THE NEIGHBOURHOOD MEDICINE

Realizing a dementia friendly Ommoord

L.M. Baak - 2019

Colophon

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PREFACE

"The Neighbourhood Medicine", is the final product of my graduation project at Delft University of Technology. This graduation thesis is part of a joint graduation project between the master Urbanism at the Faculty of Architecture and the master Science Communication at the faculty of Applied Sciences.

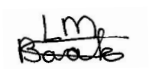
People with dementia living in their own neighbourhood is the future perspective of our country. There has been little research on dementia and the neighbourhood, which makes it a challenging case for the urbanist of today. Moreover, in complex problems of this kind it is important to join forces with involved stakeholders to find the most suitable solution. If we do not focus on finding new solutions, then there is a big chance that our elderly people with dementia will become housebound.

This project focuses on realizing a dementia friendly Ommoord, because the population of Ommoord is ageing. Moreover, most of the elderly in Ommoord want to live forever in their beloved neighbourhood.

For me, this project is the ideal combination of both studies I followed at the TU Delft. Besides, this project is in line with my sociable personality, because I am always triggered to find solutions for the most vulnerable people in the city. During an internship at a health care institution, I saw how people with dementia were 'locked up' in their nursing homes, because the public space cannot serve them.

Now it is time to change this situation. This report is the start of an interesting journey, which hopefully leads to beautiful new solutions.

Lisanne Marit Baak, June 2019



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This project was so successful, because of the help of many people. I want to thank my mentor team for their enthusiasm and support during the last one and a half year. Machiel, it was a pleasure to talk to you about the pattern language and its application in the perspective of communication. Remon, thank you for showing me the link between communication and urban planning. Maarten, you have ensured that my creative brain was constantly triggered and finally, thanks Caroline for your critical view and focus on making it all understandable and usable.

I would like to thank all involved stakeholders for their time, energy and interesting insights. It was valuable to discuss the subject dementia in the neighbourhood with you. Without you, the overall picture would never have been so complete.

Anne, Daan, Erik and Jan, it was a pleasure to start and share our graduation processes together. Moreover, I want to thank the other graduation students from the urbanism and communication studio for their help, sharing of knowledge, interest and critical remarks. All the coffee and tea moments got me through harder times.

I would like to thank my parents and sister for their mental support. Especially, my father felt like a fifth mentor to me. His help and interest in this project were limitless. Thank you for your confidence, even if I had lost it myself.

I am very grateful for all friends and family who supported me during this graduation period. In particular, a number of them deserve a personal message. Lenny, thanks for showing me true friendship. Your loyalty and trust in me as a person are very special. Denise, your enthusiasm is contagious and I appreciated your willingness to help. Linda, thanks for all the energy and interesting discussions. Your encouraging words kept me motivated.

Finally, I would like to thank everyone who has made somehow a positive contribution to this graduation project.

Summary

The world's population is aging with the result that chronic illness becomes more widespread. Dementia is one of the diseases that will play a big role in the future. The Netherlands is one of the countries in the top ten that has to house many people with dementia and, to be more specific, Rotterdam relatively has to house the most. The neighbourhood Ommoord was chosen as a test case, because the population of Ommoord will age enormously in the coming years. Most of the residents have been living there since the beginning of the realisation of the plan.

At the moment the government of the Netherlands is cutting back on the healthcare costs. The result is that elderly people have to stay at home for as long as possible. This new idea is also in line with the wishes of most elderly people, who want to live at home. Our neighbourhoods are not designed yet to serve this new trend. Especially the elderly with dementia can experience problems. If we do nothing, our elderly will become housebound.

The main goal of this project is to develop a communication tool that on the one hand will help an urban designer & planner to develop dementia friendly neighbourhoods, because the tool will include solutions on how to adapt a neighbourhood so that it becomes dementia friendly. On the other hand the tool will help the urban designer & planner to communicate and collaborate with involved stakeholders. The output of the tool will lead to a design and strategy for Ommoord. The following research question will be answered:

How can Ommoord be adapted to improve the quality of life for people with dementia with the help of involved stakeholders?

A design based research methodology is used to answer the main research question. There are two important lines in this project: research-design line and the designer-actors line, which influence and strengthen each other in the different phases of this project. The interaction of both lines ensure that theories are linked to practice and vice versa.

A dementia friendly neighbourhood must be accessible, comfortable, distinctive, familiar, legible and safe. These principles can be designed on the basis of different patterns. There are solutions on different scale levels: the neighbourhood, the street and the object. Moreover some patterns are more abstract than others. The evaluation of the abstract concepts sometimes requires the help of stakeholders. the patterns are arranged in a theoretical framework. The patterns cannot be seen as detached elements, but have connections with each other. Patterns can reinforce and complement each other.

The developed framework has been applied on Ommoord to assess how dementia friendly the neighbourhood is at the moment. The middle part of Ommoord is the most vulnerable and has to deal with the biggest problems. This middle part deals with some generic problems, such as the use of the same types of flats, which makes it difficult to understand an read the neighbourhood. The entrances are not always clear and there are many non-active zones, reinforced by the many non-active plinths. But there are also a number of specific problems. Not all the flats in the heart are connected to the basic facilities. The metro forms a barrier between North and South, but also between West and East. Moreover the pavements are not very pedestrian friendly. Although there are also opportunities. The routes with the other neighbourhoods can be given a stronger design. The courtyards can be used to realize social communities.

The Romeynshof can become the new centre for the entire neighbourhood and the artworks can serve as landmarks. It can be concluded that the aspect comfort is very well developed, but that the neighbourhood is not legible and accessible enough, which should be improved.

Because dementia in the neighbourhood is a complex problem, it is important to collaborate with non-urbanism professionals in the design and planning process in order to find a more embedded solution. The different stakeholders can be divided into two networks: a power network and a knowledge network. The power network has the resources and the power to get things done, whereas the knowledge network has the most knowledge about the subject. The challenge is to involve both networks in the process of creating dementia-friendly neighbourhoods, where different steps in the co-creation process can be distinguished. This project focussed on the first step, co-creating in the initial phase. Every stakeholder tries to find a solution for this problem himself, but it is important to map out all these sub-problems, to work together on a major problem that is linked to aging in the neighbourhood. An effective way to achieve this is to guide the stakeholders through the double diamond of the British Design Council. After completing the first two steps, there is an extensive problem exploration, which should provide tools for entering the design phase.

Not all stakeholders have urban knowledge and therefore it is important to translate the information for them, preferably a combination of text and images. The use of tools ensure that the deeper knowledge system is reached which enables us to find out what people think and dream. Furthermore it stimulates collaboration between the different professionals. Creating a 'problem network' will help stakeholders to see the problem from a wider perspective. Moreover, it helps to see the connection between the various problems. Finally, the two learning systems (inspirational and experiential) that every person has can be triggered. In the inspiration circle someone is temporarily released from reality and comes up with new and innovative concepts. The circle of experience refers to existing and feasible ideas and translates them into concepts. Every person has both systems and the use of both ensures well-founded results.

The above research has led to the development of a new tool: "Hersenspinsels". "Hersenspinsels" is a game which can be played by people who have expertise in different fields, but all have the same goal: making the neighbourhood dementia friendly. The aim of the game is to stimulate cooperation between the relevant actors by exploring the challenges for a specific neighbourhood in the Netherlands. The output can be used by the designer to create a design proposal. During the game the stakeholders are guided by the urban designer & planner through three different phases: the discovery phase, the connection phase and the conclusion phase. In the discovery phase every actor looks at the situation. Actors learn from and about each other in the connection phase. Finally, the actors reflect jointly on the established relationships. The game is played by both networks.

The results for Ommoord differ in the two networks. The power network likes to focus on three important aspects: realizing social communities, more facilities and a good infrastructure. On the other hand the knowledge network wants to make the neighbourhood attractive to the pedestrian. The routes must become safer and readable, more awareness must be created and more and better crossings must be realised. Furthermore, there must be more public toilets, a better lighting system and more benches. The urban designer wants a more accessible and legible neighbourhood. Wayfinding points are therefore an important ingredient.

The different visions have common ground and can therefore be linked in a new game board, where accessibility is the common theme. This new game board has advantages for the designer. Firstly, it helps the urban planner to form a well-founded vision of the area. In addition, it provides guidelines on which development can be initiated in which time period. And finally it provides insight into the solution direction for the pattern.

Ommoord will transform into a connected neighbourhood in 2030. The transformation consists of seven phases. In the first phase the parking spaces will be replaced and a central meeting point will be realized to inform people about the new development. In the second phase a basic ring will be embedded to connect the neighbourhood with the other neighbourhoods. The third phase focusses focuses on creating meeting places where people can ask for help. The secondary ring is constructed in the fourth phase, so that these pavilions are connected to the base ring. In the fifth phase, the existing high-rise buildings are transformed into active baseboards. Because of this there is a better connection with the court. In the sixth phase the courtyards are redesigned with the help of the residents. Finally, the area around the Romeynshof is transformed in the last phase. Basic facilities will be added. These developments will lead to a better accessibility, legibility, safety and even more comfort.

The use of the tool was very successful in this project. The developed vision fits better into the problems of different stakeholders. Furthermore the different stakeholders support this new idea for the neighbourhood. There are opportunities for the tool to be used in other neighbourhoods, because the tool is not context-bound. Hopefully more neighbourhoods will transform into dementia-friendly neighbourhoods in the future.

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Figure 1: Portrait of someone with dementia (I) (Struik, 2013)

I: INTRODUCTION

This first part of this graduation thesis introduces the project description of dementia friendly neighbourhoods. Chapter 1 introduces the three major issues: an aging world, dementia in the Netherlands and the symptoms of the disease dementia. Hereafter the problem is summarized into a problem statement. Next the case study for this project will be described. This chapter ends with an explanation of the project aim.

Chapter 2 introduces the research methodology containing the different research questions and the research approach. Moreover the two important lines in this project, the research–design line and the designer–actor line, will be elaborated. Finally, the structure of the report and the methods will be clarified.

1. PROBLEM EXPLORATION

1.1 PROBLEM FIELD

1.1.1 An aging world

The world is aging (Robertson, Nicholas, Georgiou, Johnson, & Hayen, 2015). The amount of elderly people is increasing rapidly the coming years. For Europe there is a big challenge (figure 2). The number of people over 65 in the Netherlands will increase from 2.7 million in 2012 to 4.7 million in 2041 (Boer & Vriens, 2014). That is a third of the total population (CBS, 2015). As the elderly grow older, their daily action space is getting smaller. The quality of the direct living environment becomes more important (Dam, Daalhuizen, Groot, Middelkoop, & Peeters, 2013). The elderly are more dependent on what their neighbourhood has to offer (Sugiyama & Thompson, 2007). The neighbourhood becomes more important for older people aging in place and it should meet their everyday needs (Gilroy, 2007).

As a result chronic illness will become more widespread (Ward et al., 2017). Dementia will be one of the health care challenges of the 21st century. Furthermore, the rising prevalence of people living with dementia in the aging society is one of the most striking demographic changes facing cities today (Pani, 2016).

"The rights of people with dementia have been less strongly advocated than those of people with physical disabilities. The needs of people with dementia and other types of cognitive impairment have helped shape the design of residential facilities, but the issue of accessibility to public places and spaces for people with dementia and their carers has been almost completely neglected (Alzheimer's Australia NSW, 2011)." In order to maintain the quality of life of people with dementia and to keep the care of people with dementia workable in the future, non-medical interventions and ways to reduce work pressure on staff without sacrificing quality of care must be found (Boer & Vriens, 2014). The challenge for urban designers is to

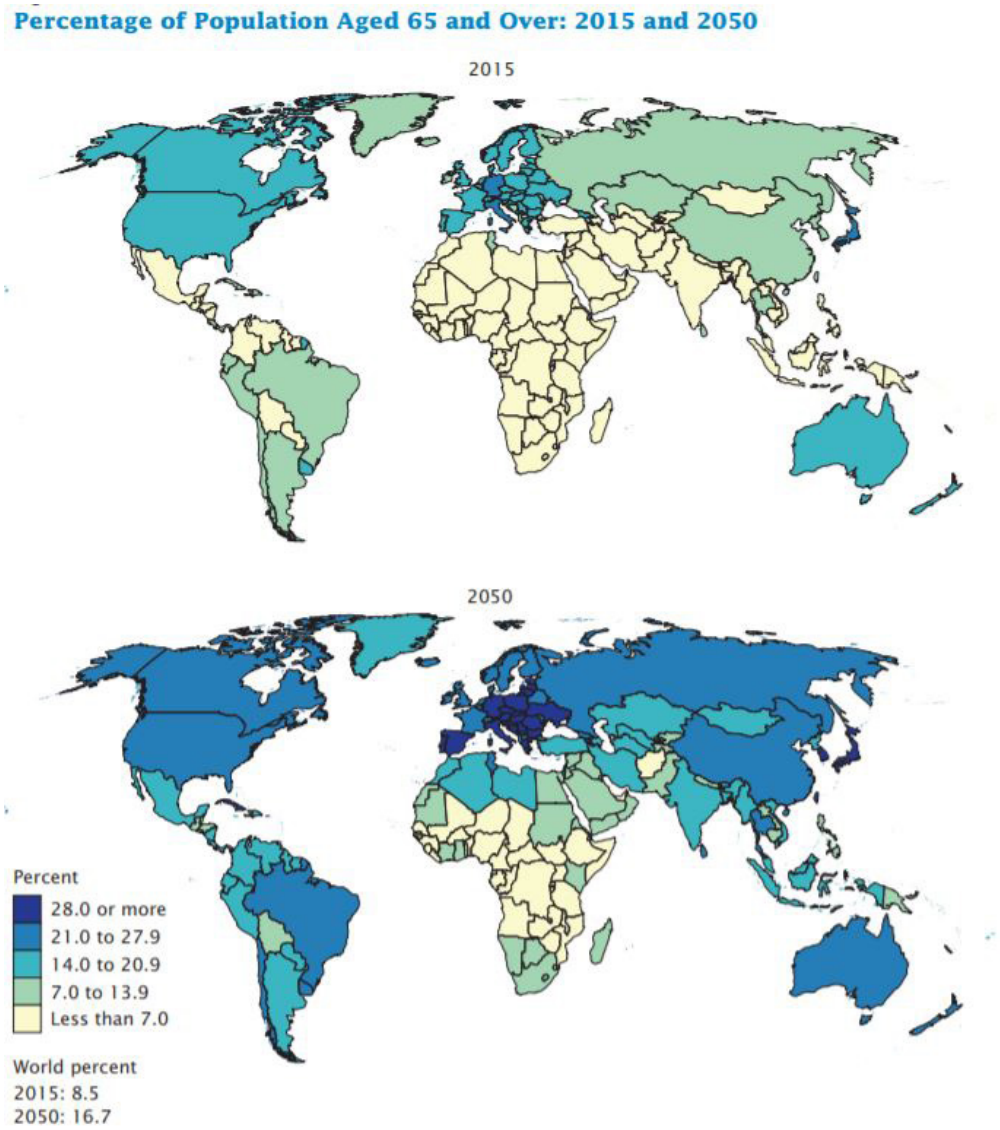


Figure 2: An aging world (He, Goodkind, & Kowal, 2016, p.14)

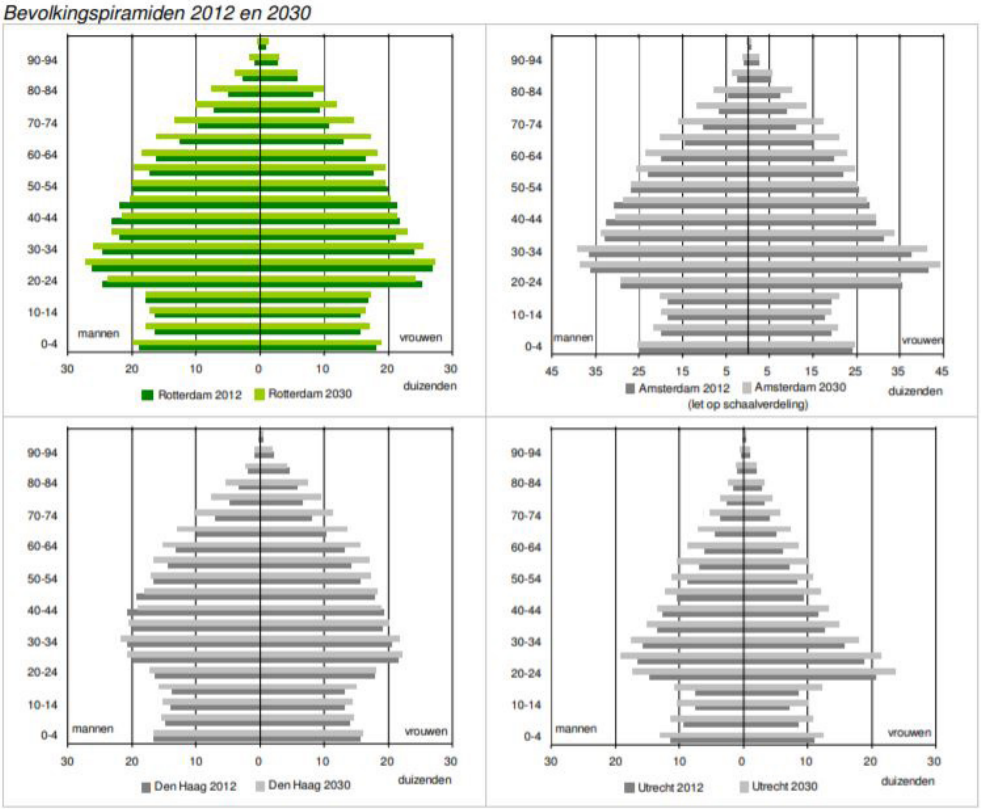


Figure 3: Aging cities (Hoppesteyn, 2012, p.59)

redesign the direct living environment of people with dementia so that it is more comprehensible for them (Mitchell et al., 2003).

1.1.2 Dementia in the Netherlands

In 2050, the Netherlands will be one of the top 10 countries with the largest amount of people with dementia, because the Netherlands is aging (Robertson et al., 2015). The Netherlands currently employs 256.000 people suffering from a form of dementia, of which twelve thousand are younger than 65 (Boer & Vriens, 2014). This number will double in the next 25 years to more than half a million people suffering from a form of dementia (Alzheimer Nederland, 2017).

Amsterdam, Rotterdam and The Hague will age enormously (figure 3) and Zuid-Holland will have the highest percentage of people suffering from a form of dementia. Rotterdam is expected to take the lead with 15.000 inhabitants experiencing a form of dementia in 2040 (Alzheimer Nederland, 2016).

The Dutch government stimulates older people to stay at their home for as long as possible (Doekhie, Veer, Rademakers, Schellevis, & Francke, 2014). The premise of design for dementia is that 70-80% of people living with dementia continue to live in their own homes rather than in any specialized form of housing (Halsall & MacDonald, 2015). This is in line with the thoughts of elderly people, who also want to live independently as long as possible (Doekhie et al., 2014).

Dementia is the common disease with the highest healthcare costs. Due to the strong increase in the number of people with dementia, the costs of care and the burden on society will increase. In 2015, healthcare costs amounted to 4.8 billion, 5% of the total healthcare costs. The healthcare costs of dementia will increase by 2.9% per year (Alzheimer Nederland, 2017). This means that the government faces a major issue; despite financial cutbacks healthcare cost will continue to increase, because the number of people with dementia will increase in the coming years (Boer & Vriens, 2014). If we do nothing problems will arise. Elderly people with dementia will and have to stay at home for as long as possible and become dependent on a partner, children, friends, neighbours and professional care. Not everyone has a social network and some of the elderly will exclusively depend on care professionals (Alzheimer Nederland, 2018).

The government wants more and more people to receive the care they need at home. Consequently, there will not be enough care institutions in the future and the number of informal caregivers will have to increase. People with dementia will no longer be able to use the activities that were previously offered in the health care organizations. It is therefore important that existing meeting places remain and that people with dementia have a place in their neighbourhood to meet people and to participate in society (Alzheimer Nederland, 2012). Otherwise there is a big chance that the elderly people with dementia will become housebound (Alzheimer Nederland, 2018).

1.1.3 Dementia disease

Dementia is a syndrome that is caused by a brain disorder or brain disease (Alzheimer Nederland, 2017). This disease will affect people's brain (Halsall & MacDonald, 2015). The likelihood of developing dementia increases with age. From one in 50 between the ages of 65 and 70, to one in five over the age of 80 (Mitchell, Burton, & Raman, 2004). 1 in 3 women is expected to get dementia in her life. For men, this is 1 in 7. Every hour in the Netherlands 5 new people will get a form of dementia. There are different forms of Dementia, but the most common form of dementia is Alzheimer's disease (70%) (Alzheimer Nederland, 2017).

The first symptoms of dementia vary per person and also per disease. Recognizing dementia takes a long

time. On average, it takes 14 months for the diagnosis to be made. People with dementia can perform less and less well every day (Alzheimer Nederland, 2017). Usually, these symptoms are noticed by the partner or a family member. Memory complaints, behavioural problems and changes in character are first noticed. For a person with dementia new actions or remembering new things costs extra effort. People with dementia have often problems with (Boer & Vriens, 2014):

- the short-term memory
- adapting to new circumstances
- orientation
- finding the right words
- learning new things
- keeping emotions under control
- making decisions.

As a result, someone has difficulties with functioning independently and becomes more dependent on help and support. People with dementia will gradually miss out on more and more activities and sensory impressions and reduce their sense of autonomy (Stimuleringsfonds creatieve industrie, n.d.). Most patients become bed-ridden at the end. These changes do not occur from one day to the next. A patient with dementia goes through different phases and each phase has its own symptoms (Alzheimer Nederland, n.d.-b). Dementia can be divided into four different phases (Boer & Vriens, 2014).

- Phase 1: I feel threatened
- Phase 2: I am lost
- Phase 3: I am hidden
- Phase 4: I am sunk

People themselves often recognize the first phase of the disease. When people discover that they are forgetting things and that they start to have trouble with orientation, they feel threatened. This person tries to hide the symptoms and will not readily admit that he / she is suffering from a form of dementia. Because these people do a lot of effort to conceal their dementia, they are often very tense and can quickly become angry or sad, while there is no reason for that at that moment. It is important that someone in phase 1 is corrected as little as possible and is only supported inconspicuously (Boer & Vriens, 2014).

The second phase will follow. As one gets further into the development of dementia and the forgetfulness increases, they also begin to lose words or use them in the wrong context. Often they no longer know how old they are and they have no sense of time and environment. People become disoriented and walk somewhere without having a goal. In this phase people can withdraw and no longer concentrate well (Boer & Vriens, 2014).

In the third phase people have ended up are even further back. These people are literally in their own world. Movements are repeated regularly and it seems that there is no contact with these people. Yet they want to feel useful and they like getting attention. For example, by placing a hand on his or her shoulder or by striking an arm around someone (Boer & Vriens, 2014).

In the last phase the person with dementia is barely reacting. Getting contact is difficult and it sometimes seems that someone is only physically present at this stage; the eyes are often closed. It is important that these people still get the feeling that they are worthwhile. This can be done by, for example, playing their favourite music (Boer & Vriens, 2014). Figure 4 gives an overview from the different symptoms per phase.

There is no cure for dementia and according to doctors and researchers, dementia has the highest burden of all diseases for the patient (Alzheimer Nederland, 2017) and they expect no cure in the near future (Universiteit

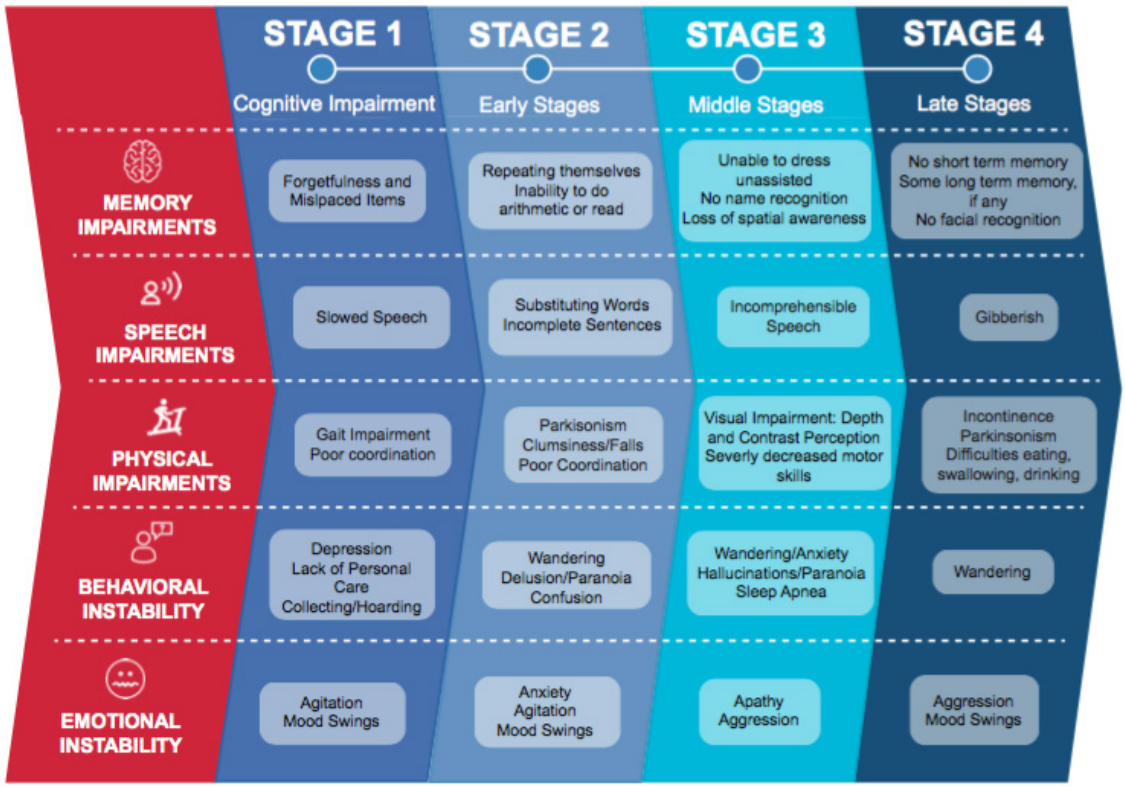


Figure 4: Stages (Dementia Aide, n.d.)

van Nederland, 2018). At the end a patient dies from the effects of dementia (Alzheimer Nederland, 2017). People with dementia live on average 8 years with the disease. Dementia is the number one cause of death in The Netherlands, according to CBS (Alzheimer Nederland, 2017).

1.1.4 Reducing symptoms

Familiarity with your surroundings is recognized as a key to reducing the symptoms and loss of function associated with dementia (Halsall & MacDonald, 2015). A familiar environment presents a predictable and reliable setting that is less likely to create stressful new situations that a person with dementia is unable to understand or contend with. People with dementia are more likely to injure themselves in unfamiliar environments, such as nursing homes or hospitals, because of the increased anxiety and disorientation caused by having to cope with unfamiliar places, people, and objects (Mitchell et al., 2003).

That people with dementia live longer in their own neighbourhood is positive. They will use the same local facilities of the neighbourhood (Halsall & MacDonald, 2015), which is very positive and it can also ensure that people with dementia can live longer in their own house (Mitchell et al., 2003). However, often people with dementia are institutionalized prematurely because of the lack of assistance required for them to maintain their engagement with the greater community. It is of course not possible to stay forever in the neighbourhood, if a person with dementia reaches the severe stage(s) of the illness. Advanced care is necessary to ensure the health and safety of this person (Su, 2013). That's why this project focusses on the first two stages of dementia, because someone in stage 3 or 4 someone has to be moved to a nursing home.

1.2 PROBLEM STATEMENT

The population in the Netherlands is aging and subsequently more elderly people will experience a form of dementia. Elderly people with dementia have to stay in their own neighbourhood for as long as possible and this group needs extra help and support to keep making good use of the neighbourhood. At the moment our neighbourhoods are not ready for serving people with dementia, so the chance that people with dementia will be housebound is very realistic.

1.3 CASE STUDY

Rotterdam is expected to get the biggest number of people with dementia (Alzheimer Nederland, 2016). The statistics show that the inhabitants of Rotterdam on average rejuvenate (Börger & Jongstra, 2015). However Prins Alexander can expect a big aging pressure in 2030 (Hoppesteyn, 2012).

Prins Alexander is divided into different neighbourhoods. Ommoord (figures 5 & 6) is one of the neighbourhoods and was part of the larger expansion plan Rotterdam Oost-Capelle aan den IJssel with which the municipality of Rotterdam tried to solve the enormous post-war housing shortage. Ommoord had to be built quickly and cheaply. The high-rise area plan was in line with the modernist urban development ideals of the sixties. There was a strict separation of functions: living, working, traffic and recreation. The high-rise buildings are concentrated around three metro stations. The shopping centres and socio-cultural facilities of the neighbourhood are placed around the metro stations (Rotterdam Woont, n.d.).

The first inhabitants of Ommoord were mainly young families from Rotterdam. The rents at that time were relatively high. The price instrument had to select mainly residents who could give the district a good

Figure 5: Plan Ommoord (Devolder, 1993)

reputation. The original residents are for the greater part still living there. That is why Ommoord is an interesting location for further research. Because Ommoord (figure 7) is aging, it is plausible that more and more people living there will experience a form of dementia (Börger & Jongstra, 2015).

The municipality is committed to the elderly. Their ambition is as follows: Ommoord is a quiet, green neighbourhood in 2030, where elderly people can live independently and there is room for residents with different lifestyles. The goals are focused on the transformation of a vulnerable to a resilient neighbourhood. In addition, the municipality has already set a number of priorities. High-rise buildings must be manageable and habitable. There must be safe traffic routes. The outdoor space must be tackled and maintained. The level of provision must be maintained and social isolation must be prevented. Young people and the elderly must be connected to each other. Finally, Ommoord needs to be further developed as a residential service area, attention must be paid to domestic burglary, inconvenience and nuisance perception, and efforts must be made to ensure safety for the elderly (Gemeente Rotterdam, 2014).

The policy of the municipality and the fact that the age of the inhabitants is going to increase makes it an interesting test case for his graduation project.

1.4 PROJECT AIM

If the neighbourhood does not fulfil the needs of someone with dementia there is a big chance that he or she will get housebound and that the quality of his or her life will deteriorate. This has to be prevented and it is time to focus on creating dementia friendly neighbourhoods. The expertise of several involved actors is needed, because solving complex problems requires the help of other professionals (Sanders & Stappers, 2018).

The main goal of this project is to develop a communication tool that on the one hand helps the urban designer to develop dementia friendly neighbourhoods and on the other hand helps the urban designer to communicate with involved stakeholders.

Urban knowledge has to be translated for non-urbanism experts so that ideas from the urbanism field can be supplemented with ideas from non-urbanism experts. Joining forces ultimately results in

Figure 6: Location Ommoord (Rotterdam Woont, n.d.)

deelgemeente	gerealiseerd (1 januari)				prognose			
Pr Alexander	2000	2005	2010	2012	2015	2020	2025	2030
0-4	4.499	4.477	5.094	5.337	5.297	5.156	5.048	5.004
5-9	4.941	4.721	5.036	5.114	5.244	5.365	5.222	5.151
10-14	4.719	5.063	4.955	5.085	5.117	5.220	5.302	5.190
15-19	4.335	4.872	5.395	5.308	5.203	5.231	5.243	5.287
totaal 0-19 jr	18.494	19.133	20.480	20.844	20.861	20.972	20.815	20.632
20-24	3.717	4.373	4.861	5.233	5.208	5.043	4.921	4.856
25-29	4.707	4.412	4.975	5.145	5.185	5.213	5.054	4.977
30-34	6.198	5.528	5.535	5.665	5.481	5.444	5.386	5.323
35-39	7.002	6.543	6.274	6.017	5.945	5.814	5.689	5.673
40-44	6.666	7.020	6.712	6.885	6.522	6.178	6.012	5.906
45-49	5.993	6.549	7.043	6.995	6.815	6.643	6.267	6.134
50-54	5.938	5.965	6.490	6.829	7.138	6.942	6.764	6.411
55-59	4.278	5.938	6.031	6.312	6.551	7.065	6.896	6.736
60-64	4.011	4.265	5.978	5.988	5.977	6.390	6.787	6.661
totaal 20-64 jr	48.510	50.593	53.899	55.069	54.822	54.732	53.776	52.677
65-69	4.162	3.963	4.208	4.730	5.646	5.597	5.928	6.262
70-74	4.202	3.960	3.758	3.914	3.998	5.085	5.023	5.327
75-79	3.889	3.703	3.547	3.415	3.409	3.582	4.405	4.388
80-84	2.631	2.951	3.000	3.029	2.886	2.828	2.971	3.600
85-89	1.639	1.568	1.898	1.962	1.964	1.892	1.886	2.020
90-94	606	655	682	820	910	947	944	981
95eo	119	168	173	190	215	307	360	401
totaal 65 jr eo	17.248	16.968	17.266	18.060	19.028	20.238	21.517	22.979
Totaal	84.252	86.694	91.645	93.973	94.711	95.942	96.108	96.288

Figure 7: Age development (Hoppesteyn, 2012, p.41)

more applicable solutions. This tool will help the urban designer & planner to develop a more complete, coherent and profound living environment for people with dementia.

The developed communication tool can hopefully be used by other municipalities, by other urban designers & planners and by many more involved stakeholders, so that other neighbourhoods in the Netherlands can be adapted and become more dementia friendly. In this project the communication tool will be tested on a neighbourhood in Rotterdam, namely Ommoord. With the help of the communication tool a design and strategy for Ommoord will be developed. On the other hand designing a plan for Ommoord also helps to create a better designed tool.

2. RESEARCH METHODOLOGY

2.1 RESEARCH QUESTIONS

In order to achieve the aim of this project, different research questions should be answered. The main research question of this graduation project is:

How can Ommoord be adapted to improve the quality of life for people with dementia with the help of involved stakeholders?

In order to structurally answer this research question, three sub-questions have been formulated:

1. How to adapt Ommoord to improve the quality of life for people with dementia?
   - A. What makes a neighbourhood dementia friendly?
   - B. How dementia friendly is Ommoord?

2. How can various stakeholders with the help of a tool contribute to creating a dementia friendly Ommoord?
   - A. How can urbanism and non-urbanism professionals cooperate in the planning process for dementia friendly neighbourhoods?
   - B. How to use knowledge from non-urbanism experts to reinforce the urban design and planning principles?

3. How can the output of the tool be integrated in a design for Ommoord?

2.2 RESEARCH APPROACH

The project will be researched from different perspectives, using methods and tools from two fields of studies, namely: Urbanism and Communication Sciences. To answer the research questions a design based research methodology is used. "This methodology aimed to improve educational practice through systematic, flexible, and iterative review,

analysis, design, development, and implementation, based upon collaboration among researchers and practitioners in real-world settings, and leading to design principles or theories (Wang, 2014, p.2)."

The interaction between researcher/designer and practice is reflected in the two most important lines in this project: the research–design line and the designer–actors line. The research–design line is more urbanism orientated and will give the designer guidelines on how to design the neighbourhood, while the designer–actors line is more science communication orientated and focusses on collaboration between different actors. Both lines will be part of the communication tool. The tool combines the theoretical framework with the empirical research to facilitate a discussion with involved stakeholders.

This project cannot be seen as a linear study, because the two lines influence and strengthen each other constantly. The stakeholders from another field than urbanism can have valuable input for the design. For example, a person who cares for someone who is suffering from dementia knows exactly what he / she thinks and feels. Moreover, they know how they deal with this in everyday life. Conversely, urban planning ideas can be proposed that could not have been conceived by a caretaker. Both disciplines need each other to come to a solution for this problem.

There are four different phases in this project: introduction, analysis, design & strategy and conclusion. The different phases influence the development of the tool and together they will form an answer to the main research question. Furthermore, each phase provides input for the next phase. However, new findings may occur at a later stage of this project, which may require further analysis.

In each phase the two lines play an important role. In the introduction and the analysis phase the main focus lay on research, where the interaction with the stakeholders is important. For example the different involved stakeholders are needed to determine whether something is well or not well developed in the neighbourhood. In the design & strategy phase the focus is more on finalizing and testing the created products. Collaboration with stakeholders is very important in this phase. Stakeholders are involved to make the step from research to a design for Ommoord.

A few of these design-based principles can be strongly connected to the interaction between the two most important lines in this project. The design is supported by research from the beginning. Moreover, the research will be conducted in real life settings, where the collaboration with participants is necessary. The design of the tool and the adapted neighbourhood will be refined continuously and iteratively (Wang, 2014).

2.3 STRUCTURE OF THE REPORT

Despite the fact that this graduation project is part of two masters, the report is not divided into an urbanism and science communication part. Both disciplines supplement and strengthen each other in the different chapters of this project. This report is divided into four parts (figure 8):

1. Introduction
2. Analysis
3. Design & Strategy
4. Conclusion, discussion and reflections

The introduction part forms the input for this graduation thesis. Chapter 1 sketches the problem on three different levels: An aging world, dementia in the Netherlands and the symptoms of dementia. Hereafter a problem statement can be formulated and the case study will be explained. At the end of this chapter the project aim will be described. Chapter 2 explains the

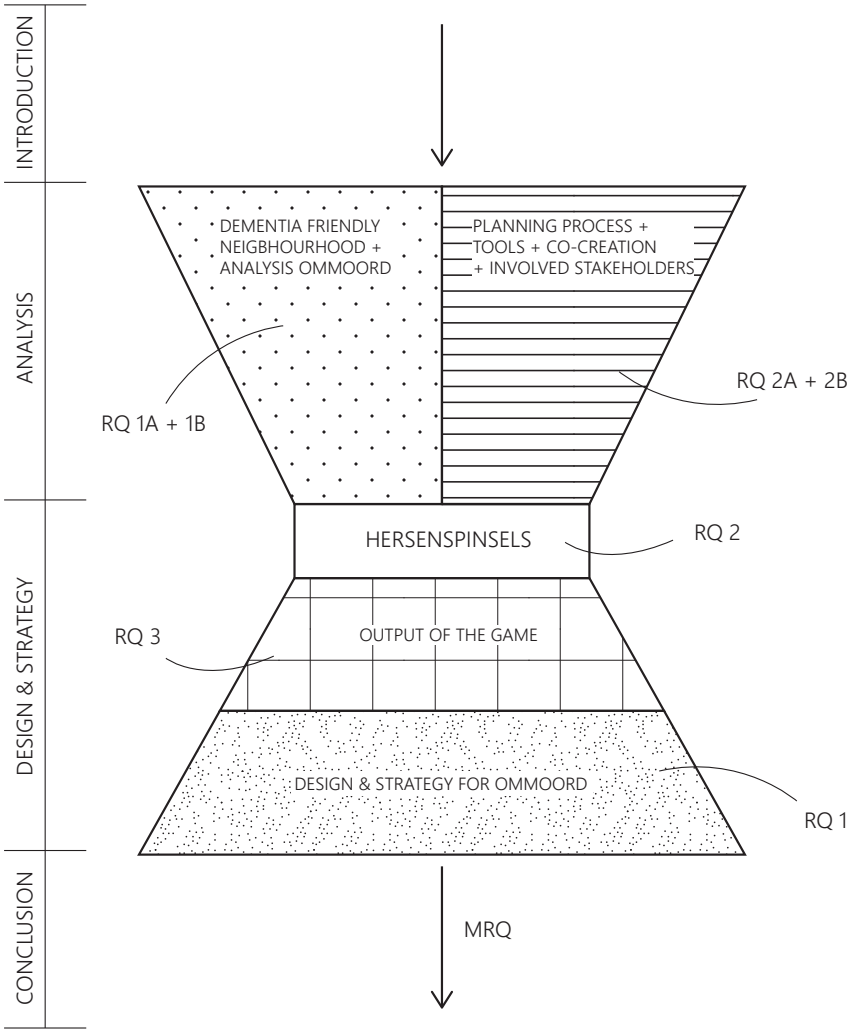


Figure 8: Reading structure

research methodology of this project. The different research questions and the research approach behind this project are described. The methods are explained per chapter in the following two parts of this report.

Part two forms the basis for this graduation project and will answer research questions 1A, 1B, 2A and 2B. In chapter 3 a literature study has been done to the qualities of a dementia friendly neighbourhood. Based on that study a theoretical framework has been established. In chapter 4 the established theoretical framework has been applied on Ommoord to discover how dementia friendly the neighbourhood is at the moment. Chapter 5 describes how urbanism and non-urbanism professionals can cooperate in the planning process for dementia friendly neighbourhoods. Chapter 6 researches how knowledge from non-urbanism professionals can be used for designing dementia friendly neighbourhoods. Finally chapter 7 sums up a number of design requirements for the game in chapter 8.

The design and strategy part is the core of this graduation project. This part answers research questions 1, 2 and 3. Chapter 8 presents the developed game "Hersenspinsels". In this chapter the different rounds in the game and the rules of the game are explained. Hereafter chapter 9 describes the different outputs of the game. Next the outputs will be analysed. This chapter ends with a description on how to integrate these ideas into a design for Ommoord. Chapter 10 presents a design and strategy for Ommoord to make the neighbourhood dementia friendly.

The last part of this graduation thesis conclude on the research as a whole. Chapter 11 answers the main research question of this project by answering the different sub-questions. Chapter 12 discusses the developed tool, the methods and give some recommendations for further research. Finally chapter 13 reflects on this graduation project, paying attention to the societal relevance, scientific relevance and the ethical dimension.

The different methods are explained in the different chapters of this project.

Figure 9: Portrait of someone with dementia (II) (Struik, 2013)

II: ANALYSIS

The analysis part pays attention to sub-questions 1A, 1B, 2A and 2B:

1A. *What makes a neighbourhood dementia friendly?*
1B. *How dementia friendly is Ommoord?*
2A. *How can urbanism and non-urbanism professionals cooperate in the planning process for dementia friendly neighbourhoods?*
2B. *How to use knowledge from non-urbanism experts to reinforce the urban design and planning principles?*

Chapter 3 describes what a dementia friendly neighbourhood should look like and how neighbourhoods could be designed or adapted to become more dementia friendly. After this, a theoretical framework, based on the pattern language, has been set up (1A). In chapter 4, Ommoord will be analysed by using the framework to determine how dementia-friendly Ommoord is at the moment (1B). Chapter 5 explains how urbanism and non-urbanism professionals can cooperate in the planning process of designing dementia friendly neighbourhoods (2A). Chapter 6 clarifies how knowledge from non-urbanism professionals can be used in the design of a dementia friendly neighbourhood (2B). Finally chapter 7 gives some design and planning requirements for the developed tool in chapter 8.

3. DESIGNING DEMENTIA FRIENDLY NEIGHBOURHOODS

More and more people with dementia will live in their own neighbourhood for as long as possible. At the moment the neighbourhoods are not equipped to serve this vulnerable group. Moreover, we do not know how we can make the neighbourhood dementia friendly. This chapter tries to answer sub-question 1A: ***What makes a neighbourhood dementia friendly?***

The first sub-chapter describes the methods used to answer this research question. Sub-chapter 3.2 outlines a vision for a dementia friendly neighbourhood. Hereafter the different principles will be explained in different sub-chapters (3.3 – 3.8). Next sub-chapter 3.9 describes how the principles with patterns can be bundled into a theoretical framework. In the last sub-chapter an answer will be given to research question 1A.

3.1 METHODS

To answer research question 1A different methods were used. The aim of this question was to come to a theoretical framework that describes the spatial conditions for realizing a dementia friendly neighbourhood.

3.1.1 Literature study

Existing research focuses primarily on the internal environment for people with dementia. In the 21st century, a switch was made to the outdoor environment, which was necessary because an increasing number of people with dementia are living in their own homes.

Mitchell and Burton were the first researchers which come up with a number of design principles that a dementia friendly neighbourhood should have, namely accessibility, comfort, distinctiveness, familiarity, legibly and safety (Mitchell et al., 2003).

These principles were supplemented with patterns through a snowball study. First, the work of Mitchell & Burton served as the basis for finding new papers.

Secondly, different papers related to theories in health, design, planning and environmental fields were studied. Because the subject is still virtually unstudied, only papers from the past 16 years could be found. The literature of different fields provides an extensive overview of knowledge that is available.

