which is projected for this space. All

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the access paths to the dwellings lead to the small footpaths between the buildings; these footpaths still have a very private feeling as was mentioned in the former sub-chapter.

For the apartment buildings there is a slightly different segmentation of zones to regulate the privacy. To come to this zoning principle a process of research by design is undertaken; through many small adjustments the final result was reached. The process is elaborated on in the following segment.

In the current state the apartment buildings are entered by several entrance halls within the building. Usually there are seven different entrance halls within one block. Eight to twelve households are connected to one entrance. From the entrance halls one can take the stairs to the other floors. There is no horizontal connection between the different stairwells. Moreover, there is no lift to get to the upper floors. Officially this is not needed for buildings with five floors or less, but the current and expected residential composition makes it desirable to include a lift.

The construction with a stairwell gives no possibility to appropriate the space and by this exert any control or make the place meaningful for its residents. Other problems are the impossibility to survey the stairwell. In many of these places there is a smell of urine because (especially) children use its darker corners as their urinal; particularly in the evening they do not want to use the toilets inside the apartments because of the chance that their mother keeps them inside afterwards. The movement of the residents is also not visible from outside; this can take away a lot of the buzz in the neighbourhood. There are several solutions that, to different extents, have a better effect on residential satisfaction as on the overall vitality of the block.

• A lift in every staircase
With the placement of a lift in every staircase the problem of accessibility by the elderly corrected. Technically it is possible to place the lift shaft inside the building. This would however result in the loss of a lot of apartment space. This is financially not desirable, so the lift shaft should be placed outside the building. The staircase is always positioned on one side of the building and in this place hugging the outer wall of the building. The staircase can be removed and placed together with the lift shaft outside the building. This way it is possible to make a connection between the lift and
the apartments inside the building. There are two to four households connected per floor. The slab of concrete that connects the building and the staircase can be made wider so that a place to appropriate and sit is created. This gives the residents more opportunities to control the place and give meaning to it. However the proximity of the lift and staircase can give a feeling that it is too public. For residents and visitors in the street the different connecting slabs give a nice view on the buildings. The alternation between concrete slab and open sky result in a playful appearance, which is a good alternative for the monotonous building. The lift shafts on the outside of the building also give a strong direction to the building. This can be a problem within the configuration of the building block, because some lift shaft will be standing outside the block while most of the shafts are positioned in this block. This harms the principle of the block as a unity within the open space. Moreover, the need for a lift shaft for every entrance is overdone. The image of the building as an entity in the open space is nullified through the wood of lift shafts.

- A walkway for every floor
  Instead of connecting the different apartments vertically one can also connect them horizontally. This is possible through the placement of a walkway on the outside of the flat. A great advantage is that less lift shafts are needed. Only on the two outer entrances a staircase will be located. With the absence of a number of lift shafts the residents have a much better view over the area. However, these staircases are still placed on the outside of the building so that the buildings get a strong direction. Again, due to the principle of the block as a unity this is not desirable. Another problem with the regular walkway along flats is that they do not have any social qualities. The walkway is only a prolonged passage which is shared with other people. Also the proximity to the private space of the residents is a problem. Many people will have a sense of crowding and shut their curtains to prevent people to look into their home.

- The improved walkway
  A regular walkway is not beneficial for the regulation of privacy for the residents and has no other qualities than being an efficient way to access an apartment. However, there are some adjustments that can be made fairly
solution can be found in a combination of the two principles; it is possible to adjust the walkway typology for every single floor. The ground floor and first floor are for families and these will have a private garden; this means that there is no need for a walkway on the first floor. On the second floor a walkway of two meters wide will be placed. The amount of light that reaches the living area inside the single-family dwellings underneath it is still enough because the living room is two levels below the walkway. The privacy of the people on the ground floor will not be an issue because they can sit under the walkway and not be seen by the neighbours living on the floors above their house. All the floors above the second floor will have a walkway set off from the building with 80 centimetres. The gap between the building and the walkway will ensure that enough light will reach the floors beneath it. The distance between building and walkway also result in less feelings of crowding by the residents.

As a second point it is important to improve the possibility to regulate one’s privacy of the walkways. This is achieved by making them wider or placing them further away from the building. There are several design problems that should be taken into account when adjusting the elevated walkway. Wider walkways will prevent light from reaching the floor beneath it. On the other hand, a gap between the building and the walkway will result in significantly less privacy for the people living on the ground floor, because people can look directly into their private garden. This way it will impair the use of these private gardens. The distance to the staircase is greater than easy to improve a lot of these aspects.

