

NETWORK OF PLAY

a research on the playability of Dutch residential districts for children



Thesis project by:

Koen Bakker
Frank Fähnrich





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LAR-80430 Thesis Landscape Architecture

Thesis project by:

Koen Bakker en Frank Fähnrich

Thesis supervisor:

Dipl. Ing. Sanda Lenzholzer

External advisor:

Magnus Weightman MA (Hons) B.Arch



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Thesis subject: **NETWORK OF PLAY** - a research on the playability of Dutch residential districts for children.

Koen Bakker - 810204029050

Frank Fähnrich - 820518236070

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The UN Convention on the Rights of the Child
Article 31 - Right to rest and leisure

- (1) *States Parties recognise the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.*
- (2) *States Parties shall respect and promote the right of the child to fully participate in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity.*





abstract

The Netherlands is dealing with an increasing amount of children that are being overweight (or are obese, which is an extreme condition of being overweight). It is important to counter becoming overweight at an early age, as it can have serious consequences in adulthood. Research shows that city children are more susceptible of becoming overweight (ca. 31%), than children living outside the city (ca. 21%).

It seems that with a change towards lifestyles that favour physical inactivity, the susceptibility for becoming overweight increases. A lack of exercise (physical activity) combined with relative overconsumption results in children being overweight. Therefore it is important to stimulate children to exercise more often. Outdoor play is an excellent trigger to stimulate the physical activity of children.

However, the play opportunities for children in city districts are limited nowadays. There are several factors which play a role in every (postwar) city district concerning the disappearance of play opportunities for children, like the enormous increase of motorized traffic, risen parcel values and scale-increasement. The problem of insufficient outdoor play activity can be ascribed to six spatial aspects of urban public space:

- 1 The quantity of potential play spaces;
- 2 The location of potential play spaces;
- 3 The accessibility of potential play spaces;
- 4 The quality of potential play spaces;
- 5 The focus of municipalities on formal play spaces and their specific age groups;
- 6 An insufficient use of landscape spaces/ elements.

Furthermore outdoor play needs to be able to compete with the increasing attractiveness of indoor leisure activities (television, computer, etcetera).

This thesis will tackle these aspects by introducing a new spatial model: the **Network Of Play model** (NOP-model).

The aim of the NOP model is to provide designers and city planners with a tool to improve the playability of public spaces in city districts. The NOP-model is a tool that acts as both a way of appraising play opportunities in city districts and neighbourhoods and a guideline for designing stimulating, connected play spaces. The NOP-model incorporates the existing public space (informal play space), instead of focussing just on playgrounds (formal play space). Not the object for play should determine the play quality (which is the case on formal playgrounds), but the preferred activity/skill development should determine the play quality.

Since the NOP-model is created with the play requirements of children in mind, the following hypothesis is formulated:

“Redesigning the public space of a city district to a ‘Network Of Play’, stimulates outdoor play.”

The NOP-model consists of three spatial elements that ensure a child-friendly, playable district:

- 1 **Primary play spaces**
Public spaces with a high play quality that act as attraction points for children.
- 2 **Secondary play spaces**
Smaller but more numerous public spaces with specific opportunities for play.
- 3 **The Childweb**
A collection of child-friendly routes.

The NOP-model is tested on the priority district Randenbroek-Schuilenburg in Amersfoort.

The district and two of its neighbourhoods (with their specific urban typologies) are tested on their playability, by using a set of spatial criteria (based on literature on children’s play requirements). Conclusions on the playability (or the lack of it) result in proposed design solutions for each of the two examined neighbourhoods.

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preface

Our interest in the play opportunities for children in city districts, started with a publication in 'de Volkskrant'. This article discussed city districts with major social and spatial problems and how these circumstances affected the health of children/residents. We were struck by the high amount of city children that are being overweight. We got interested in the relation of environmental aspects (city planning) and disappearing play opportunities for children in city districts, as researchers and designers seemed to notice this trend.

However, it seemed to us that landscape architects had yet not made significant contributions to solve this growing social-spatial problem. The urban aspects of this social-spatial topic normally falls into the realm of architects, social-cultural researchers and urban designers. We saw this as an opportunity to show that landscape architects can just as well contribute to improve the urban realm for children. Focussing on just one target group (children) made it even more challenging in our opinion.

During this thesis we had the opportunity to design an innercourt in the city district St. Marten in Arnhem. We both have our interests in small scale designs and felt that this was a perfect opportunity to get more experienced with designing public space in city districts. We were asked to design an innercourt where children could come together and play in safety. We talked to residents and children to get an idea of what they expected from a good play space, without it to become just another playground. This proved to be a very useful experience, as we got an insight in the play requirements of the modern day child in the urban realm. It also made us even more convinced of the usefulness of our research.

Our thesis research included studying play requirements of children and studying spatial models/methodologies related to play opportunities for children in city districts. This information gave us the idea of designing our own spatial model.

With help of our thesis supervisor Sanda Lenzholzer and our external advisor Magnus Weightman, it became clear that we needed to develop a systematic spatial model which can be applicable in cities all over the Netherlands. Hopefully, with this thesis we succeeded in providing designers with a helpful tool: **the NOP-model**. Most ideally it will be used in its full extend. Nonetheless, even a small implementation of the NOP-model will have an influence in improving the playability of city districts for children.

We want to thank Magnus and Sanda for their valuable contributions to our research. Their enthusiasm and critique has helped to shape this thesis into what it is. The experience of Magnus with developing a spatial method (PIP-model) to improve the play opportunities for children in city districts, was really helpfull. The guidance of Sanda especially has resulted in a more thorough and complete research. Whenever we got lost in all our research material, she knew what we had to do to extrapolate the right information. We also like to thank all the students in our thesis room for their company and positive energy during this thesis. We like to thank them for all the fun and the useful discussions about our thesis.

Finally we would like to thank our friends and families for their moral support.

We hope you will enjoy reading our thesis and most importantly, that you will take the play requirements of children in mind, the next time you might design in the urban realm.

Koen Bakker and Frank Fähnrich



chapter 1



Calvin and Hobbes
a comic by Bill Watterson

social- and spatial context

This chapter illustrates that the Netherlands deals with an extensive amount of children that are overweight. A fact - which will be addressed in this chapter - that motivated us to delve into this subject. Being overweight happens when the energy intake (nutrition) is higher than the energy burning. A way to burn energy is by being physically active. We address outside play of children as a main stimulant for being physically active. Therefore this thesis is about the relation of being overweight and possibilities for play of city children. The examined studies on growth of children illustrate differences between city children and children living outside the city. Our focus will be on city children. When we discuss being overweight it also includes having obesity, as obesity is an extreme condition of being overweight.

1.1 The problem of being overweight

“Throughout the world, the prevalence of overweight and obesity has taken on epidemic proportions. In the Netherlands, as elsewhere, there is steady rise (increasing prevalence) in the number of individuals suffering from overweight and obesity... The extent of the overweight epidemic is also clearly reflected in the increased prevalence of overweight during childhood. On average, 13% of boys and 14% of girls in the Netherlands are overweight. It seems that the most marked increase in prevalence occurs in young children above the age of three. If this trend continues, it is estimated that 15 to 20% of adults in the Netherlands will be obese by 2015.” (Health Council of the Netherlands 2003)

In 1996/1997 a fourth Regional Study on Growth of children (RSG) was held, a research on the length and weight of Dutch children. Compared with the third Regional Study of Growth in 1980, it shows a significant increase of children being overweight (see figure 1.1). Figure 1.1 shows that at least 13% of the Dutch children are overweight in 1997. This figure though, is not specific enough about the age in which children are most vulnerable to being overweight. The following two figures will illustrate age specific numbers on children that are overweight.

Figures 1.2 and 1.3 compare the 1997 RSG numbers with the numbers that TNO gathered in the years 2002 till 2004¹. TNO measured the length and weight of 80.000 school children in the age of 4 to 15 years. Although there are differences between boys and girls, the numbers speak for themselves. An increase of being overweight of **68%** and **47%** for boys and girls respectively and an increase of obesity of significant proportions: **146%** for boys and **164%** for girls.

	1980	1996/1997	Increase in % from 1980 to 1996/1997
Being overweight			
Boys (age: 0-21)	9,9%	13,0%	+31%
Girls (age: 0-21)	8,8%	13,7%	+56%
Obesity			
Boys (age:0-21)	0,5%	0,9%	+80%
Girls (age:0-21)	0,4%	1,5%	+225%

figure 1.1 / The 3rd and 4th regional Study of Growth of children (www.gezondebasis.nl)

BEING OVERWEIGHT/OBESITY OF BOYS IN THE AGE OF 4-15 YEARS IN PERCENTAGES				
Age	BEING OVERWEIGHT		OBESITY	
	1997*	2002-2004**	1997*	2002-2004**
4	9,5	9,2	1,2	3,8
5	8,3	10,0	1,5	2,5
6	9,1	10,9	3,0	2,7
7	10,6	14,9	3,5	3,6
8	10,9	17,3	0,0	4,3
9	9,0	16,1	1,2	3,2
10	6,9	14,0	0,9	2,5
11	8,7	15,4	0,3	3,0
12	7,4	16,2	0,8	2,8
13	8,1	15,3	1,2	2,8
14	8,0	15,6	1,0	3,4
15	5,4	16,8	0,5	3,9
average	8,5	14,3	1,3	3,2
increase	68%		146%	

* data from Fourth Regional Study of Growth

** data from TNO

figure 1.2 / Data of boys from the 4th regional Study of Growth and TNO numbers collected in the years 2002-2004 (www.voedingscentrum.nl)

BEING OVERWEIGHT/OBESITY OF GIRLS IN THE AGE OF 4-15 YEARS IN PERCENTAGES				
Age	BEING OVERWEIGHT		OBESITY	
	1997*	2002-2004**	1997*	2002-2004**
4	10,8	15,6	0,0	2,3
5	9,5	14,6	1,5	3,6
6	19,0	15,1	1,6	3,6
7	13,6	21,8	2,1	6,5
8	13,9	24,6	2,8	5,7
9	15,3	18,9	2,2	3,4
10	13,4	16,9	2,5	2,3
11	11,0	19,0	1,4	3,2
12	12,2	17,1	1,3	3,1
13	10,0	15,2	0,6	2,7
14	7,2	16,2	0,5	2,8
15	10,0	20,1	0,5	4,7
average	12,2	17,9	1,4	3,7
increase	47%		164%	

* data from Fourth Regional Study of Growth

** data from TNO

figure 1.3 / Data of girls from the 4th regional Study of Growth and TNO numbers collected in the years 2002-2004 (www.voedingscentrum.nl)

Concluded from this research was :

- **The last couple of years Dutch children clearly gained in weight.**
- **Dutch children are overweight at an increasingly younger age.**
- **The percentage of children that are overweight or have obesity is increasing faster every year.**
- **Girls seem to be more susceptible to weight problems. This is most likely because boys seem to have more physical activities.**

(source: de Vries, Bakker et al.2005)

1.1.1 Health risks

Being overweight at a young age can have serious consequences in adulthood. Not only does juvenile obesity typically translate into adult obesity, but it also causes metabolic changes that make the disease difficult to treat in adulthood (Brown 2001). Some of the common health risks associated to being overweight are (Brown 2001; Health Council of the Netherlands 2003):

- Cardiovascular diseases;
- Various types of cancer;
- Arthrosis;
- Respiratory problems;
- Heavier body weight increases resistance to the heart's pumping of blood elevating the blood pressure;
- It raises the stress on joints, often causing lower back pain;
- Diabetes, people who are obese are four times as likely to have diabetes as those who are not.

Next to physical consequences, being overweight can have social and psychological consequences for children as well, like a negative self-image, social isolation and eventually depression (Louv 2005).

All these negative effects of being overweight illustrate that it is important to prevent becoming overweight at an early age. As weight goes up, life expectancy goes down. "The morbidity associated with obesity (and, to a lesser extent, with overweight)

leads to numerous (medical) treatments and additional work disability, as well as increased costs for the health care." (Health Council of the Netherlands 2003). **Being overweight reduces the quality of life and has a negative effect on the vitality of a healthy society.**

1.1.2 A lack of physical activity

There are numerous researches on the correlation between being overweight and physical activity. Research published by the Health Council of the Netherlands (in 2003) acknowledges that there is such a correlation:

"Over extended periods of time, a small positive energy balance leads to major changes in body weight. National food consumption surveys reveal that there was a fall in average energy intake in the Netherlands from 1987/1988 to 1997/1998. There are clear indications of a substantial decline in the level of daily physical activity in recent years. In view of the increased prevalence of overweight, however, the extent of this decline in physical activity must more than compensate for the fall in energy intake. It therefore seems likely that the increased prevalence of overweight and obesity is due to an increasing lack of exercise, combined with relative over-consumption."

It seems that with a change towards life-styles that favour physical inactivity, the susceptibility for becoming overweight increases.

Up to date, studies on the correlation of genetic factors and becoming overweight are not reliable enough, as becomes clear in the published research by the Health Council of the Netherlands:

"While genetic factors play a major part in the development of overweight and obesity, the influence of environmental factors appears to be of overriding importance. As yet, very few of the genes responsible for susceptibility to the development of overweight have been identified. The same is true of the part played by interactions between genes, as well as interactions between genes and lifestyle factors."



figure 1.4 / Pictures of children playing in the urban realm.

1.2 The city and being overweight

1.2.1 City statistics on being overweight compared with national statistics

TNO also published a report on the correlation between spatial characteristics of a city district and the weight of children (de Vries, Bakker et al. 2005). Children living in five different city districts were monitored from October 2004 until January 2005. These cities were selected by use of the list of 56 priority neighbourhoods selected by the ministry of VROM². The research included 1228 children in the age of 6 to 11 years. The result of the research revealed that 31 percent of the children were overweight (28 percent boys/ 33 percent girls), with 9 percent having obesity.

Compared to the numbers of the national wide study of TNO (conducted from 2002 till 2004), it turns out that the percentage of city children that are overweight or have obesity is a lot higher (www.voedingscentrum.nl):

- 28 percent of the boys in the age of 6 to 11 years old living in city districts are overweight (including obesity). Compared to the national number of 18 percent it means that: the total amount of boys that are overweight or have obesity is **10 percent higher in the city.**

(In 1997, 10,7 percent of the boys in the age of 6 to 11 years in the Netherlands were overweight. Compared to city children in 2004/2005 it is a difference of 17,3 percent, in no more than 10 years!)

- **33 percent of the** girls in the age of 6 to 11 years old living in city districts are overweight (including obesity). Compared to the national number of 23,5 percent it means that: the total amount of girls that are overweight or have obesity is **9,5 percent higher in the city.**

(In 1997, 16,5 percent of the girls in the age of 6 to 11 years in the Netherlands were overweight. Compared to city children in 2004/2005 it is a difference of 16,5 percent, in no more than 10 years!)

This confirms that children that are living in the city are more susceptible to becoming overweight. Could present-day city planning have an influence on being overweight and therefore on the lack of physical activity of children?

1.2.2 Play opportunities in the urban realm

Outdoor play is an excellent trigger to stimulate the physical activity of children. Children love to play. Anyone who has grown up in a city (or outside of the city) will remember his or her play experiences on the sidewalk, the little piece of barren terrain where you were not supposed to go or the playground across the street. The urban realm is potentially full of stimulating experiences and possible adventures for children (see figure 1.4). The urban realm however is also full of risks. Risks like car traffic or social unsafety, which leads to parents not letting their children go outside or children finding other forms of amusement indoors. The lack of attention for children's play needs and movement patterns is starting to be recognized as a serious flaw of modern day urban planning. If we keep building cities with little thought about the movement patterns and the play needs of children, we soon might be the last generation to remember the potential of public spaces for play. This might result in an unmanageable amount of children being overweight. Brown states:

"Unless we can design a life-style that systematically restores exercise to our daily routines, the obesity epidemic and the health deterioration associated with it, will continue to spread along with urbanization."
(Brown 2001)

In urban development it is often children who are on the short end of the stick. Most of the time they are only taken into account when deciding where to place a playground. While everything is done to fulfil the needs of adults (like making sure that he or she can park the car in front of the house), the child just seems to have to do with the minimal required playground. The available public space and the target groups it is meant for seem to be out of balance. Children are the foremost users of public space, but it is hardly designed for them (de Vries, Bakker et al. 2005) .

Children are not taken seriously, they are not seen as fully fledged city dwellers. Investing in children at a young stage in their life will pay back in the long run. **Especially investing in the play opportunities outdoors, will prove to be a promising prevention medicine** (Sibbel, Rijnbeek et al. 2007)

A variety of (newly) released research and literature (see figure 1.5) on this subject seem to recognize the play requirements and a safe move-ability of children in their living environment. However there are hardly any examples of actual design solutions taking this into account. As landscape architects we can fill the void between theoretical knowledge and actual practical design solutions.

1.3 Research questions

Research (de Vries, Bakker et al. 2005; Lefavre and Döll 2007; Rohmer 2007) has shown that being overweight among Dutch city children will increase, unless effort is made to do something about it. Our goal is to provide a method to counter becoming overweight by stimulating outdoor play, which designers can use for future city-planning. We will focus on the urban characteristics of Dutch cities. Our main research question will be:

How can we effectively (re-)design the outdoor public space in city districts to stimulate outdoor play?

To find out how to effectively (re-)design the outdoor public space to stimulate outdoor play, we need to answer the following research questions:

- 1 How does the urban fabric of a district influence the opportunities for outdoor movement/play of children?
 - Where and how do children play in the urban public realm?
 - What are the threats to the playability of a district and how do we solve this?
- 2 Is the lack of play opportunities the only reason for lack of outdoor play of children?
- 3 In what way is current outdoor play space often insufficient for kids compared to their psychological, material, spatial and adventurous needs?
 - How does the lack of quality in outdoor play spaces relate to being overweight?
- 4 What are the benefits of a playable living environment on a child's development?



figure 1.5 / (Newly) released research and literature:

- 2005 The last child in the woods by R. Louv
- 2006 De gezonde wijk by RIVM
- 2007 Bouwen voor de next generation by M. Rohmer.
- 2007 Ground-up City. Play as a design tool by L. Lefavre and Döll
- 2007 Vrij spel voor natuur en kinderen by W. Leufgen and M. van Lier

1.4 Hypothesis

There is already a lot of literature on the relation of spatial characteristics and the health of children/people. We need to extrapolate the right information to translate this information into a spatial method. The goal of the thesis is to develop a method that proves to be effective in stimulating outdoor play. The degree in which the method will be successful can only be measured if the method is applied in real life and is evaluated after a couple of years. However, there is a lot of literature on the spatial needs of children which can be used as a guideline, to design a district/neighbourhood that stimulates outdoor play and child movement. Because of an extensive amount of literature about this subject we did not interview children to find out about their needs. We consider existing literature on this as representative for the needs of children.

1.4.1 The model

In our opinion it is essential that a district consists of safe routes for children, to make outdoor play spaces successful. Accessibility towards outdoor play spaces and the location of them, are the main issues to deal with. If it is too unsafe to go towards an outdoor play space it will not stimulate children enough to play outside. What we propose is that during a reconstruction / (re-)design of a district, more attention should be paid on how children can safely dwell through their district while still having interesting spaces to play in. In other words: creating a **'Network of Play'**.

We want to give the network of play a spatial impact by translating it into a model. Therefore our method for effectively (re-)designing the outdoor public space (to stimulate outdoor play), will be the **NOP-model (Network Of Play-model)**

(see figures 1.6 and 1.7 for, respectively, the current development of children and the desired development of children by use of the NOP-model)

The NOP-model is developed from other models and theories on providing and guaranteeing play opportunities for children in city districts (these will be discussed in chapter 4: existing methodologies and models).

1.4.2 The model in brief

The problem of insufficient outdoor play activity and the negative effects this has on children in city districts can be ascribed to several spatial aspects of urban public space, namely:

- 1 The quantity of potential play spaces**
There is a lack of potential play areas or they are too far apart for children to reach them;
- 2 The location of potential play spaces**
Potential play areas are too noisy, not centrally located in a neighbourhood, there is no social control, or are surrounded by busy roads or other hazardous environments;
- 3 The accessibility of potential play spaces**
Potential play spaces are inaccessible due to surrounding car roads or lack of child friendly connections;
- 4 The quality of potential play spaces**
Potential play spaces are not or hardly designed to stimulate play activity;
- 5 The focus is on formal play spaces and their specific age groups**
Formal play areas are only a part of a child's play territory and especially older children (6+) play outside the formal playground;
- 6 Insufficient use of "landscape spaces/ elements"**
Often the landscape of waterways, pools and green areas in a district have more potential for play activities.

(these spatial aspects will be explained in chapter 5: the Network Of Play-model)

The **NOP-model** is a concept that acts both as a way of appraising play opportunities in a district or neighbourhood and a guideline for designing stimulating, connected play spaces. The characteristics of the concept are based on child's play theories from various sources and our own interpretation of what makes a district playable. With the NOP-model we offer a structure of connected potential play spaces for children taking the 6 mentioned aspects into account. Our **hypothesis** therefore is:

**Redesigning the public space
of a city district
to a 'Network Of Play',
stimulates outdoor play.**

By stimulating outdoor play we increase activity and thus help prevent weight problems for children.



figure 1.6 / Current development (towards being overweight) of 31% of the city children.



figure 1.7 / Desired development of children (for a better quality of life) by use of the Network of Play-model.



figure 1.8 / The location of the district Randenbroek-Schuilenburg in the Netherlands. (source: Google earth)

1.5 The NOP-model and priority districts

As stated in our hypothesis, the goal of the NOP-model is to stimulate outdoor play. This is done by re-examining the current spatial layout of city districts and analyze their play potential. This examination of city districts on their playability can lead to specific spatial and infrastructural changes on district, neighbourhood and street level depending on the urban fabric (see chapter 7: Urban typologies).

Re-structuring of city districts is occurring in so-called “priority districts” all over the country. In 2003, minister Kamp (VROM) identified that the procedure of urban renewal did not happen fast enough. The main reason for this was the stagnation in the process of “moving up the house ladder” on the housing market. An action plan was needed to stimulate the progress of urban renewal; the 56-wijkaanpak (EN: “56-neighbourhoodmethod”).² It is the aim to upgrade these priority districts towards so-called “beauty districts” (NL: prachtwijken). Within 8-10 years these districts have to provide pleasant residential qualities for living again. Often this means changing outdated urban typologies (and accompanying infrastructure). It is here where the NOP model can make a change. Often these priority districts suffer from social-disintegration and have a high percentage of low-income classes. By proposing changes in spatial characteristics of such districts while they are being re-structured, the NOP model might make a contribution to the play potential of the district and ultimately on the health of children.

We will test our NOP model on a priority-district.

Potentially the NOP model can be used in new urban developments as well. It is however more useful for us, and for designers tackling urban renewal, to show how the NOP-model will work in an existing district. The goal is to show design solutions for typical urban typologies; to prove that the NOP is applicable in many districts and neighbourhoods. In other words:

A site specific design on a global/national issue.

1.5.1 Case district: Randenbroek-Schuilenburg, Amersfoort

Randenbroek-Schuilenburg is situated in the east of Amersfoort (see figure 1.8). It consists of two districts (Randenbroek and Schuilenburg) but it is considered as one district by the municipality of Amersfoort. Important criteria for the selection of this district are:

- Distinct urban forms of the neighbourhoods (1);
- Representative amount of overweight children (2);
- Enough available public space (3);
- Presence of child facilities, such as schools, day-cares, sport facilities, etcetera (4).

1 Distinct urban forms of the neighbourhoods

The district offers a variety in urban forms. We want to test our NOP-model on distinct urban typologies (see chapter 7), to research how different urban forms influence the implementation of the NOP-model in the urban fabric. The different urban typologies in Randenbroek-Schuilenburg makes this district suitable as our case area.

Randenbroek developed under influence of three different urban concepts:

- De tuindorp-gedachte (1930's)
- De na-oorlogse doorwerking op de tuinstad-gedachte (1950's)
- De woonomgeving/Het erf-principe (1970-1980's)

The northern part of Schuilenburg was developed according to:

- De wijkgedachte (1950-1960's)

The southern part of Schuilenburg was developed according to:

- De woonomgeving/Het erf-principe” (1970-1980's)

(these urban concepts will be examined in chapter 7 : urban typologies).

2 Representative amount of (overweight) children

The district has to accommodate a representative amount of children, since our thesis is about (re-) designing the public space to stimulate outdoor play of children (see figure 1.9). The amount of children that are overweight must also be fairly high, because it illustrates that there might be a connection with spatial qualities of the district (see figure 1.10). Ideally most children are within the age-group of 0-12 years. These children are most dependant on the quality of the public space, since they use the available public space within the district for their development. Especially children in the age category of 0-6 years are strongly connected with the public space surrounding the house. Children in the age of 6-12 do have a larger action-radius, but are still mostly dependent on public space in their own district (CROW 2000). The total percentage of residents in the age of 0-19 is below the average of the city Amersfoort. However, the district Randenbroek-Schuilenburg has a high percentage of children that are overweight (33%; see figure 1.10). It is even higher than the average of the five examined cities by TNO (31%; de Vries, Bakker et al. 2005).

3 Enough available public space

The average residents per hectare are 49 for Randenbroek and 57 for Schuilenburg (see figure 1.11 for residents per hectare per neighbourhood). Although this is a fairly high density, there is enough public space available for potential play (see chapter 6: District analysis). The district prides itself for the amount of greenery in its public space (Amersfoort is the 'greenest' city in the Netherlands). Lack of public space (and therefore potential playing space) does not seem to be the issue. It is therefore an interesting case for testing the NOP model; there is sufficient space, but apparently it is not used enough to ensure healthy children.

4 Presence of child-facilities

Child-facilities (like primary schools, day-cares, community centers, etc) indicate movement of children through the district. These facilities are frequently visited by children.

Randenbroek has:

- 4 primary schools
- 1 after school day-care center
- 1 kindergarten
- 1 sports center
- 4 religious centers
- 1 community center
- 27 formal playgrounds

Schuilenburg has:

- 1 primary school
- 1 broad school (ABC-school)
- 1 sports center
- 13 formal playgrounds

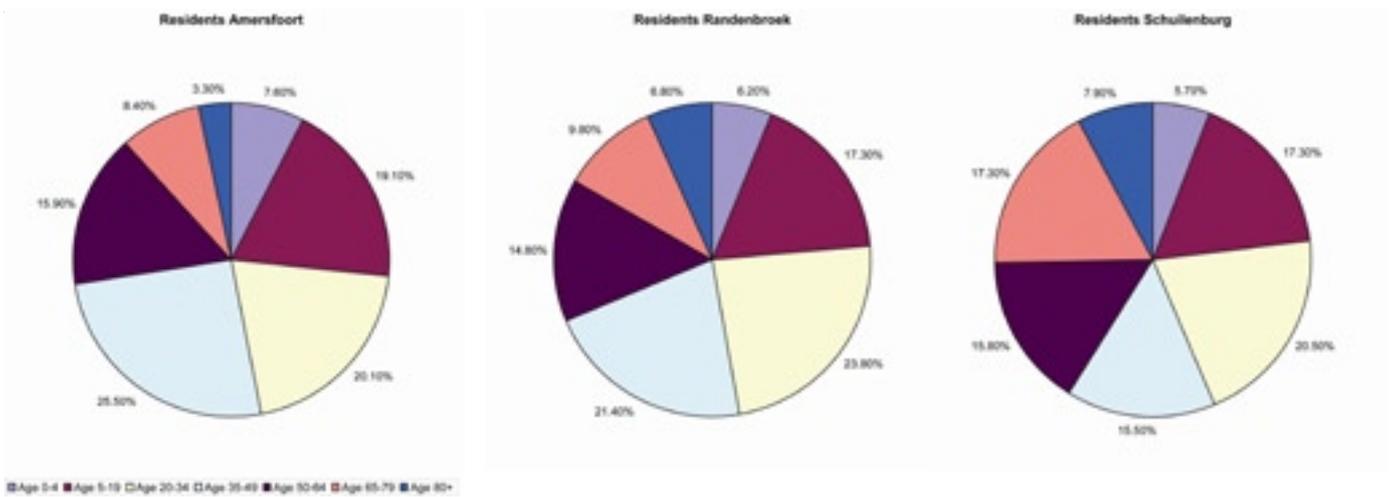


figure 1.9 / Charts on residents living in the city of Amersfoort, the district Randenbroek and the district Schuilenburg by age category, in percentages.⁴

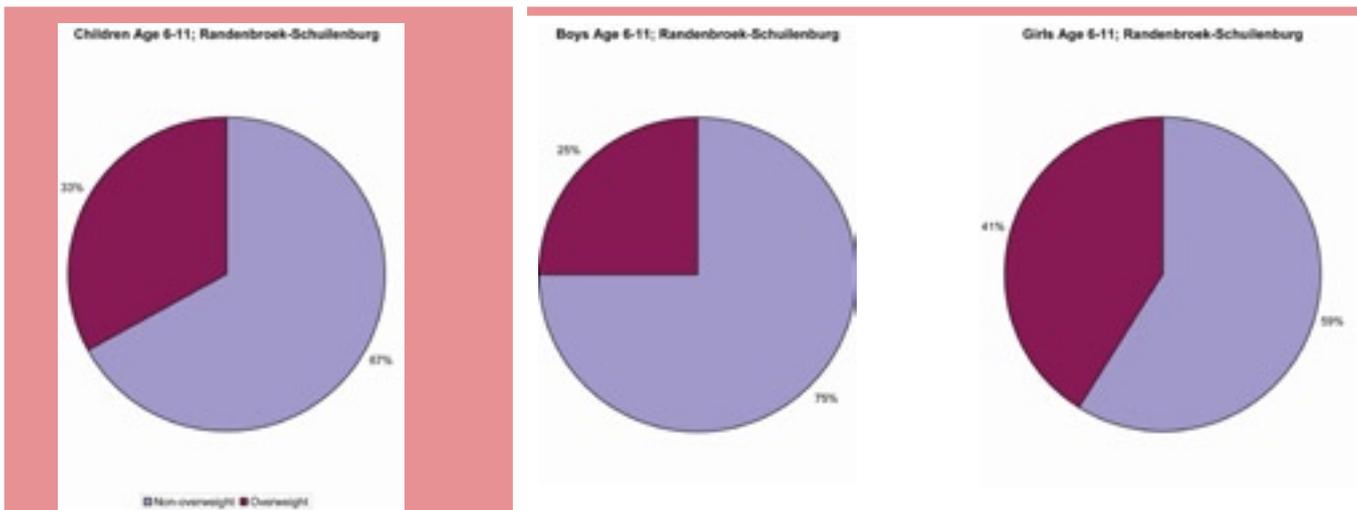


figure 1.10 / Charts on the percentage of overweight children in Amersfoort, overweight boys in the district Randenbroek-Schuilenburg and overweight girls in the district Randenbroek-Schuilenburg.⁴

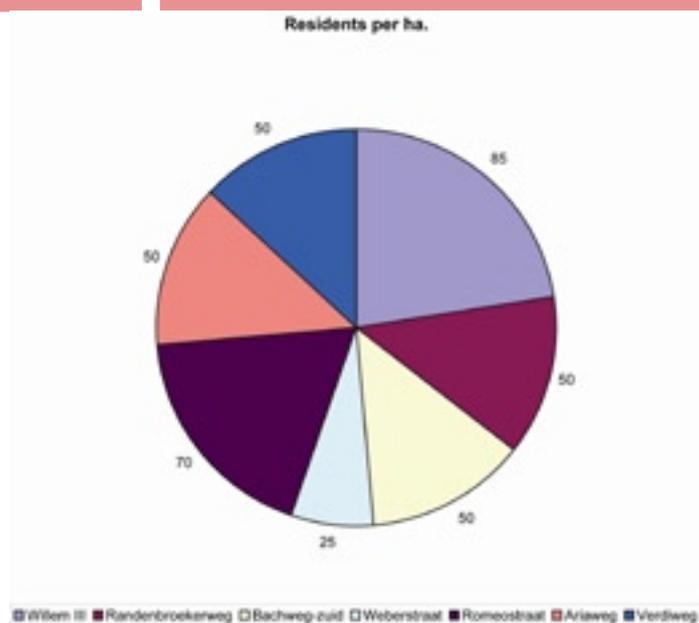


figure 1.11 / Chart about the residents per hectare, per neighbourhood in the district Randenbroek-Schuilenburg. (Randenbroek consists of the neighbourhoods: Willem III, Randenbroekerweg, Bachweg-Zuid and Weberstraat.) (Schuilenburg consists of the neighbourhoods: Romeostraat; Ariaweg and Verdiweg.)⁴

Randenbroek/Schuilenburg

- | | |
|---|--|
| <ul style="list-style-type: none"> 1 Planontwikkeling herinrichting Esterspelein 2 Planontwikkeling Melismedij/rotdpad 3 Uitwerking structuurvisie park Randenbroek en omgeving 4 Planontwikkeling schil Schuilenburg 5 Planontwikkeling schil Randenbroek met de drinkbek bij de Zwarte Vleg 6 Eigenstraat: start wonkloze 7 Buisweg: nieuwbouw gebied 8 Mondfischstraat: nieuwbouw gebied 9 Extra aandacht voor het Olyspelein bij | <ul style="list-style-type: none"> planontwikkeling schil Schuilenburg en in relatie tot planontwikkeling herinrichting Esterspelein 10 Herinrichting groenpolder met verticaal / horizontaal gebied |
|---|--|

- | | |
|--|---|
| <ul style="list-style-type: none"> 11 Sociale projecten in uitvoering of gebied 12 Hulpverleningsproject Samen Buurten | <ul style="list-style-type: none"> 13 Fysieke en sociale projecten in uitvoering of gebied 14 ABC School gebied |
|--|---|

- Legenda**
- beachschool
 - bibliotheek
 - buurthuis
 - cultuur
 - gemeente
 - overig
 - kerk/nijlge
 - verz- en verzgroenningen
 - sportvereniging
 - voortgezet onderwijs
 - winkel
 - water
 - Stichting De Alliantie
 - Stichting Omnia Wonen
 - Stichting Periaal
 - Andere grote verhuuders
 - grens wijkebeheer
 - speeluin
 - peuterspeelruimte
 - buitenschoolse opvang
 - kinderdagverblijf
 - combinatie van P, B of P, B, K



Randenbroek/Schuilenburg

figure 12. Project map of the municipality of Amersfoort for the district Randenbroek-Schuilenburg.

1.5.2 Existing plans for restructuring Randenbroek-Schuilenburg

The municipality of Amersfoort has several plans for the development of Randenbroek-Schuilenburg. The overall plan is called 'Amersfoort Vernieuwt' which describes projects for urban development, social projects and community projects³.

Important projects are (see figure 12):

Plans for urban development:

- The plan for restructuring the "Euterpeplein" is under development (nr 1);
- The plan for restructuring "Melisande/Isoldepad", including new housing (nr 2);
- The plan for the north-east edge of Schuilenburg (nr 4). Several portico flats north of Schuilenburg will be demolished and replaced with new housing. Plans of the new apartments are still under construction. The municipality wants to make the "Hogeweg" (northern road of this edge) a 'city entrance of particular quality': a high quality, urban design of a main traffic artery.
- The plan for restructuring the south-east edge of Randenbroek (nr 5)
- Restructuring east edge of Schuilenburg (nr 10). This already happened with the implementation of a soccer-/basketball court.

Social project and plans for urban development

- The introduction of the ABC-school (broad school/ brede school) is realised (nr 12).
- Improvement of the quality of the ecological and spatial structure by incorporating greenery and water better in the district and increase their users potential. Especially the green zone along the A28 (northeast of the district) and the development of a recreational structure along the (north-south) Valleikanaal.

When possible we try to take these projects into account. They may also indicate that the municipality acknowledges conflict areas that

need to be restructured in the future. Therefore it might be legitimate to say: when there is a need for restructuring, it might as well be for the benefit of children.

¹ source:

www.voedingscentrum.nl/voedingscentrum/Public/Dynamisch/zwangerschap+en+kinderen/vanaf+1+jaar/te+dik/cijfers.htm

² source: www.kei-centrum.nl

³ source: Een beekdal in de stad, 2006. Gemeente Amersfoort

⁴ source: www.amersfoort.nl

Brown, L. R. (2001). Eco economy. Building an economy for the earth. UK, Earthscan publication Ltd.

de Vries, S. I., I. Bakker, et al. (2005). Kinderen in prioriteitswijken: lichamelijke (in)activiteit en overgewicht. Leiden, TNO Kwaliteit van Leven: 180.

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chapter 2



Calvin & Hobbes
a comic by Bill Watterson

modern-day society & the effect on children's outdoor play activity

In this chapter we will examine the modern-day city planning, with its effect on play opportunities for children and its influence on the changing lifestyles of residents. Location, accessibility, quantity and quality of potential play spaces are key features in this chapter and will be widely used throughout this thesis.

Furthermore, the competition between indoor play and outside play, and the positive effects of outside play opportunities on district/neighbourhood level will be addressed.

2.1 Modern-day city-planning in relation to disappearing play opportunities

There is a tendency towards disappearing play opportunities for children in city districts. Whereas the whole district used to be a potential play area (the sidewalk, vacant lots, etcetera), nowadays the areas with any play opportunity are often limited to a fragmented number of streets that are suitable for playing outside (Masson, Karyotis et al. 2002). Although this depends per city district and also in what style (urban typology) it is designed in, there are several factors which play a role in every (post-war) city district concerning the disappearance of play opportunities for children:

- 1 Enormous increase of motorized traffic from the fifties up to now, with its accompanying infrastructure and necessary amount of space (CROW 2000);
- 2 Risen parcel values (NL: grondprijzen): Every inch of a district should be as economically efficient designed as possible, resulting in disappearance of open public space (CROW 2000);
- 3 Scale-increasement (NL: schaalvergroting) (CROW 2000).

Since 1955, with the availability of an increasing amount of motor-vehicles, scale increasement became possible. It strongly influenced the way in which people moved through the city, district or neighbourhood.

For example:

- Small neighbourhood stores could not compete with bigger supermarkets and shopping malls that were erected on specific locations.
 - The merging of primary schools has made the route to school longer (for children and parents).
 - Separation of living areas and working areas.
 - Relocation of sport facilities, playgrounds, parks and other green elements towards the edge of neighbourhoods/districts.
 - Different recreational behaviour influenced by more pressure on public space and the availability of the car.
- 4 The rise of 'the compact city' concept (Masson, Karyotis et al. 2002). The concept of "the compact city" favours a higher building intensity in the centre of the city over urban sprawl. Playing facilities and space are also being pushed out because aesthetically they often do not fit in the design of the districts (Karsten, Kuiper et al. 2001).

The location and the accessibility (or the lack of) of facilities seems to influence children's physical movement. A consequence of inaccessible facilities by bike or by foot, is that parents use the car more often to transport their children. They are known by the term "backseat-generation", introduced by Lia Karsten (Karsten, Kuiper et al. 2001). This has a negative effect on the movement (and therefore physical activity) of children.

The influence of the car on the movement pattern of children in cities also shows in change of a child's action radius. With action radius we mean the maximum distance an average child moves, on his own, from his house to anywhere in his city for playing purposes. While 20 years ago a child could go up to 4km from his home this has decreased to 400 m, and even less in very dense urban situations! The car, and its necessary infrastructure is mostly to blame for this decrease (Karsten, Kuiper et al. 2001).

The increase of the amount of motor-vehicles and their accompanying infrastructure has cut the potential play spaces for children into inaccessible pieces, resulting in a decreased action-radius of children.

2.2 Modern city-planning in relation to quality of play opportunities

Besides that modern city-planning does not provide enough public (green) space (and play opportunities) in districts or pushes it out towards district's edges, there are many examples where there is more than enough public space. **Is the lack of play opportunities the only reason for lack of outdoor play of children?**

TNO published a research called "Does the district where children grow up in, affect their movement pattern?" (de Vries, Bakker et al. 2005). This research tried to examine the direct influence of the spatial characteristics of districts on the physical health of children. The research was held in several Dutch city districts of various urban typologies, with various amounts of available public space.

Concluded from this research was:

- In city districts children are more active when there are sport fields, low-rise housing, living areas with low car traffic, green and water rich areas, and grouped parking spaces available.
- In city districts children are less active when there is a lot of dog faeces in the public space and there is busy and heavy (bus-) traffic.

(see figure 2.1)

Unexpectedly the research also revealed a negative connection between physical activity of children and the availability of sports accommodations, plenty of public space and playgrounds in the districts. Why is that? The research does not clarify this and states that more research is needed. A possibility could be that these accommodations are not clearly accessible or that they simply are not stimulating enough (due to lack of quality, bad location, etcetera).

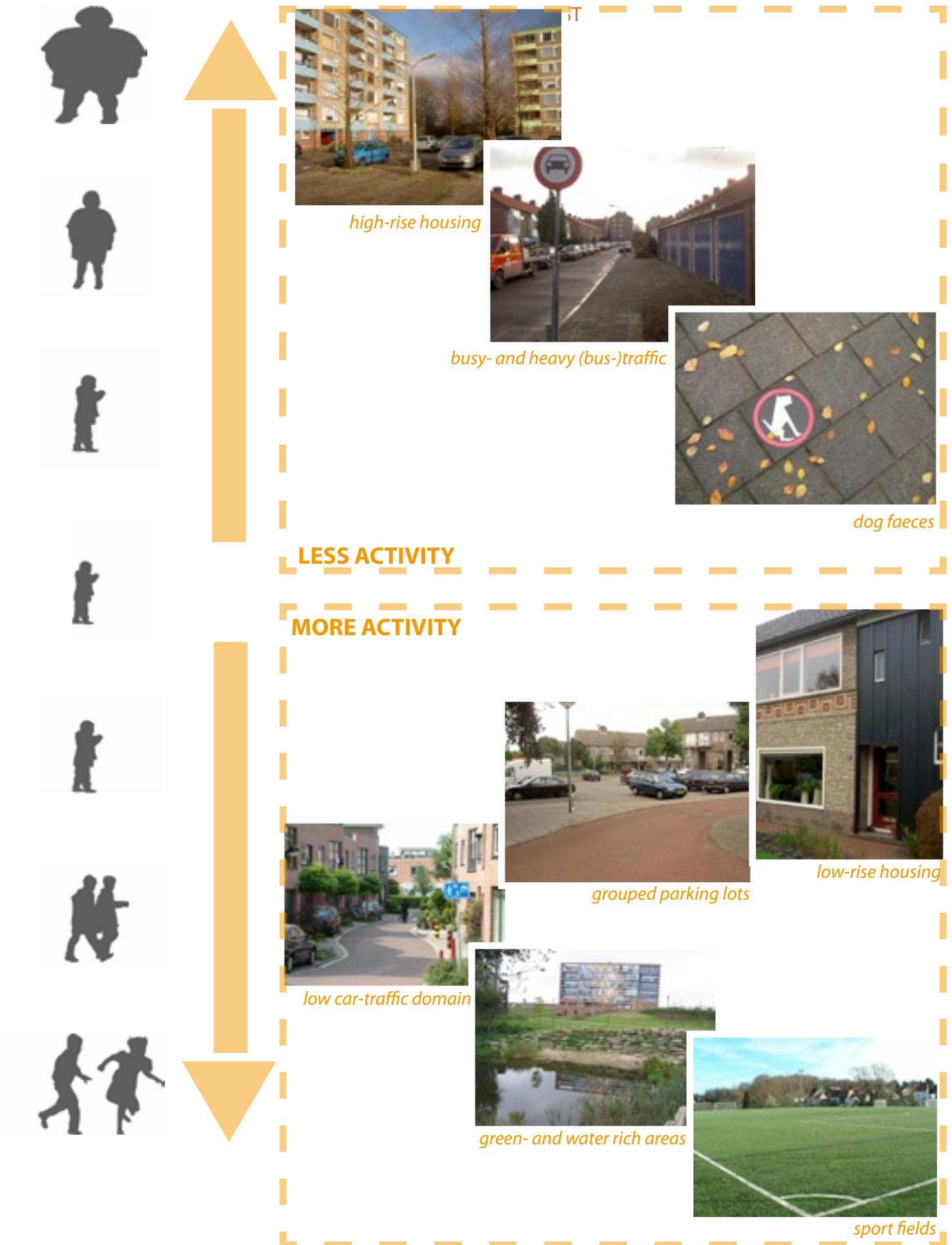


figure 2.1 / TNO conclusions on the relation of spatial characteristic of district/neighbourhoods and child activity.

Research in the Netherlands on children of 5 years old did conclude that the quality of the living environment influenced the time played outside (Karsten, Kuiper et al. 2001).

What we can conclude from this is that quantity of available public space does not guarantee actual increase in the physical activity of children. Quality (meaning quality of play opportunities) and accessibility of available public space might be an issue as well.

Karsten (Karsten, Kuiper et al. 2001) acknowledges the importance of quality of play space as well when she compares the use of a well integrated play space and a badly integrated play space in neighbourhoods with little public space. Apparently the well integrated play space is used intensively but the badly integrated one is not, even with the little public space available in the researched neighbourhood. She comments that a large quantity of public green (as can be found in post war 70's and high-rise districts) does not mean it is used by children. She blames this on the lack of recognizability of these places and the lack of stimulation they offer. In other words, they lack quality for children. If we assume that quality and accessibility of potential play spaces are of influence on a child's choice to go out and play or move from point A to B, we need to know what quality means in a child's perspective and how public space can be made accessible for them.

Furthermore the TNO research shows that the type of housing influences a child's outside play behaviour. Districts with high-rise housing seems to have a higher percentage of overweight children than districts with mostly low-rise housing. Other research shows that this might be due to the lack of direct access to the potential playing space. A child living in a low-rise house is directly connected to the public space as soon as he or she leaves the door. A child in a gallery flat needs to get down first. Often the actual interesting play space around these flats are not directly connected to the entryways and/or out of direct sight of any onlookers. The child in a gallery flat therefore is separated from the rest of his neighbourhood while playing at the nearest potential play space.

This is not very stimulating for a child (as he has no one to watch him or watch over him) nor very beneficial for other children, parents and other residents. Clear and direct connections between home and potential play spaces seems to be helpful for stimulating outdoor play.

2.3 Modern-day lifestyles and the effect on outdoor activity

Besides spatial characteristics of city districts, there is also an apparent change of people's lifestyles to blame for keeping children indoors. There is an increase in lifestyles with little physical activity that is possibly caused by growing passive leisure activities, like watching television and playing on the computer. This could result in the disturbance of the balance between energy-intake and energy-consumption. (Brown 2001; Louv 2005). A lack of activity can lead to the increase of weight (lower energy burning than energy intake) and a decrease of health (den Hertog, Bronkhorst et al. 2006) (see paragraph 1.1.2). Brown states that the two lifestyle variables that correlate most closely with obesity are television viewing and automobile ownership (in the UK):

"Children who watch television five or more hours a day are five times as likely to be overweight as those who watch less than two hours a day."

Brown also states that modern-day (children's) activities like surfing the internet and playing video games have influence on the increase of obesity. (Brown 2001; Louv 2005) With an increasing variety of indoor play opportunities children seem to be stimulated to stay inside instead of going outside (see figure 2.2). Outside play also has the safety risk attached to it making it even less attractive for parents to let their children leave the comfort of their safe home. **Inside activity/play therefore seems to be competing with outside play in modern-day society.** It is therefore not strange that there is an impression that recently children spend less time playing outside and are often brought to school by car (de Vries, Bakker et al. 2005).



figure 2.2 / A lack of stimulating outdoor play spaces leads to more passive indoor activities.

These children do not get enough physical activity because their parents do not let them use the streets due to its safety risks, mainly caused by the amount of motorized traffic. This is a cyclical process; the parents do not let their children go outside because there is too much traffic, but they do contribute to the amount of traffic by bringing their children to school. Spatial characteristics of a city seem to influence the behaviour of parents and with that, the physical movement of their children (Karsten, Kuiper et al. 2001).

Ethnicities

Another fairly recent change in Dutch lifestyles is the multi-cultural society. Many different nationalities now live in Dutch cities. Many of these are Moroccan, Turkish or Surinamese, each with their own living habits, family-composition and use of public space. About 15% of youths under 25 are of foreign origin but in cities this is often far higher (Karsten, Kuiper et al. 2001). These ethnic groups in percentage often are of lower income class and research shows they seem to be more dependant on close by public space for outdoor play than middle or higher income classes. Middle and higher income classes tend to have better opportunities/possibilities to bring their children to school, soccer practice, and other after-school activities by car (Karsten, Kuiper et al. 2001). Overweight and obesity are more common in poorly educated population groups and in population groups of Turkish and Moroccan origin (Health Council of the Netherlands 2003).

Merging of child-facilities

A trend of modern times is also stimulating after-school activities of children. 'Brede scholen' (broad schools) is one of these changes in lifestyle: the school is not just an educational institute anymore but a daycare center, children's community center, music practice center, etcetera as well (Karsten, Kuiper et al. 2001). The rise of these broad schools (NL: brede scholen) are actually partially to stimulate after-school activities for children of lower-income classes and ethnic minorities that cannot have them otherwise.

The school or other after-day care facility seems to play an increasing role in a child's development. It is therefore increasingly important that the environment around schools can offer stimulating play opportunities.

We can conclude from this that there is a need for outdoor play opportunities in cities, especially in areas with many lower income classes, but the increase of stimulating indoor activities, specific ethnic backgrounds and upbringing, and the increasing feeling of unsafety (due to spatial characteristics) prevent this.

2.4 Positive effects of a playable district

2.4.1 Positive effects on health issues

Sufficient physical activity during childhood has a positive effect on physical, psychological and social well-being, both on the short and the long term. There is convincing proof that physical activity has a positive effect on a person's body weight (de Vries, Bakker et al. 2005). Sufficient experience in exercising during childhood is also beneficial for the development of a child's basic skills like; verbal notion, spatial insight and skills to cope with cooperation, sharing, giving and taking, winning and losing, etcetera (de Vries, Bakker et al. 2005). Also playing outside can decrease the chance of astma and a shortage of vitamine D (Karsten, Kuiper et al. 2001). Besides these health issues children seem to gain more knowledge of their living environment if they are able to dwell through it on their own (Karsten, Kuiper et al. 2001). An increase in action radius therefore benefits their spatial/cognitive understanding.