The different principles, supplemented with patterns are ordered by the pattern language of Christopher Alexander (Alexander, 1979). In the pattern language, a distinction was made between scales and the level of abstractness.

3.2 PRINCIPLES FOR A DEMENTIA FRIENDLY NEIGHBOURHOOD

Changes in how cities are planned and designed are necessary (Su, 2013) so that people with dementia are living in society, not separated from society (Alzheimer's Australia NSW, 2011). The environment must be suitable for this. If people with dementia are not able to go beyond the confines of their home they will effectively become housebound (Mitchell & Burton, 2010).

For people with dementia it is important to remain connected to, and participate in, their local neighbourhoods (Alzheimer's Australia NSW, 2011). The outside environment is essential for the successful performance of activities of daily living (Mitchell et al., 2003) and for stimulation, exercise and health (Mitchell, 2004). The ability to go out for a walk or to meet basic needs such as buying food plays an essential role in maintaining independence and self-respect (Mitchell & Burton, 2010). Moreover, it also prevents older people from becoming lonely (Ward et al., 2017). These neighbourhoods need more structural and community support to remain independent (Alzheimer's Australia NSW, 2011).

Urban designers must develop neighbourhoods for life (Mitchell, 2004), so that people in every stage of their life can function in the neighbourhood. If people reach the first stages of dementia, their life experience in the neighbourhood will help them to continue living at home (Mitchell, Burton, & Raman, 2004). Dementia-friendly neighbourhoods are welcoming, safe, easy and enjoyable for people with dementia and others to access, visit, use and find their way around (Mitchell & Burton, 2010). Moreover, these neighbourhoods are very compact and locally orientated (Mitchell et al., 2004).

Mitchell and Burton (2010) were the first who investigated the design needs of people with dementia at the neighbourhood level. Their findings have been used as input in research by others since then. They formulated six design principles: Accessibility, comfort, distinctiveness, familiarity, legibility and safety. These principles would contribute to a good quality of life of people with dementia in their own homes and communities at least during the mild to moderate stages of the illness (Alzheimer's Australia NSW, 2011). The different principles will be described in more detail in the next paragraphs.

3.3 ACCESSIBLE FOR EVERYONE

An important principle is the accessibility of the neighbourhood. This implies that people are able to reach, enter, use and move around the places and spaces they need or wish to visit, regardless of any physical, sensory or cognitive impairment (Mitchell & Burton, 2010).

3.3.1 Moving through the neighbourhood

People with dementia are more dependent on walking and public transport and they only use the public transport with the help of others (Halsall & MacDonald, 2015). This makes the streets very important (Mitchell et al., 2004) to perform activities of daily living (Su, 2013).

Direct and connected routes makes it easier to navigate streets (Halsall & MacDonald, 2015). The route should be as direct as possible and may only have a few intersections and blind bends (Mitchell et al., 2003). Staggered, forked and T-junctions do have the preference in a dementia friendly neighbourhood. The level may only change if it is unavoidable and if it changes then it is better to design a gentle slope than stairs. Ramps and steps must be clearly marked and well-lit with handrails and non-slip, non-glare surfaces (Mitchell & Burton, 2010).

People with dementia prefer pedestrian walkways, which create a feeling of safety and encourage outdoor activity (Alzheimer's Australia NSW, 2011). In landscape designs circular paths or paths in a figure of eight work the best, because they allow people with dementia to return to their starting point without any assistance. They also prevent any sense of unease or alarm that might be induced when confronted by a dead end (Furness & Moriarty, 2006).

3.3.2 Local facilities

Local facilities on the ground floor provide more enjoyable spaces for people with dementia, contributing to their independence. Besides that local facilities contribute to wayfinding. Sometimes it is insurmountable to install everything on the ground floor, but it is necessary to aim for as few height differences as possible to prevent boundaries for people with dementia. If this is not possible, there must be a clear focus on making the different floors accessible (Pani, 2016).

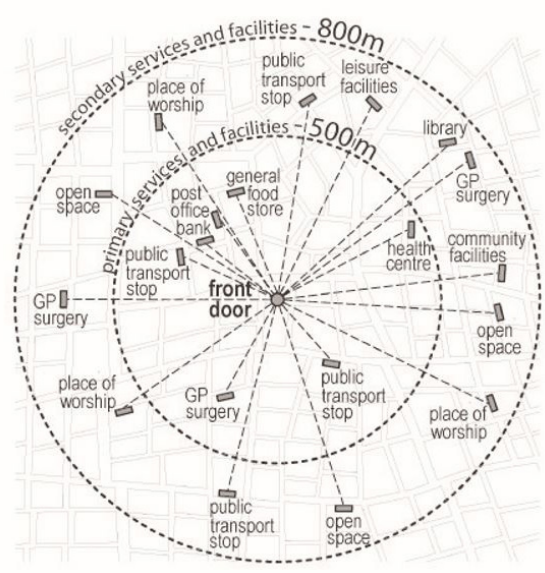


Figure 10: Primary services within 500 meter and secondary services within 800 meter (Mitchell & Burton, 2010, p.18)

Moreover, in the neighbourhood a distinction must be made between basic and secondary needs. For basic needs a walking distance of 500 metres from the front door is acceptable and for the secondary needs this is about 800 metres (figure 10) (Pani, 2016). Furthermore, the entrances must be clear designed, so that people with dementia can understand where they can enter the building (Mitchell & Burton, 2010).

3.3.3 Social contact

Another important aspect is that people with dementia have to meet other people to have social contact. Communal spaces allow people to meet others outside their house. People with dementia prefer sitting in informal spaces rather than traditional squares (Pani, 2016). Also, the creation of intergenerational spaces, like community gardens, stimulates interaction between old and young (Pani, 2016).

3.4 COMFORTABLE LIVING ENVIRONMENT

People feel at ease and are able to visit, use and enjoy places and spaces of their choice without physical or psychological discomfort (Mitchell & Burton, 2010).

3.4.1 Green areas

Green spaces in the neighbourhood provide relaxation and stimulation (Halsall & MacDonald, 2015). A green view and access to space for walking, socializing and enjoying the sunshine have particular therapeutic benefits for people with dementia (Halsall & MacDonald, 2015). Calming environments with plenty of trees have a positive effect on people with dementia (Alzheimer's Australia NSW, 2011), because it reduces stress (Halsall & MacDonald, 2015). Water is an important feature of a sensory garden because it provides a sense of movement and sound (Furness & Moriarty, 2006).

3.4.2 Informal spaces

Furthermore, people with dementia prefer sitting in informal spaces rather than traditional squares (Pani, 2016). People with dementia tend to avoid socially demanding situations, such as visiting friends or attending church, preferring less challenging activities such as going to the corner shop or posting a letter. In formal settings they feel intimidated (Mitchell et al., 2004). This is because they are fearful to lose the ability to always understand what is expected of them in demanding environments (Mitchell et al., 2004).

It can be concluded that people with dementia tend to prefer vibrant spaces full of activity such as urban squares surrounded by shops, offices and cafés and parks providing a range of facilities. Moreover these spaces must be very welcoming. Furthermore these vibrant spaces provided the interest and environmental cues they need to find their way around (Mitchell et al., 2004).

3.4.3 Resting points

In the neighbourhood more benches must be realised. Not only in the parks benches must be placed, but also on the routes to for example shops and in waiting areas such as transport hubs (Alzheimer's Australia NSW, 2011). These seating areas must be shaded and there must be a seating every 100 to 125 metres (Pani, 2016).

3.4.4 Separate functions

People with dementia feel discomfort and insecure if they have to share paths with other road users, like cyclists, cars or runners (Alzheimer's Australia NSW, 2011). That is why it is advisable to separate sidewalks from other lines (Pani, 2016). These paths must be wide and bordered to provide secure footing (Alzheimer's Australia NSW, 2011). Acoustic barriers such as planting and fencing, to reduce street and background noises increases comfort (Mitchell et al., 2003). Another good

option is to create buffer zones between busy roads and footways, such as trees or a grass verge. The green ensures that people with dementia feel relaxed and, moreover, it strengthens the differentiation of different traffic flows (Mitchell & Burton, 2010).

3.4.5 Facilities

People with dementia have a greater need for public toilets that are easily accessible (Alzheimer's Australia NSW, 2011). Moreover, people with dementia also like sheltered places (Mitchell et al., 2003). Third, people with dementia also enjoy gardening. Raised beds make it easier for people with dementia to work in the garden, but they also have an another advantage. Plants they contain can be seen more easily by people with visual impairment than those at ground level (Furness & Moriarty, 2006).

3.5 DISTINCTIVE PARTS

People's attention and concentration are captured by the distinctiveness of the various parts of the neighbourhood, which aids orientation and wayfinding (Mitchell & Burton, 2010). People with dementia tend to have significantly reduced cognitive mapping abilities. They are also restricted in the type of decisions they can master. Decisions requiring memory or inferences are no longer possible while they may still be able to make decisions based on explicit architectural information and directional signs. Maybe the most striking observation is that they can no longer develop decision plans, and can only operate from one decision point to the next. They also have distinct deficiencies in processing information. Among the most striking is their inability to distinguish relevant from irrelevant information which leads to a servile reading of everything along their path (Passini, 1996).

3.5.1 Wayfinding points

Wayfinding is the apparent or inert aspect of the built form that aids in navigation and legibility (Su, 2013). Local landmarks have a key role in aiding orientation (Halsall & MacDonald, 2015), 2015). Landmarks can also help to distinctive different parts of the neighbourhood (Pani, 2016). Landmarks directly accessible from the street to identify places, to act as cues to location and route, and to divide routes (Mitchell et al., 2003). Wayfinding points can be best positioned where visual access ends, especially decision points, such as junctions and turnings (Mitchell et al., 2003).

3.5.2 Varied forms

Varied urban form and architecture stimulates the distinctiveness (Mitchell & Burton, 2010) and furthermore it creates identity. People with dementia prefer traditional designs for architectural features rather than ambiguous modernistic styles. It is advisable to distinguish architectural creations by style material and colour (Mitchell et al., 2003). Streets should have distinctive features rather than repetitive uniformity (Halsall & MacDonald, 2015).

But identity can also be created on a small scale (Halsall & MacDonald, 2015). Street furniture is a great example (Mitchell et al., 2003). Chairs in a range of colour or designs work very well (Halsall & MacDonald, 2015). Where colours on the blue- green spectrum must be avoided, because these colours are difficult to see in bright sunlight (Mitchell et al., 2003).

3.6 FAMILIAR SURROUNDING

Familiar surroundings enable people to recognise and understand their surroundings, which helps to prevent and alleviate spatial disorientation and confusion and to aid short-term memory (Mitchell & Burton, 2010).

3.6.1 Catalogue of streets

It is important to distinguish different types of streets, such as high streets and residential streets. A visual hierarchy of familiar types of street stimulates familiarity (Mitchell & Burton, 2010). For main routes and centres, wider streets can be designed and for secondary side streets narrower streets can be used.

Besides that small-scale street blocks with buildings and open spaces are familiar to older people. Clear and unambiguous designs and appearance of buildings create unequivocal representation of identity of place and building (Mitchell et al., 2003).

3.6.2 Colour

The use of colour and contrast can also help to create familiar surroundings. Colour, particularly at the red/yellow end of the spectrum is valued. Contrast in tonal values can be used to distinguish a directional route or to identify the difference between horizontal and vertical surfaces or form. Colour could also help to identify, for example, an individual front door in a uniform row of properties (Halsall & MacDonald, 2015).

3.6.3 Regularity

Regular interaction with the same people in the same places builds familiarity and a broader sense of belonging. With the result that people with dementia will build confidence in navigating through an area (Ward et al., 2017). Orientation through familiarity assists legibility (Halsall & MacDonald, 2015).

3.7 LEGIBLE NEIGHBOURHOODS

People can understand where they are and identify which way they need to go, helping to prevent and alleviate spatial disorientation, confusion and anxiety (Mitchell & Burton, 2010). People with dementia can get lost at different times. Some lose their way at road junctions or when trying to follow a less familiar route. Others lose their way when they lose concentration (Mitchell et al., 2004).

3.7.1 Streets

Small blocks laid out on an irregular grid with minimal crossroads reinforce the legibility of the neighbourhood (Mitchell & Burton, 2010). Short, narrow and gently winding streets were generally considered more interesting than long, wide or straight streets and therefore helpful in maintaining the concentration people with dementia need to avoid losing the way (Mitchell et al., 2004). Streets with a variety of building styles, shapes, colours and sizes were seen as more exciting to walk along and, therefore, helpful in maintaining the concentration. Different architectural features, such as varying roof tiles, chimney pots, front doors, windows and gardens were also useful wayfinding cues (Mitchell et al., 2004).

Buildings should follow the building line with good visual access along the street (Mitchell et al., 2003). The opening up of views while walking along winding streets and being able to see the end of short streets also had a positive effect on wayfinding (Mitchell et al., 2004).

3.7.2 Landmarks

An important design element to increase the legibility of the neighbourhood is the use of landmarks. Landmarks can help people with dementia to understand their environment. They can be distinctive elements on the junctions in order to enhance wayfinding (Pani, 2016). People with dementia regularly look for landmarks and other environmental features to help them clarify their location and route (Mitchell et al., 2004).

A landmark is a point-reference. They are usually a rather simply defined physical object. Paths, edges, districts and nodes can also function as a landmark (Lynch, 1962). Together they create a legible city (Halsall & MacDonald, 2015). Furness & Moriarty added a sixth characteristic to this, namely trees. In parks, trees are often used as a centrepiece (2006). Finally, also places of activity, including mixed-use squares, parks and playgrounds can function as a landmark (Mitchell et al., 2004). Also, special distinctive neighbourhood specific features will increase readability. For example street furniture and trees at junctions (Mitchell & Burton, 2010).

3.7.3 Signs

Clustering similar shops together in one area or a large mall or shopping centre can help avoid confusion for people with dementia (Alzheimer's Australia NSW, 2011). Good signage is important to increase the readability of the neighbourhood. Minimal signs giving simple, essential and unambiguous information at decision points. This means that they are primarily signs on single pointers. Finally, there must be striking entrances to buildings (Mitchell & Burton, 2010).

3.8 SAFETY FIRST

People are able to use, enjoy and move around the neighbourhood without fear of coming to harm (Mitchell & Burton, 2010). Besides that they are also able to navigate without harming others (Su, 2013).

3.8.1 Social communities

Social communities will reinforce the social cohesion and inclusion in the neighbourhood. Many people with dementia live in secret and have few contacts with their fellow human beings. The environment does not connect to this (Teller, 2011), while the urban environment can maximise people's quality of life (Mitchell, 2004). Environments should encourage people to socialize (Halsall & MacDonald, 2015).

Raising awareness for dementia in the neighbourhood is a good thing, so that if people with dementia are lost, others can help (Pani, 2016). This capacity to offer care and to watch out for others might be considered a key element to social health, based upon people's ability to participate in social life through reciprocity (Ward et al., 2017).

3.8.2 Lighting

Better lighting is crucial in the public space. Street lighting bright enough for older people that does not cause light pollution (Mitchell et al., 2003). Better lighting is essential around pedestrian crossings,

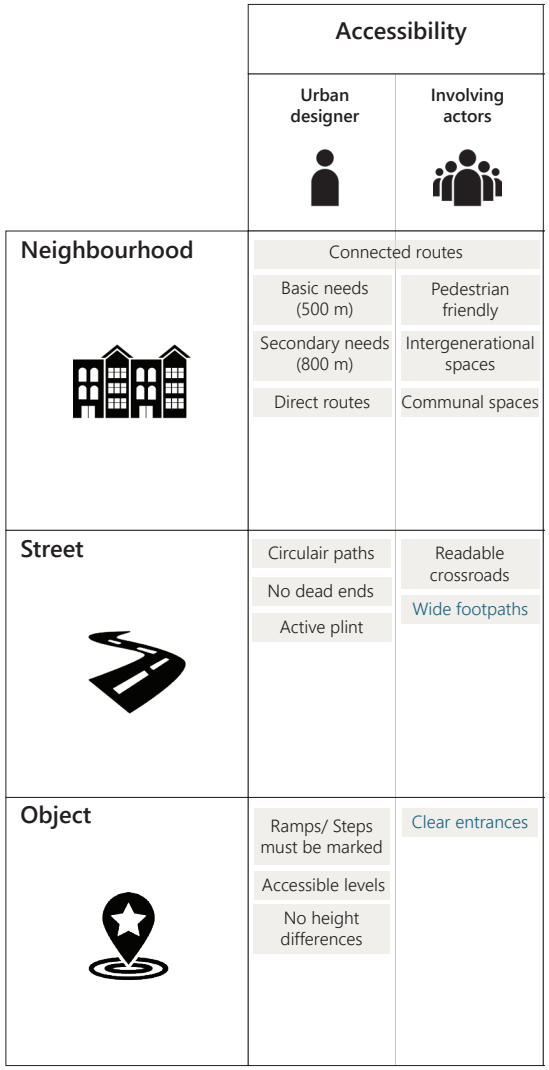


Figure 11: Theoretical framework

Familiarity		Legibility		Distinctiveness		Comfort		Safety	
Urban designer	Involving actors	Urban designer	Involving actors	Urban designer	Involving actors	Urban designer	Involving actors	Urban designer	Involving actors
Hierarchy of familiar streets		Irregular grid		Varied urban form		Green spaces			Social communities
Small street blocks		Different shapes	Viewports	Distinctive Architecture	Wayfinding points	Informal spaces			Places to socialize
Open spaces		Variety in building styles		Different street furniture		Places of activity			Raising awareness for dementia
		Neighbourhood furniture					Welcoming spaces		Frequent pedestrian crossings
		Cluster shops together							
		Small street blocks							
Coloured streets		Short streets		Streets with distinctive features		Seperate footpaths		Wide footpaths	
Contrast		Narrow streets				Wide footpaths		Buffer zones	
		Gently winding streets				Bordered footpaths			
		Buildings follow the building line				Buffer zones			
		View of the end of the street							
Use of colour			Landmarks		Landmarks	Accessible toilets		Good lighting	
			Good signage			Plenty of trees			No arbitrary changes
			Clear entrances			Water element in the park			Signs for dangerous areas
						Benches			Safe crossings
						Shaded places			
						Raised beds			

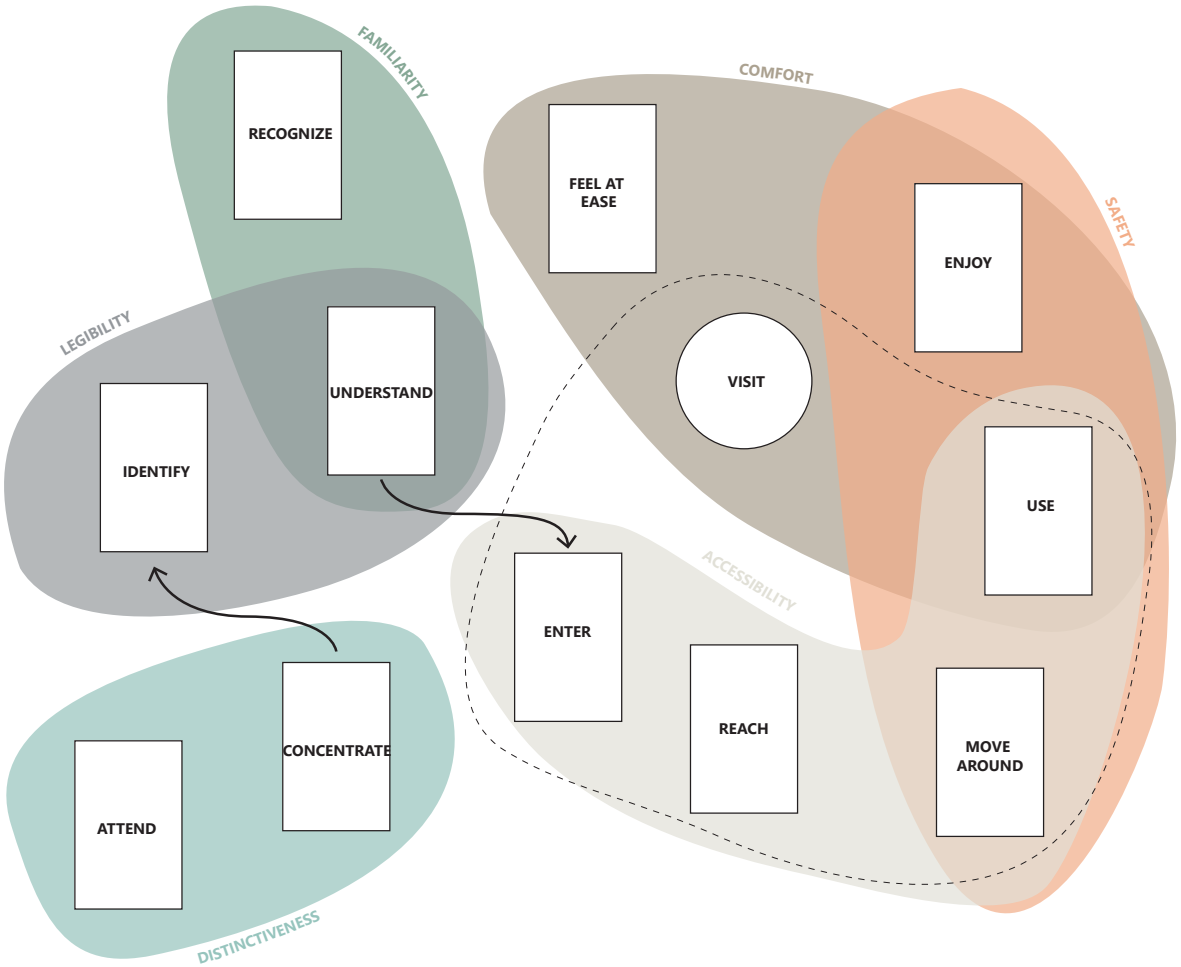


Figure 12: Different clouds

recreational areas, toilet areas and car parks to provide better visibility and to increase feelings of safety and security (Alzheimer's Australia NSW, 2011).

3.8.3 Reduce traffic risks

First of all it is important to realize wide footpaths (Mitchell et al., 2003). Buffer zones between busy roads and footways, such as trees or a grass verge increase the sense of security (Mitchell & Burton, 2010). Moreover, safe crossings must be realized. Frequent pedestrian crossings with audible and visual signals are necessary (Mitchell & Burton, 2010). Furthermore, hazards can arise from arbitrary changes in surface tonal value or from steps which may be invisible because of lack of contrast creating a trip hazard (Halsall & MacDonald, 2015). Finally, it is important to design features for private or dangerous areas (Mitchell et al., 2003).

3.9 THEORETICAL FRAMEWORK

The previous sub-chapters researched which principles are needed to set up a dementia friendly neighbourhood. Within these principles different patterns can be used to transform or adapt the neighbourhood. This sub-chapter investigates how to organize the themes and principles so that they become helpful for the design process.

The first part of this sub-chapter focusses on using a pattern language. A pattern language is not only useful to structure the research and design process, it is also a good communication tool between different stakeholders. In the second part, overlap between the use of the same patterns in multiple themes is explained.

3.9.1 Pattern language

The previous chapter investigated which patterns can be used to realize dementia friendly neighbourhoods. These patterns are ordered by six design themes, namely accessibility, comfort, distinctiveness, familiarity, legibility and safety. Patterns can be used to structure the research and design process, because patterns can convert research results into design conditions. With this, patterns contribute to the quality of the living environment, but the quality is not a sum of patterns. The pattern language is easy to use because the structure of the language can be seen separately from the content (Dorst, 2005).

The different patterns can be organised into a theoretical framework (figure 11), where a distinction is made between the themes (x-axis) and different scale levels (y-axis). On the x-axis a distinction is made between patterns that are easy to research for an urban designer and patterns where the help of involved stakeholders is necessary. Often this can be explained by the fact that some patterns are more abstract than others. The abstract patterns represent visons and the concrete patterns are more thematic. Arranging patterns by scale is another way to organize them. Moreover, it emphasizes that patterns can be used on different scale levels and moments. When developing a vision for the neighbourhood, people will quickly see the large scale, but a process can also start on the small scale to ultimately achieve the large scale. The object-scale in this case gives solutions for very specific things. For example, painting a bench in the neighbourhood so that it is recognizable for people with dementia. Organizing patterns from abstract to concrete and to scale creates a hierarchy. This is never unambiguous because for a design problem it is not possible to formulate a set of complementary patterns that together cover the entire solution space (Dorst, 2005).

3.9.2 Overlap in the developed framework

In the theoretical framework different patterns are used in multiple themes. To understand this, the different principles need to be better examined. Every principle has its own goals to achieve, which do have some overlap. See the list below:

Accessible:

- People with dementia are able t**o reach** the places and spaces they need or wish to visit.
- People with dementia are able **to enter** the places and spaces the need or wish to visit.
- People with dementia are able **to use** the places and spaces they need or wish to visit in the neighbourhood.
- People with dementia are able **to move around** the places they need or wish to visit in the neighbourhood.

Comfort:

- People with dementia **feel at ease** in the neighbourhood.
- People with dementia are able **to enjoy** places and spaces of their choice in the neighbourhood.
- People with dementia are able **to visit** places and spaces of their choice.
- People with dementia are able **to use** the places and spaces they need or wish to visit in the neighbourhood.

Distinctiveness:

- **The attention** of people with dementia is captured by the distinctiveness of the various parts of the neighbourhood.
- **The concentration** of people with dementia is captured by the distinctiveness of the various parts of the neighbourhood.

Familiarity:

- People with dementia are able **to recognize** their surroundings.
- People with dementia **can understand** where they are and understand their surroundings.

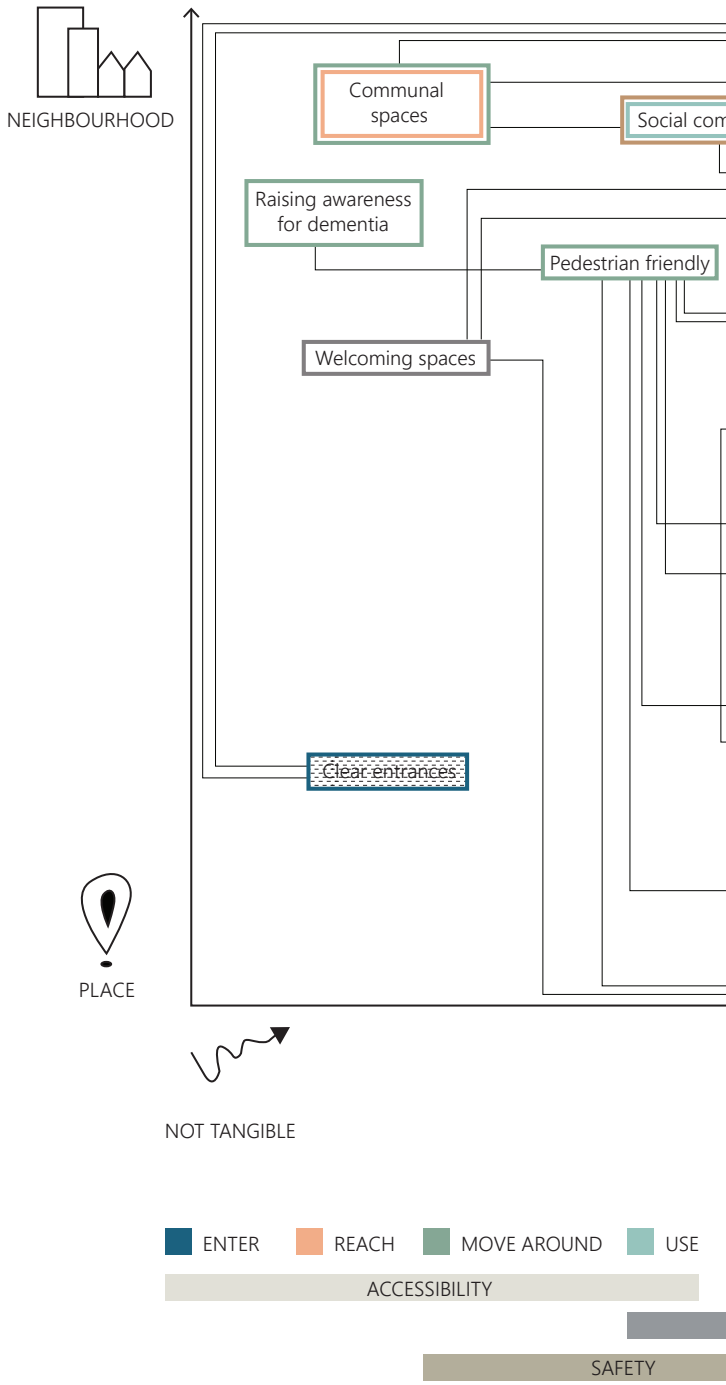
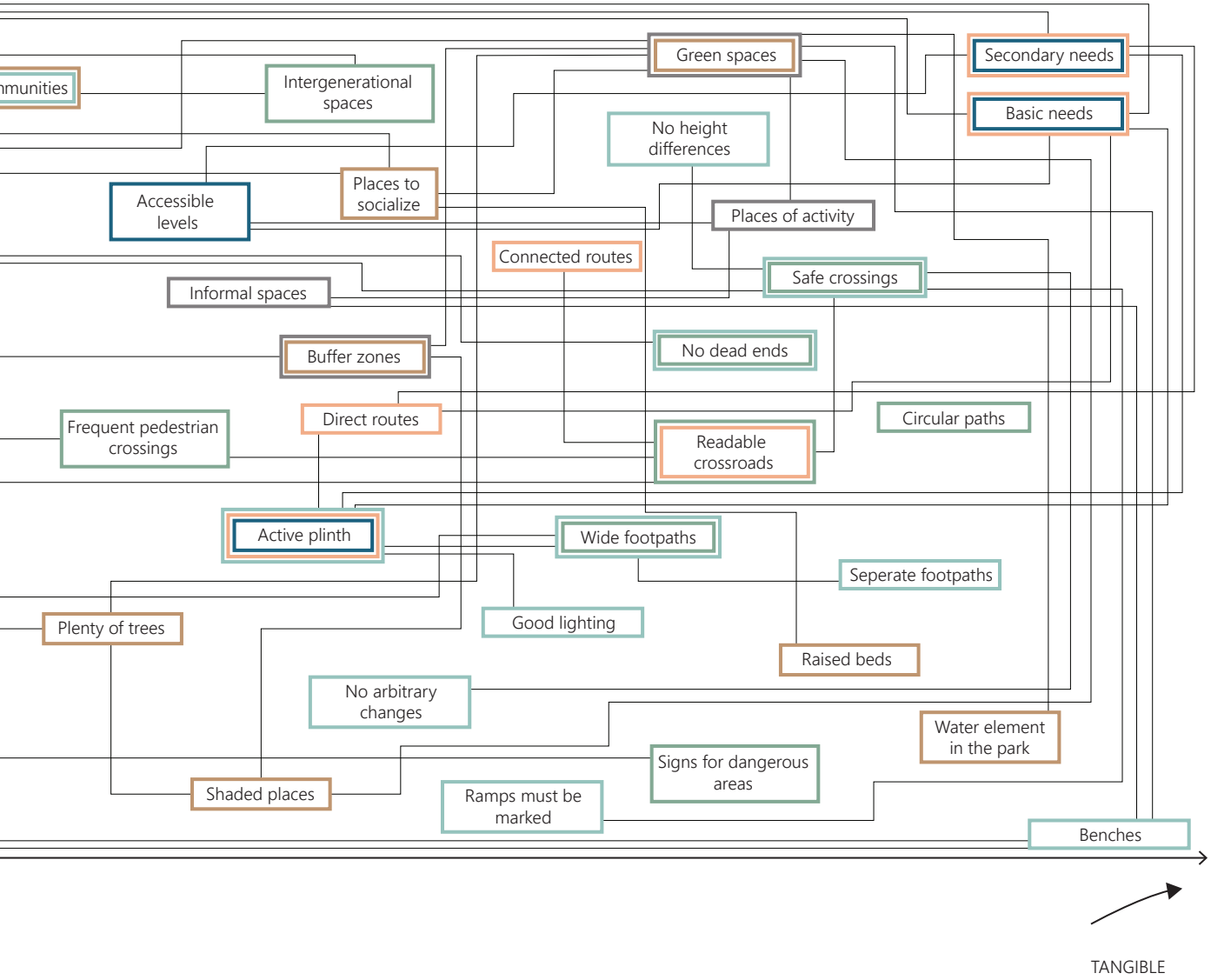


Figure 13: Cloud ACS



ENJOY FEEL AT EASE

COMFORT

Legibility:

- People with dementia **can understand** where they are and understand their surroundings.
- People with dementia **can identify** which way they need to go.

Safety:

- People with dementia are able **to enjoy** places and spaces of their choice in the neighbourhood.
- People with dementia are able **to use** the places and spaces they need or wish to visit in the neighbourhood.
- People with dementia are able **to move around** the places they need or wish to visit in the neighbourhood.

There are strong relations between the different principles, because the underlying goals do have overlap, which is illustrated in figure 12.

The visit card is a combination of four other cards, namely, entering, reaching, moving around and using the neighbourhood. The patterns for visit are the same as for the other four cards. Familiarity and legibility are connected by the understand card. While the use card is part of three principles, comfort, safety and accessibility. For example wide footpaths improve the safety, comfort and accessibility of a neighbourhood. Moreover safety and comfort are also connected by the enjoy card and safety and accessibility are connected by the move around card. By betting on one of these four cards, the neighbourhood will not advance on one principle, but on several. It can be concluded that there are three clouds: ACS (Accessibility, comfort and safety), FL (Familiarity and Legibility) and D (Distinctiveness).

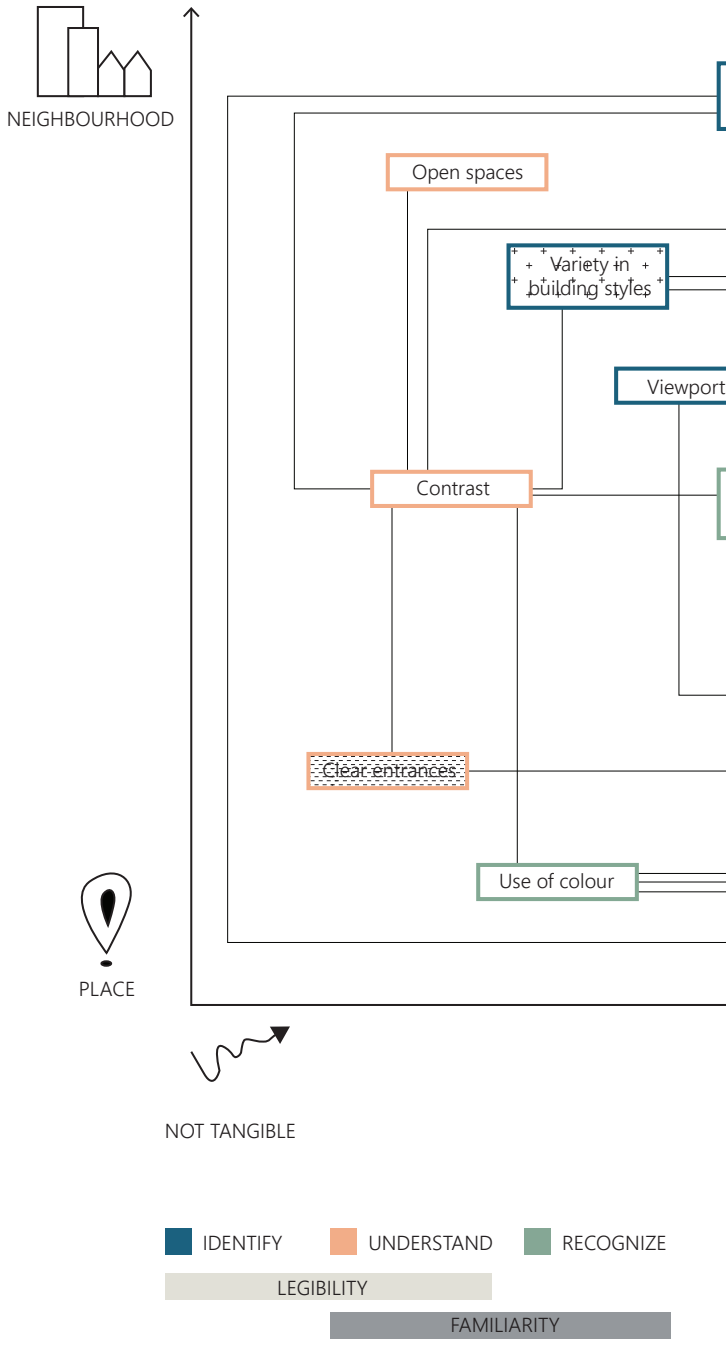
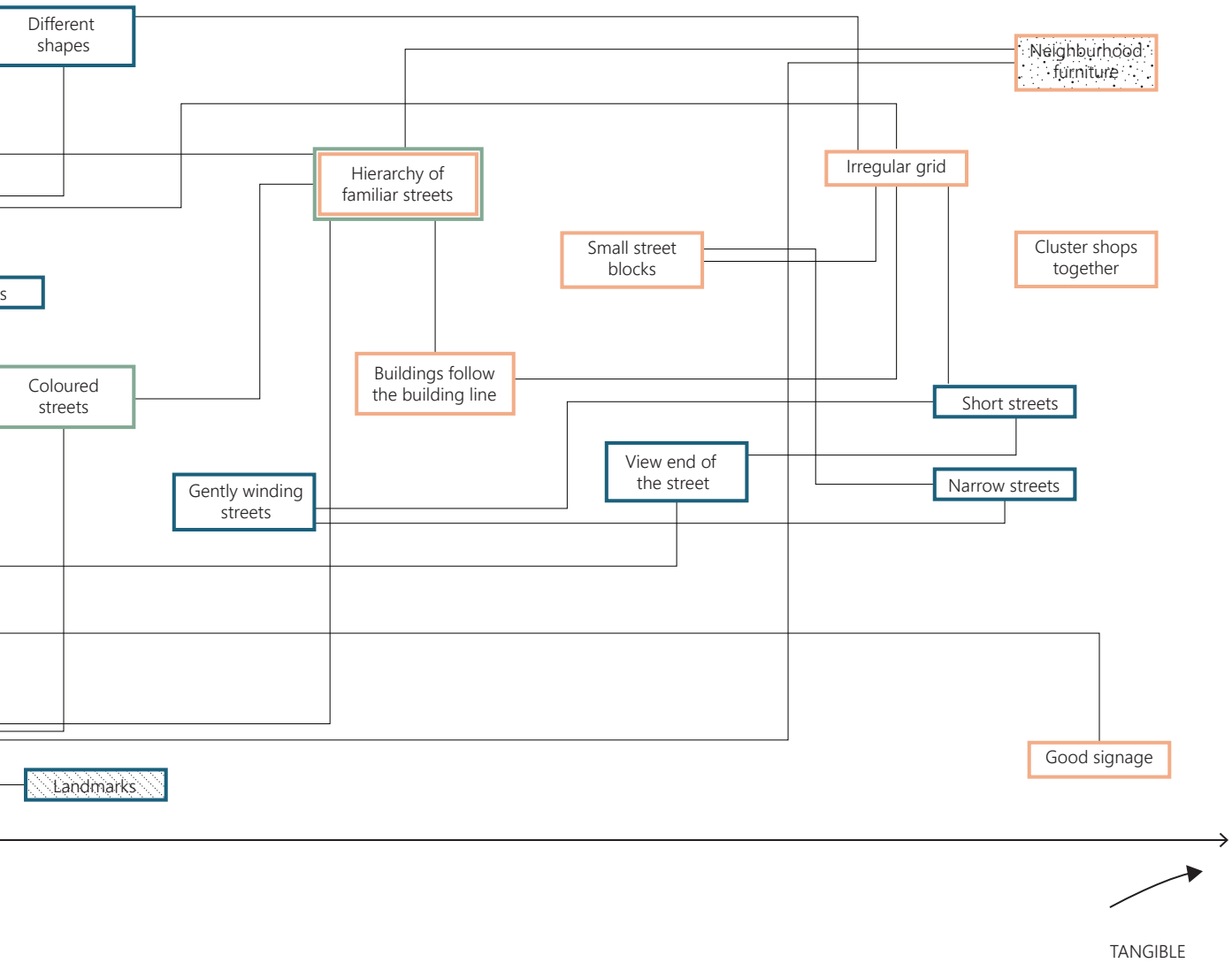


Figure 14: Cloud FL


Different shapes
Neighbourhood furniture
Hierarchy of familiar streets
Irregular grid
Small street blocks
Cluster shops together
Coloured streets
Buildings follow the building line
Short streets
View end of the street
Gently winding streets
Narrow streets
Good signage
Landmarks
TANGIBLE

Not all the double patterns from the theoretical framework are explained by this figure. The black arrows show links between the FL and ACS cloud, as well for the D and FL cloud. Behind the three clouds, there is a network of patterns. To clarify this the links between these cards must be researched in more detail (figures 13, 14 en 15). Every pattern has connections with others. Some patterns are very tangible and others are not. In this study there are a few patterns that ensure that the clouds are connected to each other. "Clear entrances" for example helps to enter the buildings. This makes buildings easily accessible. On the other hand, well-designed doors also help to better understand the environment. That's why there is a connection between understand and enter in figure 12. Another example is different street furniture in the legible principle. This ensures that people with dementia know that they are in their own neighbourhood if they for example red benches. Besides that it also helps to distinctive the neighbourhood. Red is the colour of the benches, while for example all the trash cans are yellow. It keeps people with dementia focussed. Landmarks is another example. The area becomes more readable when there are landmarks, but it also helps to distinguish particular buildings / places from the houses. The same goes for variety in building styles. There is a strong connection between concentrate and identify.

The patterns do have a strong relation with each other. Working on one patterns can also stimulate and strengthen other patterns. It is important that people are aware of that aspect to see the problem in a broader perspective. However the solution space is infinite, because it is a complex problem. The pattern field is difficult to define and new patterns can always be added. The same pattern field can be used for the same assignment, although the nuance can be completely different (Dorst, 2005).