Firstly, there are only two staircases and even one lift shaft needed per building, these numbers make it a lot more feasible to integrate the staircases into the building by transforming one of the apartments on every floor in a place for the staircase and lift. With no staircases on the outside of the building the view for the residents is blocked even less, and there will be less differences between the front and the back of the building. Only the elevated walkways will give a notion of direction from the building. This way, unity in the building block is much more achieved.

To give the people on these floors still a place to exert control over this semi-private space the access to all apartments will be made wider, like in the solution with the lift shafts. Here the residents can appropriate space, personalise it and thus give it meaning.
in the solution with seven lift shafts; this will result in the appropriated places not feeling as being public space. For the people in the street the connection between walkway and building will again give the playful effect between concrete slab and open sky.

In contrast with the single-family dwellings the entrance to the apartment buildings connects to the central square in the block. However, the number of zones between the private dwelling and the public square will remain the same as with the single family dwellings.

Another detail in the apartment dwellings is the introduction of the balconette on the side of the elevated walkway; this way the residents will get even more opportunities to control their privacy and they can enjoy the feeling of being outside while living in an apartment.

All these elements on the different scales contribute to the neighbour being more liveable. The different elements strengthen each other and result in a overall strong design for Kanaleneiland-Noord. Much emphasis is placed on the two lower scales, here the residents of the neighbourhood will have the most possibilities to exert control over the open space. With the gradual transition from private to public space and the zoning in the public space the residents of the block can acquire the amount of privacy they want. There are a lot of opportunities for personalisation of the space in the block. And with the natural open space the mystery in the plan is increased, while with the rational organisation it is still legible. The connections in the neighbourhood and from the neighbourhood to other nodes are improved and the human scale is brought back with the reduction of open space and the reduction of number of floors for the buildings inside the block.

The conclusion to the main research question will be answered in the next chapter. This will discuss the theoretical part of the thesis.
Left
Different privacy zones for apartment dwellings
(source: by author)

Right
Different privacy zones for single-family dwellings
(source: by author)
With all the analysis, theoretical research and the new design it is time to answer the main research question. The question was as following:

*How can we improve the liveability in the post-war modernist neighbourhood Kanaleneiland-Noord by redesigning / redefining the outdoor space?*

The main research question could be subdivided in four groups; there are questions about the liveability, modernistic neighbourhood, redesign or redefine, and the outdoor space. First the concept ‘liveability’ will be explained again, together with mentioning the aspects of liveability that were assessed. Before going to an elaboration on these aspects the other groups of sub-questions will be discussed. After this the different liveability aspects will be considered in more detail and will be followed by the solution found in this research.

Liveability can be subdivided in many different aspects, which all slightly different concepts which can be measured. From a psychological and sociological perspective three types of liveability can be distinguished: presumed, apparent and perceived liveability. Of these three the apparent liveability would give the best overview on what needed to be changed in the neighbourhood. However, this type of liveability is only measurable subsequently and cannot be used for this research, because of the relative low amount of time available. Therefore a combination of studies into the presumed en perceived liveability is necessary. The presumed liveability gives more objective data to analyse. The solutions for most of these aspects are fairly easy to denominate. However, only taking these environmental characteristics in mind is not enough. The social-cultural context and personal characteristics from the perceived liveability should also be taken into account. These aspects consist of much more subjective data; therefore it is harder to derive to univocal conclusions. It is much more the responsibility of the designer to interpret the found data in his way. This may give the eventual design a more personal touch.

For this research to focus laid on privacy regulation and vitality as foremost criteria of assessment. In this regard the regulation of privacy is of more importance than the vitality, because without the possibility to regulate privacy people will withdraw from the public space and there will not be any vitality. Vitality could again be divided in
‘human scale’ and ‘legibility’, this is derived from the interpretation in Van Dorst’s doctorate thesis (2005a). These aspects were chosen because in a modernistic neighbourhood like Kanaleneiland-Noord these aspects are often the most problematic. Moreover, finding a solution for these aspects is a much more complex task than finding a solution for other liveability aspects like the amount of parking spots for cars. The large amounts of space between the buildings, the monotonous design, the lack of differentiation in housing typology and the disregard for the human scale can be seen as the biggest problems in the area. These problems can primarily be traced back to the lay-out of the original plan. However when the neighbourhood was designed the society worked very differently than it does today. The problems arose due to these changes. This is also the case in other modernistic neighbourhoods.