We can conclude from this that outdoor activity has positive effects on physical, mental and social development of a child.

2.4.2 Positive effects on a district

Physical activity is not only of influence on the physical, psychological and social well being of children, it also has social consequences for the districts where children live in (Karsten, Kuiper et al. 2001; de Vries, Bakker et al. 2005).

If children have the opportunity to play in their districts, social contact between residents increases. Parents get into contact with each other due to their children playing together, but also children get into contact with other children and adults. There is hardly any empirical research proving this directly, however people with children seem to have more social contacts in their neighbourhood than people who have not (Karsten, Kuiper et al. 2001). Karsten mentions that the outdoor playing space seems to be the main factor in the maintaining of social networks between children and parents in these cases (Karsten, Kuiper et al. 2001). Especially in priority districts where social integration is often lacking, outside play activity might be beneficial. Also here it might be more necessary as children of lower-classes (often living in such priority districts) seem to be more dependent on their public space than children of higher classes (Karsten, Kuiper et al. 2001). Research shows that children that live in districts with sufficient playing facilities are also less aggressive than children that live in districts where these facilities are lacking. Playing outside also has effect on preventing vandalism and other small criminal activities (de Vries, Bakker et al. 2005). Outside play seems to have positive effects, in part, on the social integration of a district. It is however not the answer to solving all social issues in a district as social integration is also depended on class, ethnicity, etcetera (Karsten, Kuiper et al. 2001). People (including children) seem to appreciate social contacts between their own social-class. Stimulating outside play therefore not necessarily solves social integration between different social groups (Karsten, Kuiper et al. 2001).

Brown, L. R. (2001). *Eco economy. Building an economy for the earth.* UK, Earthscan publication Ltd.

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2.5 Summary

Chapter 1 already illustrated the problem of increasing amount of children with weight problems. This chapter confirms that the modern-day city planning is partly to blame for not designing child-friendly districts/neighbourhoods. Some spatial characteristics of districts/neighbourhoods strongly influence a child's inactivity:

- Due to increasing car traffic a child's action radius decreases;
- Due to the domination of cars, the streets have lost their function as attractive play spaces;
- Child-facilities are hardly accessible and/or have a bad location.

The quantity of play spaces do not guarantee outdoor play activity. City planning focuses on formal playgrounds which do not possess enough qualities to attract older children (age category 6-12 years old). High quality outdoor play spaces are needed to compete with attractive indoor play activities. Outside play benefits a child's development and offers possibilities for a better social integration in a district/neighbourhood. The benefits of outside play for the development of children will be explained in the next chapter.

den Hertog, F., M. Bronkhorst, et al. (2006). *De gezonde wijk. Een onderzoek naar de relatie tussen fysieke wijkenmerken en lichamelijke activiteit.* Amsterdam, EMGO Instituut.

Karsten, L., E. Kuiper, et al. (2001). *Van de straat? De relatie en openbare ruimte verkend.* Assen, Koninklijke van Gorcum.

Louv, R. (2005). *Het laatste kind in het bos. Hoe we onze kinderen weer in contact brengen met de natuur.* Utrecht, Jan van Arkel.

Masson, K., S. Karyotis, et al. (2002). *De straat aan de jeugd. Een ontwikkelingsgericht onderzoek naar drie jaar 'Thuis Op Straat.'* Amsterdam, aksant.

chapter 3



Calvin and Hobbes
a comic by Bill Watterson

the educational role of play

Playing outside is an essential part of a child's education. It is a chance for a child to experience the world around him. Starting from the safe environment of their home or backyard, a child comes in contact with an increasing hazardous environment while he grows older. Once he is outside, he comes in contact with adults (many whom are strangers), other children (often of different ages) and different forms of traffic. He therefore needs to learn to manage all these aspects of city life as he eventually has to stand on his own two feet, without the help of his parents. Playing outside teaches him these skills which are essential in later life (Heseltine and Holborn 1987). It is therefore important to look at what exactly children can and should learn while playing outside and how we can incorporate this in the NOP-model. Beginning with types of play spaces, we will discuss the different types of outdoor play activities and describe what specific skills children can learn while playing.

3.1 Types of play spaces

Children play in many spaces, both indoor and outdoor, public and private. When discussing playing areas for children it often means discussing formal playgrounds; those areas riddled with fixed play equipment, a sand box and some 'wobble chickens' (NL: wipkippen). However these areas are often meant for younger children (0-6 years) who are too young to be wandering around their neighbourhood by themselves and need parental supervision (Karsten, Kuiper et al. 2001). However, children do not just play in areas specifically designed for them (Heseltine and Holborn 1987) (see figure 3.1). There are two main types of playing spaces that can be distinguished in the public space: the formal playing space and the informal playing space (de Vries, Bakker et al. 2005) (see figure 3.2):

Formal playing space

Formal playing space is space that is designed and facilitated specifically for playing purposes. Playgrounds, schoolyards and sport fields (basketball, soccer, etc.) belong to this group.

Type of play space	Grass field	Street/sidewalk	Environment materials	Playground	Sand/water	Shrubs	Pedestrian paths	Outdoor play areas
Boys	23%	32%	6%	19%	4%	2%	6%	7%
Girls	15%	26%	7%	33%	5%	1%	6%	7%
Average	20%	29%	6%	25%	5%	2%	6%	7%

figure 3.1 / Types of play spaces where children play (in percentages)
(speelruimte 1995 in CROW 2000)



Park Rozendaal, Leusden
(formal playground)



't Jeurlink, Deventer
(formal playground)



Emmerhout, Emmen
(formal playground)



't Jeurlink, Deventer
(formal playground)



Stadstuin, Amersfoort
(natural area)



Stadstuin, Amersfoort
(pathway)



IJsselstein
(doorway/entrances)



Emmerhout, Emmen
(back of garages)



't Jeurlink, Deventer
(semi-private parking lot)

figure 3.2 / Types of play spaces: formal and informal

Informal playing space

Informal space is the public space where children can play in relative safety but which is not necessarily designed for this purpose. Spaces where children use their own imagination for play activities but that are not officially noted as playing areas by the municipality, like parks, waterways, the sidewalk, squares, etcetera. Heseltine and Holborn further distinguish these informal play spaces in three types (Heseltine and Holborn 1987):

1 Maintained areas

Areas where ownership can be ascertained. They can be areas with some landscaping (parks), semi-private parking lots, etcetera. Generally the environment provides the play activities here;

2 Unmaintained areas

Areas where ownership cannot clearly be ascertained. Backs of garages, shopping areas, doorways and entrances to apartments, pathways, etcetera belong to this group;

3 Natural areas

Areas of natural land where the primary responsibility is to ensure their conservation and protection and to undertake minimal maintenance. These areas often have a high potential for play for both sexes. These areas can be further distinguished between four types:

- **Underused land**

For example, land between a main road and an estate road to which there is restricted access, either by barriers or by parental prohibition;

- **Idle or dormant land**

Land which is essentially un-damaged and which could easily be made usable, possibly on a temporary basis;

- **Despoiled land**

Land which requires major reclamation treatment;

- **Operational land:**

Land held by local authorities, nationalized or private industry, which is surplus their requirements.

In most city districts the amount of these potentially informal play spaces are higher than the amount of formal play spaces. Therefore the NOP-model considers these informal play spaces just as essential for children's play experiences as formal play spaces. The degree in which informal play spaces are suitable for qualitative play, strongly differs among city districts. It is easier to ascertain play qualities to sparsely populated districts with more public space compared to districts that are densely populated and have a limited amount of public space. Also children often might not recognize certain informal play areas as potential play spaces.

3.2 Types of play

Children's outside play activities can be separated in four distinct activities (van AnDEL 1985):

1 Exploration and movement play

An important activity for children to discover how they and their environment work. For older children practice and physical development come into play (Millar 1968; van Rossum in (van AnDEL 1985)). This type of play takes up most of a child's play time;

2 Construction play

Manipulation activities and form-shaping of their own environment. There is a direct connection between manipulation of the environment and the construction/creation of objects and the development of intellectual skills (like problem solving) (Piaget 1963 in (van AnDEL 1985));

3 Fantasy play

This form of play can be important for children's social development, especially for young children (Rubin and Pepler 1980 in (van Andel 1985)). This form of play is a step from solitary play (done by young children) to cooperative play (done by older children).

4 Rest

Like looking around, talking, observing. An important activity nonetheless for children and something that can take up to 20 percent of their play activities.

These activities contain multiple skill developments. It is therefore important to look at what children actually learn while playing. Playing soccer for example is a form of movement play which stimulates physical activity but can stimulate social activity as well as it is played in fairly large groups. Figure 3.3 shows the play activities of children in percentages per activity.

3.3 Physical and locomotive development

One of the first associations with play is running, jumping, climbing and playing ball games; all activities that stimulate a child's physical and locomotive development. Besides raw physical strength, a child learns to coordinate and use his or her body. Many studies have proven that children can play more intensive and with more variety outside than inside. Their rough and fine locomotive skills seem to be more developed than children who play mostly indoors (Karsten, Kuiper et al. 2001).

Heseltine and Holborn state (Heseltine and Holborn 1987);

"Physical play has a function in the straightforward release of energy."

When physical behaviour is well stimulated in a child's play environment it can solve many behavioural and disciplinary problems of a child (Heseltine and Holborn 1987). Being overweight and having obesity

are problems that occur partially due to lack of physical activity (see chapter 1).

Physical development seems to influence intellectual and social development as well. Intellectual skill development almost always contain a matter of physical activity (Heseltine and Holborn 1987). These developments seem to influence a child's physical and mental characteristics through the rest of his life. Karsten (Karsten, Kuiper et al. 2001) states that a lack of locomotive skills influences the personal development of a child like self-esteem, concentration-span and the amount of social contacts the child has (chance of isolation) (also confirmed by R. Louv; see paragraph 1.1.1 Health risks). Stimulating physical activity is therefore essential at an early age, not only to counter weight problems but also for improving the overall development of a child.

3.4 Mental development

As a child grows older and gets to control his/her own body and its surroundings in more complex ways, so does the child become more independent. Beginning with complete supervision from his/her parents up to independently using his/her neighbourhood. To become more competent, especially outside, a child needs to learn all sorts of cognitive, perceptive and creative skills (Weinstein and David 1987).

3.4.1 Cognitive skills

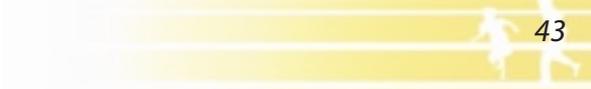
Cognitively, children will experience far more complex situations when playing outside than playing inside. They need time to learn to discriminate, make choices, selectively attend to stimuli, and clarify ambiguities in the outdoor environment (Rapoport 1977 in (Weinstein and David 1987)). Cognitive skills are essential not just for playing purposes but for recognizing (traffic) hazards as well. If a child has no opportunity to practice these skills it could influence his safety when he/she is outside (CROW 2000).

Cognitive development is important for being able to understand the environment, control the environment and create a competence of the environment. A child develops this by large-scale environmental perception and cognitive mapping.



	Rest	Movement	Ball play	Fantasy play	Construction activity
Boys	26%	36%	29%	3%	5%
Girls	34%	50%	6%	4%	5%
Average	29%	42%	20%	4%	5%

figure 3.3 / Activities profile
(speelruimte 1995 in CROW 2000)



A child develops its perception and cognitive mapping of its environment over time; becoming more complete and sophisticated. Proshansky et al (in (Weinstein and David 1987)) consider cognitive mapping as;

“...not simply a collection of landmarks, paths and routes but includes social information collected by the child about that setting, including norms about what takes place in given spaces , behaviour in response to others in these spaces, and how these spaces are controlled and by whom ... These cognitive skills help a child orientate around its neighbourhood but also help to establish a sense of self, that is influenced by the specific places and spaces in the life of that child and in the connections between them”.

As the outdoor environment is far more complex compared to the situation indoors, it takes longer to fully understand these environments (Weinstein and David 1987). Starting at an early age might therefore be beneficial for a child’s development.

3.4.2 Perceptive skills

Perception of a child of its environment, is an aspect that deserves special attention. A green living environment for example, seems to counter behavioural problems and stress in children (Heseltine and Holborn 1987; Louv 2005). But actual descriptions on what qualitative green means to a child is usually not mentioned. To be surrounded by green is different than actually experiencing it. A child should be able to get into contact with landscape elements in his or her neighbourhood to truly appreciate it.

A child’s perceptive (and cognitive) skills are different than an adult’s. For example: young children have more difficulty judging the speed from a car than an adult (CROW 2000). The fact that they are much smaller than an adult makes their perception of space different too. One has to just visit his or her own childhood’s play area to realize how small everything seems now.

3.4.3 Creative skills

A child’s education often has aspects that stimulate their creativity and fantasy. Playing with clay for example, is such an activity played indoors. Outdoors a child can have many more manipulation opportunities, like building shacks or playing with water and sand; activities that are often not allowed indoors. Furthermore, a child needs to think for himself, devising his own games by using his/her fantasy as there is not necessarily fixed play equipment or monofunctional play equipment around (like dolls, toy cars, etcetera). This too, is part of creative play. Creative play has many benefits for a child. He/she gets to use and interact with his/her environment and therefore gains a greater understanding of this environment, increases his/her self-competence and increases his/her problem-solving skills (Heseltine and Holborn 1987; Weinstein and David 1987). Heseltine & Holborn state that (Heseltine and Holborn 1987):

“Unless sufficient good quality, opportunities and encouragement are provided for children to practise their creative abilities, the use of these abilities appears to become less spontaneous”.

What this means is that creative play can only be expected if we create conditions where children are stimulated to do this. More so than say physical play.

3.4.4 Outside play

Playing outside can teach children these cognitive, perceptive, and creative skills. It can teach children about concepts like (Heseltine and Holborn 1987):

- shape;
- size;
- number;
- relationship between parts;
- colours;
- smell.

“Learning these skills by play is important as a child can get familiar with these concepts at his or her own pace, experimenting and experiencing along the way” (Heseltine and Holborn 1987)

When taking mental development in child’s play into account, these concepts can be visualized in design solutions.

3.5 Social development

Independent outside play has a large influence on the social-emotional development of children (CROW 2000). Children of younger ages (0-4) tend to play on their own, mostly having social interaction only with their parents (Rubin and Pepler 1980 in (van Andel 1985)). Social interaction does become important at a later age. After all playing is much more fun with friends and most games need more people to work. Making friends requires social interaction. Often, a certain game or activity makes this interaction necessary. More than indoor play, outside play stimulates a child to interact with children from different backgrounds with different habits. Communication, negotiation, making rules, power struggling and co-operation are all part of playing in groups outside (Karsten, Kuiper et al. 2001). Children who can play outside without direct supervision seem to be able to make social contacts with other children and adults quicker than children who can not (CROW 2000). Children like to rehearse these social relationships and it enhances their social understanding when they are grown-up (van Andel 1985; Heseltine and Holborn 1987; Karsten, Kuiper et al. 2001).

Besides the social interaction between other children, a child gets into contact with a variety of people while being outside, many of whom are strangers. They must learn to act how they react to these people (look away, not stare, etcetera). They learn which people they can interact with and which ones they should avoid (Weinstein and David 1987).

Proshansky et al (in (Weinstein and David 1987)) state that:

“...cognitive mapping and non-verbal strategic interaction skills (like not staring at strangers) are both important, in that they enable children to act competently and confidently in the neighbourhood setting. Furthermore the neighbourhood setting is also of considerable importance in the child’s social development ... It provides the setting in which children can get away from the watchful eye of adults and as a consequence can explore the social role of ‘friend’ rather than of ‘sister’ or ‘daughter’”

Playing outside tests a child autonomy and helps him/her to understand his/her independence and freedom (Weinstein and David 1987).

CROW (2000). Handboek. Ontwerpen voor kinderen. Aanbevelingen voor een kindvriendelijke inrichting van de verblijfs- en verkeersruimte. Ede, CROW.

de Vries, S. I., I. Bakker, et al. (2005). Kinderen in prioriteitswijken: lichamelijke (in)activiteit en overgewicht. Leiden, TNO Kwaliteit van Leven: 180.

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van Andel, J. (1985). Woonomgeving en kinderen. Een onderzoek naar de invloed van ruimtelijke kenmerken en veranderingen van de woonomgeving op kinderen van 6 tot 12 jaar. Helmond, Dissertatiedrukkerij Wibro.

Weinstein, C. S. and T. G. David (1987). Spaces for children. The built environment and child development. New York, Plenum Press.

chapter

4



Well, I did that this morning. HOW GREAT! It smelled like a bunch of stupid flowers! The dullest thing I have ever experienced.



Calvin and Hobbes
a comic by Bill Watterson

existing methodologies and models

This chapter describes current methodologies (spatial and social) as well as models (theoretical or for practical application) for providing and guaranteeing play opportunities for children in city districts. It gives us useful insights in possible (spatial) solutions, which we try to translate into our own methodology.



4.1 The ecological model

(den Hertog, Bronkhorst et al. 2006)

To be able to construct a method that stimulates the physical activity of children, it is important to know which factors make children move regularly. Ecological models can be used to develop such a method. Ecological models presume that behaviour of health (NL: gezondheidsgedrag) can be influenced on different levels. A combination of these levels would lead to a bigger impact on behaviour of health.

The ecological model illustrates 3 different levels that influence the behaviour of health (see figure 4.1). Our focus is not upon the individual level and the social environment but on the level of the physical environment as this is what we can change as landscape architects. **Therefore our Network of Play-model will influence the behaviour of health only on the level of the physical environment.** It is important though, not to forget that the other levels are of significant importance on the behaviour of health, and that health problems are not totally solved with an improved physical environment. However, an improvement on the level of the physical environment could also positively influence the social- and/or individual level, and in that way also indirectly the behaviour of health.

For example: A public space is transformed into a social meeting point. It might stimulate people to go outside and talk with the neighbours (develop a community feeling). On the level of the social environment it means more interaction between people. It might motivate people to go outside, which influences their behaviour of health. The individual level might be influenced because more interaction means less isolation, which decreases the chance of getting depressed or developing a negative self-image. This also influences the behaviour of health.

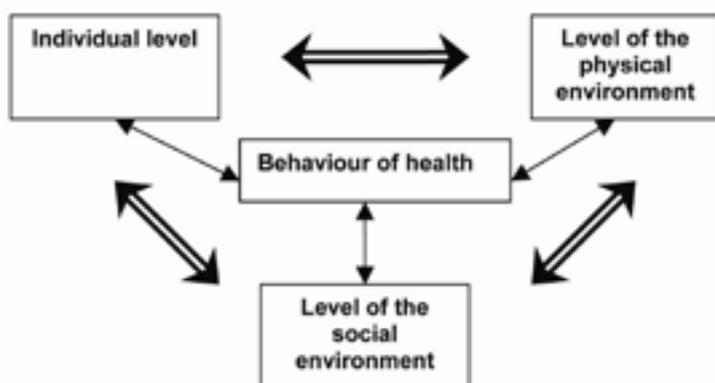


figure 4.1 / The ecological model

(Titze 2003 in den Hertog, Bronkhorst et al. 2006)

So, changes on the level of the physical environment (for example by use of the NOP-model) might result in changes on the social- and/or individual level as well.

4.2 Municipality guidelines for playgrounds

Formal play spaces like playgrounds, basketball fields, etcetera usually are planned and managed by the city's municipality. The guidelines on the amount and dispersion of these formal play spaces are often the same in Dutch cities. The national norm is developed by the NUSO (National organisation for playground development and youth recreation) and the national youth foundation "Jantje Beton". This norm, described in the "Handboek Speelruimtebeleid (1999)"¹ advises municipalities how to conduct their policy on playgrounds and play opportunities (NL: speelruimtebeleid) by providing specific guidelines.

These guidelines determine per housing block, per neighbourhood or per district size, the amount of space necessary for play space. The total size of playable space is ideally about 3% of the size of the neighbourhood/district/ housing block.

Other frequently used guidelines are mostly concerned with quantitative aspects; 'x' number of playgrounds per 'x' number of children, and a home should be within 'x' number of meters from a playground.

Both methods are based on early research on children's play (mostly on action radius of a child) and provide a fairly solid quantitative aspect to providing play opportunities for children.

Although these methods for applying play areas for children in neighbourhoods and districts sounds logical, it has a serious flaw; **'Children play everywhere not just on playgrounds'** (Heseltine and Holborn 1987; Karsten 2002; Lefaivre and Döll 2007). From street to park, to empty plots. A child, when it has the age to roam through their neighbourhood/district without parental supervision, will try to find play opportunities beyond the 'wobble chicken' (NL: wipkip; see figure 4.2) or the sandbox.

Quality, accessibility and other such aspects, which are important for good play spaces, are not as clear as the quantitative aspects (which can be checked and made obligatory if the municipality so desires).

A neighbourhood might have the right amount of play spaces, but if they are designed with little thought for variety in play opportunities, accessibility or use of the surrounding landscape, it is a missed opportunity.

We will describe the guidelines of the Municipality of **Amersfoort**² as an example, as it is our case-study area. These guidelines will be thoroughly examined on their usefulness for the NOP-model. The guidelines of the Municipality of Amersfoort are a good average example of the playground legislation in the rest of the Netherlands. The municipality does not necessarily refer to the guidelines of the "Handboek Speelruimtebeleid 1999", but uses similar quantitative measures for providing play spaces in the city:

Action radius guidelines (Quantitative guidelines)

- **1-6 year olds: +/- 150 meters**
150m², width minimal 6m on block-level;
- **7-12 year olds: +/- 400 meters**
250m², width min. 10m on neighbourhood-level;
- **13-18 year olds: +/- 800 meters**
variable m², width min. 18m on district-level;



figure 4.2 / "Wobble-chickens"
(photograph taken in Randenbroek / Amersfoort)

Guidelines for location and accessibility

- Safely accessible, easy to reach
- There is social control
- Only near water features when safety can be assured
- Maintenance should be feasible with machinery
- Preferred to be within a 30 kilometer zone
- Preferred not to be next a main traffic/bicycle artery
- Preferred to be safely reachable
- Preferred to have to cross a minimal amount of obstacles
- Preferred not to be too close to water
- Preferred to be in green facilities with a broader function
- Preferred not to be next to a dog waste area

Unlike the quantitative guidelines these location guidelines are not strict and can be broadly interpreted. This leads to playgrounds which might be in the vicinity of a home but completely unattractive for children.

For the NOP model it would be prudent to use clear, definable criteria for the location of potential play spaces (including informal play space).

Design guidelines

- Age specific design
- Physical edges between play areas with facilities for different age groups (separating age group play opportunities)
- Publicly accessible
- Use of safely proven material only
- None or little use of moving parts in play elements
- Street furniture should be durable, maintenance friendly, vandalism proof and there should be enough sitting elements.

The guidelines only consider individual playgrounds. There is no mention of the actual play experiences children might have while playing there. This would suggest that no specific attention is given to the individuality of such playgrounds. By doing this, there

is the risk that playgrounds around a neighbourhood end up looking the same; similar play equipment leads to **monotone play experiences**. Furthermore these design guidelines focus only on fixed play equipment, not necessarily on landscape elements as design tools. **The NOP should be clear on which potential play space should have what kind of playing quality. It has to guarantee different play spaces with different qualities and therefore assure more varied play opportunities in a neighbourhood.**

Safety guidelines

- Physical barrier when playground is next to a main traffic/bicycle artery;
- Road crossing area should be clearly visible and safe;
- Traffic safety decisions dependant on age group and play activities;
- Water elements need to be physically separated in areas for 1-6 year olds;
- 7-12 year olds need to be prevented to fall in the water and need to be able to exit water safely (by way of shallow area = plasberm);
- Preferred design should provide variation in play opportunities;
- Preferred: design should be compatible with age group(s);
- Preferred: design for 1-6 age group should have meeting opportunities for parents;
- Preferred: design should be accessible for invalids.

These safety guidelines are all valid and should be taken into account. They are however all meant for the **individual design of a play space** and do not have a direct influence on the Network of Play. Only when/if designing the individual play spaces these guidelines become essential.

A reflection on the playground guidelines of municipalities (Amersfoort)

Is this current methodology proficient for all children in a city district/neighbourhood?

As our literature research shows, these formal areas are usually meant for specific age groups; often playgrounds for children up to 6 years old.

This leaves large groups of children with little or no stimulation for outdoor play. This might result in a lack of outdoor play and possibly in being overweight. It is also questionable if the current guidelines are even met in many districts/neighbourhoods, if one only takes formal play spaces into account.

Besides this quantitative aspect the municipalities have guidelines on the quality, location and accessibility aspects of playgrounds. The clear quantitative approach does not reflect in the qualitative approach in our opinion. In fact it often results in play spaces of little or no quality just to conform to the quantitative norm. For example a place counts as a playground as soon as a few 'wobble chickens' are placed on a sidewalk (see figure 4.2).

They are not very stimulating for children, nor their parents who have to take them there.

These examples are not rare, during our research and site visits to various neighbourhoods we came across many of these examples.

The NOP model should provide a solution to this; a clear methodology for providing qualitative play spaces/opportunities, not just quantitative.

4.3 Kindlint

(SOAB / www.kindlint.nl)

The "Kindlint" (EN: the Childline) is a spatial instrument: a path which children can walk and/or cycle along, on their own, in relative safety towards all kinds of child facilities like day-care centers, schools and recreational facilities. The concept combines spatial planning, traffic safety, (traffic) education and differentiated (play) facilities through the perception of a child. The Kindlint does not only improve their independence and move-ability through the district but also improves their action radius.

The model connects play spaces with other child facilities along a single route (see figure 4.3). The location of the route is mostly dependent on the location of the child facilities (like schools) and not necessarily on the preferred play spaces. It is therefore debatable if a child actually will play in spaces along the route just because it is on the way to 'school'.

Also accessibility to this one route is questionable as well. It might not be possible for some children to actually access it without crossing serious obstacles. Is one route enough to ensure that every child in a district/neighbourhood profits from it?

In our opinion a network shape is more ideal instead of a single route. Furthermore, not just child facilities should shape this route. Interesting potential play spaces determine a child's movement pattern through a district/neighbourhood too. This should therefore be taken into account. Nonetheless the "Kindlint" concept is useful for stimulating movement of children.



figure 4.3 / The "Kindlint" (EN: the Childline)

4.4 TOS

(Masson, Karyotis et al. 2002)

TOS stands for “Thuis Op Straat” (EN: At Home on the street). This model focuses on a better usage of the existing public space in districts by children and teenagers. This has to lead to less aggression and a clearer, more pleasant, decent and friendlier atmosphere on public squares and on the streets, a higher usage of the public space by girls and young children, emergence of a quicker and more effective network for children that have social problems, and a more effective prevention of inconveniences, threats and violence. TOS projects have been realised in four Dutch cities: Rotterdam, Gouda, Leiden and Dordrecht.

Comparing with the ecological model, **TOS operates on the level of the social environment.** The creators indicate that on the social level there still are no models that offer practical solutions for social problems. The NOP-model is a tool to bridge the gap between theoretical knowledge and practical design solutions on the level of the physical environment as the TOS is the tool to bridge the gap on the level of the social environment. TOS focuses upon the usage of the public space and not on how to improve the spatial design of this space. The main principle is that children and youths depend on the neighbourhood for their primary social relations and therefore are important users of the public space. Karsten (1999) states (in Masson, Karyotis et al. 2002) that outside play is still important for children in the age of 4-12 years. This mostly happens within the geographical borders of the neighbourhood. Children that are going to school daily traverse (on average four times) along the same route through the neighbourhood. Children living in large families or noisy apartments are outside by necessity (Karsten in Masson, Karyotis et al. 2002). This illustrates that children are dependent of the neighbourhood they grow up in. TOS also recognizes changes in outside play influenced by developments like: decreasing amount of free space, more children at limited play opportunities and play that is limited to a couple of streets (instead of the whole neighbourhood).

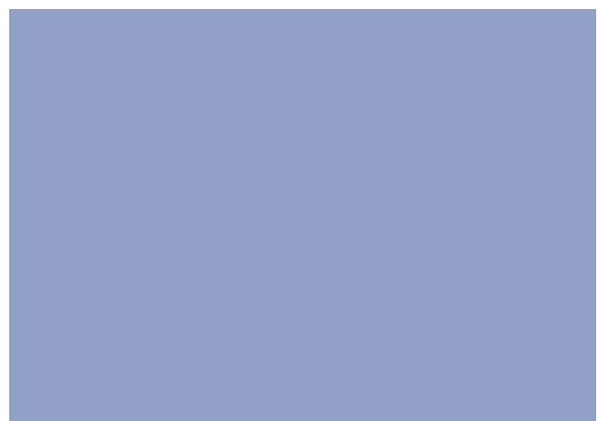
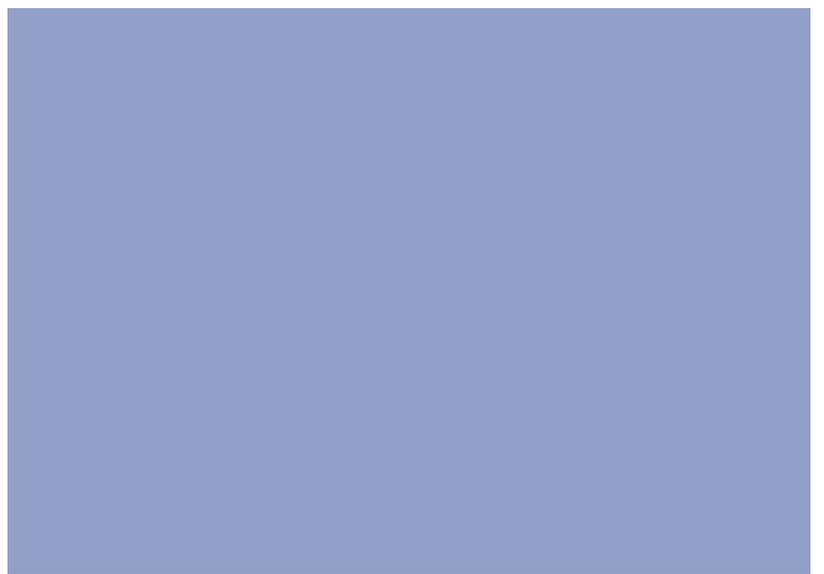
Almost never have city renewal projects restored a desirable balance between parking and the play opportunities for children (Karsten in Masson, Karyotis et al. 2002). The TOS is useful to give insight in the practical value of a certain public space and bringing children together through organized activities/events, but it does not give spatial solutions. TOS contributes to the development of the NOP-model by illustrating what kind of activities/events are needed to have a better usage of public space. **The NOP-model has to provide spatial possibilities for organizing or constructing these activities/events.**

4.5 KiSS

(Kips, Zomervrucht et al. 2007)

KiSS stands for “Kinder Straat Scan” (EN: Child Street Scan). KiSS is a questionnaire that can be used to measure the child friendliness of a street. It measures the move-ability through the street by foot, bike or play. With the publication of the results of the questionnaire; the necessity of a child friendly design can be emphasized, the shortcoming in street-design can be revealed and a discussion on how to improve the design of the street can be provoked. The questionnaire deals with 6 aspects: protection, walk-ability, cycle-ability, move-ability, experiential value and the playability.

KiSS is a useful method because it provides tools on how to make a street friendlier for a child. But the model is limited to the street-level. It does not provide help on how to connect play functions of those streets with each other or how to connect the street with formal and informal playing areas or child facilities. The ideal situation would be that every street in a district meets the required standard of the model to be child friendly, but probably this is not possible on the scale of a district. Nonetheless it gives us useful insight on what to think about when proposing street-related design interventions. **The questionnaire is a helpful tool to use for locating and designing the childlines (childweb) of the NOP-model.**



4.6 Spielleitplanung

(Apel 2007)

The “Spielleitplanung” criticizes the shortcoming of spatial instruments to improve the quality of a city/district for the benefit of children.

For example, there is a planning instrument for the infrastructure but none are relating to children as fully fledged city dwellers. With the “Spielleitplanung” the province “Rheinland-Pfalz” has a tool which takes children into account.

“Spielleitplanung” (planning for play as primary goal) is a method used in some German cities for improving the child- and family friendly side of the city. **It is a new planning instrument which focuses on the whole city or municipality as a play- and experience space.** Formal playgrounds are only a part of this. “Spielleitplanung” looks at all the public spaces, in which children and youths can spend time and are active in. This includes streets, entryways, construction grounds, a district’s edges, squares, etcetera.

Participation of girls and boys in the planning, decision-making and relocation steps is a central part in the “Spielleitplanung”. Planners and educationists (NL: pedagoog) work together with children to identify possible problems children come across while dwelling through their neighbourhood. Workgroups translate the planning process into practical applications and are supervised by a network of involved schools, unions, resident-initiatives, associations, etcetera.

“Spielleitplanung” works systematically. Three planning phases are used:

- The analysis of the urban form in layers; accessible, car-free public spaces-map and the road structure-map.
- The development of measures to transform existing urban structures into a child-friendlier city/district.
- The development of intentions to transform existing urban structures into a childfriendlier city/district.

Symbols are developed for the realization of spatial qualities of the plan. They describe the clarifications for play spaces; from the complete design of large scale spaces to details of small scale designs, like steps or climbing trees.

The designed plan is based on the results of the problem analysis and questionnaires (mental map method). It makes statements about the quality of the public space and of the requirements that will guarantee these qualities. A separate plan is made for the road system.

The “Spielleitplan” makes statements on where play-, experience- and sojourn spaces should be kept secure or should be developed (newly designed). The “Spielleitplan” also makes suggestions on how the quality can be improved of the traffic network through the eyes of children. Important in the “Spielleitplanung” is the concept of qualities. It describes the qualities for streets, squares and road shapes. The Spielleitplan is a binding concept for the realisation of qualities (in favour of children). With this the children are seen as equal city dwellers with their necessities and needs for qualitative public spaces firmly anchored in city policy and city planning.

This methodology is thorough in the both quantity and quality aspects of play opportunities. The methodology stresses the importance that one should look beyond formal playgrounds and look at the district as one big play opportunity and try to secure and develop qualitative play spaces. The neighbourhood encompassing design guidelines and suggestions are based on workgroup discussions and site-specific problems. This makes the implementation of this methodology very time-consuming. It is not a methodology that is easy to implement on any kind of neighbourhood or district and it depends a lot on actual participation of schools, institutions and other actors.

The NOP model should take the “Spielleitplanung” methodology into account while being more directly applicable.

4.7 PIP

(Lefavre and Döll 2007)

PIP is a model which resulted from research by Liane Lefavre on the existing archives of playgrounds in Amsterdam. Aldo van Eyck had been involved in the design of these playgrounds for Amsterdam during the 1940's towards the middle of the 1970's. What made the Amsterdam playgrounds unique was that they were not conceived as isolated, one-off, individual playgrounds. On the contrary, they were part of a bottom-up, integrated, urban process. They formed a polycentric net of public spaces around which community formed, creating micro-urban villages. These did not disrupt the urban tissue around them, they were inserted into the left-over spaces, the empty interstices.

This approach to playgrounds – participatory (bottom-up), interstitial and polycentric – is not just revolutionary in the design of playgrounds but in the design of public space in general. It can be said that the Amsterdam playgrounds were the first example, not only of a new type of playground design, but also, in general, of a new approach to public space.

This process - Participatory, Interstitial and Polycentric – is translated into PIP by Lefavre.

These keywords mean the following:

Participatory

The analysis of play culture. It describes what children want from their play environment.

Interstitial (in-between)

Sidewalks and playgrounds that are integrated in the urban fabric. Not every interstitial space is a suitable place for play. What the suitable places have in common is that they mark the transition between public and private areas. They are places that are close to the front door and within view of the houses.

Polycentric (network)

Refers to the density of the play network. After the analysis of the play culture (Participation) and the spatial qualities of the district (Interstitial), the term polycentric in this practical study has been given significance in a design proposal for a network of play.

This network is spread like extended tissue across the districts. The merit of this tissue is its high density. The small places are stepping stones from which the youngest children, step by step, can discover the public space around them.

Its polycentric idea illustrates the importance of a child friendly public space on the scale of the whole district or neighbourhood. The interstitial part maps the spatial qualities of a district and where they are lacking in play opportunities.

Although it is useful to incorporate participation in the PIP-model, to guarantee actual use of play spaces, it does not necessarily describe what children could learn from outdoor play. It merely describes what they like to do. The NOP model might differentiate itself here by coupling educational roles of play (see chapter 3) to spatial design.

The PIP also acknowledges the importance of play in the whole district (polycentric part) but it does not specifically illustrate how to (safely) connect these play spaces with each other. For the NOP model the idea that each play space should be a stepping stone to the next one is an interesting idea. **Making sure children can reach these play spaces should therefore be an essential part of the model.** Furthermore the actual application by studio Döll focuses on very urban and formal solutions for implementing play opportunities, solutions with landscape element are not too apparent. **It might be beneficial to incorporate landscape elements as tools for stimulating play in informal settings in the NOP model.**

1 Beleidsregel speelplekken gemeente Amersfoort 2005
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chapter 5



Calvin and Hobbes
a comic by Bill Watterson

the **Network Of Play** model

In this chapter we will thoroughly explain the essence of the NOP-model. We will start with a brief summary of all the existing methodologies and models (see chapter 4) that have contributed in shaping the NOP-model. After that, we will explain the 3 basic elements of the NOP-model: the primary play spaces, the secondary play spaces and the childweb. For the implementation of the NOP-model it is necessary to have design criteria, which will be explained in the last paragraph.

In the previous chapters we have described:

- The social and spatial context of a lack of outside play by city-children (age 6-15);
- The effect this has on the health of children;
- The role of current city-planning in this;
- The changing lifestyles;
- The positive effects of outside play on the health of children and the positive effects for a district;
- The essential skills which children should develop while playing, and;
- Several existing methodologies and models that try to solve the problems that children face while trying to play in their district/neighbourhood.

As is mentioned in paragraph 1.4, the goal of this thesis is to develop a method that proves to be effective in stimulating outdoor play.

Therefore we propose an integral systematic model for implementing, guaranteeing, and providing qualitative play opportunities for children in city districts; The Network Of Play model (from now on the NOP-model).

We have indicated that the problem of insufficient outdoor play activity and the negative effects this has on children in city districts, can be ascribed to several spatial aspects of urban public space (see chapter 1.4.2 shaping the model), namely:

- The quantity of potential play spaces;
- The location of potential play spaces;
- The accessibility of potential play spaces;
- The quality of potential play spaces;
- The focus is on formal play spaces and their specific age groups;
- Insufficient use of "landscape spaces/ elements".

(these will be thoroughly explained in chapter 5.1)

How do we adjust these spatial characteristics to stimulate outdoor play by children? The existing methodologies and models (see chapter 4) have helped us in creating and shaping our NOP-model.

We will explain briefly how the different methodologies and models have contributed to the NOP-model:

The ecological model

Our Network of Play-model will influence the behaviour of health only on the level of the physical environment. It is important though, not to forget that the other levels are of significant importance on the behaviour of health, and that health problems are not totally solved with an improved physical environment. However, an improvement on the level of the physical environment could also positively influence the social- and/or individual level, and in that way also indirectly the behaviour of health.

Municipality guidelines for playgrounds

Although these methods for applying formal play spaces for children in neighbourhoods and districts sounds logical, it has a serious flaw; 'Children play everywhere not just on playgrounds' (Heseltine and Holborn 1987; Karsten 2002; Lefavre and Döll 2007). A neighbourhood might have the right amount of play spaces, but if they are designed with little thought for variety in play opportunities, accessibility or use of the surrounding landscape, it is a missed opportunity.



Kindlint

In our opinion a network shape is more ideal instead of a single route. Furthermore, not just child facilities should shape this route. Interesting potential play spaces determine a child's movement pattern through a district/neighbourhood too. This should therefore be taken into account. Nonetheless the "Kindlint" concept is useful for stimulating movement of children.

TOS

The TOS is useful to give insight in the practical value of a certain public space and bringing children together through organized activities/events, but it does not give spatial solutions. TOS contributes to the development of the NOP-model by illustrating what kind of activities/events are needed to have a better usage of public space. The NOP-model has to provide spatial possibilities for organizing or constructing these activities/events.

KiSS

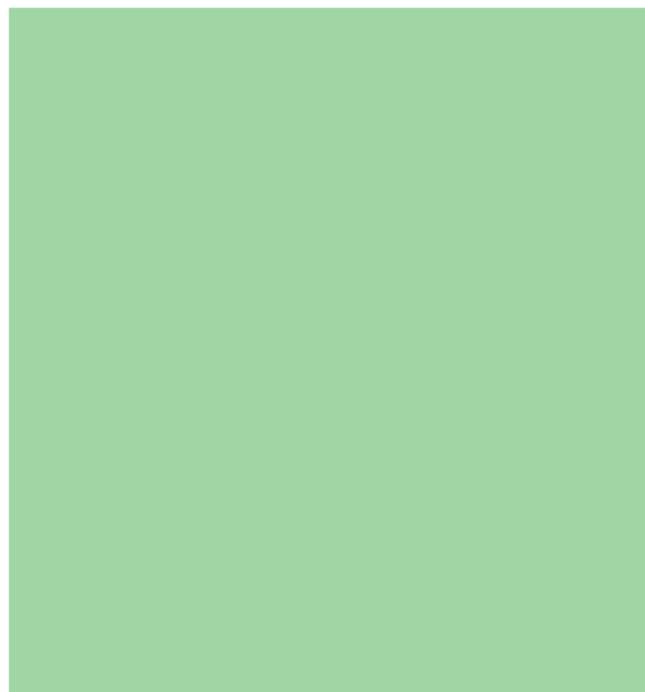
KiSS is a useful method because it provides tools on how to make a street friendlier for a child. But the model is limited to the street-level. It does not provide help on how to connect play functions of those streets with each other or how to connect the street with formal and informal playing areas or child facilities. The questionnaire is a helpful tool to use for locating and designing the childlines (childweb) of the NOP-model.

Spielleitplanung

This methodology is thorough in the both quantity and quality aspects of play opportunities. The methodology stresses the importance that one should look beyond formal playgrounds and look at the district as one big play opportunity and try to secure and develop qualitative play spaces. It is not a methodology that is easy to implement on any kind of neighbourhood or district and it depends a lot on actual participation of schools, institutions and other actors. The NOP-model should take the "Spielleitplanung's" methodology into account while being more directly applicable.

PIP

The PIP also acknowledges the importance of play in the whole district (polycentric part) but it does not specifically illustrate how to (safely) connect these play spaces with each other. For the NOP-model the idea that each play space should be a stepping stone to the next one is an interesting idea. Making sure children can reach these play spaces should therefore be an essential part of the model. It might be beneficial to incorporate landscape elements as tools for stimulating play in informal settings in the NOP-model.



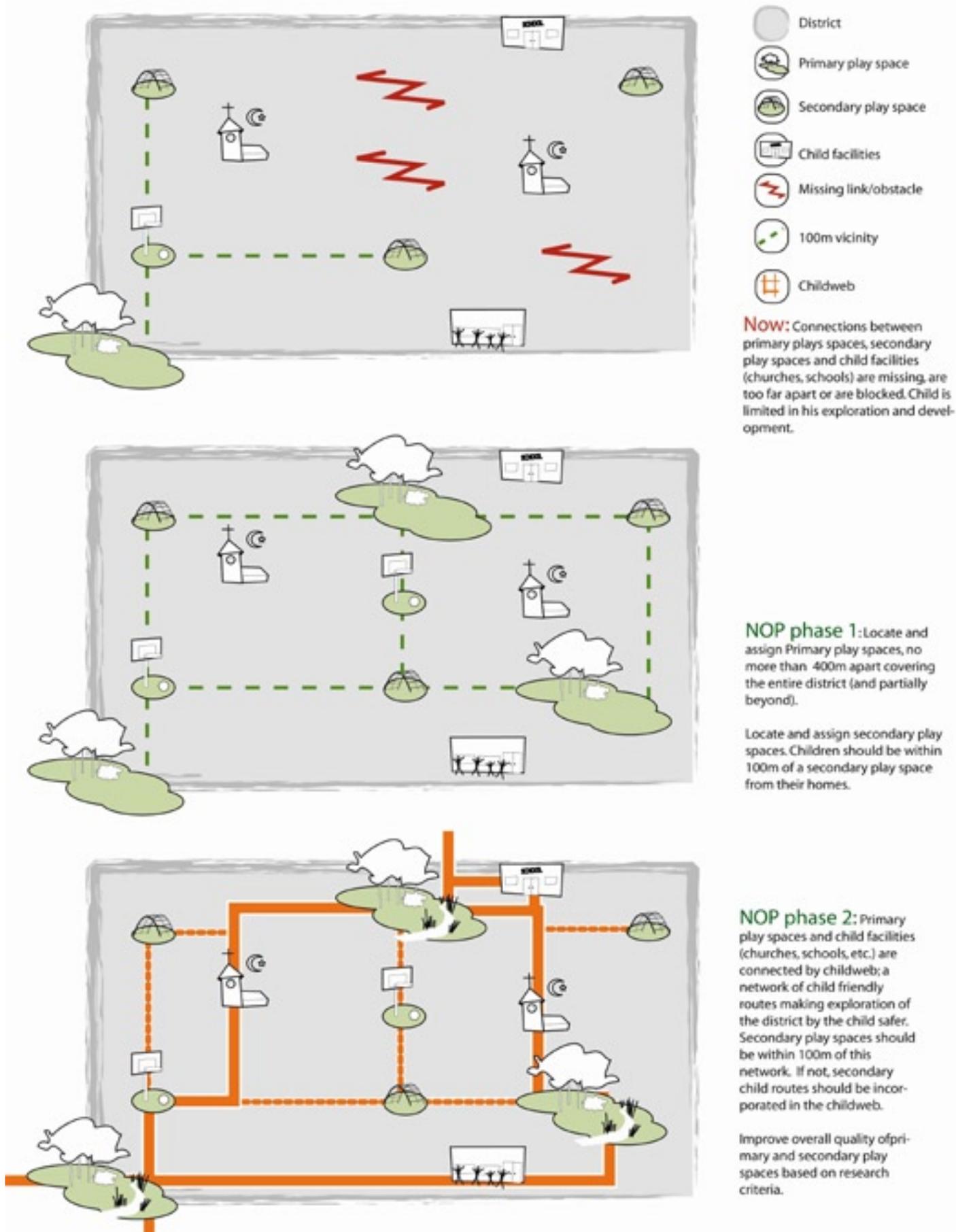


figure 5.1 / The essence of the Network Of Play model.

5.1 The NOP-model

The NOP-model is a concept that acts both as a way of appraising play opportunities in a district or neighbourhood and a guideline for designing stimulating, connected play spaces. It is a quantitative and a qualitative tool. The model ensures that a (potential) play space is within a certain action radius for a child (quantitative tool) and ensures play that contribute to the development of children by stimulating the development of their skills (qualitative tool). The goal is to stimulate children of all ages to play outside (which is beneficial for improving their physical, mental and social skills; see chapter 3: the educational role of play). This is done by providing a network of safe child routes that connects various formal and potential informal play spaces throughout the district and neighbourhoods.

The NOP-model differentiates between three elements:

- 1 primary play spaces;
- 2 secondary play spaces, and;
- 3 childweb/lines.

These elements are illustrated in figure 5.1. This figure illustrates the essential problems which a child comes across, when playing in his district/neighbourhood, and the solutions that the NOP model proposes. The primary play spaces, secondary play spaces and the childweb will be explained in, respectively, the following paragraphs 5.3, 5.4 and 5.5.

Child-facilities strongly influence the NOP-model implementation. With child facilities we mean those facilities, that are present in a district, where a lot of child movement/activity to and from, can be expected. Therefore we incorporate the facilities into our "Network of Play." Those child-facilities are:

- primary- and broad (NL: brede) schools;
- kindergartens;
- after-school daycares;
- religious centers (churches, mosques, etc.);
- community centers;
- sport facilities, and;
- scouting centers.

Paragraph 5.5 will discuss the child-facilities. The next paragraph will explain the spatial aspects of urban public space which influences the outdoor play activity, mentioned earlier.

5.2 Design criteria and guidelines

To be able to make the NOP-model applicable on a district, we need to formulate design criteria (based on the results of our literature research). The mentioned spatial characteristics that influence outdoor play have to be translated into criteria, to be able to value the existing public space. By giving a value to these criteria we can differentiate between the significance of public spaces for potential play. The criteria also differ in significance. Criteria that have a high importance, have to be used as strict design criteria. Criteria of a lesser importance are still useful as design guidelines (for example to bring variety between public spaces).

We can differentiate five spatial criteria for playability:

- 1 **Quantity of play**
the quantity of potential play spaces;
- 2 **Location of play**
the location of potential play spaces;
- 3 **Accessibility of play**
the accessibility of potential play spaces;
- 4 **Quality of play**
the quality of potential play spaces, and;
- 5 **Landscape use**
sufficient use of "landscape spaces/elements."

In the following sections the criteria are described in more detail.

5.2.1 Quantity of play

This aspect entails the amount of, and the distance between, potential play spaces. The NOP-model uses the action radius of 0-6 year olds and 8-12 year olds as a guideline for the spread of its potential play spaces (see paragraphs 5.3 primary play spaces and 5.4 secondary play spaces). The action radius principles are based on the current guidelines used by most municipalities in the Netherlands (see paragraph 4.2). The NOP-model differs somewhat from the guidelines used by municipalities that justify the amount of formal play spaces based on the amount of children living in the district/neighbourhood. The NOP-model sees informal areas as potential play spaces, as well as the amount of formal play areas. Both are important to be within the vicinity of the homes of children.

Furthermore the NOP model does not differentiate between neighbourhoods with high or low percentages of children. Municipality guidelines most often react on the density of children. Areas with more children have more playgrounds and areas with a lesser amount of children have a low amount of playgrounds. We stress that every child should have equal opportunity to be in the vicinity of a qualitative play experience.

The 'Quantity of play' is dependant on the type of play spaces which we distinguish. Primary play spaces are less common in the neighbourhood than secondary play spaces. This will be made clear in paragraphs 5.3 and 5.4.

5.2.2 Location of play

'Location of play' is a criteria aspect of the NOP-model describing specific location-dependent characteristics of a potential play space. The location characteristics we consider essential for a good play experience are:

- Amount of Social control

Are play spaces within sight of housing and/or do adults pass by/look on to these play spaces? Although children can consider the lack of parental supervision as pleasant, it is difficult to judge if spaces with little or no social control are safe for children.