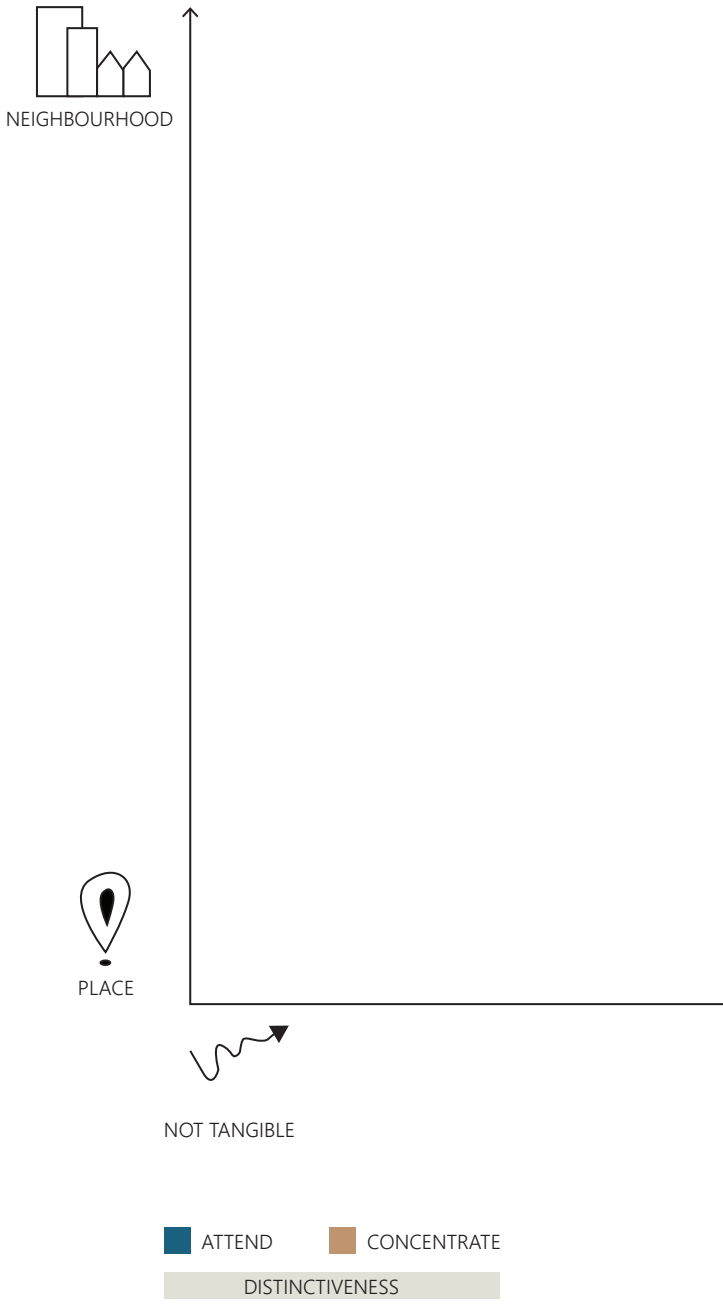
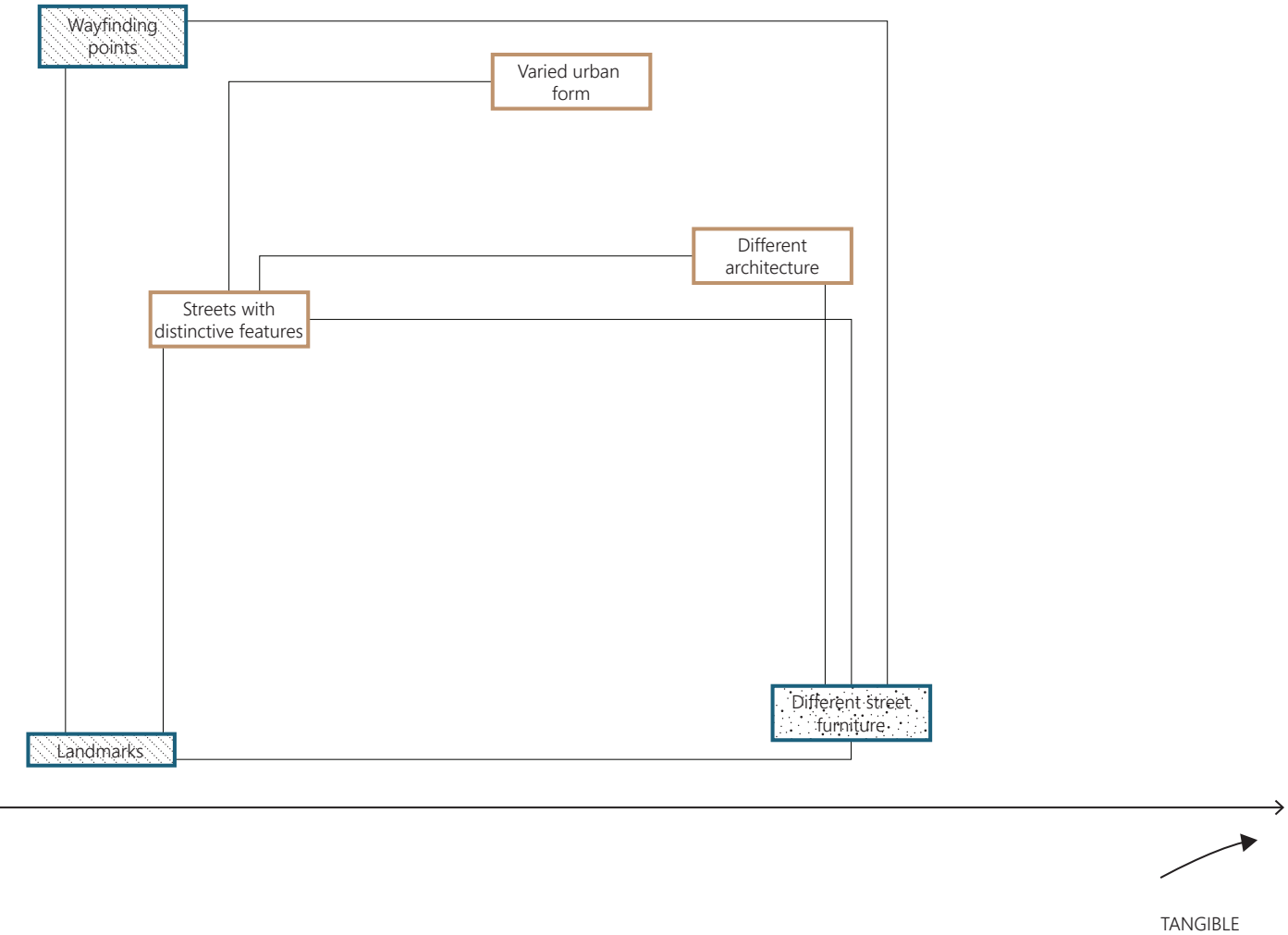


Figure 15: Cloud D


Wayfinding points
Varied urban form
Different architecture
Streets with distinctive features
Different street furniture
Landmarks
TANGIBLE

The use of patterns has advantages. All actors can participate because they can express preferences and discover relationships. Finally, the pattern field can become the consensus on the solution for a specific design assignment, without the design being fixed (Dorst, 2005).

3.10 CONCLUSION

This chapter answers research question 1A: What makes a neighbourhood dementia friendly? The results of this questions helps people with dementia to live at home for as long as possible without deteriorating the quality of life.

The work of Mitchell and Burton has laid a nice foundation in determining the requirements of a dementia friendly neighbourhood. A dementia friendly must be accessible, comfortable, distinctive, familiar, legible and safe.

An accessible neighbourhood means that people suffering from dementia can reach, enter use and move around the places and spaces they need or wish to visit. Familiar surroundings enable people to recognize and understand their surroundings. In a legible neighbourhood people with dementia can understand where they are and identify which way they need to go. A distinctive neighbourhood captures people's attention and concentration by the distinctiveness of the various parts of the neighbourhood. People with dementia must feel at ease before they are able to visit, use and enjoy places of their choice. Finally, the neighbourhood must be safe for people with dementia to move around.

Some neighbourhoods will already meet certain requirements and some will have to be adjusted, which can be done by a number of patterns. The principles with their patterns are bundled in a theoretical framework, where a distinction is made between the different scales and the level of abstractness. This creates a hierarchy. There is a lot of overlap in the scheme, because the principles have the same goals. The patterns therefore have strong relationships with each other and can reinforce or complement each other.

The developed framework can be used as an basis to evaluate when a neighbourhood is dementia friendly or not. In the next chapter Ommoord will be analysed based on the framework. Further research should show whether this framework can be used and whether it should still be adjusted.

4.
THE DEMENTIA-FRIENDLINESS OF OMMOORD

The population of Ommoord is aging and most of them want remain in their own neighbourhood for as long as possible. Is the designed plan by Lotte Stam-Beeste aimed for people with dementia? This chapter tries to answer sub-question 1B: ***How dementia friendly is Ommoord?***

Sub-chapter 4.1 describes the idea behind Ommoord. Hereafter the developed theoretical framework will be applied to Ommoord, whereby the different sub-chapters will assess the six dementia principles (4.2-4.7). Finally sub-chapter 4.8 will give answer to sub-question 1b.

4.1 METHODS

The aim of research-question 1B was to find out how dementia friendly Ommoord is at the moment. Hereafter it was possible to identify a crucial design location in the neighbourhood. Moreover, chances and problems for the chosen crucial area could be mapped. For this research different methods were used.

4.1.1 Applying the framework

In the first place, documentation about the plan of Ommoord was used so that the ideas of Lotte Stam-Beese could be compared with the dementia friendly design principles developed in the previous chapter.

Besides that the developed framework was applied on Ommoord to determine how dementia friendly the neighbourhood is. A distinction was made between the different scale levels: the neighbourhood, the street and the object. Not all the patterns in the framework were tackled trough mapping. Observations and personal experiences were needed, because they helped to translate theory into practical and real life examples. Moreover it helped to better understand the social life in Ommoord.

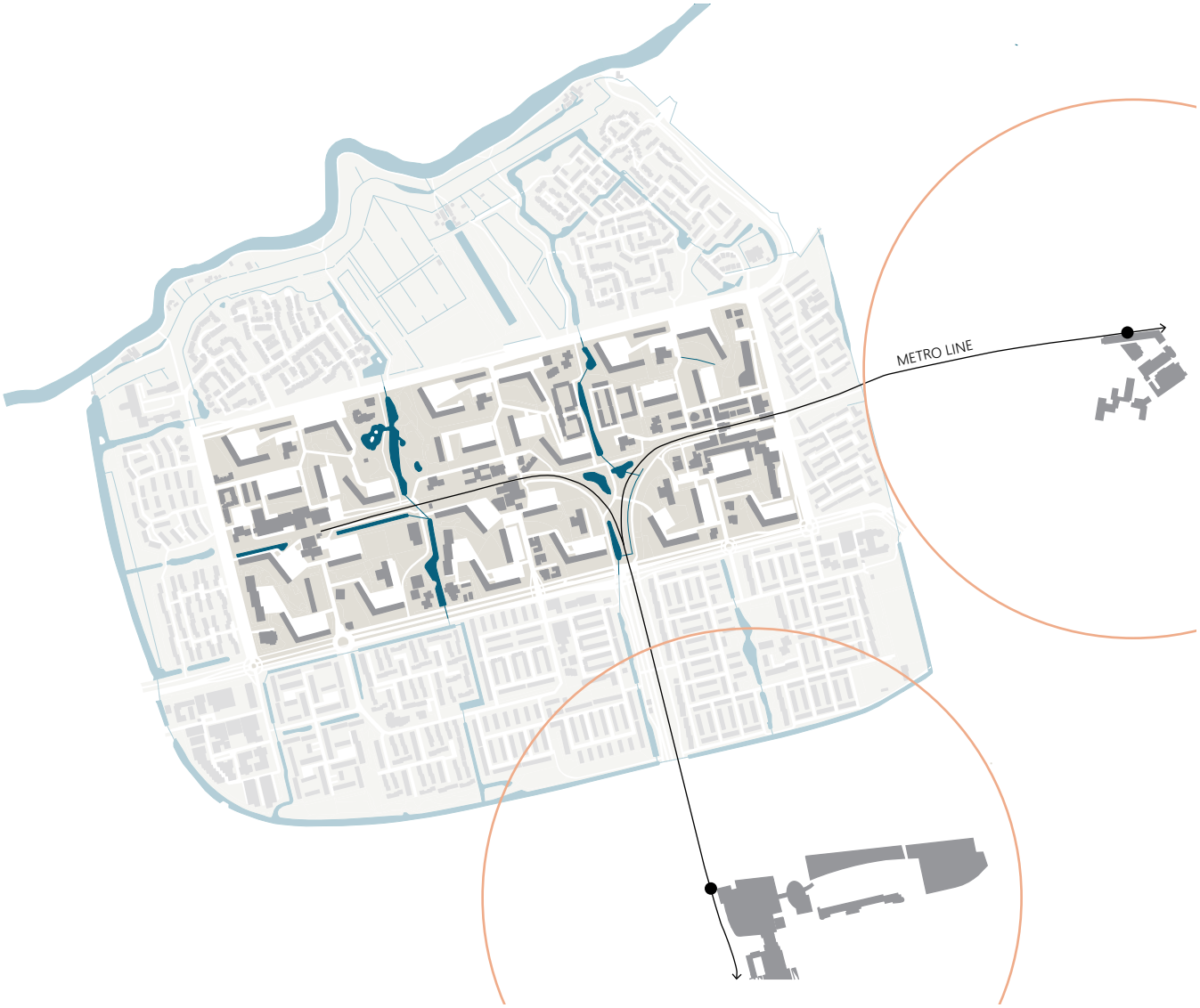


Figure 16: Distance secondary needs, 1:20000

4.1.2 Fieldwork with participants

It was not possible to research all the patterns without the help of others, because some of the patterns are not tangible and required the opinion of others. During fieldwork with participants, three non-urbanism professionals evaluated the patterns were involvement was needed (Appendices B & C). Each participant evaluated a different set of patterns. Their opinion about these patterns are presented on maps of Ommoord. After the fieldwork workshop they completed an evaluation form (five-point scale), which gave relevant insights into how others thought of the dementia friendliness of Ommoord.

4.2 THE IDEA BEHIND OMMOORD

The Ommoord district is located within the north-eastern part of Rotterdam. Ommoord is bordered on the north by the Rotte and on the southside by the A20 motorway. The former horticultural area with farms was designated at the end of the reconstruction period as part of the large expansion plan Prins Alexanderpolder and Rotterdam Oost-Capelle aan den IJssel to counter the still acute housing shortage in Rotterdam. The new district provided nearly 10,000 homes where approximately 35,000 people had to live. The houses were mainly intended for residents working in the city centre of Rotterdam and the region. These were mainly teachers, civil servants and office staff with their families (Rijksdienst voor het cultureel Erfgoed, 2016).

Ommoord is the last designed post-war residential neighbourhood of Rotterdam which is designed by Lotte Stam-Beese. The neighbourhood consists of a central high-rise section that is constructed within a rectangle of roads: the president Wilsonweg, the Martin Luther Kingweg, the President Rooseveltweg and the Jon Mottweg. Within the rectangle three smaller neighbourhoods are situated which are separated by two green zones (figure 30). Low-rise neighbourhoods have been built around the ring road. In this project the focus is on the central high-rise building neighbourhood within the access roads (Rijksdienst voor het cultureel Erfgoed, 2016).

Ommoord has three important spatial distinctive core qualities (Rijksdienst voor het cultureel Erfgoed, 2016):

1. Housing production at the height of standardization and industrialization.
2. Residential area set up according to three main principles: infrastructure, housing units and green space. Every layer reinforces the other layers.
3. High rise zone with large-scale kink flats in park like surroundings.

These qualities influence the realization of a dementia friendly neighbourhood and will be further discussed in the next sub-chapters.

4.3 ACCESSIBLE OMMOORD

Ommoord was built shortly after world war II, when urban functions were increasingly separated. As a result more and more people were living outside the city centre. Traffic therefore became an important aspect in the making of urban development plans, because the number of cars started to increase. The ring road of Ommoord is embedded in a rough network of roads in the east of Rotterdam. This network connects the neighbourhood with the region. From the rectangular ring road, the six smaller neighbourhoods are accessed by residential streets. The streets end at parking lots. There are no roads within the ring road that cross the neighbourhood. This keeps the neighbourhood relatively traffic-free and therefore safe. In addition to the car streets, a fine-meshed system of cycling and walking paths has been created in the neighbourhood which connects the entire area (Rijksdienst voor het cultureel Erfgoed, 2016).

Stam-Beese designed the neighbourhood more in the context of its environment; its own independence was less important. She was convinced that the life of the residents was not limited to neighbourhood boundaries, but was extended to the rest of the city. The metro line had to ensure a good connection between the district and the city centre, so that the secondary facilities could also be reached. The facilities are linked to the metro stations and the metro line was eventually constructed above ground instead of underground so that the three residential neighbourhoods were divided into a northern and a southern part (Rijksdienst voor het cultureel Erfgoed, 2016). Because of these thoughts, it is not necessary to place secondary facilities in the neighbourhood, but it is hard for people with dementia to use the metro on their own with the result that most of the secondary facilities are not accessible (figure 16) Moreover, it is difficult for people with dementia to understand the crossing at the metro station.

Figure 18 shows that most of the houses have access to the basic needs, but the heart of the neighbourhood is not connected to all basic needs. The neighbourhood consists of many direct routes from the ring road (figure 19). There are two important streets in the area which connect the western part with the eastern part. These connectors are good, but not well designed. In redesigning the neighbourhood this lines need a stronger design (figure 17). The southern connector has to deal with two height differences to cross the metro. For people with dementia this can be difficult (figure 24). The courts of Ommoord work very well for setting up communal spaces, but they could be better designed in the future. To ensure that more and better meetings can take place between young and old.

The main road structure of Ommoord is based on a dead end structure, which is on the one hand very positive because Ommoord does not suffer from through traffic. On the other hand, a dead structure is confusing and not always clear (fieldwork) for people with dementia (figure 22). Circular or curved roads work better for people with dementia, but they are hardly present (figure 21). The combination of straight dead-end roads and curved roads could be better developed. A positive aspect is that the pavements are very wide (fieldwork).

There are not many plinths in the neighbourhood, because in the plan of Stam-Beese the ground floor was reserved for communal entrances, storerooms and

Connected routes

Direct routes

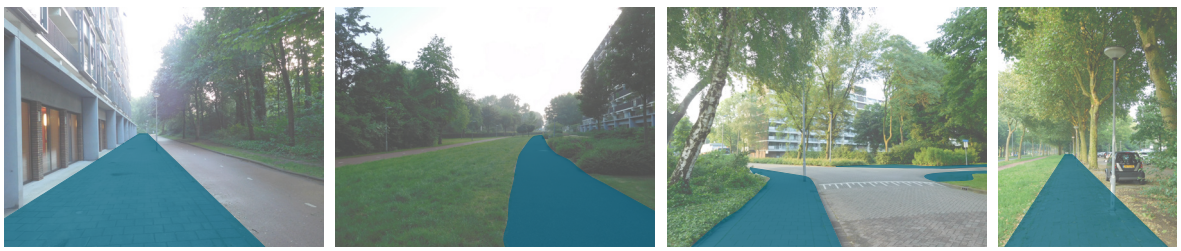


Figure 17: Direct and connected routes

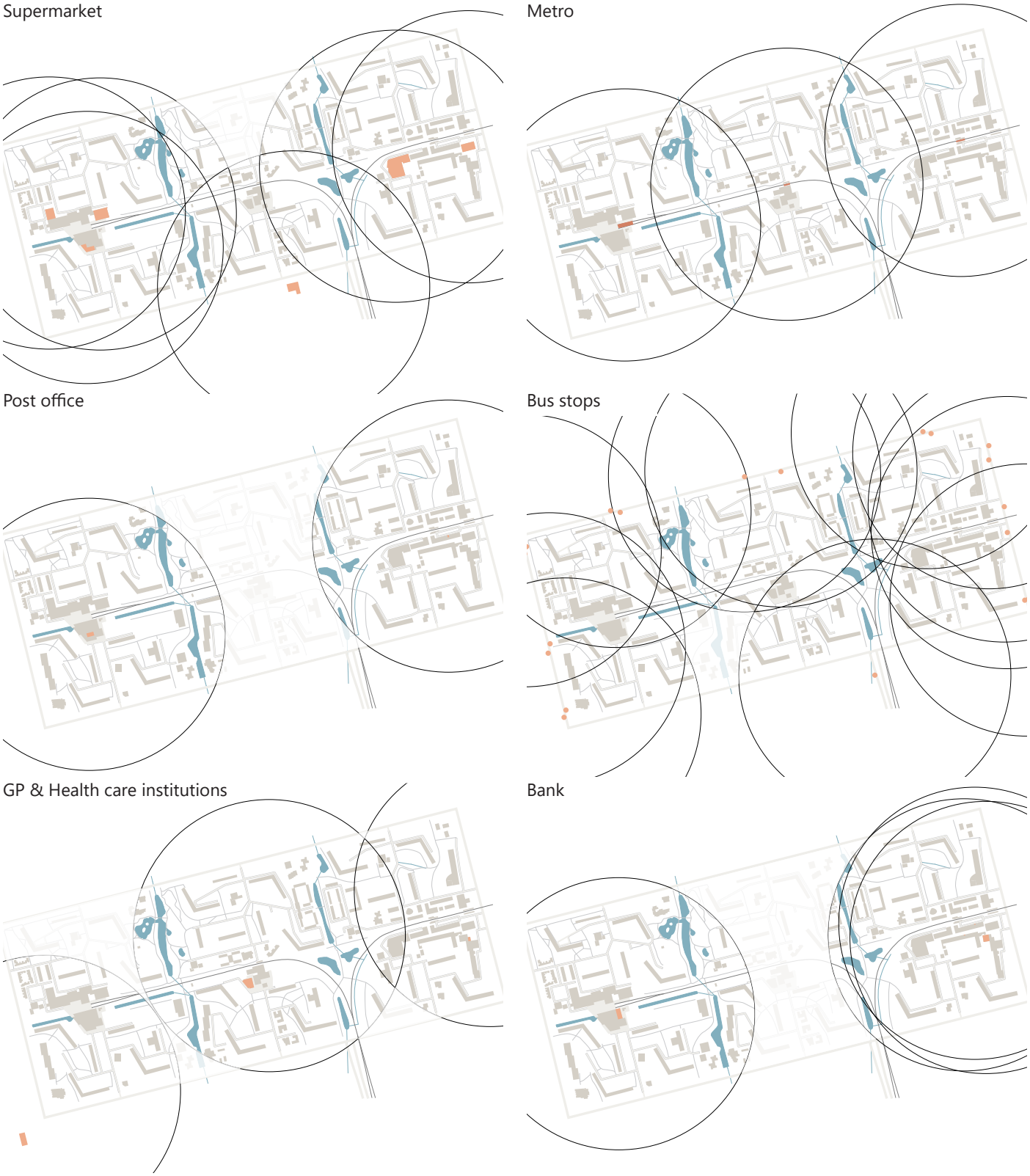


Figure 18: Distance basic needs, 1:20000

Figure 19: Direct and connected routes

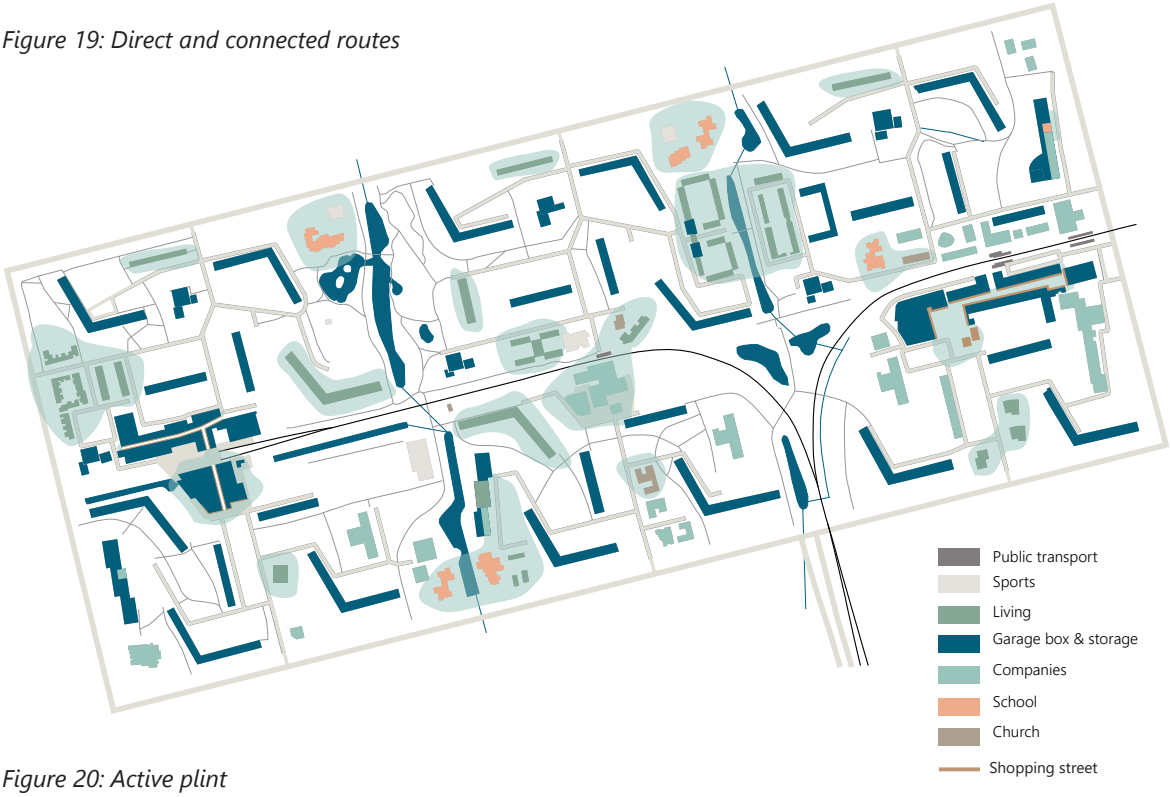


Figure 20: Active plint

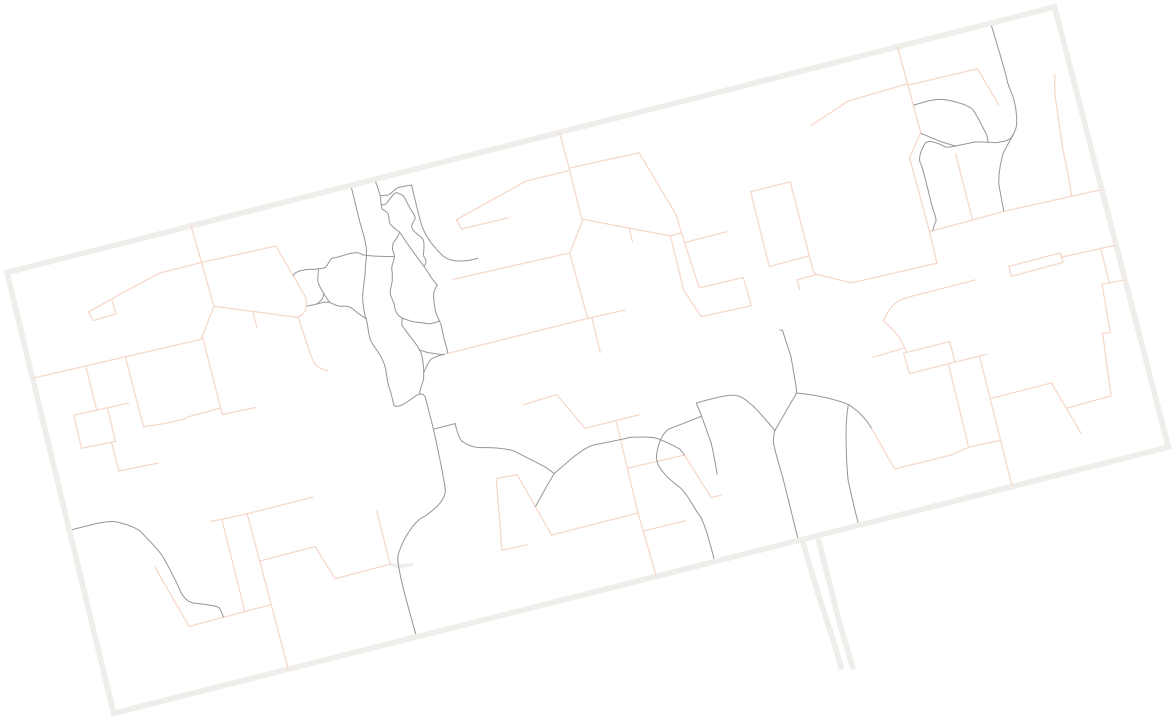
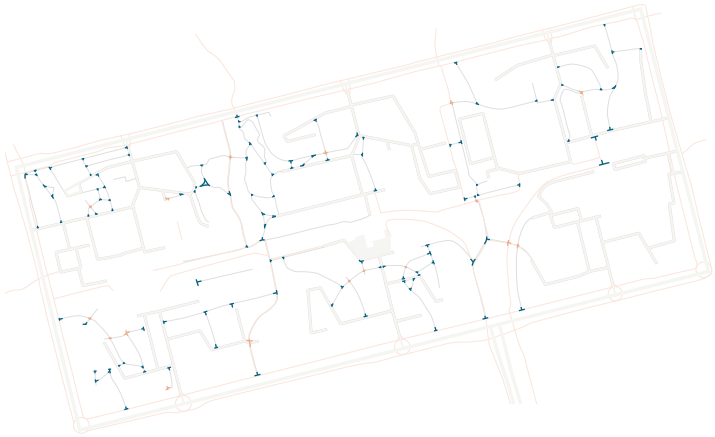
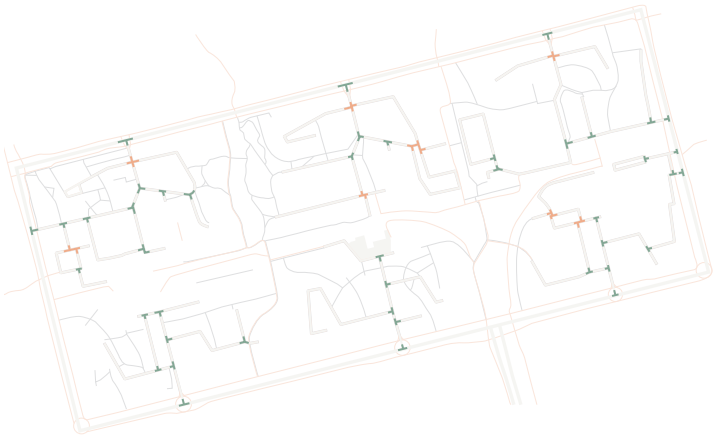


Figure 21: Circulair paths

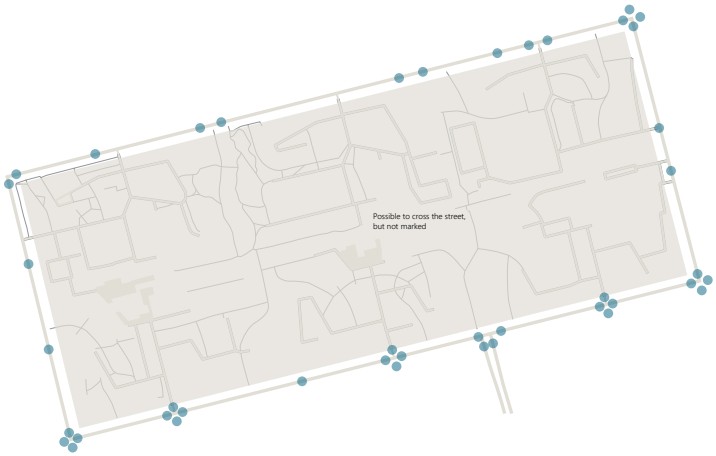
Figure 22: Dead end structure



Crossing pedestrian and cycling paths



Crossing car roads



Marked pedestrian crossings

Figure 23: Crossings, 1:20000

Figure 24: Height differences in the Neighbourhood

Figure 25: Clear (left) and unclear entrances (right)

Figure 26: Buffer zones

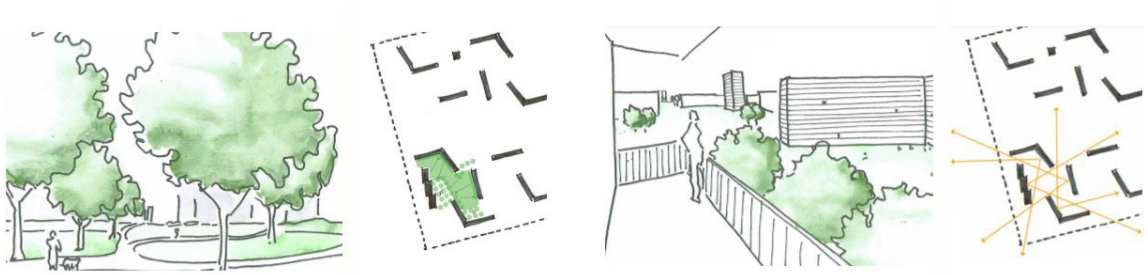


Figure 27: Views (Rijksdienst voor het cultureel Erfgoed, 2016, p.19)

garages (figure 20). BIQ architects already renovated a number of flats in 2010. The ground floor has been transformed into dwellings with adjoining private gardens which is positive for people with dementia (Rijksdienst voor het cultureel Erfgoed, 2016). Further investments would create opportunities for the development of Ommoord.

The two shopping centres provide a lively environment. It is positive that the buildings of the different shops are only one floor high, which prevents inaccessible levels. The flats all contain a lift core, so that people with dementia can reach their home. Figure 23 shows the number of crossings in the neighbourhood. There are a few dangerous crossings, which are difficult to understand for people with dementia. During the fieldwork workshop it was established that the pedestrian crossings are not always recognizable and clear.

On the smallest scale of the framework there is still much research to be done. It is not clear yet if all the ramps and steps are marked. During the fieldwork workshop, the doors were both experienced as clearly and unclearly by the participants (figure 25).

4.4 COMFORTABLE OMMOORD

The comfort aspect is very well developed in Ommoord on all the different scales of the theoretical framework. On the largest scale, much green is present. That is because the high rise buildings are inextricably linked to the public green. High rise leaves more space for green areas. The green is a backdrop in which the buildings form the scenes. Without the flats the green areas would not have been so interesting and without the greenery the flats would have stood in a bare plain, the quality of the houses would have disappeared. Furthermore, the green structure of the neighbourhood is used as a separating and connecting element and works empowering and mitigating. From the flat, inhabitants have a view on the landscape that serves the collective and hides the parking lots (figure 27) (Rijksdienst voor het cultureel Erfgoed, 2016).

The neighbourhood is embedded by a green ring and consists of two green zones. These zones connect the neighbourhood with the outlying green area in the north. The zones contain water elements and windy bicycle and pedestrian paths. Everywhere in the neighbourhood and not only in the green zones, there are plenty of trees (figure 30).

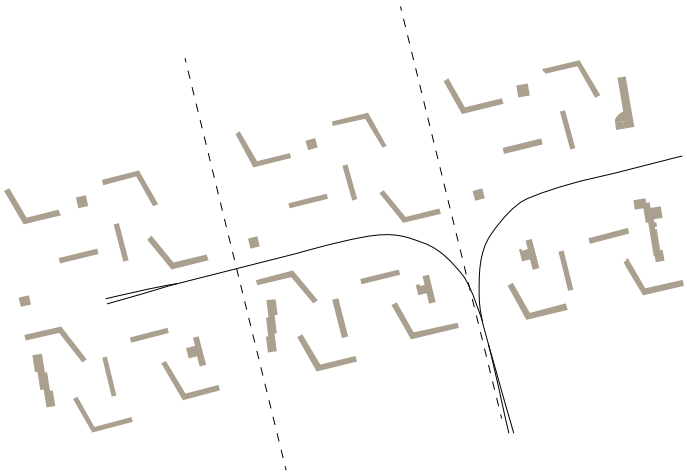


Figure 28: Regular grid

Figure 29: Artworks in Ommoord

Water

Trees

Green zones

Green ring

Figure 30: Green and water

Figure 31: Variety in building styles

Figure 32: Four types of flats (Rijksdienst voor het cultureel Erfgoed, 2016, p.10)

Figure 33: Small street blocks

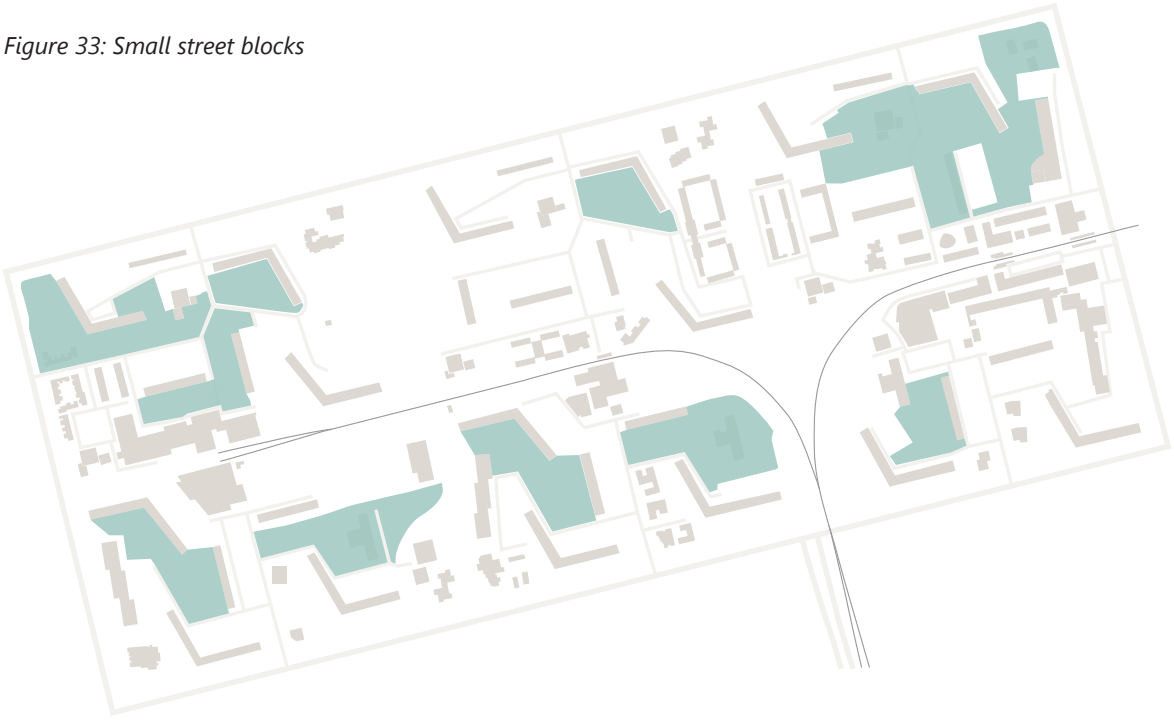
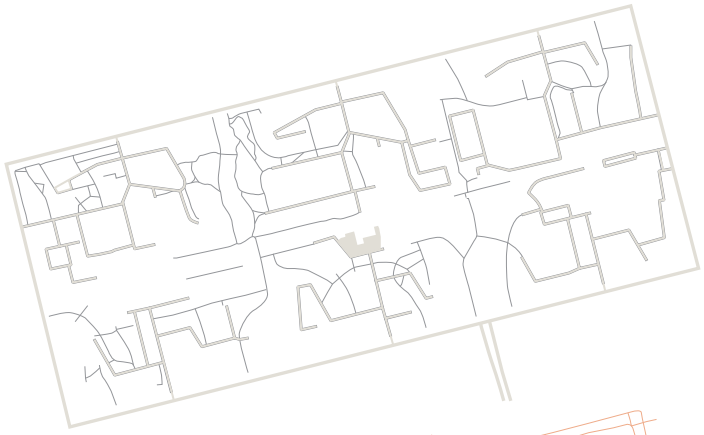


Figure 34: Open spaces

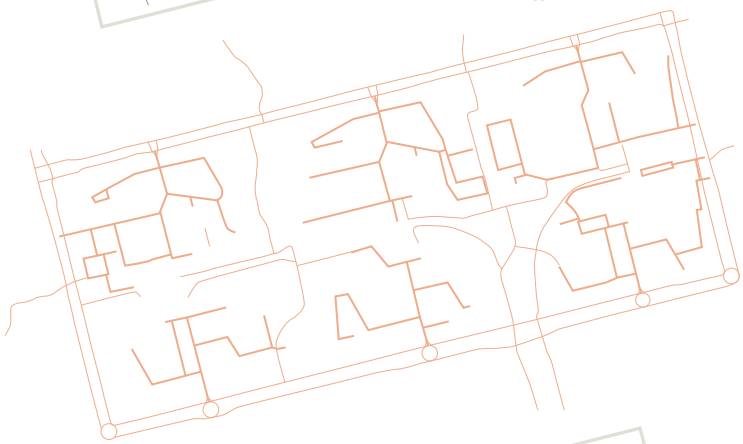
Figure 35: Hierarchy of familiar streets

Figure 36: Colored streets

Pedestrian network



Cycle network



Car network

Figure 37: Traffic flows, 1:20000

It is doubtful if the courts of Ommoord are very informal, but the places around the shopping centre are informal, because these are the places where activities can take place. Moreover, Ommoord has a playground and a sports club, where there is plenty to experience. In the design for the courts, Stam-Beese planned quiet sitting areas and busy play areas. The green does not only have a decorative function, it also has a social function. Gardens for gardening, sport and play facilities for children and benches in the green to meet other inhabitants (Rijksdienst voor het cultureel Erfgoed, 2016). However, at the moment the green could be utilised better. The original planned facilities are not there or are not being used. New activities, like gardening can be added in the system of green courts. It is just a matter of activating the right spots, so that activities can actually take place (fieldwork).

At some places in the neighbourhood the footpaths are separated from other traffic flows. This helps people with dementia to understand the different traffic flows. In Ommoord most of the separation spaces are green (figure 26), which is good in reducing stress and creating comfort. Most of the footpaths are bordered by shrubs. Figure 38 shows that the footpaths are wide, which makes it pleasant for people with dementia to walk there.

On the scale of object, the results are also very positive. The presence of plenty of trees creates enough shade. There are enough benches, but the design could be better. Not all the benches can be used by people with dementia, because there is no handrail (fieldwork). Moreover, the benches are placed too far from the sidewalk (fieldwork). Toilets are currently only present in the shopping centres and in the homes. During the first study, no gardens were detected, they could be a valuable addition to the neighbourhood, providing more activity and being a social meeting place.

Figure 38: Wide streets

4.5 DISTINCTIVE OMMOORD

In Ommoord, the repetition of housing ensembles and the choice for a specific land parcel type was a way of giving spatial expression to ideas about community forming. Monotony is a repetition of the same elements, but also a lack of variety. The plan always uses the extremes; open or closed, narrow or wide, high or low and quiet or industrious (Rijksdienst voor het cultureel Erfgoed, 2016). Because the urban plan is made up of a number of stamps, it is difficult to recognize where exactly you are in the area.

The modern building techniques were very decisive for the architecture in Ommoord. The buildings are primarily developed as a system and less as architectural objects. The architecture is not outspoken, but rather reserved and strengthened with its unambiguous design and reserved character. The sober architecture dominates the green in the neighbourhood and is characterized by (Rijksdienst voor het cultureel Erfgoed, 2016):

- All-sidedness
- Horizontality, with continuous concrete edges and contiguous cantilevered balconies
- Entrances that are emphasized with vertical façade elements
- The application of the same materials
- The light and natural use of colour
- A lack of ornaments and purely decorative elements

The design consists of four types of flats (figure 32) and these components also determine the urban design which is very essential for the aesthetic spatial experience of Ommoord (figure 28). The flats vary in height. The kink flats are eight high, the floor flats are fourteen high and the towers are twenty floors high. The flats are directed to the sun and the parking spaces are positioned on the shay side of the different flats (Rijksdienst voor het cultureel Erfgoed, 2016). The architecture is monotonous, but the smaller buildings show some variety (figure 31). In the original plan, all high-rise buildings had a residential function. The low rise-buildings were only intended for facilities (Rijksdienst voor het cultureel Erfgoed, 2016).

It is difficult to see the buildings as wayfinding points. During the fieldwork workshop, a non-urbanist professional was not convinced about this, because all flats have a name. This could make the streets

Figure 39: Unclear crossings

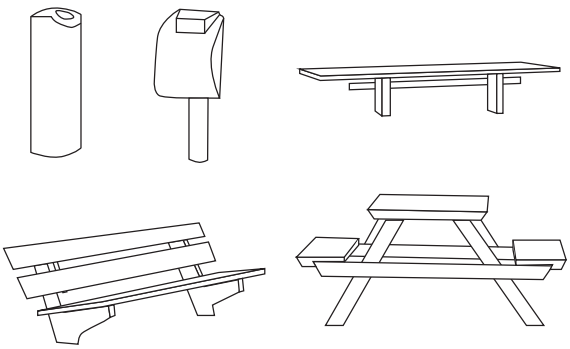


Figure 40: Neighbourhood furniture

distinctive, but the streets distinctiveness can certainly be improved. The street furniture is not striking and recognizable as neighbourhood furniture, which should be improved in a future plan.

4.6 FAMILIAR OMMOORD

On the scale of the neighbourhood it is quite clear that the neighbourhood is not built up with small street blocks (figure 33). Large flats characterize the neighbourhood. Yet there is a clear hierarchy of four different street types:

- A pedestrian path
- A pedestrian path and a cycling path
- A pedestrian path and a combined cycling and car road
- A pedestrian path, cycling path and a car road

Participants from the fieldwork workshop concluded that there is no hierarchy of familiar streets within the ring road. The design of the different types could be a lot better and more distinctive (figure 35). Nevertheless, due to the use of different materials, there is a clear contrast between the different traffic flows. Only in the third image it is difficult for people with dementia to distinguish the road from the sidewalk, because the colour is almost the same. Type three is the most common street profile in the neighbourhood, this should be improved to help people with dementia. Because the neighbourhood is made up of high blocks of flats and lots of greenery, there are plenty of open spaces (figure 34).