An answer to the question to what extent the neighbourhood should be redesigned or that the space should be redefined was sought in the ‘Research by design’ chapter. The intention at the beginning of the project was to keep as much of the existing buildings as possible. However this resulted in the inability to solve a lot of the problems. The space between the buildings could not be properly redefined and it was difficult to introduce a human scale in this plan. Further in the process it was reckoned that more and more buildings needed to be adapted or demolished so that the problems in the modernistic neighbourhood could be resolved. Eventually a situation is created where the original configuration is still clearly visible, due to the edge of the newly created block and the apartment buildings which are persevered as much as possible.

With these adjustments a lot more possibilities came to surface for the outdoor space. It was possible to introduce a new housing block between the old ‘Stempels’ which made it much more easy to control the rest of the outdoor space. Moreover, with the replacement of the 15 metres deep private gardens with gardens of only four to six metres deep the outdoor space was could be used much more efficiently. This results in private outdoor space for more residents in Kanaleneiland. Moreover, the rest of the outdoor space is arranged in different zones which make the transition from private to public more gradual.

With the elaboration of the sub-questions it is now possible to focus on the main
research question of this thesis: how to improve the liveability. The different aspects that are important in this regard were already mentioned. Their contribution to a more liveable neighbourhood will now be discussed.

Privacy regulation is the most important aspect in liveability in this respect. Privacy regulation has much to do with control. Control in the living environment is about the control of the social and physical environment (Van Dorst, 2005a). Control over the surroundings is more than only changing what you want. It is also about the possibility to be involved in the neighbourhood. Legibility will also make it easier to control an area; when it is clear for whom the area is meant people will also act accordingly. Legibility gives meaning to a place in this case. This can be done, inter alia, by personalising the physical space. Through this the residents create links with the physical world and make the place more meaningful for them (Carr, 1992). With the control over the regulation of privacy the possibility to withdraw from more public spaces is meant. When a person can choose when to be alone and when to be in company of others he will also appreciate the situation more. This will also indirectly improve the tolerance towards others (Van Dorst, 2005a).

By converting enough space to private outdoor space the remaining space is made easier to control. Now there is a place where people can be alone and also a gradual transition to the public space, which gets through this much more meaning. Also the people living in the apartments will get more space to personalise. The elevated walkways are designed in such a way that they not only serve as transit zone, but also as high quality residing space. The control of privacy is done very subtle through privacy zoning. With different design elements one can control the privacy and the physical space.

When discussing vitality the legibility can be seen as the most important aspect to assess when trying to answer my research question. Legibility has a close connection with control and therefore indirectly with privacy. When studying the legibility one should also take mystery and complexity into account (Kaplan, 1987). There is an ever shifting distribution between these aspects and a good space has a well-balanced ratio between coherence and complexity, legibility and mystery.

In a neighbourhood as Kanaleneiland the legibility can be improved a lot. When one
walks through the area everything looks very much the same; the place is too coherent and through this too complex. Also on a higher level it is hard to distinguish the different places. Moreover it is not really clear which places belong to whom. When one leaves the apartment building he is directly in the public space; there are no soft transitions that can help this person get control over his surroundings.

With territories the control can be enhanced (Habraken, 1992; Newman, 1996). However, one cannot close off one area from another. This will disrupt the different connections there are between the areas (Alexander, 1965). Privacy zoning is a nice tool to make territories visible without interfering in the connections between the different areas (Van Dorst, 2005a). With this zoning principle places are foremost made more legible. The places are made meaningful and with a good zoning design the physical space and the privacy can be regulated easily. This can be traced back in the new design for Kanaleneiland-Noord. With little changes in the physical space it has been made clear what the function is of every place within and outside the block. This will eventually improve the liveability in the neighbourhood.
This project is linked to the studio ‘urban regeneration’ and the theme ‘design of the urban fabric’; the studio and theme are closely related. This theme mainly focuses on the smaller scale like the city neighbourhood. They promote a sustainable, attractive and vital urban design. My project is very closely related to those goals. With the plan for Kanaleneiland-Noord I intend to improve the liveability of the neighbourhood with a sustainable and attractive design/strategy. Vitality is together with legibility one of the key aspects in this project. I wanted to explore the scientific side of the discipline, which this theme tries to strengthen. The transition between public and private space and how it can help people to control their privacy are my main focal points. I chose this subject because I am interested in to what extent it is possible to influence behaviour with urban design; what elements will increase the control over one’s environment and which elements will reduce this control. What effects does transition space have on the person and their perceived control over their privacy? With this project I try to contribute a bit to these questions so that in the future neighbourhoods will be designed with more care for the residents’ needs. Until now this works out very well, I was able to acquire a lot of information from different sources. I really have the feeling my scientific base is strengthened by this. Also the human level is very important in this theme; another point that will be directly discussed for the design in Kanaleneiland-Noord. Moreover, the morphology in this graduation project is very important; this is also one of the focal points in the theme of the studio. In Kanaleneiland the old morphology of the urban fabric is very typical. The configuration comes from the Stempelbouw principle which was very much used in that time. Nowadays there are many problems in the neighbourhoods designed according to this principle; there probably is a link between the morphology and the performance of the neighbourhood.