Children might also not be allowed (by their parents), in areas where no one can keep an eye on them. Besides this, a lack of social control might lead to vandalism, dereliction and misbehaviour as well, especially in neighbourhoods with safety issues. To assure that play spaces are used and that the interaction chances between children (and children and adults) is improved, the NOP-model prefers areas with at least some form of social control. Potential play areas in direct sight of housing or along an often used route are preferred, above areas without any social control. Besides safety issues children often prefer to show their skills in front of others (parents and other adults). The amount of social control therefore says something about the opportunity for showing off, as well.

- Amount of Disturbance

Too much interference of noise, pollutions, light, etcetera, can have a negative influence on the attention span of children. A lack of concentration has a negative effect on the play experiences of a child. Heseltine states:

"The more time a non-repetitive play activity lasts and holds the child's attention, the greater the play value" (Heseltine and Holborn 1987)

The NOP-model therefore prefers play spaces with little outside disturbance. A space next to a busy road for example, scores negatively (noisy, pollution) and is therefore considered as unsuitable.



amount of disturbance



environmental conditions



amount of social control

figure 5.2 / Location characteristics

- Environmental conditions

With this we mean the location of a play space in correlation with environmental conditions like sun and wind. A play space which lies in the shadow of a building for a large part of the day, is considered as unfit for example. Research on play spaces conclude that children need sunlit areas (with partial shade for hot days) with some protection from the environmental elements (like wind and rain).

“Vast areas of empty tarmac or grass without shelter or shading represent hostile environments for child and adult” (Heseltine and Holborn 1987).

The ‘Location of play’ criteria are one of the most important aspects, as its characteristics form the basis of a good play experience. If a potential play space scores badly on these characteristics any kind of proposed play opportunities are difficult to guarantee as a child will not be attracted to such a space (see figure 5.2).

5.2.3 Accessibility of play

This aspect of the NOP model describes the traffic situation around a formal/informal play space. This aspect gives an indication of the traffic safety around a particular play space. The accessibility criteria which the NOP model considers important (for stimulating play opportunities) are:

- Child-friendly connections

Is the particular play space connected to a child-friendly route? With child-friendly route we mean bicycle or pedestrian routes, which are clearly separated from motorized traffic and which connect the particular space with the surrounding neighbourhood.

- Separation from motorized traffic

A play space which is surrounded by motorized traffic routes is difficult to access by children. A preferred play space is not in direct contact with a motorized traffic route, especially very busy ones. If it is connected with a very busy motorized traffic route (50km/h road for example) it can have negative influences

on play experiences (also see section 5.2.2 Location of play). Just like the ‘Location of play’ criteria the ‘Accessibility of play’ criteria forms the basis of a good play opportunity. If a potential play space scores badly on this criteria aspect, any kind of play quality is negligible as the space is inaccessible for a child without the help of a parent (see figure 5.3).

5.2.4 Qualities of play

The previous described criteria guarantee a sufficient amount of play spaces and a good basis for a good play experience. However, the actual playability qualities of such spaces are important too. The ‘Qualities of play’ criteria determines the actual play opportunities of the potential play spaces. They act as design guidelines for creating stimulating play opportunities for informal play spaces.

Hill (Hill 1983 in Heseltine and Holborn 1987) measures the quality of formal playgrounds on several aspects. By taking informal play spaces into account, a child should be able to develop the following skills while playing in their neighbourhood (not only on formal playgrounds):

- **Physical fitness**

By providing equipment, space and/or opportunities which develops muscular growth and coordination;

- **Intelligence**

Providing equipment, space and/or material which can be adapted and developed;

- **Creativity and imagination**

Providing a variety of equipment, textures and loose materials which stimulate creativity;

- **Social assurance and co-operation**

By providing suitable materials, spaces and equipment for co-operative play;

- **Non-sexist/non-racist appearance**

By ensuring that play areas meet the needs of both sexes and all ethnic groups.



child-friendly connections



separation from motorized traffic



no separation from motorized traffic

figure 5.3 / Accessibility characteristics

Defining the quality of a playable environment is complex. However, we can measure the quality by looking at how we think play should improve the skills of children. Besides physical development, the social and mental development of children are important too.

In chapter 3 we already mentioned the specific types of play which a child between 5 to 12 years can have and the educational role this can have on their development:

- Exploration and movement play;
- Construction play;
- Fantasy play;
- Rest.

To be able to test our model we need to combine types of play with the skills which children should develop, into design criteria and guidelines (see paragraph 5.2). The NOP model differentiates between six design criteria of 'Qualities of Play' (see figures 5.4, 5.5 and 5.6):

1 Complexity

With complexity we mean spatial complexity that can stimulate play activity. Too little or too much environmental stimulation seems to have negative consequences on the development of children. Intensity and diversity of stimulation are important aspects (Wohlwill and Heft, 1977 in (van Andel 1985)). A more complex system of play opportunities tend to be more highly appreciated than simple ones (van Andel 1985; Weinstein and David 1987). A simple grass field stimulates very little activity, besides ball games, running games and other physical activities. It is therefore less complex than say, an area with various horizontal and/or vertical materials, enclosed and open spaces, solid and moveable objects, etcetera. As a child grows older and his play needs grow more complex and varied, the NOP model can offer this complexity (and variety).

Complexity can be achieved by providing (in a potential play space):

- variation in relief;
- variation in hardened and soft surfaces;
- variation in planting;
- variation in materials, colors, textures, shapes, etcetera;
- variation in light-dark, dry-wet, enclosed and open spaces.

As a design guideline, complexity should always be apparent in a potential play space. Even with the minimal implementation of qualities, the designer has to try to make the space more complex. Complexity offers the ability to give the space its own identity, and makes it therefore better recognizable and more stimulating for children to play (also for a longer amount of time).

2 Environment manipulation opportunity (EMO)



The possibility to actively change the environment with loose elements is seen as an important activity for children (Millar 1968 in (van Andel 1985)). Environments which can be manipulated seem to be highly appreciated by children and are often used (mostly for construction games and such). Portable materials (like water and sand), textures and a variety of equipment encourage children to use their fantasy. This will develop their intelligence and creativity (Heseltine and Holborn 1987).

Nicholson (Nicholson 1971 in (van Andel 1985)) states that the amount of variables in an environment determine the possibilities for creativity and discovery by its users ("theory of loose parts"). EMO can spatially be achieved by providing opportunities/materials, like:

- water-sand-mud combination;
- loose rocks, boulders, gravel, wood, tiles, construction materials;



EMO



EMO

complexity: variation in hardened and softened surfaces; variation in planting; etc.

figure 5.4 / Quality characteristics: E.M.O and complexity



3 Plural target groups

With this we mean the opportunities for play which an environment can offer for various groups of children. An area with a high variety of uses stimulates outdoor play for girls and boys, or children of different ages (Schellekens 1978 in (van AnDEL 1985)). Ellis (Ellis 1971 in (van AnDEL 1985)) talks about the 'Interaction potential' with which is meant; the ability of a play object (or space in our case) to interest a child and to remain interesting, so as to uphold the interaction. It is also of influence on the attraction of the number of children, diversity of the children and the children's play behaviour. Popularity in use will increase if there are several activities and if there are (many) other children to talk or play with (Moore 1989-1991 in (Karsten, Kuiper et al. 2001)).

In this case, the quality of a play environment designed for plural target groups, is the ability of the area to motivate different children to use the space. This means we need to look at what different groups of children we can differentiate, and what spatial needs these different groups have:

Age groups (Speelruimte 1995 in (CROW 2000))

0-6 year olds

- Play action radius 50-100m
- Usually accompanied by parents/siblings
- First attempts at bicycle movement
- More construction and fantasy play
- Prefers small play areas (stimulates more imitative play than larger areas)
- Field of vision still undeveloped (difficulty defining proportions and outlines).

6-10 year olds

- Play action radius between 300-600m
- More independent movement to school/facilities
- Increased movement by bicycle

10-12 year olds

- Play action radius is 800-1000 m
- Independent movement through district and to facilities
- Better understanding of traffic situations
- Bicycle and public transport use normal
- More movement play and ball games

Gender (Speelruimte 1995 in (CROW 2000))

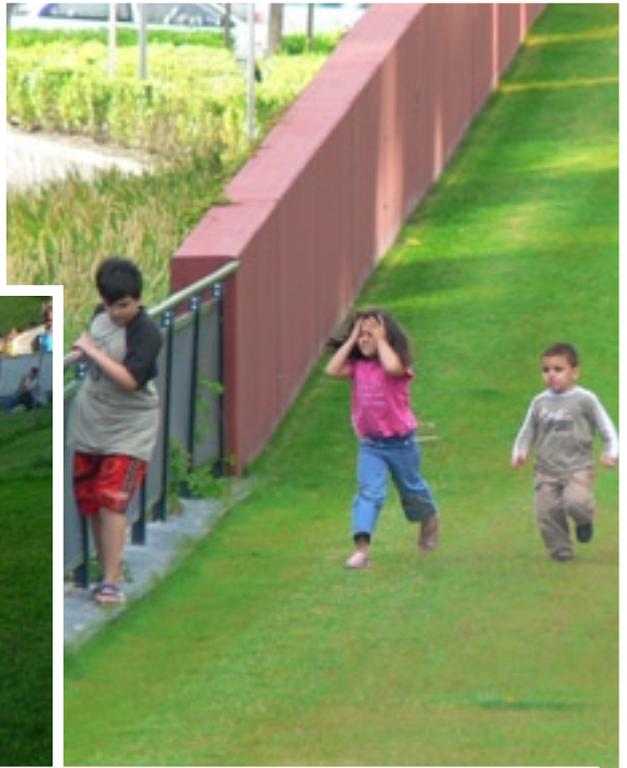
Boys

- Play outside more often than girls (60% boys - 40% girls);
- Are less dependent on formal playgrounds (19%);
- Use more space and in more locations (AnDEL et al, 1985);
- Have more physically active play than girls outside the formal playground (AnDEL et al, 1985);
- Have more random movement than girls (AnDEL et al, 1985)

Girls

- Play less outside than boys (40% girls – 60% boys);
- Are more dependent on formal playgrounds (30%);
- Are more physically active on formal playgrounds;
- Usually play closer to home compared to boys (smaller action radius);
- Have more socially active play compared to boys (AnDEL et al, 1985)
- Have more purposeful movement compared to boys (from point a to b) (van AnDEL 1985).

Physical stimulation



Plural Target Groups



Plural Target Groups and Physical stimulation



Physical stimulation

figure 5.5 / Quality characteristics: Physical stimulation, Plural Target Groups

Ethnicity and class

The ethnicity and social-class of children can influence their play opportunities. This usually translates to an increased/decreased action radius compared to other ethnicities and classes (Karsten, Kuiper et al. 2001). The plural target group-criteria already covers the need for differentiated play opportunities for various users. Therefore the NOP-model will not go into detail about ethnicity and class.

Spatially the plural target group qualities can be realized by (Heseltine and Holborn 1987; Moore, Goltsman et al. 1992):

- Providing hardened and natural surfaces in a potential play space;
- Providing potential play space near home (for girls and young children);
- Providing sufficient social control (for young children and girls);
- Separating potential play spaces in several smaller spaces for different target groups, activities, and group sizes;
- Providing spaces that accommodate the activities of different sexes and ages.

It does not necessarily mean by implementing all these plural target group qualities, that a higher play quality is achieved. Some target groups or activities may conflict with each other. Therefore designing for plural target groups must be done carefully.

4 Physical stimulation



Play spaces should provide physically stimulating play activities. Active play opportunities will stimulate the physical fitness of children. It develops the muscular growth and coordination, for example by running, jumping or playing ball games. Physical stimulation can be of importance for other types of play as well and therefore should be considered as an essential quality for most potential play spaces (see paragraph 3.3). Physical stimulation can be achieved by providing:

- Pathways for running, bicycling, etcetera;
- Stepping stones, raised elements, etcetera for balancing and co-ordination;
- Vertical elements for climbing, hanging, balancing, etcetera;
- Flat horizontal, vertical and/or diagonal surfaces for ball games.

5 Mental stimulation



Play spaces provide different kinds of stimuli that offers children the opportunity to train their brain. In paragraph 3.4 the benefits of playing outside on children's mental development is described in detail. With mental stimulation we mean the stimulation of imaginative skills, cognition, perception, intelligence, verbal skills, problem solving skills, creative skills and fantasy. This quality of play often goes hand in hand with other qualities of play, like social stimulation or being able to manipulate the landscape (EMO). Spatially the mental stimulation quality can be achieved by providing (Heseltine and Holborn 1987; Moore, Goltsman et al. 1992):

- move-able elements to stimulate creative skills, fantasy and problem solving skills;
- a variety of textures, colors, material, plantings to stimulate cognitive skills, fantasy and imagination;
- a certain level of intimacy and mystery (by using plantings for example) to stimulate imagination and fantasy;
- elements and spatial obstacles that stimulate problem-solving skills;
- plantings which provide color, texture, flowers, smells, fruits, insects, mammals, etcetera, that can stimulate fantasy, cognitive or imaginative skills.

Furthermore it is important more so than other skills, to keep potential play spaces free of disturbances (to stimulate mental skills). For example, like noise or pollution from (heavy) car-traffic, but also negative climate related occurrences (like too much shadow or wind). Mental stimulation seems to be at its best if a child is able to play continuously without disturbance (Heseltine and Holborn 1987).

6 Social stimulation



Play spaces can contribute in social interaction, like cooperative play and constructive play.

But also opportunities to rest and sit-down and have a conversation, help to develop verbal skills. Social stimulation should be taken into account when designing play spaces. Social stimulation can be achieved by providing:

- Sojourn spaces with (sun lit) seating possibilities: like rocks, walls and hills;
- Site-specific play elements, so as to make a space a meeting point for children ("totem pole function") (CROW 2000)
- Areas with play opportunities that stimulate social cooperation.



Social stimulation



Social stimulation

Mental stimulation



Mental stimulation



Social stimulation

figure 5.6 / Quality characteristics: Mental- and Social stimulation

5.2.5 Landscape use

Stimulating a child's play imagination can hardly be realized by planting fixed play equipment everywhere in the public realm (making it a formal play space). The NOP model considers the landscape as a general basis for play, rather than concrete play areas or fixed play equipment (like most current urban planning). In our opinion play areas are not necessarily made 'playable' by constructing and placing fixed play equipment. They also make this space incapable to use for other residents. With the durability of a district in mind, it is better to provide more potential play spaces with the landscape as a general basis. These spaces provide flexibility and therefore they are able to adjust to future circumstances. Fixed play equipment will claim spaces that are only suitable for play. "Landscape use" is, like complexity, an overall design criteria/guideline for giving shape to the spatial qualities of play (see section 5.2.4).

A district often has many natural landscape elements; waterways, grass fields, woodland edges, etcetera, Experiencing these forms of 'nature' seems to be essential for the development of a child (Leufgen and van Lier 2007). More natural play areas have also proven to be more successful in keeping children more satisfied with their play activities and create more respect for the green elements in their residential environment (Louv 2005; Leufgen and van Lier 2007).

"Children interpret a landscape element and give meaning to it, and the same element can have different interpretations" (Santostefano in (Louv 2005))"

"The landscape offers children a better opportunity to express their feelings." (Louv 2005).

This is also apparent in the increasing attention towards providing natural play areas in residential areas (NL: speelbos; speeluiterwaarden; etc.) (Louv 2005; Leufgen and van Lier 2007) Many existing natural elements in districts are not very stimulating for children, because they have never been designed with the play opportunities of a child in mind. Waterways are inaccessible, plain grassfields are not stimulating play, etcetera.

Use of landscape elements

The 'landscape use' criteria, tests the existing natural landscape of a potential play space on its play value. This can be very broadly interpreted. A good use of landscape elements can be (Heseltine and Holborn 1987; Karsten, Kuiper et al. 2001; Louv 2005; Leufgen and van Lier 2007):

- **Trees and shrubs**
besides giving shade, plantings provide stimulating play opportunities (color, smell, cover, climbing opportunities, etcetera);
- **Fauna**
landscape elements that attract insects, birds, etcetera, may be stimulating for children's fantasy and exploration;
- **Relief**
differences in relief can stimulate play (Heseltine and Holborn 1987);
- **Water**
increase accessibility and safety by making use of safe slopes, materials like rocks or stepping stones and pebbles, platforms;
- **Texture**
variety and mix of textures like sand and water, grass and rock, etc. can stimulate play.

The 'landscape use' criteria is mostly useful for testing more large-scale natural, public spaces; like parks and water edges. However, many urban typologies/ types have little of these public spaces to start with. In these cases improvement of playability by use of the landscape can be achieved by adaptations to individual urban landscape elements; like the square, the street/sidewalk, the parking lot, etcetera. These adaptations can be (see figure 5.7):

- **Trees and shrubs**
Introduce plantings that provide stimulating play opportunities (color, smell, cover, climbing).
- **Informal play equipment**
Introduce stimulating elements; like large rocks in the pavement, raised walls (for balancing, hiding), etc.



Textures



Relief



Water

Trees and shrubs



Fauna



figure 5.7 / Use of landscape elements



figure 5.8 / Potential primary play spaces

5.3 Primary play spaces

Primary play spaces are those spaces that have the potential to contain all the 'Quality of play' criteria aspects (see section 5.2.4). These areas are often:

- Of significant size (to fit in all the 'Qualities of Play');
- Are well located ('Location of Play'), and;
- Have a good accessibility ('Accessibility of Play').

The primary play space is mostly meant for older children (starting from 6 years old) who have grown out of the formal playground and need more stimuli to keep themselves interested.

Children between 6 and 12 seem to gain little developmental benefits from formal playgrounds. Heseltine states that these children benefit the most from construction playgrounds, natural play spaces or by minor features in the environment (Heseltine and Holborn 1987). To prevent a limited development of children during play activities, we introduce the Primary play space (see figure 5.8).

All qualities of play

The aim of primary play spaces is to keep children interested in playing outside, by providing all the "Qualities of Play" (see section 5.2.4) In theory, by spreading these spaces out over a district, it gives children a reason for dwelling through different neighbourhoods. Children can find all "Qualities of Play" in one primary play space, but in each primary play space these qualities will be designed differently. Therefore it might still be interesting for children to go beyond the borders of their own neighbourhood and experience primary play spaces of other neighbourhoods. Primary play spaces can be rest space between building blocks, parks, edges along waterways, etcetera. The NOP uses the landscape of a district as a basis for play, therefore primary play spaces are preferably informal play spaces:

"areas untouched by the playground designer, but which are an essential part of the hierarchy of provision" (Heseltine and Holborn 1987).

They should not be designed as formal playgrounds but by using landscape elements as a design tool, "Qualities of play" can be realized (see section 5.2.4). The selection of public spaces that are suitable to be primary play spaces, is largely dependant on the actual availability of space. As this depends per urban typology of the district, we do not determine a fixed size or shape. However, to guarantee that all qualities can be implemented, the primary play spaces often are of larger size than most secondary play spaces (see figure 5.1).

Action radius

The NOP tries to assure that there are enough primary play spaces in a district and that they are reachable for children starting from 6 years old. The NOP therefore states that a primary play space is no more than 400 meter apart from at least one other primary play space. The action radius of a 6-12 year old can differ between 300 to 600 meter and children over 10 years old can have an action radius of 800-1000 meter (CROW 2000). As the action radius of children can differ (depending on sex, ethnicity, age and/or upbringing), a 400 meter action radius between primary play spaces will be the norm which the NOP-model uses. With this norm it can be assured that primary play spaces can be reached by children starting from 6 years old, while preventing an abundance of primary play spaces (which might decrease the carrying capacity of primary play spaces, and which might be unrealistic in most urban typologies). This quantitative measure guarantees the complete coverage of high quality play spaces for children living in the district (if not the entire city, if the NOP model is used on city level). Research has shown that children will travel greater distances to playspaces if the space is sufficiently desirable, the access sufficiently safe and easy, and they have the time available (Heseltine and Holborn 1987). It is important to note that the 400 meter rule will not automatically guarantee that the primary play space can be reached if major obstacles are in the way (like busy car roads).

This should be taken into consideration when deciding where primary play spaces should be developed. The choice of suitable areas for a primary play space-designation is based on the “Criteria analysis diagram” (see chapter 6 for the criteria-analysis diagram on district-level). The criteria aspects “Location of Play” and “Accessibility of Play” are essential for deciding which potential area should become a primary play space. ‘Quality of play’ is of less importance at this point, as this aspect can be improved purely by design. However, it does give a current indication about the playability of this space for children.

5.4 Secondary play spaces

With lesser qualities, but no less important than primary play spaces, secondary play spaces are formal and informal play spaces that have the potential to be play areas for children of various ages. These areas can be smaller than primary play spaces as they do not need all of the proposed ‘Qualities of play’. Secondary play spaces can be any kind of public space, like green fields between portiek flats, rest space between housing blocks, some streets, canal edges, etcetera (see figure 5.9). Size and form are dependant on the specific urban types/typologies of the district (see chapter 7 for urban typologies).

Stepping stones

Secondary play spaces are meant as a stepping stone towards the primary play spaces, they are more numerous and are often the first play space outside of the home that children encounter. Because a child’s action radius grows with his age, it is important that their first play opportunity away from home is reachable. To assure this, the NOP-model states that a residential building has at least one secondary playspace within a 100 meter action radius. This is the minimal action radius of a child under 6 (CROW 2000). As action radius of children can differ depending on sex, ethnicity, age or upbringing a 100 meter action radius is a minimal average (see section 5.1.4 plural target groups).

Using this action radius the NOP-model can guarantee a sufficient spread of secondary play spaces which are reachable for children of all ages (not taking obstacles into account). This however does not mean that they are only meant for young children, secondary play spaces can be designed for plural target groups as well (see section 5.1.4 plural target groups). The NOP-methodology considers every piece of public space in a district/neighbourhood as potential play areas. However, the criteria ‘Location of play’ and ‘Accessibility of play’ (see figure 8.2 for an example) determine if areas are in fact fit to get the distinction of secondary play space. At first glance this does not include sidewalks (a popular play area for kids), unless it is specifically shaped to be more than a pedestrian path. Sidewalks are very near to car roads. These are potentially dangerous and not specifically stimulating. Therefore with the NOP-criteria in mind, we do not consider these suitable to be secondary play spaces. Only when there are no other play areas within the vicinity, we consider sidewalks as potential secondary play spaces.

Specific qualities

The various qualities of play need to be spread evenly among neighbouring secondary play spaces. This guarantees a variety of play-activities for children who live in the vicinity. This makes moving from one play area to another, a different play experience. The NOP presumes that different play-experiences, spread around a district, help to stimulate movement through the neighbourhood/district (why would you go to another play area, if it offers the same as the one in front of your house?). It also helps to stimulate physical activity, as well as the social and mental development of children, as they get into contact with different kinds of play opportunities.

The network of secondary and primary play spaces guarantee a variety of play opportunities for children throughout their childhood (see figures 5.10 and 5.11). Their connectivity however, is not yet assured. For this we propose the third aspect of the NOP-model: the childweb.



figure 5.9 / Potential secondary play spaces



	PRIMARY PLAY SPACES	SECONDARY PLAY SPACES
PLAY SPACES	Informal	Formal and informal
AMOUNT OF PLAY QUALITIES	 High variety	 Limited variety
CRITERIA	Good location and accessibility	Good location and accessibility
QUALITIES	All	Some
SIZE	Significant	Smaller than primary play space
QUANTITY AND SPREAD	400 meter action radius	100 meter action radius
USABLE TYPES OF SPACES	Parks, left-over areas, large green/blue edges	Playgrounds, semi-public green spaces, squares, left-over spaces, broad sidewalks

figure 5.10 / The characteristics of primary- and secondary play spaces

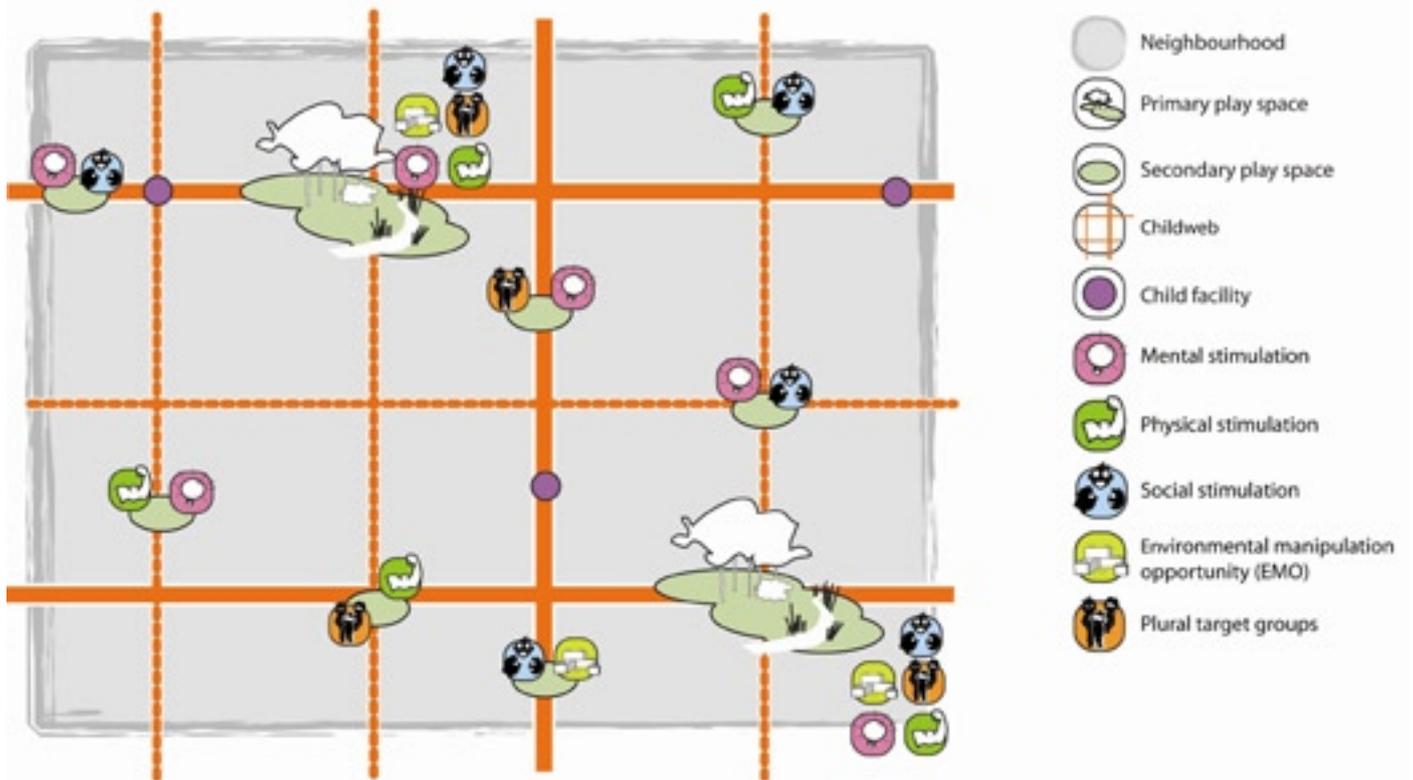


figure 5.11 / Concept of the NOP-model with the dispersion of the Qualities of Play



figure 5.12 / Potential childlines

5.5 The Childweb

The childweb consists of a network of child-friendly routes (based on the 'kindlint' from paragraph 4.3). The main purpose of the childweb is to guarantee a network of safe routes for children, to and from primary play spaces, secondary play spaces and child facilities, and thereby stimulating their movement through the district/neighbourhood.

A childweb is the collection of connected childlines; a clearly marked child-friendly path which is only used for non-motorized traffic (see figure 5.12). It often is connected to existing bicycle and pedestrian routes but it is not specifically designed for bicycles. The NOP differentiates between two types of childlines:

1 Primary childlines

These are child-friendly routes which directly connect Primary play spaces with each other and child facilities in the district. This type of childline goes through the entire district (or possibly the city) and is meant as the main connection between intensively used areas (by children) in the district. Primary childlines are preferably separated from car roads and are often connected with existing bicycle and pedestrian routes. Where possible/logical, secondary play spaces are connect with primary childlines as well.

(see figure 5.12 for an example)

2 Secondary childlines

These are child-friendly routes connecting any secondary play spaces that are not yet connected to the network by primary childlines. Often these routes are small existing pathways like back-alley pathways, sidewalks, etcetera. These childlines can, for example, be marked by emblems in the pavement. In this way, they are recognizable for children wandering through their district/neighbourhood. In practice, childlines often can be realized by:

- Using existing pathways
- Slight adjustments to current sidewalks/paths;
- Creating completely new routes;
- Traffic solutions where children cross obstacles (like cross-overs over busy streets).

Which alternative is preferable depends on the urban typology (see chapter 7 for urban typologies) or site specific characteristics.

(see figure 5.12 for an example)

CROW (2000). Handboek. Ontwerpen voor kinderen. Aanbevelingen voor een kindvriendelijke inrichting van de verblijfs- en verkeersruimte. Ede, CROW.

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chapter 6



Calvin and Hobbes
a comic by Bill Watterson

NOP-model on district-level

This chapter describes the methodology for implementing the NOP-model on district level. The district “Randenbroek-Schuilenburg” will be used as a test-case on how the NOP-model can be implemented (see figure 6.1).

The methodology for implementing the NOP-model is designed in such a way, that it is suitable and applicable to city districts all over the Netherlands. The masterplan forms the guideline for the implementation of the NOP-model on neighbourhood-level. This will be described in chapter 8.

6.1 Methodology for implementation

The NOP-model methodology uses four steps:

- 1 Determine possible primary play spaces and connect them by primary childlines;
- 2 Determine important facilities for children in the district and connect them with the primary play spaces by primary childlines;
- 3 Locate secondary formal and informal play spaces within the district and connect them to the child-web;
- 4 Identify obstacles, barriers, threats and gaps in play opportunities that result after implementing steps 1 to 3.



figure 6.1/ District map of Randenbroek-Schuilenburg

1 Determine primary play spaces

The NOP model's basis are its primary play spaces; those spaces that contain all of the "Qualities of play"-criteria for guaranteeing a maximum play experience and development of skills for a child, as described in chapter 5. It is therefore essential to start with determining possible primary play spaces within the district first.

To determine which spaces in a district are suitable to become primary play spaces, we have to test them using the NOP-model design criteria (see paragraph 5.2). This is done by looking at the different neighbourhoods (as differentiated by the municipality) in the district separately. Of each of these neighbourhoods several pre-determined public spaces of significant size are tested by using the design criteria. Analysis of the surrounding infrastructure, aerial photographs and site visits help to determine which spaces are fit to be primary play spaces. The results are formulated in criteria diagrams (see figure 6.2 and the appendix I)

On the district-level of the NOP-model the "Accessibility of Play" and "Location of Play" criteria have a higher priority than the "Qualities of Play" and "Landscape use" criteria. This is because the location and accessibility of these areas are difficult to change without major transformation of the urban structure.

For example: A potential area next to a highway, with hardly any social control, could score well for "Quality of Play" criteria (complexity, EMO, etcetera) and have a sufficient size. But it would be insufficient as a primary play space, due to scoring badly for "Location and Accessibility of Play" criteria. "Qualities of play" aspects can be improved with design interventions. An area with very low "Qualities of Play" scores, but excellent "Location of Play" scores, therefore can still become a good primary play space. "Qualities of Play" can be solved on neighbourhood level, when the design of the actual spaces come into play.

"Size", "Qualities of Play" and "Landscape use" criteria are decisive factors when there are several primary play spaces that have a similar score for "Accessibility and Location of Play".

Example of the criteria-analysis diagram

The complete list of criteria-analysis diagrams for each neighbourhood can be found in the appendix I.

Figure 6.1 shows an example on how to determine suitable primary play spaces for the neighbourhood "Weberstraat", located at the south of the Randenbroek district. The neighbourhood has several different building types and also a variety of open public spaces. We differentiate ten separate areas for possible primary play spaces. All areas are public spaces with no or hardly any formal play equipment. Looking at the "Size" criteria first, all locations score average or good on this point. A "-" would mean the area would most likely be insufficient to be a primary play space.

Location and Accessibility of Play

Looking at the "Location of Play" and "Accessibility of Play" criteria we can see that areas 2, 6, and 9 score mostly neutral (o) or good (+).

- Area 2



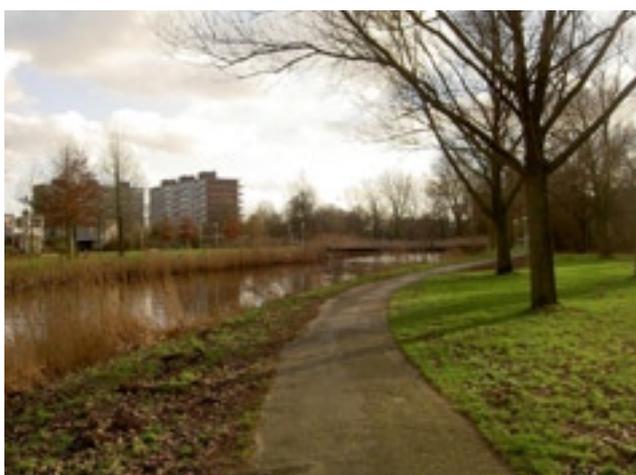
Area 2 lies centrally in the neighbourhood in clear view of several houses (good social control). It is however surrounded by car roads and a main traffic artery with a bus line, which can lead to disturbances ("o" score for disturbance). This also means it is difficult to access/reach ("- score on "Separation from motorized traffic" criteria).

- Area 6



Area 6 comprises of public space belonging to the strip of gallery flats, as well as of a pond with surrounding greenery. The pond was originally meant as a rainwater retention area¹. Area 6 has a good “Social control” score, as it is in between two large gallery flats and clearly visible. The only part that is accessible however is near the gallery flats. There are no paths running along the south-east side, nor is it connected to the rest of the neighbourhood. It therefore scores badly (-) for child friendly connections. It is separated from motorized traffic for the most part. Only the part along the north-west and east is directly connected to car roads. It therefore scores neutral (o) for the “Separation from motorized traffic” criteria.

- Area 9



Area 9 scores well in “Location of play” and “Accessibility of play” criteria. It is a car-free green and blue area, which forms a connection area between Randenbroek-Noord and Schuilenburg-Zuid.

Although not in clear line of sight of many residential buildings a central path runs through it, increasing the areas accessibility (“+” score for child-friendly connections) and the amount of social control (“o” score).

- Area 4



When looking at area 4 one could assume that its separation from motorized traffic, child-friendly connections and large size make it an ideal area for a primary play space. However if one would look closely, the area is on the edge of the neighbourhood, near the highway with hardly any social control, therefore scoring badly on “Location of Play” criteria. In this case, the “Location” criteria in this area are difficult to change. It is therefore unsuitable as a primary play space.

¹ www.amersfoort.nl

N: Weberstraat Place	Location of Play			Accessibility of Play		Quality of Play						Size	Landscape use	Formal (F) or Informal play area (I)	
	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	EMO	P.T.G.	P	S	M				
1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	+	0	+	0	-	-	-	-	-	0	-	+	-	-	I
3	-	0	0	+	0	0	-	0	0	0	-	+	-	-	F/I
4	-	-	0	0	+	-	-	0	-	-	-	+	-	-	I
5	0	-	0	0	-	-	-	-	-	0	-	0	-	-	I
6	+	0	+	+	0	0	-	-	-	0	-	0	0	-	I
7	0	0	0	0	0	-	-	-	0	+	-	+	-	-	F
8	0	-	0	0	-	0	-	-	-	-	0	+	0	-	I
9	0	+	+	+	+	+	-	0	0	0	0	+	0	-	I
10	-	0	0	0	-	-	-	-	-	+	-	+	-	-	F

N = Neighbourhood
C = Complexity
E.M.O = Environmental Manipulation Opportunity
P.T.G. = Plural target group
P = Physical stimulation
S = Social stimulation
M = Mental stimulation
- = not relevant, private space

(+) Good
(0) Neutral
(-) Bad

✓ Chosen primary play space



figure 6.2/ Criteria diagram on district level of the "Weberstraat" neighbourhood

Quality of play criteria

Areas 2, 6 and 9 all score neutral or badly on the "Quality of Play" criteria. As an example;

- Area 6 scores neutral (○) for 'complexity', 'plural target group' and 'mental stimulation'. This is because it has a formal playground (for younger kids), green areas and a pond creating spatial complexity for multiple groups and ages. The variety in texture and plantings can help stimulate fantasy and imaginative games (Mental stimulation). Specific design interventions can use these strengths to improve overall "Qualities of Play" for this area.
- Area 2 is not much more than a flat grass area with several trees and shrubs. It is not the most stimulating space to play in. Again, specific design interventions could improve this however;
- Area 9 scores good on physical stimulation due to its long shape, with accompanying path that runs to other neighbourhoods. The water edge, green elements and path make it score neutral for 'complexity'. This complexity has a positive effect on the "E.M.O.", "Mental stimulation" and "Social stimulation" criteria as well. However there is hardly any possibility or stimulation to go near the water edge due to steep slopes and high vegetation. It therefore scores negative for "Plural target group" criteria (not suitable for younger children) and only neutral for "E.M.O.", "Mental stimulation" and "Social stimulation" criteria.

The scores for the "Landscape use" criteria are all negative or neutral. Although the primary play spaces that have been analyzed are compromised of mostly green and water landscape elements, the play opportunities are minimal. The potentials are there but the playability is insufficient; water is inaccessible, green elements are plain and dull (flat grass with trees), minimal variety in textures, etcetera. In these cases landscape use can be increased with design interventions.

In this neighbourhood it is decided that areas 2, 6 and 9 have the potential to become primary play spaces. As mentioned above, the "Location, Accessibility and Qualities of Play" in some of these areas are still weak. When zooming in on individual neighbourhood implementation of the NOP-model, this can be dealt with (see chapter 8).

This method of testing potential primary play spaces is done for every separate neighbourhood in the district Randenbroek-Schuilenburg (see appendix I for criteria diagrams results of the district).



figure 6.3/ 400 meter action-radius map

Quantity of play - 400 meter action-radius check -

When for each neighbourhood the best potential primary play spaces are determined, they are drawn in the district map (see figure 6.3). By using the minimum action-radius of 400 meter for 6+ year olds (see section 5.3), we measure the distances between every chosen primary play space. If one or more of these spaces are not within 400 meter of another primary play space one should go back to the criteria-analysis diagram and consider another primary play space; one that is within 400 meter of another primary play space. In this case the orange 400 meter action-radius circles cover all of the residential areas in the district. In certain instances a major barrier (like a busy car road), can separate two or more primary play spaces from each other. Although they lie within 400 meter from each other, the barrier might form such an obstacle for children that one should consider; either connections with other primary play spaces or lift the barrier with a design intervention (a bridge, cross-over, etcetera).

Although the criteria-analysis diagrams works by analyzing separate neighbourhoods, not every neighbourhood needs a primary play space. The 400 meter action radius rule might determine that one primary play space is sufficient for another surrounding neighbourhood as well.

The 400 meter action-radius rule assures that the NOP model retains its network characteristic. Children from age 6 and above therefore have a better chance to traverse through their district to one or more primary play spaces.

Connecting primary play spaces

Once the locations for the primary play spaces are determined and the 400 meter action-radius rule is checked, the primary childlines (see paragraph 5.5) can be drawn in (see figure 6.4). The childlines can be adapted during the process of implementing the complete NOP-model. As the childweb structure is dependant on the location of facilities and partially secondary play spaces as well, it can adapt overtime with the disappearance or addition of child-facilities and/or secondary play spaces. Instead of completely re-doing the NOP-model, one can go back to previous

steps of the NOP-model methodology to see which structure formed the basis of the childweb and change it accordingly with the new or lost facilities/secondary play areas.

The primary childlines avoid heavy (car) traffic roads as much as possible and tries to follow existing bicycle paths. It is therefore not necessarily the most direct connection between primary play spaces but, theoretically, the safest one.

2 Locate facilities

Besides moving to play spaces, children roam between facilities within and outside their district as well. Facilities that the NOP model takes into account are:

- primary schools;
- kindergartens;
- religious centers (mosque, churches, etcetera);
- community centers;
- sport facilities (gym, swimming pool);
- after-school daycare centers, and;
- so called 'brede scholen' (broad schools).

More specialized facilities (like scouting clubs) can be used too, as long as children's traffic to and from these facilities can be expected.

Adding shopping facilities to the network is debatable. This is wholly dependant on the kind of shop. It is not taken into account in this research, as it is not a direct play or educational stimulating facility in our opinion and therefore they are not having a direct influence on the childweb. The city center of Amersfoort beyond the north-west edge of the district is taken into account in this case, as some child traffic to and from this area can be expected. The childweb therefore extends beyond the district Randenbroek-Schuilenburg. With the addition of child facilities in the "Network Of Play" the childweb starts to take shape. Primary childlines are slightly adjusted at some points to include facilities and some new routes connect the facilities to the rest of the network (see figure 6.5).

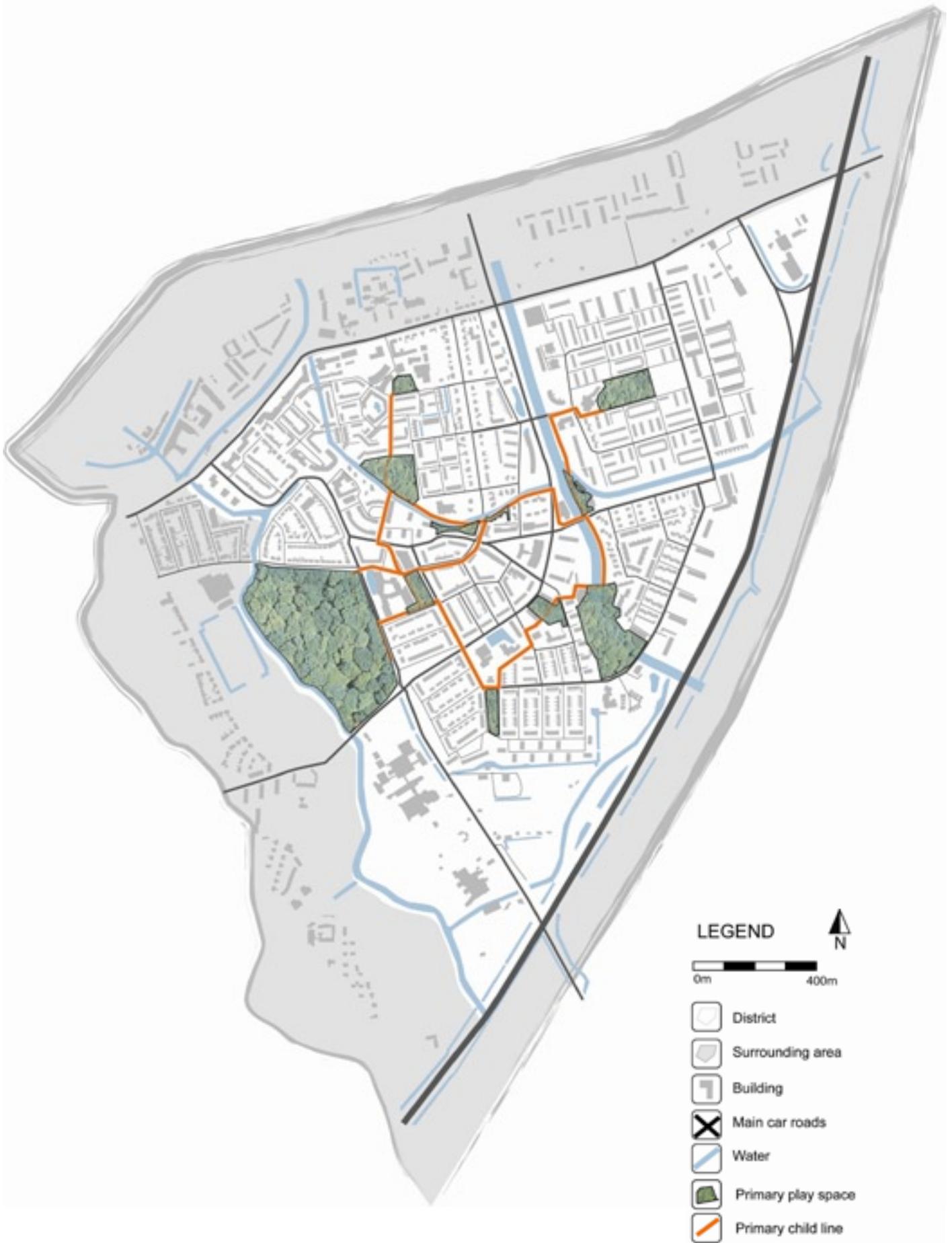


figure 6.4/ primary play spaces and connections map

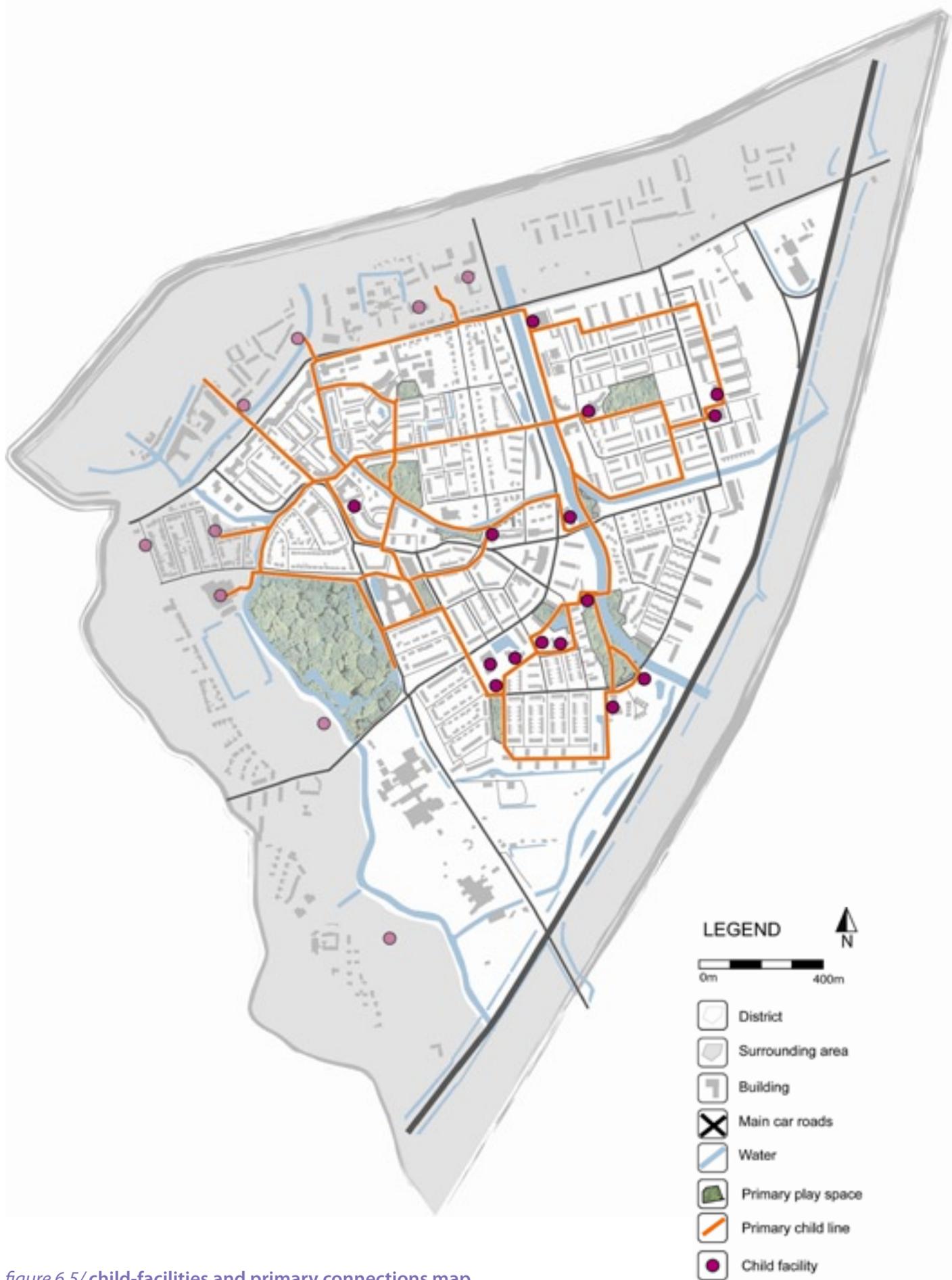


figure 6.5/ child-facilities and primary connections map

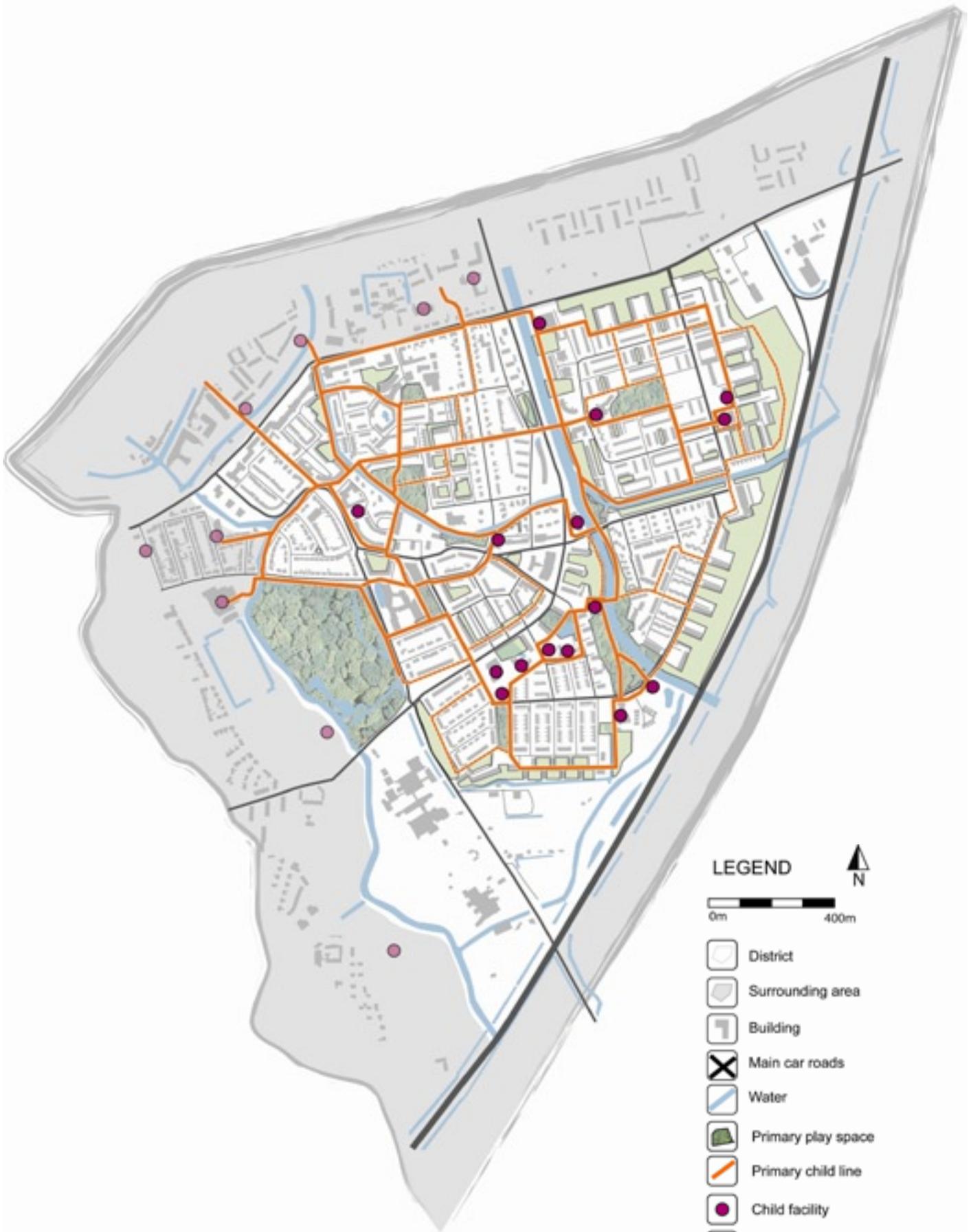


figure 6.6/ secondary play spaces and connections map

3 Secondary play spaces

Secondary play spaces are an essential part of the NOP-model (see paragraph 5.4). These smaller, formal and informal play spaces are spread over the district. The spaces that were not deemed fit for primary play spaces are taken into account as secondary play spaces in this step (see figure 6.6).