On the scale of the street there is much room for improvement. Not much colour is present in the area (figure 36). A participant from the fieldwork workshop suggested to paint every flat in a distinctive colour to make them recognizable. Some nameplates of for example supermarkets or public buildings have colour. Ommoord already has a number of artworks that are very colourful, which can be used as wayfinding points (figure 29).

4.7 LEGIBLE OMMOORD

Ommoord is built up on a regular grid, which is in contrast with the irregular grid people with dementia prefer. Stam-Beese formulated the housing unit as an organizing principle, spatially, economically, socially and aesthetically. Because of these spatial characteristics, an openness has been reached which completely lacks the limitations of a grid of building blocks along the street. New spatial relations arose. The ensembles that were created are almost identical. This rhythm had to provide an overview in the large number of buildings, so that people could orientate themselves at all times. The neighbourhood consists of quadrants. The addition of low-rise buildings and extra residential towers deteriorated the recognisability of the quadrants and the size of the green (Rijksdienst voor het cultureel Erfgoed, 2016).

It can be said that Ommoord consists of three smaller neighbourhoods, cut in two by the underground. Actually, Ommoord consists of two stamps which are repeated in the other parts of the neighbourhood (figure 28). Because of this plan, there is little room for smaller building blocks, differentiation in shapes and there is hardly any variation in building styles and this is not at all positive for people with dementia. Participants from the fieldwork session found the architecture at the western shopping mall striking which is good for the orientation, while they found it difficult to orientate in the park between the west and the middle sub-neighbourhood. The neighbourhood

Figure 41: Places to socialize

Figure 42: Entrances

Figure 43: Lighting

furniture may also be renewed, as this is very standard and not distinctive (figure 40). A positive point on the scale of the neighbourhood is that the shops are clustered together (figure 20).

On the scale of the street there are some interesting findings. First, the main structure of the neighbourhood is based upon short streets (figure 37), but they are not narrow (figure 38). The chance of losing the overview is therefore greater, but the connecting streets are gently winding which is positive. Buildings follow the building line, but because most of the streets have a dead end, this does not work in guiding people. Moreover, the number of viewports is limited (fieldwork).

The signage in the area is very bad (fieldwork). Also, the signage within the western shopping mall is not understandable (fieldwork). The entrances of the flats are not always logical (figure 42). Some entrances are located at the court, others are not. If all entrances were situated at the court, this would strengthen the feeling of having a community. The entrances to the shopping mall in the western part of the area are difficult to find. This is because shopping takes place inside.

Finally, it is difficult to find landmarks in the area. The roofs of the buildings cannot be seen from the ground because of the many trees. There are a few sustainable trees, such as wingnuts, chestnuts and beech trees which may become iconic elements (Rijksdienst voor het cultureel Erfgoed, 2016) Moreover the existing artworks could serve as landmarks (fieldwork).

4.8 SAFE OMMOORD

Figure 23 shows that there are few unsafe crossings in the neighbourhood. Within the ring there are no clearly designed pedestrian crossings (fieldwork). It would help people with dementia if there were more signed pedestrian crossings (figure 39). In a future plan a number of pedestrian crossings in the area should be added.

In the fieldwork workshop, places to socialize have been determined. In the library, theatre, cafés, parks and playgrounds it is possible to meet other people. There is also a coffee corner for residents. The picnic benches in front of the supermarket are good for socialising. The square around metro station "Binnenhof" is also a place to socialize (fieldwork) (figure 41). Some places have the potential to become a place of activity, but still have to be developed. A good example of this, is the area around metro station 'Romeynshof' in the middle of the neighbourhood of Ommoord.

More awareness must be created for dementia in the future, so that everyone knows how to approach someone with dementia in panic. This removes the first anxiety and fear.

On the scale of street there are wide streets, buffer zones and there are enough places where it is possible to cross the street. On the scale of object, there is a good lighting system (figure 43). The connection route between the western part of the neighbourhood and the middle part of the neighbourhood could be improved. It is difficult to cross the park and besides that the southern part only has one path where it is possible to switch to the other side. There are no arbitrary changes, but there are often irregularities in the sidewalks (fieldwork). This should be improved.

There are many street signs, but signage to the most important places in the neighbourhood is missing (fieldwork). Finally, bushes are used to demarcate areas (fieldwork). The warning signs around the metro stations could be improved. Furthermore, the barriers of the metro must block both roads. People with dementia can otherwise walk through the barriers and at the moment the crossing is not safe (fieldwork).

4.9 CONCLUSION

This chapter tries to answer research-question 1B: How dementia friendly is Ommoord? The developed framework has been applied on Ommoord to find out which aspects are very positive developed in the neighbourhood and which aspects should be improved.

Ommoord is very comfortable. The presence of green is very positive in Ommoord. There are plenty of trees and several ponds present in the parks. The trees provide sufficient shade spots and all the green also creates a good and relaxing atmosphere. But that is not all: the green stimulates social interaction, like gardening, sports and play facilities and a lot of benches to meet other people. The parks create advantages, but the developed courts do too. Courts can function as communal spaces. The ring road consists of many trees, which is positive for creating a relaxing feeling and it also functions as a buffer zone. The result is that people with dementia can better distinguish the different traffic flows.

The car network is important in Ommoord and what is good is that the six smaller neighbourhoods are connected by residential streets. There are no roads crossing the neighbourhoods. This makes the neighbourhoods traffic-free and much safer. People with dementia do not have to cross very busy streets. The shops are clustered and the parks have winding streets with the result that the legibility of the place will increase.

Nevertheless, the accessibility can improve significantly. Not all facilities are included in the neighbourhood. People with dementia are dependent on their own neighbourhood and need all the basic facilities in a radius of 500 metres. Secondary needs may be at a maximum distance of 800 meters. That is why Stam-Beese developed a good car and metro network. It can be assumed that people with dementia will not drive a car anymore, so this network will become less important in the future. It is positive that there are good connections to the city centre by metro, but people with dementia will only use the metro with assistance. On the other hand the metro is a barrier within the ring of Ommoord, because it makes it difficult to get from north to south. Also the dead end structure in Ommoord causes confusion for people with dementia. Another idea of Stam-Beese – closed plinths - is not suitable for people with dementia either. closed plinths make it more difficult to get in touch with other residents and make accessibility more difficult. They already transformed some close plinths into transparent plinths which is good development.

The neighbourhood is not that distinctive either, because the urban structure is a repetition of stamps and its architecture is monotonous. For people suffering from dementia this makes wayfinding difficult. Research should be done on how to place landmarks in this structure, such as street furniture. The large scale and the broad streets are a disadvantage for people with dementia, too. It has been found in literature that a smaller scale works better, because this is a more human scale which helps people to get familiar with certain places. Another negative aspect is the lack of viewports and landmarks, which makes it difficult for people in the area to orientate. The park in the north west is difficult to cross because it is so densely forested. Better signage and clear entrances should already improve this, but there is a lot to be gained in the urban design. The legibility of the neighbourhood has to improve.

Finally, safety can be improved. There are not enough pedestrian crossings and these crossings should be more recognizable and safer. Arbitrary changes must be prevented. The addition of warning signs may also help to improve the safety of the neighbourhood.

During this analysis, the entire area within the ring was analysed and it can be concluded that the middle part is the least dementia friendly. This is mainly because the houses are not connected to the basic facilities. Moreover, the metro forms a barrier between north and south, but also between the middle and the eastern neighbourhood. Furthermore, the park in north west makes the transition between the middle and the western neighbourhood difficult. The other problems listed in the previous paragraphs are common throughout the area.

Fortunately, there are also many opportunities for this part. Better and new connections can be realized to embed the middle neighbourhood better with its surroundings. Making the structure of the park more comprehensible would ensure that the inhabitants will experience even more comfort. There are also a number of places that can easily be transformed to places where activities can take place, for example the open-air theatre at the Romeynshof and the meeting place at the billiards club of Ommoord. The courts can function as social communities and the open plinth will also reinforce this. Finally, the Romeynshof has the potential to become the new heart of Ommoord. Figure 44 shows how the neighbourhood should develop to become more dementia friendly.

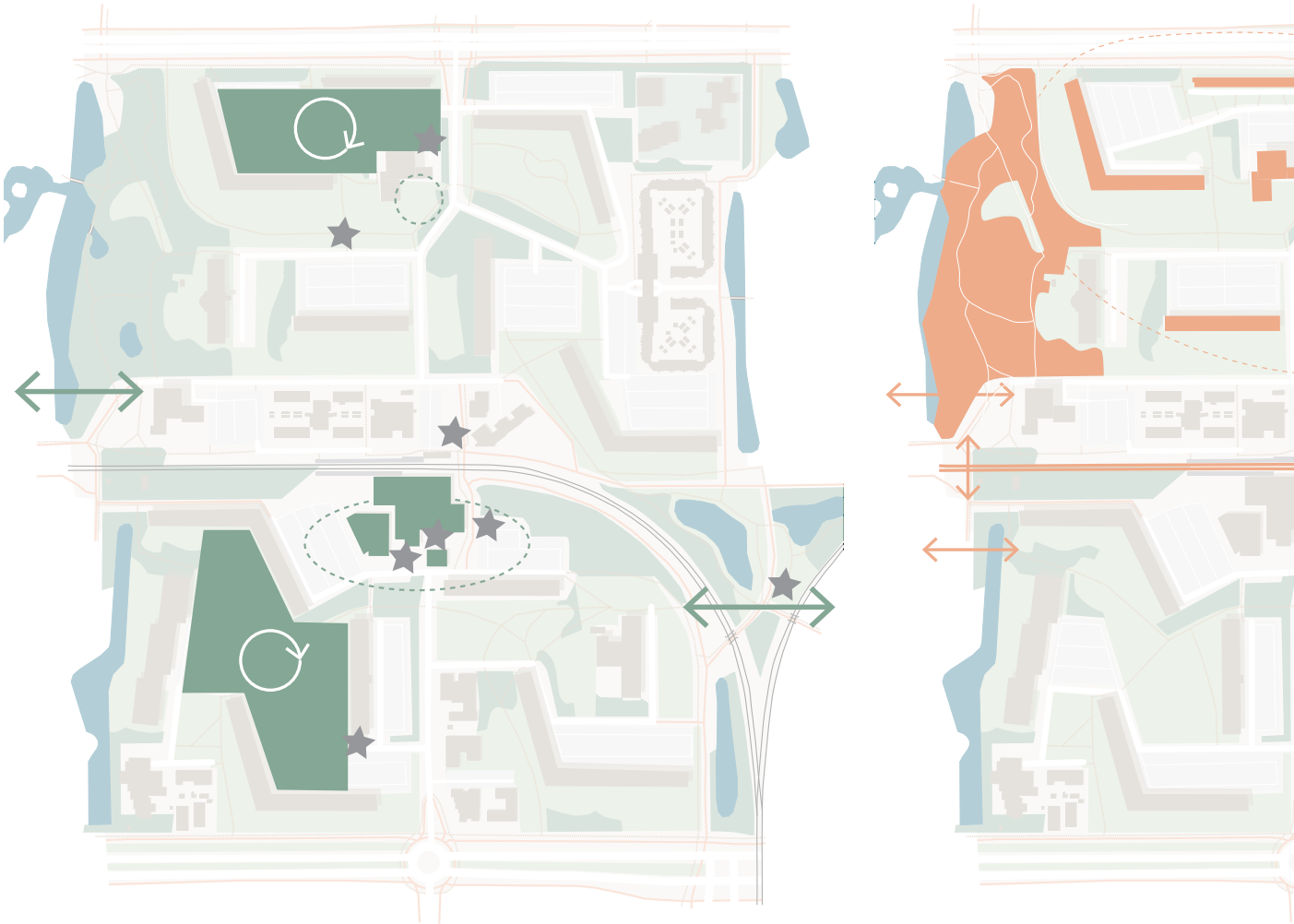
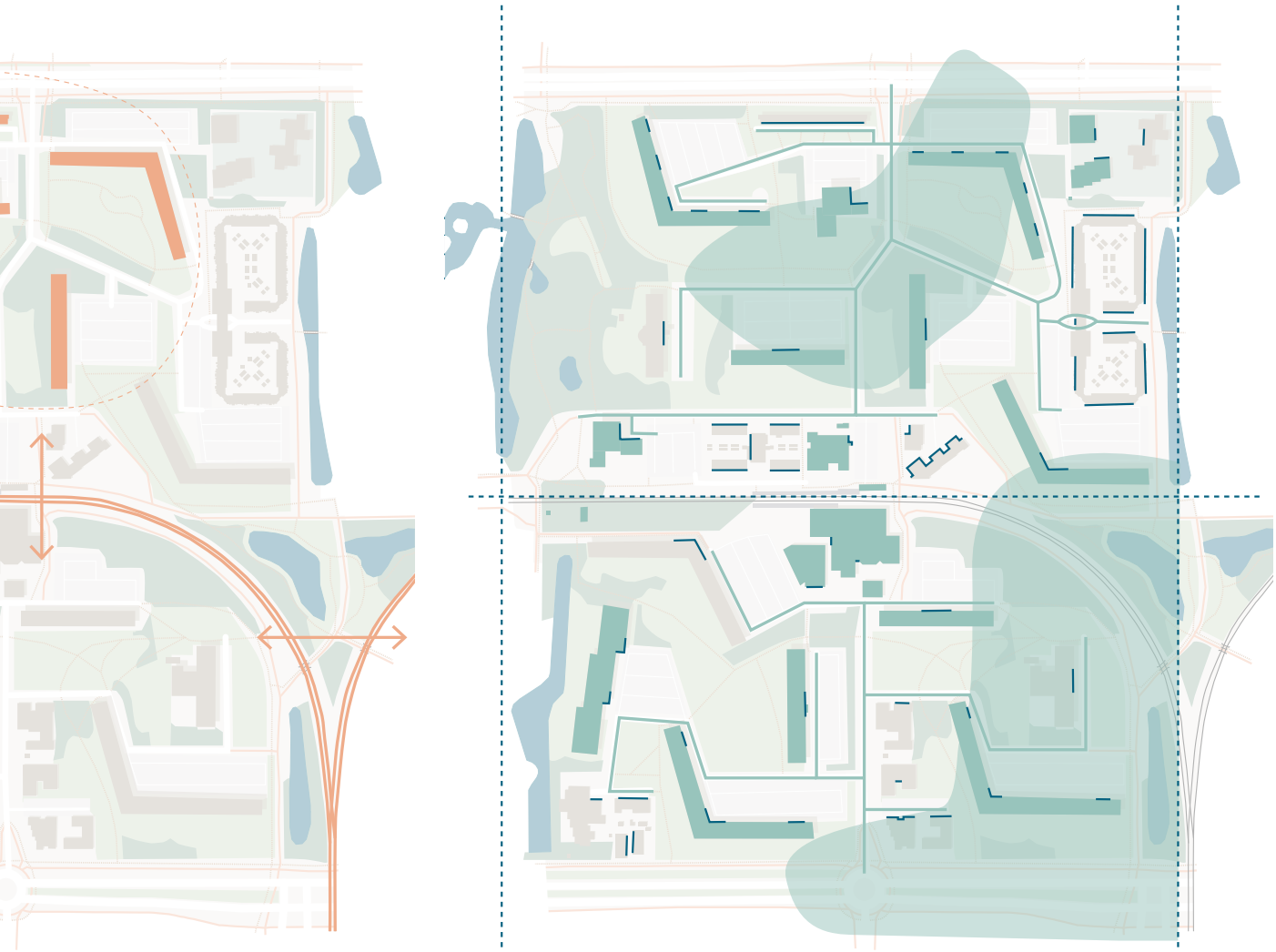


Figure 44: Chances & problems for the middle heart of Ommoord



SPECIFIC PROBLEMS

Not connected to the basic facilities

The metro is a barrier

Difficult connection

The park is not accessible for the elderly

GENERAL PROBLEMS

Non-active zones

The entrances are not always clear

The same type of buildings

5.
CO-CREATING IN THE DESIGN AND PLANNING PROCESS FOR DEMENTIA FRIENDLY NEIGHBOURHOODS

The role of urban designers and planners is changing. The role of urban design is not so much to tear down and build new but to offer a different view on the future based on what is already happening (Ellin, 2013). Urban planners and designers will be confronted with very large challenges and that is why they need a team of specialists (Sanders & Stappers, 2018).

Realising social networks creates very strong benefits. It helps to build social capital and can form a platform to build up strengths. Moreover, it can change situations. However, social networks are often absent in urban studies (Alvarez, Borsi, & Rodrigues, 2017), which is a missed chance because a wide range of professionals and stakeholders can bring ideas into life (Ellin, 2012). Other advantages of co-creation are (Advany, 2014):

1. Involvement and cooperation
2. Innovative insights, which supports creativity
3. Visibility and support, which will lead to a better result.

This chapter focuses on the collaboration between different stakeholders in the design and planning process for dementia friendly neighbourhoods and answers research question 2A: ***How can urbanism and non-urbanism professionals cooperate in the planning process of dementia friendly neighbourhoods?***

Sub-chapter 5.1 describes the methods used to answer this research-question. Sub-chapter 5.2 describes the involved network in transforming Ommoord into a dementia friendly neighbourhood. Hereafter the different steps in the co-creating process in the urbanism field will be explained (5.3). In chapter 5.4 the design process will be analysed. Finally, chapter 5.5 provides an answer to research question 2A.

5.1 METHODS

The aim of this research-question (2A) was to determine in which stage of the design and planning process of dementia friendly neighbourhoods stakeholders could co-create, so that optimum quality and input could be extracted.

5.1.1 Stakeholder analysis

Different stakeholders were analysed to create an overview of involved stakeholders in de planning process for dementia friendly neighbourhoods. The interests and needs were summarized by analysing their websites. Gunsteren (2011) stated that there is a distinction between stakeholders who have power and stakeholders who have the knowledge to change something. Both networks are indispensable. By the theory of van Gunsteren it was possible to establish a power and a knowledge network for Ommoord.

5.1.2 Literature study

A literature study was done to provide clarity about the possible options for co-creation. "Urbanism" and "Co-Creation" were the two search keys to find papers. This has led to two important co-creators. Fuad-Luke (2009) and Ellin (2013) distinguish different steps in the co-creating process for developing urban areas.

Next, the design process (Design Council, 2013) was studied to understand how this process could cooperate with the theories of Fuad-Luke and Ellin.

5.2 NETWORK OF OMMOORD

Good urbanism is not top down or bottom up. "It proceeds sideways, beginning with an idea hatched by one or more people who quickly include others to refine and realize the vision so that decision-makers, urban design professionals, and communities are working together toward mutually-beneficial ends (Ellin, 2012, p.248)." Finding a solution for this problem is difficult and requires strong commitment with involved stakeholders. The developed solution on what a dementia friendly neighbourhood should look like will be based on various sub-solutions in different fields of knowledge. Stakeholders that want to connect to this new vision on what a dementia friendly neighbourhood should look like form a network. They depend on each other. However, personal engagement is still essential (Ramaswamy & Ozcan, 2013).

In the case of Ommoord, different stakeholders are involved in the network. They all want to make Ommoord more dementia friendly, but now they walk different paths and find different solutions to achieve this goal. In the future closer cooperation will be needed.

Van Gunsteren stated that there are four kind of powers: formal power, sanction power, knowledge power and reference power (2011):

- Formal power: I have an important position within an organization, so I can determine what happens.
- Sanction power: I am in a position to reward or to punish.
- Knowledge power: I have the most knowledge about the subject.
- Reference power: I have strength due to individual prominence.

However, in this case, a distinction can be made between power (formal & sanction) and knowledge. The reference power can occur in both groups and is therefore not distinctive enough.Large powerful parties can change something because of their position in a big company, but due to their status they can also block ideas. The smaller parties that have knowledge, such as informal caregivers and people suffering from dementia, are often the experts (Gunsteren, 2011) (figure 45). Both networks are indispensable.

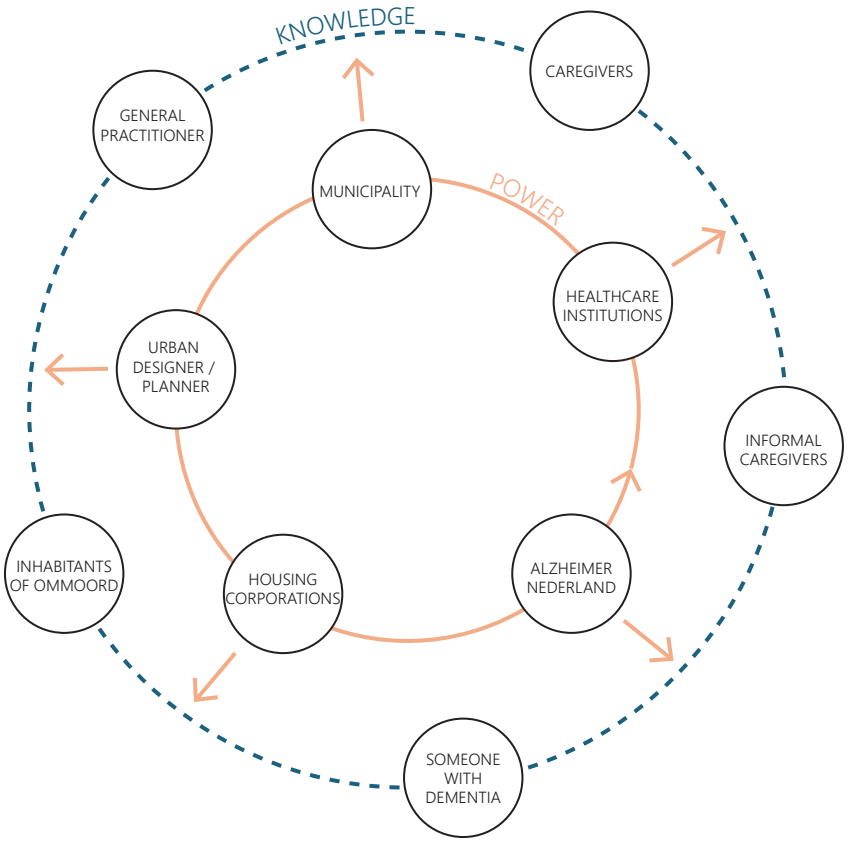


Figure 45: Two networks in Ommoord

In order to achieve a successful project, both networks must work well together. A selection of key people ensures that the project remains well structured. Another point that needs to be managed is that there is commitment to the same problem (Gunsteren, 2011).

5.2.1 Power network

In the power network the biggest parties will be represented. The municipality has two departments that can be interested in this topic. The department urban development is building a strong economy and an attractive residential city. The spatial and economic investments are started here. This department has two important roles, namely developing the city and to control the quality of the city (Gemeente Rotterdam, n.d.-b). The other department "social development" set up a "Langer Thuis" program for living at home for as long as possible. The program makes it easier for the elderly and people with disabilities to live independently for as long as possible. Together with healthcare providers, welfare institutions, housing corporations, health insurers and inhabitants the plan was developed. In the next years suitable homes, vital networks, accessible neighbourhoods and clear information will be realized (Gemeente Rotterdam, 2016).

Other big stakeholders are the health care institutions in the neighbourhood Ommoord. Most of the health care institutions offer care at home and rehabilitation help. If a person is not able to live at home, they offer accommodation in a nursing home. People in the final phase of their life are housed in an institution. During the research it is possible to investigate which elements in the public space are needed to provide and facilitate the right care.

Furthermore housing corporations are also an important force. Woonstad Rotterdam has property in Ommoord. Woonstad Rotterdam builds and manages good, beautiful and sustainable homes for residents of Rotterdam. All the residents are dependent on the social housing market. Woonstad Rotterdam pays extra attention to vulnerable residents. The neighbourhoods must be liveable and pleasant to live in (Woonstad Rotterdam, n.d.). Within Woonstad Rotterdam, a program "Langer Thuis" has been set up which helps residents to live at home independently and for as long as possible.

Next Alzheimer Nederland is an important part of the network. Alzheimer Nederland is the expert on the field of dementia and is working on a future without dementia. The quality of life for people with dementia and their loved ones must be improved. To realize this, Alzheimer Nederland provides information about dementia and offers support. There must be better care for people with dementia and Alzheimer Nederland makes scientific research possible through financial support (Alzheimer Nederland, n.d.-c).

Finally, an urban designer and planner will be added to the power network. Because this person has the power and knowledge to develop a plan for a chosen neighbourhood and therefore has knowledge that the others in the power network do not have (Sanders & Stappers, 2018). The designer does not necessarily have all the knowledge about dementia, because the knowledge network will contribute this.

5.2.2 Knowledge network

On the other hand the knowledge network is important. These stakeholders do not have the means to change something, but they know the problem of someone with dementia much better. Caregivers for example talk face to face with residents. They know exactly what resources are needed to offer the right treatment. For example walking exercises could be offered outside if the public space has been made suitable. Caregivers can provide important and new information. The same goes for informal caregivers.

Another important person is someone with dementia in an early stage. People in an early stage of dementia still have cognitive abilities and know best what they encounter in the neighbourhood. Moreover, they can indicate what they need in the neighbourhood.

The inhabitants of Ommoord should not be forgotten. These residents are familiar with the neighbourhood. Moreover the neighbourhood must not only be dementia friendly, it must also be a comfortable neighbourhood for other city users. Other areas of improvement could be incorporated directly in the redevelopment of Ommoord. In the report of "Langer Thuis" is already written about the wishes and needs of the inhabitants. This is valuable info and in line with the thoughts of Jane Jacobs. She claims that cities have the capability of providing something for everybody, only because, and only when, they are created by everybody (Ellin, 2013). Finally, General practitioners and physiotherapists can also be considered to be part of the network.

5.3 PLANNING CO-CREATION

Co-creation is a very broad concept and can be used for different purposes in different phases of the design and planning process. Ellin (2013) described six different steps of communication in the urban design and planning process, named prospect, polish, propose, prototype, promote and present. Following these steps will lead to a path toward prosperity (figure 46). It is the task of the urban professional to guide trough these loops.

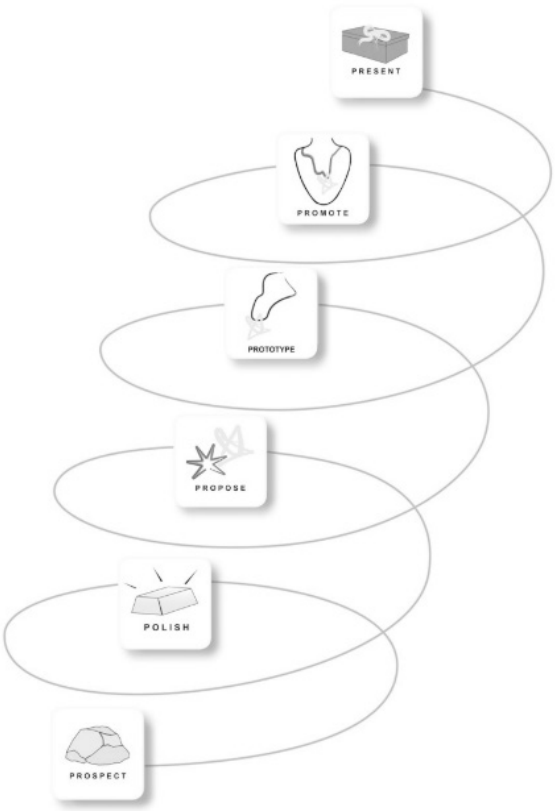


Figure 46: Path toward prosperity (Ellin, 2013, p.7)

Prospecting involves listening to one's own feelings, others, and looking at the place specifics. In the first step, an urban professional creates an image about a certain place, which challenge him to reflect on the place and to come up with first ideas. It is important that a vision is created so that others in the next step can build on this vision to strengthen it. There are three important questions to ask yourself (Ellin, 2013):

- Personal prospecting: What do I see, hear, smell, taste, feel, remember, and imagine in this place? What do I think should happen here?
- Collective prospecting: Ask others: What do you love, value, about this place? How would you like to see it evolve?
- Place prospecting: What are the relevant historical, geological, geographic, political, economic and sociocultural aspects of this place?

The aim of the second step is to fine-tune the vision. Every stakeholder in the network has its own gems and it is important to share them to learn from each other. It is plausible that each of the stakeholders answers the three questions from the previous step. The challenge is to bring the three kinds of prospecting together to polish the vision. This step ends when the following questions can be answered: What are the strengths of this place and how can I co-create with others to build on them (Ellin, 2013)?

Possible ideas will be created after this step. The proposing plans should add economic, social, aesthetic and environmental value to places. A first prototype can be made, which can be helpful for the fourth step. The prototype will be tested and refined. This step answers what needs to be done and how it can be made possible (Ellin, 2013).

The question is how the prototype can be best communicated to a larger public to obtain even more input and build support (promote). In step six, the project will be implemented. First it will be presented to reliable partners, so that they can give the project a stable basis. Subsequently, other projects can also be catalysed (Ellin, 2013).

Fuad-Luke (2009) also distinguishes different phases in the co-creation planning process. The four phases follow each other linearly, which is the same as in the model of Ellin. In each phase different stakeholders can be involved and there are different aims. The four phases are:

- Initiation and planning
- Collective understanding and exploring
- Participatory design with design team
- Doing and learning

Both models can be combined into one model. The six phases of Ellin can be part of the four steps of Fuad-Luke. Prospecting fits into the first part of initiation and planning. Co-creation starts with an initiator in both plans. In the model of Fuad-Luke the initiator is often triggered and amplified by other parties, where in the model of Ellin, the image is mainly formed by the initiator himself.

Collective understand and exploring of Fuad-Luke has the same goal as the polish phase of Ellin. The problem is deepened and a shared vision, goals and aims is formed. In the following step there is a big difference between Ellin and Fuad-Luke. In the propose step of Ellin a plan will be created by an individual, while in the participatory design step of Fuad-Luke a design team will get started. In the next steps of Ellin, understanding must be created for the plan, while in the plan of Fuad-Luke there is more understanding because it is conceived together. That is why Ellin needs three steps (propose, prototype, promote) to achieve the same result as Fuad-Luke in one step (Participatory design).

Finally, present (sixth step of Ellin) and learning and doing (fourth step of Fuad-Luke) are in the same section. In both steps the plan is implemented and will be updated to come to a final design. In the model of Fuad-Luke, the final design can give a trigger to start the circle again.

5.4 STRUCTURING THE DESIGN PROCESS

One of the tricks to let involved stakeholders think of designing dementia friendly neighbourhoods it to reduce and enlarge the topic constantly, to prevent that stakeholders get stuck on one idea. Creativity will be encouraged to come to the best idea. This is in line with the thoughts of the design council. The Design Council (2013) works with four different steps: Discover, Define, Develop and deliver (figure 47). It maps how the design process passes from a point where thinking and possibilities are as broad as possible to situations where they are deliberately narrowed down and focused on distinct objectives (Design Council, 2013).

In the first phase it is time to discover to get new explorations. Important is that designers try to look at the topic for the first time, so that fresh innovative ideas can still arise. There is a lot of room for inspiration, because there are no limits yet. "This phase gathers insights, developing an opinion about what they see, deciding what is new and interesting, and what will inspire new ideas (Design Council, 2013)."

In the second phase it is time to order the ideas from the previous phase. The mass of ideas and findings are analysed and structured into reduced set of problem statements. The goal is to find the most crucial ones to develop a clear statement which will be tackled in the design phase (Design Council, 2013).

In the third phase it is time to broaden the subject again. A design has to be developed and often several solutions are possible. Several variants will be tested and analysed in order to eventually develop a favourite design. It helps the designer to improve and refine the ideas (Design Council, 2013).

In the last phase of this model it is time to deliver. The chosen solution in the previous phase will be build, tested and iterated again for a few times. But at the end of this phase the final design is created. The deliver phase is also the point to feedback lessons from the process to colleagues and partners, sharing new knowledge, insight tools, or ways of working (Design Council, 2013).

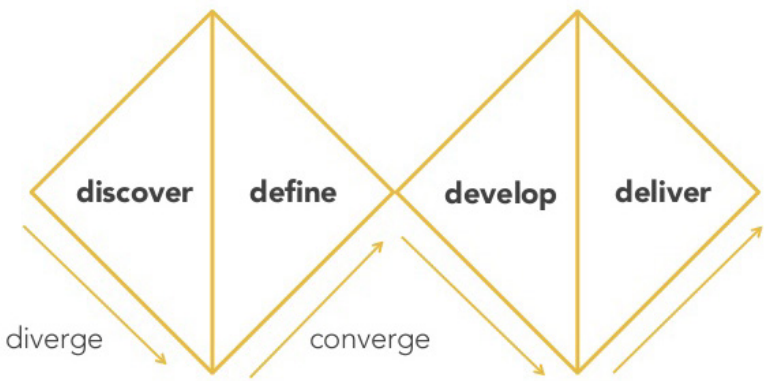


Figure 47: Discover, Define, Develop and Deliver (Howard, 2014, p.14)

5.5 CONCLUSION

This chapter answers research question 2A: How can urbanism and non-urbanism professionals cooperate in the planning process for dementia friendly neighbourhoods?

It is necessary that professionals cooperate in complex problems, because these problems are difficult to solve because the conditions are constantly changing. Moreover good urbanism is not top down or bottom up, it is a sideways process. An idea is hatched by one or more people, who quickly include others to refine and realize. Realizing a network has even more advantages: there is more involvement, it supports creativity which will lead to a better result.

The first step in this process is to understand which parties are involved in the planning process for dementia friendly neighbourhoods. Because there are so many people involved the stakeholders are divided into a power and knowledge network. The power network (the municipality, health care institutions, an urban designer, housing corporations and Alzheimer Nederland) have the money and the means to achieve something, while the knowledge network (inhabitants, people with dementia and (informal) caregivers) contains the most experience and knowledge. Including both will contribute to a better design.

Co-creation can be used in different steps of the process. According to Elin this happens in six steps: prospect, polish, propose, prototype, promote and present. Fuad-Luke also considered different steps, but he focusses on four phases: initiation & planning, collective understanding & exploring, participatory design with design team and doing & learning. Both argue for a collaboration to create a shared vision and hereafter to come up with design proposals. In the theory of Fuad-Luke, the designer and team collaborate to come to a first proposal, while in the theory of Elin it is up to the designer. As a result, support from those involved must still be created in Elin's theory. Both theories end with the same step which is called learning and doing. Hereafter a final design can be created.

The double diamond can be used during the design process, so that stakeholders do not stick to the first idea. Creativity is stimulated to come to better ideas. To do this, the topic will be converged and diverged twice. After the first diamond a problem statement can be formulated and after the second diamond a first solution is determined.

6. USING KNOWLEDGE FROM NON-URBANISM PROFESSIONALS

Living with dementia in the neighbourhood is one of the most complex problems of the current century. Different solutions can be found in different studies, but it is time to share knowledge and to join forces. Using a design team with participants from different fields of knowledge will be a step in the right direction. This chapter tries to answer research question 2B: ***How to use knowledge from non-urbanism experts to reinforce the urban design and planning principles?***

The first sub-chapter describes the different methods to answer research question 2B. Sub-chapter 6.2 focusses on making the urban patterns understandable for non-urbanism professionals. Next sub-chapter 6.3 explains the use of games in collaboration settings. Sub-chapter 6.4 describes how people can learn from each other. Hereafter sub-chapter 6.5 focusses on how to evoke new and more knowledge by people. Finally sub-chapter 6.6 gives answer to research question 2B.

6.1 METHODS

The purpose of this research question was to optimally use the knowledge of stakeholders. To achieve this an important distinction was made between understanding the urban design and planning principles and sharing your own knowledge.

6.1.1 Designing a dictionary

The book of Jos van den Broek (Broek, Koetsenruijter, Jong, & Smit, 2016) was recommended by my supervisor to develop a visual language, which contains visual and verbal elements. The patterns from the framework developed in research question 1A were translated by using images and a short description. All the translations have been combined in an urban dictionary for creating dementia friendly neighbourhoods. The dictionary was tested orally per pattern by three laymen selected on their visual or verbal skills. Hereafter adjustments were made.

6.1.2 Literature study

The book "Convivial Toolbox" was recommended to get a grip on the use of tools in co-creative processes (Sanders & Stappers, 2018). Using tools ensures that the deeper knowledge layer can be achieved. Moreover, a literature study has been carried out with different search keys (Gamification, Playful games, Social learning, Co-Creation) to achieve a wide range of information how people can collaborate and learn in a playful way. In this research only papers from 2000 - 2019 were used.

6.2 TRANSFERRING KNOWLEDGE

The first step is to make urbanism knowledge understandable for non-urbanism professionals. It can be assumed that the urban patterns from chapter 3 are difficult to understand for laymen. Some urban patterns are very similar and it is just a matter of a nuance to understand the difference. But there will also be urban patterns where they have never heard of.

One way to solve this is to create a visual language. Visual language refers to the integration of images and elements of images (visual elements) and words (verbal elements) into a single unit of communication. Images help to clarify difficult concepts and make complex relations easier to understand (Broek et al., 2016). It is important to use visual and verbal elements, so that the reader is guided to the right direction. The different urban patterns from the theoretical framework can be translated by a piece of text and an image. This will help to make the patterns more comprehensible.

6.3 PLAY WITH DEEPER KNOWLEDGE

To solve complex problems it is important to discover what people know, feel and dream. This can be done by organizing generative sessions. By only doing interviews and observations it is not possible to come to the deeper layer of knowledge (figure 48) (Sanders & Stappers, 2018).

One way to support generative sessions is the use of games. "Gamification is defined as the use of game elements in a nongame context (Brigham, 2015)." Whereby it is important to keep in mind is that gamification is often used to advance goals outside the context of the game (Matallaoui, Hanner, & Zarnekow, 2017). Gamification is a set of activities and processes to solve problems (Kim, Song, Lockee, & Burton, 2018).

Games give players the opportunity to do something out of the ordinary and freely within the boundaries of time and space (Matallaoui et al., 2017). The role for the urban designer will change if a co-creation game is used. The environment with inhabitants and stakeholders plays an import role, so the urban designer will be the creator, facilitator or mediator of experiences (Ali, Schouten, Göbel, & Arnrich, 2014).

Gamification can help stakeholders to think critically when solving complex problems, which is one of the skills people should have in the 21st century (Brigham, 2015). Complex problems will be reduced by using games, because games use broad generalizations to represent reality (Gunsteren, 2011). Besides that games can motivate and engage people in high interaction. A participatory mind-set can help to break the boundaries. A tool can help to put everyone on the same playing field and support a shared language. It will support the exploration of new ideas, even in wicked problem situations (Sanders & Stappers, 2018). Furthermore it stimulates learning and knowledge sharing. For example if people solve the problem in their own domain, they will revert to existing solutions and principles, while when they are faced with different domains, new solutions and creative applications will arise. Because every participant has its own goals and responsibilities, the participant really has to think about certain actions and decisions (Kapp, 2012). In the most ideal situation serious gaming changes the behaviour of participants (Ali et al., 2014).

There are different elements that can be used by gamification. Gamification uses game-based elements and strategies to increase engagement, motivation, learning, and even solve problems (Brigham, 2015). The game should have a goal, which helps the player focus and give measurable outcomes. Moreover it give players the opportunity to choose for different approaches to achieve the goal (Gunsteren, 2011). The goal of the tool mustn't be that simply, but the player must be challenged (Basten, 2017), so that a higher order of skills will be addressed (Kapp, 2012).

Another important element is that the players keep focused during the game. In the first phase of the curve of interests the players attention must be captured. The player is curious about the subject and wants to learn more about it. In the second phase of the game it is the challenge to take the initial interest and raise it to a new level. The aim of this phase is that the player is really excited about his learning experience. The idea is that if the player does not participate in this round, he must have the feeling that he misses something. In the last phase the interest will continually rise, because the players interest is already drawn. At the end the player hopefully leaves the game with some interest left and with knowledge gained by the carefully sequenced instruction (Gunsteren, 2011). The use of badges, points and a leader board can be easily implemented (Brigham, 2015). Another element is the use of a timeline, so that everyone knows where there are, what they have to do and what they really want to do (Ali et al., 2014).

Finally, it is important that a game can be played again. "Games that are complex and have multiple routes to complementation tend to require a great deal of higher-order thinking skills by the players (Ali et al., 2014)." Other decisions, options and compromises can be made (Ali et al., 2014). Sometimes it is relevant to end the session with asking a few questions to encourage other behaviour. For example (Kerzner, Goodwin, Dykes, Jones, & Meyer, 2019):

- What do you know now that you did not know this morning?
- What will you do differently tomorrow, given what you have learned today?

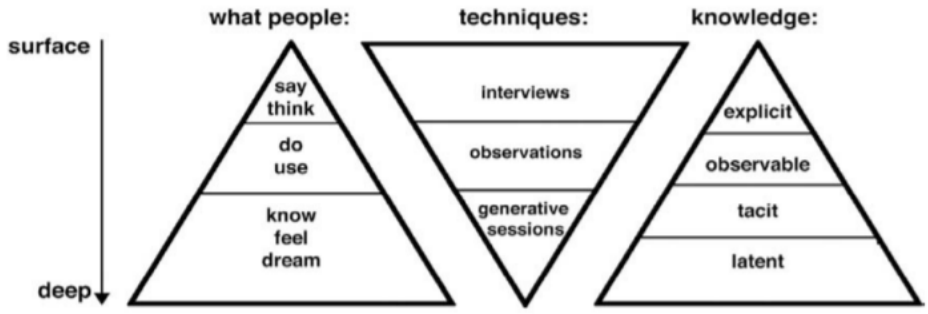


Figure 48: Different types of knowledge (Sanders & Stappers, 2018, p.67)

6.4 NETWORK OF KNOWLEDGE

Sharing knowledge is also an important aspect in the learning process. Meaningful interaction is important because it offers additional opportunities for thinking (Kapp, 2012). It helps if stakeholders see the problem as one system, in which they are independent on each other (Ison, 2010). A way to do this is to connect the dots among different interests (Ellin, 2013). A entire network of nodes and links will arise, which has multiple benefits. First it is a way to organize the data and to see the relationships between them. Secondly a lot can be learned by studying the imposed tiles because it facilitates search and discovery (Meirelles, 2013). Analysing the field can be reinforced by adding concrete actions and decisions points so that everyone knows what his or hers tasks are (Ison, 2010). Finally, a system with information can help participants to come up with new ideas. "Some of these are close to the dictionary definition, but most of these associations have to do with their personal histories and how they have used or thought about the idea before (Sanders & Stappers, 2018)." New information can thus also be added in the system. By discovering new relations, boundaries will be removed (Wenger, 2010).

The dialogue is also very important it provides an environment for learning and to think together. This helps the involved stakeholders to get new insights and to understand the problem better. The result is that it is easier to act jointly (Ison, 2010). A good scientist focuses on the connection that bind individuals together and not exclusively on their internal qualities and abilities (Meirelles, 2013).

Another point of attention is the size of the group. The more people participate the more communication channels there are. However, larger groups ensure that more knowledge is gained. In large groups there is a greater chance of conflicts because there are so many different opinions. In addition, quiet people will not say much in large groups. In a large group, leaders will rise up and sub-groups will arise. Research has shown that a group between 5 and 7 people offers the most results. People are dependent on each other and there is still sufficient information on the table (Oomkes, 2003).

6.5 KNOWLEDGE SYSTEMS

The theory of Bawden describes the different systems of knowledge: inspirational and experiential thinking. Every person thinks in one of the two systems which can vary at different times, but using both techniques can help to see the world differently (Bawden, 2010). Creativity does not happen inside a person's head but in the interaction between a person's thoughts and a socio-cultural context (Sanders & Stappers, 2018).

Fuad-Luke is convinced that inspiring is necessary in the design process, but there will always be a tension between freedom and constraints. For example a designer or design team always has a starting point, so that the creativity is already delineated. Creativity is therefore only sought for a particular problem or issue and thus limited (2009).

Sometimes it is hard for people to come with new fresh ideas and they stick to earlier experiences. Discovering new relations can provide inspiration and is extremely important. In the most ideal situation there is always interaction between inspiration and experience (Fuad-Luke, 2009).