Relation methodical line of the studio and used by student

The methodical line of approach in the urban regeneration studio is focussed on case studies and research by design. Case studies are not conducted in this project. The available time was not sufficient to perform a whole case study. Case studies done by others have been studied; this is seen as literature study. The cases studies were not performed because the focus lay on the research by design. A lot of the design solutions were acquired through this. It
would have been better to make one or two case studies instead of looking them up in the literature. This way one can get a better notion of the crucial points in the other designs, something I lacked for my design. Another important method on this scale would be making Cognitive maps. Residents all have a different view on what is important in their neighbourhood. By drawing cognitive maps it easily becomes clear what is on their mind, what places they visit the most and what areas they (dis)like. In this project no cognitive maps were made; this is due to the mistrust with the residents. So many projects have been proposed and not one has been implemented. Residents do not trust the official agencies anymore and are not very willing to cooperate with other projects like this one.

In this project the relationship between research and design was very close. The first months were mostly spent on reading theory on territories, privacy zoning and legibility; from this a theoretical framework is constructed. Furthermore, a visit to the location was planned together with interviews with actors in Kanaleneiland-Noord. Numerous analysis have been conducted and the interviews gave a good view on what the different actors in the area reckoned as positive and negative points in the neighbourhood. This gave more grip to the project overall. After the P2 presentation I got the advice to specify the research question and look more into the history of the location. The focus was narrowed down to the improvement of the liveability of an area. I reckoned afterwards that the specification of the research question was a necessary step. This made it possible to dive much deeper into the theory and gave me more preconditions for the design. A visit to the archives in Utrecht made the choices made for the original plan much clearer. After this the design phase was started. I had a hard time starting the designing phase; before P2 I only had some conceptual drawings, I told myself I needed more information from the theory. The design came much later, when the mentors started to demand it. However, when the first design was made it became much easier, because I had something tangible to work with. Here the connection between research and design became a lot closer. The designs were tested on the hand of the criteria obtained from the theoretical framework. Every scale and aspect was assessed this way. This resulted in a long and thorough process where elements within
the design could be changed several times within one week. This approach is very time consuming. There are constantly adaptations needed. Some are very obvious but others only become apparent when other aspects in the plan were studied. This was even harder with the absence of a leading principle. This choice was only made somewhere after the P3 meeting. This was way too late. Only at that point I realised that I had been stuck for quite some time. I was fixated on the plan that I had and did not see the incoherence in the plan. The choice for a leading principle was hard. On the one hand there was the public space which could be seen as the place where the most adjustments needed to be made. On the other hand the building layer defined this public space. Eventually I chose for the buildings as leading principle, mainly because this gave me more preconditions. Just like with the adjustment of my main research question the amount of preconditions was the main criterion to base my decision on. Other criteria are hard to find in this respect. I did not have enough knowledge on other projects: what they used as their leading principle and how it worked out in those situations. It is hard to assess if the effects in one of the precedents will be the same in my design. I found that the hardest part, not being able to know if the choices I made would have the effect I fought it would give. This is typically a problem which only can be resolved by having a lot of knowledge of the theory and practice of the profession.

Another point that could be gone differently is the choice of criteria on what I would assess the liveability. Finally I chose for vitality. On the one hand because I wanted to show that vitality is an important part of the perceived liveability, where it currently is seen as a part of the presumed liveability. Moreover, the link with control and the dependency on privacy regulation were very important in the choice for this aspect. control is linked with vitality through legibility and vitality is dependent of privacy regulation because without the possibility to regulate privacy there will be no vitality in a neighbourhood. So I chose vitality because it had a much stronger link with other aspects of liveability. We can reason the other way around, privacy regulation was an important aspect to improve in the neighbourhood; vitality can be seen a bit as the opposing aspect of privacy regulation. With privacy regulation and territories people quickly think about closing off spaces and keeping it safe. However, we need to pay attention to
the possibility for vitality as well, this means that people must also be able to see others and be seen. These two conflicting needs with people are actually very important to bring together.