The primary childlines are extended towards the secondary play spaces where this is logical/possible. If secondary play spaces are still not connected to the network, secondary childlines are integrated (see paragraph 5.5).

Quantity of play -100 meter action-radius check -

As stated in the NOP-model guidelines (see paragraph 5.4), a child should not have to travel more than 100 meters from his home to a secondary play space, so as to comply with the action radius of a young child. This step in the district implementation therefore checks if the amount of potential secondary play spaces, provide enough play opportunities for every young child (under the age of 6) in the district.

As is shown in figure 6.7 gaps appear in the network (areas not covered by the orange stains). In these places there is a lack of potential secondary play spaces, resulting in an incomplete coverage of play opportunities. Solving this, requires a more detailed approach on neighbourhood level (see chapter 8).

On this scale-level it is not practical to check every potential secondary play space on their suitability. In chapter 8 we will analyse all the potential secondary play spaces on neighbourhood-level. We will test these spaces using the NOP-model criteria, just like was done for the primary play spaces (see section 6.2.1). This could mean that some areas are deemed unfit and/or new ones should be implemented.

4 Identifying obstacles, barriers, threats and gaps

The previous steps showed us where each element of the “Network of Play” is located and how they are connected by the childweb. Step 4 is a necessary step to identify where conflicts can occur between the proposed NOP-model and the existing urban infrastructure (see figure 6.8).

The red exclamation marks illustrate the areas where the childweb crosses potentially hazardous car roads (busy 30 km/h roads, 50+km/h roads) or other major obstacles that might impede a child’s movement. To assure that children are able to safely overcome these obstacles, often specific solutions on traffic engineering have to be proposed. This should be done on neighbourhood-level (see chapter 8).

The blue exclamation marks illustrate the gaps in the network structure; those areas not covered by any potential secondary play spaces. Again these need to be solved on neighbourhood-level.

6.2 From district masterplan to neighbourhood design

The NOP model has now been implemented on district level. The primary play spaces have been determined and the childweb has been laid out over the district. This is however not enough to guarantee a playable district as figure 6.8 shows. Obstacles and lack of play opportunities have not yet been solved and overcome. Also the playability of the mentioned primary and secondary play spaces has not been improved. To do this, we need to do a more thorough analysis and implementation on the specific neighbourhoods of Randenbroek-Schuilenburg. Chapter 7 will go into more detail as it examines the urban forms of the different neighbourhoods. In chapter 8, the neighbourhood implementation of the NOP-model on two different neighbourhoods will be described:

- Randenbroek-zuid (or “Weberstraat”), and;
- Schuilenburg-noord (“Romeostraat and Ariaweg”).

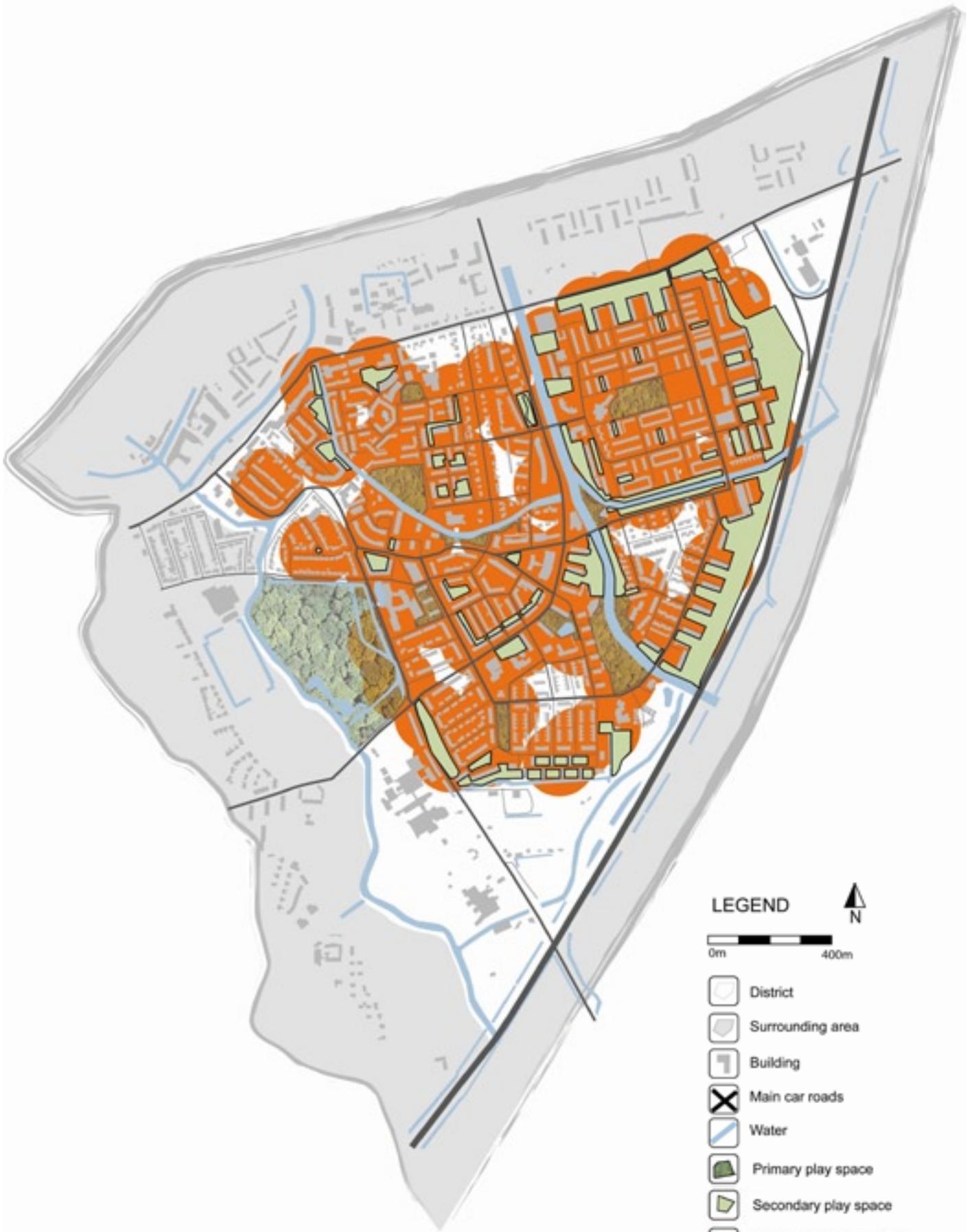


figure 6.7/ 100 meter action-radius map

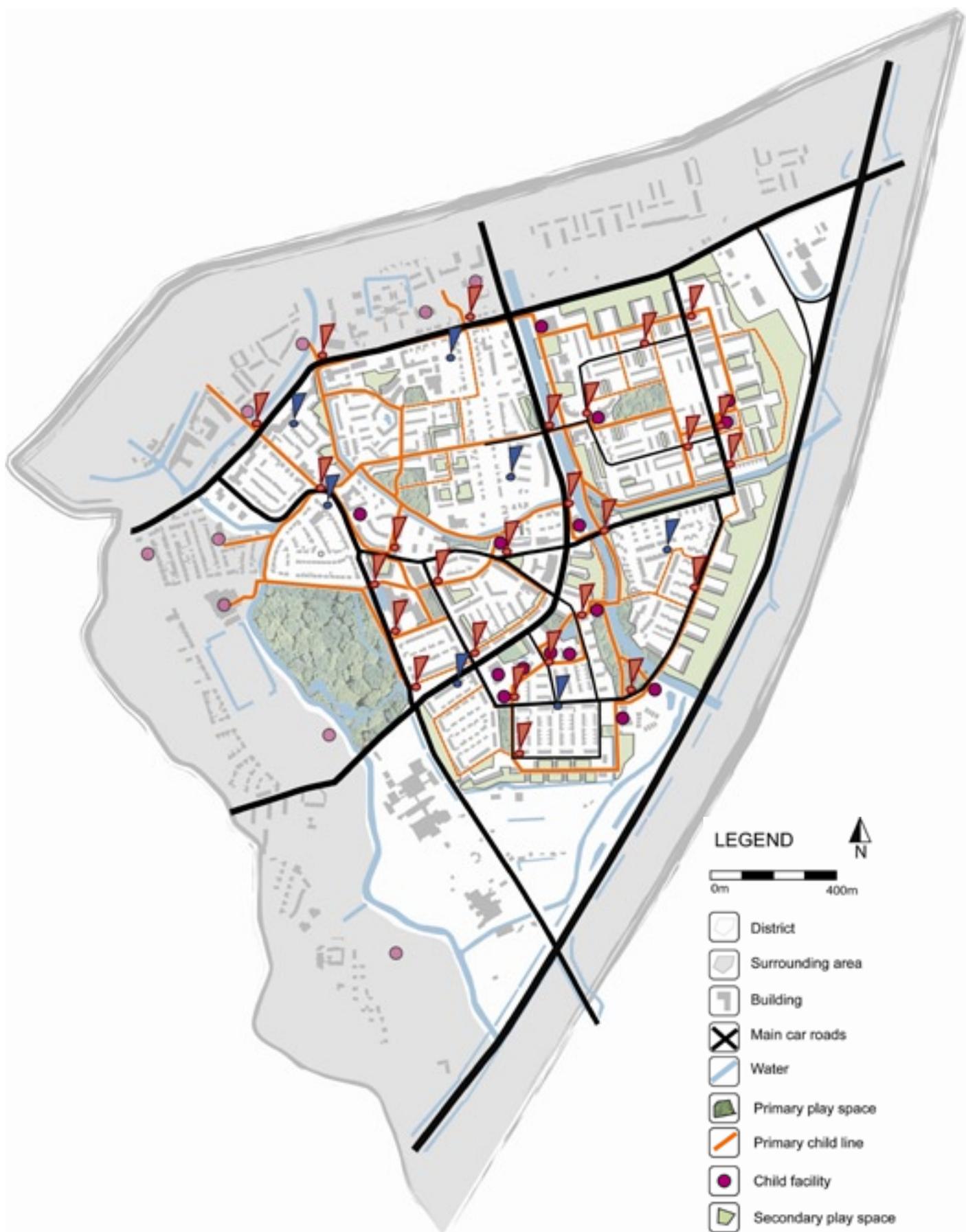


figure 6.8/ obstacles, barriers, threats and gaps map

chapter 7



Calvin and Hobbes
a comic by Bill Watterson

urban typologies in relation to playability

an examination of the district Randenbroek-Schuilenburg

In this chapter the urban fabric of cities will be examined. During time, a city will become a composition of different urban forms. We will examine the urban form of the district Randenbroek-Schuilenburg. To get an understanding of urban forms, these are organized in typologies. Which will be explained in paragraph 7.1. The paragraphs 7.2 and 7.3 thoroughly explain two typologies that are present in Randenbroek-Schuilenburg district and are widely realised throughout cities in the Netherlands.

In Paragraph 7.4 we will evaluate urban types and typologies on their playability, with the use of the NOP's spatial criteria (see figure 7.1)

Finally, paragraph 7.5 will illustrate similar typologies in other cities in the Netherlands.

7.1 Types and typology

We first need to know how to interpret the word typology. A type is:

- A concept that expresses the essence of a group of objects. (de Jong, 1983; in Vroom, 2005)

A typology is:

- The tenet of types. (van Dale; in Vroom, 2005).

In architecture a type is the principal form of strong differentiated designs. Typologies can be used to understand the logic of spatial patterns. (de Jong, 1983; Strauwen 1981; in Vroom, 2005).

By formulating clear urban typologies and by relating them to opportunities for play we want to illustrate that our model is not only applicable on a particular case-study, but to case-studies all over the Netherlands.

By using spatial criteria (see paragraph 5.2 and figure 7.1) we can evaluate typology characteristics on their play potential for children. With the limitations and opportunities for play of these typologies, we want to illustrate in which situations the "Network of Play" might have a positive effect (is succesful) or has a limited (or no) effect on the playability. This will be concluded in the final chapter of this thesis, chapter 10.

SPATIAL CRITERIA FOR PLAYABILITY		
1	Quantity of Play	
2	Location of Play	
	Amount of Social control	
	Amount of Disturbance *	
	Environmental conditions	
3	Accessibility of Play	
	Child-friendly connections	
	Seperation from motorized traffic	
4	Landscape use	

* (-) a lot of disturbance / (+) hardly any disturbance

figure 7.1 / Spatial criteria to evaluate the playability of urban typologies



figure 7.2 / The urban typologies of Randenbroek-Schuilenburg

The following typologies are characteristic for the district “Randenbroek-Schuilenburg” (see figure 7.2):

- 1 **Het traditionele tuindorp**; 1930-1950
(De Kattekampen)
- 2 **Het naoorlogse tuindorp**; 1950-1960
(Weberstraat (with a part of Bachweg-zuid))
- 3 **De wijkgedachte**; 1960-1970
(Schuilenburg-noord)
- 4 **De woonomgeving benadering**; 1970-1980
(Willem III & Verdiweg)

It is not always easy to assign an urban typology to a certain time-frame. Most typologies are created out of the successes or failures of its predecessor or by the current developments in society. Therefore some years might overlap. (de Boer, 1987)

Two urban typologies

The NOP-model focusses on evaluating public spaces, which often contain greenery and water elements, for playing purposes. Key aspects for the ‘Network Of Play’ are the location, accessibility, quantity and (landscape) use of these green and blue spaces (see figure 7.1). These features manifest themselves differently in each urban typology and will strongly influence the playability of a neighbourhood/district. In this project we will examine two out of the four urban typologies that we have distinguished. These are: a Dutch post-war variety on the Garden City, “het na-oorlogse tuindorp”, and a neighbourhood designed according to the idea of “de wijkgedachte.” All the available public space/greenery that is present in a typology (or building-unit) will be examined and evaluated according to the following spatial criteria:

- 1 **Location of Play**
These are the same as in our criteria-analysis diagram (see figure 6.1)
- 2 **Accessibility of Play**
Same in our criteria-analysis diagram

3 Quantity of Play

The “Quantity of Play” illustrates if there is a sufficient amount of public space which is suitable as potential play space (for children living in its vicinity).

4 Landscape use

“Landscape use” illustrates the degree in which present greenery is used to bring variety in spaces and the degree in which it offers play potential.

“Quality of Play” is not evaluated as it is site-specific. With the implementation of the NOP-model we would always add or strengthen “Qualities of Play.” This criteria therefore, does not say anything about typology characteristics and their relation to playability.

The two urban typologies will be explained by maps that illustrate the main principle(s) of the typology. In the city, a group of objects is decided by the composition of buildings. Therefore we make distinctions between different building-units (the types). The different building-units will be explained by using four illustrations:

- **The composition of the buildings**

This map illustrates the type of buildings and the size of the area.

The types of buildings that we distinguish are:

- 1 Row houses
- 2 Flats with an open stairwell (NL: portiek flats)
- 3 Gallery flats

- **The infrastructure**

This map illustrates the relation between the car- and pedestrian domain.

- **The types of green spaces**

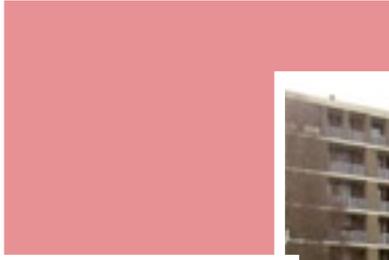
Separated into private and public space.

- **A section**

To illustrate the relation between the previous maps and to show the entrances into the buildings. This will influence the amount of social control and accessibility towards the surrounding public spaces.



row houses



gallery flat



"portiek flat"

figure 7.3 / "Het naoorlogse tuindorp": Randenbroek-zuid "Weberstraat" and "Bachweg-Zuid" (north-west)

7.2 Het naoorlogse tuindorp (source: de Boer, 1987)

The years after World War II mark a transition in the design principles of urban developers. The war had a destructive impact on the Dutch cities. It did not only end with a lot of damage but it had also caused an economic crisis. There were a lot of undeveloped and unrealized urban plans that had to be finished. Most of them were developed accordingly to "het traditionele tuindorp" concept. Their realisation however, happened after the war. Therefore these plans are called 'het naoorlogse tuindorp'. Randenbroek-zuid (in municipality legislation: neighbourhoods "Weberstraat" and a part of "Bachweg-Zuid") is a neighbourhood designed before the war and realized afterwards according to this concept (see figure 7.3). The economic crisis led to an urgency for standardization. The cities were short of money and had to accommodate many people. It was necessary to change the design principle of the Garden-city. Not the street and its composition were the most important design elements but the row houses and multi-level apartments combined in groups, also called building-units. This did not mean that the urban developers fully neglected the road system, but it lost its function as a compositional element. That this was just the first step towards standardization will become apparent when we examine "de Wijkgedachte". The northwestern part is considered as a separate neighbourhood ("Bachweg-zuid") as it is separated

by the Ringweg Randenbroek (see figure 7.4) from the rest of Randenbroek-zuid. This part is therefore not further treated in the following paragraphs.

The design principles

- Row houses, grouped in open building-units (NL: open bouwblok/ see figure 7.3: black box).
- Multi-level apartments at the edge of the city neighbourhood as explicit features; to function as a kind of visual entrance into the city (see figure 7.3: orange box).
- The main artery (Ringweg Randenbroek) that connects the neighbourhood with the center of the district does not run through the middle of the neighbourhood (see figure 7.4).
- A facility strip separates the neighbourhood into groups of building-units. (see figure 7.5: dotted box)
- A residential environment in which green spaces dominate (see figure 7.5)
- A central, elongated green element (neighbourhood park) that is within the vicinity of a couple of hundred meters from surrounding buildings.



figure 7.4/ Road system



figure 7.5/ Facility strip in a green setting

7.2.1 Building units

In this section the following building-units will be examined:

- 1 Row-house building-unit
- 2 "Portiek flat" building-unit I
- 3 "Portiek flat" building-unit II
- 4 Gallery flat building-unit

There are two examinations of the "portiek flat" building-unit because they differ in layout (see figure 7.3 for the location of these building-units).

We focus on general characteristics of these building-units and not on site-specific issues. By doing so, we try to create general conclusions of the influence of characteristic urban forms on the playability of neighbourhoods/districts. These conclusions can therefore also be helpful in other parts of the Netherlands with these urban forms.