Figure 49 illustrates the process. A person who thinks spiritually comes to new insights by dreaming leading to a spiritual world. The reality is not there yet, but it gives a picture of how reality should be. On the other hand, there are persons who think experientially. Their ideas are based on experiences from other situations, which can produce a concrete picture. The power is precisely in the use of both. The use of the dream world and the concrete world can yield an innovative meaning or concept (Bawden, 2010).

Both circles do have a sub-system (figure 50). In the case of spiritual learning it all starts with meditation where de learner is triggered to move from abstract conceptualisations to reflective contemplations. The goal of the meditation phase is to disconnect the person from the normative worldview in order to give space to new ideas and insights. During the focus step the learner will develop spiritual insights. In the accepting phase the spiritual insights will be translated into active applications. In the last step (applying), the applications are converted into a concept (Bawden, 2010).

In the experiential learning circle, the learner starts with planning. Active conceptualisations will be translated into active experimentations. These experimentations will be compared with concrete experiences to make it more realistic. Perceiving involves the learner to move from concrete experiences to reflective observations. After this stage the person reaches a cognitive worldview. This means that knowledge is gathered, that the knowledge is processed and that it is possible to apply the knowledge. In the understand step, the observations will be realised in abstract concepts (Bawden, 2010). You can also play with both circles. Where one participant thinks spiritually, it can help the other to come to an experimental concept. The same applies the other way around.

A meaning or concept can evoke new knowledge in both circles. The visual material will help the participants to move from the present, to the past, to move to the future with new dreams (Sanders & Stappers, 2018). Figure 50 also shows that there are two other important aspects that influence the two learning systems: power and emotion. Emotions really influence the way we learn. It is sensible to learn how to use them to our advantage. Finally, power can influence as a potential source of distortions in communication, and thus on learning.

6.6 CONCLUSION

This chapter answers research question 2B: How to use knowledge from non-urbanism experts to reinforce the urban design and planning principles? First of all it is important to know that there are different flows of knowledge, which can be divided into four categories for this project:

- Transferring knowledge
- Play with deeper knowledge
- Network of knowledge
- Knowledge systems

First non-urbanism experts should understand the urbanism design and planning design patterns before they can react on it. Creating a visual language is the solution. Visual language is not only the use of images, but the use of words is also necessary.

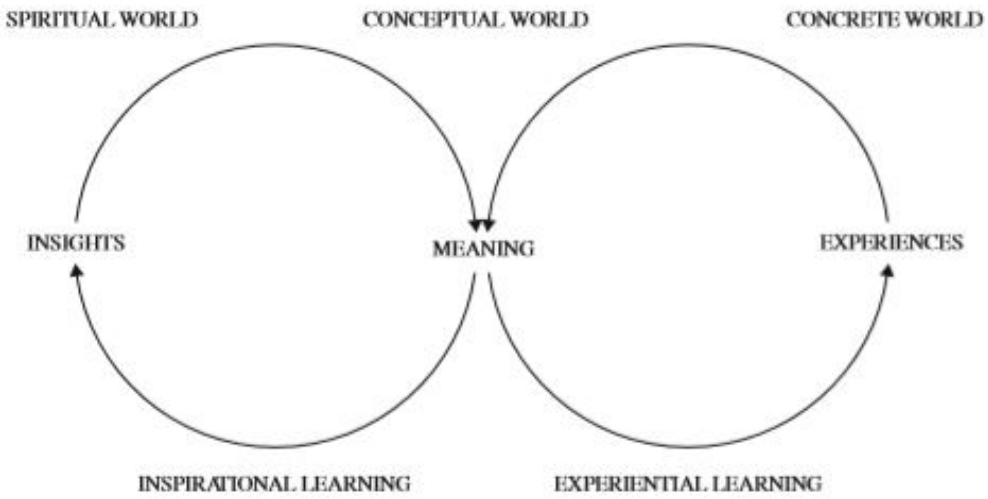


Figure 49: Meaning as an emergent property of two ways of learning (Bawden, 2010, p.44)

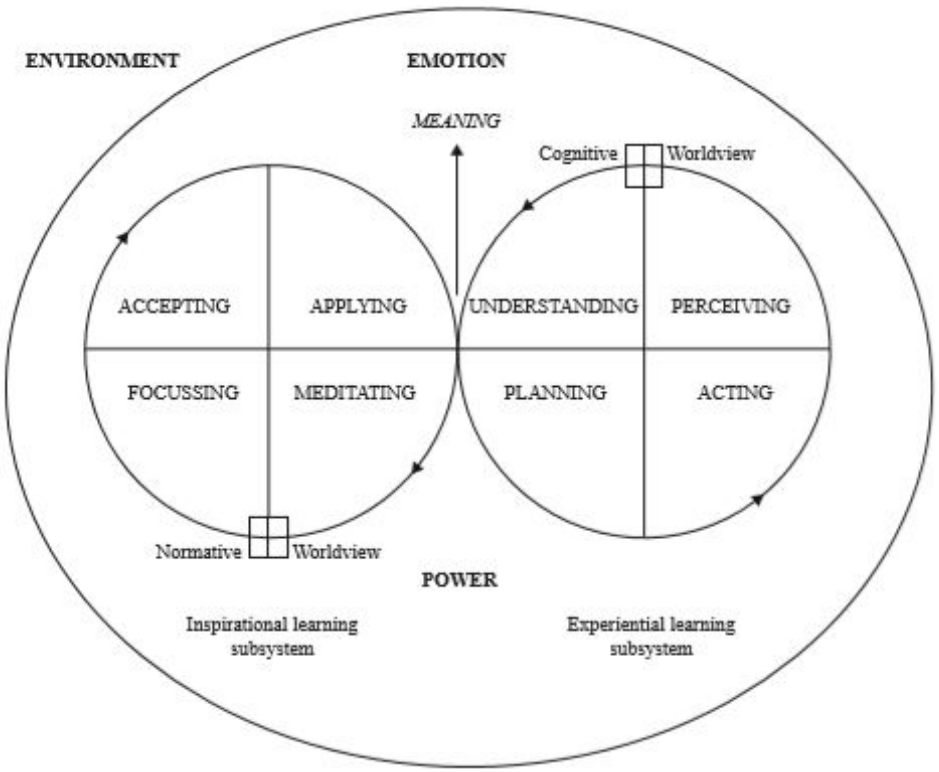


Figure 50: The integrated critical learning system (Bawden, 2010, p.53)

Another challenge is to come to the deeper knowledge layer, which can be stimulated through the use of games. Playing games reduces the boundaries and ensures that everything is possible. Furthermore it reinforces the motivation and the engagement of people, because everyone is situated on the same playing field. It also stimulates the knowledge sharing. However it is important that the goal of the game is clear. The attention of players must be kept during the different phases of the game otherwise they will drop out. A game is good designed if it is possible to play it again.

Sharing knowledge helps to see the problem in broader perspective with the result that stakeholders will see the problem as a system. A way to achieve this is to realize a network of problems and ideas. It helps to organize the data and to see the link between them. The imposition of a system also ensures that new relationships are discovered. However, it is important to explain why they have certain ideas or thoughts so that they can better understand each other. The transfer of knowledge and collaboration works best in a group of 5 to 7 people.

Finally, every person has two knowledge systems: inspirational and experimental. The inspirational knowledge system ensures that people think outside the box with the result that everything is possible. The ideas that arise can be new inspiring concepts. The knowledge gained from experience ensures that people come up with actual and feasible concepts. Going through both systems ensures that people constantly gain new knowledge.

7. REQUIREMENTS FOR THE TOOL

7.1 RESULTS FROM THE ANALYSIS PART

The analysis part has answered the four most important sub-questions of this graduation project. These answers led to the requirements for the tool. Chapter 3 forms the content for the tool. The framework of Mitchell & Burton was used as a starting point to discuss dementia friendly neighbourhoods. Moreover the tool ensured that stakeholders see the connections between the different patterns, because the patterns can reinforce and supplement each other. Every pattern belongs to one or more principles with a maximum of three. The aim of the tool is therefore to connect ideas and problems, so that a shared vision is created.

Chapter 5 describes that it is important that stakeholders form an individual vision first, before a shared vision can be formulated. This ensures that the joint vision is richer and thoroughly explored. It is advisable to use the tool at an early stage in the design and planning process for dementia friendly neighbourhoods, because dementia in the neighbourhood is a new field of research. At the moment there is a lot to be gained if involved stakeholders share a common vision and understand they share a common problem. With this shared vision a first proposal can be realized. These different steps of Ellin (2012) can be combined with the double diamond of the British design council (2013). To uncover the joint problem, this problem must be diverged and converged. The same goes for the step between joint problem and first proposal.

Chapter 5 also provides insight into the different networks that can play a role in the development of dementia friendly neighbourhoods. It is important that involved stakeholders collaborate when investigating complex problems, because these problems are difficult to solve. A distinction can be made between two networks. The power network has the power and resources to change something, while the knowledge

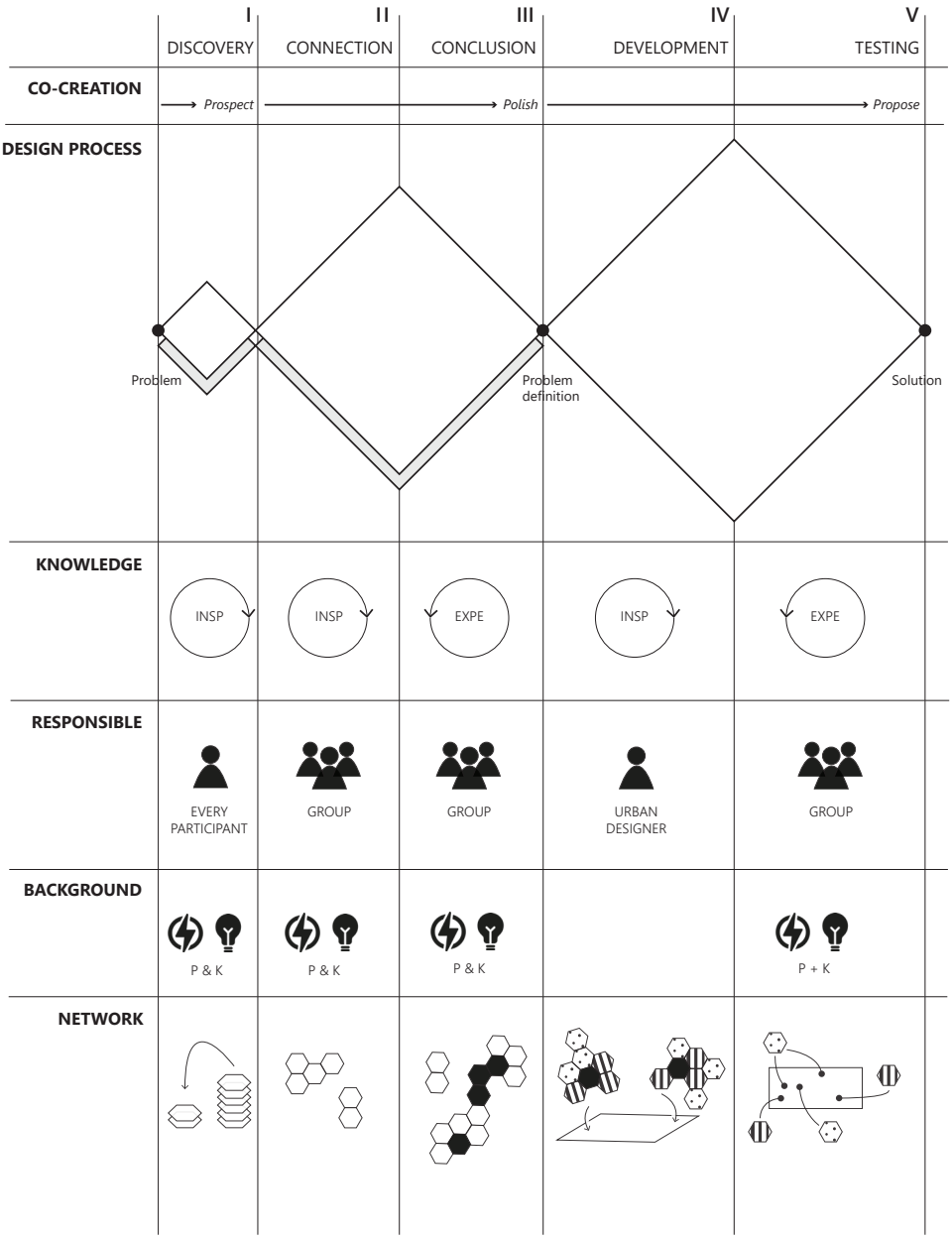


Figure 51: Basis for the game

network has the most experience with the problem. It is important that both networks provide input for the first design. Chapter 6 argues for a group size no larger than 5 to 7 people, so that everyone can contribute in the discussion.

Chapter 6 explains how knowledge from non-urbanism professionals can be used in the design and planning process of creating dementia friendly neighbourhoods. First it is important that stakeholders understand the urban design and planning patterns for realizing dementia friendly neighbourhoods. They must be translated by words and images. To reach the deeper knowledge layer, games can be used to find out what people know, feel and dream. Moreover, it stimulates cooperation. The completion of the game could be the joint establishment of a network. Stakeholders will see the problem in broader perspective and understand each other better. The dialogue is important here. The knowledge systems of Bawden (2010) can be used for maximum input so better ideas will come up. The inspirational system helps people to escape from reality and to find new and fresh concepts, while the experiential system refers to existing concepts.

The introduction part in this thesis has resulted in a risk area in Rotterdam; Ommoord. Chapter 4 determines which part of the neighbourhood in Ommoord is the most crucial to develop. The embedded framework of chapter 3 helps to decide how dementia-friendly the neighbourhood is. The most crucial part of Ommoord forms the test case for the developed tool in chapter 8.

Chapter 3, 5 and 6 have resulted into requirements for the tool, which can be summarized into a model (figure 51). A game will be developed to come to the deeper knowledge layer and to stimulate collaboration. The developed game must contain five different steps: Discovery, Connection, Conclusion, Development and Testing step.

These different steps correspond to the theory of Ellin (2013) and the British design council (2013). A personal vision about the problem is developed in the discovery step, where it is important that stakeholders are confronted with all possible problems in order to find their crucial problems. This requires a converge and diverge step according to the British design council. In the second step, the problems are bundled to form a large problem case, which is a converging step. Hereafter the problem case will be evaluated to summarize it in a problem statement in the conclusion step (diverging). At this point the polish step of Ellin has been reached. Hereafter it is time to seek for possible solutions (converging) in the development step. Finally, these ideas will be analysed to come to a first proposal, reaching the proposal step of Ellin (diverging).

In every step different actors are involved. In step 1 the power network and knowledge network individually have to think about personal problems in relation to the topic. In the second step these problems will be put together in a group session to discover the broader problem. In the third step the group analysis the broader problem to come to a problem definition. Then in the fourth step the urban designer has to develop design and planning ideas on how to transform the neighbourhood and in the final step these ideas will be tested by the power and knowledge group together.

In steps 1, 2 and 4 the inspirational system is triggered. Inspirational thinking helps to diverge the topic, because non-realistic ideas can also be used to convince people to research the problem from another perspective. Steps 3 and 5 ensure that the experiential system is used to make the plan realistic and feasible.

Translating the theoretical framework is necessary in the first step, so that everyone knows and understand the different patterns. It will help them to select the most crucial ones. In the discovery phase participants have

to select their crucial patterns and in the connection phase the different patterns will be connected to create a clear overview. In the third step these systems with patterns can be analysed to come to the problem definition. The crucial patterns can be used to come up with design proposals and in the testing step involved participants evaluate if the new proposal meets the established requirements.

The tool, which will be developed in the next part, will focus on step 1 to 3 so that a more embedded problem definition will be reached. Moreover in these steps it is important to use all the knowledge the others have to come to better design proposals. In these steps it is important that the focus will remain. In step 1 the involved stakeholders are curious and want to learn about the subject. This curiosity increases in the second step because people want to know which patterns the other participants have chosen. In the third step the focus is already captured and the interest will increase even more.

7.2 PERSONAL ADDITIONS

In addition to staying as close as possible to the results of the analysis, personal additions are needed to design a game to set up dementia friendly neighbourhoods. The sense of ignorance and fear have been the guiding principles in the design of the game. On the one hand, someone with dementia does not know what awaits him or her and will not remember everything. On the other hand, different stakeholders do not know how to design a dementia-friendly neighbourhood and what the other stakeholders are doing to tackle this problem.

Based on this feeling, choices can be made. Every player in the game receives a memory box. Elderly people with dementia often have such a box to reminisce. In the game, each box contains a personal opinion about how a neighbourhood should be changed, which is the starting point for every player in the game.

Tiles can be used to connect the different personal visions. In the Carcasonne game, for example, tiles are laid together to eventually achieve something bigger. But also in the game "Kolonisten van Catan" tiles are used to realize a game board. The challenge is to design a tile which can easily connect to others. For this game a hexagon is used. The advantage of a hexagon is that it can easily be connected to other hexagons. Moreover, it also fits in with the 6 themes to realize a dementia-friendly neighbourhood. Each side can represent a theme. It has been found that a pattern can have a maximum of 3 themes. If tiles represent the same theme, they can be connected. The tiles are lasered in order to create a real play stone. This has given the different themes different prints.

Moreover, the game also contains a number of attributes. The flags represent a time frame. They can be seen as milestones when something must be achieved. For me, the golden stars are positive elements that can indicate something good. The triangle, on the other hand, is an element for me to block something. The blocks in different colours correspond to different pawns to indicate who is responsible for what.

Figure 52: Portrait of someone with dementia (III) (Struik, 2013)

III: DESIGN & STRATEGY

The design & strategy part pays attention to sub-questions 1, 2 and 3:

- *1. How to adapt Ommoord to improve the quality of life for people with dementia?*
- *2. How can various stakeholders with the help of a tool contribute to creating a dementia friendly Ommoord?*
- *3. How can the output of the tool be integrated in a design for Ommoord?*

Chapter 8 describes the developed game "Hersenspinsels" (2), which is a tool to stimulate set up collaboration and to give the urban designer guidelines to start the design process. Hereafter chapter 9 describes the different outputs of the game, which is composed by the power and the knowledge network (3). These different outputs will be discussed and bundled, where the chapter ends with a description on how the tool and the design can cooperate. Finally chapter 10 shows the new development vision for Ommoord and the new strategy and design for Ommoord will be revealed.

8.
HERSENSPINSELS

In this chapter the game "Hersenspinsels" is presented. The game is based on theories and design ideas from the previous part. In Dutch "Hersenspinsels" means a thought cloud or having an illusion. Having an illusion fits perfectly into the medical picture of a person with dementia. The thought cloud refers to the different ideas that different stakeholders have, but not yet come together. This chapter answers research-question 2: ***How can various stakeholders with the help of a tool contribute to creating a dementia friendly Ommoord?***

Sub-chapter 8.1 describes the method to come to a design for the game. Hereafter sub-chapter 8.2 explains the rules of the game, whereby the different rounds are explained in more detail. Finally sub-chapter 8.3 concludes on research question 2.

8.1 METHODS

The aim of research question 2 was to develop a tool which helps the stakeholders to collaborate and to share knowledge.

8.1.1 Testing a prototype

The established theoretical framework and personal design ideas about the game and the disease have led to a first prototype. The prototype was tested to determine whether it achieved the objectives set. After this, the tool was tested with a group of urbanism students, to check whether the set goals were actually achieved. As a result, the prototype could be further improved. This loop was repeated a few times, until the desired result was achieved.

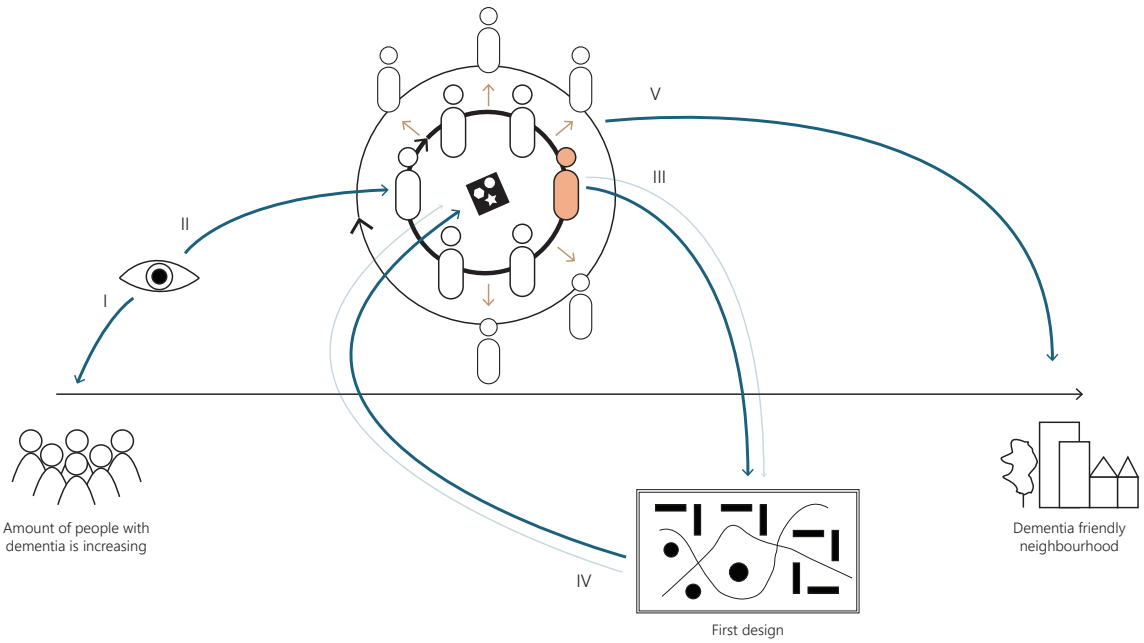


Figure 53: Implementation of the tool

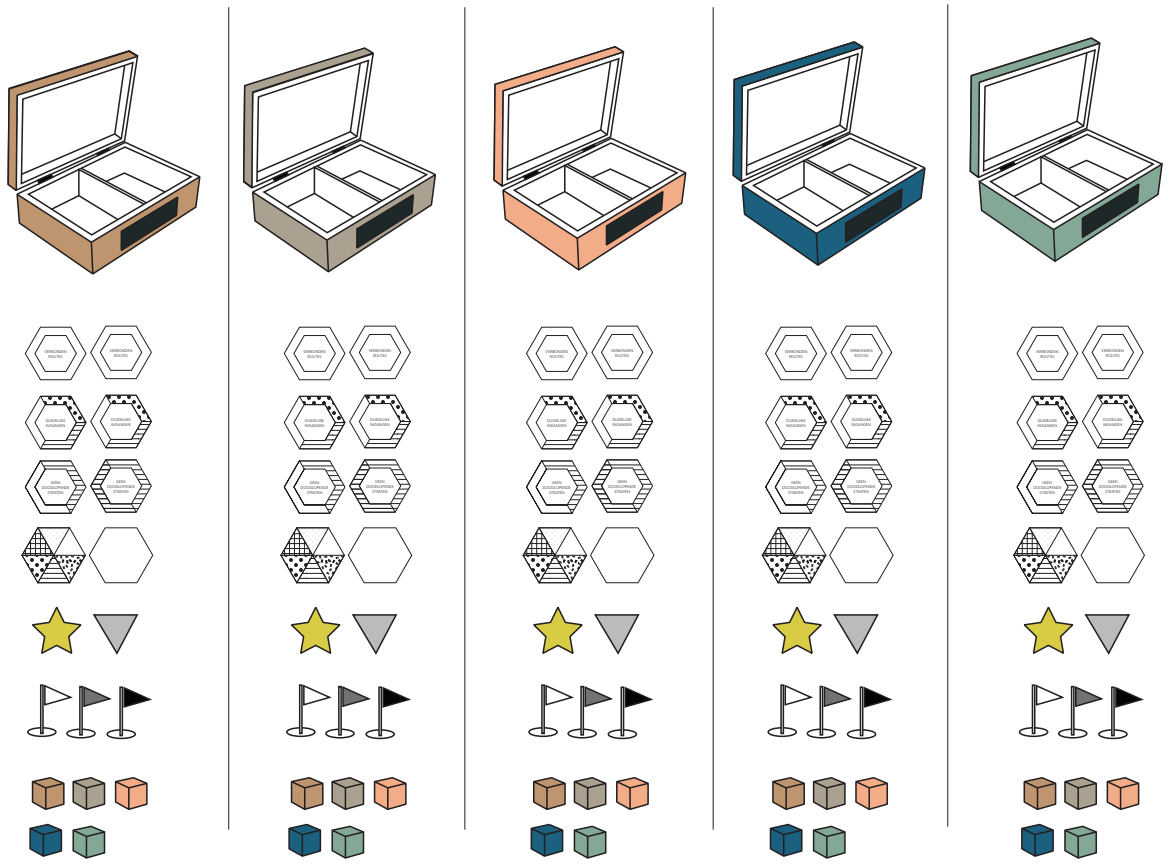


Figure 54: Materials for five players

8.2 RULES OF THE GAME

"Hersenspinsels" is a game which can be played by people who have expertise in different fields, but all having the same goal: making the neighbourhood dementia friendly. Linking different fields of knowledge ensures that the conceived and designed solutions fit better in the environment. Furthermore it ensures that the socio-spatial neighbourhood challenges associated with dementia are deepened.

The aim of this game is to stimulate cooperation between the relevant actors by exploring the challenges for a specific neighbourhood in the Netherlands. Second the game must ensure that the urban designer can use the output to create a design proposal. However everyone in the power network have the possibility to set the game in motion (figure 53). This happens when someone in the power network notices that that there is an increase of the amount of people with dementia in a neighbourhood or that a neighbourhood is not dementia friendly anymore (I). The next step is to turn to the entire power and knowledge networks and to use the developed tool (II). Hereafter the urban designer makes a first draft (III) and tests it with the network to make a better design (IV). This loop can be repeated for several times. Finally, a definitive design will be developed (V).

The game consists of three rounds: and individual 'discovery step', where all participants develop their own vision; a 'connection step' where the participants look for the broader perspective; and a 'conclusion step', where new insights can be achieved. The urban designer and planner gets the role of facilitator, because he or she is the only one involved in both sessions and has to propose a first design.

The board game in step one till tree is designed for 5 to 6 players. The different steps have different playing times. The first round has to be done individually and costs a maximum of fifteen minutes. Round 2 and 3 will take place in one session and here a time of 2 to 3 hours applies. Depending on the familiarity with the rules. After round 2 and 3, a photo will be made of the game board. The discussion is recorded in round 2 and 3, so that no crucial information is lost.

The following materials are required for the game:

- The game rules (One per player) (Appendix D)
- Questionnaires for round 1 (One per player) (Appendix E)
- Memory boxes (One per player) (Appendix H)
- Urban dictionary (One per player) (Appendix F)
- Jokers (One per player) (Appendix F)
- Empty tiles (Two per player) (Appendix G)
- 228 Play tiles (Appendix G)
- Black flag (One per player)
- Grey flag (One per player)
- White flag (One per player)
- Star (One per player)
- Triangle (One per player)
- Pawns in different colour (Dependent on the amount of players)
- Pieces of chalk (One per player)

Every player receives a memory box, with the game rules, a questionnaire, an urban dictionary, a joker, two empty tiles, a black flag, a grey flag, a white flag, a star, a triangle and as many pawns as players who participate (figure 54). The memory box is the personal property during the game and therefore contains all the materials needed to play the game. The 228 tiles are sorted next to the game board.

After the game with the two networks have been played, the game continues for the urban designer and planner. In the fourth step the urban designer has to combine the results of the power and knowledge network. Missed connections are picked up and the first plan will be developed. In the final step, the plan will be tested by all involved stakeholders to improve it and to come to a final design.

The different steps will be better described in the next paragraphs. Moreover the use of the different materials will explained.

8.2.1 Discovery phase – Every actors looks at the situation

The goal of this round is to develop a personal vision. The players individually think about dementia in the neighbourhood and find out what important is for their field of knowledge.

Every player has to complete a questionnaire. As a result, everyone develops a personal vision. In the questionnaire, each participant individually assesses 57 urban patterns to develop a dementia friendly neighbourhood. The questionnaire helps the player to evaluate which patterns are very bad or very good developed in the neighbourhood. Not everyone will be familiar with these urban patterns and therefore every participant can use the urban dictionary, where each pattern is explained by means of a text and a picture.

After the form has been completed, each participant may choose six crucial urban patterns for a dementia friendly neighbourhood, which can be stored in his or her box. A participant can, for example, choose themes that are weak in the neighbourhood, which are very good and / or themes that a participant has a lot of expertise about. This choice of six tiles forms the starting point for the second (interactive) round of the game.

8.2.2 Connection phase - The actors learn from and about each other

In the second round the challenge is to connect your personal chosen tiles with the tiles from the other participants (figure 55).

The goal is to see the problem in a broader perspective. In turn, the players lay a tile on the table, explaining why the tile was chosen. Providing explanations ensures that players understand each other's vision. The next player tries to connect his or her tile to the ones already placed on the table. If this is not possible then the player has to start a new cloud. Players can have the same tiles, then they have to be placed on top of each other. The tiles have different hatchings. All the tiles in the game have their own characteristics which is related to the theme they are part of; accessibility, familiarity, legibility, comfort, safety or distinctiveness. Some tiles are related to multiple themes, others just belong to one theme. The tile is hexagonal and the edges indicate in which theme they belong. There are three variants: one connection, two connections or three connections. The shading can differ, creating a lot of options. Tiles that belong in the same theme can be connected. For an overview of all the tiles see appendix G.

It is possible that a player sees a connection between two tiles, but due to the shading the connection is not possible. In that case the joker can be used. A new connection has been created. Moreover, laying tiles can also evoke new ideas. Players can write on their blank tile and connect the tile to a tile in the playing field. It is important to ask if the players miss certain tiles where they doubted to choose and that were not thrown by other players. These tiles can also be added in the game.

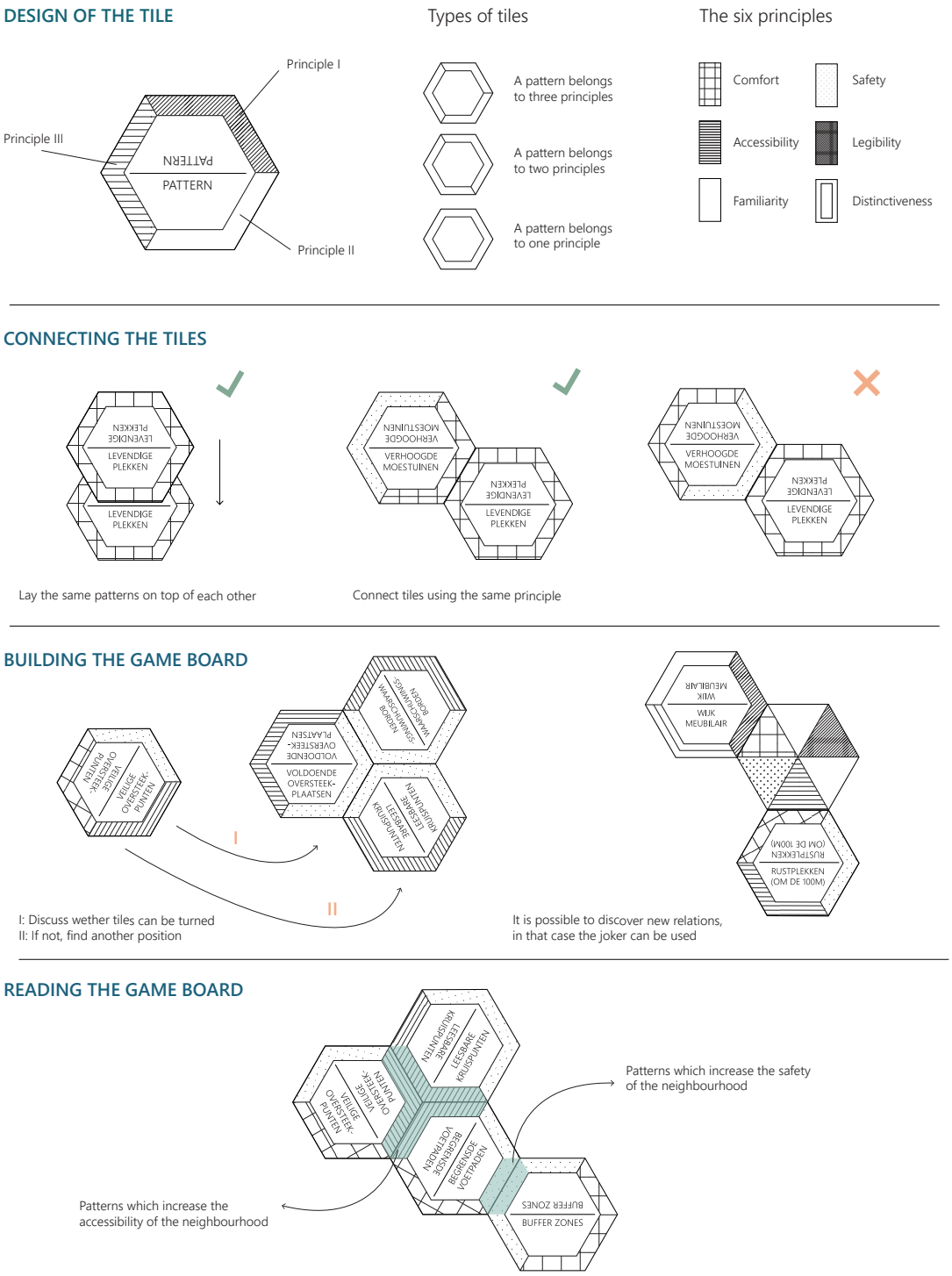


Figure 55: The tile

At the end of this round there is a cloud of tiles that are connected to each other. Not all tiles fit together, so it can also happen that multiple clouds arise. The result is that new relationships are discovered between the tiles and that the parties see that they can reinforce each other by connecting forces and thoughts.

8.2.3 Conclusion phase – actors reflect jointly on the established relationships

In the final round, the clouds are analysed by the players together to arrive at new insights. Tiles can be moved to make more or new connections. In addition, each player has access to a number of tools which can be used during the game:

- A black flag: A dream that has to be realized in the future and requires a lot of work.
- A grey flag: The solution on the tile requires a small investigation, but must be applied as quickly as possible.
- A white flag: The solution on the tile is immediately realized.
- A star: Tile with the best solution.
- A triangle: Tile with a less good idea.
- Different coloured pawns: Pawns represent the other participants and can be used to indicate the responsibility.

If a player decides to use a tool, the player has to explain why he or she does this action. The purpose of the round is to provoke a discussion between the different parties. What is striking? Which tiles should we focus on now or in the future? Which tiles have many connections with others tiles? Why is that? Do we have to focus on the tiles with many connections? Besides answering these questions the height difference also gives some important information. Why are some tiles chosen more often than others?

At the end of the round the problem has been explored and there is a plan that needs to be focused on the relevant neighbourhood. Every participants is aware of his own tasks. The urban designer develops the first design after the sessions with the power and the knowledge network.

8.2.4 Development and testing phase

Now the urban designer/ planner has one of the hardest tasks to fulfil. The ideas gained from the two sessions must be translated into a future plan for a chosen neighbourhood. How the developed game boards from the power and the knowledge network are brought to a design is described in more detail in chapter 9.

The urban designer/ planner not only uses the information from the sessions, but also checks whether important connections have been forgotten. After all, he possesses all the hardware behind the game. At the end of this round the urban designer/ planner has developed a first design, which will be validated with the involved stakeholders. Moreover, other challenges in the neighbourhood can be added in the plan to strengthen it.

In this validation step all the involved stakeholders from the two networks will be invited to discuss the plan. in this step the two networks can learn from each other and understand why certain choices have been made. It may be that one group has suggested something, but the other group has suggested the opposite. The urban designer & planner will present the plan in a short pitch. Hereafter the two networks will evaluate the plan together. Some ideas will not be translated in the way they were intended, but there may also be things that are still missing in the plan. By discussing these together, these problems can be resolved in a subsequent design round. This rounds can be repeated for several times, until all stakeholders share a common approval.

8.3 CONCLUSION

The focus of this chapter is to answer research question 2: How can various stakeholders with the help of a tool contribute to creating a dementia friendly Ommoord? A way to let stakeholders contribute with input is the use of tools in the process. For this graduation thesis the game "Hersenspinsels" is designed to stimulate cooperation by exploring the challenges for a specific neighbourhood. The game will be used in a beginning stage of a new project, when some in the power network notices an increase of the amount of people with dementia or that a neighbourhood is not dementia friendly anymore.

To achieve the aim, different rounds have to be played by the two networks. In the first round everyone looks at the situation and determines which patterns (from the theoretical framework) he or she wants to develop in the neighbourhood. In the second round participants learn from each other by connecting the chosen patterns. Moreover they have to explain why they have chosen pattern. In the third round stakeholders reflect on the established relationships by using different tools. At the end of this round the problems have been explored and there is a plan how to developed the chosen neighbourhood.

Hereafter it is up to the urban designer to combine the outputs from the two sessions into a future plan for the chosen neighbourhood. Different design proposals can be made, which have to be evaluated by the power and knowledge network together so that they can be refined and strengthened. In the end a final design can be realised.

9.
OUTPUT OF THE GAME

The game "Hersenspinsels" was played by the power and knowledge network. This chapter presents the results of these sessions. Moreover, it will be explained how these results are used to create a first design for Ommoord. This chapter answers research question 3: ***How can the input of all involved stakeholders be integrated in a design for Ommoord?***

The method is explained in the first sub-chapter. Sub-chapter 9.2 describes the session with the power network on two levels: Co-creation and the output of the game. Sub-chapter 9.3 does the same, but for the knowledge network. Hereafter sub-chapter 9.4 describes the similarities and differences between the two networks. Sub-chapter 9.5 describes how this output is used in the design and planning process. Finally sub-chapter 9.6 concludes on research question 3.

9.1 METHODS

9.1.1 Sessions with the stakeholders

Hereafter, the tool was used by professionals in two networks: the power network and the knowledge network. Five people participated in the session with the power network:

- Urban designer & planner (Myself)
- Strategic analysist and consultant of a housing corporation (Specialisation: To live at home for as long as possible)
- Account manager (Health care institution)
- Urban designer & Planner (Municipality of Rotterdam)
- Policy advisor welfare adult, area Prins Alexander (Municipality of Rotterdam)

Six people participated in the knowledge session:

- Urban designer & planner (Myself)
- Elderly social worker
- District agent + Elderly social worker

- Registered caregiver
- Doctor emergency care
- Resident with a partner suffering from dementia

At the end of round 2 and 3 a picture of the game board was made to determine the output. In both sessions audio and film recordings were made to analyse the outcomes of the games (Appendices I & J). The participants completed an evaluation form (Appendix O) at the end of the session. This outcome and the audio and film recordings were used to check whether the set of goals have been achieved.

9.2 SESSION WITH THE POWER NETWORK

9.2.1 Collaboration

The participants from the power network liked the idea of collaborating in an early stage of a new project. It helps them to clearly understand who is doing what and what the tasks are for a chosen neighbourhood. Instead of working alongside each other, they now worked together.

The power network had some troubles with selecting six tiles in the first round of the game, because they found it difficult how to evaluate them. Do you assess which is not present in the neighbourhood yet or do you choose patterns that are needed from your field of work? However at the end everyone was able to select six most crucial ones.

In the second round the discussion between the different stakeholders started. The players did not play in order, but alternately and reacted on each other. They often had another tile that matched with what the other said. The participants from the power network were curious and wanted to learn from and about each other. In addition, they discovered that their ideas have common ground when laying the tiles, because clusters were created. For some, not everything seemed feasible and they were surprised that some tiles were used. People liked the "natural interaction" and kept an eye on the playing board to ensure that every tile was placed in the right place. Furthermore the participants helped each other to find the best connection.

Participant A: *"Ja, het gesprek erover is actiever merk ik. Je haalt op en je kijkt weer terug. Terwijl je tijdens de hele route, omdat je ook uitlegt waarom je iets doet, al veel sneller de dialoog met elkaar hebt."*

Participant B: *"Waarom haak je die bijvoorbeeld niet daaraan?"*

In the third round the discussion fell silent or was no longer about dementia in the neighbourhood. At the end of this round the power network felt that a common problem was identified and the tasks were clear for everyone.

Participant C: *"Hier staan we samen voor aan de kar."*

Participant D: *"Nou we hebben toch een hele stad ontwikkeld."*

During this collaboration, the participants had the idea that some tiles were still missing, especially in the social and technical domain. They would like to see this reflected in the further development of the game. Audio, video and transcripts can be found in appendix I.

9.2.2 Output of the game

The power network is convinced that Ommoord has to develop to a connected Neighbourhood (figure 56). The connected neighbourhood consists of three import elements: the accessibility of the neighbourhood, the functions within the neighbourhood and the realisation of social communities.

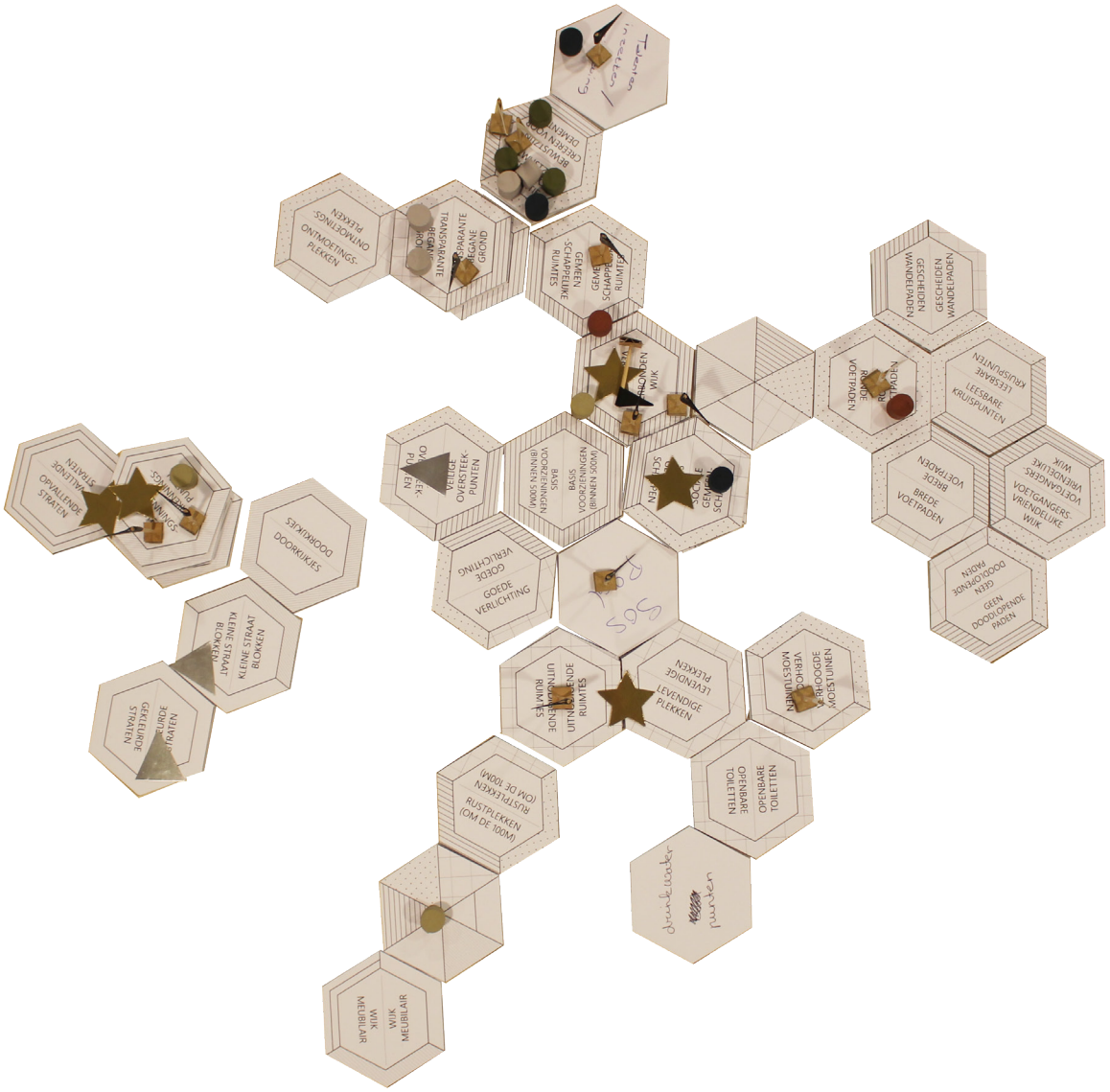


Figure 56: Output of the power network

In the first place the accessibility has to improve. Ommoord has to be pedestrian friendly, whereby the footpaths are wide en circular. This policy already applies in the city centre and must also be carried out in the other neighbourhoods of Rotterdam. Besides that it must be prevented that there are dead ends. The result is that it will be easier for people (with dementia) to move around in the neighbourhood. Given the fact that elderly people (with dementia) cannot walk indefinitely, it is necessary to place sufficient resting places. This makes it possible for the elderly to achieve all the functions they want to achieve.