The ratio between redefining and redesigning the public space is interesting to discuss a bit as well. In my research question I stated that I wanted to do both. I have done both in a certain way but I have not paid specific attention on my reasons to choose for redesign or redefining the space. Eventually it is much more easy to redesign the space, because this gives visible changes, which are easier to explain to others. I have redefined some spaces, for example the private back gardens into parking space. Redefining the space is in this case subordinate to the redesigning of the space. It would be interesting to see if the opposite was also possible in my plan, that the design was subordinate to the redefinition of the spaces.

Now I want to take a look at the bigger picture. To what extent would it be possible to create a different design with the same research? In the design there was much attention for detailing of the plan. This was necessary if I wanted to show the gradual transition between the different zones. Other design aspects in the plan served as precondition for the design of the privacy regulating elements. These other aspects were chosen more intuitively. A good example is the use of vertical and horizontal accents in the façade. This was chosen only because I needed to make the different typology clear; the first two floors formed one dwelling, the apartments on the floors above the single-family houses formed a long horizontal succession which followed the whole length of the building. Eventually it was chosen to strengthen the horizontal and vertical orientation in the façade; this resulted in the use of columns in the plan for privacy zoning. I could have chosen other ways to show the difference in typology, this would result in other aspects in the design serving as precondition for the design of the privacy regulating elements. Therefore I think that it is very well possible that with the same research another design could be made.

If we look at it the other way around: is it possible to come up with the same design with other research done, or even no research done at all. In this respect I think it would not be possible to get the same results without the design. Many elements in the design are created this way because the result of the
performed studies showed that through this the privacy could be better regulated. If the regulation of privacy through zoning was not the starting point these elements would never been created. Specific examples are elements which have no other function than showing the different zones in the plan; a good example is the use of permeable fences in the grass or small gates which does not physically separate different spaces.

In this year there is a lot I have learned; aspects that have to do with Urban planning and design, but also aspects that have to do with regular planning.

The most important lesson I have learned for urban planning and design is the importance for a strong research base. In all the projects before my graduation project research never played that much of a role. In most projects there was not enough time to perform a good research on a specific aspect in the plan. With the graduation project I had significantly more time to spend on research. Choices are much easier to take when you have a specific idea in mind and have knowledge on this concept. This is immediately the second thing I learned; the satisfaction I get from conducting research. Specifically the research on a socio-spatial level. As the project got further I began to like it more and more, primarily because my knowledge on specific urban phenomena increased; I realised that theoreticians which I had to high standards in the first place became less important (and vice versa) when I read the research from other theoreticians. I realised that I only have seen the smallest bit of information about the subjects I studied; I think experience will always be the most important thing for (researchers of) urban planners. This is actually pretty easy for me to improve, the only thing I have to do is to get older and visit a lot of projects; a good analysis on these projects remains important off course.

Another thing I learned in this project is the importance to use different techniques and approaches together to get a good overall view on the strengths, weaknesses and possibilities in a new design. Moreover I learned how important it is to design all elements together. Before this project I had the tendency to design each element separately and bring it together at the end. This will not get a coherent end result. With this design I think eventually it all came together pretty nicely due to the fact I tried to take everything into account at the same time (although this is not entirely possible as
the future is taking the next step after reading
the theory. It is important to form your
own opinion on the theory you read. I
have difficulty with quickly forming an opinion
on the theory. I think this is not necessarily
a bad thing. It is important to quickly have
an opinion on the thing you read, However,
a good opinion can only be formed when
one has knowledge on the different opinions
there are. I must find a good middle course
between creating an opinion quickly and read
enough about others to form a well thought-
through opinion. This is maybe the most
important lesson I take with me in my future
career, where-ever that may be.

My planning was not that good during
my graduation project and this is something
I need to improve in my further career. I
have been too chaotic, did not plan enough.
I have tried to make a planning for a week
in several occasions but it was easier to just
keep working on the project. Eventually
this has given me some problems with time
and product management. I think I could
improve my overall work/design a lot when I
learn myself a proper way of planning.

The documentation of my work had some
good aspects and bad aspects. I documented
the audio of all my meetings, with mentors
and interviews, which I typed out when I
had more time. This way I could not make
mistakes through bad interpretation of the
notes. The documentation of the theory
was not very good. I summarised important
aspects of the theory in small sentences, this
way it was hard to recall what the essence was
from this sentence. It would have been better
to make small stories from the documents I
read, I will do this in my next projects. On the
other hand, the use of schematic drawings as
summary for the research did suit me very
well. I will keep doing this in the future.

The last thing I have learned a lot during
this project, but will have to be much better in

we may believe Alexander (1965))
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