1 ROW HOUSE BUILDING-UNIT

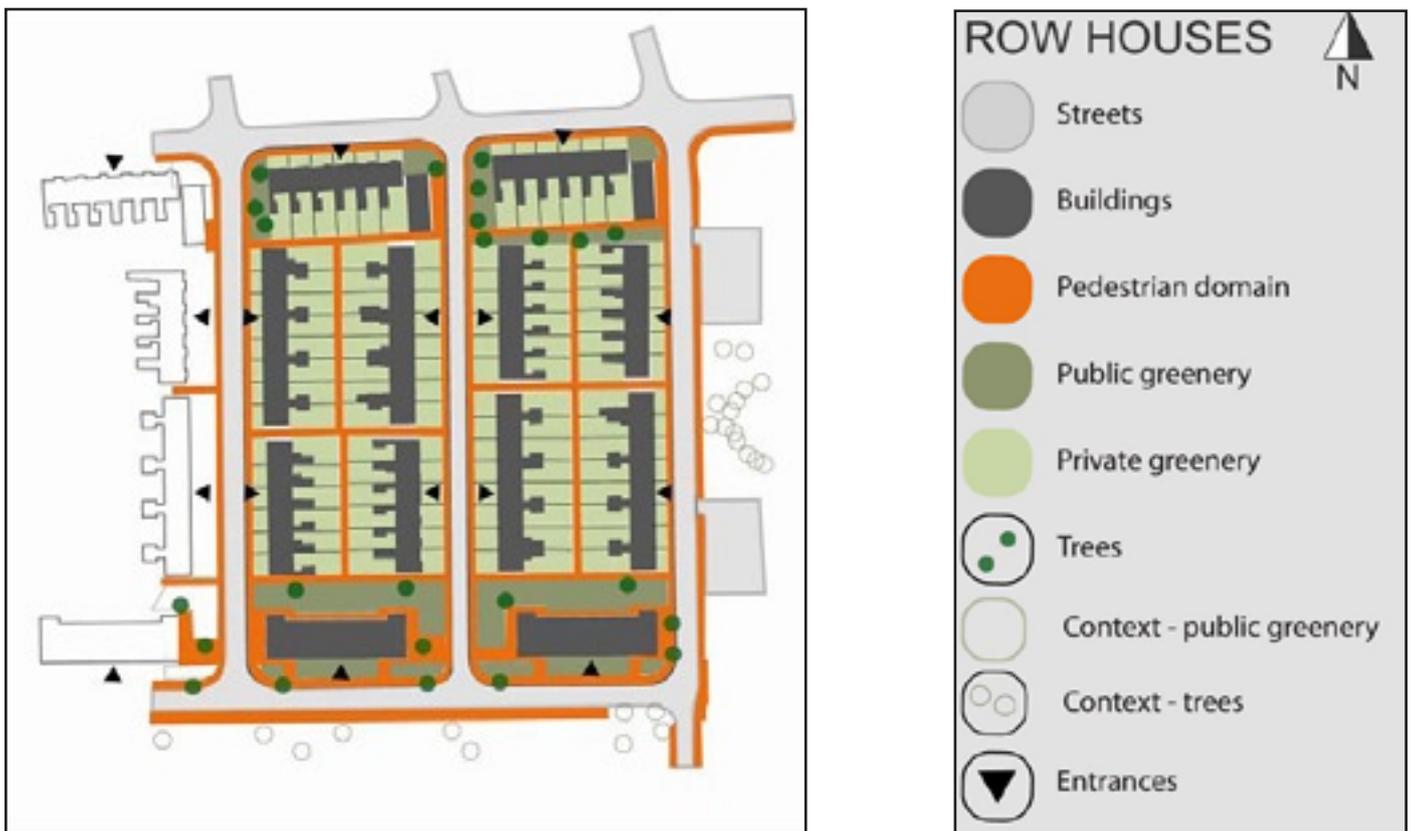


figure 7.6 / Row house building-unit

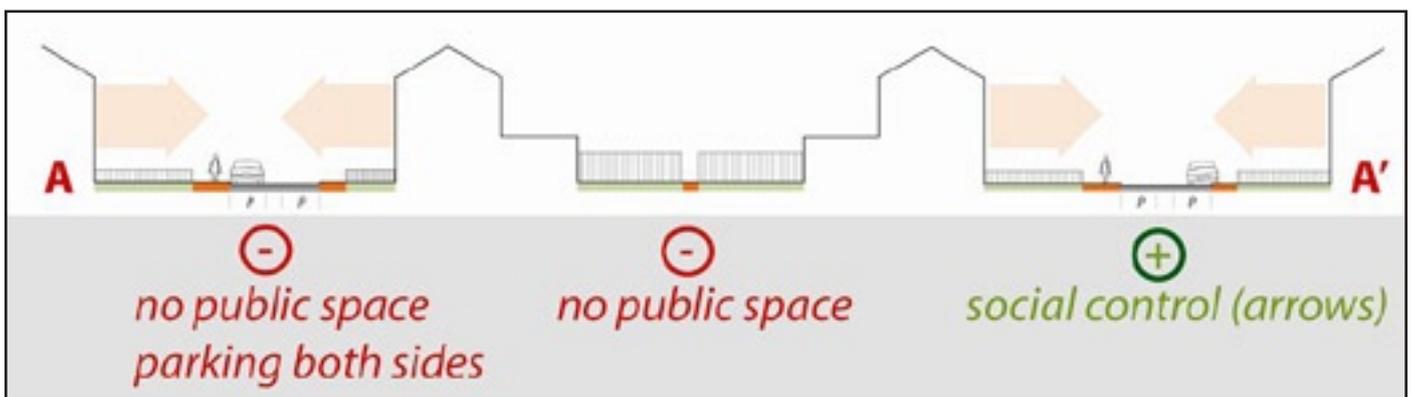


figure 7.10 / Section

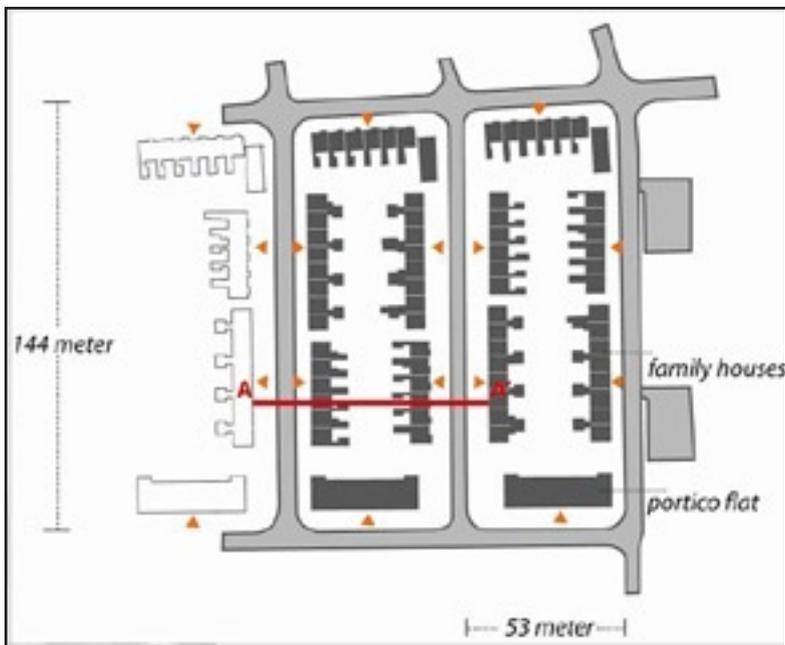


figure 7.7 / The composition of the buildings

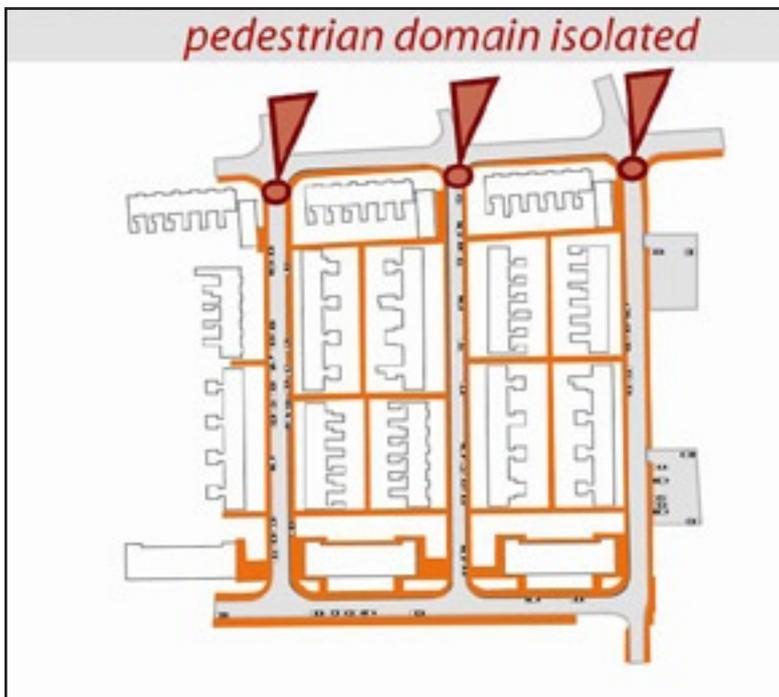


figure 7.8 / The infrastructure

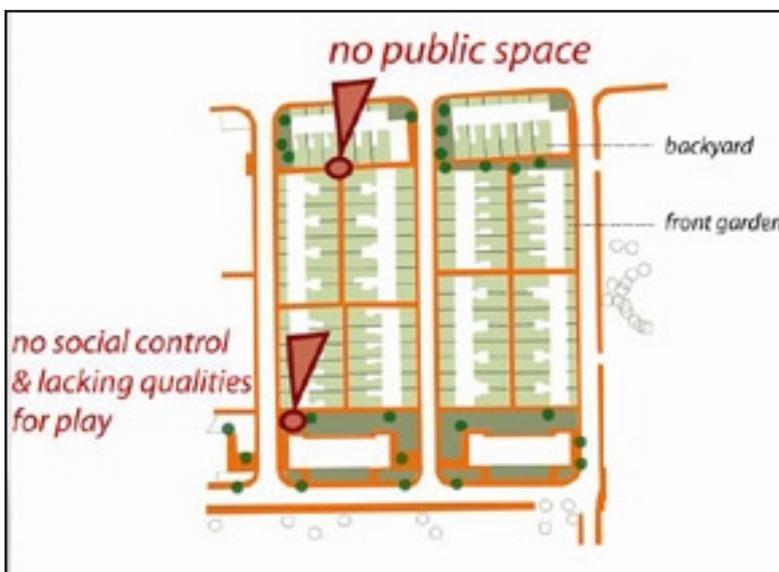


figure 7.9 / The types of green spaces

2 PORTIEK FLAT BUILDING-UNIT I

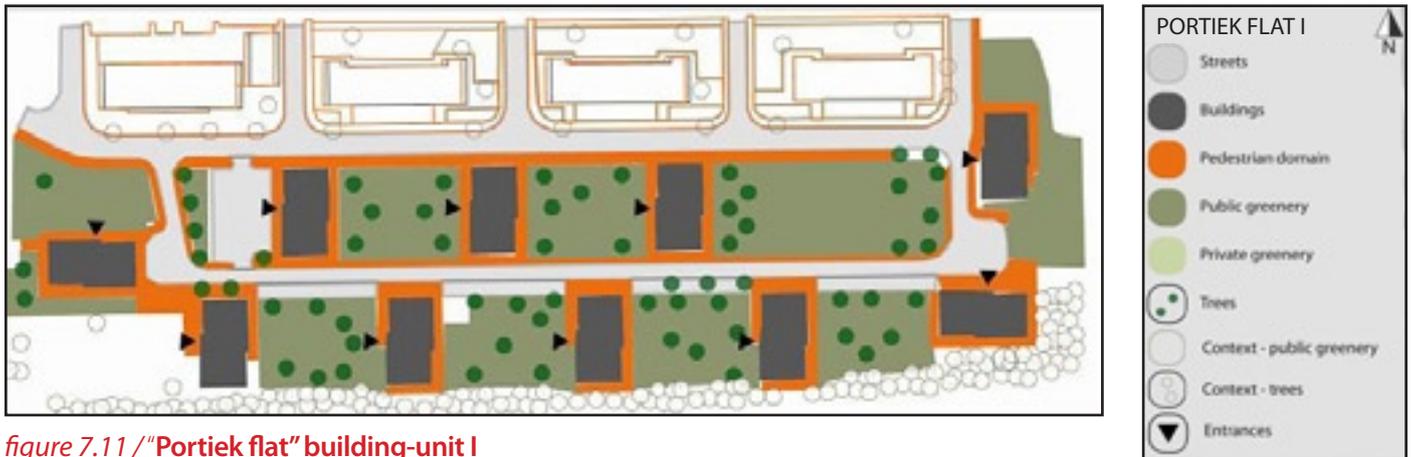


figure 7.11 / "Portiek flat" building-unit I

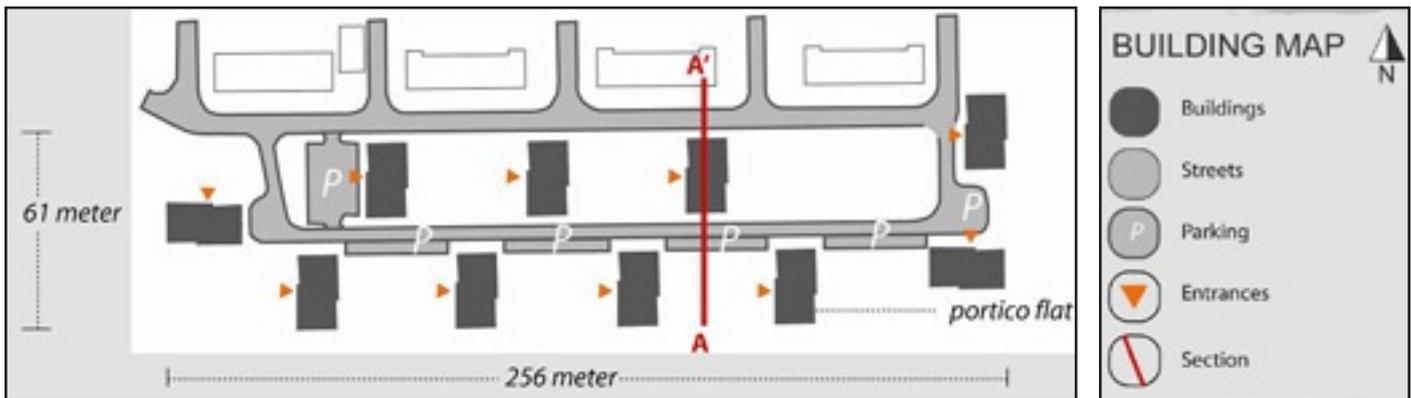


figure 7.12 / The composition of the buildings

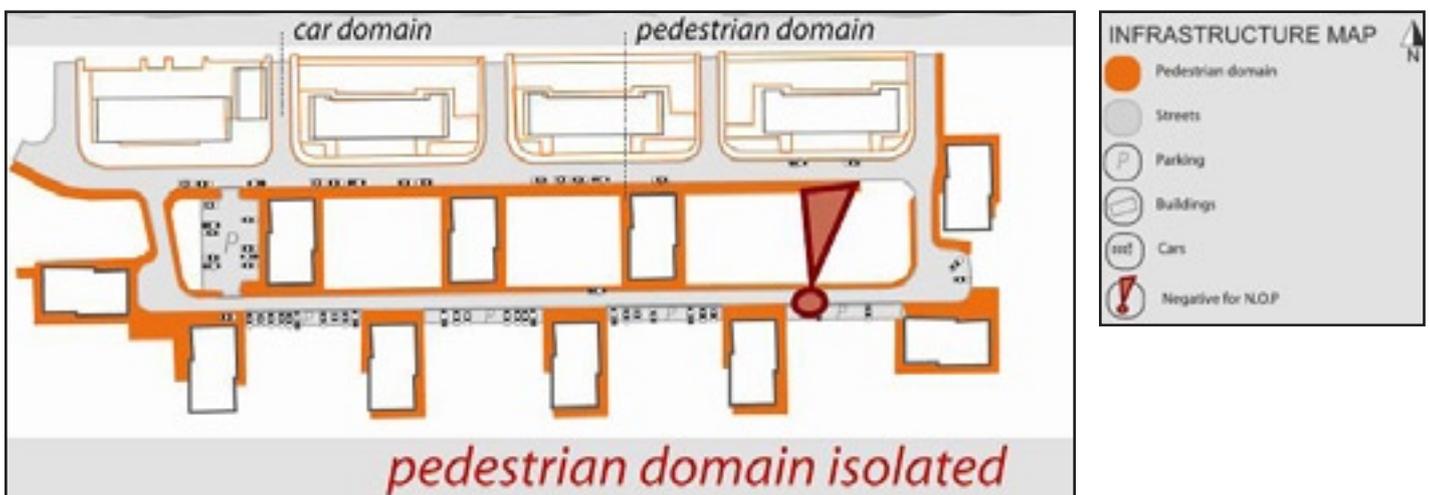


figure 7.13 / The infrastructure



figure 7.14 / The types of green spaces



figure 7.15 / Section

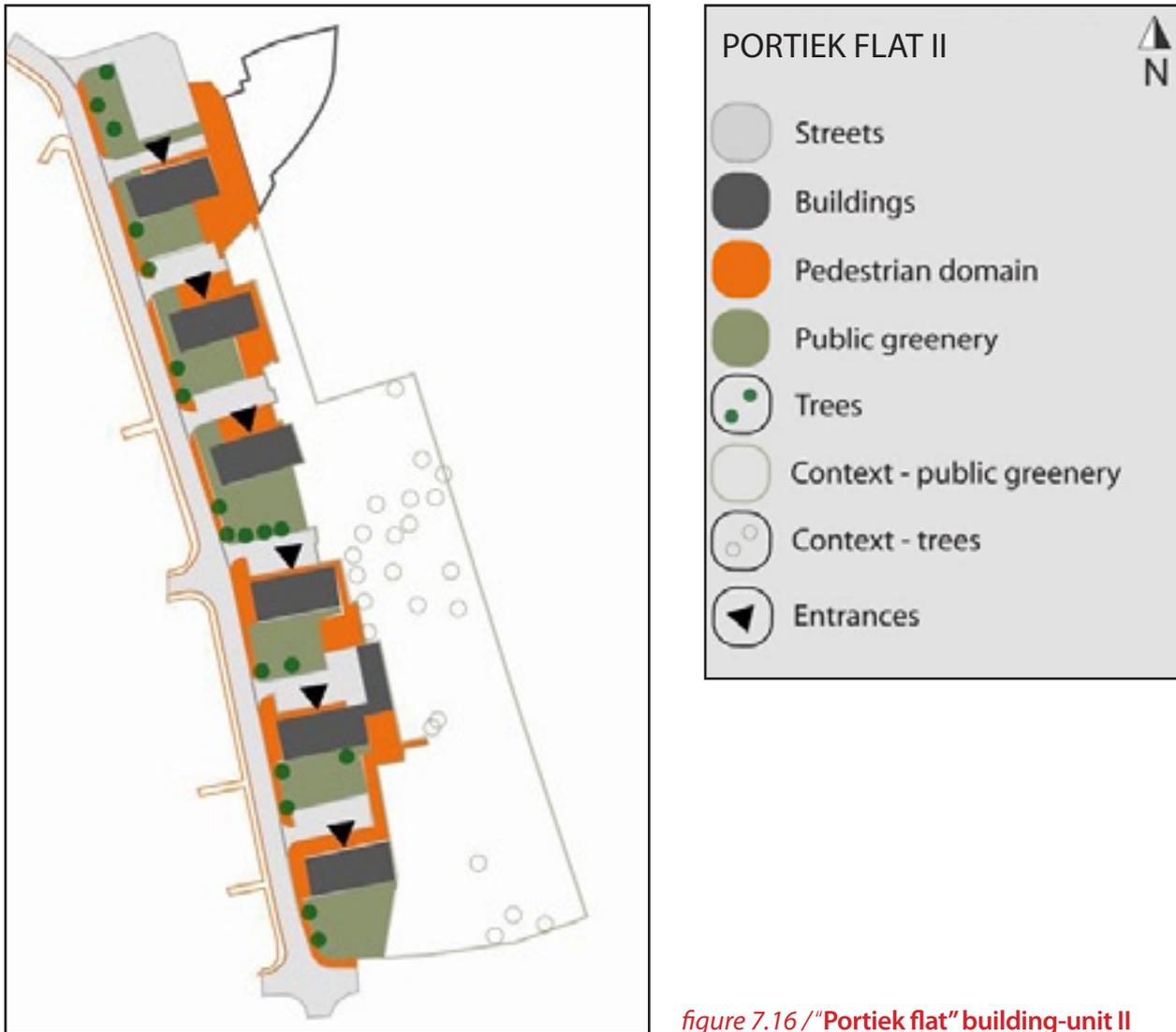


figure 7.16 / "Portiek flat" building-unit II

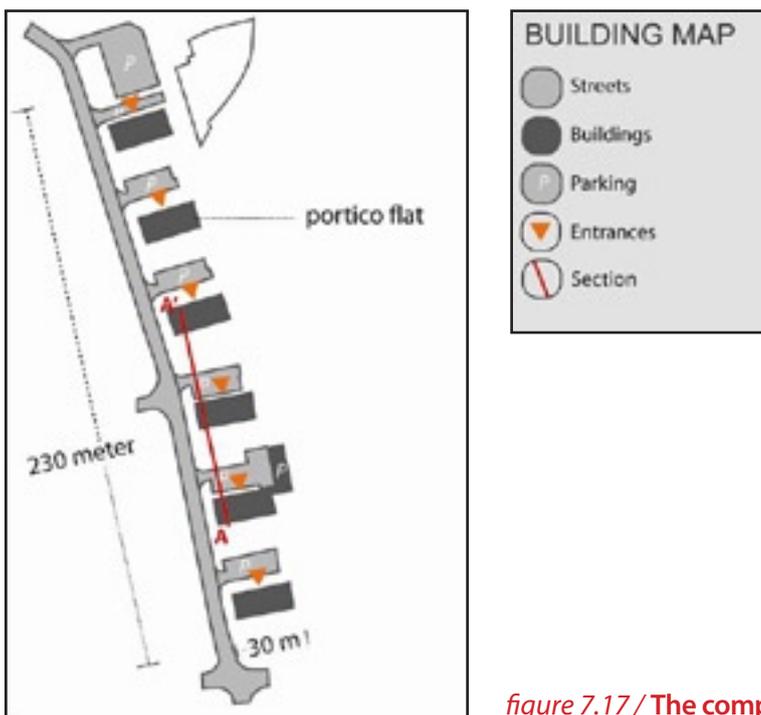


figure 7.17 / The composition of the buildings

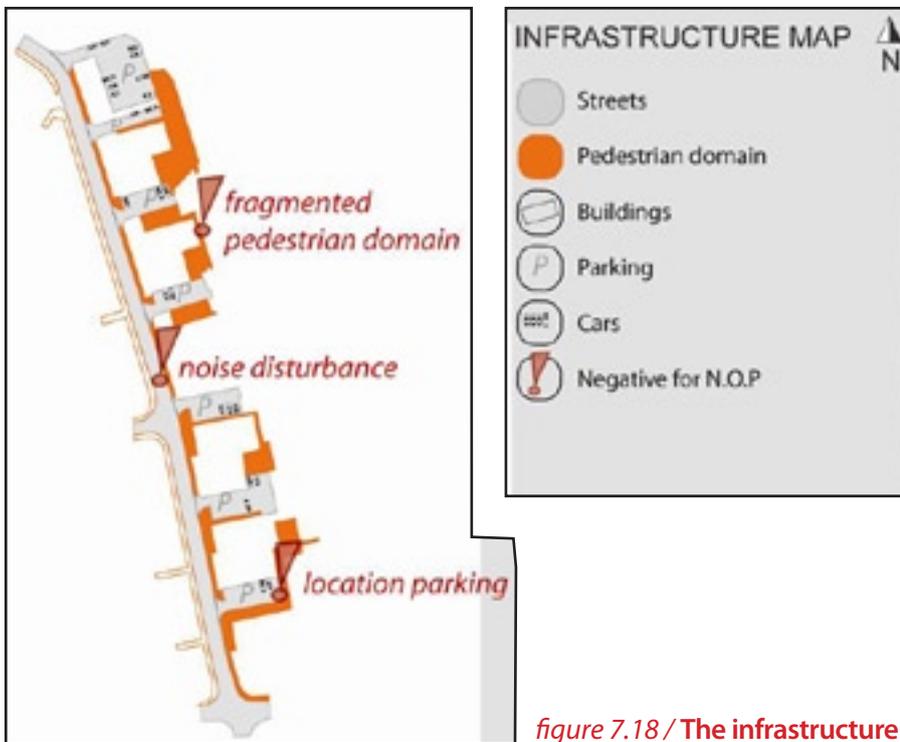


figure 7.18 / The infrastructure

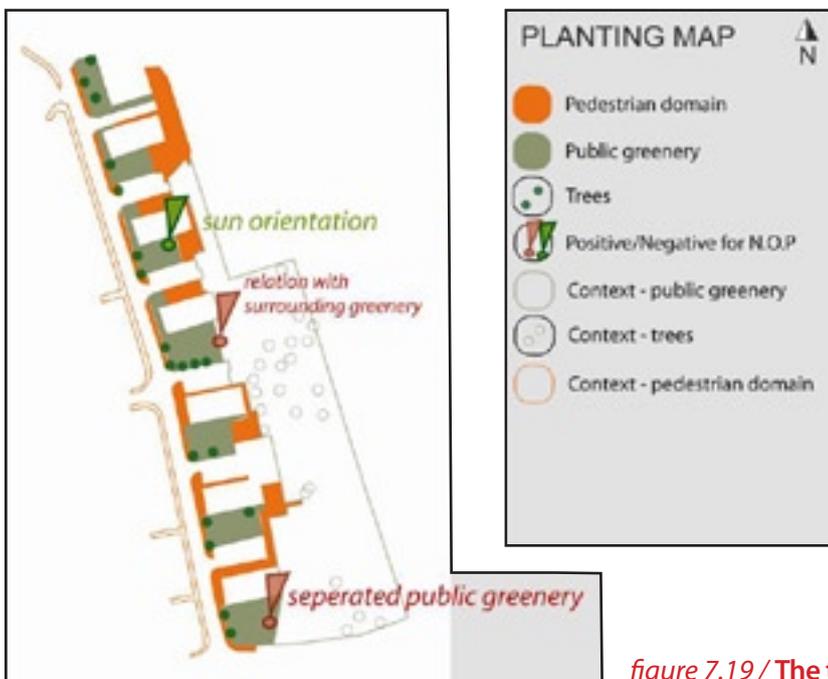


figure 7.19 / The types of green spaces

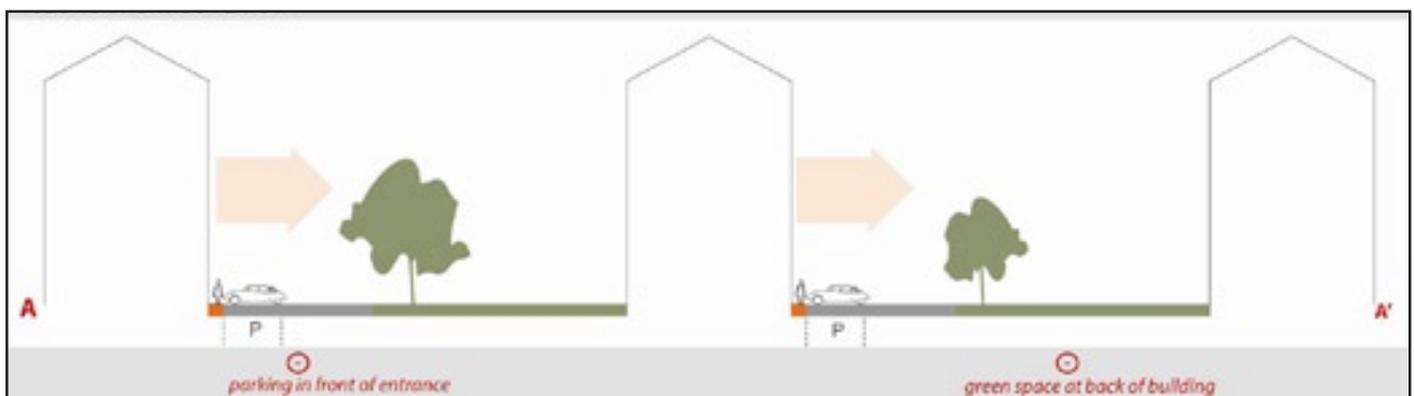


figure 7.20 / Section

4 GALLERY FLAT BUILDING-UNIT

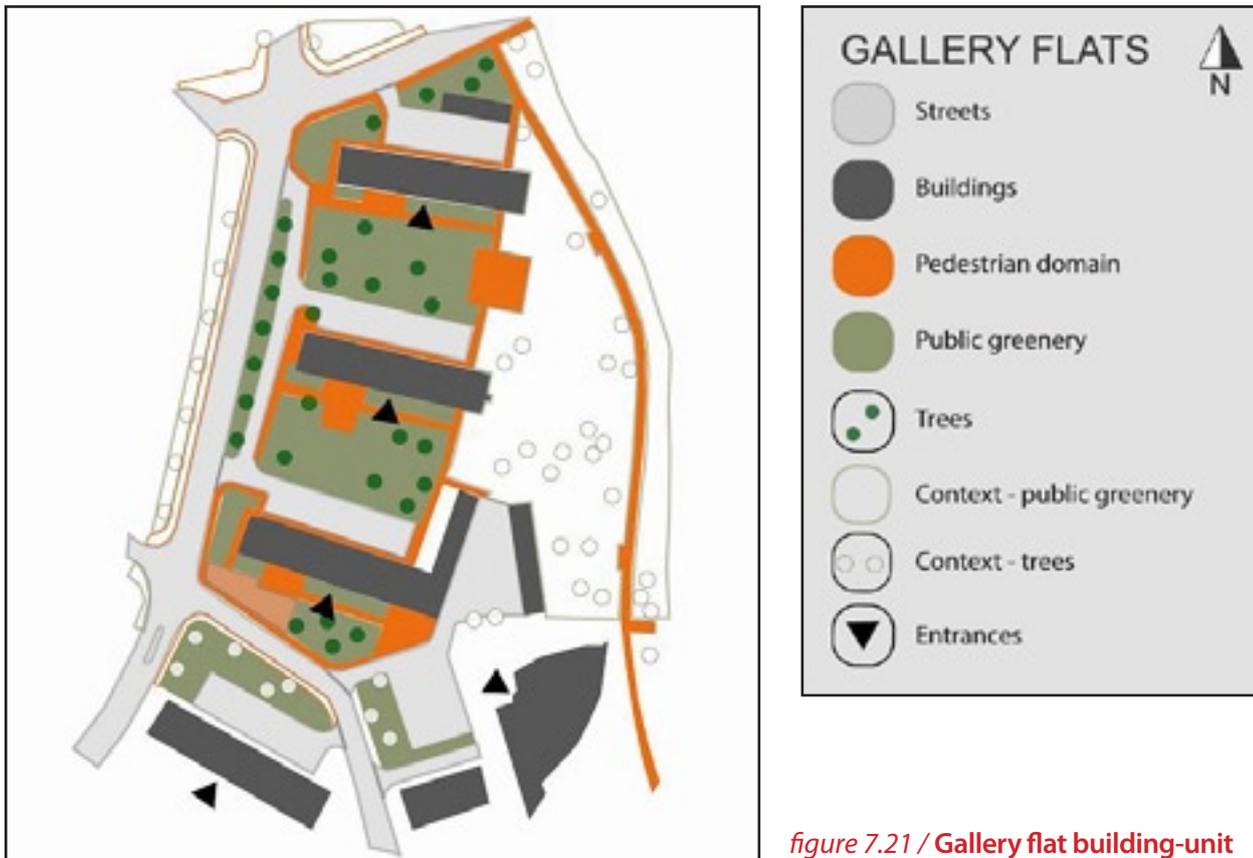


figure 7.21 / Gallery flat building-unit

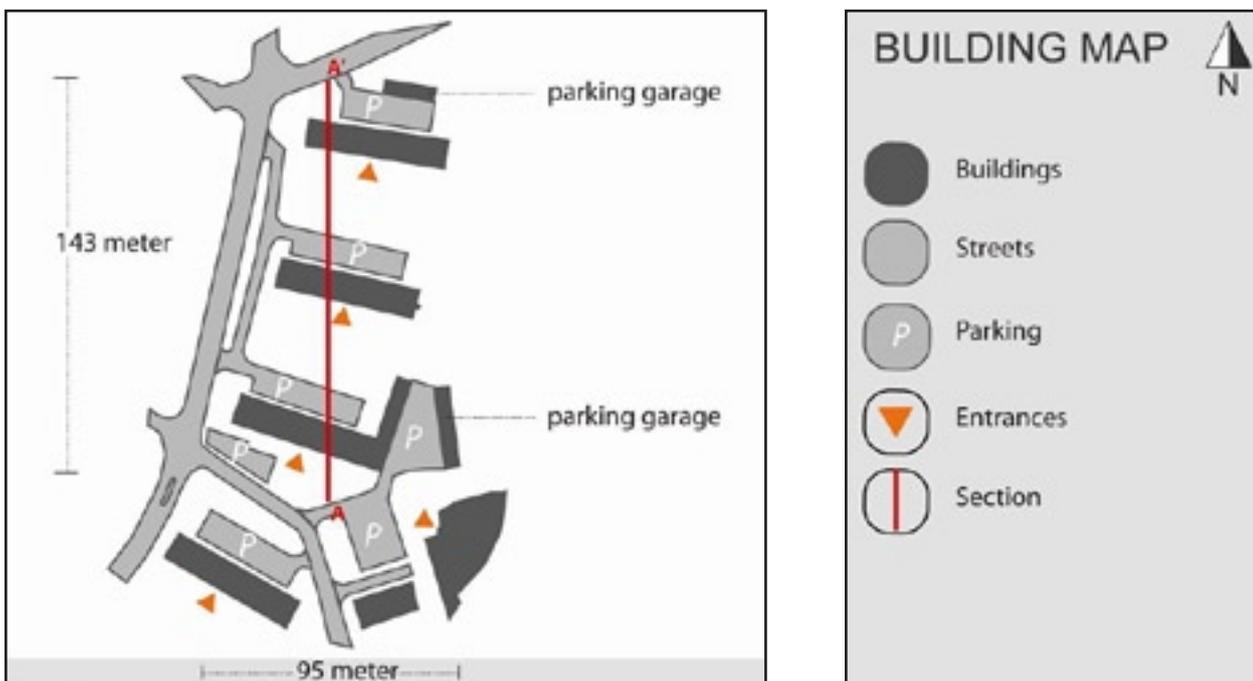


figure 7.22 / The composition of the buildings

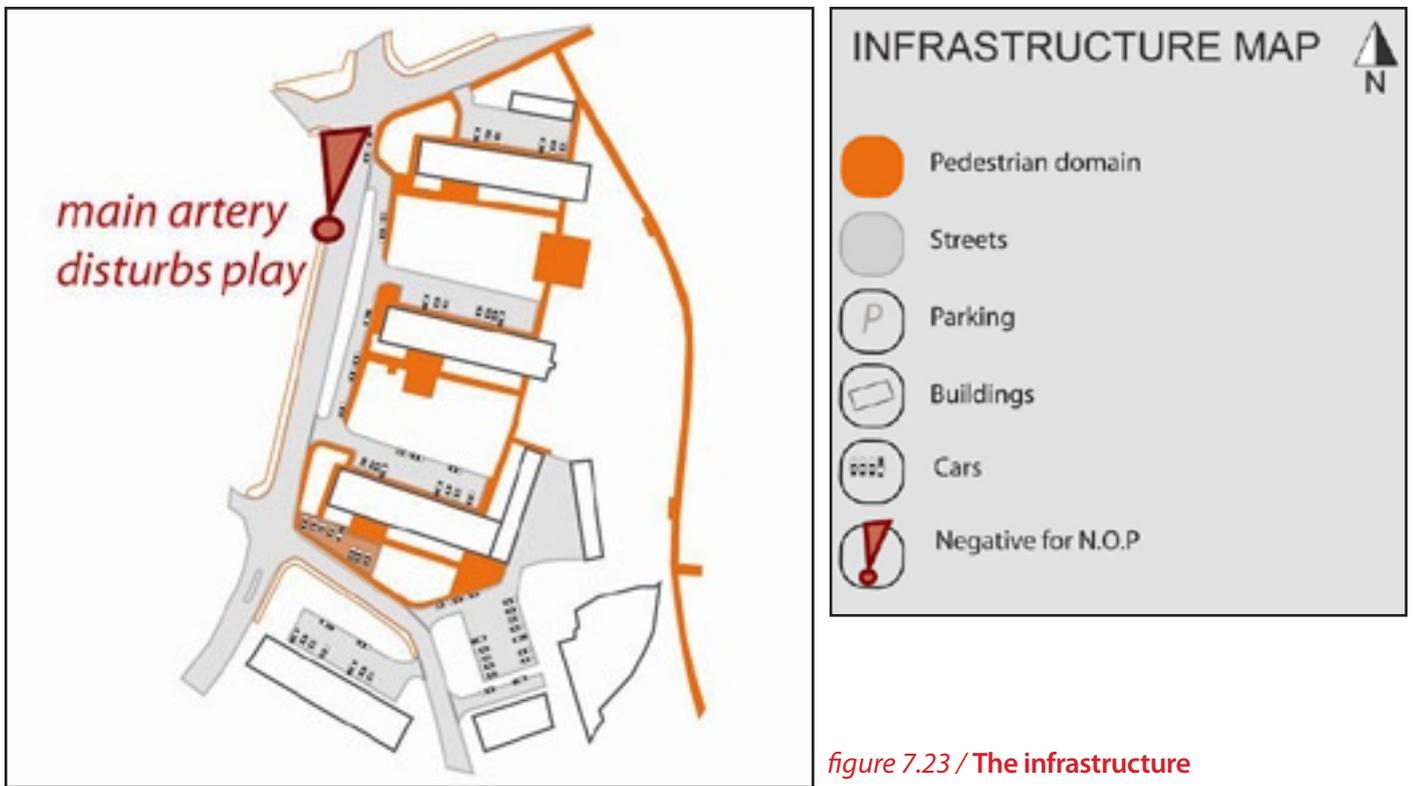


figure 7.23 / The infrastructure

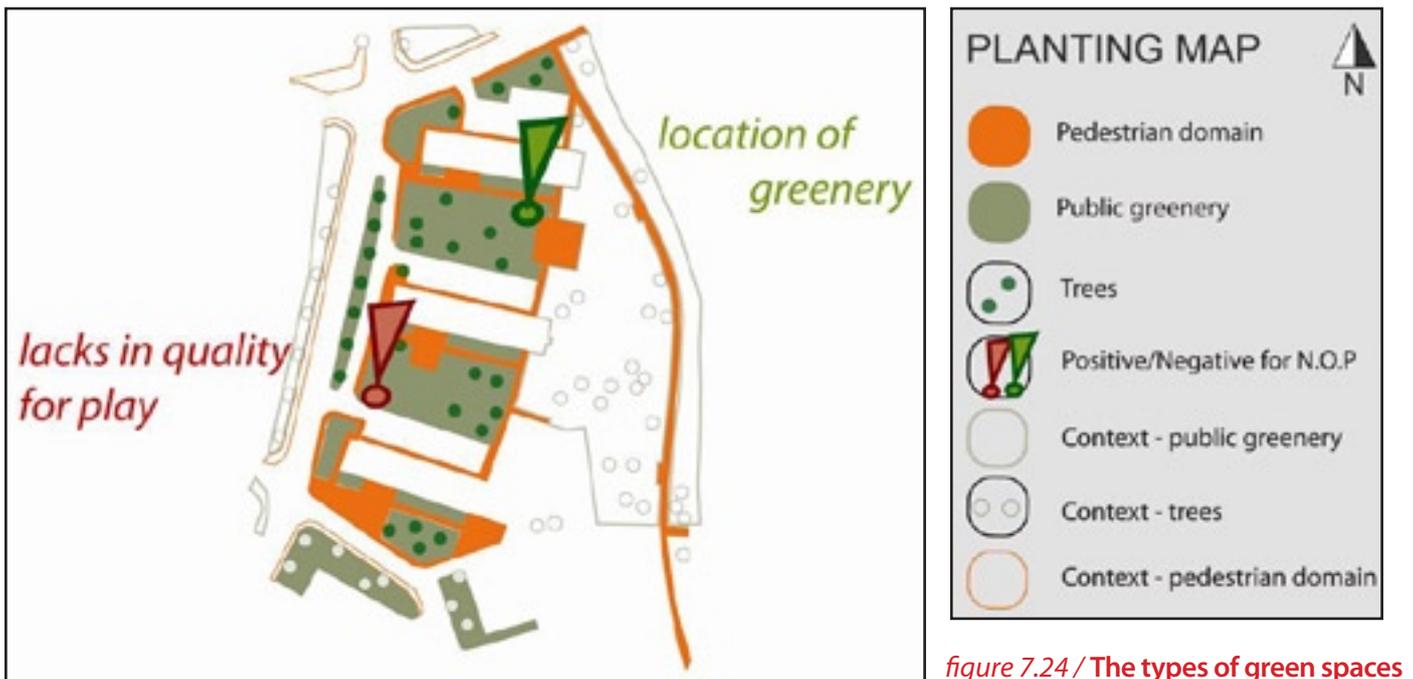


figure 7.24 / The types of green spaces

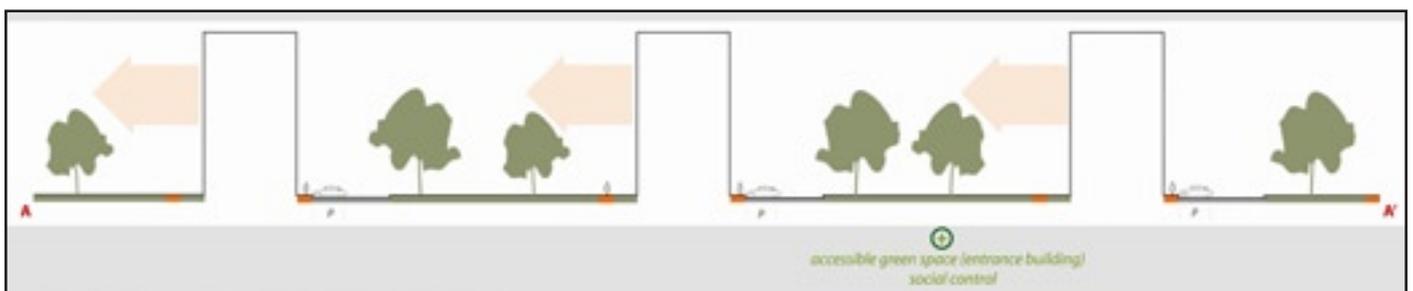


figure 7.25 / Section



row houses (with public squares)



gallery flat



"portiek flat"

figure 7.26 / "De wijkgedachte": "Schuilenburg-noord"

7.3 De Wijkgedachte (source: de Boer, 1987)

As was mentioned before, “het naoorlogse tuindorp” was already an indication of a change towards standardization. After World War II there was a great necessity for the mass-production of cheap buildings to inverse the process of regression, a development that strongly characterizes the “1960’s and 1970’s Wijkgedachte”. The standardization is most recognizable in repetitive clusters of buildings-units. Each cluster has a certain size and has to stimulate social bonding between its residents (sense of place/identity). Accessibility of facilities is a key aspect of “de wijkgedachte”. The clear and straight-forward hierarchy in the road system makes facilities easy to reach by car. The neighbourhood Schuilenburg-noord is developed according to the principles of the “de Wijkgedachte” (see figure 7.26).

The municipality legislation considers this area to consist of two neighbourhoods (Ariaweg and Romeostraat) but for our analysis these are considered as one entity: Schuilenburg-noord.

The design principles

“De Wijkgedachte” concept is developed for a differentiated society and has to bring variable residential conditions. These conditions have to improve:

- accessibility (see figure 7.27)
- variable spaces (see figure 7.28)
- safety for pedestrians
- opportunities for play and recreation
- maximum potential of sunlight

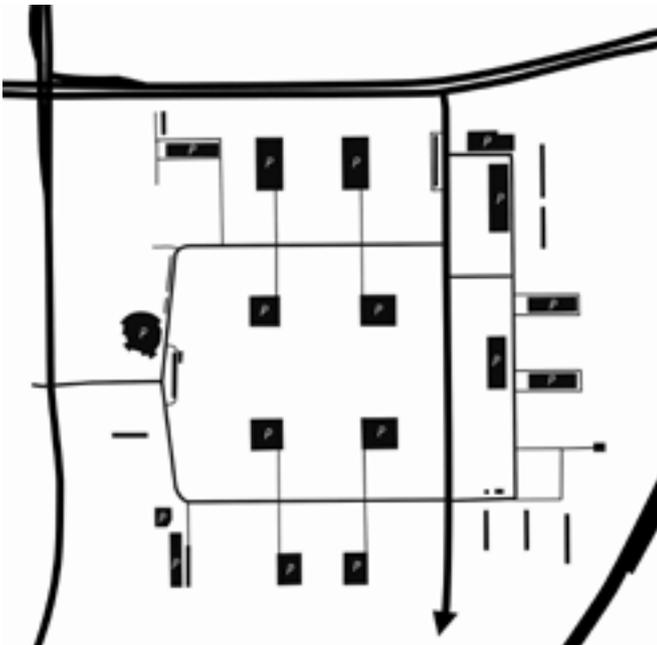


figure 7.27/ Road system



figure 7.28/ Facilities and greenery

7.3.1 Building-units

In this section the following building-units will be examined:

- 1 Row-house building-unit
- 2 "Portiek flat" building-unit
- 3 Gallery flat building-unit

1 ROW HOUSE BUILDING-UNIT

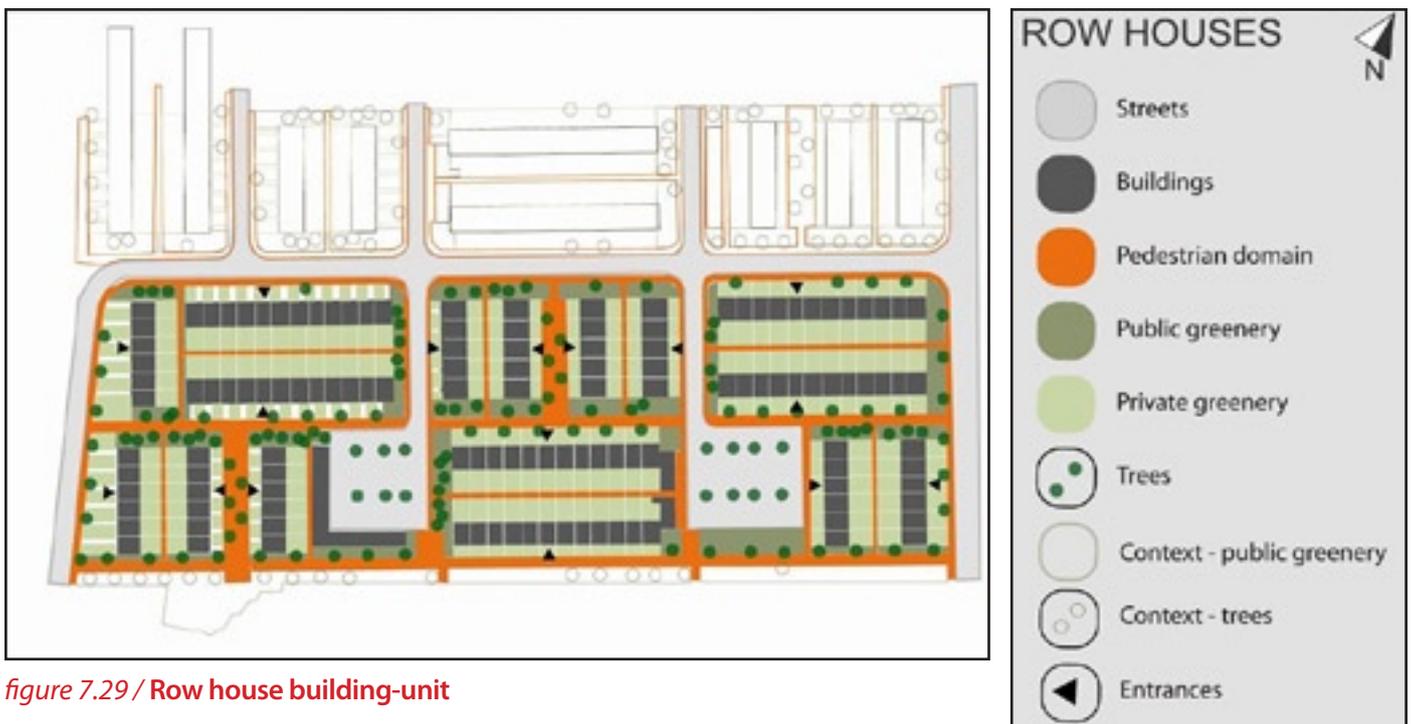


figure 7.29 / Row house building-unit



figure 7.30 / The composition of the buildings

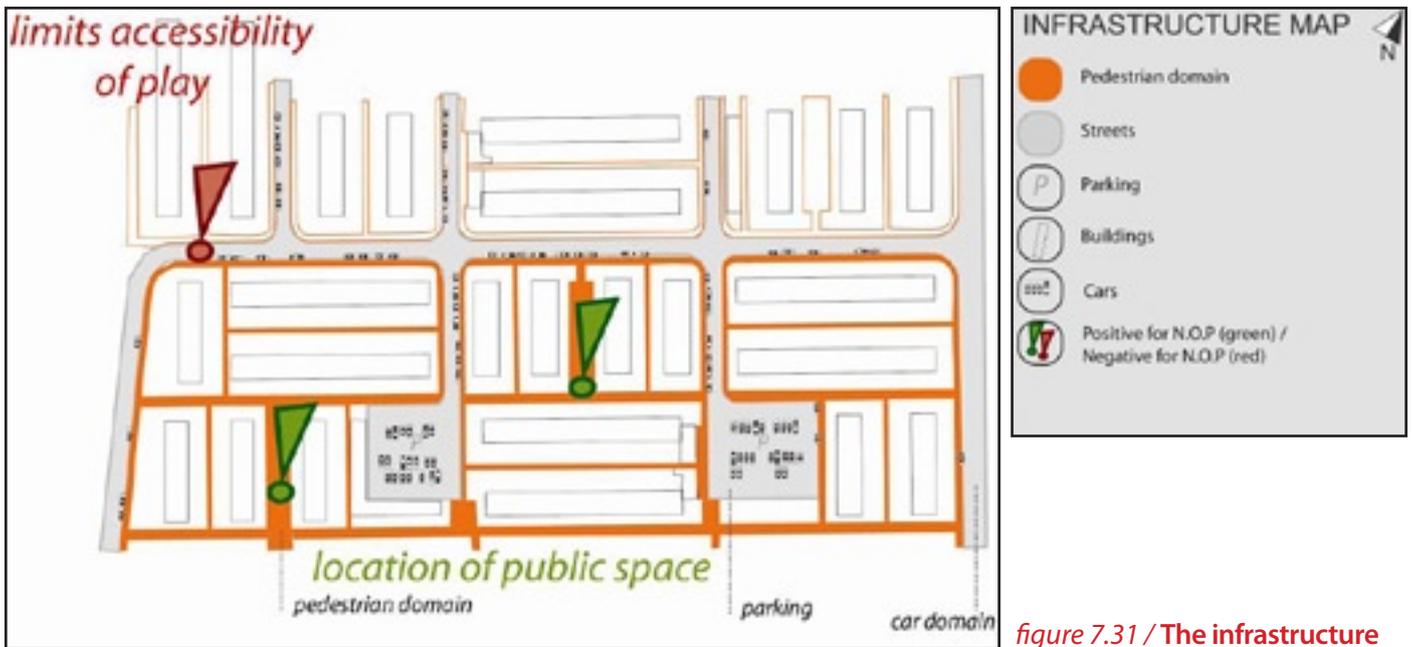


figure 7.31 / The infrastructure

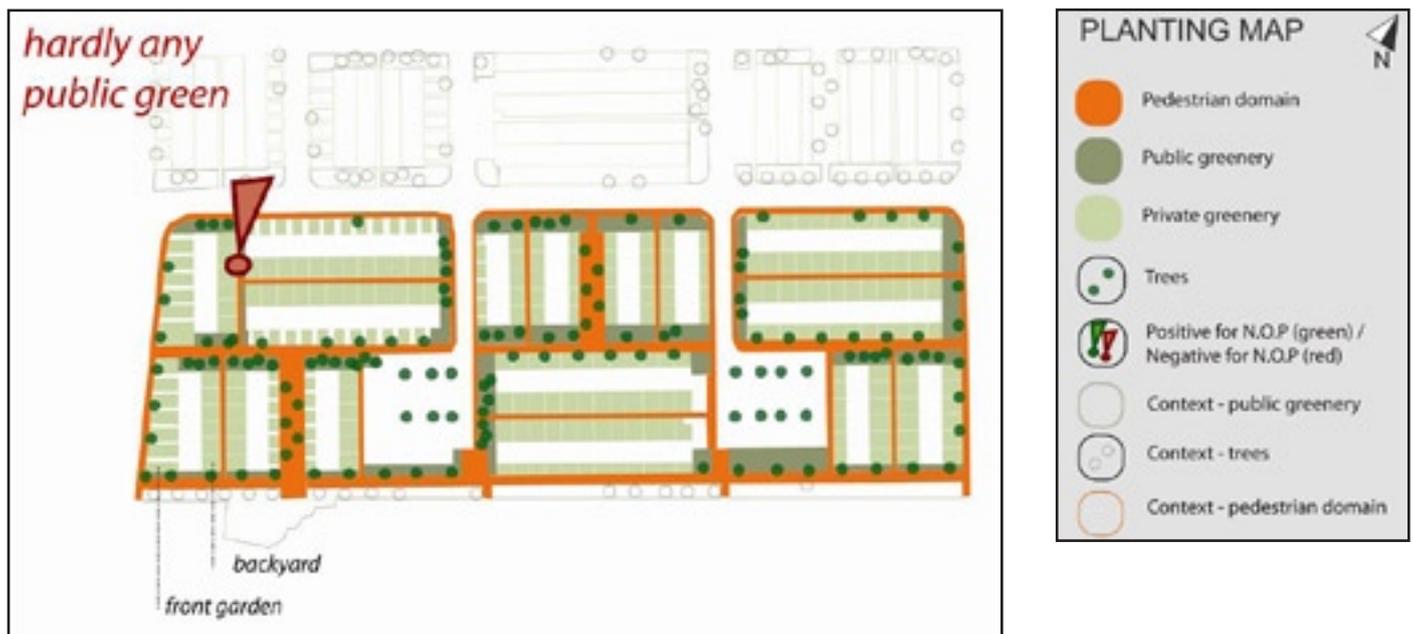


figure 7.32 / The types of green spaces

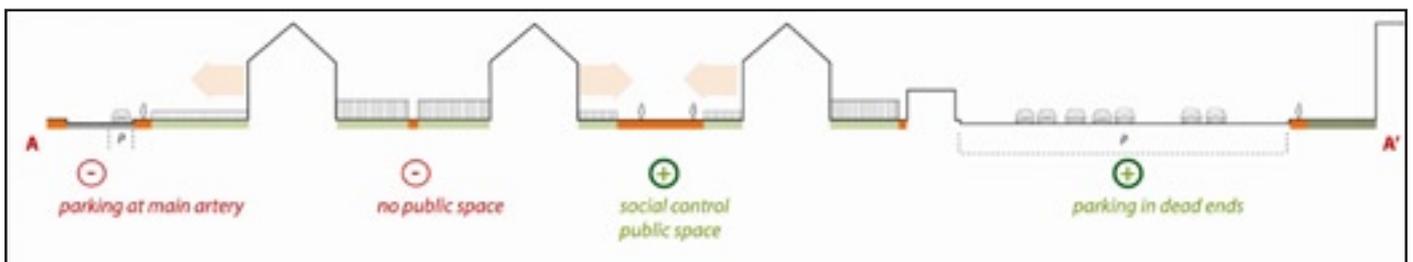


figure 7.33 / Section

2 PORTIEK FLAT BUILDING-UNIT



figure 7.34 / Portiek flat building-unit

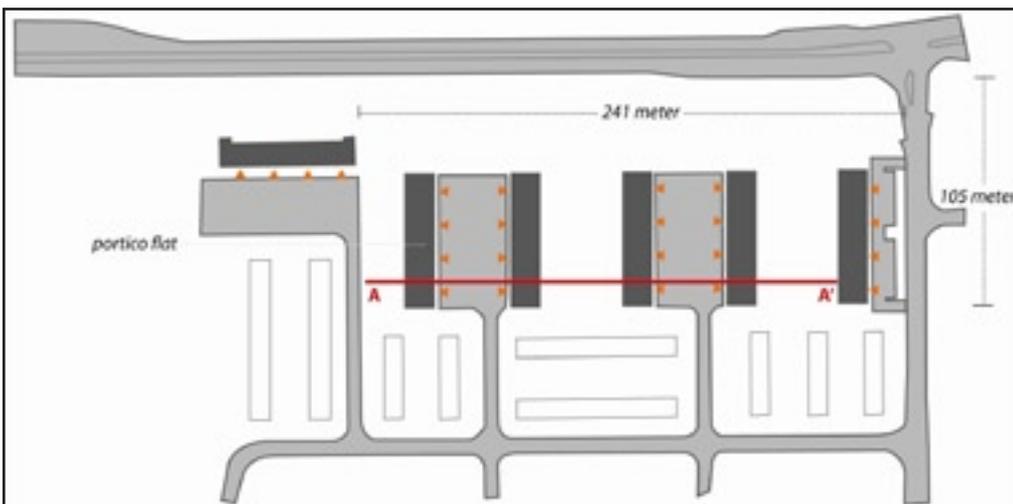


figure 7.35 / The composition of the buildings

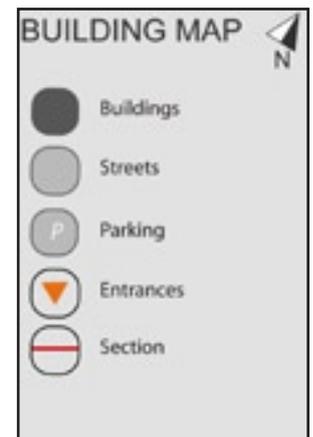


figure 7.36 / The infrastructure

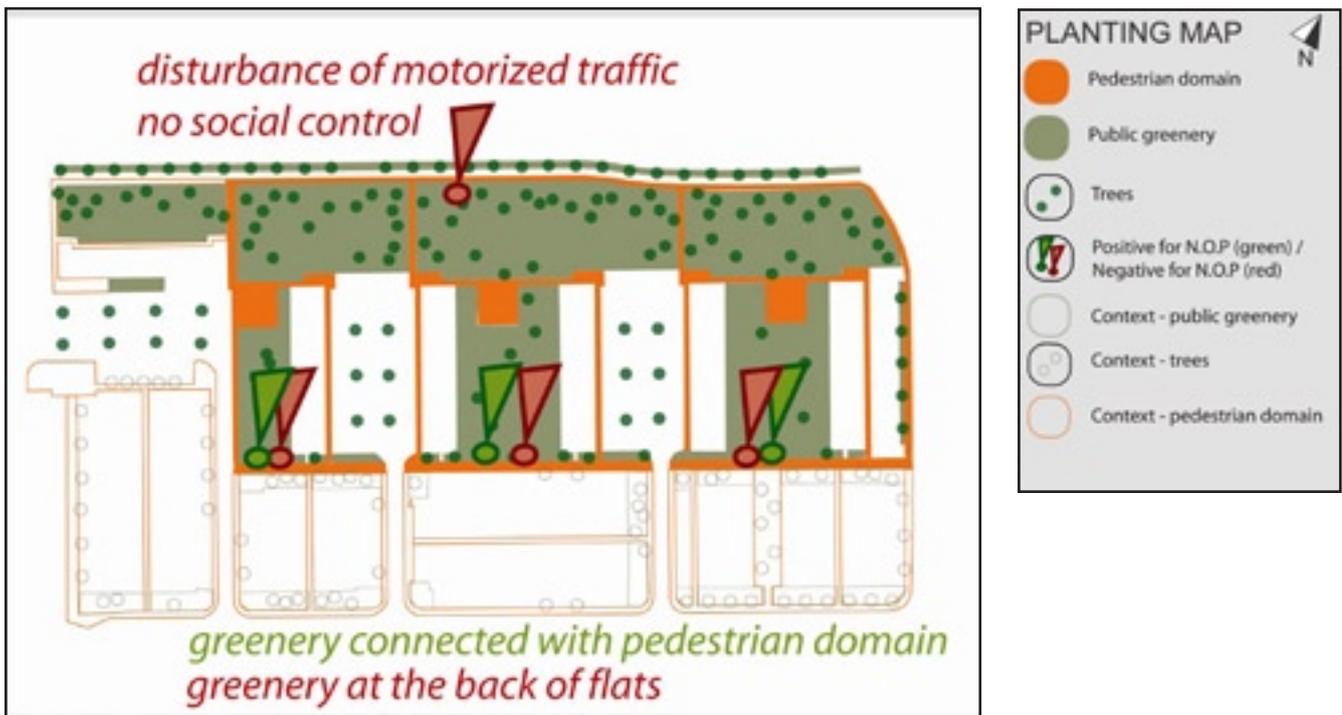


figure 7.37 / The types of green spaces

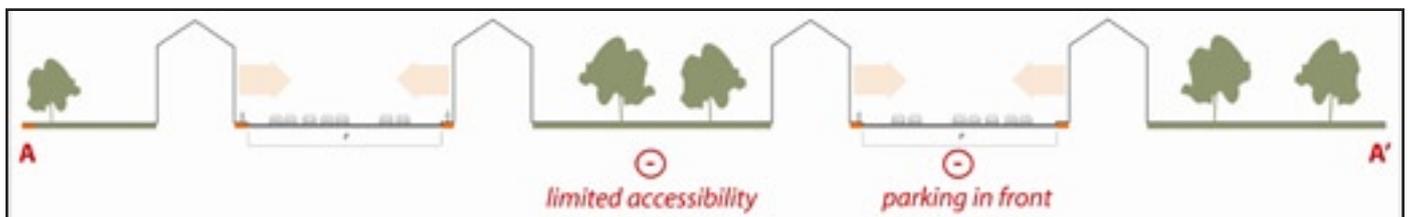


figure 7.38/ Section

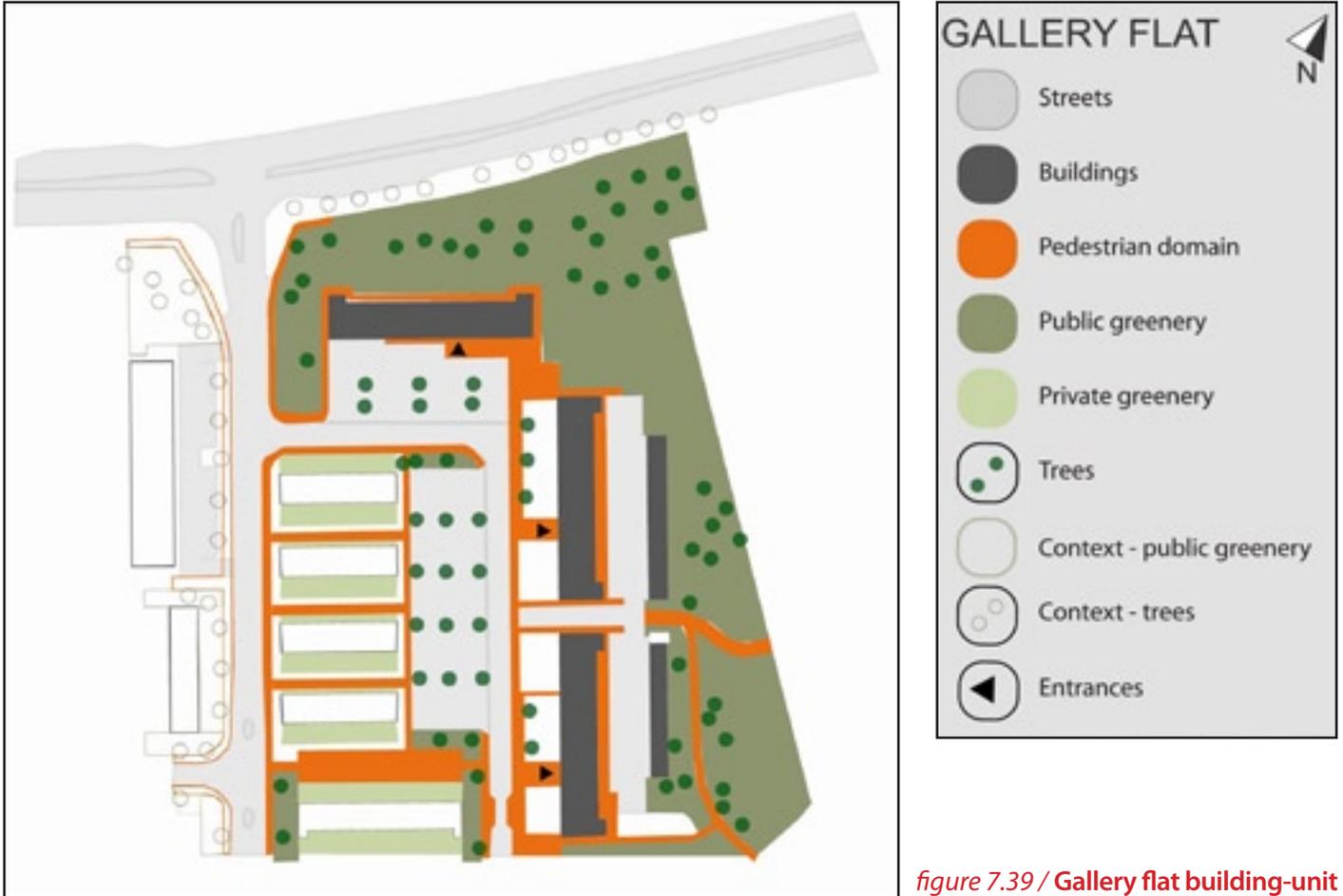


figure 7.39 / Gallery flat building-unit

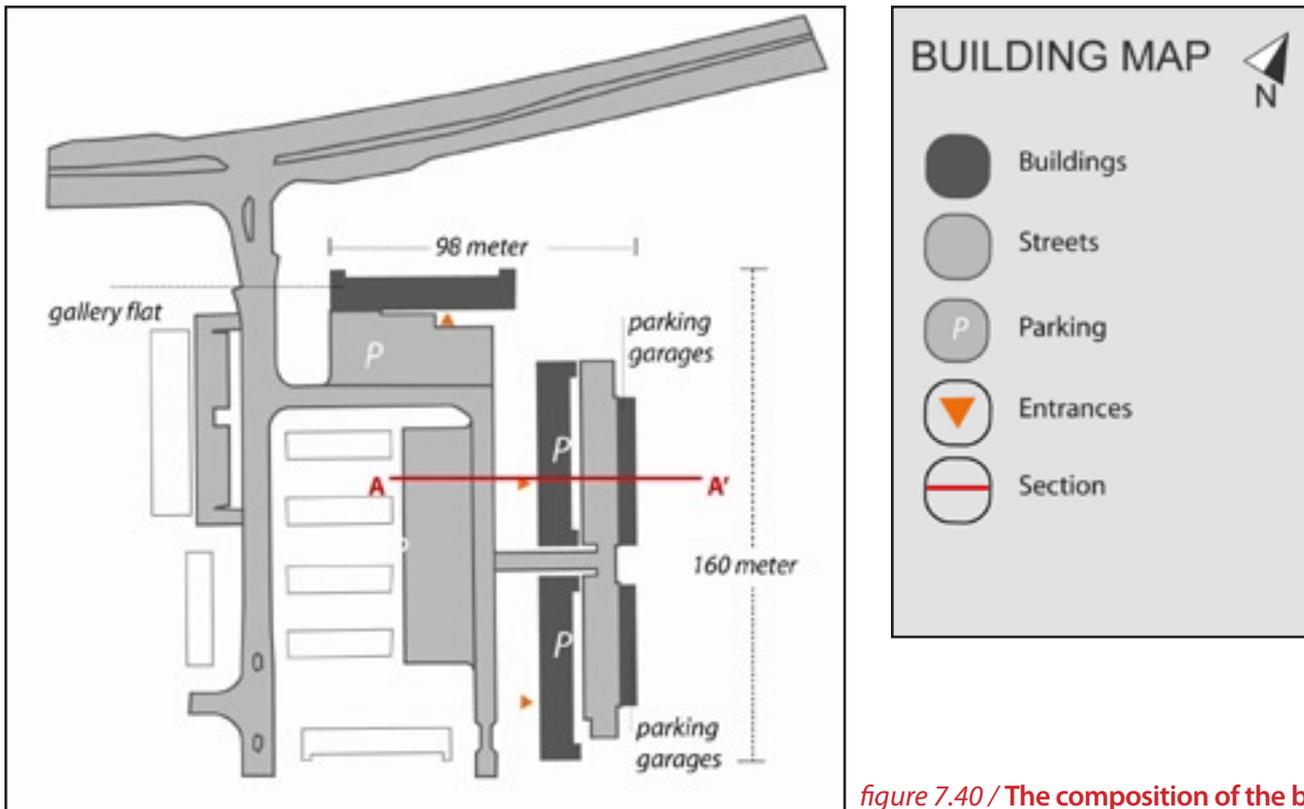


figure 7.40 / The composition of the buildings

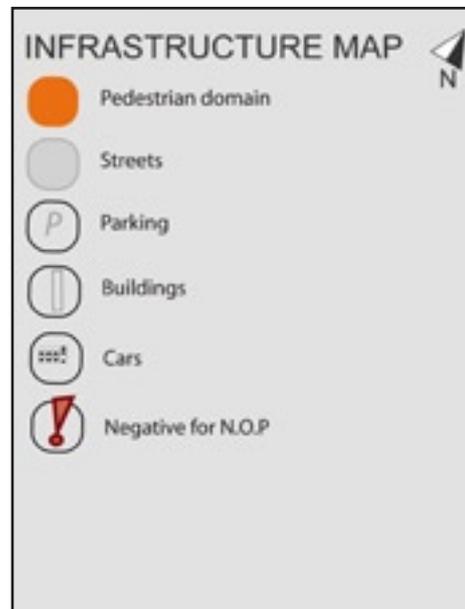
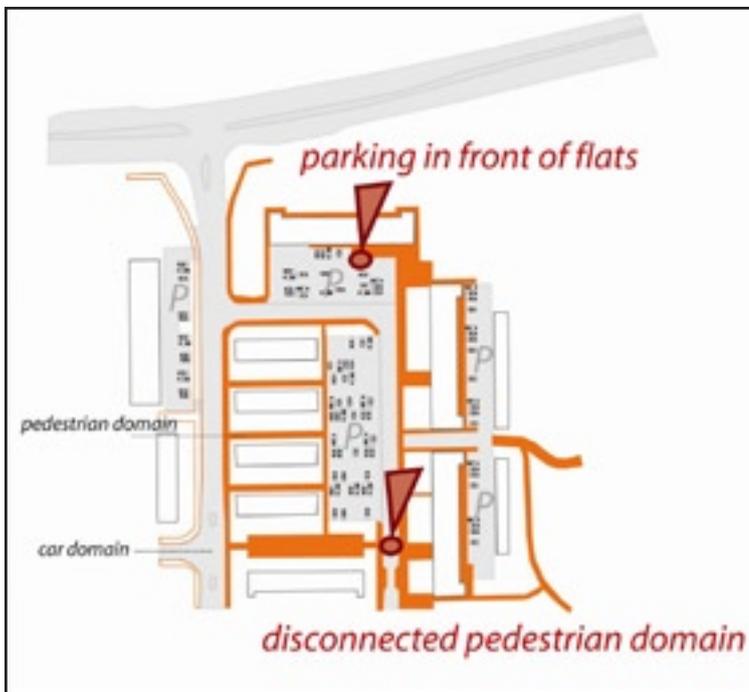


figure 7.41 / The infrastructure

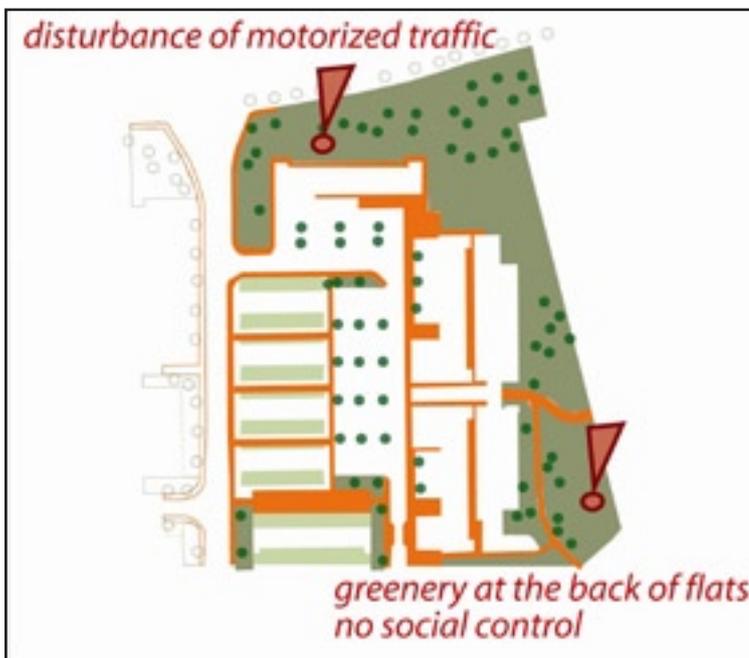


figure 7.42/ The types of green spaces

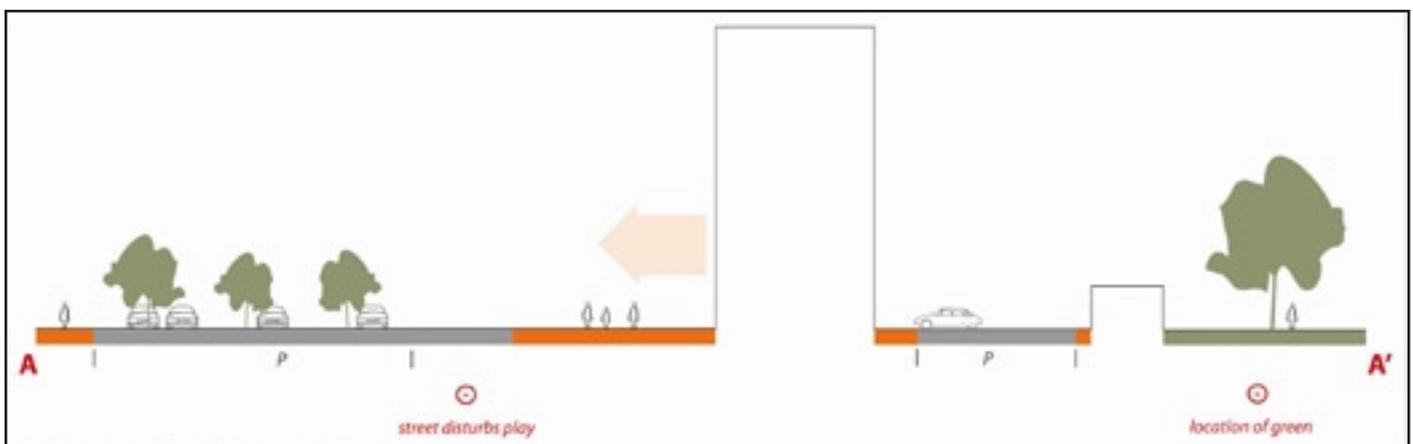


figure 7.43/ Section

7.4 Spatial criteria evaluation of the playability of urban types and typologies.

The detailed illustrations of the building-units of each typology show that the two typologies clearly have different characteristics and therefore face different limitations and opportunities for implementing the NOP-model.

The limitations and opportunities on the playability of the building-units and the typologies are summarized in spatial criteria diagrams.

Each building-unit per typology has been evaluated according to the spatial criteria. Paragraph 7.4.1 evaluates the “Na-oorlogse tuindorp” typology and paragraph 7.4.2 “de Wijkgedachte” typology.

The diagrams will be used again in chapter 10, the conclusion, to illustrate in which building-units (or typologies) the “Network Of Play” will be successful in improving the playability.

7.4.1 Randenbroek-zuid - “Na-oorlogse tuindorp” typology

Na-oorlogse tuindorp / Row house building-unit

SPATIAL CRITERIA FOR PLAYABILITY		
1	Quantity of Play	-
2	Location of Play	
	Amount of Social control	+
	Amount of Disturbance	-
	Environmental conditions	o
3	Accessibility of Play	
	Child-friendly connections	-
	Seperation from motorized traffic	-
4	Landscape use	-



1 QUANTITY OF PLAY

- There is hardly any public space/greenery (=potential play space) around and in-between the row houses. The existing public greenery around the portico flat (south, at the head of the building-block) has little social control. By lack of any public greenery, the sidewalk might have to function as the only potential play space.

2 LOCATION OF PLAY

- + **Amount of social control**
Because of the orientation of the row houses with their fronts to the streets, there is a lot of social control orientated towards the sidewalks. Unfortunately these provide little space for play.

- **Amount of disturbance**
The sidewalk as play space conflicts with the one-way streets. The small streets and the high car ownership result in parked cars on the sidewalks. These parked cars impede the movement of children and conflict with their play opportunities.

- o **Environmental conditions**
The lack of public space make the environmental conditions are hard to evaluate. The north-south orientaton of the row houses provide sufficient environmental qualities for play (sun, limited amount of shadow/wind).

3 ACCESSIBILITY OF PLAY

- Child-friendly connections**
The pedestrian domain is isolated, caused by the dominant car domain. Children have to cross a street to get out of their building-block.
- Seperation from motorized traffic**
There are no public spaces. Sidewalks that guide the movement of children are always connected to the car domain.

4 LANDSCAPE USE

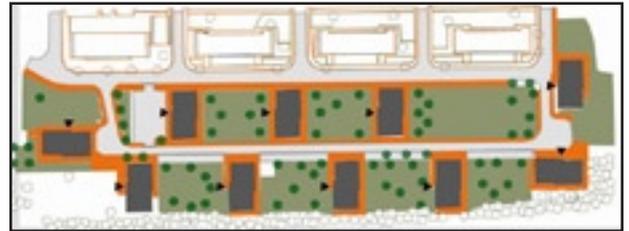
- There is hardly any public greenery. Therefore there is no use of the landscape. The public greenery around the portico flat is dominated by a bushy vegetation, which is not meant for playing purposes.

CONCLUSION

The "Quantity of Play", the "Accessibility of Play" and the "Landscape use" are insufficient. The "Location of Play" has enough social control (in case of the sidewalks as play area), but also has a high amount of disturbances. In this building-unit the playability is weak.

Na-oorlogse tuindorp/ Portiek I building-unit

SPATIAL CRITERIA FOR PLAYABILITY		
1	Quantity of Play	+
2	Location of Play	
	Amount of Social control	+
	Amount of Disturbance	o
	Environmental conditions	o
3	Accessibility of Play	
	Child-friendly connections	-
	Seperation from motorized traffic	-
4	Landscape use	-



1 QUANTITY OF PLAY

- + There is public greenery (=potential play space) surrounding every "portiek" flat.**

2 LOCATION OF PLAY

- + Amount of social control**
The public greenery is connected with the entrances/fronts of the buildings. This means that a lot of people are passing by and are looking on to it.
- o Amount of disturbance**
The public greenery is surrounded by low /medium intensity car roads causing some disturbance.