Secondly it is important to add or preserve functions in Ommoord. The care institutions that are already situated in the Romeynshof must be retained. The same applies to the library, the theatre and the meeting place. A supermarket, toilets and drink water points must be added. Moreover it is time to focus on welcoming spaces and places of activity. At ground level the area is now dominated by cars and trees instead of people recreating and interacting. Realizing facades on the ground floor can contribute to a more lively environment. Furthermore it can stimulate meeting points. Creating a vegetable garden, depending on what residents want, could also be a good option to realize activity.

It can happen that inhabitants of Ommoord with dementia do not know where they are in the area. A suggested idea was to set up a SOS phone. This phone could offer assistance if someone with dementia needs help. Not everyone was convinced of the use of technology. Volunteers in a certain place could also be a good option.

There is also a social change necessary. The physical change can be arranged, but if the social change does not work then the total change fails. At this moment there needs to be focus on the use of social communities. Physical places have to be designed where people can meet each other. Ommoord is a big neighbourhood and has only one "huis of de wijk" on the border of the neighbourhood. This house is not accessible for everyone. In the flats there are some common places, but people from outside are not welcome. Adding new places is needed. Moreover, the talents of people with dementia must be used. The municipality of Rotterdam is already working on a project "Dement talent", this could be a project to collaborate with. Finally, it is important to create awareness for dementia, so that everyone in the neighbourhoods knows how to deal with people with dementia and can offer help if that's necessary.

The other cloud which arises focuses more on the distinctiveness and the legibility of the neighbourhood. The use of landmarks in Ommoord is important. At the moment people have difficulties with recognizing where they are in the neighbourhood. It is not possible to remove all the high rise buildings and to replace them into small street blocks. The stakeholders have also tried to colour the flats to support the legibility of the neighbourhood which did not work well. Therefore it is not preferable to focus on coloured streets. Ideas that are well worth further investigation are realizing viewports and creating streets with distinctive features. Both will contribute to the topic landmarks.

During the session there were some interesting thoughts which can be used by creating a more recognizable neighbourhood. To help people with dementia, it was suggested to place blue houses, where they can always meet and ask help. These blue houses could also serve as landmarks in the structure of the neighbourhood. The houses can be managed by volunteers. Because the neighbourhood furniture also needs an update, this can ensure that the legibility will increase.

9.3 SESSION WITH THE KNOWLEGDE NETWORK

9.3.1 Collaboration

In contrast to the other group, this network found it easy to select tiles in round one. They also selected patterns that do not contribute to the dementia friendliness of a neighbourhood in the evaluation form.

Round two also went differently than in the power group. Most participants had chosen the same tiles and agreed with each other what should change in the neighbourhood. The group was unanimous. There was little discussion, so the conversation regularly stopped. In this group, the urban designer & planner had chosen different tiles than the rest of the group. It helped them to think outside the box and to search for non-standard solutions. Moreover, it helped to test whether the ideas from the power group were also supported by the people from the knowledge group.

Participant A: "*Leuk spel dat tot nadenken zet.*"

Because the group was so united, they did not have the feeling that the realized game board was complete. Some of them expected others to connect a certain tile to the game board, which did not happen. As a result, the group decided to lay a few extra tiles at the end of round two.

In the third round the people from the knowledge group were not convinced that a common problem was identified. This is partly due to the fact that the solutions must be financed and realized in the power group, so for them it did not feel that the team was complete. The knowledge network would like to talk to the power network because the participants expect to disagree with this group. Audio, video and transcripts can be found in appendix J.

9.3.2 Output of the game

The knowledge network mainly sought solutions for the pedestrian (with dementia). The safety, accessibility and comfort are seen as the most important aspects to develop in the neighbourhood (figure 57).

In the first place the group agreed about the fact that there must be good lighting in the neighbourhood. Dark spots cause unsafe situations and unrest for people with dementia. They get more confused by it. Besides good lighting it is important to connect this aspect to wide footpaths, no dead ends and buffer zones. Wide footpaths ensure that people with dementia can move easier for instance with a wheelchair or a walker. Buffer zones ensure that it is also clear where people can walk and where not. Dead-end paths must be prevented, because this causes a lot of confusion.

Another aspect is the design of sufficient pedestrian crossings, which are safe and recognizable. At the moment, this is not well developed in Ommoord. Ramps or steps, must be marked. The routes must be direct and give accessibility to the basic facilities. Moreover a few plinths must be transformed into active plinths, so that people with dementia have the opportunity to ask something in for example a shop or a meeting centre. It is important that the shops are clustered, which stimulates the recognition. Besides that adding extra landmarks in the area is seen as a good solution.

The knowledge groups wants to set up places where people can socialize. People with dementia will then feel safer and supported. This idea can be combined with "a free cup of coffee point" to support inhabitants to socialize and to drink. Moreover there must be plenty of accessible toilets, because at the moment it is only possible to go the toilet in the Romeynshof. The addition of benches every 100 metres must be realized, so that people with dementia will not have the fear

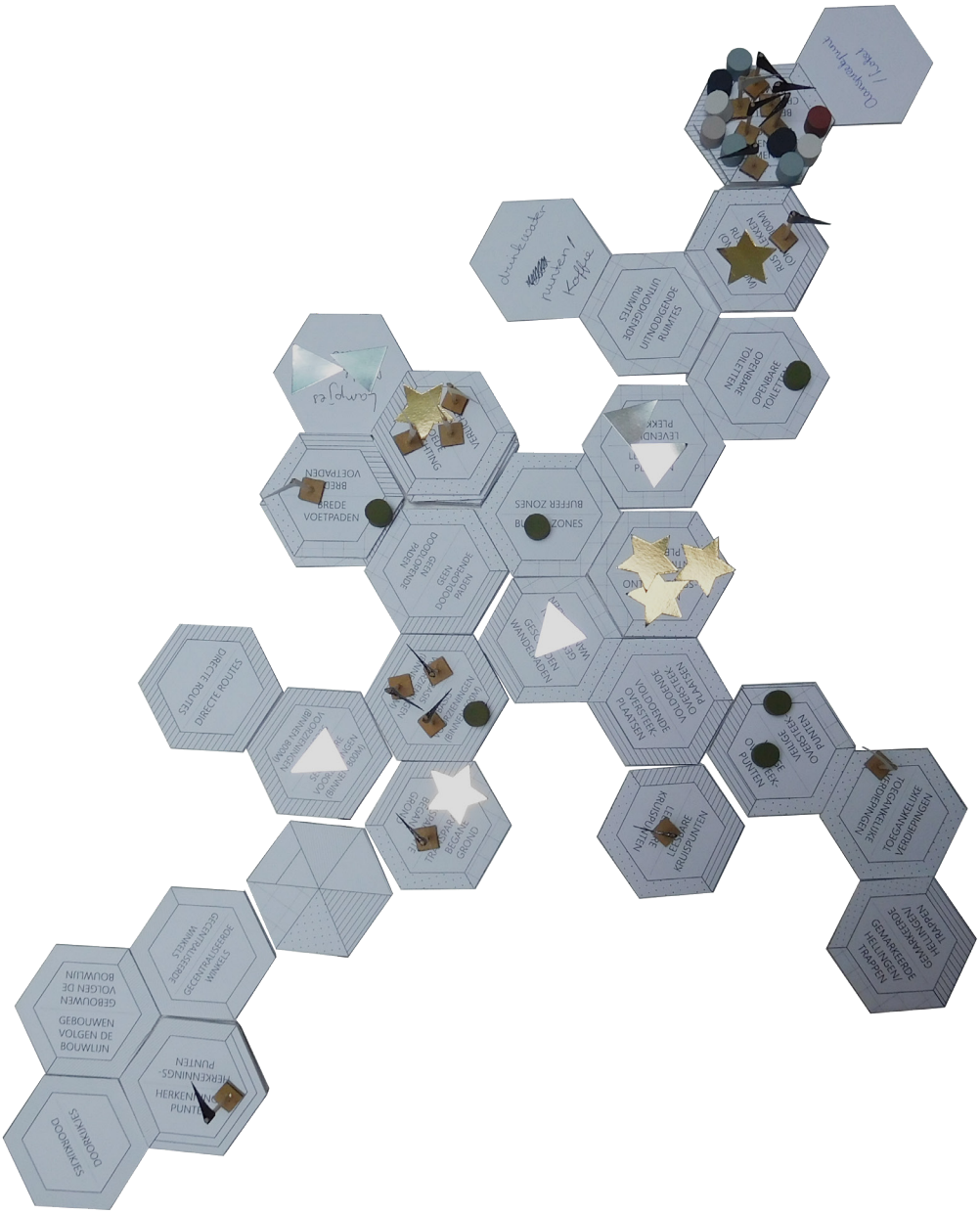


Figure 57: Output of the knowlegde network

of not being able to go outside, because they cannot reach a certain place.

Finally it is important to create awareness for dementia. The entire neighbourhood can be redesigned, but if a lost person cannot get the right help, everything is for nothing. It is a major challenge to keep everyone informed. The realisation of help desks can create comfort for this aspect.

9.4 THE DIFFERENT OUTPUTS

After doing the two sessions, different problems and solutions have been addressed. Besides that the two networks created a different development plan for the coming 10 years for Ommoord. Figure 58 shows an overview of the results, which includes the vision of the urban designer & planner. This figure illustrates that every stakeholder has its own focus points, but there is some overlap. The varied results give the urban designer & planner the opportunity to change his mind and to strengthen his vision of the area.

9.4.1 Analysing the scale of the chosen patterns

By analysing the scales of the chosen patterns in figure 58, there are some important findings. The power network mainly chose patterns on the scale of the neighbourhood, which is in line with their vision. Solutions at the neighbourhood level are supplemented with solutions at the street level to fulfil the total vision. The knowledge network chose mainly options on the scale of the street level. This is mainly because their vision is to create good circumstances for the pedestrian with dementia. Their solutions are based on the moving pedestrian and the street plays an important role in this. The solutions at street level are supplemented with ideas at object level and neighbourhood level. Benches for example provide extra resting points in the street and recognition ensures that pedestrians can better orient themselves in the street. Finally the urban designer also focuses

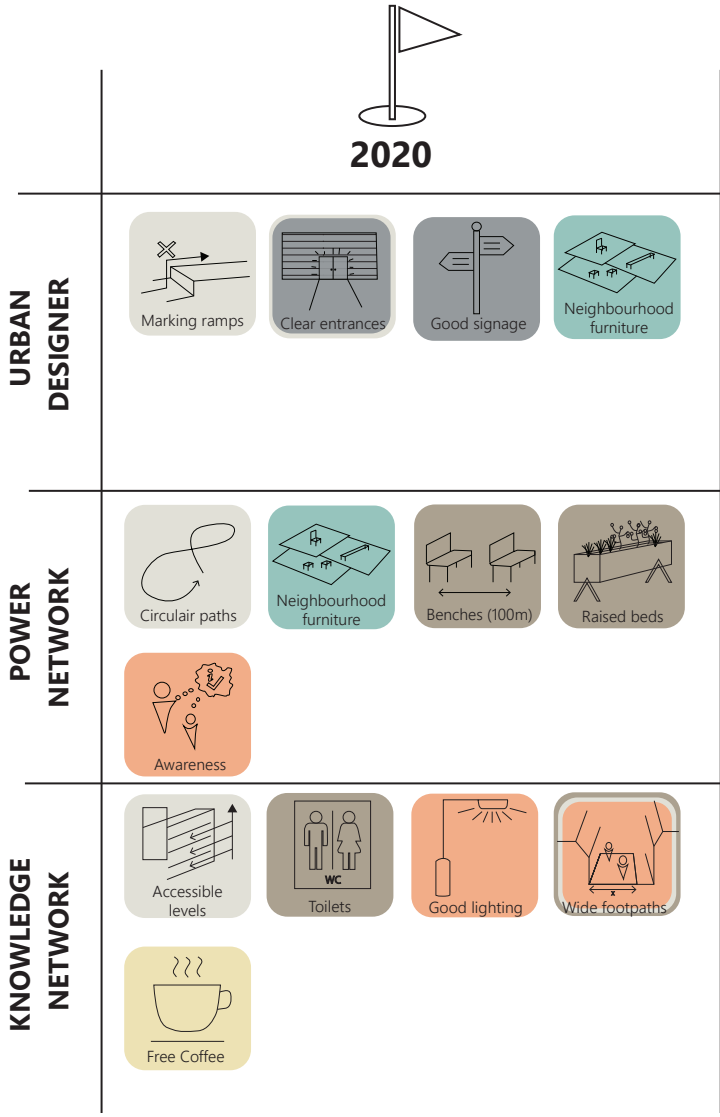
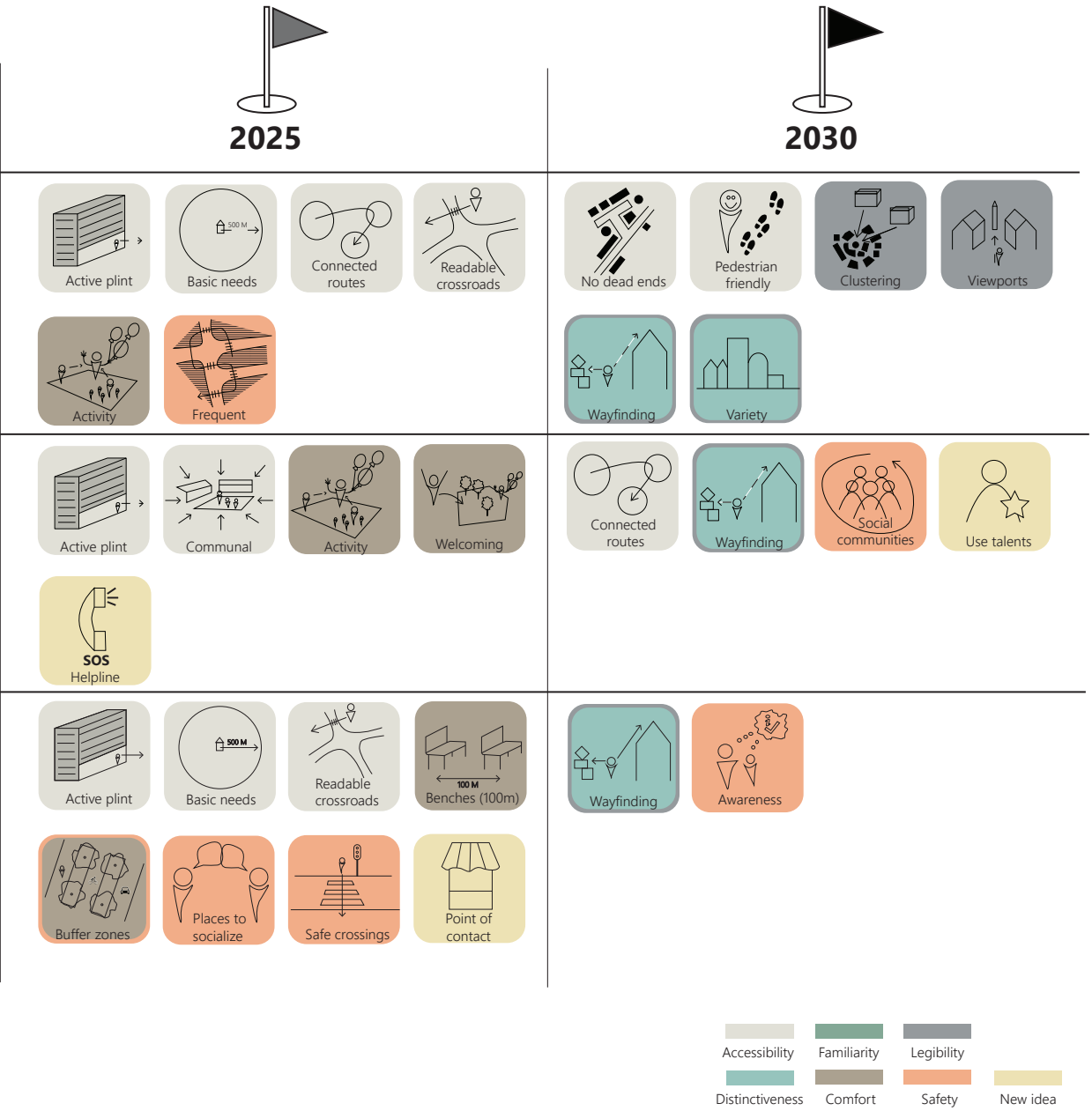


Figure 58: Timeline


2025
2030
Active plint
Basic needs
Connected routes
Readable crossroads
No dead ends
Pedestrian friendly
Clustering
Viewports
Activity
Frequent
Wayfinding
Variety
Active plint
Communal
Activity
Welcoming
Connected routes
Wayfinding
Social communities
Use talents
SOS
Helpline
Active plint
Basic needs
Readable crossroads
Benches (100m)
Wayfinding
Awareness
Buffer zones
Places to socialize
Safe crossings
Point of contact
Accessibility
Familiarity
Legibility
Distinctiveness
Comfort
Safety
New idea

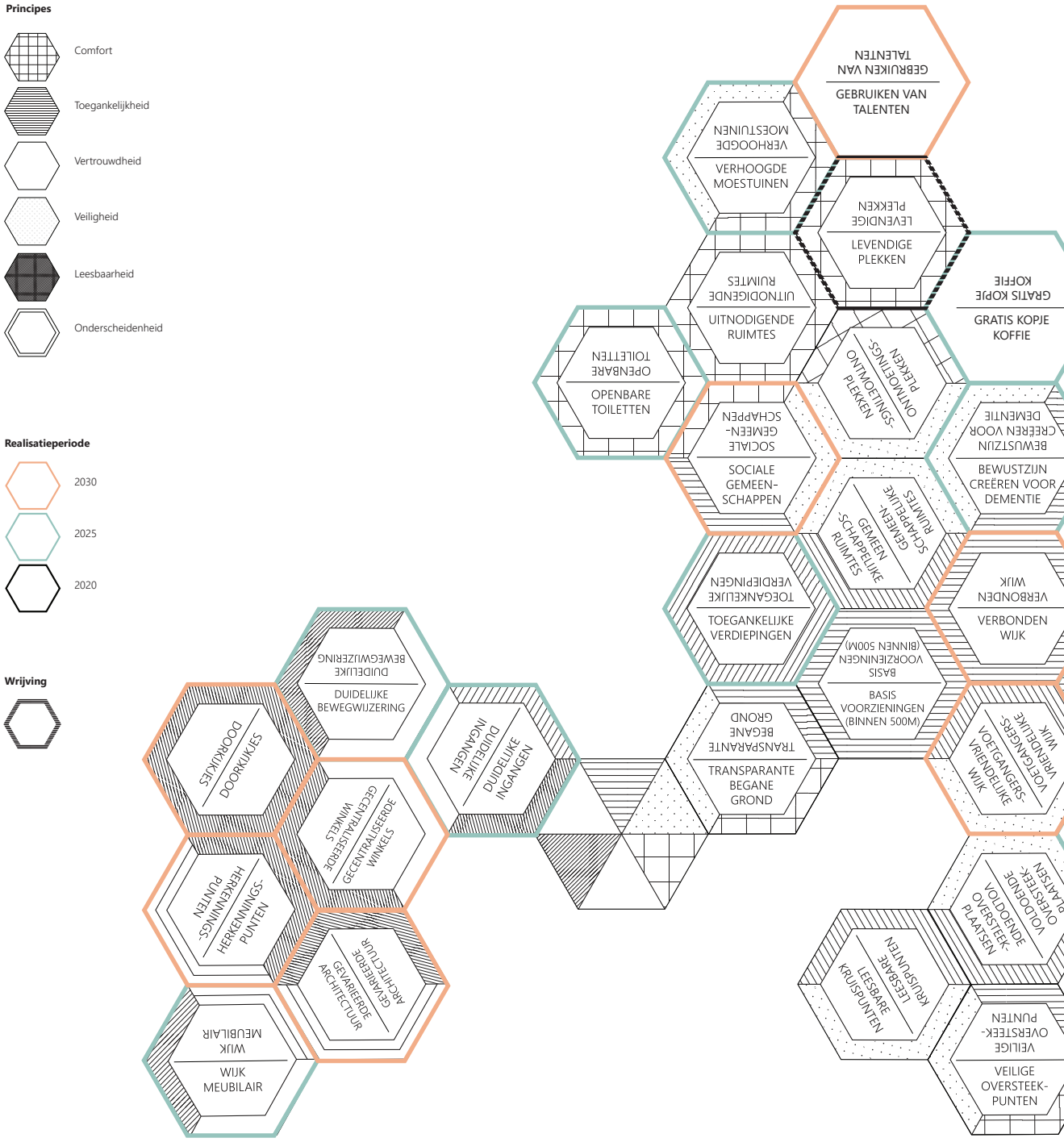


Figure 59: Total output

primarily on the solutions on neighbourhood level. This is not surprising, because this person sees the neighbourhood as a total image and in relation with other areas. The urban designer and planner has supplemented the vision with solutions on street and object level.

9.4.2 Analysing the different dementia friendliness principles

There are different outcomes with regard to the six dementia friendliness themes: accessibility, comfort, distinctiveness, familiarity, legibility and safety. The urban designer mainly chose solutions in the field of accessibility and legibility, while the power network focuses on comfort which the urban designer analysed as already well developed. Their idea is to make the good even better instead of improving the bad to a sufficient. In addition to comfort, the power network has also opted for accessibility. This corresponds to the idea of the urban designer. The knowledge network, on the other hand, chose mainly patterns in the safety theme and accessibility. Accessibility is therefore well represented in all visions and can be seen as the connector between the different visions. The other themes can become part of this.

None of the networks has chosen for familiarity, because they had the opinion that all the patterns are already well developed or that it is not possible to improve a pattern in this category. For example the neighbourhood consists of high-rise flats and it is not possible to demolish them and to replace for small street blocks. There are already many open spaces, so it is not necessary to design them in this neighbourhood. The coloured streets where not seen as a good idea, because they already tried to paint the flats and this hardly had any effect in creating more differences. The patterns in the theme familiarity are not feasible for Ommoord and maybe even for these types of neighbourhoods.

9.4.3 Searching for new ideas

The power and knowledge network have thrown up the same new ideas. Both argue for points of contact in the neighbourhood, where someone with dementia can always go to. The urban designer tested the idea of drinking water points in both groups. The power network agreed on the fact that they have to be placed, while the knowledge network would rather see coffee points instead of water. Including drinking points in the realization of dementia-friendly neighbourhoods would be a valuable addition to the existing framework.

However it was a pity that only a few new ideas arose from the two sessions, while the inspirational circle (Bawden, 2010) was triggered in round 1 and 2. Further research should be done how new ideas can be triggered, so that a richer problem exploration arises.

9.4.4 Similarities in the two networks

Both networks want to create more awareness for dementia. Creating social communities could help to tackle the ignorance of people, according to the power network. Designing meeting places and common areas is a good idea to support this, according to both networks. The transparent façade can also be a nice anchor point, and it ensures that people can easily make contact. As an urban designer & planner it is difficult to estimate whether this has already been developed in an area, but this discovery provides enrichment for the new plan. There was a lot of similarity at the smaller level, such as the construction of toilets, good lighting and the placing of benches. All three parties prefer to see a recognizable area with many landmarks at the neighbourhood level. Another major agreement is that both would like to see the basic needs back in the vulnerable heart of Ommoord.

Some themes are introduced in a different way. The knowledge network gives extra emphasis to achieving sufficient, safe and legible crossing points, while the power network on the other hand would rather see a pedestrian zone, without dangerous intersections. It is not possible to make the entire area car-free. Still it must be achievable to accommodate both. Moreover the power network prefers to set up wide, round and not-ending walking paths. The knowledge network also sees opportunities in the development of wide and not-ending walking paths, but advocates separate walking paths that can be shaped by buffer zones. The power network doesn't prefer separate walking paths. It is a challenge for the urban designer to develop

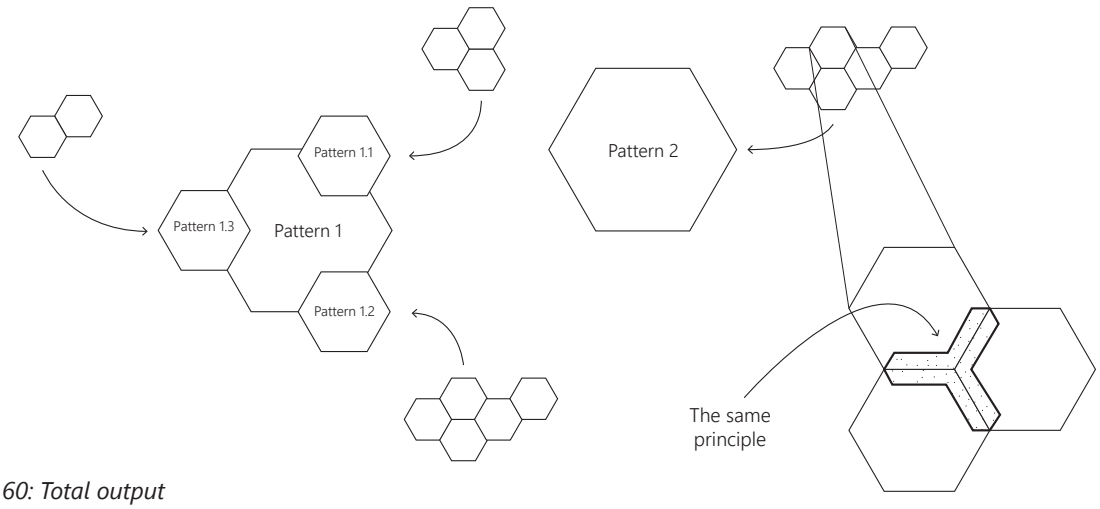


Figure 60: Total output

a street profile that looks spacious, but ensures that natural separation occurs.

9.4.5 Greatest friction

The greatest friction lies in the creation of welcoming and informal spaces. People from the knowledge network are of the opinion that both spaces cause a lot of unrest for people with dementia, because there are many incentives there. The power network sees this development in its own right, because it looks broader than just people with dementia. Ultimately, the city is for everyone. However a combination must be possible, so that people with dementia can avoid these lively spaces.

9.5 COOPERATION BETWEEN THE OUTPUT OF THE TOOL AND THE DESIGN FOR OMMOORD

It can be concluded that it is important to ask the opinion of other professionals, because they want to develop the area in a different way and they can provide answers to patterns that are difficult for the urban designer & planner to analyse. In this sub-chapter the ideas will be brought together to come to one vision.

9.5.1 New game board

The developed tool "Hersenspinsels" can be used to combine all the ideas from the different networks. Each session has selected a number of tiles that are of extra importance to them. This may be because they have received flags, a golden star or because they have been discussed a lot. The most appreciated tiles from every session will be used in a new game board (figure 59).

During the development of the new board it is important to understand both visions of the two networks. Within these visions different clusters of patterns are linked to each other. It is important to find the most crucial tile in this cluster. Other tiles can contribute to this tile. And others can be connected to these tiles. Sometimes it can happen that there is not just one crucial tile, but that there are several. It is important that the connections between the tiles remain correct, so that they belong to the same design principle (figure 60).

In this case the power network outlined the greater vision for the area. The tile "connected neighbourhood" was the connector of three clusters: social, infrastructure and facilities. Most of the ideas from the knowledge network fit in the infrastructure cluster. This made it easy to expand the game board. In addition, the theme of "accessibility" often occurs in all three visions, which made it easy to lay the rest. In both session a recognisability cluster has been established. There was a lot of overlap in these tiles and the other tiles could easily be added.

The advantage of laying a new board is that as an urban planner you remain fairly neutral and do not have to choose between tiles that you do and do not want to use. Moreover your chosen tiles are a small part of the overall picture. It helps to focus on the most crucial developments. This new board can be used as a guideline in the design and planning process for Ommoord.

This game board is intended to help the urban planner & designer and will not be discussed with involved stakeholders. The proposals that result from game board, will be discussed with those involved at a later stage of the process.

9.5.2 Creating a vision

In the first place this new board helps to create a vision for Ommoord. In first instance, the total game board sets out the guidelines for how the area should be developed in the coming years. The tiles that can be realized last are the starting points for the vision. The tile "connected neighbourhood" is centrally located

in the game board and has connections with four other important themes: basic facilities, communal spaces, creating awareness for dementia and the pedestrian-friendly neighbourhood. Next the tiles that are connected with these four topics have common ground with these themes.

A second cloud arose, which is connected by a joker to the other cloud. This cloud focuses on a recognizable neighbourhood with clustered shops and wayfinding points. Signage and neighbourhood furniture could be part of this.

However the tension, described in sub-chapter 9.3.5 is still part of this vision. The discussed tile is situated on the edge of the game board, so it is not in a crucial place in relation to other tiles. Moreover it is not necessary to remove the tile, because one of the network is against something. Adding the tile to the game board ensures that other groups will be satisfied with the new design for Ommoord. Furthermore, this tile facilitates a number of other tiles, like for example to meet people.

9.5.3 Developing a development strategy

Once the vision has been aligned, it is possible to put the ideas in a time frame (plans which must be realized immediately, plans that need some research and plans that should be developed in the future), which forms the basis for the developed strategy. The tiles chosen for 2030 form part of a dream vision for Ommoord. In addition, the tiles that can be realized in 2020/2025 serve as a start-up engine to achieve that dream vision. To start development, the low-hanging fruit is used first.

Moreover these are often the tiles on object and street scale. It can be concluded that the knowledge network has made the largest contribution here. The future vision for the total area is mainly determined by the urban designer & planner and the power network. There is still a level in concrete and less concrete ideas. The patterns that can be achieved in 2030 are less concrete. As a result, parts of these patterns are already taken up in different steps of the strategy, so that ultimately everything can be achieved at the final step in the strategy. The patterns that can be realized quickly are often very concrete.

The stakeholders have different opinions about the timelines for implementing possible solutions. Creating awareness for dementia is a great example. The power network is convinced that we can start with creating awareness, while the knowledge network puts the tile as a dream scenario in 2030. Here the urban designer & planner is challenged to comprehend both networks. In principle awareness can be created starting tomorrow, but not everyone will be aware of the disease. Creating an aware community will take a couple of years. The conclusion is that we can start creating awareness to reach the understanding a few years later. Another point of discussion is creating connected routes. The power network saw the concept as a combination of different patterns, making it difficult to realize it immediately. The term “connected neighbourhood” as originally intended, creating a better infrastructure, can be realized in 2025. The other patterns will have their own position on the timeline. Finally the placement of benches fall into various time frames. Here I think we can start placing benches tomorrow and in five years there will be an area full of benches.

The final plan led to 7 development steps, which are visualized in Appendix K. The content of the various steps is explained in the following chapter.

9.5.4 Provides insights in the relationships between the different patterns

The new game board gives the urban designer & planner relevant information about how the stakeholders see the relationships between the different tiles. For example, the connection of good lighting and

resting places every 100 meters is connected by the accessibility theme, that is therefore the guideline for the design. Next to accessibility, a number of other clusters can be seen in the game board. Comfort plays a big role, which is about setting up places where people feel at ease and are able to visit, use and enjoy places and spaces of their choice without physical or psychological discomfort. Adding more meeting places, toilets and welcoming spaces should reinforce this theme. There are a few small safety clusters, which are very valuable. Moreover a new cluster has emerged, legibility, containing landmarks, viewports, centralized shops and varied architecture.

New questions during designing can be partly solved by looking at the game board again. This should give many answers. It is possible that the question cannot be solved, then there is freedom for own interpretation, which can be validated by the game board and will be tested if the first design will be showed to the involved stakeholders.

9.6 CONCLUSION

This chapter answers research question 2: How can the output of the tool be integrated in a design for Ommoord?

First of all different outputs have been created. The power group likes to see Ommoord develop into a neighbourhood where there are facilities, social communities and a better infrastructure. They want to develop some wayfinding points to make the area more readable. On the other hand the knowledge group wants to focus on the pedestrian infrastructure. Adding more safety and accessibility in the area. Moreover the analysis from the urban designer is different, in comparison to this two sessions. The neighbourhood then would become more readable by adding variety in building styles, wayfinding points and better signage.

By analysing the different visions conclusions can be drawn. The power network and the urban designer & planner mainly chose solutions on the scale of the neighbourhood, while the knowledge network mainly chose patterns on the scale of the street or object. Each group wants to develop Ommoord into a more accessible neighbourhood. The power network wants to combine this with comfort, the knowledge network with safety and the urban designer & planners with legibility. No one has chosen for familiarity as theme, because the patterns in this category are not feasible to realize. Both networks came up with the same idea, to realize drinking points in the neighbourhood. The tile "places of activity" was not supported by both groups. Although it is important not to remove it from the timeline, because the neighbourhood should serve more groups.

The different visions can be analysed by looking at the position of different flags, golden stars or tiles which have been discussed a lot at the game boards. The most appreciated tiles can together form a new game board. Using these tiles helps the urban designer and planner to become neutral, because he or she did not choose the tiles. This new game board has many advantages for the urban designer in the design and planning process for Ommoord. In the first place it helps to outline the vision for Ommoord. All the tiles together outline the broader picture for the area. Secondly, it provide insights when a development can be initiated. The patterns that can be realized in 2030 are usually more abstract. The use of patterns from 2020 and 2025 can contribute to these abstract concepts. Finally the new game board gives the urban designer and planner relevant information how the stakeholders see relationships between the different tiles. This helps to find a more suitable solution.

10.
THE FUTURE OF OMMOORD

The previous chapter forms the input for this chapter. This chapter answers research question 1: ***How to adapt Ommoord to improve the quality of life for people with dementia?***

In sub-chapter 10.1 the method is clarified. Sub-chapter 10.2 presents the new vision for Ommoord and in sub-chapter 10.3 the different development phases of "Remember Ommoord" are clarified. Sub-chapter 10.4 describes the feasibility of this new plan. Hereafter sub-chapter 10.5 describes whether "Remember Ommoord" has effects on other goals. Finally sub-chapter 10.6 concludes on research-question 1.

10.1 METHODS

10.1.1 Validation of the plan

The previous chapter describes how the collection information is bundled to guide the urban designer & planner during the design process. This eventually led to the plan "Remember Ommoord". As a final step, the plan has been validated by the involved stakeholders.

Someone from the power network (strategic analysist and consultant of a housing corporation) and someone (doctor emergency care) from the knowledge network were asked if the new plan for Ommoord is in accordance with the outcomes of their session. First the developed game board was discussed, in which I told them how I interpreted the board. After this, the plan "Remember Ommoord" was explained and discussed, whereby it was evaluated whether the ambitions in every session were translated correctly.

10.2 VISION FOR OMMOORD

Ommoord will be a connected neighbourhood in 2030, where there is a clear focus on pedestrians. The connected neighbourhood can be divided into four important elements:

1. Adding more basic facilities in the heart of Ommoord
2. Creating more awareness for dementia
3. Setting up spaces where people can meet each other
4. Focussing on a better pedestrian infrastructure for Ommoord

Adding more facilities in the heart of Ommoord ensures that all inhabitants can reach their basic needs. Besides that it makes it possible to meet other inhabitants and to recreate in the area. The plinths of the basic needs must be transparent and in the most ideal situation there are no height differences. Creating awareness is also important, so that people with dementia can get help if necessary. Free coffee and houses where there is assistance are good solutions. This contributes to the social communities. The urban environment must welcome and attract people to stay. Finally focussing on pedestrians is necessary because people with dementia will not use the car or the public transport anymore. There must be frequent, readable and safe pedestrian crossings. The paths must be wide and need good lighting and resting places. Moreover it is important that there are no dead ends to prevent confusion.

Besides being more connected, Ommoord must also be recognizable by the adding of a few landmarks and viewports.

10.3 THE NEW PLAN: REMEMBER OMMOORD

To achieve this vision in 2030, various steps will have to be taken. Figures 68 and 69 show the transformation on the map and figures 61-67 illustrates which points can be achieved quickly and which points can be executed in the future. The different paragraphs in this chapter will describe the different steps at strategy and detail level.

10.3.1 Removing the parking spots and adding an information centre

The first step (figure 61) is to make the courts car free and to replace some of the parking places. Three parking fields will continue to exist temporarily, until the garages are built. This will result in more welcoming courts and space is created for communal spaces.

Most of the parking areas (figure 72) can be easily repositioned to an area outside the courtyards, with the result that the flats are still directly linked to the parking plots. It has been assumed that fewer parking spaces are needed, because people who get older (with dementia) often no longer drive a car. The striped parking field is the only parking field that does not immediately return at another location, because it would otherwise be at the expense of the ring. If there is too much resistance in removing this field, a more expensive solution can be considered.

In the south it is possible to make a one-way street. The lanes of cyclists and car users are located directly next to each other. The pedestrian walkway is separated from the other streams through grasses and trees. In the north it is not possible to make a one-way street. Here cyclists and cars use the same street. For the rest, the profile resembles that of the south. The trees in the northern and southern profile are already existing, so no problems will be expected for the underground infrastructure (figures 76 & 77) (appendix N).

Besides starting with this project it is necessary to focus on setting up a central meeting point so that inhabitants are aware of the new future developments and to get the chance to ask questions. The Romeynshof in the heart of the neighbourhood is a suitable place, because it is possible to create an exhibition room and there is always someone present in the location. The replacement of the parking spaces is a task for the municipality. The inhabitants can cause friction,

but hopefully enough understanding will be created by the established meeting point. Overseeing the new developments can be fulfilled by the municipality of Rotterdam and different housing corporations in collaboration with health care institutions.

10.3.2 Realizing a connected basic ring

In the next step (figure 62), a better connecting will be realized between the different sub neighbourhoods within Ommoord by adding a basic ring (figure 74). Moreover this basic ring forms the backbone for the middle part. The area within the ring is reserved for new facilities and is pedestrian friendly (figure 71).

This basic ring gives enough space for the pedestrian (figure 74). In a short time this ring will be provided with more resting places and a better lighting system. New neighbourhood furniture and lighting system fit in the Rotterdam style (figure 87), which is tough, robust and innovative (Gemeente Rotterdam, n.d.-a). The ring is wide, circular and bordered by buffer zones. Enough shadow is created by the trees. The ring is only meant for pedestrians and cyclists, which are separated from each other.

it is inconceivable that the different traffic flows never have to cross each other. Pedestrians always get priority at intersections and this is reflected in the design. Clear crossings will be designed. The crossing point between pedestrians and metro must be greatly improved. The barriers must close the entire footpath in width (figure 86).

In the future the ring could be a recognizable object in Ommoord, because the trees have a different colour than the other trees (Malus Royal Raindrops, appendix L) in Ommoord. However for the basic ring there are some bottlenecks underneath the surface (appendix N). Here it can be considered not to place the trees, but the grasses should certainly be there to maintain the buffer zones. At some points it is still up to the municipality in this phase. Minimal friction is expected because the ring lies mainly on the existing structure and is only designed more strongly.

10.3.3 Adding meeting places in the neighbourhood

The third phase (figure 63) focuses on realising meeting places in the form of community centres in the different courts. Moreover some meeting places will be located in crucial places as part of the ring system (figure 71). Every centre must be able to offer assistance in emergency, if for example someone with dementia needs help when he or she is lost. In this way, if someone is confused, help can be offered. In these community centres attention will be paid to the disease dementia and it will offer places to socialize. The free cup of coffee can bind people. These places must be welcoming and in every building it must be possible to go the toilet. The buildings are jointly managed by the adjacent flats. These centres are recognizable by the use of blue accents (figure 86). The centres are built by the municipality, but placed under the management of the residents. This gives the opportunity to work with existing projects like “Dement talent”.

10.3.4 Constructing a secondary ring

In the fourth phase (figure 64), recognizable footpaths will be realized in the courtyards, the so-called secondary ring. The secondary ring connects the courts with the basic ring and is bordered by one row of trees and grasses on both sides. The trees (Acer negundo ‘Flamingo’, appendix L) do have another colour than the existing trees in the neighbourhood, which makes them recognisable objects. No problems with the underground structure is expected for the secondary ring. On the short term this ring provides more resting places and a better lighting system, the same as the basic ring. In the future it will contribute to a more pedestrian friendly neighbourhood and will be a recognizable object. The second ring leads the residents to the various community centres.

In this phase, also a third pedestrian layer can be added. These paths ensure that people can easily reach their flat and facilities but they are not so strongly designed as the two rings. The third layer is mainly intended for inhabitants (without dementia). It is up to the municipality to realize the secondary ring and the third layer.

10.3.5 Transforming the plinths

Active plinths will be realized in the fifth phase (figure 65). All buildings must have direct access to the court. Some of the flats are already renovated and that makes it difficult to do another transformation. For these flats it is in any case important that there is a door to the court. Besides creating transparent plinths it is important that the entrances are recognisable. Another big project in this phase is the transformation of the Romeynshof. The Romeynshof must have a more open and welcoming atmosphere . The library, cafe and theatre will stay in this building. Different roles have to be taken in this phase. The municipality is responsible for the development of the Romeynshof and the flats owned by the municipality. The housing corporation is responsible for renovating the plinths in their possession and this also applies to healthcare institutions. Residents can experience a lot of nuisance from the renovation in this phase. It is therefore important that they are well informed.

10.3.6 Upgrading the courtyards

The designed courtyards in the plan of Lotte-Stam Beese (figure 71) will get a stronger form in this phase (figure 66). In this phase is all about working together with residents to give the courtyards an unique recognisable design.

The starting point is that these courtyards are under common management and that residents feel welcome there. The greater goal is to create social communities in this way. During the sessions with "Hersenspinsels" design ideas are offered for the courts, but these have to be validated with the inhabitants. An example is the realisation of communal vegetable gardens in the courts. This working method is in line with the concept of tactical urbanism, in which citizens themselves are responsible for the public space where they live in. The design of your own environment contributes to more living pleasure, health and social contacts that cannot be left to others (Westendorp & Bodegom, 2015). This approach requires cooperation between municipality and the inhabitants of the courts.

10.3.7 Setting up a new heart

The last phase (figure 67) adds new facilities in the heart of Ommoord. Moreover the basic facilities will be added and the health care institutions will stay in the area, but in a renovated building. The shops are centralised which is good for the legibility of the place. The new buildings must stand out from the existing buildings. Different architecture reinforces the recognition of a place. The buildings are on the ground floor, making them accessible to everyone. Furthermore they need active plinths and clear entrances. A number of parking garages will be added, so that all flats have access to a nearby parking area. In the new heart there must be room for places of activity and welcoming spaces to fulfil the needs of every inhabitant. To create more comfort public toilets and help desks must also be added here. Various parties are involved in this phase. The municipality is responsible for adding the new buildings. The inhabitants must be drawn to the new area. The caregivers start work at a new location. Finally, there are a lot of new store owners who together must ensure that it becomes an attractive area.

After realizing the seven phases different higher goals are achieved. The area is connected and pedestrian friendly. The new plan no longer contains dead ends which will contribute to the dementia friendliness of the neighbourhood. Figure 73 shows a more detail plan from a piece of the neighbourhood. This map

shows how the basic ring connects to the secondary ring, but also how different crossings are put together. Moreover, there is a variety of urbanity and intimacy in a court. The impressions (figures 78-85) show how Ommoord could look like in 2030.