- o Environmental conditions**
The north-south orientation of the buildings are blocking parts of the greenery from sunlight.

3 ACCESSIBILITY OF PLAY

- Child-friendly connections**
The pedestrian domain around the buildings is isolated from its surroundings. Children need to cross a road or parking lot to be able to get further away from (or go back to) their homes.
- Seperation of motorized traffic**
All the public greenery is directly connected to car roads.

4 LANDSCAPE USE

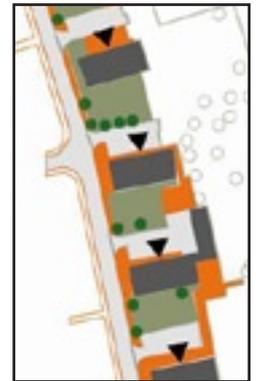
- There is plenty of greenery but of little variety and play potential (Qualities of Play).

CONCLUSION

The location of the potential play spaces is well located and the quantity is sufficient. It lacks in Accessibility of Play and Landscape use aspects. The building-unit has the potential to incorporate a better playability when accessibility aspects and Landscape use are improved.

Het Na-oorlogse tuindorp / Portiek flat II building-unit

SPATIAL CRITERIA FOR PLAYABILITY		
1	Quantity of Play	+
2	Location of Play	
	Amount of Social control	+
	Amount of Disturbance	-
	Environmental conditions	o
3	Accessibility of Play	
	Child-friendly connections	-
	Seperation from motorized traffic	o
4	Landscape use	-



1 QUANTITY OF PLAY

- + There is public greenery (=potential play space) surrounding every "portiek" flat.

2 LOCATION OF PLAY

- + **Amount of social control**
The potential play spaces (greenery) are located in-between the buildings. There is a high amount of social control because people are passing by or looking on to it.

- **Amount of disturbance**
Every public green spaces is connected to the main artery at the west. This causes a lot of disturbance from motorized traffic.

- o **Environmental conditions**
The potential play spaces (public greenery) can all receive enough sunlight. However, the building height might drop shadow on these spaces.

3 ACCESSIBILITY OF PLAY

- **Child-friendly connections**
Every potential play space (greenery) is located at the back of the accompanying building. If children want to reach these spaces they at least have to cross a parking lot. Entering the greenery from the west, means that children have to cross a busy car artery. Access from the east is also not possible, because the greenery in-between the buildings is isolated from the greenery at the east (by vegetation).

- o **Seperation from motorized traffic**
Every public green space is connected with the main artery to the west and to a parking lot.

- **LANDSCAPE USE**
There is no variety in size, form or textures in the greenery. It is also not connected with the greenery (park) at the east.

CONCLUSION

Like the other layout of the “portiek” building-unit, the weaknesses for playability are the accessibility aspects and the insufficient landscape use. More potential for play means improving the connection with the surrounding greenery and improving the accessibility towards the greenery.

Het Na-oorlogse tuindorp / Gallery building-unit

SPATIAL CRITERIA FOR PLAYABILITY		
1	Quantity of Play	+
2	Location of Play	
	Amount of Social control	+
	Amount of Disturbance	o
	Environmental conditions	o
3	Accessibility of Play	
	Child-friendly connections	o
	Seperation from motorized traffic	o
4	Landscape use	-



1 QUANTITY OF PLAY

- + There is public greenery (=potential play space) surrounding every gallery flat.

2 LOCATION OF PLAY

- + **Amount of social control**
The potential play spaces (greenery) are located in-between the buildings. There is a high amount of social control because people are passing by or looking on to it. The entrances of the buildings are also directly connected with public greenery.

- o **Amount of disturbance**
Because of a small parallel road, along the main artery at the west, the public greenery is not directly connected to the main artery. This decreases the amount of disturbance of motorized traffic.

- o **Environmental conditions**
The height of the buildings limit the amount of sunlight that could enter the public green spaces.

3 ACCESSIBILITY OF PLAY

- o **Child-friendly connections**
A north-south pathway going under the gallery flat acts as a decent child-friendly connection between the green spaces. The surrounding car domain and lack of connections with the rest of the neighbourhood frustrate a child's movement however.

- o **Seperation of motorized traffic**
The gallery building-unit shares a lot of its edges with high-intensity car roads. This strongly limits the movement of children.

4 LANDSCAPE USE

- No variety between the spaces and hardly any connections with surrounding greenery (to the east).

CONCLUSION

The location of play aspect is sufficient but could be better. Playability is strongly limited by the limited use of the landscape in the playable public spaces and limited Accessibility of Play aspect.

GENERAL CONCLUSION on the playability of “ het Na-oorlogse tuindorp” typology

From the previous building-unit evaluations can be concluded that:

- In the row house building-unit the total playability is weak;
- In the “portiek” flat building-units (I and II) the “Accessibility of Play” is weak;
- In the gallery flat building-unit the “Accessibilty of Play” is weak.

The composition of the building-units do not cover the total organisation of a typology. The facilities within a typology are often strategically located and have an important role in the total organisation of the typology. Therefore also the facility strip (see figure 7.5) has been evaluated as well.

For the facilities playability is not the most important aspect but accessibility. We analyzed the location of the facilities and their accessibility. Figure 7.44 illustrates that the facility strip is cut up in pieces, caused by the car domain. Every (child) facility is located along a ongoing car road (black lines in figure 7.44), which impedes the movement of children towards the facilities (red exclamation marks).



figure 7.44/ Shortcomings of typology relating to play opportunities for children

Relating to play opportunities for children

Attention should be paid to;

- The limiting effect on the unimpeded movement through the neighbourhood (by bike or by foot) caused by **increasing motorized traffic**.
(see figure 7.44: black lines)
- **The inaccessibility of the facility strip (facilities for children).**
Since the facility strip has been put in a green setting (potential play areas) it is important to combine it with play opportunities. (see figure 7.44: exclamation marks)
- **The inaccessibility of the neighbourhood park.**
The neighbourhood park is hardly accessible because it is surrounded by roads on all sides (see figure 7.44: bottom left exclamation mark).
- **Car-parking in streets.**
With the increased car- ownership the streets are turning into parking spaces, leaving no room for children to play. It also decreases safety because of lack of sight and obstruction of movement. (see figure 7.44: red crosses)

The design opportunities and their effectiveness are dependent on the available public space. Since there is little public space available in the row house building-units, this causes difficulties.

The NOP-model is weakest with little available public space and therefore on dense housing typologies.

The location (and resulting accessibility) of child facilities also determine the success or failure of the NOP-model. In this case, all child facilities are surrounded by car roads.

GENERAL CONCLUSION

The dominance of the car road system causes a lack of potential play spaces, obstructs movement between home, play space and child facilities and reduces the playability of the neighbourhood in general.

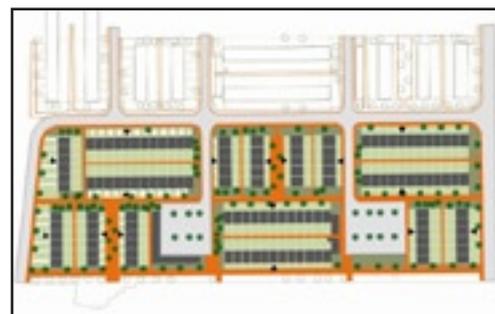
SOLUTION

Decrease the influence of the car domain.

This has to result in an improved "Accessibility of Play" for the child facilities and potential play spaces, improve the "Location of Play" of the potential play spaces as well as increase the "Quantity of Play" in certain building types (where necessary).

De Wijkgedachte / Row house building-unit

SPATIAL CRITERIA FOR PLAYABILITY		
1	Quantity of Play	o
2	Location of Play	
	Amount of Social control	+
	Amount of Disturbance	+
	Environmental conditions	+
3	Accessibility of Play	
	Child-friendly connections	+
	Seperation from motorized traffic	+
4	Landscape use	-



1 QUANTITY OF PLAY

○ There is hardly any public greenery. Hardened surfaces (squares) in-between row houses provide opportunities for play, but they have a limited size and are limited in number.

2 LOCATION OF PLAY

⊕ **Amount of social control**
Public spaces (squares) are orientated towards the front of the buildings; resulting in good social control.

⊕ **Amount of disturbance**
The public squares are hardly influenced by noise or pollution from their surroundings.

⊕ **Environmental conditions**
Sunlight is not blocked by the low-rise buildings. The buildings are effective to protect the squares against unpleasant conditions like heavy wind.

3 ACCESSIBILITY OF PLAY

⊕ **Child-friendly connections**
The pedestrian domain connects all the potential play spaces (squares) with each other. The pedestrian domain is only interfered by entries to parking lots.

⊕ **Seperation from motorized traffic**
Along the edge of the building-unit is a main car artery situated, which makes access to and from the building-unit difficult. The potential play spaces however, are completely seperated from motorized traffic.

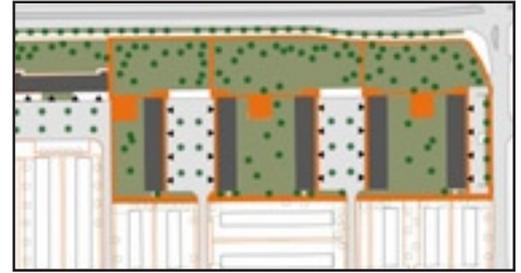
4 LANDSCAPE USE

⊖ Since there is little public greenery, the building-unit is limited in the use of landscape elements. Trees and shrubs are used for visual purposes, not for playing purposes.

CONCLUSION

The location- and accessibilty aspect provide good opportunities for play. The playability of the building-unit lacks only in the amount of available potential play space and the use of landscape elements (for play).

SPATIAL CRITERIA FOR PLAYABILITY		
1	Quantity of Play	+
2	Location of Play	
	Amount of Social control	o
	Amount of Disturbance	o
	Environmental conditions	+
3	Accessibility of Play	
	Child-friendly connections	o
	Seperation from motorized traffic	o
4	Landscape use	-



1 QUANTITY OF PLAY

- ⊕ There is public greenery (=potential play space) surrounding every "portiek" flat with a couple of formal play areas.

2 LOCATION OF PLAY

- **Amount of social control**
The greenery at the north can not be viewed from inside the buildings. The other green spaces are located at the back of the buildings, but are in sight of people that are inside the buildings.
- **Amount of disturbance**
The northern green space is located along a busy city car artery and therefore has a lot of disturbance from motorized traffic. However, the green spaces in between the buildings are positioned further away resulting in less disturbance.
- ⊕ **Environmental conditions**
The orientation of the buildings and their distances from each other result in good environmental conditions. Enough sunlight enters the potential play spaces and it is not exposed to heavy wind.

3 ACCESSIBILITY OF PLAY

- **Child-friendly connections**
The public greenery is connected with the pedestrian domain but not directly to the entries of the flats.
 - **Seperation from motorized traffic**
A busy car road runs along the northern strip of greenery. The public greenery located at the west is also not seperated from motorized traffic. The other public green spaces in between the "portiek" flats are free from motorized traffic.
- ## 4 LANDSCAPE USE
- ⊖ There is a sufficient amount of public greenery, but there is little variety in the use of landscape elements.; plain fields of grass with a couple of trees.

CONCLUSION

In general this building-unit scores neutral for its playability. Strengthening the "Location of Play" and the "Accessibility of Play" will make this an excellent building-unit to provides opportunities for play. The "Landscape use" needs to be improved to succeed in creating succesful play spaces.

SPATIAL CRITERIA FOR PLAYABILITY		
1	Quantity of Play	+
2	Location of Play	
	Amount of Social control	o
	Amount of Disturbance	-
	Environmental conditions	-
3	Accessibility of Play	
	Child-friendly connections	-
	Seperation from motorized traffic	o
4	Landscape use	-



1 QUANTITY OF PLAY

+ A lot of public greenery (=potential play space) is located at the back of the gallery flats. In front of the two north-south orientated flats are two small strip of formal playgrounds.

2 LOCATION OF PLAY

o **Amount of social control**
There is little social control on the public greenery because it is located at the back of the flats. The formal playgrounds have a lot of social control because they are connected with the entrances into the buildings and a road runs along them.

- **Amount of disturbance**
The formal playgrounds have a lot of disturbance because of the road running next to it. The public greenery at the north is disturbed by a busy city car road to the north and the highway to the east.

- **Environmental conditions**
The building height drops a lot of shadow on the public spaces. The formal playgrounds are not protected from any wind or over-exposure of sunlight.

3 ACCESSIBILITY OF PLAY

- **Child-friendly connections**
The neighbourhood road in front of the gallery flats impedes the movement of children. There is also no child-friendly connection towards the public greenery. Children have to cross a parking lot to enter the greenery.

o **Seperation from motorized traffic**
The public greenery is partially seperated from motorized traffic. The playgrounds however are not.

4 **LANDSCAPE USE**
- The existing greenery is of poor quality. It is not designed and only seems to function as "buffer groen"(buffer greenery).

CONCLUSION

The location and accessibilty aspects are weak, and also the use of landscape elements is weak. There is enough potential play space, but it does not make the building-unit any more playable.

GENERAL CONCLUSION on the playability of "de Wijkgedachte" typology

From the previous building-unit evaluations can be concluded that:

- In the row house building-unit the opportunities for play are good;
- In the "portiek" flat building-units the "Location of Play" and "Accessibility of Play" could be improved;
- In the gallery flat building-unit the "Location of Play" and the "Accessibility of Play" are weak.

The composition of the building-units do not cover the total organisation of a typology. The location and accessibility of (child) facilities are not included in building-unit evaluations.

Figure 7.45 illustrates the dominance of the car

domain and how this affects the facilities (purple colour). The north-south orientated facility strip in the east, is totally surrounded by car roads and hardly possesses any public greenery/potential play space. For children, access of facilities is problematic since they need to cross a road to get to the facility. The school (facility) in the west is also orientated towards the car road, while at the back there is a neighbourhood park.

The figure (7.45) also illustrates that a lot of the neighbourhoods greenery is located at the edge. The spatial criteria evaluation of the building-units and the evaluation of Primary play spaces in chapter 6 already showed that these spaces are not the most suitable play areas.



figure 7.45/ Shortcomings of typology relating to play opportunities for children

Relating to play opportunities for children

When evaluating the building-units, it is apparent that most of the public greenery (=potential play space) are on the edges of the neighbourhood (see figure 7.45). Relocating the public greenery towards the center of the neighbourhood will prove to be more space efficient, as it;

- **Stimulates more social cohesion/integration:** people passing by or looking on to it.
- **Is less vulnerable to hazardous environments.**
- **Has a higher carrying capacity;** because more residents pass through it.
- **Is better accessible for children;** because it has access from different sides, and directly from the home of children.
- **Therefore provides a better starting point for play and recreation.**

The road system should play an additional role in the urban fabric, but not be a leading principle. Adaptations on this road system concern;

- **Relocation of parking lots.** They are situated in front of the buildings which stimulates car traffic towards the front door.
- **Relocation of main arteries.** By relocating intensively used roads towards the border of the neighbourhood/ building-unit, it stimulates a child friendlier movement inside the neighbourhood.
- **Frequently visited child facilities should be as free from motorized traffic as possible.** A child facility that has been cut off of the pedestrian- and cyclist network discourages a child or parent to go there by bike or by foot.

Proficient public space makes it easier to implement the NOP-model. There is a lot of public greenery situated at the edge of the neighbourhood. This however, does not guarantee a good playability. Common problems are parking in front of the flats and unused/ineffective greenery for play. The road system is still dominant, since it disconnects all child-facilities from the pedestrian-/cyclist domain.

GENERAL CONCLUSION

The dominance of the road system impedes the child-movement towards child facilities and play spaces. Most public greenery at the edge of the neighbourhood is unsuitable for play.

SOLUTION

Relocate public space (existing greenery) from the edge of the neighbourhood towards the center. This will require changing the car road system.



7.5 Similar urban typologies in the Netherlands

Now that we have thoroughly examined “het Naoorlogse tuindorp” and “de Wijkgedachte” typologies, we want to illustrate in this chapter that these typologies exist all over the Netherlands.

Our proposed solutions and therefore our method of implementing the NOP-model are thus not only site-specific. Our aim was to develop a method that is applicable to more than just one case-area. With this model we hope to provide designers a necessary tool to take children into account in city planning.

We will examine four different districts in four different cities to illustrate the similarities with our case-study area in “Randenbroek-Schuilenburg”. These are:

- 1 Soesterkwartier, Amersfoort
(het Naoorlogse tuindorp)
- 2 De Bennekel, Eindhoven
(het Naoorlogse tuindorp)
- 3 Presikhaaf, Arnhem
(de Wijkgedachte)
- 4 Overdie, Alkmaar
(de wijkgedachte)

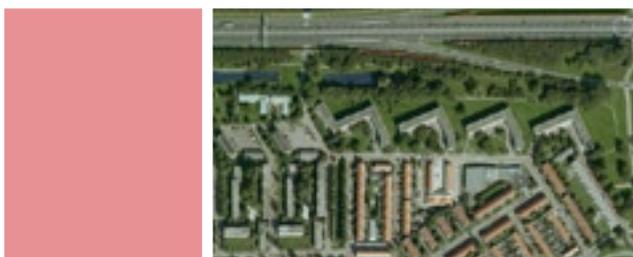
Because of site characteristics or the influence of designers, certain typologies do not always appear in their purest, most characteristic forms. However, these district might still have common problems which are characteristic for that typology. With the implementation the NOP-model, designers might therefore encounter the same problems and need the same solutions. Other neighbourhoods/districts in the Netherlands that are (partly) realised according to these typologies are:

- Malburgen, Arnhem
(het naoorlogse tuindorp)
- Ondiep, Utrecht
(het naoorlogse tuindorp)
- Vreewijk, Rotterdam
(het naoorlogse tuindorp)

“De wijkgedachte” characteristics can be found in almost every medium-sized city in the Netherlands; like Apeldoorn, Zwolle or Nijmegen.



Apeldoorn



Zwolle



Nijmegen

7.5.1 Soesterkwartier, Amersfoort (source: de Boer, 1987)

Like “Weberstraat” and “Bachweg” in the district “Randenbroek”, this district is also designed accordingly the design principles of the typology “het naoorlogse tuindorp” (see figure 7.47):

- Row houses, grouped in open building-units (see figure 7.47: black box).
- Multi-level apartments at the edge of the city/neighbourhood as explicit features; to function as a kind of visual entrance into the city (see figure 7.47: orange box).
- The main artery that connects the neighbourhood with the center of the district does not run through the middle of the neighbourhood.
- A residential environment in which green spaces dominate (see figure 7.47)
- Facilities in a green setting
- A central, elongated green element

This district also faces problems like:

- **Parking of cars in the streets.**
The streets are too narrow, therefore cars also park on the sidewalk, interfering children’s movement and play opportunities.
- **Available public greenery is surrounded by car roads at all sides.**
Children have to cross the road to get to the child-facilities or the centrally located neighbourhood park.



figure 7.46/ Aerial photograph of Soesterkwartier



figure 7.47/ Map of Soesterkwartier, Amersfoort

7.5.2 De Bennekel, Eindhoven (source: de Boer, 1987)

This district is also typically designed according to “het naoorlogse tuindorp” typology (see figure 7.49):

- A facility strip separates the neighbourhood into groups of building-units.
- Row houses, grouped in open building-units (see figure 7.49: black box).
- Multi-level apartments at the edge of the city/neighbourhood as explicit features; to function as a kind of visual entrance into the city (see figure 7.49: red box).
- The main artery that connects the neighbourhood with the center of the district does not run through the middle of the neighbourhood.

What is most noticeable in this district is the lack of public spaces/greenery in the row house building-units. The district depends on the available greenery in the center of the district. Although this is the only public space that is available, it is hardly accessible; a common problem in districts that are realised in the 1950-1960's. The districts Soesterkwartier and Randenbroek also illustrate this.



figure 7.48/ Aerial photograph of De Bennekel



figure 7.49/ Map of De Bennekel, Eindhoven

7.5.3 Presikhaaf, Arnhem (source: de Boer, 1987)

The dominance of the car, like in “de wijkgedachte” typology, is clearly present in this district. Typical are:

- **A clear, straight-forward road system.**
Facilities and homes must be easily accessible by car. This strongly interferes with the pedestrian domain and therefore it impedes the child movement through the neighbourhood/district.
- **Repetative building-units.**
- **Existing greenery is located at the edge of the neighbourhood/district.**

The existing greenery is hardly accessible because it is surrounded by wide, busy car roads. The greenery mostly functions as a buffer between high-rise buildings and busy roads and therefore are not designed for playing or recreational purposes.

Many of these characteristics are visible in the “Schuilenburg-Noord” neighbourhood.

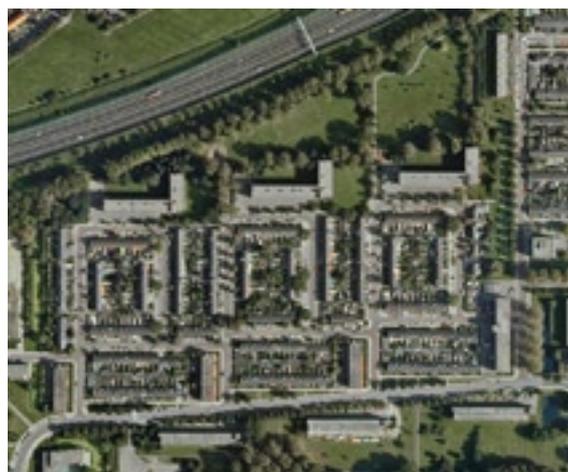


figure 7.50/ Aerial photograph of Presikhaaf



figure 7.51/ Map of Presikhaaf, Arnhem

7.5.4 Overdie, Alkmaar (source: de Boer, 1987)

Again, a typical 1960-1970's district which favours an easy car movement over an easy pedestrian movement through the neighbourhood/district.

Existing greenery is located at the edge of the neighbourhood/district and act as a buffer between the high-rise buildings and the highway.

Like in "Presikhaaf" (see figures 7.50 and 7.51) and "Schuilenburg-noord" the greenery at the border of the neighbourhood/district is not connected to the entrances of the buildings. This does not help stimulate children to go outside and play (Karsten 2001).



figure 7.52/ Aerial photograph of Overdie



figure 7.53/ Map of Overdie, Alkmaar

chapter

8



Calvin & Hobbes
a comic by Bill Watterson

NOP-model on neighbourhood-level

The NOP model works from the district level down to the neighbourhood level (and optionally even the individual play spaces). The district masterplan, as described in chapter 6, acts as a guide to the further development of the 'Network Of Play' in the separate neighbourhoods within the district.

Chapter 7 resulted in general conclusions on the playability of the urban typologies and building units present in the two neighbourhoods.

The results described in this chapter, together with the conclusions of chapter 7 will make clear which design interventions are necessary to improve the playability of these neighbourhoods.

8.1 NOP-model implementation

The district Masterplan sets the basic structure of the Network Of Play; the location of the primary play spaces and the location of the childweb. It however does not mention the playability of secondary play spaces nor how the "Qualities of play" should be spread out over all the available play spaces. The neighbourhood level implementation of the NOP model treats these issues (see figure 8.1).

Again, 3 elements of the NOP model are apparent:

- the primary play spaces;
- the secondary play spaces, and;
- the childweb.

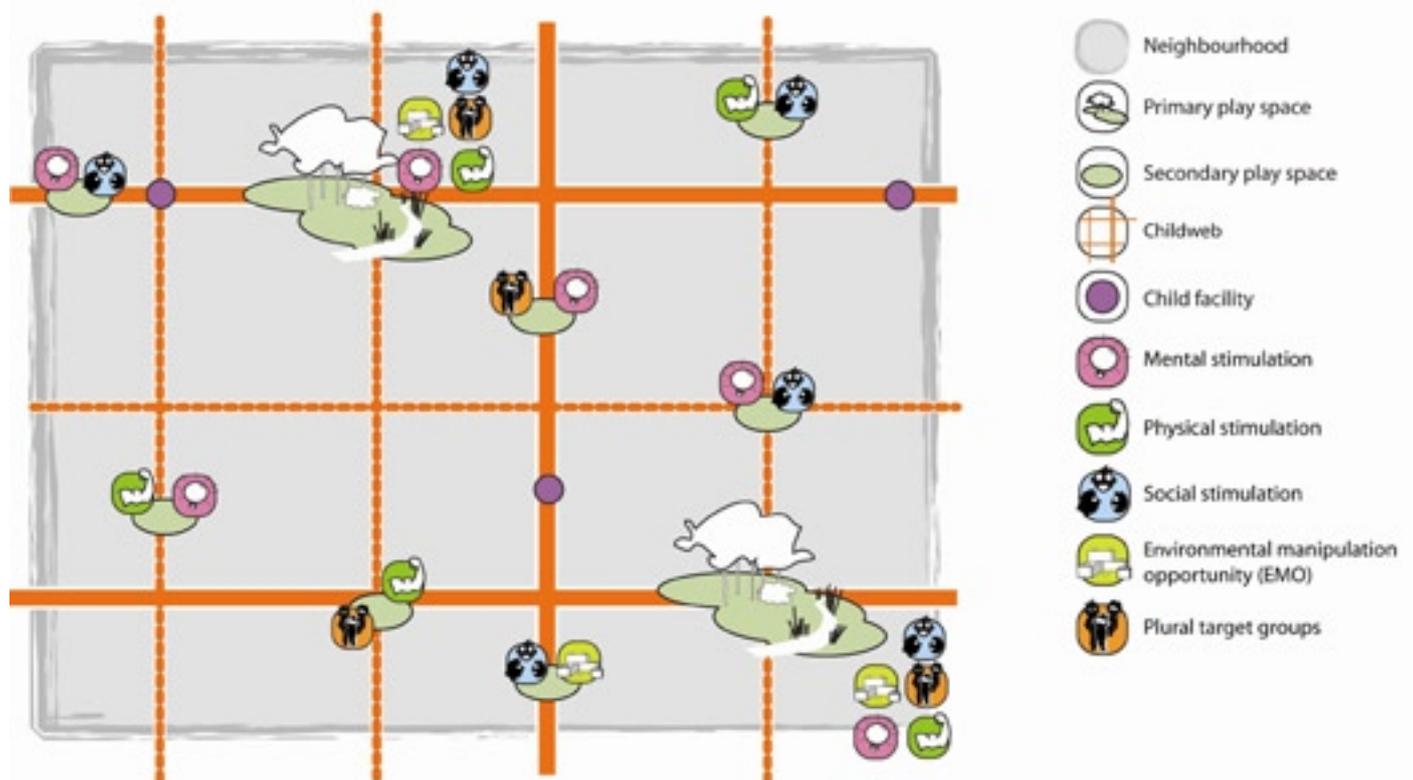


figure 8.1 / Concept of the NOP-model with the dispersion of the play qualities.

Primary play spaces are connected with child facilities by primary childlines. Secondary play spaces are mostly connected to the network by secondary childlines. Primary play spaces contain all the five “Qualities of play” (see section 5.2.4) but secondary play spaces only several. An even spread of these “Qualities of play” over the spaces in a neighbourhood assures different play experiences for children; no potential play space is the same.

It is however not yet clear which spaces in the neighbourhood are actually suitable for children’s play activities nor how the spread of the “Qualities of Play” look on an actual neighbourhood. In other words; which spaces can be designated as secondary play spaces and which qualities do they contain? The primary play spaces have been determined in the district implementation (chapter 6) so these do not have to be checked again.

The shape of the “Network Of Play” is dependant on the characteristics of the neighbourhood it is implemented in. It is therefore interesting to look at how the NOP differentiates itself in different urban typologies. In chapter 7 the two case neighbourhoods and their specific urban types were already analysed in detail on their playability.

The neighbourhood level implementation of the NOP goes through several steps, just as the district level approach. These steps are:

- 1 Determine potential secondary play spaces.
- 2 Spread of the “Qualities of play” over primary and secondary play spaces.
- 3 Overlay the “Network Of Play” masterplan and locate conflicts.

1 Determine potential secondary play spaces

While on the district level the first step entailed determining the primary play spaces. On neighbourhood level implementation it is the secondary play spaces that require a more thorough analysis on their suitability for play activities.

The neighbourhood criteria diagram (see figure 8.2, and 8.3) tests every potential outdoor formal and informal play space on their suitability as a secondary play space. This is done by analyzing aerial photographs, making analysis maps and taking site visits.

The determined potential play spaces are tested on their playability with the NOP criteria list just like was done in chapter 6. Figure 8.2 shows the criteria diagram for Randenbroek-zuid while figure 8.3 shows the criteria diagram for neighbourhood Schuilenburg-noord. Note that Randenbroek-zuid does not contain the northern part as shown in figure 7.2. A major car road divides these parts in such a way that the northern part would always be divided from the other part. We consider this road as the edge of the neighbourhood Randenbroek-zuid. Therefore our test-case has the same borders as the neighbourhood “Weberstraat” in the municipality’s legislation.

Again the “Location of play” and “Accessibility of play” criteria are essential for deciding which spaces can be designated as secondary play spaces.

Areas marked with a red “x” are determined to be unsuitable for play activities. These areas have a low score for “Location of play” and/or “Accessibility of play” and are therefore unsuitable for children’s play activities (see figure 8.2).

N: Wijkdeel Place	Location of Play			Accessibility of Play		Quality of Play						Size	Landscape use	Formal (F) or Informal play area (I)	
	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	P.T.G.	P	S	M				
1A	+	0	0	-	0	-	-	-	-	0	0	-	+	-	F (I)
1B	+	0	0	-	0	-	-	-	-	0	0	-	+	-	F (I)
1C	0	+	+	+	+	-	0	-	-	0	0	+	0	-	I
2A	+	-	0	-	-	-	-	-	-	0	0	+	-	-	I
2B	+	-	0	-	-	-	-	-	-	0	0	-	0	-	I
2C	+	-	0	-	-	-	-	-	-	0	0	-	0	-	I
2D	+	-	0	-	0	-	-	-	-	0	0	-	0	-	I
2E	+	-	0	-	0	-	-	-	0	-	-	0	-	-	F (I)
2F	+	-	0	-	0	-	-	-	-	0	0	-	0	-	I
2G	+	-	0	-	0	-	-	-	-	0	0	-	0	-	I
2H	0	-	0	-	0	-	-	-	-	0	0	-	0	-	I
3A	0	+	+	0	+	nr	nr	nr	nr	nr	nr	+	0	-	F
3B	+	-	+	-	-	-	-	-	-	-	-	+	-	-	I
4A	0	0	0	-	-	-	-	-	-	-	-	+	-	-	I
4B	0	0	0	-	0	-	0	-	-	0	0	+	0	-	I
4C	+	-	0	-	-	-	-	-	-	-	-	+	-	-	I
4D	0	-	+	-	-	-	-	-	-	-	-	0	-	-	I
5	0	-	0	-	-	-	-	-	-	-	-	+	-	-	I
5A	0	0	0	-	-	-	-	-	-	-	-	+	-	-	I
6B	+	0	0	-	-	-	-	-	-	-	-	+	-	-	I
6C	-	0	-	-	+	-	-	-	-	-	-	-	-	-	I
6D	-	0	-	0	+	-	-	-	+	0	-	+	-	-	F
7A	+	0	0	0	0	-	-	-	-	-	-	+	-	-	I
7B	+	0	0	0	0	-	-	-	0	-	-	+	-	-	F (I)
7C	+	0	0	0	0	-	-	-	0	-	-	+	-	-	F (I)
7D	+	0	0	0	0	-	-	-	-	-	-	+	-	-	I
8A	+	-	0	-	-	-	-	-	-	-	-	+	-	-	I
8B	+	-	0	-	-	-	-	-	0	-	-	+	-	-	I
8C	+	-	0	-	-	-	-	-	-	0	0	+	-	-	F (I)
9A	-	-	0	-	+	-	0	-	0	-	-	+	0	-	I
9B	-	0	+	-	-	nr	nr	nr	nr	nr	nr	+	-	-	F
10A	0	-	0	-	-	-	-	-	-	-	-	0	0	-	I
10B	0	-	0	-	-	-	-	-	-	-	-	0	0	-	I

N = Neighbourhood
 C = Complexity
 E.M.O. = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space
 (+) Good
 (0) Neutral
 (-) Bad
 X Un-suitable play space



figure 8.2 / Neighbourhood criteria-checklist Randenbroek-zuid

N: Schuilenburg N	Location of Play			Accessibility of Play		Quality of Play						Size	Landscape use	Formal (F) or Informal play area (I)	
	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	P.T.G.	P	S	M				
Place															
1A	+	-	-	0	0	-	-	-	-	-	-	-	-	-	I
1B	-	-	0	0	0	-	-	-	0	-	-	-	-	-	F/I
1C	0	+	+	0	0	-	-	-	0	-	-	-	-	-	F/I
1D	+	+	+	0	+	-	-	-	0	0	-	-	-	-	F/I
1E	+	+	+	0	+	-	-	0	0	0	-	-	-	-	F/I
1F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I
2A	0	+	0	+	+	-	-	-	0	-	-	-	-	-	I
2B	0	+	0	0	0	-	-	-	0	-	0	-	-	-	I
3A	+	+	+	+	+	-	-	-	-	-	-	-	-	-	I
3B	+	+	+	+	+	-	-	-	-	-	-	-	-	-	I
3C	+	+	+	+	+	-	-	-	-	-	-	-	-	-	I
3D	+	+	+	0	0	-	-	-	-	-	-	-	-	-	I
3E	+	+	+	0	0	-	-	-	-	-	-	-	-	-	I
3F	-	-	0	-	-	-	-	-	-	-	-	-	-	-	I
4A	0	-	0	-	-	-	-	-	0	-	-	-	-	-	F
4B	0	-	0	-	-	-	-	-	0	-	-	-	-	-	F
4C	0	0	-	0	0	-	-	0	0	-	-	-	-	-	F/I
4D	+	0	+	0	0	-	-	0	0	-	-	-	-	-	F/I
4E	+	0	+	0	0	-	-	-	-	-	-	-	-	-	I
4F	+	0	+	-	-	-	-	0	0	-	-	-	-	-	F
5A	+	0	0	0	0	-	-	-	0	-	-	-	-	-	F/I
5B	+	0	0	0	0	-	-	-	0	0	-	-	-	-	F/I
5C	0	-	0	-	-	-	-	-	-	-	-	-	-	-	I
6A	+	0	+	0	0	-	-	-	-	-	-	-	-	-	I
6B	+	+	+	+	+	-	-	-	-	-	-	-	-	-	I
6C	+	+	+	+	+	-	-	-	-	-	-	-	-	-	I
6D	+	+	+	+	+	-	-	-	-	-	-	-	-	-	I
7A	+	-	0	-	-	-	-	-	-	-	-	-	-	-	I
7B	0	+	0	0	+	-	-	0	-	0	-	-	-	-	I
8A	+	0	+	+	+	-	-	0	0	0	-	-	-	-	I
8B	-	-	0	-	-	-	-	0	-	-	-	-	-	-	I
9A	-	-	0	+	+	-	-	-	-	-	-	-	-	-	I
9B	-	-	0	+	+	-	-	0	0	-	-	-	-	-	F/I
9C	-	-	-	-	+	-	-	-	-	-	-	-	-	-	I
10	-	-	-	-	0	nr	nr	nr	nr	nr	nr	-	-	-	F

N = Neighbourhood
 C = Complexity
 E.M.O. = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space

 (+) Good
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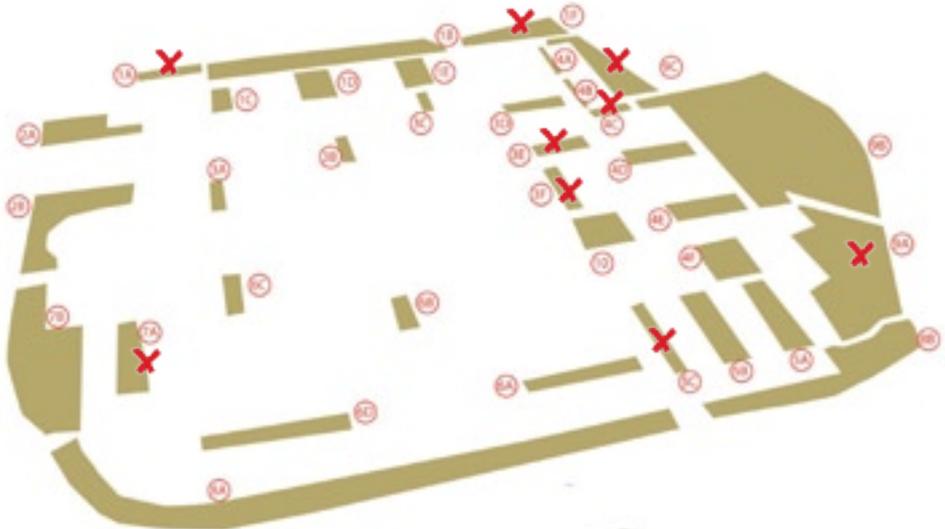


figure 8.3 / Neighbourhood criteria-checklist Schuilenburg-noord

Example Schuilenburg-noord:

Area 1F scores badly (-) on every point of "Location of play" and "Accessibility of play". This space consists of a dirty field of grass with a few mature trees. It lies between the back of a gallery flat and a busy car road. It therefore scores badly for social control, disturbance and separation of motorized traffic. Furthermore it lies mostly in the shade scoring badly for environmental conditions and has no clear connection to other parts of the neighbourhood (scores badly for child-friendly connections). Place 1F is therefore no more than some buffer-greenery between gallery flat and car road. It is decided this space would be very difficult to change into a suitable play space and is therefore discounted.

Current playability

The criteria diagrams leads to an existing playability map for both neighbourhoods (see figures 8.4 and 8.5). The green areas with a red border are secondary play spaces that are weak in either "Location of play" and/or "Accessibility of play" -criteria but are not necessarily completely unsuitable for play activities.

The analysis also designates where certain "Qualities of Play" are already apparent (score 0 or + in the criteria-diagram). In both neighbourhoods these qualities are only minimally present.



figure 8.4 / Current playability Randenbroek-zuid



figure 8.5/ Current playability Schuilenburg-noord

Example Schuilenburg-noord

Area 1B (see figures 8.3 and 8.5) has similar “Location of play” characteristics as the earlier mentioned area 1F. Area 1B lies along the same road as 1F, meaning it scores badly for disturbance. The surrounding residential buildings, consisting of portiek flats, to the south are positioned with their sides to 1B, so there is no direct line of sight from a residential building on this space (meaning it scores badly (-) for social control). Space 1B however is directly connected to public space between these portico flats, but not directly to the entrances of the buildings, so it scores neutral (o) for child-friendly connections.

It scores neutral (o) on separation from motorized traffic as only the northern part runs along a road, the south end is free of any on-going car roads.

The location characteristics are not ideal here, but it is not enough reason to discount this space entirely. To make it more playable the social-control and especially the disturbance characteristics of these areas should be improved.

(see section 7.3.1 for detailed portico building-unit maps)

100 meter action-radius check

During the district implementation of the NOP-model some of the neighbourhoods did not have a complete coverage by its secondary play spaces (see figure 6.6). On neighbourhood level it becomes clear that there are more potential secondary play spaces than could be determined on district level. Figures 8.4 and 8.5 also show several unsuitable spaces (red crosses) determined by the NOP-model criteria. It is therefore necessary to once again use the 100 meter action radius check (see chapter 5.4) to see if the number of suitable secondary play spaces provide enough coverage for the particular neighbourhood. Figures 8.6 and 8.7 show the coverage of secondary play spaces for Randenbroek-noord and Schuilenburg-zuid respectively.

In Schuilenburg-Noord (figure 8.7) it is apparent that the secondary play spaces provide enough coverage of playable spaces for the entire neighbourhood and therefore for every child living in that neighbourhood. Randenbroek-Zuid however still show gaps in the network. This due the very dense urban structure and accompanying dominance of the car (see figure 7.3).

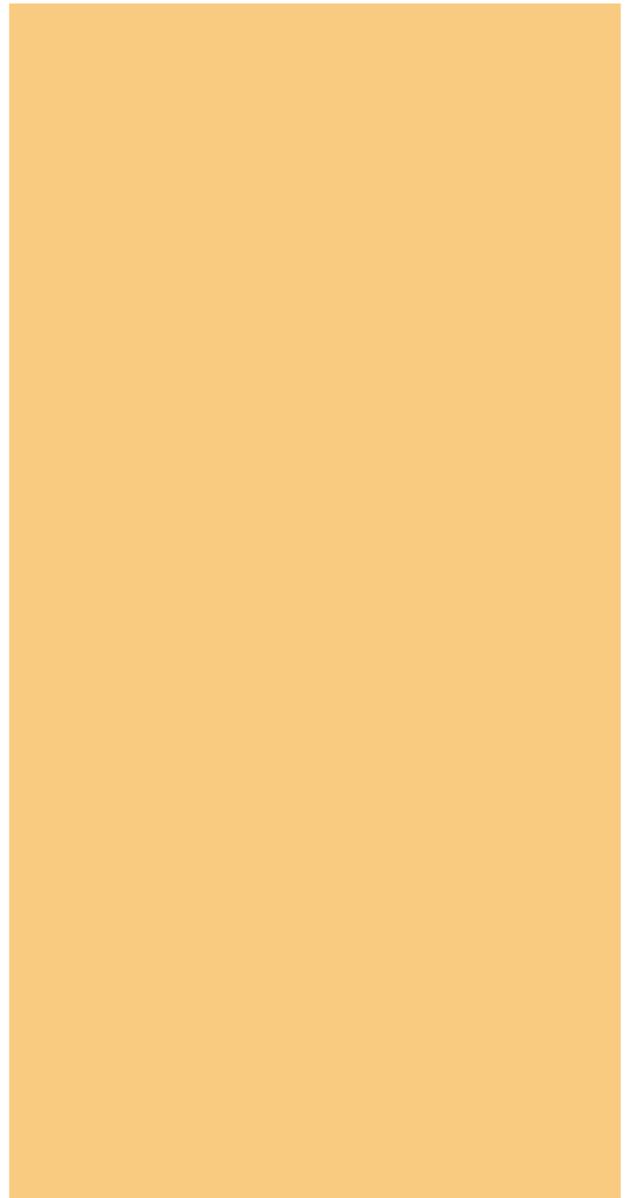


figure 8.6/ 100 meter action-radius check Randenbroek-zuid



figure 8.7/ 100 meter action-radius check Schuilenburg-noord



figure 8.8/ Spread of the NOP "Qualities of Play" in Randenbroek-zuid

2 Spread of the “Qualities of play” over primary and secondary play spaces

Having determined the suitable secondary play spaces in the two neighbourhoods we can now distribute the “Qualities of play” amongst them like shown in figure 8.1.

Figures 8.8 and 8.9 show the ideal distribution of “Qualities of play” if the existing urban structure is kept intact. This would be an absolute minimal implementation of the NOP-model. However, with implementing/adding (new) “Qualities of Play,” we do not solve any shortages in the availability of secondary play spaces and negative “Location and Accessibility of play” characteristics.

The “Quality of Play” icons (white fill) in the areas with a red stroke (see figures 8.8 and 8.9) illustrate that, while there are enough play qualities, it does not necessarily stimulate play (because of a weak “Location of Play” or “Accessibility of Play”).

Potential play spaces that have scored neutral (o) or good (+) for most of the “Location of play” and “Accessibility of play” criteria are illustrated with a coloured fill (see figures 8.8 and 8.9). Providing these qualities here would be enough to assure a sufficient playability. Nonetheless playability here can still be improved, by providing a better accessibility for example.



figure 8.9/ Spread of the NOP “Qualities of Play” in Schuilenburg-noord

3 Overlay the “Network Of Play” masterplan and locate conflicts

Having determined the locations of all the potential play spaces we can overlay the rest of the NOP; the childweb and the child facilities.

Figures 8.8 and 8.9 show the “Network Of Play” if the urban structure would be left intact. Analysis of the previous steps as well as the detailed analysis of the urban types of the two neighbourhoods in chapter 7, show that there are still many unresolved conflicts between the NOP and the urban structure.

8.2 Conclusion

With the NOP-model implementation on neighbourhood-level we can conclude that:

- Simply implementing “Qualities of play” will not guarantee a maximal increase of the playability of the neighbourhoods;
- Location of public spaces (greenery) and the accessibility of these spaces, are vital to the succesful realisation of potential play spaces;
- The existing car road network reduces accessibility of child facilities and primary and secondary play spaces (see figures 8.10 and 8.11);



figure 8.10/ Conflict map of the implementation of the NOP-model in Randenbroek-zuid

- Mostly the car road network reduces the playability of the primary and secondary play spaces (noise, crossings, pollution, visual disturbance, space occupation).
- Changing this structure is the only way of maximizing the playability of the primary and secondary play spaces and improving the accessibility towards these play spaces and child facilities;
- A complete coverage of secondary play spaces (see figures 8.6 and 8.7), on neighbourhood-level, strongly depends on building-unit characteristics (composition of buildings, infrastructure, planting; see chapter 7).



figure 8.11/ Conflict map of the implementation of the NOP-model in Schuilenburg-noord

chapter 9



Calvin & Hobbes
a comic by Bill Watterson

final designs

This chapter will illustrate how we got to the final designs of the two neighbourhoods, using the conclusions from chapters 6, 7 and 8. This chapter will start with various design alternatives for both neighbourhoods. These alternatives show how the NOP-model can influence the existing urban structure of a neighbourhood by using practical design solutions.

9.1 Re-structuring the neighbourhood

Chapters 6, 7 and 8 have shown how the NOP model is implemented on district- and neighbourhood-levels. Concluded from this was that the urban types and accompanying road structures are essentially the cause for negative spatial characteristics (negative scores for “Location of Play” and “Accessibility of Play”) of the available potential play spaces. These ‘weak spots’ cannot be simply made playable by implementing a variety of “Qualities of Play” (see figures 8.8 and 8.9).

The building units are set, they cannot be changed without demolishing them. This is not an option however, as the NOP-model should be applicable by using existing urban types/typologies. It is also difficult to justify to demolish buildings, simply to improve playability of a neighbourhood (with the exception of some sheds or garage boxes).

The road structure (including parking lots) in these neighbourhoods can be changed however. This chapter will show how potential play spaces can be improved in both “Location of Play” and “Accessibility of Play” characteristics by re-structuring the car domain in these urban types/typologies. As the two neighbourhoods differ in urban types/typology, we will discuss them separately.

As described in chapter 7, the road is a barrier for the child to cross and it often makes the housing block the child lives in an ‘island’, separated from the rest of the neighbourhood. The NOP-model tries to diminish the amount of roads to cross as much as possible, as this helps to stimulate the movement of a child through his/her neighbourhood (either by his/her own account or being allowed by his/her parents). The ‘islands’ are areas that consist of one piece. Roads do not divide these into smaller parts. They are visualized as areas with two different colors, either red or green (see figure 9.1).

Green areas have potential play spaces (either primary- or secondary play spaces). Children living in these areas therefore have the space/opportunity to play outside without having to cross a street.

The red areas are areas with no potential play spaces. Children living in these areas have no, or very limited opportunity for playing outside. The goal of the design alternatives is to diminish the amount of small 'islands' (both green and red) and diminish the amount of red areas as much as possible.

Diminishing the amount of 'islands' can be achieved by restructuring the car domain. The design options that can be used are:

- Removing redundant car roads;
- Re-routing car roads towards the edges of the neighbourhood;
- Re-routing the entry/exit of car roads to and from the neighbourhood;
- (In lesser extent) make a car road a one-way road, and;
- Introduce more parking lots (instead of parking along the street).

Larger connected areas would mean less children need to cross car roads to get to different potential play spaces; therefore improving their move-ability. Decreasing the amount of red areas can be achieved similarly as described above. Furthermore they can be 'made green' (meaning a child living in such an area has opportunities for outside play, without having to cross a street) by creating a potential play space. The design options that can be used are:

- Make a separate, carpark-free, areas in the street for playing purposes, and;
- Make connections to potential play spaces by removing redundant car roads;

The following paragraphs will show the design alternatives, as well as the desired alternative for Randenbroek-zuid followed by the final design. The same will be done for the neighbourhood Schuilenburg-noord.

9.2 Circulation alternatives Randenbroek-zuid

Figure 9.1 shows the existing structure of the neighbourhood Randenbroek-zuid. It is immediately visible that the areas with the densest urban structures and the largest concentration of car roads are causing problems (also see figure 7.5). They do not provide any play opportunities and are therefore marked in red.

The four design alternatives shown in figures 9.2 to 9.5 show several variations on the road structure. The primary childlines and child-facilities are taken into account as well to illustrate their connection to the car road network. This is important as it indicates where a child's movement is impeded by the car domain.

The alternatives use a variety of design solutions as described in 9.1, to decrease the amount of 'islands'.

The alternative with the least amount of separate islands and the least amount of red areas is the most preferred design solution. However one should take into account that the car road network remains functional and that buildings remain accessible as well. After all, playability would be maximized by removing the car entirely from the neighbourhood but this would be unrealistic, not to mention undesirable.

Figure 9.5 shows the preferred alternative. Although it does have more red areas than say alternative 1 (figure 9.2) it is a more realistic alternative. Alternative 1 would mean the neighbourhood would be very difficult to access by car, as it cuts off a lot of ongoing roads, making it difficult to justify.

The preferred alternative (figure 9.5) distinguishes itself from the other alternatives by connecting most of the playable areas with the child-facilities and most of the primary play spaces. This decreases the number of islands as well as making most of the child-facilities and primary play spaces better accessible for the major part of the children in the neighbourhood.

The design interventions used to achieve this were:

- Re-routing the central car road to the west, connecting the central primary play space to the rest of the central facility strip;
- Removing redundant car roads;
- Decreasing the amount of on-going car roads, and;
- Create dead-end roads where possible.

Important to note is that by re-routing the central car road to the west, the western part of the neighbourhood becomes unplayable (becomes red) as it becomes disconnected from the rest of the neighbourhood. This area (area 5 in figure 8.2) scored negatively for playability anyway during the criteria analysis of the neighbourhood implementation of secondary play spaces. So, this is not a loss.