10.4 FEASIBILITY OF REMEMBER OMMOORD

"Remember Ommoord" is a big investment for multiple stakeholders. Although admitting people with dementia to a health care centre also costs a lot of money. Within the ring of Ommoord there live around the 12.000 people. A third of them lives in the vulnerable heart of Ommoord. Not everyone in the heart gets dementia, but statistically 325 people will get the disease. Through the adjustments in the neighbourhood, we hope that people with the disease will deteriorate less quickly and that it will be possible to let them live longer at home. Suppose this would be 2 years longer, then you save 2 years on healthcare costs. Someone who just ends up in a care centre with mental complaints costs 154 euros per day. Ultimately, the 325 people will cost around 36 million euros in 2 years. This amount is still an conservative estimation because the 154 euros is a starting rate and this increases quickly as the complaints get worse. On the other hand, people will also have to receive home care if they stay in the neighbourhood. The investment in this project is estimated at 35 million, which is ultimately cheaper than taking care of people in healthcare (appendix M). Investing in the neighbourhood could therefore have an effect if all parties are willing to collaborate.

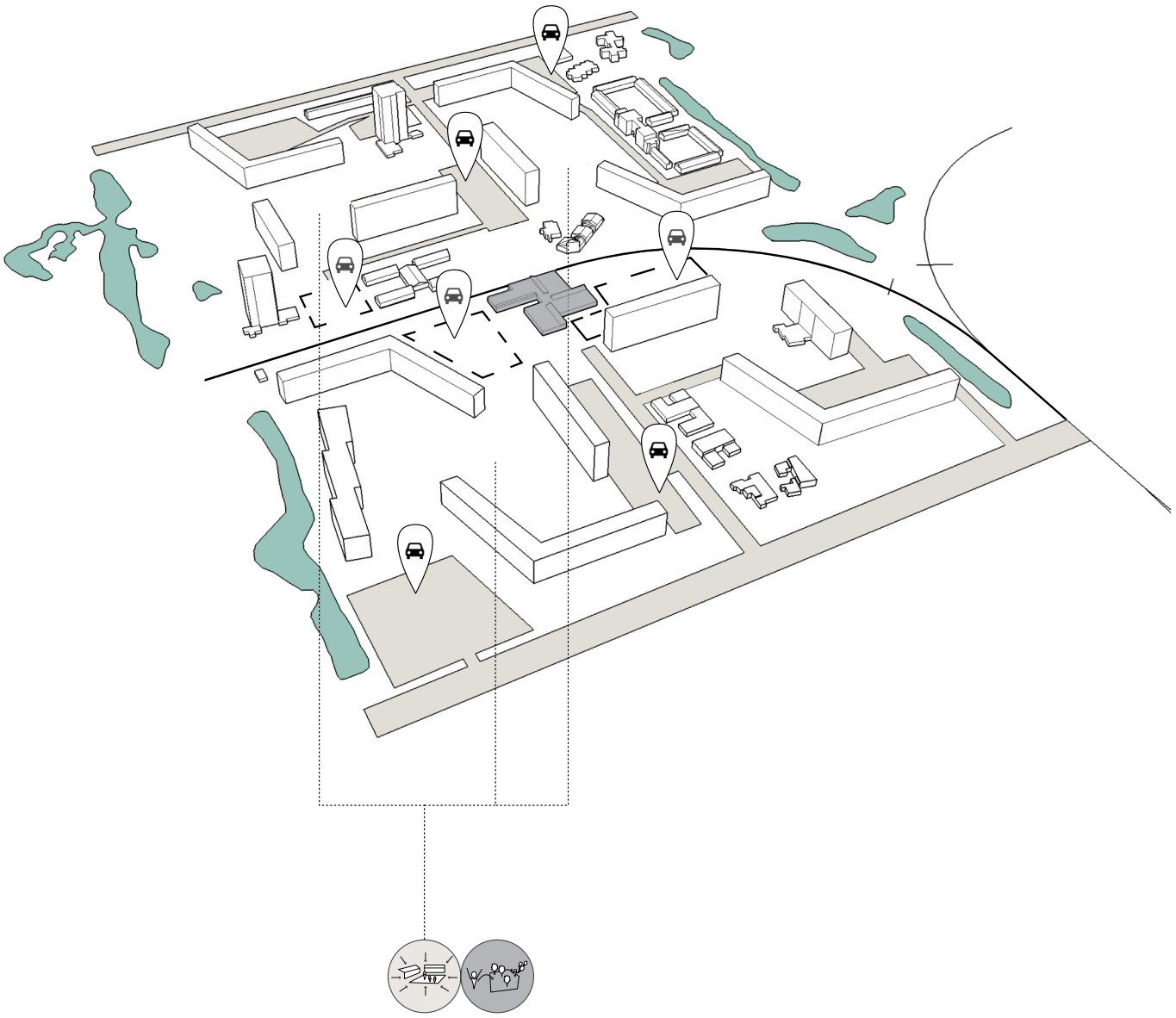


Figure 61: Phase I

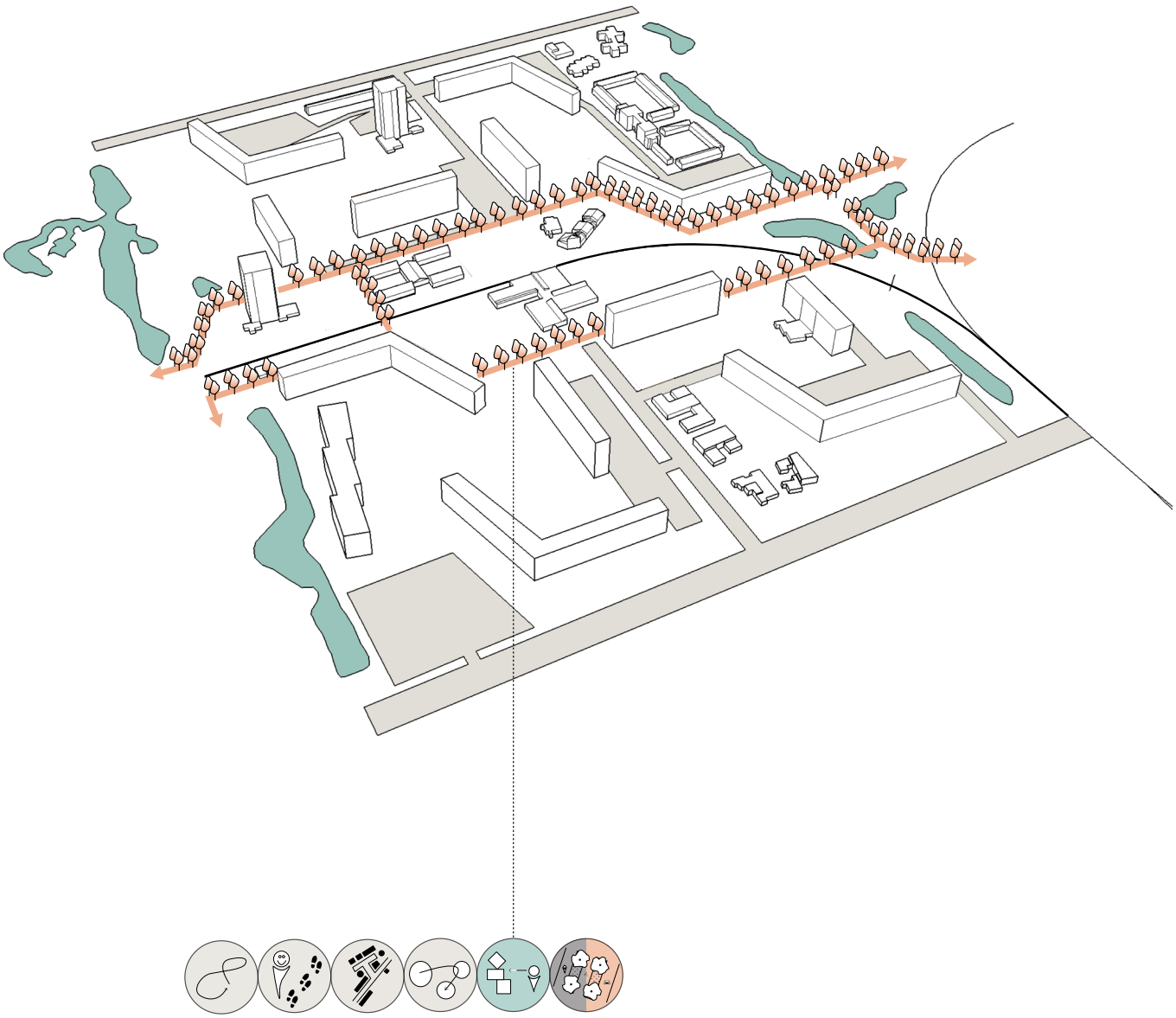


Figure 62: Phase II

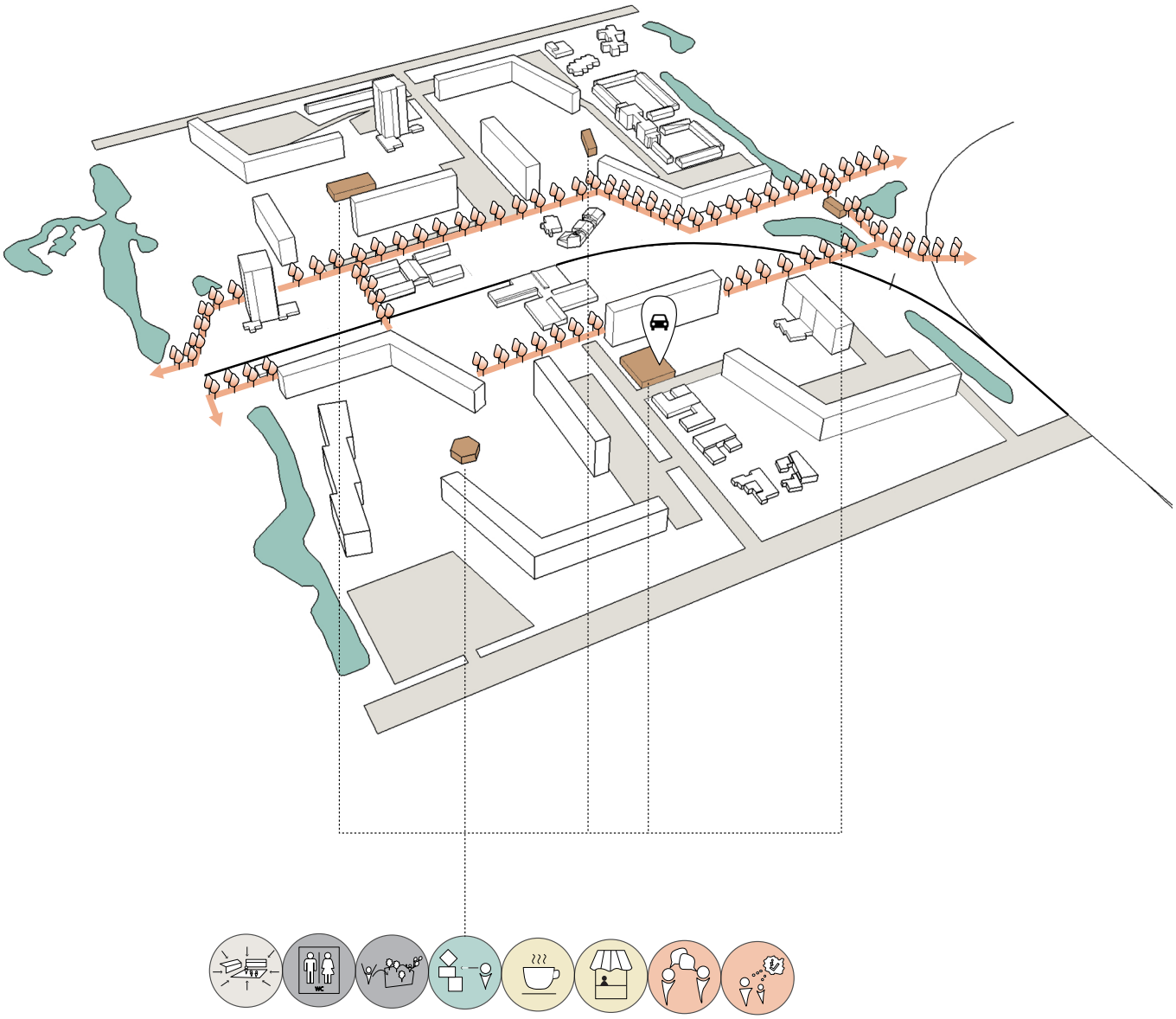


Figure 63: Phase III

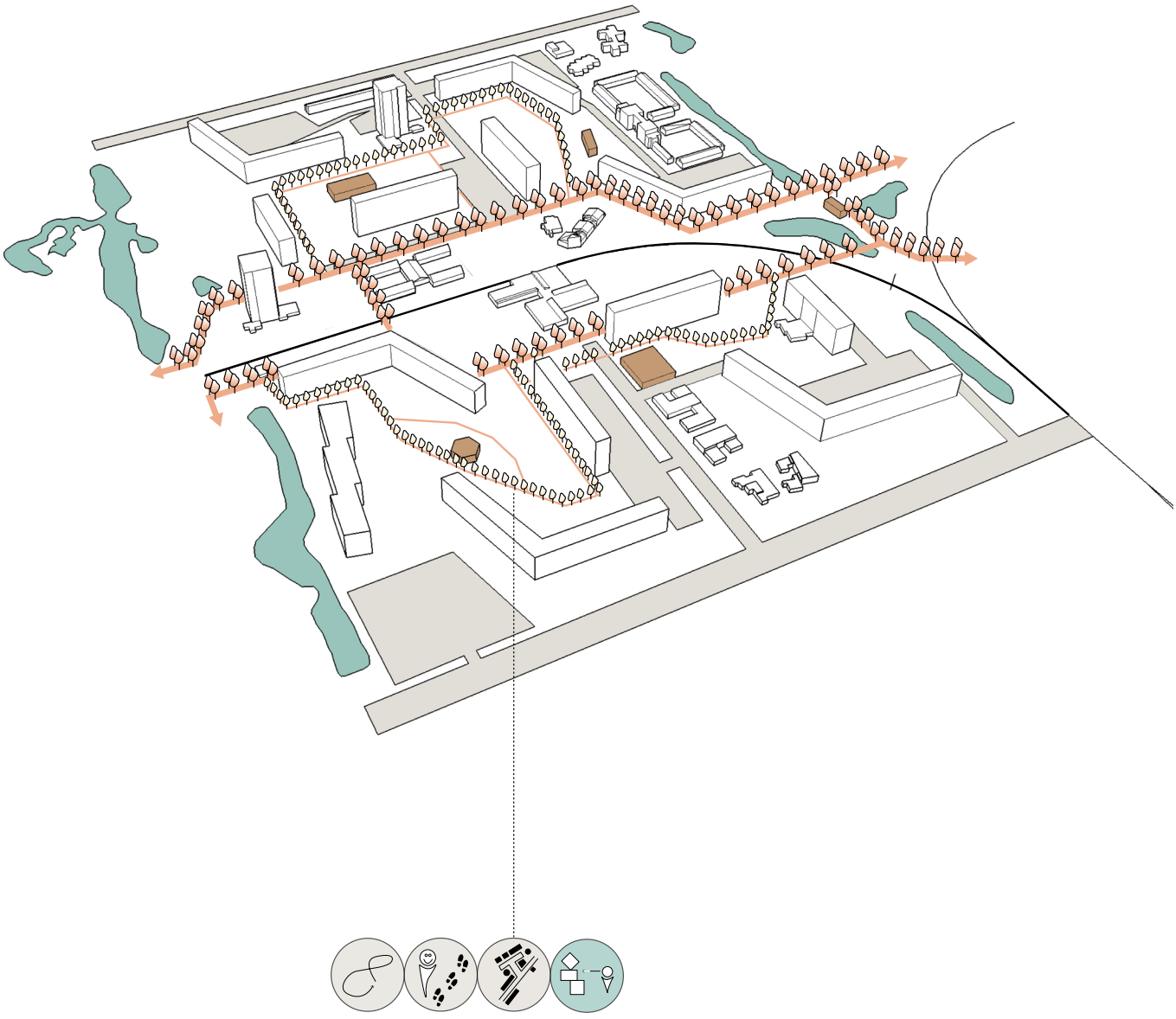


Figure 64: Phase IV

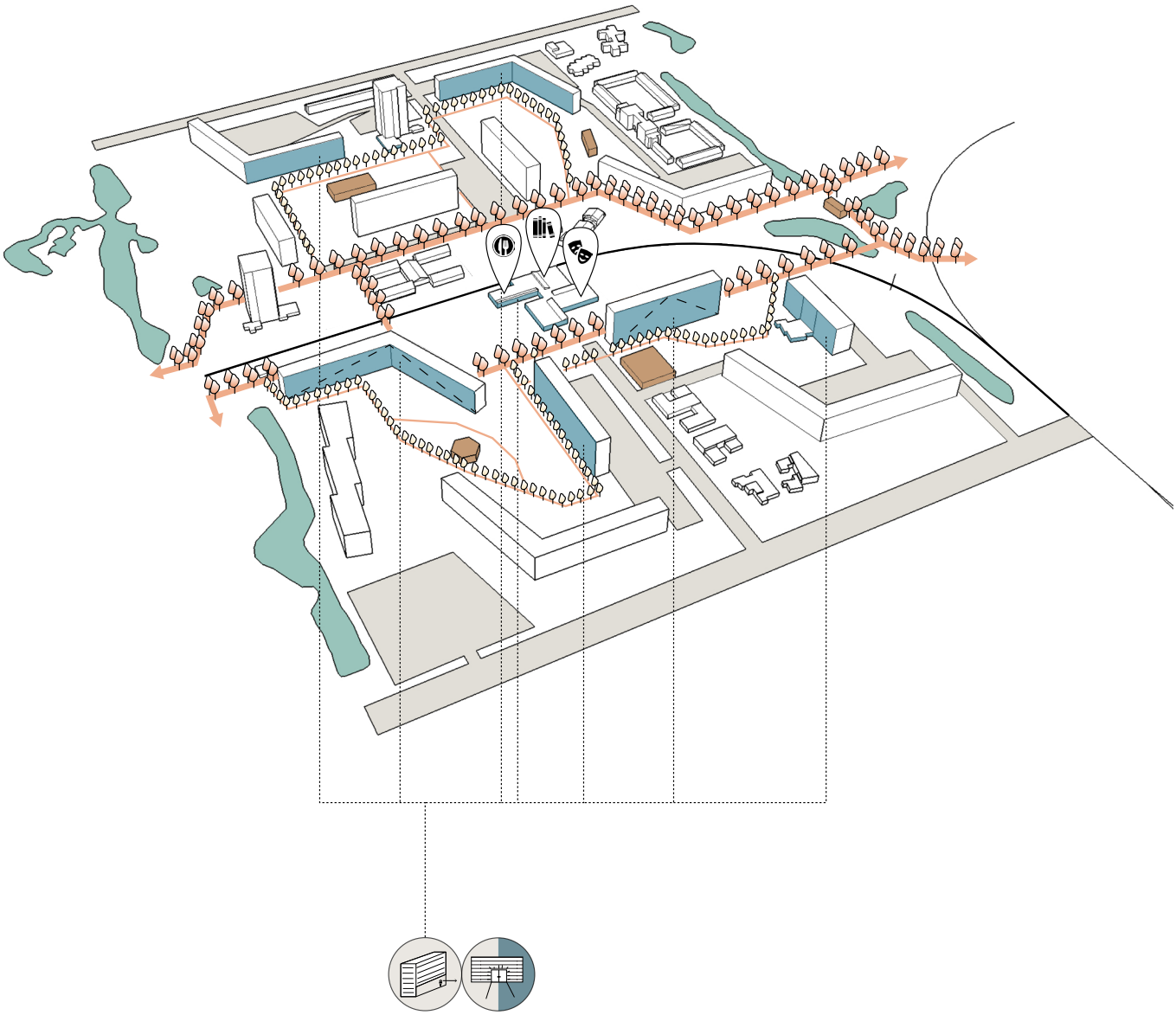


Figure 65: Phase V

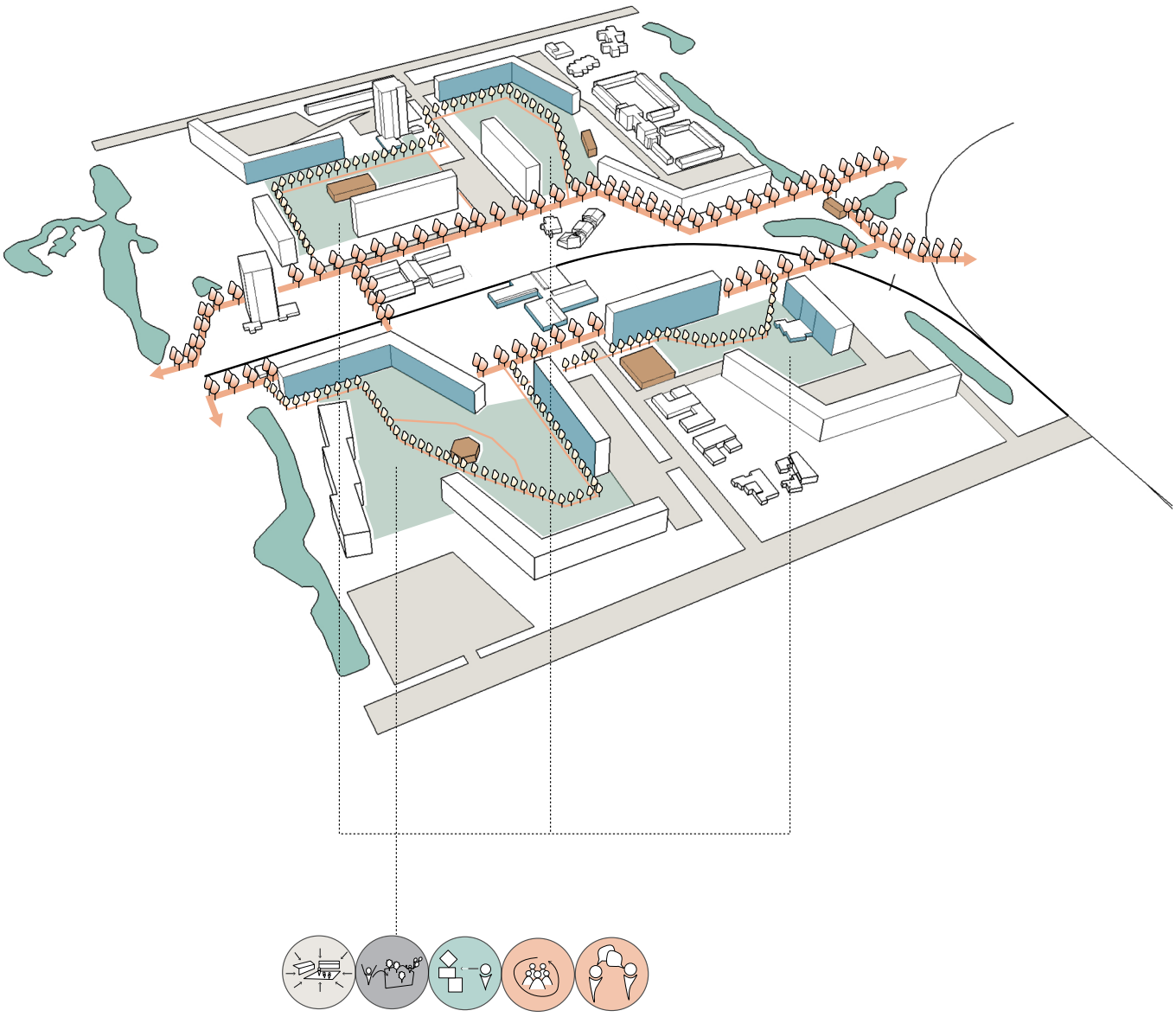


Figure 66: Phase VI

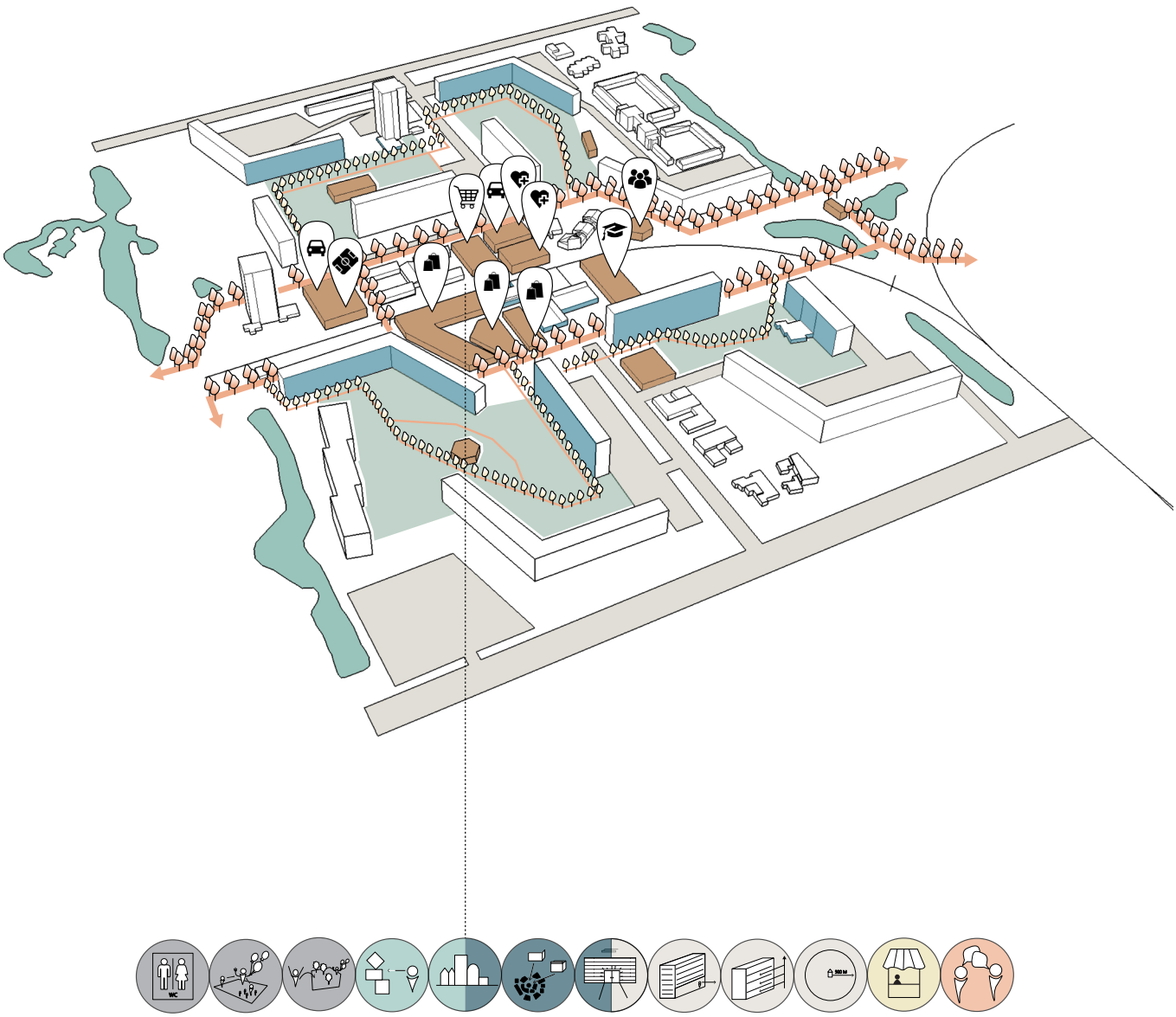


Figure 67: Phase VII

Figure 68: Ommoord 2019, 1:5000

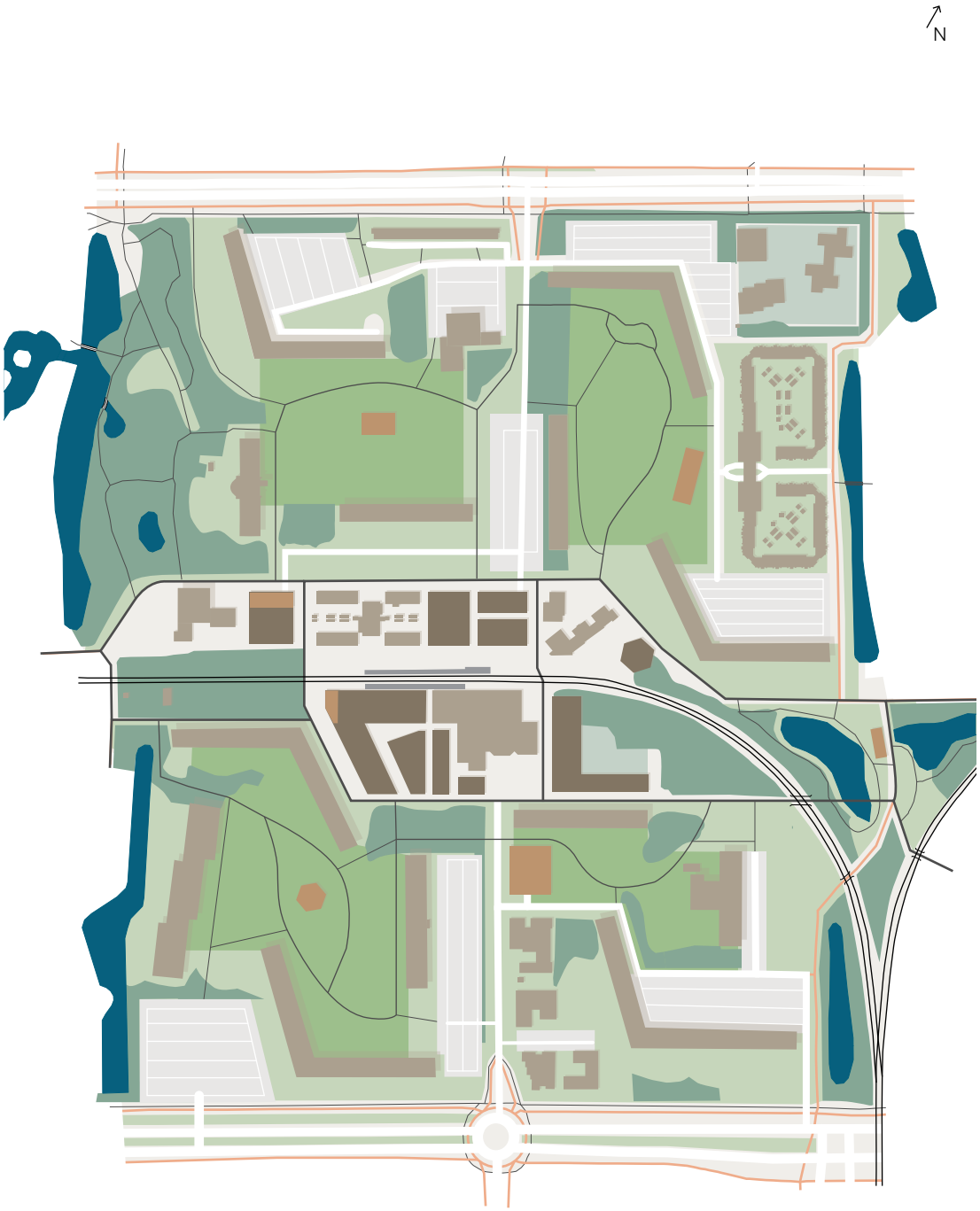


Figure 69: Ommoord 2030, 1:5000

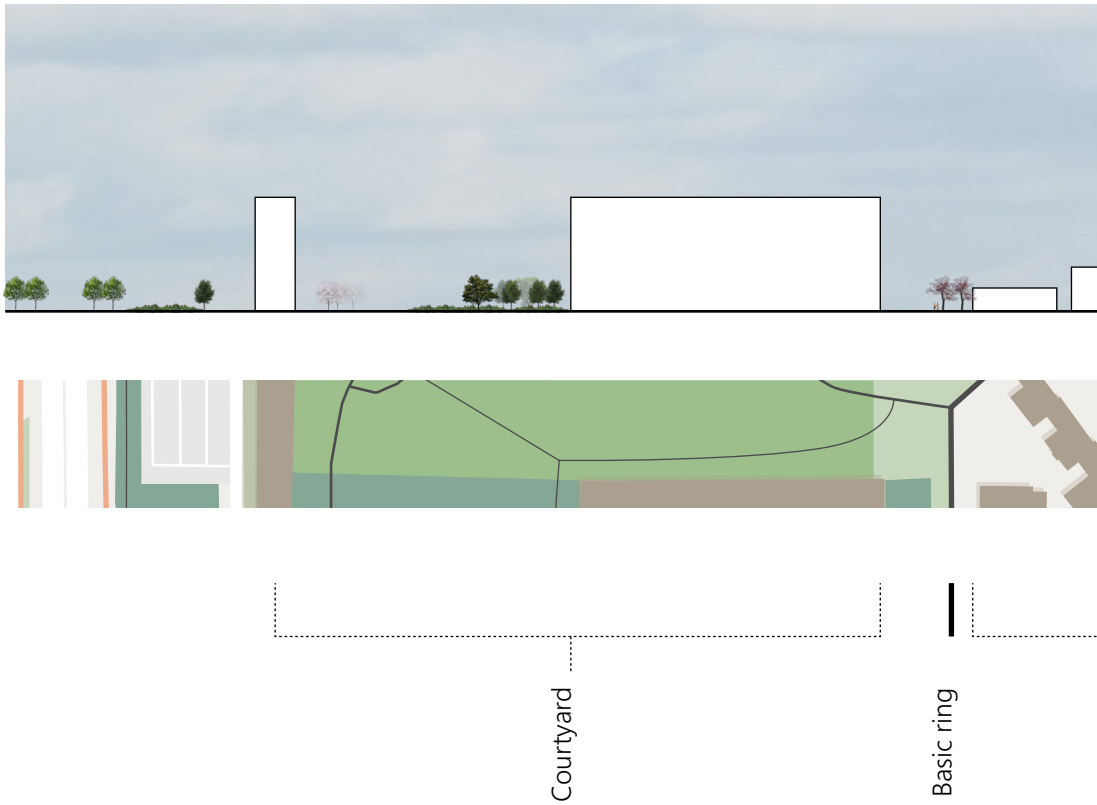


Figure 70: Section new plan, 1:2500

New heart of Ommoord

Basic ring

Courtyard

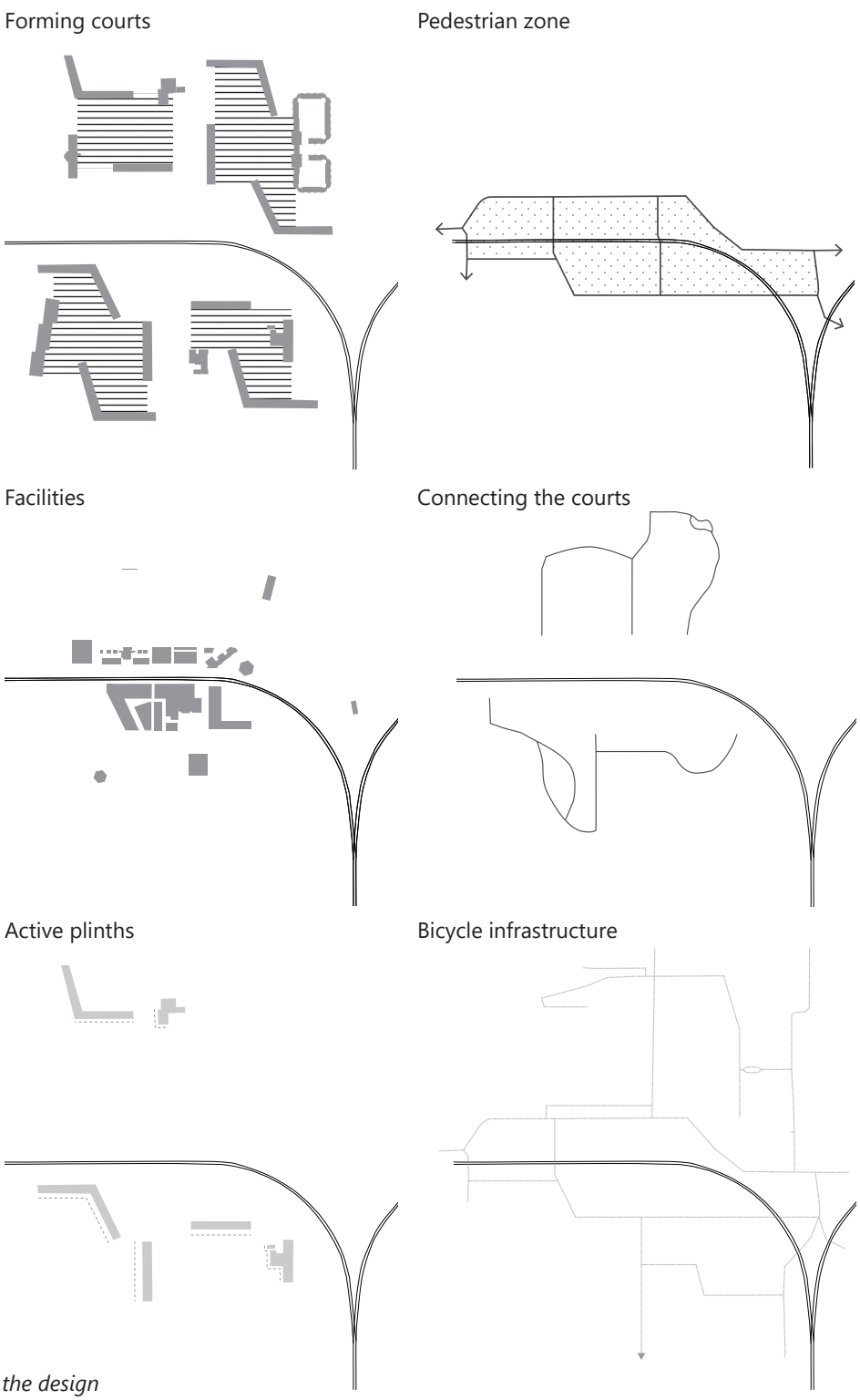


Figure 71: Concepts in the design

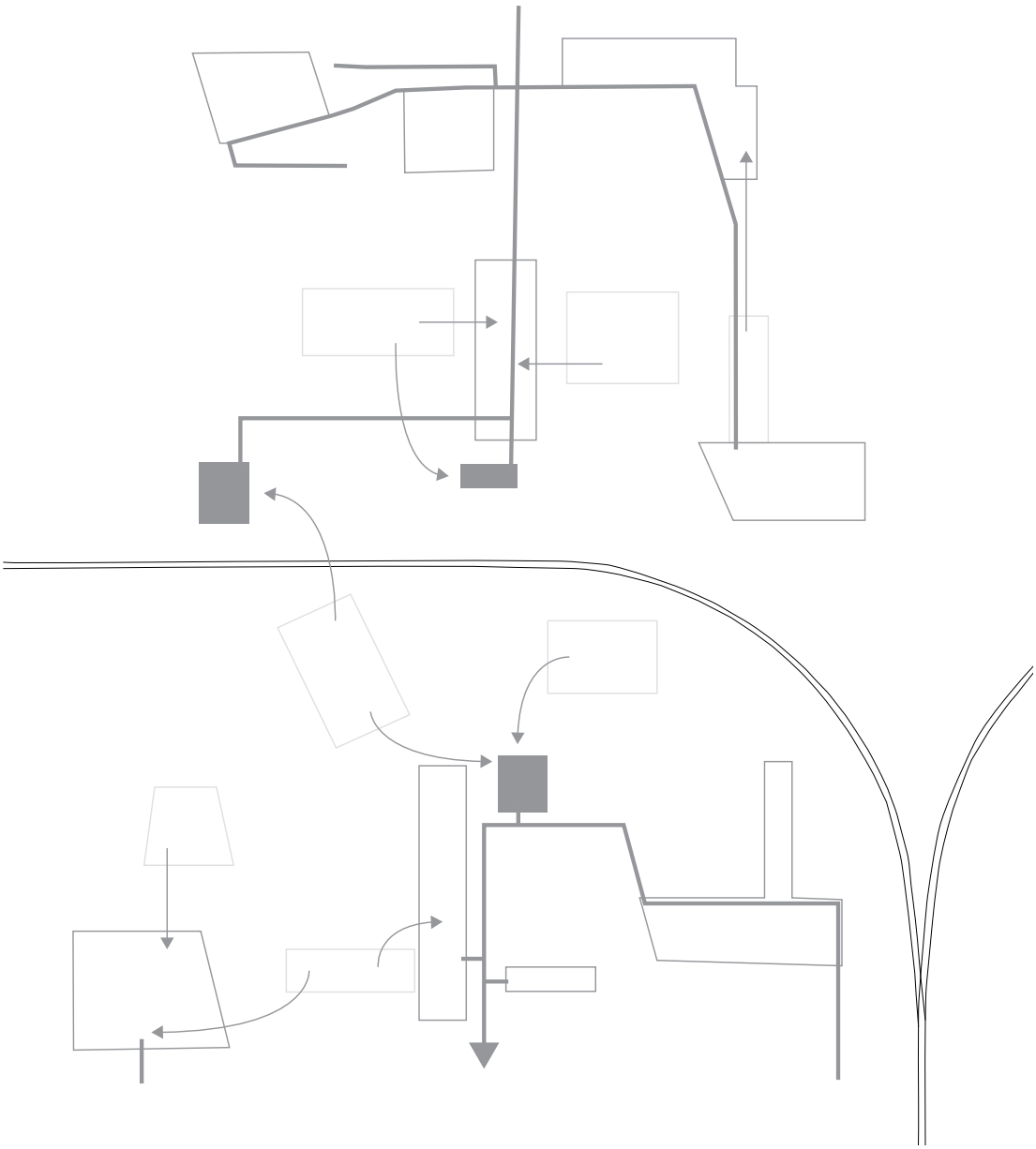
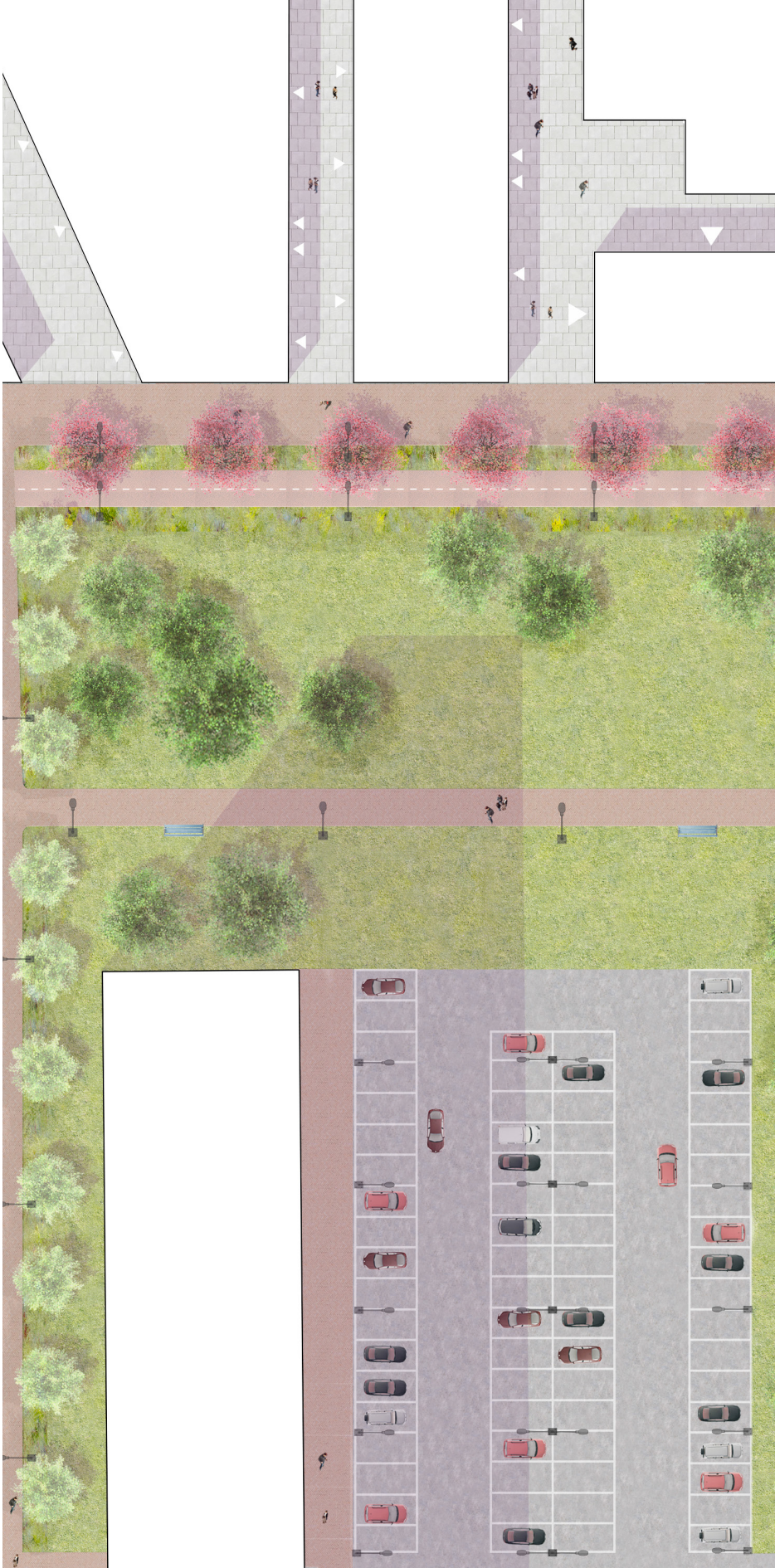