It proved to be impossible to get rid of every red area without making the alternative completely unrealistic. The urban types/typology (row house building-unit/ see section 7.2.1) of this neighbourhood is of such a structure that solutions to solve the lack of play opportunities are difficult to implement. Only by making space suitable for playing purposes can improve the playability of these areas. This will be shown in the final design in the next paragraph.

9.3 Final design Randenbroek-zuid

The preferred alternative (figure 9.5) can now be translated into a final design. Next to the design an aerial photograph is shown, to compare the current situation with our proposed interventions (see fold out figures 9.6 and 9.7). We will design representative parts of the neighbourhood designs into more detail. The representative detailed designs have to illustrate how to design the various "Qualities of Play."

Therefore we will also add impressions of these places to illustrate how they might look, if they are designed according to the NOP-model.

- Dark green

The dark green areas represent the primary play spaces determined in chapter 7.

- Light green

The lighter green areas are secondary play spaces deemed suitable in chapter 8, as well as newly created ones due to changes in the car domain.

- Lightest green

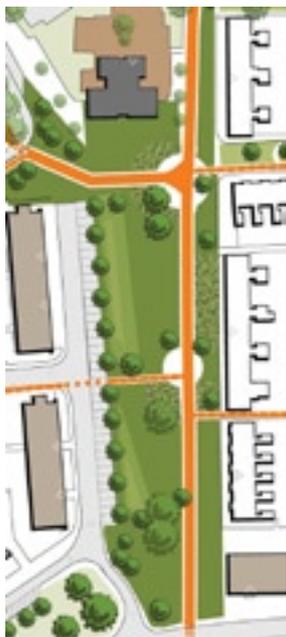
The lightest green areas are areas with greenery but are determined unplayable as described in chapter 8.

The dark green trees, besides giving an impression on the atmosphere of the space, also show where changes in the urban structure have occurred. Transparent trees are existing trees (therefore showing little or no changes in the existing urban structure). The design illustrates an impression of the proposed spatial complexity as well. Complexity is shown for variations in shape, variation in texture/color/planting and variation in relief.

As was shown in the preferred alternative (see figure 9.5) the car domain is re-structured. The primary play space in the west as well as the northern facility strip are now connected with each other and are relieved of car traffic as much as possible. The accessibility of these areas are improved. In the design, the main car-artery of the neighbourhood uses an existing road, running from the east, going down to the south and connecting to the rest of the district (car-) road network to the west, by way of a new connection. In this way the main car artery, including a bus loop, relieves the largest part of the neighbourhood of on-going car traffic.

The neighbourhood park / Primary play space

Any disappeared parking spaces around this primary play space are replaced at its western edge. In this way nearby residents still have a place to park their car while reducing the amount of disturbance and accessibility of this space as much as possible. The residents at the east are directly connected to this public space. There is also a direct connection towards the facility strip at the north.



The (child-) facility strip



The northern facility strip that consists of a kindergarten and primary schools is now better accessible. This is partially done by removing a car road and partially by relocating entrances of the school to the north (facing the northern gallery flats). By relocating the entrances of one of the schools, the schoolyard is directly connected to a primary play space (area around the eastern waterpond in the illustration). Any parents that need to drop off their children can do this by using a new 'Kiss-and-Ride' (drop-off) point between the two most western gallery flats. More children from this school can be stimulated to use the primary play space in this design solution.

Southern portiek flats



In the design, the southern portiek flats have a car free middle section, improving the accessibility and play potential of the formerly loose grass plains. Loss of parking spaces is completely compensated in the new grouped parking lots along the main traffic artery at the north and to the south-west.

The best public spaces; those close to the entrances and within sight of residential buildings are now made car-free. In other words their potential for qualitative play opportunities have increased.

Row-house area



The most problematic areas of this neighbourhood were the densely built low-rise housing in the central and western part. These had no play opportunities what so ever. The design proposes parking-free areas (brown boxes in the illustration), with a distinctly different design than the rest of the street. Location of these parking-free areas are situated in such a way that they overlap existing back-alleys. These can function as secondary childlines in connecting every new secondary play space to each other. This design proposal increases the move-ability of children as well as their chances to meet children from other streets. The lost parking spaces can be compensated along the road at the north of the illustration. This road, which was formerly the central artery for the neighbourhood is converted into an one-way road. This leaves extra space for parking along the road.

9.3.1 The distribution of the “Qualities of Play”

The re-structuring of Randenbroek-zuid has improved potential play spaces, as well as created whole new ones. The distribution of the “Qualities of Play” as described in chapter 8 is therefore not entirely applicable anymore (see figure 9.8). Figure 9.9 shows the distribution of “Qualities of Play” in the new situation.

The changes in the car road structure are clearly visible if one compares both maps (figures 9.8 with 9.9).

By using the NOP-model guidelines we have improved the “Accessibility of Play” as well as the “Location

of Play”, which forms the basis for a good potential play space (and play experience). The distribution of the “Qualities of Play” help with the design of these potential play spaces. They can act as themes for these spaces. It is up to the individual designer how to interpret what makes up a certain “Quality of play”, using the guidelines we provide in this thesis.



figure 9.8 / Qualities of Play distribution before re-structuring



figure 9.9 / Qualities of Play distribution after re-structuring

9.4 Impressions of the “Network Of Play” in Randenbroek-zuid

The following impressions give an idea how we visualize “Qualities of Play” in Randenbroek-zuid. This can range from small design interventions to completely redesigning the public space. We will show how, by using landscape elements, these “Qualities of Play” can be implemented in the public space. That these public spaces are often used by other people than children, is taken into account.

The impressions follow a child when travelling through his/her neighbourhood, following the

childweb. Several secondary and primary play spaces as well as child facilities will be shown as the child passes them. For some spaces with the Mental stimulation Quality of play a second impression represent a child’s interpretation of such a space.

Figure 9.10 shows the locations of the design impressions.



figure 9.10 / Randenbroek-zuid design: location impressions

1 Impression portiek flats / Secondary play spaces



figure 9.11 / Detail design portiek flats

Figures 9.11 and 9.13 shows a more spatially complex situation. The car domain has been pushed back to the northern edge, resulting in a more playable area. The primary childline connects the variety of spaces while being a playing element as well. This is achieved by changes in width, shape and the use of plantings in the path itself.

Figure 9.13 and 9.14 shows how mental and physical stimulation is achieved by providing surfaces for cycling, running etcetera and drawing (creativity).



figure 9.12 / Current situation

figure 9.13/
Impression: Qualities of play



figure 9.14/ Impression:
children's interpretation
of the play space



2 Impression community park / Primary play space



Figure 9.15 shows the community park as a primary play space. The variety in different spaces, textures, colors and shapes can contain all Qualities of Play (figure 9.17). The primary childline is made a playable object by its flowing shape and changes in relief.

The childweb junctions act as attraction points for children ('totempole' function (source: CROW 2000)). A small indentation in the pavement makes it retain rainwater (see figure 9.17) creating various Qualities of play.

Plantings are used shade and hiding and for creating separate spaces. The hills stimulate movement, and separates the car domain physically from the park, decreasing any disturbance.

The Primary childline is marked at intervals with a tile (see figure 9.17) making it immediately recognizable:



Primary childline marker tile

figure 9.15 / Detail design community park



figure 9.16/ Current situation



figure 9.17 / Impression: Qualities of play



3 Impression car-free street / Secondary play space



figure 9.18/ Detail design: Car-free street

Figure 9.18 shows how the NOP proposes to change this dense urban area. A playing space is created by raising the street up to sidewalk level and making it a park-free area. Color markers are used to designate the secondary childlines running through the building unit's back -alleys (the warmer the colour of the ring, the closer one is to a play space). Figures 9.18 and 9.20 show how such a street can be made more attractive for children. Seating arrangement and colored pavement can make this space suitable for social and physical stimulation while the space itself acts

as a meeting area itself (totempole). Children can move from here to other streets as well as other play spaces in the neighbourhood following the colored markers.



figure 9.19/ Current situation

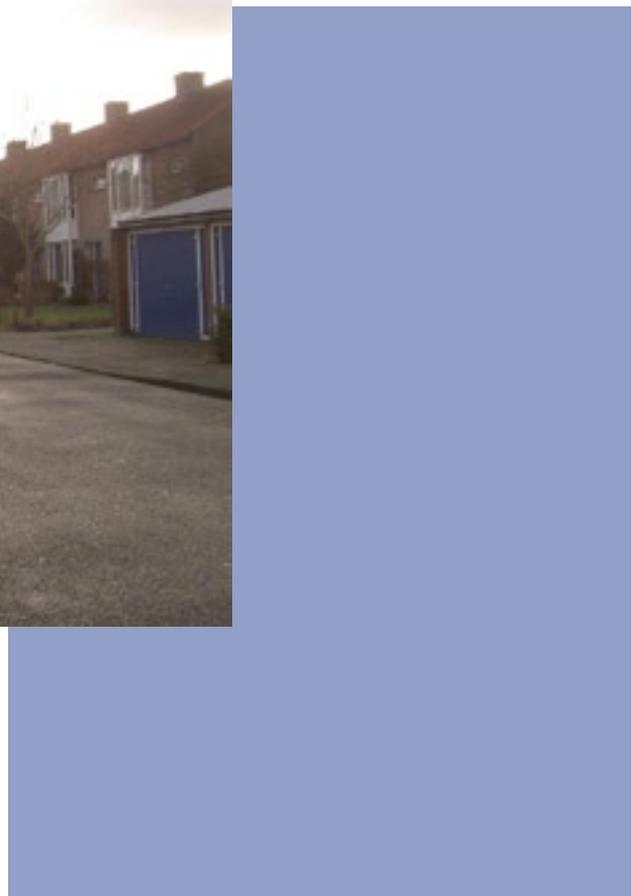


figure 9.20/ Impression: Qualities of Play



4 Impression facility strip / Primary play space

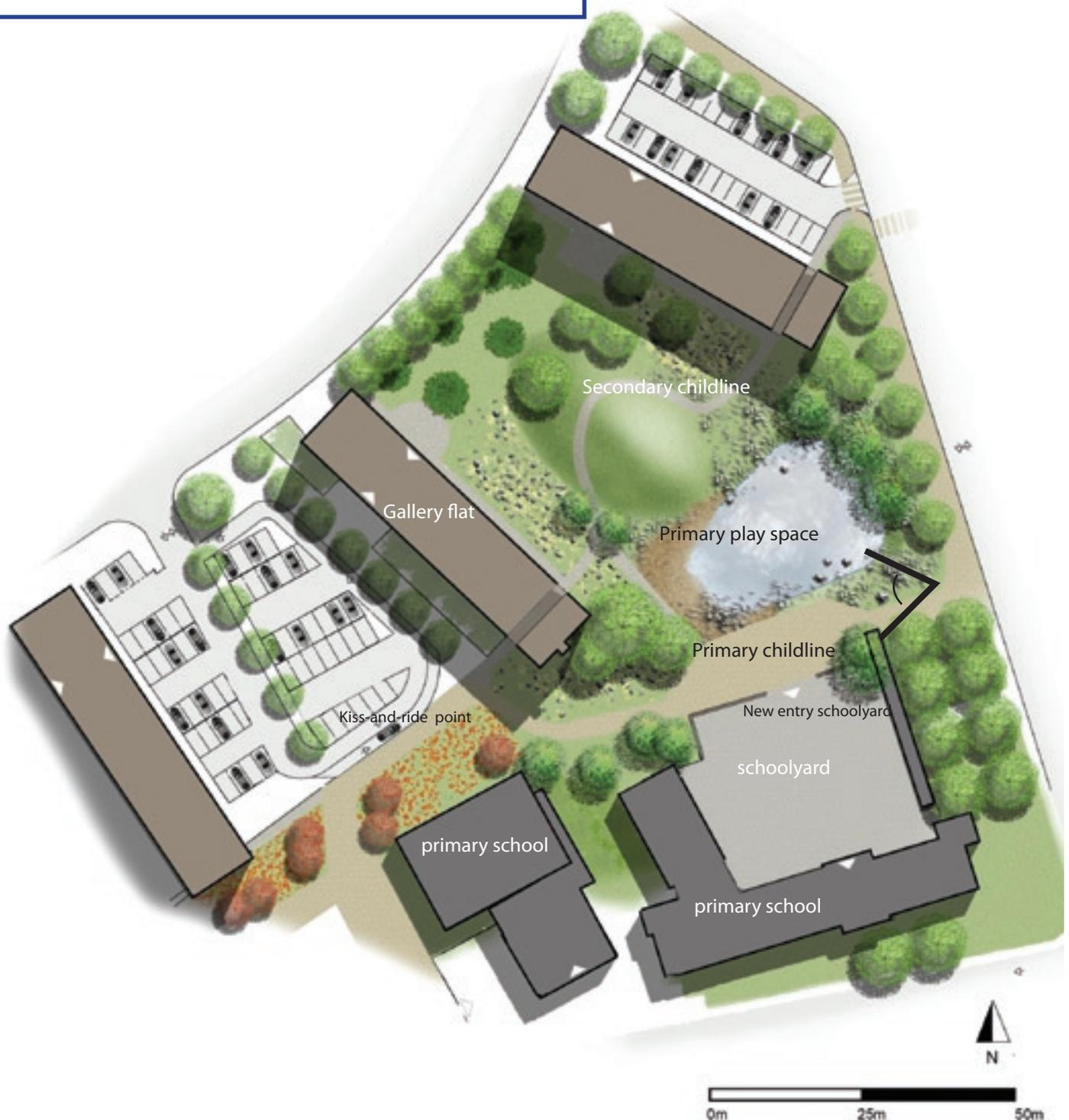


figure 9.21/ Detail design Primary play space facility strip

Figure 9.21 shows a detail design for the primary play space around the facility strip and gallery flats. A primary childline runs along the relocated entry to the schoolyard and the kiss-and-ride (drop-off) point. The combination of the existing parking-lot with a kiss-and-ride point decreases car disturbance in this area while the direct connection between schoolyard and primary play space maximizes use of this space.

All the Qualities of play are introduced by using a variety of textures, colors, plantings and shapes as figure 9.23 illustrates. Loosely laid boulders along the pond proved access to the water and create micro-climats for various fauna, making exploration of the area more stimulating (Mental stimulation). Stimulating access to the water creates all sorts of environment manipulation opportunities as well (EMO).



figure 9.22/ Current situation

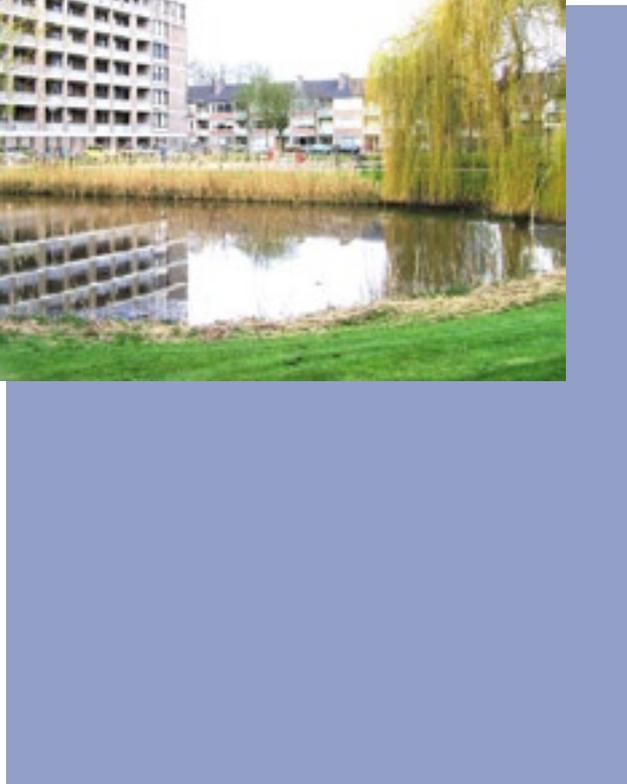


figure 9.23/ Impression: Qualities of play

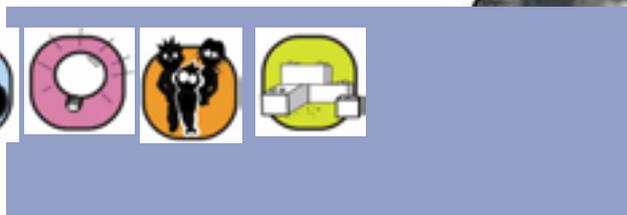




figure 9.24/ Detail design Primary and secondary play spaces along Valleikanaal

Figure 9.24 shows the combination of secondary play spaces and the primary play space along the Valleikanaal. The secondary play spaces blend into the larger park area. This direct connection by line of sight and new paths makes the entire area more attractive for play. Furthermore, social control (via line of sight) of this space is improved.

The Valleikanaal is partially made more accessible by creating a separate slow flowing, shallow area with stepping stones with a reduced slope. This improves EMO and Mental

stimulation.

The variation in plantings can improve the ecological value of the space, attracting all sorts of insects and birds giving a child a good reason to explore (Mental stimulation)

Central hardened areas act as a meeting places and rest spots (social stimulation). Vertical landscape elements like shrubs provide shelter and enclosure as well as provide cover for hiding games.

Figure 9.26 and 9.27 show how children might use and interpret such a space.



figure 9.25/ Current situation



figure 9.26/ Impression: Qualities of Play

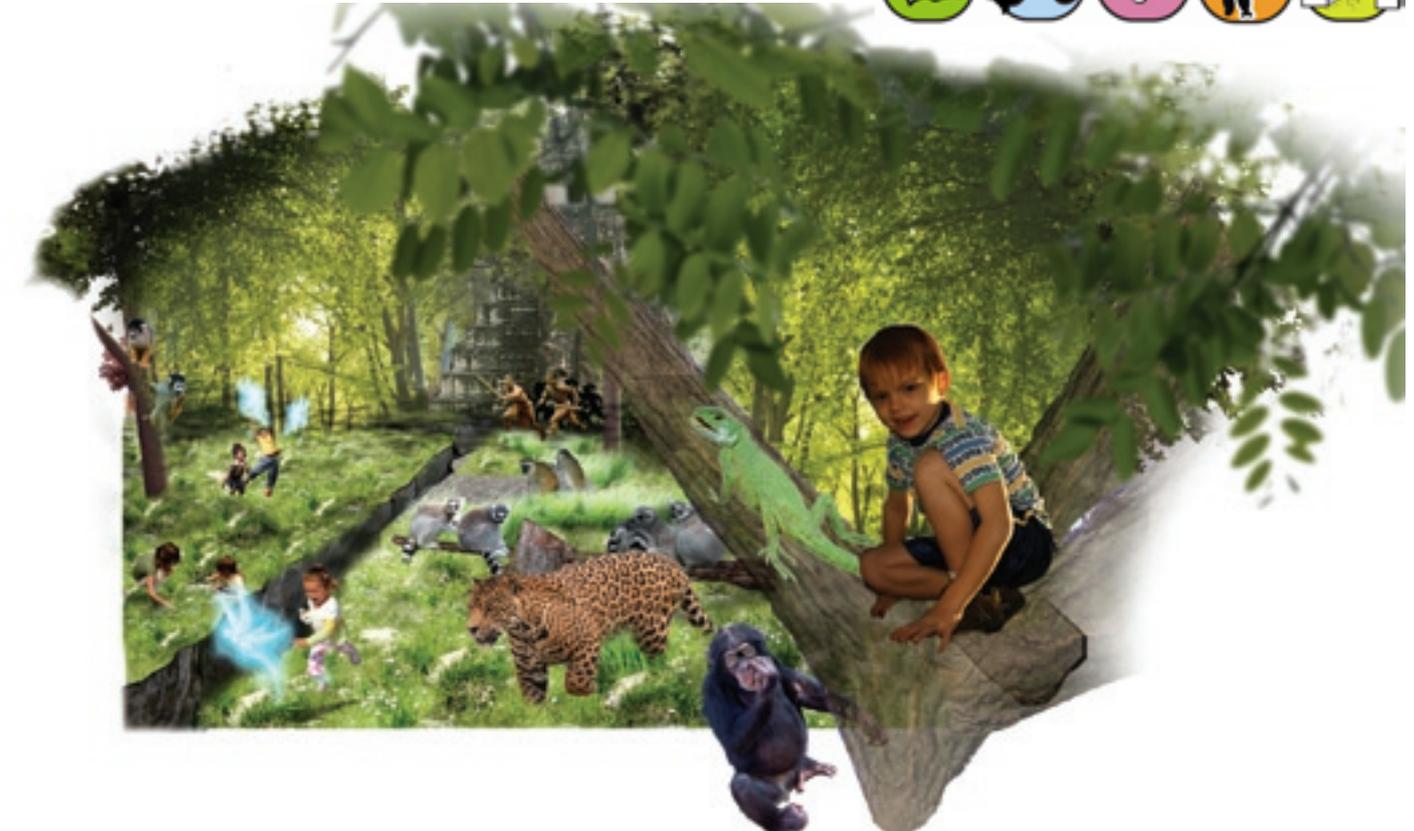


figure 9.27/ Impression: children's interpretation of the play space

9.5 Circulation alternatives Schuilenburg-noord

Figure 9.28 shows the existing structure of the neighbourhood Schuilenburg-noord. Unlike Randenbroek-zuid this neighbourhoods urban types/typology does not contain as many red areas, nor as many separate 'islands'.

The four design alternatives shown in Figures 9.29 to 9.32 show several variations of the road structure in the Schuilenburg-noord neighbourhood. Again they are used as a design study for determining what kind of re-structuring of the car road system creates the most playable neighbourhood.

The structure of the Schuilenburg-noord typology/types has already created fairly large areas with opportunities for play (meaning large green areas) compared to the urban typology/types of Randenbroek-zuid

The neighbourhood is cut in two, by the north-south orientated district road. It was decided that removing or re-routing this important artery was not possible. This leaves two separate areas to be re-structured.

The design alternative in figure 9.32 is chosen as the preferred alternative. By re-routing the major arteries to the edges of the neighbourhood the amount of separate 'islands' is reduced, creating a more child-friendly neighbourhood. This alternative creates the largest connected playable areas. Any red areas are gone, because they are connected to areas with playable spaces. Child facilities are disconnected from car roads as much as possible. This increases not only safety but also helps to stimulate children's independent movement towards these facilities. Although the preferred alternative reduces the amount of crossings between childweb and car roads, the central north-south road still forms an obstacle for children that are moving between the eastern and western parts of the neighbourhood. Reducing speed and raised cross-overs, among others, can decrease the crossing risks in this case.

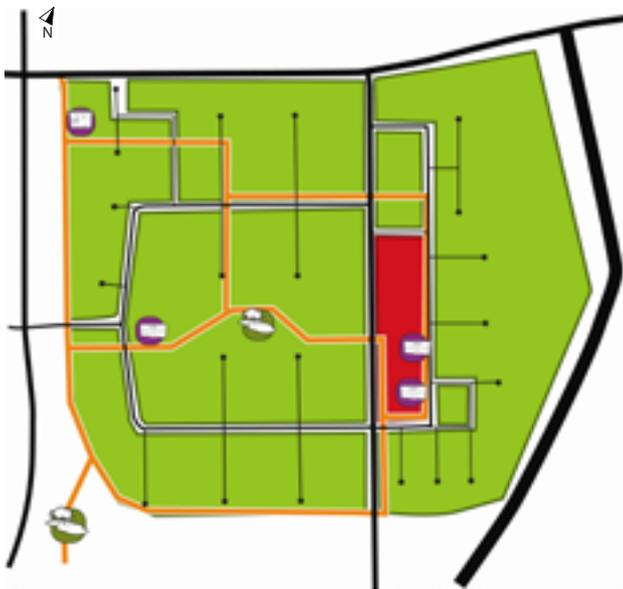


figure 9.28/ Current situation Schuilenburg-noord



figure 9.29/ Alternative 1 Schuilenburg-noord

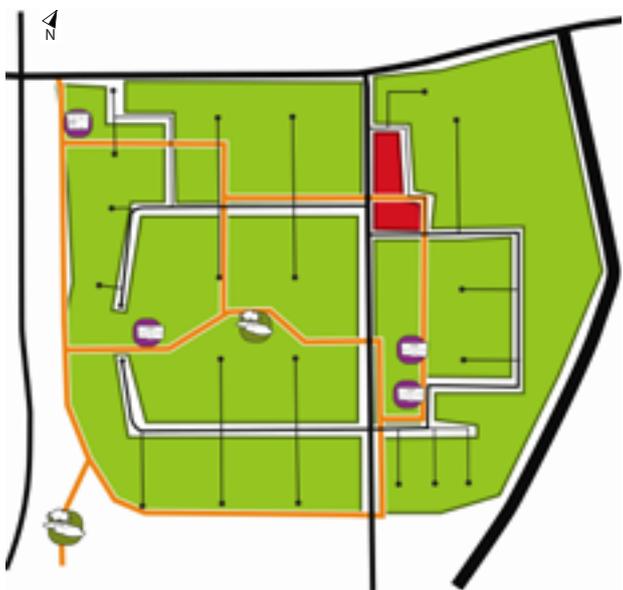


figure 9.30/ Alternative 2 Schuilenburg-noord



figure 9.31 Alternative 3 Schuilenburg-noord

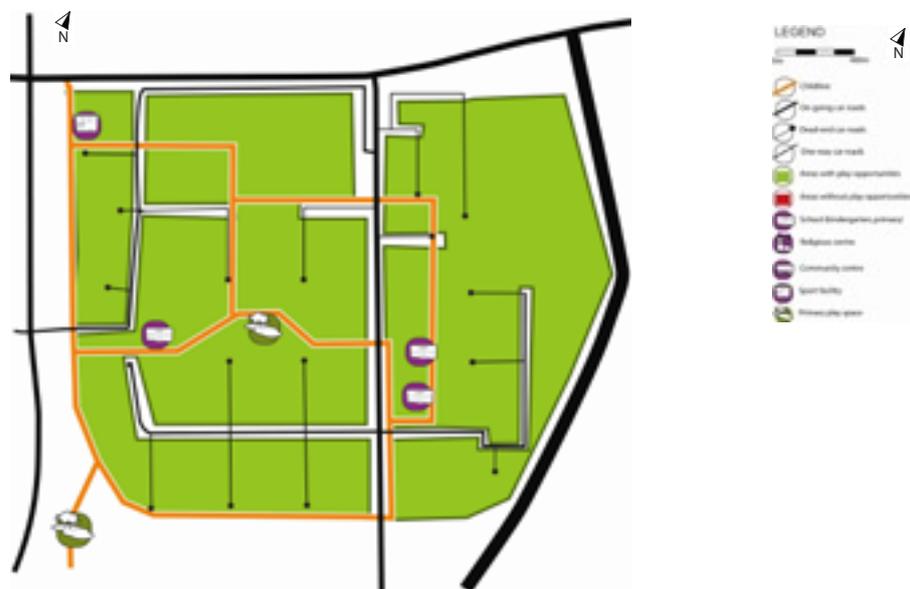


figure 9.32/ Preferred alternative Schuilenburg-noord

9.6 Final design Schuilenburg-noord

The preferred alternative (figure 9.32) can now be translated into a final design. Next to the design is an aerial photograph given, to compare the current situation with our proposed interventions (see fold-out figures 9.33 and 9.34).

The design refrains from detailing individual play spaces too much, as this scale-level is unsuitable for detailed designs. It is also not our intention to design every individual play spaces. In paragraph 9.7 we will show impressions of a few of these play spaces.

- Dark green

The dark green areas represent the primary play spaces determined in chapter 7.

- Light green

The lighter green areas are secondary play spaces deemed suitable in chapter 8, as well as newly created ones due to changes in the car infrastructure.

- Lightest green

The lightest green areas are areas with greenery but are determined unplayable as described in chapter 8.

The dark green trees, besides giving an impression on the atmosphere of the space, also show where changes in the urban structure have occurred. Transparent trees are existing trees (therefore showing little or no changes in the existing urban structure). The design illustrates an impression of the proposed spatial complexity as well. Complexity is shown for variations in shape, variation in texture/color/planting and variation in relief.

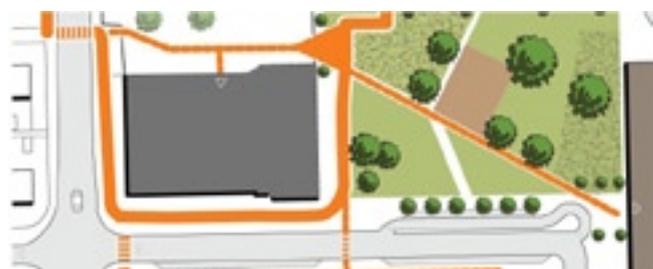
Car free facility strip

In the eastern part of the neighbourhood, the formerly central car road connecting the various gallery and portiek flats is removed altogether and replaced by a variety of connected secondary play spaces. This whole strips is made car free, guaranteeing a good "Location of Play" and "Accessibility of Play" of these spaces. The complexity indicates interesting play opportunities for children.



A central primary childline connects these secondary play spaces with the rest of the neighbourhood. This can take the shape of a path for cycling and walking. Car roads have been relayed to the eastern edge, so as to create the car-free central area. The parking lots are now at the back of the portiek and gallery flats, so that the entrances can be directly connected to the play spaces. This can help to stimulate children living in these high-rise buildings to play outside. Social control of such spaces are improved in this way as well.

Primary (Broa) school



The broad school to the south is now directly connected to potential play spaces. A 'Kiss-and-ride' (drop off point) spot is located at the south-east. This way the school is still accessible by car but also more safely to reach by bike or foot.

Northern strip of portiek flats



By re-positioning the west-east orientated ongoing car road to the northern edge of the neighbourhood, the northern portiek flats are directly connected to the centrally located primary play space (neighbourhood park). Parking is located at the back of the portiek flats, with the result that the entrances of the flats are directly connected to a playable public space.

A primary childline connects these building units with the centrally located school and primary play space of the neighbourhood.

Row house public space



The existing squares in between the low-rise housing units are connected to the rest of the network by way of secondary childlines. These take the shape of existing sidewalks.

Primary school



The centrally located primary school was already connected to the central primary play space. The accessibility of the school is improved by making its entrance partially car-free. This is done by making the ongoing car road to the south, a dead-end road.

The school is now accessible for children going by foot or bike without having to cross a street to reach this school or the connected primary play space. The proposed dead-end road furthermore makes the remaining car roads in the southern part of the neighbourhood better traversable for children as traffic-intensity on these roads will be decreased.

9.6.1 The distribution of the "Qualities of Play"

The re-structuring of Schuilenburg-noord has improved potential play spaces, as well as created whole new ones. The distribution of the "Qualities of Play," as described in chapter 8 is therefore not entirely applicable anymore (see figure 9.35). Figure 9.36 shows the distribution of the "Qualities of Play" in the new situation. The changes in the car road structure are clearly visible. Re-structuring the neighbourhood by using the NOP-model guidelines, have improved the "Accessibility of Play" as well as the "Location of Play". Which form the basis for a good potential play space (and play experience). The distribution of the "Qualities of Play" help with the design of these potential play spaces. They can act as themes for these spaces. It is up to the individual designer how to interpret what makes up a certain "Quality of play", using the guidelines we provide in this thesis.



figure 9.35/ Qualities of Play distribution before re-structuring

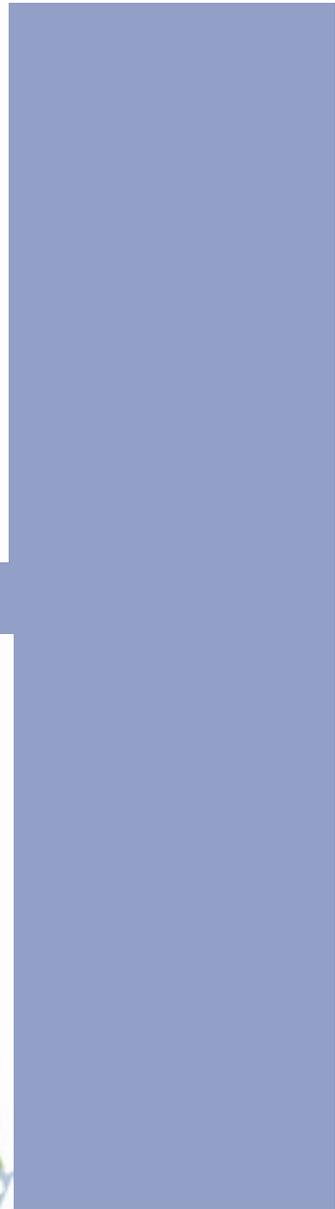


figure 9.36/ Qualities of Play distribution after re-structuring



9.7 Impressions of the “Network Of Play” in Schuilenburg-noord

The following impressions give an idea how we visualize “Qualities of Play” in the neighbourhood Schuilenburg-noord. This can range from small design interventions to completely redesigning the public space. We will show how, by using landscape elements, the “Qualities Of Play” can be implemented in the public space. That these public spaces are used

by other people than children, is taken into account. The impressions follow a child when travelling through his/her neighbourhood, following the childweb. Several secondary and primary play spaces as well as child facilities will be shown as the child passes them. Figure 9.37 shows the locations of the design impressions.



figure 9.37/ Schuilenburg-noord design: location impressions

1 Impression portiek flats / Secondary play space



figure 9.38/ Detail design Secondary play space inbetween portiek flats

Figure 9.38 shows a new secondary play space in between two portiek flats. The parking lot is now situated at the back of the building leaving a playable space directly connected to the entries of the building.

The direct connection between entry and play space, the variation in hardened surface and greenery and the use of round shapes and colored materials makes improve the use for plural target groups (boys, girls, young and old)

as well improving mental stimulation as figure 9.40 illustrates.

The space is also directly connected to a primary childline running along the flats to the west making exploration of the neighbourhood easy and attractive.



figure 9.39/ Current situation



figure 9.40/ Impression: Qualities of Play



2 Impression facility zone / Secondary play space



figure 9.41 / Detail design Secondary play space in front of school

Figure 9.41 shows the detail design of the primary school (brede school). The design shows the car-free area between the two building units and the primary school.

Figure 9.43 further illustrates how a variation of textures and changes in relief provides opportunities for various balance and running games (physical stimulation) while a clear central area with seats can function as a meeting point (social stimulation). The direct connection by use of play space between the different building units and facilities can furthermore stimulate interaction between

residents (social stimulation).

A primary childline directly connects this space with the rest of the neighbourhood while secondary childlines are marked with colored markings at regular intervals.

A new kiss-and-ride point makes the school accessible for parents dropping their kids off to school by car while preventing the secondary play space being disturbed by this car traffic.



figure 9.42 / Current situation



figure 9.43/ Impression: Qualities of play



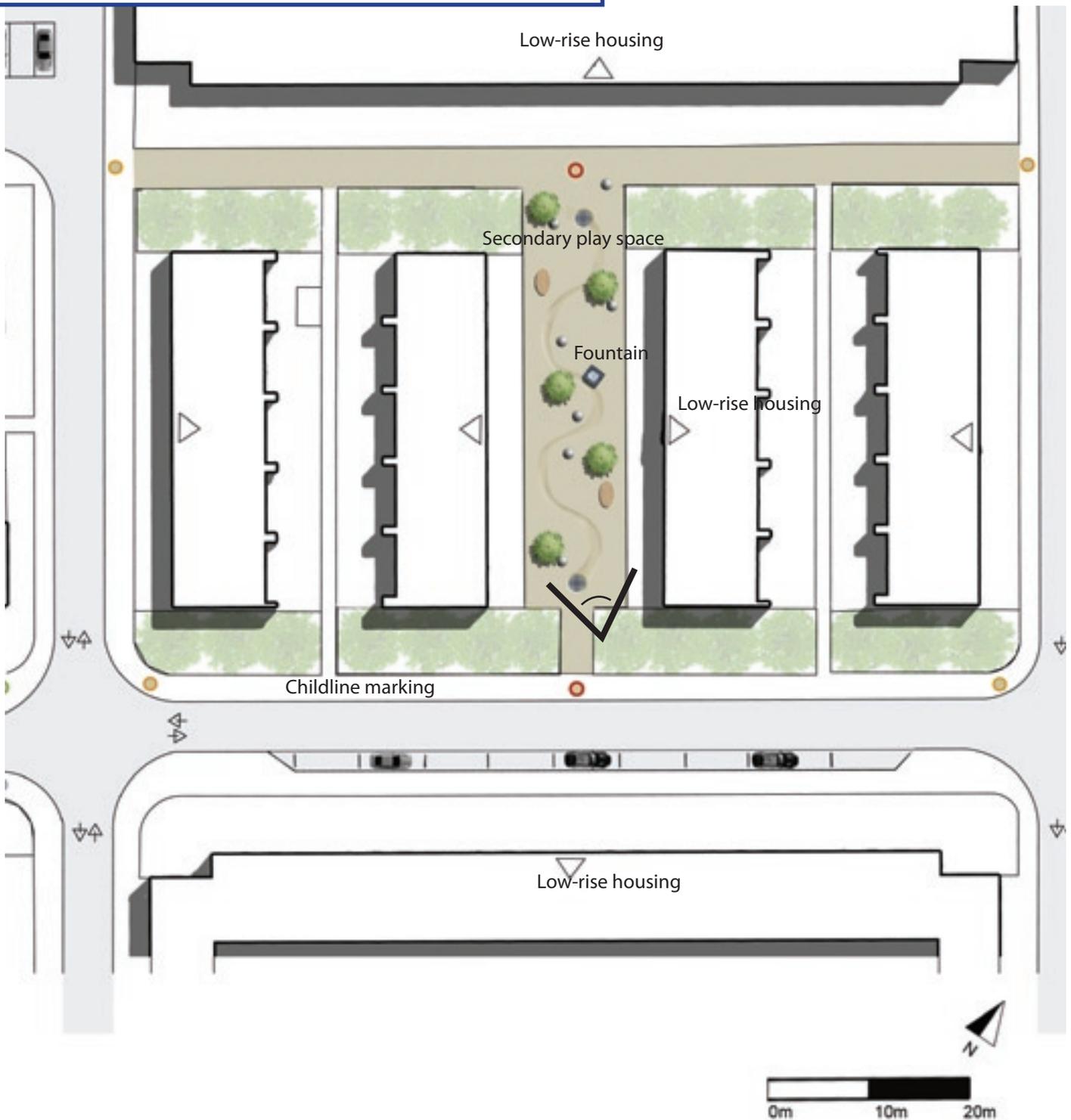


figure 9.44/ Detail design Secondary play space on square in between row houses

Figure 9.44 shows an existing inner-square in the Schuilenburg row-house building unit. Two Qualities of play are introduced to improve the space's playability. In this case a water element and slight indentations in the pavement provides opportunities for introducing flowing water in this space.

Small, non-descriptive design elements like stone protrusions provide seating opportunities as well as inviting children to use their

imagination and invent their use and function. Figures 9.46 and 9.47 illustrate how children might interpret such implementations. In this building-unit the childweb makes use of the existing pavement. The childlines need therefore be marked. Colored marks in the pavement at crossing and regular intervals help guide children to potential play spaces (the hotter the color the closer one is to a play space).



figure 9.45 / Current situation



figure 9.46 /
Impression: Qualities of play



figure 9.47 / Impression:
children's interpretation
of the play space

4 Impression community park / Primary play space

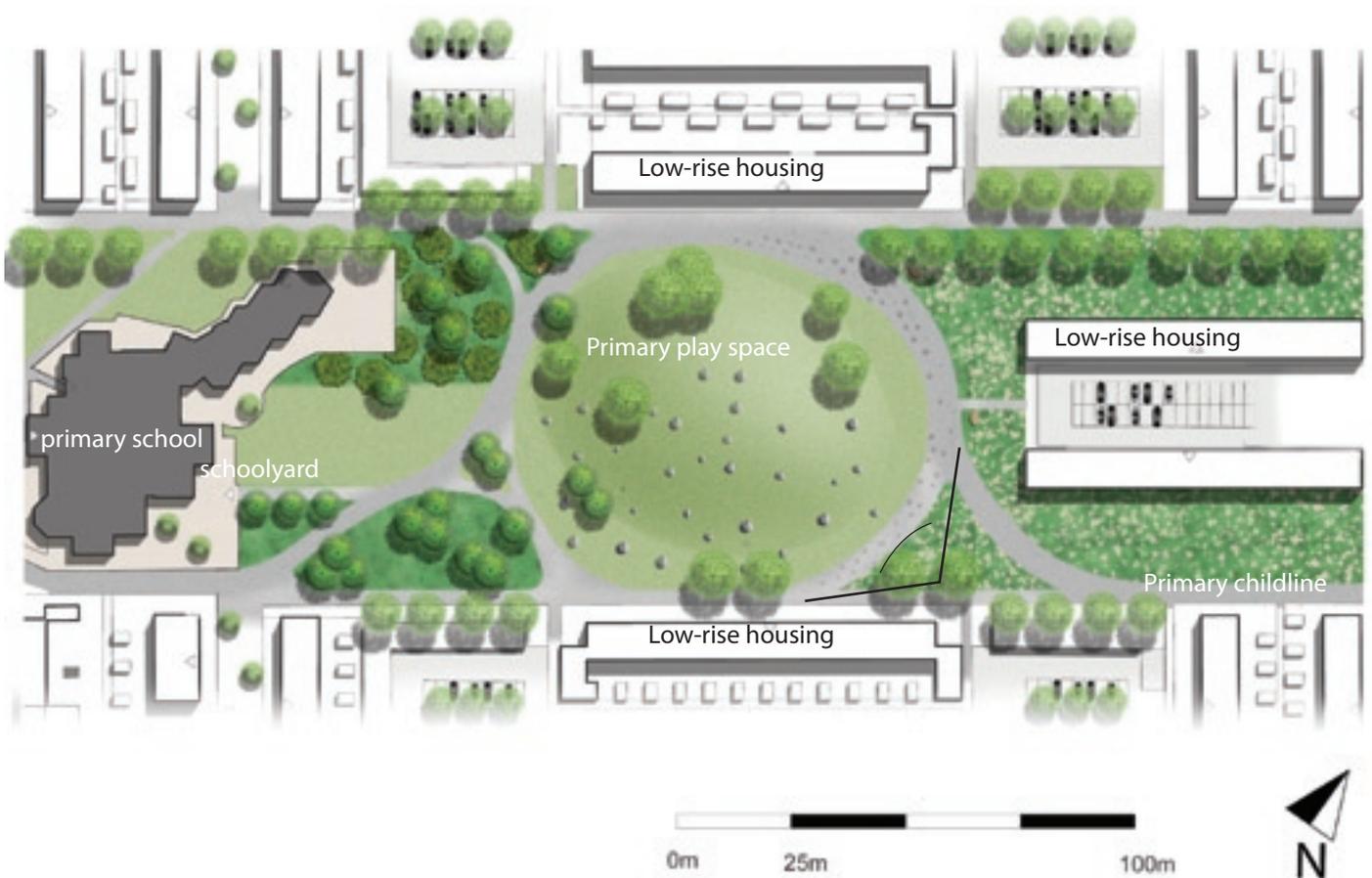


figure 9.48 / Detail design Primary play space community park

Figure 9.48 shows the detail design of the central community park as a primary play space. This existing park already had good characteristics for a potential play space; disconnected from the car domain, Location and Accessibility of play characteristics.

The space (figure 9.49) is transformed into a more spatially complex area in this design to accommodate all the Qualities of play. A central hill functions as a meeting point and provides overview over the entire space. This not only reduces the large intimidating space but actually divides the park in smaller separate areas with different atmospheres and play opportunities. The shape and texture of the pathway provides opportunities for children to practice cycling, skateboarding etcetera in a car-free area.

Loose large boulders provided in the hill can provide opportunities for sitting, balancing, hiding and other uses and functions a child might give to it (see figures 9.50 and 9.51).

Different plantings like flowerbeds and berry shrubs can improve the ecological value of the play space attracting various fauna (Mental stimulation).



figure 9.49 / Current situation



figure 9.50 / Impression Qualities of play:



figure 9.51 / Impression: children's interpretation of the play space

chapter

10



conclusion

As is mentioned in paragraph 1.4, the goal of this thesis is to develop a method that proves to be effective in stimulating outdoor play. Whether our proposed “Network Of Play”-model is the right tool to achieve this goal, will be concluded in this chapter.

Paragraph 10.1 is a short introduction to state our research question and hypothesis again.

Paragraphs 10.2 and 10.3 will conclude per building-unit and typology (as analyzed in chapter 7) if the NOP-model is effective in improving the playability, in respectively Randenbroek-zuid and Schuilenburg-noord.

The last paragraph (10.4) will confirm if our hypothesis is proven to be right or wrong.

10.1 Introduction

The main trigger for this research was the undeniable problem of children that are overweight, especially in city districts. This social problem made us wonder if city characteristics contribute to the weight problems of children. People are dependent on their living environment and therefore it seemed logical to assume that weight problems are not only caused by the nutrition intake (food en drinks). Research on this subject confirmed that city characteristics and physical (in)activity were related to each other. The increase in children’s weight is an indicator that they are not physically active enough. As this thesis illustrates, the inactivity of children is a complex combination of factors of modern day society. Partially it is due to changes in lifestyle, partially it is a result of spatial issues. The lack of attention for children’s needs in city planning and the changes in lifestyles of children and their parents seems to have resulted in an increased inactivity. So by being more active, children can loose weight and create a healthier lifestyle. Outdoor play seemed the best way of stimulating activity in children. This led us to our research question:

- **How can we effectively (re-) design the outdoor public space in city districts to stimulate outdoor play?**

Our answer: Develop a spatial model which takes the play needs of children into account. We want to prove that our spatial model, the “Network Of Play” is effective in stimulating outdoor play. Therefore our hypothesis is:

- **Redesigning the public space of a city district to a “Network of Play” stimulates outdoor play.**

10.2 The influence of the NOP-model on the playability of urban types and typologies: Randenbroek-zuid

The spatial criteria of chapter 7 will be used again to evaluate the examined types and typologies on their playability, after the implementation of the NOP-model on neighbourhood level.

By comparing the situation before the NOP-model implementation and after the NOP-model implementation, we can derive conclusions about the effect of the NOP-model on the playability of the building-units (types) of the examined typologies.

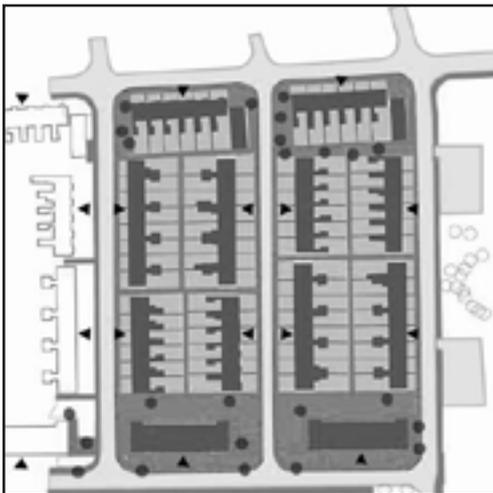
The conclusions of the building-units do not cover the total playability of a typology and effectivity

of the NOP model. Changes around child facilities are also important to take into consideration. Therefore we will conclude with the evaluation of the playability of the overall typology; before the NOP-model implementation and after the NOP-model implementation.

With this evaluation we want to prove our hypothesis right or wrong. Is the NOP-model effective in stimulating outdoor play?

10.2.1 Het na-oorlogse tuindorp / Row house building-unit

Randenbroek-zuid



Before the NOP-model



After the NOP-model

SPATIAL CRITERIA FOR PLAYABILITY		before the NOP-model	after the NOP-model
1	Quantity of Play	-	o
2	Location of Play		
	Amount of Social control	+	+
	Amount of Disturbance *	-	-
	Environmental conditions	o	o
3	Accessibility of Play		
	Child-friendly connections	-	o
	Seperation from motorized traffic	-	-
4	Landscape use	-	-

* (-) a lot of disturbance / (+) hardly any disturbance

CONCLUSIONS

- 1 The NOP-model improves the “Quantity of Play”, though it is still insufficient.
- 2 The implementation does not affect the “Location of Play”
- 3 “Childfriendly connections” are slightly improved, but “seperation from motorized traffic” remains weak.
- 4 There still is no use of landscape elements.

The NOP-model implementation has an effect on two spatial criteria:

- Quantity of Play
- Child-friendly connections

Quantity of play

By introducing ‘no parking’ areas in the one-way street system, small spaces are created for play activities for children. It is not possible to introduce a parking ban along the whole street. Therefore these spaces remain limited in their size and remain limited in its “Quality of Play.”

Child-friendly connections

It is important to strategically locate the ‘no parking’ areas. These spaces will be the only accessible public spaces near residents to contain a “Quality of Play” (Physical stimulation, Social stimulation, Mental stimulation, Plural target group or E.M.O.) By connecting these spaces with the existing back-alleys (secondary childlines/ orange line in the figure: After the NOP-model), in between the rowhouses, it is possible to offer children an easier movement through the neighbourhood. Play activities and movement of children will still be interrupted by passing cars. But children have a better overview and therefore have more time to react on passing cars (improved safety).

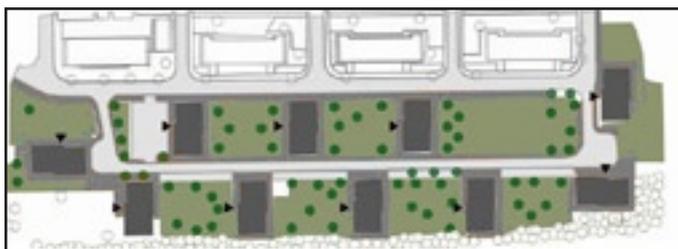
PLAYABILITY OF THE BUILDING-UNIT

The playability of the rowhouse building-unit in a “na-oorlogse tuindorp” typology remains weak with the implementation of the NOP-model.

The “Quantity of Play” strongly limits the play opportunities for this building-unit. The NOP-model is weakest when there is little space available.

10.2.2 Het na-oorlogse tuindorp / Portiek flat I building-unit

Randenbroek-zuid



Before the NOP-model



After the NOP-model

SPATIAL CRITERIA FOR PLAYABILITY		before the NOP-model	after the NOP-model
1	Quantity of Play	+	+
2	Location of Play		
	Amount of Social control	+	+
	Amount of Disturbance *	o	+
	Environmental conditions	o	o
3	Accessibility of Play		
	Child-friendly connections	-	+
	Seperation from motorized traffic	-	+
4	Landscape use	-	+

* (-) a lot of disturbance / (+) hardly any disturbance

CONCLUSIONS

- 1 The "Quantity of Play" remains strong.
- 2 The implementation improves the "amount of disturbance" (less disturbance).
- 3 The "Accessibility of Play" is improved from weak towards strong.
- 4 An insufficient use of landscape elements is changed into a strong "Landscape use".

The NOP-model implementation has an effect on four spatial criteria:

- Amount of disturbance
- Child-friendly connections
- Seperation from motorized traffic
- Landscape use

Amount of disturbance

By removing the southern car road, the play spaces are further away from motorized traffic. At the northern side, the potential play spaces are only connected with parking lots and not with the busy car artery. These interventions strongly reduce the amount of disturbances (pollution, noise, visual disturbance).

Child-friendly connections

By removing a car road, extra space is created to introduce a primary childline. The childline connects every public space with eachother. This strongly improves the accessibility of these spaces. The building-unit acts as a stronger entity, since every public space (greenery) interacts with one-another. The child-friendly connections from or towards the building-unit are also improved.

Seperation from motorized traffic

See "Amount of disturbance"

Landscape use

The landscape is used in every public space to shape the "Qualities of Play." The "Qualities of Play" are spread out over these spaces to bring variety among them. Every public space (greenery) is designed different, according to the qualities that are implemented.

PLAYABILITY OF THE BUILDING-UNIT

The implementation of the NOP-model effectively improved the playability of the "portiek" flat building-unit. The location and accessibility aspects of the building-unit limited the play opportunities. These are successfully improved with the interventions of the NOP-model. The landscape elements available are also used to incorporate the "Qualities of Play."

10.2.3 Het na-oorlogse tuindorp / Portiek flat II building-unit

Randenbroek-zuid



Before the NOP-model



After the NOP-model

SPATIAL CRITERIA FOR PLAYABILITY		before the NOP-model	after the NOP-model
1	Quantity of Play	+	+
2	Location of Play		
	Amount of Social control	+	+
	Amount of Disturbance *	-	o
	Environmental conditions	o	o
3	Accessibility of Play		
	Child-friendly connections	-	o
	Separation from motorized traffic	o	o
4	Landscape use	-	+

* (-) a lot of disturbance / (+) hardly any disturbance

CONCLUSIONS

- 1 The “Quantity of Play” remains strong.
- 2 The implementation slightly improves the “amount of disturbance” (less disturbance).
- 3 There is little improvement in “child-friendly connections.”
- 4 An insufficient use of landscape elements is changed into a strong “Landscape use”.

The NOP-model implementation has an effect on three spatial criteria:

- Amount of disturbance
- Child-friendly connections
- Landscape use

Amount of disturbance

The parking lots are relocated towards the backs of the flats instead of directly being in front of the entrances. By bringing the potential play space towards the entrance of the building, these become easier accessible and children will be less disturbed by car traffic. The main artery at the west still disturbs play, therefore “the amount of disturbance” does not have the maximum score (+).

Child-friendly connections

The connections are improved by bringing potential play spaces (greenery) towards the front of the buildings and by connecting these with the greenery (primary play space) at the east. The child-friendly connections are not optimal, because the main artery at the west is still an obstacle. A secondary childline connects this building-unit with the rest of the neighbourhood (towards the west and east). Towards the west it crosses the main artery, which means that it is not as safe as it could be.

Landscape use

Landscape elements are used to shape the implemented “Qualities of Play.” The potential play spaces have increased in size (and therefore in play potential/qualities) by connecting them with the greenery at the east.

PLAYABILITY OF THE BUILDING-UNIT

The play potential has clearly improved in this building-unit by implementing the NOP-model. But “Accessability of Play” is still an issue. The building-unit is difficult to reach from the west, because of the main artery.

In this building-unit the NOP-model is succesful, but can not solve all the accessibility problems.

10.2.4 Het na-oorlogse tuindorp / Gallery flat building-unit

Randenbroek-zuid



Before the NOP-model



After the NOP-model

SPATIAL CRITERIA FOR PLAYABILITY		before the NOP-model	after the NOP-model
1	Quantity of Play	+	+
2	Location of Play		
	Amount of Social control	+	+
	Amount of Disturbance *	o	o
	Environmental conditions	o	o
3	Accessibility of Play		
	Child-friendly connections	-	o
	Seperation from motorized traffic	o	o
4	Landscape use	-	+

* (-) a lot of disturbance / (+) hardly any disturbance

CONCLUSIONS

- 1 The "Quantity of Play" remains strong.
- 2 The implementation of the NOP-model does not change "Location of Play".
- 3 There is little improvement in "child-friendly connections."
- 4 An insufficient use of landscape elements is changed into a strong "Landscape use".

The NOP-model implementation has an effect on two spatial criteria:

- Child-friendly connections
- Landscape use

Child-friendly connections

The spaces in between the gallery flats are connected with each other by making the greenery at the east better accessible. This stimulates movement through the potential play spaces. The main artery at the west and south however, still disconnects the building-unit from the rest of the neighbourhood/district and causes some disturbance.

Landscape use

Landscape elements are used to shape the implemented "Qualities of Play." The high potentials of the size of the public space and the existing green and water elements can be used to their full extent with the NOP model implementation.

PLAYABILITY OF THE BUILDING-UNIT

The limiting factors for a good playability were "child-friendly connections" and "landscape use." The implementation of the NOP-model successfully improved these criteria aspects. Although "Location of Play" and "Accessibility of Play" are still not optimal (because of the car artery at the west), the NOP-model increases the playability of this building-unit sufficiently.

10.2.5 Het na-oorlogse tuindorp / Typology evaluation

Randenbroek-zuid



Before the NOP-model

The figure above illustrates:

- The dominant car domain (black lines for main arteries; dotted lines for low-intensity roads), which impedes the movement of children through the neighbourhood.
- Child facilities which are hardly accessible, because of the car roads surrounding them (red exclamation marks).



After the NOP-model

The figure above illustrates:

- The change in the car domain as a result of the implementation of the NOP-model. Instead of three main arteries located at the north, there is a main artery at the north and a main artery connected at the west.
- This intervention relocates the main car circulation towards the border of the neighbourhood and improves accessibility of child facilities (green exclamation marks) for children; 'improved separation from motorized traffic'.

The previous building-unit conclusions were:

- 1 The playability of the rowhouse building-unit in a “na-oorlogse tuindorp” typology remains weak with the implementation of the NOP-model.
- 2 The implementation of the NOP-model effectively improved the playability of the “portiek” flat building-unit.
- 3 In the second “portiek” flat building-unit the NOP-model is succesful, but can not solve accessibility aspects.
- 4 Although “Location of Play” and “Accessibility of Play” are still not optimal (because of the car artery at the west), the NOP-model increases the playability of the gallery flat building-unit.

With the conclusions of the building-units and the influence of the NOP-model on neighbourhood level, we can formulate the following conclusions about the usefulness of the NOP-model for “het na-oorlogse tuindorp” typology.

PLAYABILITY OF THE TYPOLOGY

This typology/neighbourhood has large amounts of public space available around most building units. Enough to provide sufficient potential playing space for children. The location, accessibility and quality of these spaces (for playing purposes) seem to be significantly improved with the NOP model. Where little space for play is available the NOP model can only minimally create space due to the demands of the car domain.

The overall limiting factor for the NOP model on this typology/neighbourhood is therefore the amount of flexibility in its existing car domain. The location of the several building units and child facilities within the neighbourhood and their accompanying public spaces and car infrastructure determine if they can significantly be improved in their playability.

In general, it can be concluded that the NOP-model does improve the playability in “Randenbroek-zuid.” However, lack of playing space caused by dense housing (like the row-house typology) are difficult to solve. At dense housing types, the NOP-model is weakest.

10.3 The influence of the NOP-model on the playability of urban types and typologies: Schuilenburg-noord

The spatial criteria of chapter 7 will be used again to evaluate the examined types and typologies on their playability, after the implementation of the NOP-model on neighbourhood level, in Schuilenburg-noord.

10.3.1 De wijkgedachte / Row house building-unit

Schuilenburg-noord



Before the NOP-model



After the NOP-model

SPATIAL CRITERIA FOR PLAYABILITY		before the NOP-model	after the NOP-model
1	Quantity of Play	o	+
2	Location of Play		
	Amount of Social control	+	+
	Amount of Disturbance *	+	+
	Environmental conditions	+	+
3	Accessibility of Play		
	Child-friendly connections	+	+
	Seperation from motorized traffic	+	+
4	Landscape use	-	o

* (-) a lot of disturbance / (+) hardly any disturbance

CONCLUSIONS

- 1 The "Quantity of Play" has improved.
- 2 There is no change in the "Location of Play"
- 3 There is no change in the "Accessibility of Play"
- 4 An insufficient use of landscape elements is slightly improved.

The NOP-model implementation has an effect on two spatial criteria:

- Quantity of Play
- Landscape use

Quantity of Play

By relocating a main car artery (west-east car road in the figure: Before the NOP-model) towards the edge of the neighbourhood, extra public space is created. The row-house building-unit however, has little possibilities to incorporate more public space. The composition of the buildings is inflexible. Therefore it might not always be possible to create more public space, by relocating car arteries. Although in number there might be enough potential play spaces, they are limited in size. These spaces are therefore limited in the amount of 'Qualities of Play' they can contain.

Landscape use

The "Landscape use" is the most limiting spatial criteria in this building-unit. Although the NOP-model improves the use of landscape elements, the dense urban environment means this aspect can only be improved to a certain point.

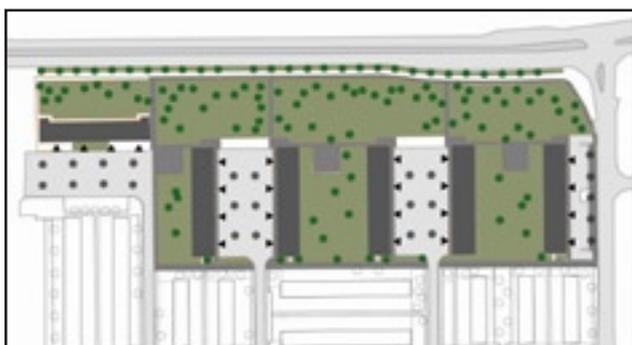
PLAYABILITY OF THE BUILDING-UNIT

The location- and accessibility aspects of this building-unit were good, even without the implementation of the NOP-model. This building-unit therefore has a solid starting point to stimulate outdoor play. The limited possibility for the use of landscape

elements and the small size of the individual play spaces limit the play potential. The decrease in car roads (and accompanying crossing obstacles) has improved movement from this building unit to the rest of the neighbourhood however. The playability of this building unit will mostly increase by simply implementing the proposed 'Qualities of Play' (see figure 9.34).

10.3.2 De wijkgedachte / Portiek flat building-unit

Schuilenburg-noord



Before the NOP-model



After the NOP-model

SPATIAL CRITERIA FOR PLAYABILITY		before the NOP-model	after the NOP-model
1	Quantity of Play	+	+
2	Location of Play		
	Amount of Social control	o	+
	Amount of Disturbance *	o	+
	Environmental conditions	+	+
3	Accessibility of Play		
	Child-friendly connections	o	+
	Seperation from motorized traffic	o	+
4	Landscape use	-	+

* (-) a lot of disturbance / (+) hardly any disturbance

CONCLUSIONS

- 1 The "Quantity of Play" has not changed significantly.
- 2 The "Location of Play" is improved.
- 3 The "Accessibility of Play" is improved.
- 4 An insufficient use of landscape elements is changed into a strong "Landscape use".

The NOP-model implementation has an effect on five spatial criteria:

- Amount of Social control
- Amount of Disturbance
- Child-friendly connections
- Seperation from motorized traffic
- Landscape use

Amount of Social control

The former parking lots are transformed into public spaces (greenery), which are directly connected to the entrances of the buildings. These play spaces are ideal for playing purposes, in terms of social control, since people are passing by or looking on to it.

Amount of Disturbance

The former greenery at the edge of the neighbourhood (northern green strip in the figure: Before the NOP-model) has become a main artery (which is important for the car circulation through the neighbourhood) and parking lots. By 'sacrificing' this green strip (which was already evaluated as a weak potential play space, see figure 8.3) we created more public space in between the "portiek" flats. These spaces are not connected with the main artery (only with the parking lots) and therefore have a lesser amount of disturbance.

Child-friendly connections

With the restructuring of the car domain it is possible for children (that live in the "portiek" flats) to move towards the center of the neighbourhood without having to cross a single car road. The public spaces in between the buildings are also connected with each other by a childfriendly connection (the childline).

Seperation from motorized traffic

With the restructuring of the car domain, the public spaces (greenery) are almost fully seperated from motorized traffic. Some public spaces share an edge with a parking lot. But these parking lots do not interfere with the play potential of the public spaces.

Landscape use

The available greenery has been used to incorporate all the "Qualities of Play." With the implementation of these qualities, variety has been created between the potential play spaces. Before the NOP-model implementation there was little variety between these spaces and landscape elements were hardly used to stimulate children for outdoor play activities.

PLAYABILITY OF THE BUILDING-UNIT

After the NOP-model implementation all the spatial criteria have a strong value (+). This indicates that the NOP-model is a good tool to improve spatial characteristics for playing purposes, of this building-unit.

10.3.3 De wijkgedachte / Gallery flat building-unit

Schuilenburg-noord



Before the NOP-model



After the NOP-model

SPATIAL CRITERIA FOR PLAYABILITY		before the NOP-model	after the NOP-model
1	Quantity of Play	+	+
2	Location of Play		
	Amount of Social control	o	+
	Amount of Disturbance *	-	+
	Environmental conditions	-	+
3	Accessibility of Play		
	Child-friendly connections	-	+
	Seperation from motorized traffic	o	+
4	Landscape use	-	+

* (-) a lot of disturbance / (+) hardly any disturbance

CONCLUSIONS

- 1 The "Quantity of Play" has not changed.
- 2 All the location aspects are improved.
- 3 Both accessibility aspects are improved.
- 4 An insufficient use of landscape elements is changed into a strong "Landscape use".

The NOP-model implementation has an effect on six spatial criteria:

- Amount of Social control
- Amount of Disturbance
- Environmental conditions
- Child-friendly connections
- Seperation from motorized traffic
- Landscape use

Amount of Social control

The greenery at the edge of the neighbourhood is relocated to the front of the gallery flats. There was hardly any social control on these spaces on their former location. After the NOP-model implementation there is a high amount of social control, since the greenery is in front of the flats and in clear view of residents and people passing by. Furthermore it is connected with the entrances of the building units.

Amount of Disturbance

Before the NOP-model implementation the north-south orientated car road in front of the gallery flats (see figure: Before the NOP-model) caused a lot of disturbance for the formal playgrounds in front of the flats (see figure 8.4). After relocating the car road and the accompanying parking lots, there is no more disturbance from car traffic.

Environmental conditions

Most public greenery has poor environmental conditions. They hardly receive sunlight because of the height of the flats and their soil is too wet for play activities. The new location of the greenery (public space) receives sufficient sunlight and is protected against heavy wind by the flats.

Child-friendly connections

After the NOP-model implementation the greenery is directly connected with the entrances of the buildings. The childlines through these spaces provide a safe childfriendly route from and towards the building-unit.

Seperation from motorized traffic

All green areas (potential play space) are now separated from car roads. Only a few parking lots share an edge with a potential play space, but this does not interfere with the play opportunities of these spaces

Landscape use

The poor conditions of the former greenery has been transformed into greenery which fully incorporates the provided landscape elements. The size and amount of the created potential play spaces is sufficient to contain most of the "Qualities of Play."

PLAYABILITY OF THE BUILDING-UNIT

The NOP-model implementation successfully improved the location and accessibility aspects of this building-unit. Before the NOP-model implementation the building-unit had a weak playability and after the NOP-model all the spatial criteria have the highest value (+). This means that the NOP-model proves to be effective in this type of gallery building-unit in a typology based on "de wijkgedachte."



10.3.4 De wijkgedachte / Typology evaluation

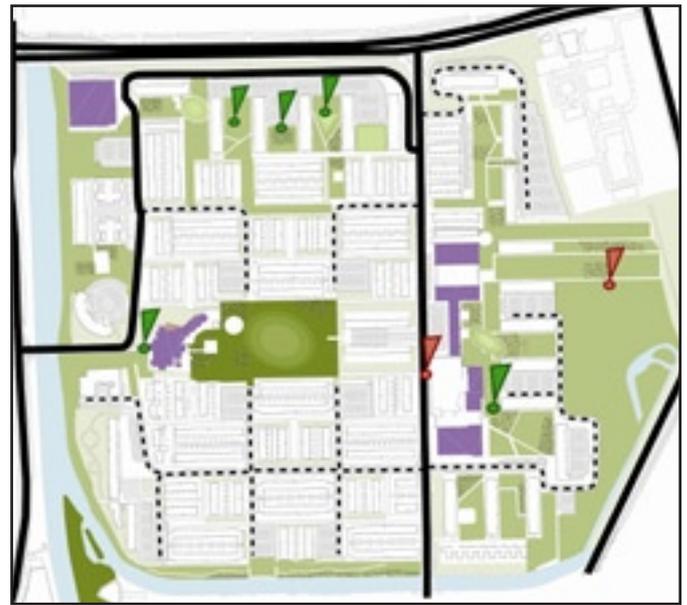
Schuilenburg-noord



Before the NOP-model

The figure above illustrates:

- The car domain designed as the leading principle of “de wijkgedachte” typology (see paragraph 7.3). The blacklines are ongoing main car arteries and the dotted lines are dead-ends (mostly connected to parking lots).
- Child-facilities that are surrounded by car roads, which make them difficult and unsafe for children to reach the facility (west and south exclamation marks).
- Greenery at the border of the neighbourhood, which are weak in their play potential (north and east exclamation marks / see section 7.4.2)



After the NOP-model

The figure above illustrates:

- The restructuring of the car domain. The center of the neighbourhood is separated from ongoing car roads. This improves the accessibility towards the center. Most obvious is the new location of an ongoing road along the northern edge of the neighbourhood. The north-south orientated car road (left red exclamation mark) is impossible to remove. This road still separates the neighbourhood into two parts.
- The child facilities have been improved in their accessibility (bottom left and right green exclamation marks). Car roads have been removed to make them easier accessible by bike or by foot.
- There is more variety in the greenery, because of the implemented “Qualities of Play” (north green exclamation marks)

With the conclusions of the building-units and the influence of the NOP-model on neighbourhood level, something can be said about the usefulness of the NOP-model for “de wijkgedachte” typology.

The previous building-unit conclusions were:

- 1 The NOP-model influences the playability of the row house building-unit minimally.
- 2 The NOP-model is a good tool to improve playability of the “portiek” flat building-unit.
- 3 The NOP-model is a good tool to improve playability of the gallery flat building-unit.

PLAYABILITY OF THE TYPOLOGY

This typology/neighbourhood proved to have sufficient amounts of potential play spaces (see chapter 8) in every building-unit. The location, accessibility and quality of these spaces (for playing purposes) seem to be significantly improved with the NOP model.

Again the overall limiting factor for the NOP model on this typology/neighbourhood is the amount of flexibility in its existing car domain. The location of the several building units and child facilities within the neighbourhood and their accompanying public spaces and car infrastructure determine if they can significantly be improved in their playability. This is apparant in the large changes in the car infrastructure around the ‘portiek’ and gallery flats which resulted in in great improvement of their playability. The relative little changes in car infrastructure in the row-house building unit resulted in lesser, but still important improvements of its playability.

The changes in the car domain were also benefetal for the Location and Accessibility of play of the child facility in this neighbourhood.

In general, it can be concluded that the NOP-model does improve the playability in “Schuilenburg-noord.”



10.4 Answer to our hypothesis

As has become clear, the NOP-model implementation strongly depends on the availability of certain spatial characteristics in a typology. One of these characteristics is the availability of enough public space. In dense urban structures it is difficult to improve the evaluated spatial aspects. Another spatial criteria is the availability of landscape elements (greenery). The NOP-model uses green and blue landscape elements to shape the "Qualities of Play." If we compare both examined typologies, it becomes noticeable that the same building-units differ in layout (spatial composition) and therefore also provide different limitations and opportunities for the implementation of the NOP-model.

Row house building-unit

SPATIAL CRITERIA FOR PLAYABILITY		het na-oorlogse tuindorp		de wijkgedachte	
		before NOP	after NOP	before NOP	after NOP
1	Quantity of Play	-	o	o	+
2	Location of Play				
	Amount of Social control	+	+	+	+
	Amount of Disturbance *	-	-	+	+
	Environmental conditions	o	o	+	+
3	Accessibility of Play				
	Child-friendly connections	-	o	+	+
	Separation from motorized traffic	-	-	+	+
4	Landscape use	-	-	-	o

* (-) a lot of disturbance / (+) hardly any disturbance

In both situations the NOP-model implementation has little influence on the playability of the neighbourhood. However, the building-composition of "de wijkgedachte" has strong location and accessibility aspects, which are absent in "het na-oorlogse tuindorp" typology. Therefore the NOP-model implementation strongly differs in both typologies. In "het na-oorlogse tuindorp" typology it is essential to start with improvements of the accessibility aspects, while these are fine in "de wijkgedachte" typology. Here, it is more important to start with improvements of the "Landscape use".

Portiek flat building-unit

SPATIAL CRITERIA FOR PLAYABILITY		het na-oorlogse tuindorp		de wijkgedachte	
		before NOP	after NOP	before NOP	after NOP
1	Quantity of Play	+	+	+	+
2	Location of Play				
	Amount of Social control	+	+	o	+
	Amount of Disturbance *	o	+	o	+
	Environmental conditions	o	o	+	+
3	Accessibility of Play				
	Child-friendly connections	-	+	o	+
	Seperation from motorized traffic	-	+	o	+
4	Landscape use	-	+	-	+

* (-) a lot of disturbance / (+) hardly any disturbance

In both typologies, the implementation of the NOP-model resulted in strong improvements of the playability of these building-units.

Both building-units (portiek I building-unit for “het na-oorlogse tuindorp” typology) have more or less the same value before the NOP-model implementation and also after the implementation. The most noticeable aspect are the weaker accessibility aspects of “het na-oorlogse tuindorp” typology compared with “de wijkgedachte” typology.

Gallery flat building-unit

SPATIAL CRITERIA FOR PLAYABILITY		het na-oorlogse tuindorp		de wijkgedachte	
		before NOP	after NOP	before NOP	after NOP
1	Quantity of Play	+	+	+	+
2	Location of Play				
	Amount of Social control	+	+	o	+
	Amount of Disturbance *	o	o	-	+
	Environmental conditions	o	o	-	+
3	Accessibility of Play				
	Child-friendly connections	-	o	-	+
	Seperation from motorized traffic	o	o	o	+
4	Landscape use	-	+	-	+

* (-) a lot of disturbance / (+) hardly any disturbance

The location aspects of “de wijkgedache” are valued much lower than those of “het na-oorlogse tuindorp” typology. But it is remarkable that after the NOP-model implementation these become stronger compared to the location aspects in “het na-oorlogse tuindorp” typology. The NOP-model implementation uses its full potential in “de wijkgedachte” typology, while in “het na-oorlogse tuindorp” some spatial aspects remain insufficient for playability.

(The evaluation of the “portiek” II building-unit of “het na-oorlogse tuindorp” typology is comparable with the gallery building-unit evaluation of this typology.)

With the previous evaluations (of the influence of the NOP-model implementation on the playability of the urban typologies), we conclude that the “Network Of Play” will most likely improve the playability of Dutch residential districts. Therefore we can assume that our hypothesis is right:

“Redesigning the public space of a city district to a ‘Network of Play’ stimulates outdoor play”

The proposed design solutions are not only affecting the play opportunities for children (stimulating their outdoor play activity), but can also have a positive effect on other residents. Better connected public spaces (not interfered by car traffic) are beneficial for all residents that are dependent on bicycle or pedestrian paths (like the elderly).

The NOP-model is designed to improve the public space in urban residential districts, with a realistic point of view. Currently, a lot of post-war residential districts are being restructured and old buildings are replaced by new ones. Although demolition of old buildings might help to solve some spatial problems, the NOP-model does not revert to such solutions. The aim of the NOP methodology is to give more insight in characteristic urban typologies and their relation to play opportunities and improve them if possible. Some design solutions have a large effect on the motorized traffic circulation of the neighbourhood/district. A safe pedestrian environment and an optimal car circulation, most often do not go together. The NOP-model prefers separated paths/spaces from motorized traffic. But even in the restructuring of the car circulation, the preferred alternative is based on realistic solutions. In the end, the possible inconveniences for motorized traffic result in a healthier, safer residential environment for every resident, child and adult alike.

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PICTURE CREDITS

(t=top, m=middle, b=bottom, l=left, r=right)

Deviant art	/	18, 67t, 67m, 69mb, 71t, 71tm
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Stock exchange	/	35b, 71m, 71mb, 71b





APPENDIX I



Criteria diagrams / District level

Willem III

N: Willem III Place	Location of Play			Accessibility of Play		Quality of Play						Size	Landscape use	Formal (F) or Informal play area (I)
	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	Age	P	S	M			
1	+	+	+	+	+	0	-	0	0	-	-	+	-	F/I
2	+	+	+	+	+	-	-	0	0	0	-	+	-	F
3	0	0	0	+	+	-	-	-	0	+	-	+	-	F
4	-	-	-	0	+	-	-	-	0	-	-	+	-	F/I
5	+	+	+	+	+	-	-	-	-	-	-	-	-	I
✓ 6	+	+	+	+	+	0	0	0	0	0	+	+	-	I

N = Neighbourhood
 C = Complexity
 E.M.O. = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space

(+) Good
 (0) Neutral
 (-) Bad

✓ Chosen primary play space



APPENDIX I



Criteria diagrams / District level Randenbroekerweg

Randenbroekerweg Place	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	P.T.G.	P	S	M	Use	Informal play area (I)
1	+	0	+	-	0	-	-	-	-	-	-	+	I
2	+	0	+	-	+	0	-	-	0	0	-	-	I
3	+	0	+	-	2	-	-	-	-	-	-	2	I
4	+	-	0	0	2	-	-	-	0	+	-	2	I
5	+	-	0	-	-	-	-	-	-	-	-	-	I
6	+	0	+	0	-	-	-	-	0	+	-	2	F
7	+	-	0	0	-	-	-	-	0	+	-	+	F

N = Neighbourhood
 C = Complexity
 E.M.O. = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space

(+) Good
 (0) Neutral
 (-) Bad



APPENDIX I



Criteria diagrams / District level

Bachweg-zuid

Bachweg zuid Place	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	P.T.G.	P	S	M		use	Informal play area (I)
1	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2	+	+	0	0	0	-	-	-	0	+	-	0	-	-
3	+	+	+	0	+	0	-	+	0	+	+	+	0	F
4 ✓	+	0	+	0	+	0	-	-	0	0	0	+	0	-
5	0	-	-	-	-	-	-	-	-	-	-	+	-	-
6*	+	0	+	+	+	0	-	-	0	0	-	0	0	-
7** ✓	-	+	+	-	-	+	+	0	+	+	+	+	+	-

N = Neighbourhood
 C = Complexity
 E.M.O = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space

(+) Good
 (0) Neutral
 (-) Bad

✓ Chosen primary play space

* semi-private space
 ** city park



APPENDIX I



Criteria diagrams / District level

Weberstraat

Weberstraat Place	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	P.T.G.	P	S	M	use	Informal play area (I)
1	0	-	-	-	-	-	-	-	-	-	-	0	-
2	+	0	+	0	-	-	-	-	-	0	-	+	-
3	-	0	0	+	0	0	-	0	0	0	-	+	-
4	-	-	0	0	+	-	0	-	-	-	-	+	-
5	0	-	0	0	-	-	-	-	-	0	-	0	-
6	+	0	+	-	0	0	-	-	-	0	-	0	-
7	0	0	0	0	0	-	-	-	0	+	-	+	-
8	0	-	0	0	-	0	-	-	-	0	-	0	-
9	0	+	0	+	+	0	0	-	+	0	0	+	-
10	-	0	0	-	-	-	-	-	+	-	-	+	-

N = Neighbourhood
 C = Complexity
 E.M.O = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space

(+) Good
 (0) Neutral
 (-) Bad

✓ Chosen primary play space



APPENDIX I



Criteria diagrams / District level

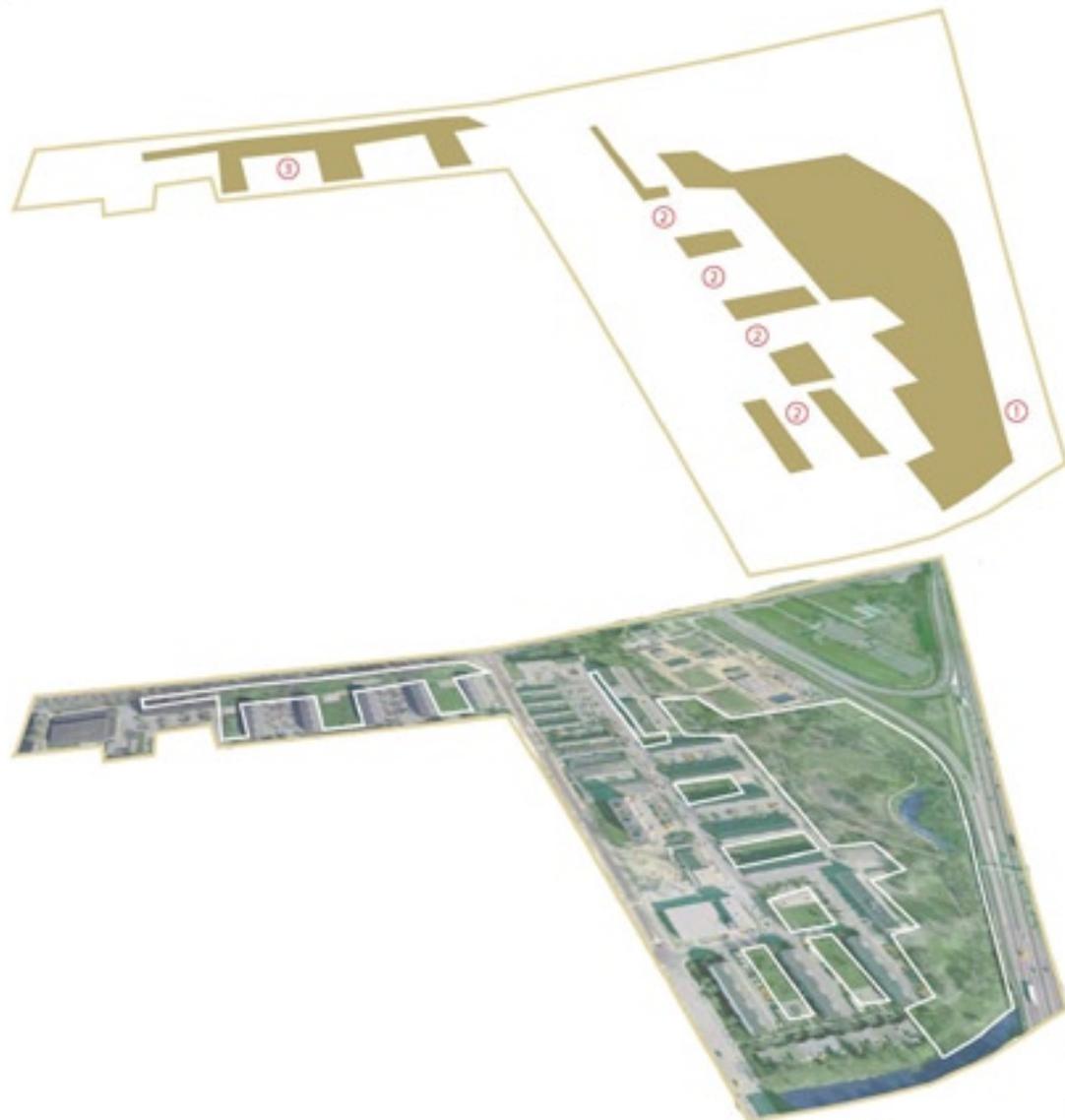
Ariaweg

Ariaweg Place	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	P.T.G.	P	S	M	use	Informal play area (I)
1	-	-	o	+	+	o	o	o	o	o	o	+	o
2	o	o	o	o	-	-	-	-	o	-	-	-	F
3	o	o	o	+	+	o	-	o	+	+	-	+	F/I

N = Neighbourhood
 C = Complexity
 E.M.O = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space

(+) Good
 (o) Neutral
 (-) Bad

✓ Chosen primary play space



APPENDIX I



Criteria diagrams / District level

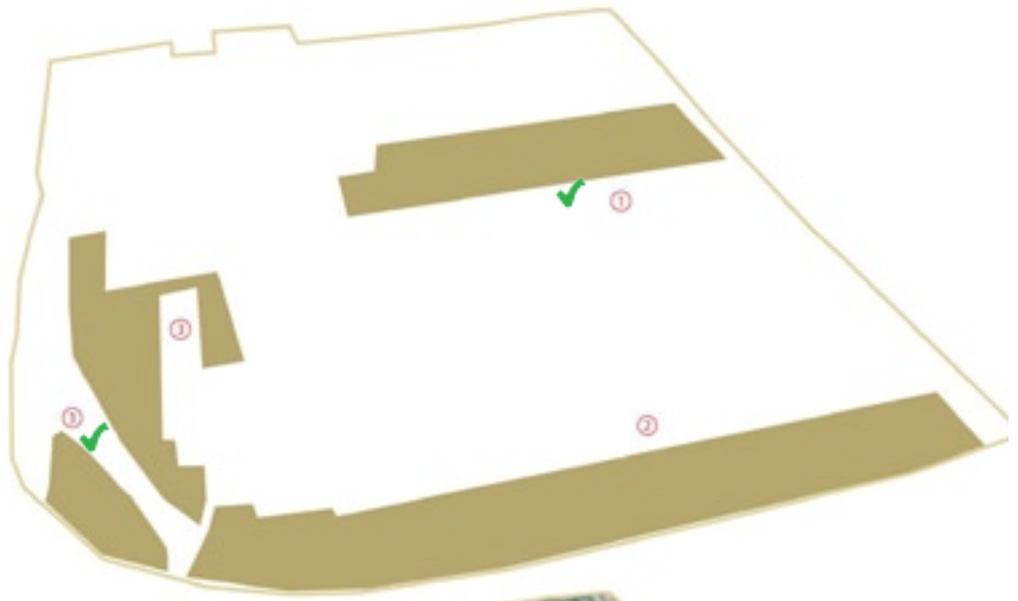
Romeostraat

Romeostraat Place	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	P.T.G.	P	S	M	USE	Informal play area (I)
1	+	-	+	+	+	-	-	-	0	+	-	+	+
2	+	0	0	+	+	0	0	-	0	0	0	+	+
3	+	+	0	-	+	-	-	-	-	-	0	0	+

N = Neighbourhood
 C = Complexity
 E.M.O = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space

(+) Good
 (0) Neutral
 (-) Bad

✓ Chosen primary play space



APPENDIX I



Criteria diagrams / District level

Verdiweg

Verdiweg Place	Social control	Disturbance	Environment condition	Child-friendly connections	Separation from motorized traffic	C	E.M.O.	P.T.G.	P	S	M		use	Informal play area (I)
	-	-	o	+	-	-	-	-	o	-	-	+	c	l

N = Neighbourhood
 C = Complexity
 E.M.O. = Environmental Manipulation Opportunity
 P.T.G. = Plural target group
 P = Physical stimulation
 S = Social stimulation
 M = Mental stimulation
 nr = not relevant, private space

(+) Good
 (o) Neutral
 (-) Bad

✓ Chosen primary play space



APPENDIX II

Topic related publications:

26 - 03- 2007 / **Probleemwijken ontvangen Vogelaar**

AMSTERDAM - Veertig probleemwijken krijgen de komende weken bezoek van minister voor Wonen, Wijken en Integratie Ella Vogelaar (PvdA). De bewindsvrouw begint haar wijkentour maandag in de Rotterdamse buurten Bloemhof, Hillesluis en de Tarwewijk.

Vogelaar bezoekt tijdens de tour alle veertig wijken die op de vorige week gepresenteerde lijst van aandachtswijken staan. Ze doet dat onder het motto 'samen buurten, samen binden'.

Het kabinet streeft ernaar dat de bewoners van de veertig geselecteerde wijken over acht tot tien jaar meer kansen hebben en dat het in de wijken weer prettig wonen is. In de wijken wordt ingezet op wonen, werken, leren, integreren en veiligheid.

Rotterdam heeft met zeven wijken het grootste aantal geselecteerde wijken. Amsterdam staat met vijf wijken op de lijst, waaronder de Bijlmer en Bos en Lommer. Vogelaar voert in Rotterdam gesprekken met buurtbewoners, ondernemers, schooldirecties en maatschappelijke organisaties.

31 - 03 - 2007 / **Iemand zegt sorry op straat**

Krantenartikel De Volkskrant

Rubriek Kennis / pagina 7

Interview Sociologe Talja Blokland over de maakbaarheid van prachtwijken

Van probleemwijk naar prachtwijk

"In een wijk waar verschillende bevolkingsgroepen naast elkaar wonen, samen naar school gaan en samen gebruik maken van voorzieningen als speeltuinen, parken en pleinen worden de voorwaarden voor vanzelfsprekende ontmoetingen gecreërd."

"Stadswijken ontwikkelen zich steeds meer tot een wereld apart met een armoedecultuur die nauwelijks raakvlakken meer heeft met het welvarende deel van de samenleving."

(brug slaan tussen achterstandsgroepen en de middenklasse)

Proefschrift "Wat stadsbewoners bindt: sociale relaties in een achterstandswijk."

1998. Talja Blokland

"Leefbaarheid verbeteren door korte contacten."

"Openbare ruimte ervaren als van jezelf." (Ruth Soenen)

"Vroeger wisten de mensen meer van elkaar af." (afgenomen door gebruik van de auto)

"Het bouwen van dure huizen in arme wijken is niet effectief als middel tegen armoede of werkloosheid, omdat er geen duurzame bindingen tussen arm en rijk tot stand komen. Maar het mengen van bevolkingsgroepen is wel een manier om kennis over elkaar te bevorderen."

"Door herhaalde korte contacten kan de voorspelbaarheid in de openbare ruimte weer toenemen." (netwerken mengen)

APPENDIX II

04 - 09 - 2007 / **In 2015 één op vijf kinderen te dik**

DEN HAAG - Nog geen 10 procent van de kinderen op de basisschool haalt de minimum beweegnorm van een half uur per dag. In de leeftijdsgroep van twaalf tot zeventien jaar ligt dat percentage onder de 30.

Deze ontwikkeling leidt ertoe dat in 2015 één op de vijf kinderen te dik is.

Dat blijkt uit een rapport dat het Nicis, het instituut dat onderzoek verricht naar de sociaal-economische ontwikkeling van de grote steden, dinsdag presenteert.

Wijken

De inrichting van de wijken speelt een belangrijke rol hierin. Volgens het onderzoek is er een duidelijk, aantoonbaar verband tussen de mogelijkheid voor sport en spel in een wijk en de deelname hieraan.

“De gemeenten onderschatten hun eigen rol hierin”, concludeert directeur Wim Hafkamp van Nicis. “Zij moeten hier veel meer in investeren.”

Ouders

Ook constateert het onderzoek dat de rol van ouders van belang is om deze neerwaartse spiraal te stoppen. Kinderen kopiëren namelijk het sportieve gedrag van hun ouders: luie ouders maken luie kinderen.

Verder is gebleken dat binnen allochtone huishoudens meisjes veel minder betrokken zijn bij sport en bewegingsactiviteiten dan jongens.

Fietsen

Nicis merkt op dat het al enorm zou schelen als alle kinderen naar school zouden gaan fietsen. Ook hierin kunnen de gemeenten een rol spelen, door routes naar scholen veiliger te maken.

Een ander punt van aandacht is het veiliger maken van speelplaatsen. Deze worden door kinderen te vaak als onveilig beschouwd door de aanwezigheid van hangjongeren, loslopende honden, kinderlokken en verslaafden.

21- 11 - 2007 / **Kinderen hebben weinig interesse in natuur**

AMSTERDAM - Kinderen tonen de laatste twintig jaar steeds minder interesse voor de natuur. Ze gaan minder de natuur in en blijven er korter.

Dat blijkt uit een woensdag gepubliceerd onderzoek van de Vrije Universiteit in Amsterdam waaraan 325 kinderen in de leeftijd van tien tot dertien jaar deelnamen.

Televisie

Media, school, ouders en de woonomgeving zijn van invloed op de afnemende natuurinteresse. Zo besteedt een ruime meerderheid van de kinderen minimaal twee uur per dag aan televisie, internet of de spelcomputer.

Ook zijn de hoeveelheid natuur in de woonomgeving en de veiligheid daarvan afgenomen, waardoor het groen minder toegankelijk is geworden voor de jeugd. Daarnaast besteedt de school minder aandacht aan dit onderwerp. Zo is ruim één op de drie leerlingen nog nooit met de klas de natuur ingegaan.

(c) ANP

APPENDIX II

21- 11 - 2007 / **Twee nieuwe natuurspeelplaatsen in de stad**

In bomen klimmen, hutten bouwen, met water klieren, kikkers en padden bekijken – en dat allemaal midden in de stad. Dat kan op een natuurspeelplaats. In december legt de gemeente in Klein Zwitserland (Berg-Zuid) en Nimmerdor (Leusderkwartier) zulke speelplaatsen aan.

Op een natuurspeelplaats kunnen kinderen op een speelse manier de natuur ontdekken en beleven. In Klein Zwitserland komen houten stellages, die als basis kunnen dienen voor het maken van takkenhutten. In Nimmerdor wordt een aantal boomhutten geplaatst op een open plek bij het fietspad naar landgoed Den Treek. In 2008 worden de plannen uitgewerkt voor zo'n vijf andere natuurspeelplaatsen in de stad.

Meer speelruimte

Uit onderzoek blijkt dat kinderen graag spelen en ravotten op braakliggende, natuurlijke terreinen, waar niet te veel controle door volwassenen is. In de praktijk hebben kinderen uit de stad daar helaas minder mogelijkheden voor. Met Operatie Amersfoort Jong wil de gemeente meer en betere speel- en ontmoetingsruimte ontwikkelen.

Ontwikkeling

Door een diversiteit aan natuurspeelplaatsen aan te leggen, worden bewegen en creativiteit gestimuleerd, net als samen spelen. Dit is goed voor de motoriek van kinderen én hun sociale ontwikkeling. Bovendien kunnen ze op een natuurspeelplaats meer interesse voor de natuur ontwikkelen.

08- 05 - 2008 / **PvdA wil 'slank' bouwen**

TON DAMEN

AMSTERDAM - Buurten moeten zo worden ingericht dat zij mensen niet dik maken, vindt de PvdA.

"De inrichting van wijken luistert nauw. Zo moeten winkels niet twee kilometer van huizen liggen, zoals in Osdorp, want dan pakken mensen de auto om er te komen. In Osdorp wonen mede daardoor ook meer dikke mensen dan in Noord," aldus raadslid Hetti Willemse.

Ze verwijst naar VU-onderzoeker Frank den Hertog, die concludeerde dat vooral groene wijken, zoals die in West, overgewicht veroorzaken.

Willemse: "Het is zo simpel. Bouw woningen dicht bij een parkje, een fonteintje, maar ook bij wat winkels, een buurthuis of lunchroom. Dan krijg je de mensen de straat op. Dat is ook beter voor de sociale controle. Als voorzieningen wat verder uit elkaar liggen, fietsen mensen, maar de volgende stap is de auto."

Andere fracties, maar ook PvdA-wethouder Tjeerd Herrema zien er weinig in de stad ook voor slankere burgers te laten zorgen.

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Overgewicht bij kinderen

Het aantal kinderen en volwassenen met overgewicht en obesitas is de laatste jaren wereldwijd snel toegenomen. Ook in Nederland is overgewicht een uitdijend probleem. TNO Kwaliteit van Leven analyseerde in samenwerking met het VUmc de gegevens van meer dan 80.000 kinderen in de leeftijd vier tot vijftien jaar. Gemiddeld is veertien procent van de jongens en zeventien procent van de meisjes te dik.



TNO onderzocht in samenwerking met het VUmc en in opdracht van het ministerie van VWS hoeveel kinderen overgewicht en obesitas hebben. Elf GGD-en registreerden daartoe tussen 2002 en 2004 lengte en gewicht van meer dan 80.000 schoolkinderen. De gegevens zijn vergeleken met de cijfers van de vierde Landelijke Groeistudie uit 1997.

Overgewicht verdubbeld

Gemiddeld is veertien procent van de jongens en zeventien procent van de meisjes te dik. Sinds 1997 is het aantal jongens dat op negen-jarige leeftijd te dik is met bijna tachtig procent toegenomen van (9,0 % naar 16,1). Voor twaalf-jarige jongens en voor vijftien-jarige meisjes is het aantal zelfs

ruim verdubbeld. Er zijn meer meisjes te dik dan jongens, met name op jongere leeftijd. Zo is op acht-jarige leeftijd bijna een kwart van de meisjes te dik ten opzichte van 17,3 procent van de jongens.

Obesitas nog sterker toegenomen

Het percentage jongens en meisjes dat veel te zwaar is (obesitas), is ook sterk toegenomen. Bij jongens van vier en twaalf jaar en meisjes van vijf en dertien jaar is het zelfs verdriedubbeld.

Meisjes jonger te dik

Kinderen worden op steeds jongere leeftijd te dik. Opmerkelijk is dat het percentage vijfjarige meisjes (15 %) dat al te dik is, veel hoger is dan bij jongens. Vanaf zeven jaar is er bij meisjes een verdere stijging te zien, bij jongens is dat bij acht jaar.

Snellere stijging

Het percentage kinderen dat te dik is of obesitas heeft, stijgt steeds sneller. Had in 1980 bijvoorbeeld 1 op de 15 negenjarige meisjes overgewicht, in 1997 was dit al 1 op 7. In de zes jaar daarna is dit verder toegenomen en heeft 1 op 4 negenjarige meisjes overgewicht.

APPENDIX II

Onderzoeksresultaten Overgewicht bij kinderen

Aanbevelingen

- * Kinderen worden op steeds jongere leeftijd te dik en het aantal neemt steeds sneller toe. Om deze stijgende trend om te buigen, zijn gerichte interventies nodig. De Jeugdgezondheidszorg is de aangewezen instantie om overgewicht te registreren, te signaleren en kinderen zo nodig te verwijzen.
- * Het is aan te raden voor jongens en meisjes een aparte aanpak te kiezen

voor het tegengaan van overgewicht en obesitas, omdat meisjes op jongere leeftijd al te dik zijn. Het signaleren en behandelen zou voor meisjes al moeten gebeuren voor het vijfde jaar.

- * Om het effect van preventie en interventies te meten, is een uniforme registratie nodig volgens de reeds ontwikkelde standaarden van de Lokale en Nationale Monitor Jeugdgezondheid.

TNO Kwaliteit van Leven

Preventie en Zorg

Postbus 2215
2301 CE Leiden

Stef van Buuren
T 071 518 16.62
F 071 518 19 15
E S.vanBuuren@pg.tno.nl

www.tno.nl/zorg

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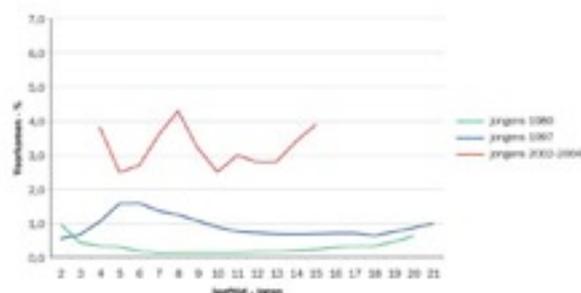
Tabel 1 Overgewicht bij jongens en meisjes, in 2002-2004 en 1997 (in percentages)

Leeftijd	Jongens		Meisjes	
	2002-2004	1997	2002-2004	1997
4	9,2	9,5	15,6	10,8
5	10,0	8,3	14,6	9,5
6	10,9	9,1	15,1	19,0
7	14,9	10,6	21,8	13,6
8	17,3	10,9	24,6	13,9
9	16,1	9,0	18,9	15,3
10	14,0	6,9	16,9	13,4
11	15,4	8,7	19,0	11,0
12	16,2	7,4	17,1	12,2
13	15,3	8,1	15,2	10,0
14	15,6	8,0	16,2	7,2
15	16,8	5,4	20,1	10,0

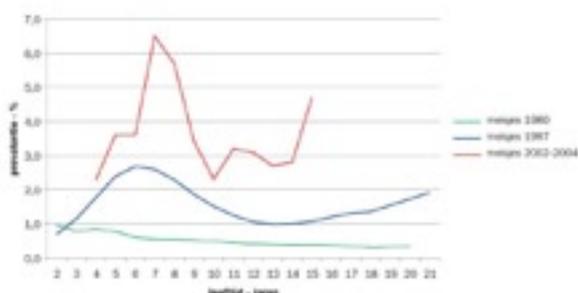
Tabel 2. Obesitas bij jongens en meisjes, in 2002-2004 en 1997 (in percentages)

Leeftijd	Jongens		Meisjes	
	2002-2004	1997	2002-2004	1997
4	3,8	1,2	2,3	0,0
5	2,5	1,5	3,6	1,5
6	2,7	3,0	3,6	1,6
7	3,6	3,5	6,5	2,1
8	4,3	0,0	5,7	2,8
9	3,2	1,2	3,4	2,2
10	2,5	0,9	2,3	2,5
11	3,0	0,3	3,2	1,4
12	2,8	0,8	3,1	1,3
13	2,8	1,2	2,7	0,6
14	3,4	1,0	2,8	0,5
15	3,9	0,5	4,7	0,5

Figuur 1 Voorkomen obesitas jongens (in percentage)



Figuur 2 Voorkomen obesitas meisjes (in percentage)





CONTACT INFORMATION

Koen Bakker

email: koenminator@hotmail.com

tel: 06-14145151

Frank Fähnrich

email: funkyassfrank@hotmail.com

tel: 06-41912591

Thesis supervisor: Dipl. Ing. Sanda Lenzholzer

email: sanda.lenzholzer@wur.nl