Figure 72: New parking concept



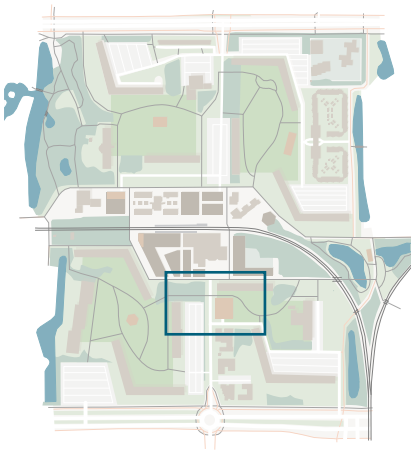


Figure 73: Detailled plan, 1:500

Figure 74: Basic ring, 1:100

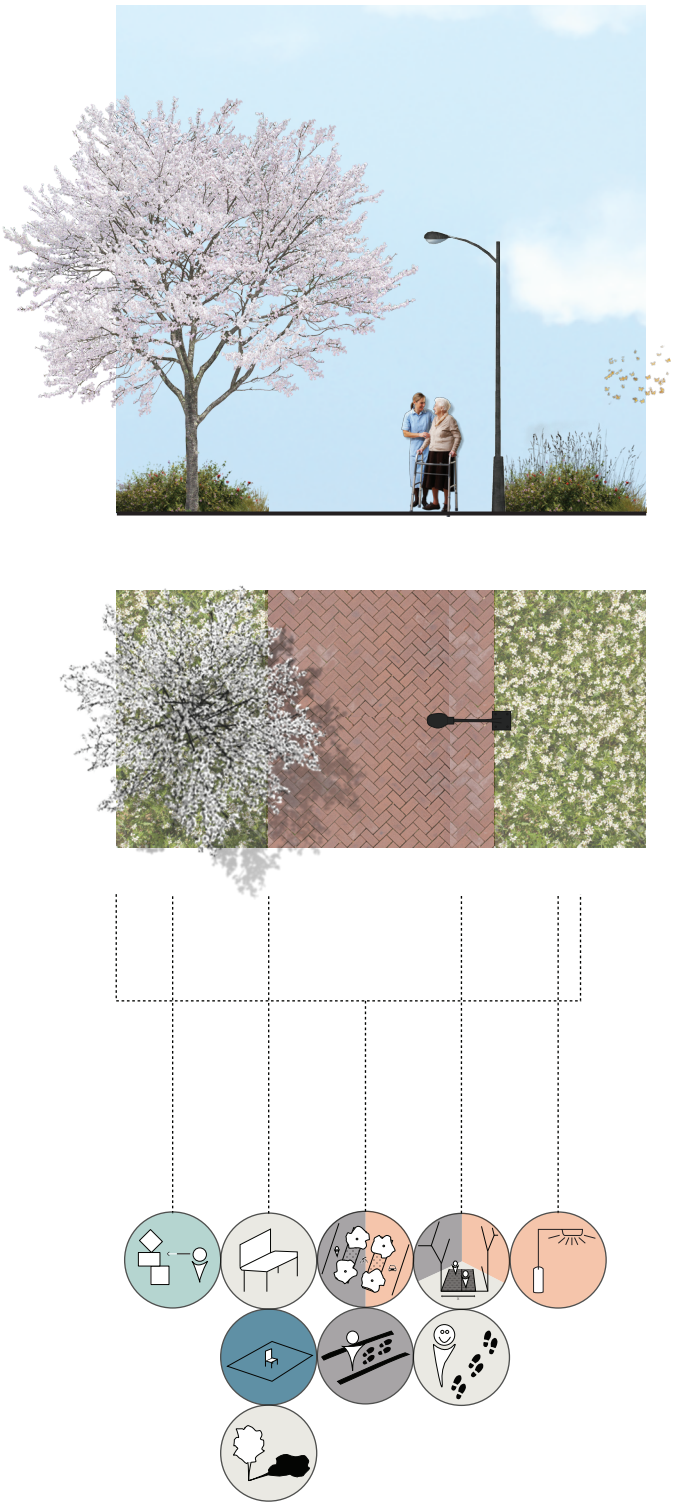


Figure 75: Secundary ring, 1:100

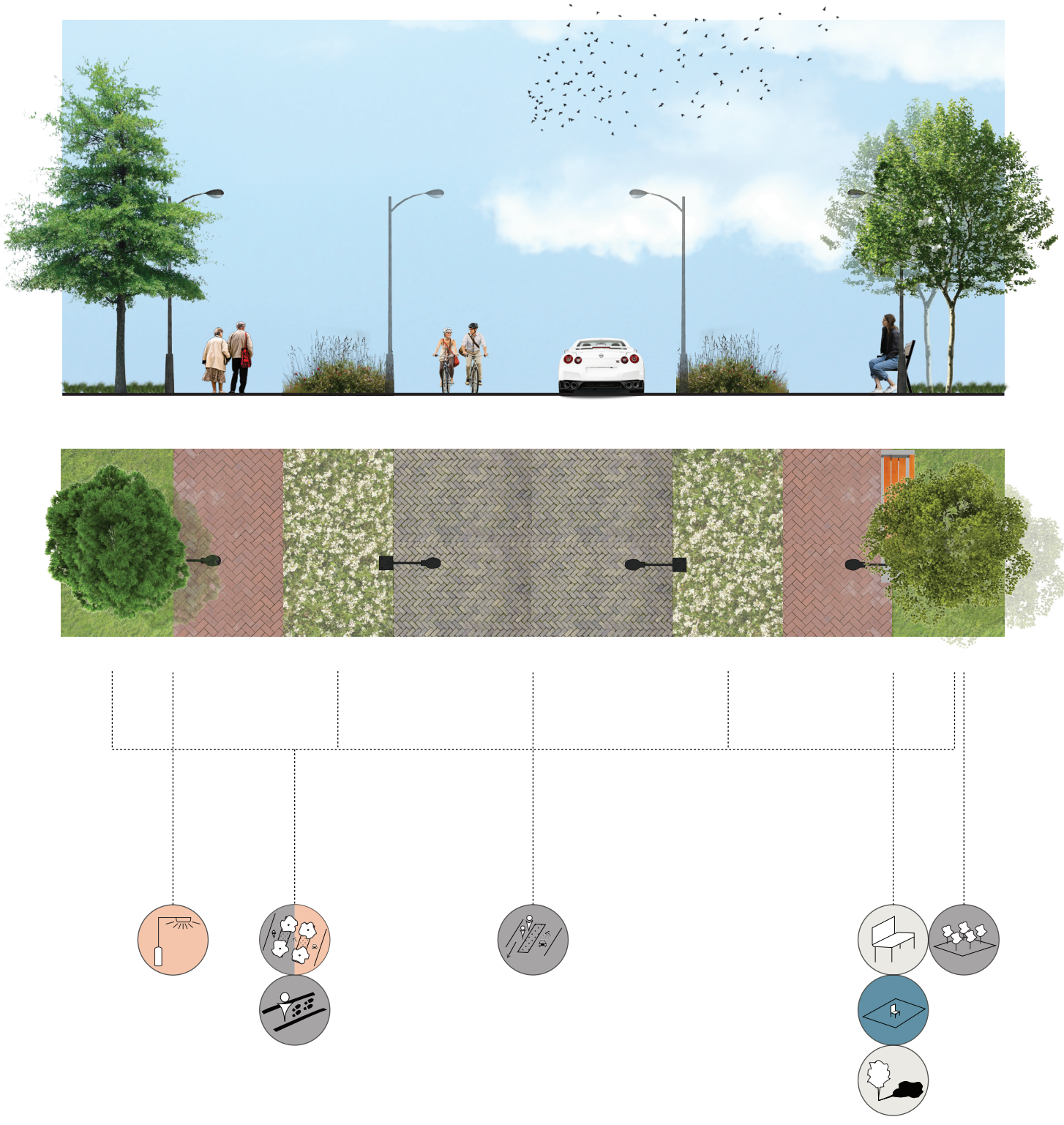


Figure 76: Car route north, 1:100

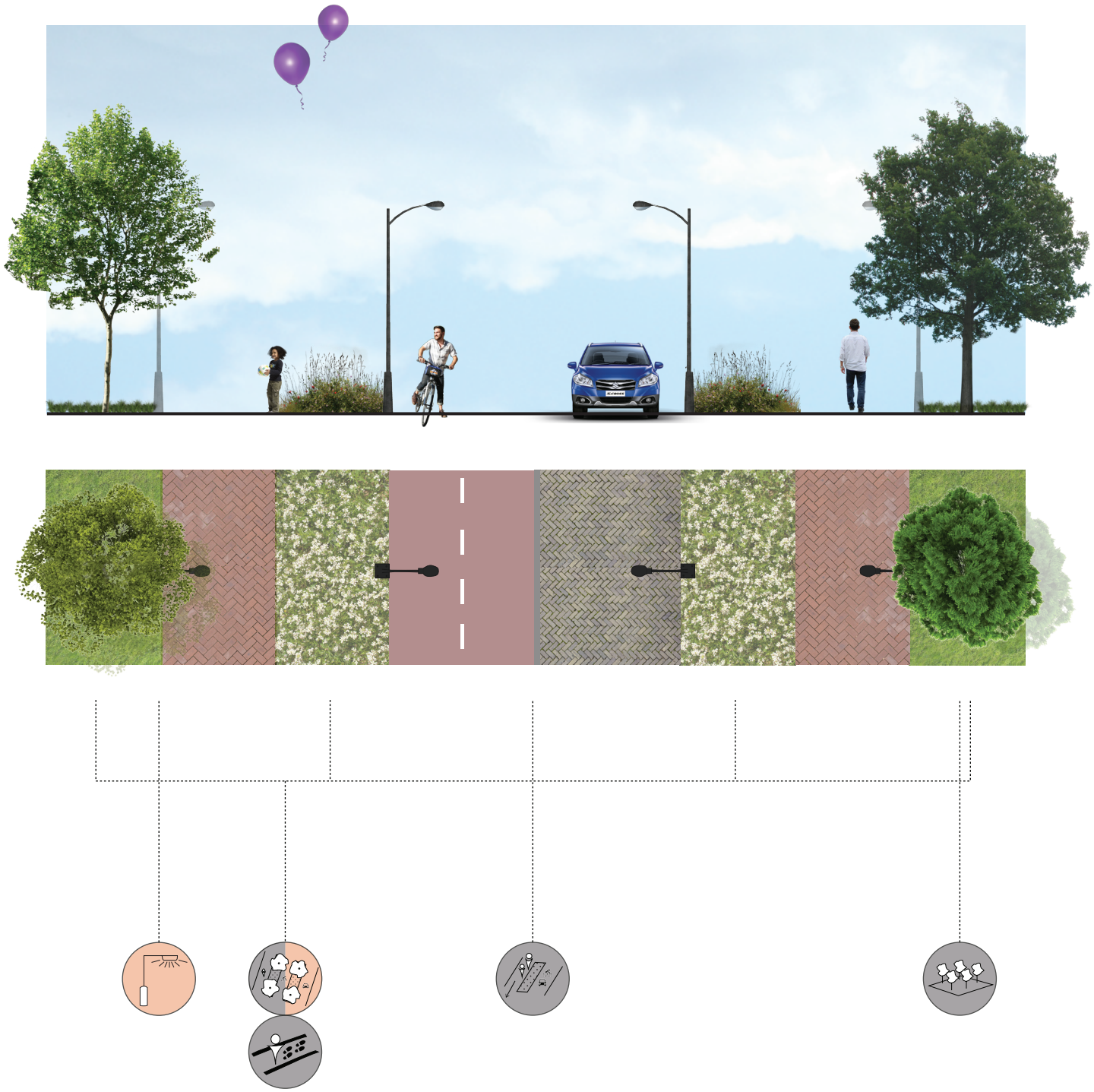


Figure 77: Car route south, 1:100

Figure 78: Old situation Hendersonplaats

Figure 79: New situation Hendersonplaats

Figure 80: Old situation Kellogplaats

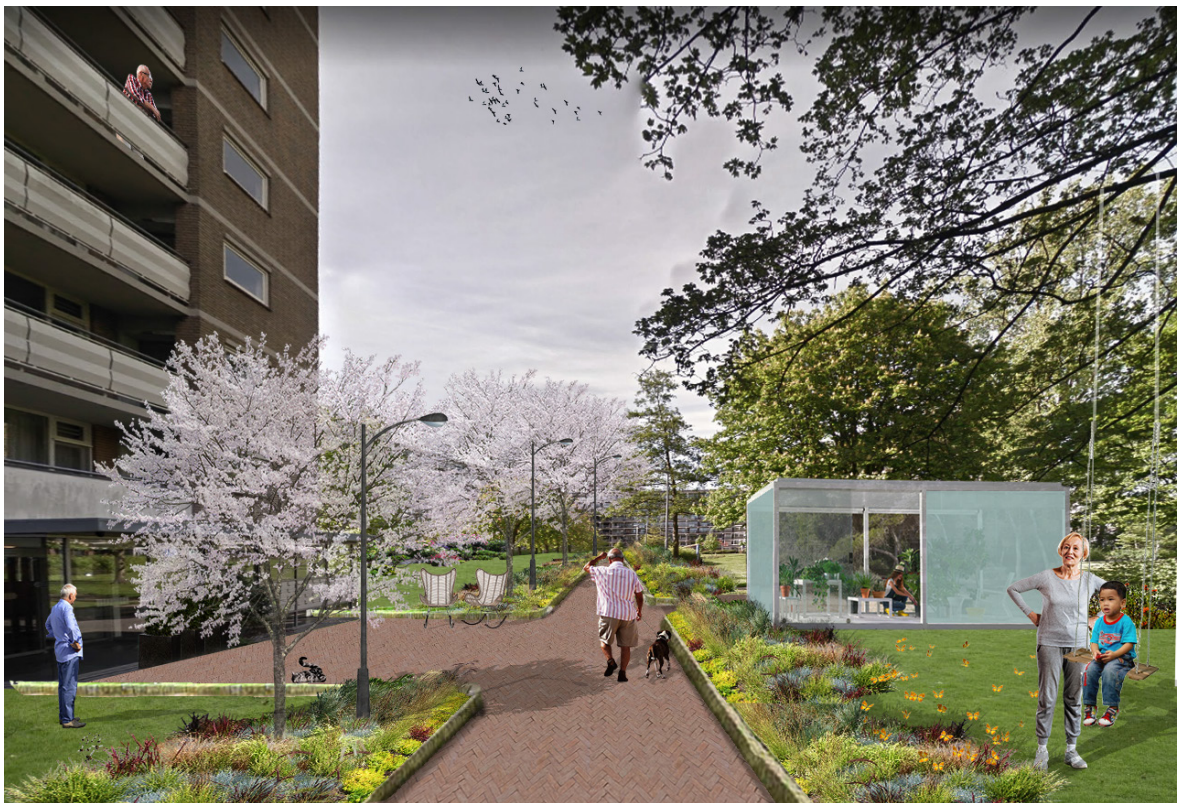


Figure 81: New situation Kellogplaats

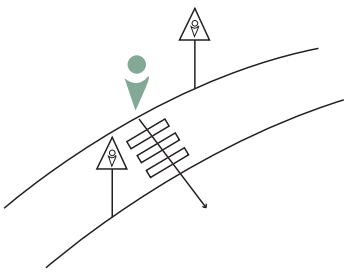
Figure 82: Old situation Cordell Hullplaats

Figure 83: New situation Cordell Hullplaats

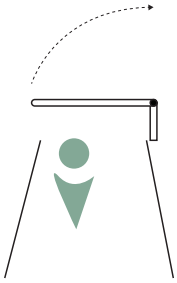
Figure 84: Old situation theatre square

Figure 85: New situation theatre square

Clear pedestrian crossings



Metro crossing



Community centres

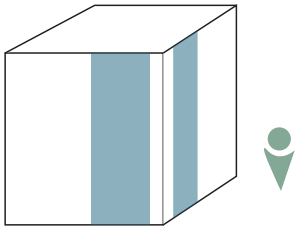


Figure 86: Principles in Ommoord

Figure 87: Neighbourhood furniture

10.5 EFFECTS ON OTHER GOALS WITHIN OMMOORD

"Remember Ommoord" is intended for people with dementia, but people with dementia are not the only inhabitants of the neighbourhood. This sub-chapter investigates how this plan influences other local residents. Moreover it evaluates whether it can contribute to other objectives set by the municipality of Rotterdam.

10.5.1 Other neighbourhood users

The biggest age group population is older than 65 within the ring of Ommoord. The municipality wants to ensure that the neighbourhood is suitable and enjoyable for the elderly (Gebiedscommissie Prins Alexander, 2018). "Remember Ommoord" will positively contribute all the elderly. The plan aims to increase the self-reliance of the elderly. Moreover, the developed meeting centres and the stronger design of the courts enhances community forming with the potential result that the loneliness of the elderly will reduce. Furthermore, it helps the elderly to widen the network around them. This is not only beneficial for the elderly, the majority of the population is single within the Ommoord ring road. Creating attractive and safe spaces will hopefully ensure that the elderly remain active and vital in their own neighbourhood. In the program "Oost 2017 – 2019", the municipality established "huismeesters" in large-scale residential buildings. For the heart of Ommoord, there are 15 "huismeesters" situated. These "huismeesters" help to solve practical problems and form the link with other (healthcare) professionals. However this program ends and in the new plans there is no financial support for the "Huismeester". This is worrying, because the "Huismeesters" are a contact point for the elderly (Gebiedscommissie Prins Alexander, 2018). In "Remember Ommoord" this gap could be filled by the community centres that could become a new contact point.

More and more young families move to Ommoord. Many of these families have debts and/or poverty problems and a language deficit (Gebiedscommissie Prins Alexander, 2018). At the moment there is no attention for an integrated approach to the various problems. However, the local community centres could be used to facilitate language lessons. Moreover, it is a nice place to meet other residents and to speak the Dutch language, which will solve part of the problems. Interaction between the elderly and people with a language deficit creates benefits for both parties. Furthermore, the young families will appreciate the safety of the Ommoord neighbourhood. There is a lot of social control and the environment is a lot safer in the new plan. It is important to add play and sport facilities to the area, which could become part of the courtyards. Some flats do not have direct access to a parking area, which could be disadvantageous for this target group.

The same goes for the people between 46 and 65 years old, the third biggest group of inhabitants in Ommoord (Oozo, n.d.). The other interventions in the plan "Remember Ommoord" are not so radical that an amount of friction can be expected from this group and the others. They will probably experience the relocation and reduction of parking spaces as a less good idea, but hopefully they will appreciate the qualities of the new plan.

Another big problem is the youth that hangs around doing nothing in Ommoord (Gebiedscommissie Prins Alexander, 2018). There will be more social control in the courtyards in the new plan, which reduces the chance that they will stay in these places. The plan "Remember Ommoord" has more transparent facades and the area is better lit, making it less attractive for them. However, the new shopping centre around the Romeynshof could expect an increase in "hanging" youth. It is important to develop a place for the "hanging" youth in a next design step. The areas on

the edge of the plan area could be used to set up such a place, so that no nuisance is experienced by the other residents.

Finally, there are opportunities in this area to attract students, a student complex can be realized in the new heart of Ommoord. The metro connects the neighbourhood directly with the university campus and the rents of the houses are not that high compared to the rest of the city (Gemeenteraad Rotterdam, 2007). On the one hand, this can be a danger, because a too busy neighbourhood would create too many incentives for people with dementia. However it offers opportunities to set up successful collaborations. For example, in exchange for rent reductions, students could help the elderly by, for example, going out for a walk with them, shopping or volunteering in one of the community centres. The students like to visit restaurants, cafés and cultural institutions (Gemeenteraad Rotterdam, 2007). The municipality is committed to developing these facilities in the centre of Rotterdam and the neighbourhoods around it, so it is not necessary to add these facilities in Ommoord because there is a direct metro connection with these places.

It is important that the various neighbourhood users mix, because if this does not happen, tensions can be expected (Gebiedscommissie Prins Alexander, 2018). Appropriate programming and sufficient opportunities to meet each other are essential. The community centres and the new heart must be able to facilitate this. At the moment the "Huis van de wijk" is situated on the edge of Ommoord. Research has shown that this is not a suitable location to serve all residents (Gebiedscommissie Prins Alexander, 2018). It should be investigated whether a new "Huis van de wijk" can be added in the heart of Ommoord for the development of activities. Moreover, residents initiatives will be encouraged to facilitate the connection with other people (Gebiedscommissie Prins Alexander, 2018).

10.5.2 Current plans for the district of Prins Alexander

The neighbourhoods within the district of Alexander generally have good quality of public spaces and are important in their current form for the Rotterdam housing market. (Gemeenteraad Rotterdam, 2007). This is partly because the neighbourhoods are very green and water-rich. The living environments are spacious, safe and have facilities. Moreover, in this area of Rotterdam it is possible to live in a green environment, while it is also possible to quickly reach the city centre of Rotterdam. (Gemeente Rotterdam, 2014). The neighbourhoods in the district of Alexander require attention, but the character does not have to change radically.

Although Rotterdam has to deal with a demand for densification, the municipality does not have plans to build new houses in the district of Ommoord. Living in the green is considered a quality and must be preserved (Gemeenteraad Rotterdam, 2007). In the new plan "Remember Ommoord", the green environment and spaciousness of Ommoord have been enhanced and made more attractive. Densification is not one of the core ideas of this plan. Although the courtyards would come out even stronger if they were more closed off.

In the coming years, investments will mainly be made in public space by the municipality. One of the largest projects is the improvement of the current sewer system. (Gebiedscommissie Prins Alexander, 2018). This ensures that the underground system for Ommoord can partly change if there are pipes in the way to place trees. Additionally, the housing can be connected to district heating. Changing the underground infrastructure also ensures that the footpaths and bicycle paths can be renovated, which have been damaged by the resounding of earth (Gemeente Rotterdam, 2014). Housing corporations on the other hand are investing in their property. The buildings

Figure 88: De Hofbogen (Rotterdam Tourist Information, n.d.)

are becoming more sustainable and given a powerful and robust look (Beek, 2018). It is important to make housing associations aware of the positive effects of transparent facades for people with dementia, so that they can be included in the transformations.

No measures have been taken in the proposed plan in regard to the design of the ring road. Residents complain that they cannot cross safely, mainly on routes to and from schools (Gebiedscommissie Prins Alexander, 2018). This must be further investigated in the next step.

10.5.3 Stimulating the creative industry

Ommoord is a urban renewal area of national importance. The design for Ommoord is an important example of the progressive standardization of Dutch post-war architecture and urban design. There is no other high-rise neighbourhood from this period of comparable scale and coherence in the Netherlands. The Rotterdam monument policy aims to use monuments for area redevelopment, which focuses on the quality of the cultural-historical value. But cultural heritage has a strong economic value and attracts a variety of businesses and residents. For example, the baseboards of the flats can be used for the creative economy, which improves both the economic profile and the image of the neighbourhood (Gemeenteraad Rotterdam, 2007). The "Hofbogen" in Rotterdam is in my eyes a good example of a successful project, which can be used as inspiration (figure 88).

In Rotterdam, the creative industry has a smaller share in the local economy than for example in Amsterdam, Den Haag and Utrecht. Nevertheless, the share is currently growing strongly in all segments of the sector, especially in creative business services. Rotterdam is a leader in the field of architecture. Moreover, it is the second fashion city in the Netherlands. Rotterdam also has a lot to offer in the field of music and dance. Rotterdam stimulates four promising clusters in the creative sector: architecture, design and product innovation, media and music (Gemeenteraad Rotterdam, 2007). The Romeynshof also offers a lot of potential to set up something for these clusters. In addition, the skirting boards can be used to facilitate creative businesses. Moreover, the best reconstruction area can best be promoted in the neighbourhood itself.

10.5.4 Reinforcing the green in the neighbourhood

The presence of a lot of green has many benefits for Ommoord. Greenery improves the environment, increases the biodiversity, reduces air pollution, ensures water storage, dampens noise pollution and cools down during warm periods. Furthermore, it has been demonstrated that green has a positive effect on the health and social connections of people who live, work and play in a green environment (Stuiver, n.d.).

To increase the biodiversity in Ommoord, the roadsides are cut less. As a result, more flowery plant species can grow, serving bees, butterflies, other insects and birds (Stadskrant, 2016). The use of more green can be encouraged in "Remember Ommoord". Adding green roofs would be beneficial to increase the sustainability of the area. Green roofs are energy-saving, retain water and increase the biodiversity in the neighbourhood (Gemeente Rotterdam, 2018). At the moment, Ommoord is not one of the areas that has enormous heat stress (Hoeven & Wandl), but because the new plan is being compacted in the centre, it is important to add green to prevent heat islands. Façade gardens could be realized to ensure that the façade stays cooler during extremely warm days (Gemeente Rotterdam, 2018). Moreover, this greenery could also be a landmark in the neighbourhood. The green roofs will also the area cooler.

It is important to create a better connection from the neighbourhood to the river Rotte, because a recreational green area must be connected to the city (Gemeenteraad Rotterdam, 2007). At the moment, no direct recognizable connection has been made to the river Rotte when developing "Remember Ommoord".

However, in the current situation, greenery sometimes also causes unsafe situations. The green courtyards with parking facilities often cause the feeling of insecurity in the evening. This feeling is enhanced by the closed facades on the ground floor. "Remember Ommoord" will have more open facades, creating a stronger connection between building and outside space. Moreover the basic round and the secondary round will have a good lighting plan. A good lighting plan must also be designed around the various flats thus diminishing the unsafe feelings.

Finally, it is important to do even better research into the function of green in Ommoord, because the decorative greenery is hardly used and is poorly maintained (Gemeenteraad Rotterdam, 2007). The quality of this green must remain guaranteed (Gebiedscommissie Prins Alexander, 2018). The developments in the courtyards in the "Remember Ommoord" plan will give green a function. In the next step, research must also be carried out into the greenery in the rest of the neighbourhood.

10.5.5 Facilitating other sustainable solutions

The sustainability goals of the municipality of Rotterdam are progressive and challenging. Sustainable solutions and improvements must be made visible in the direct design. The people from Rotterdam need more knowledge and information about sustainable solutions and improvements. Moreover initiatives from the people from Rotterdam must be encouraged, so that everyone can participate to become more sustainable (Gemeente Rotterdam, 2018).

Next to deploying the green, the municipality also focuses on CO2 reduction water storage and the deployment of sustainable development approaches (Gemeente Rotterdam, 2018). Rotterdam wants to position itself as a world city with low-CO2 energy, which will result in cleaner air. Where the municipality focuses on the use of bicycles and public transport, "Remember Ommoord" focuses first and foremost on the pedestrian. The use of the car is not encouraged, by putting the priority on pedestrian flows and the reduction of parking spaces.

It is important to further analyse the metro connection in the next step of the design. At the moment there is no direct connection between "Nesselande" and "Binnenhof". This is disadvantageous for elderly people, because switching to another metro is often difficult for them. When realizing a direct connection, problems can arise within Ommoord, because then the number of dangerous crossing points will increase.

Water storage is necessary in the north of Rotterdam (Gemeenteraad Rotterdam, 2007). In Ommoord there are a lot of ground and rainwater problems (Gemeente Rotterdam, 2014). The construction of wadi's, ponds or ditches is dangerous for people with dementia. To tackle this problem it is important to look at alternatives. Green roofs are good solutions, but the construction of rain gardens is also a good idea. Furthermore half paving can be used on parking fields, for example. The parking spaces that are moved can be transformed first. Then the others can follow. It is important that the main path to the entrance remains paved, so that disabled people can use it.

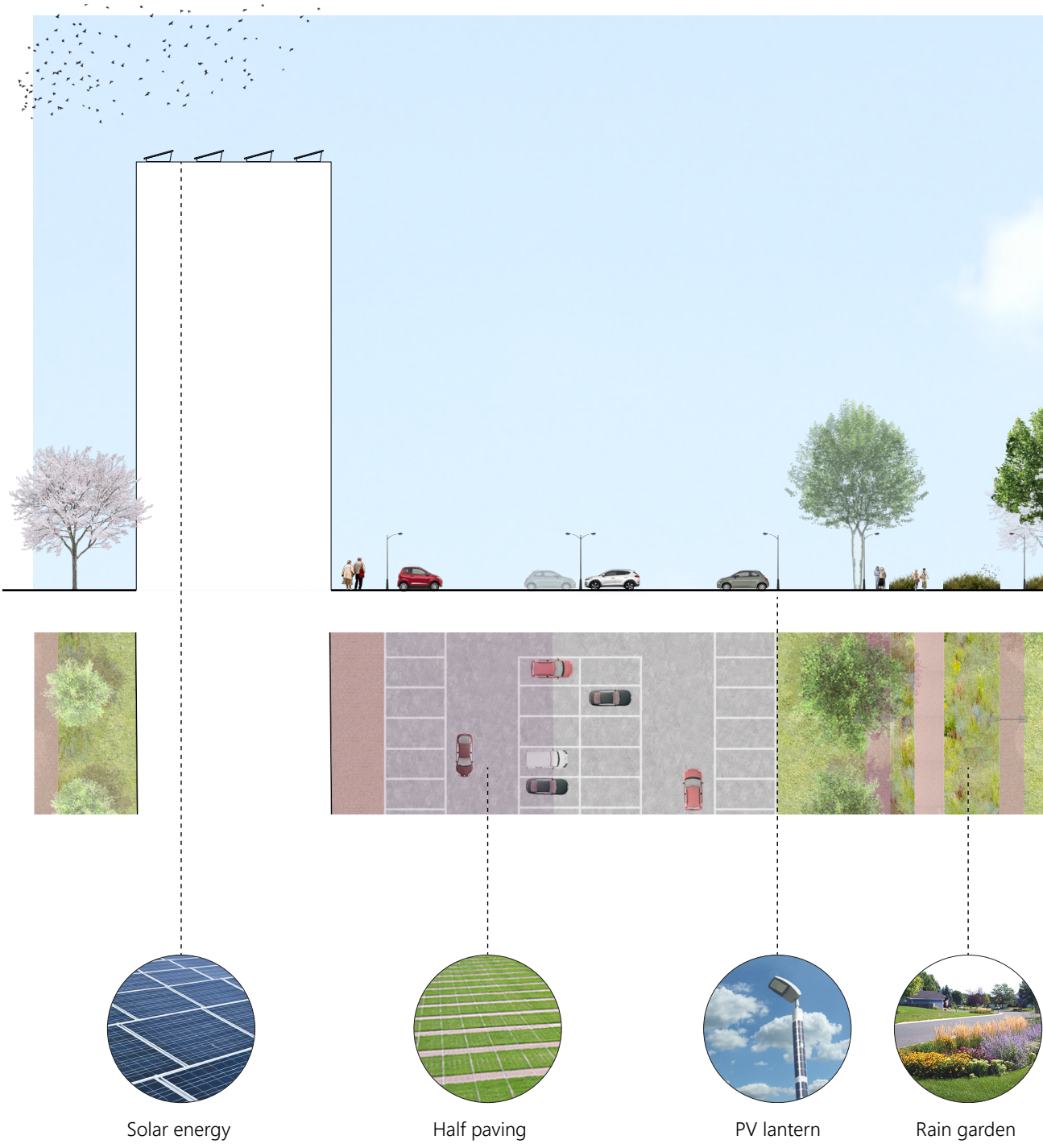
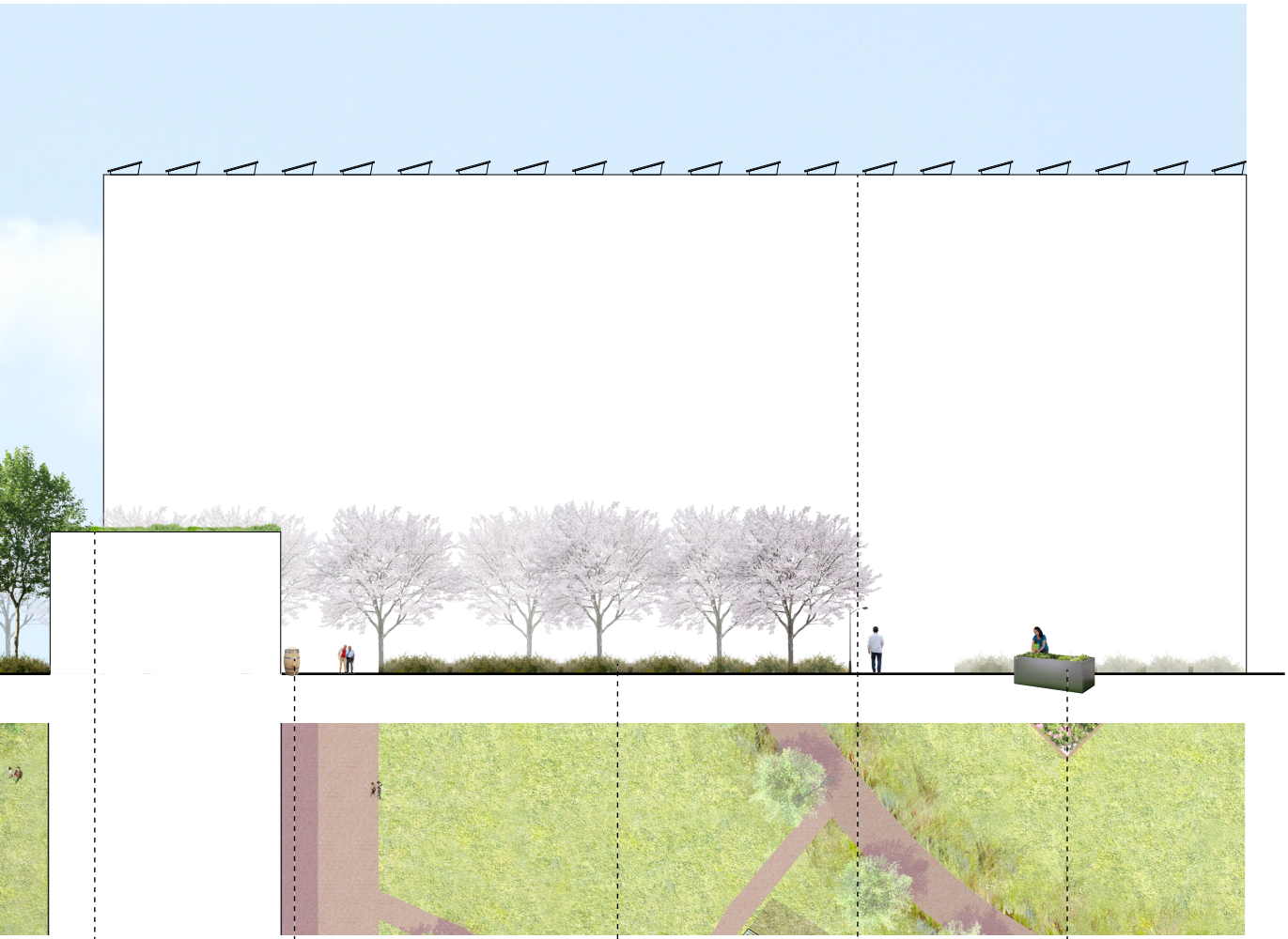


Figure 89: Sustainability section West - East, 1:500



Green roof

Disconnect
rainwater drainage

Increase
biodiversity

Solar energy

Grow your
own food

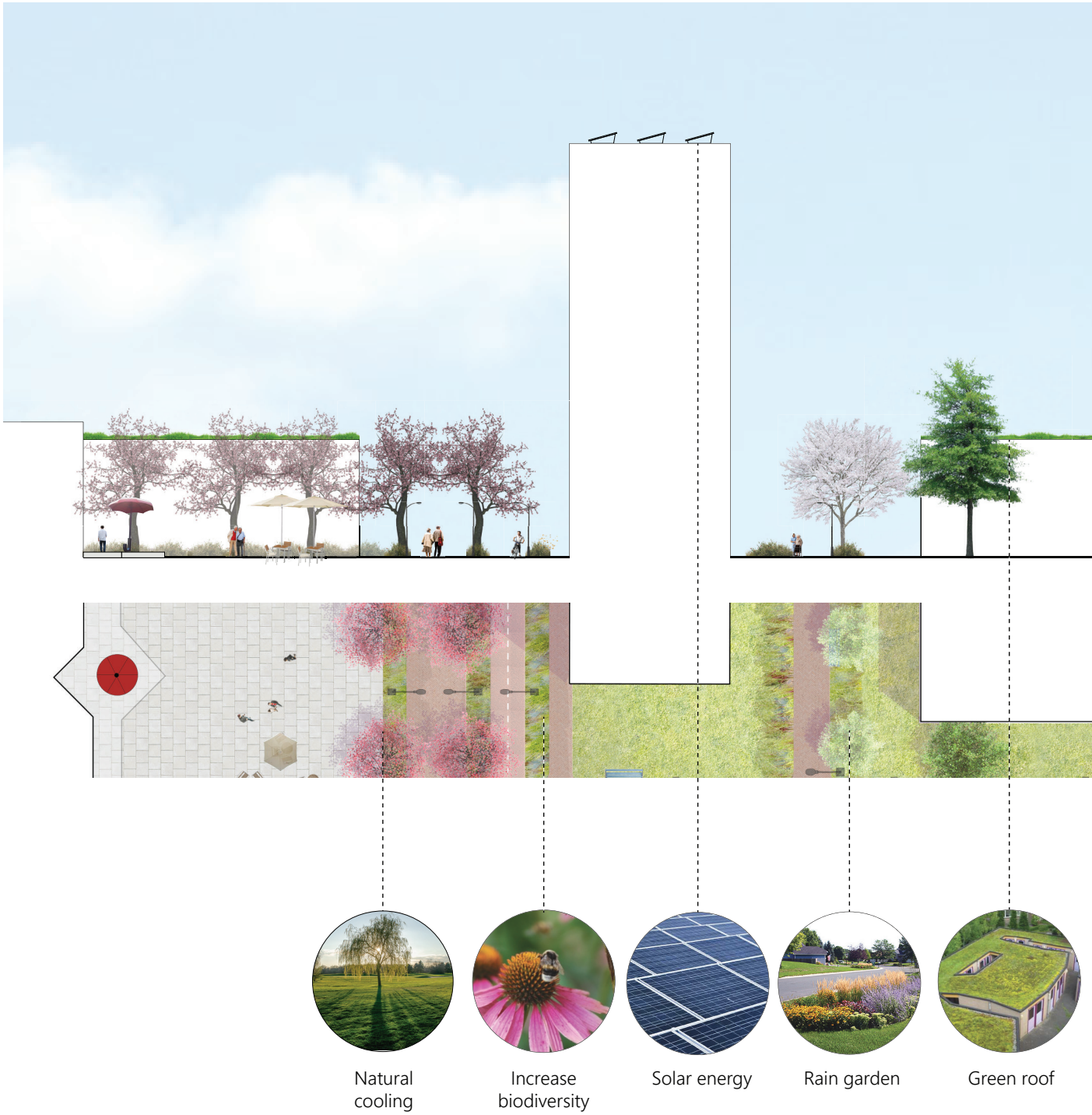
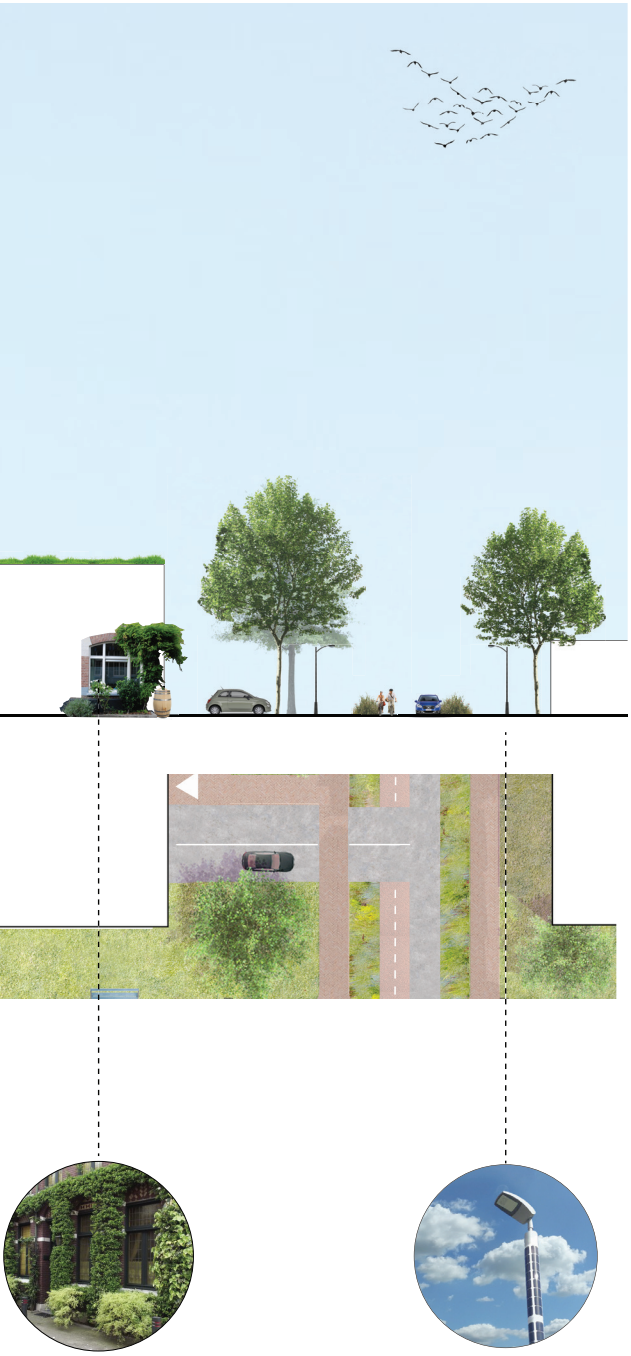


Figure 90: Sustainability section North - South, 1:500



Facade gardens

PV lantern

Finally, during the transformation of the flats, it can be investigated which sustainable solutions can be realized. Generating solar energy would be a nice addition. The new buildings in the plan can even be built energy-neutral or even energy-generating. Figures 89 and 90 illustrate how "Remember Ommoord" can be reinforced with sustainability principles.

10.6 VALIDATION OF THE PLAN BY INVOLVED STAKEHOLDERS

The representative of the power network was pleasantly surprised with the proposed plan for Ommoord. This person confirmed that the main themes set up in the game "Hersenspinsels" have been translated into the design. The social communities are strongly developed in the plan, whereby the central new heart is appreciated. But the courtyards, for something more intimate encounters, are a nice development too. Moreover, the facilities are clustered in the heart, which is perceived as logical. The infrastructure has become more manageable and there is better control where you have to go. In addition, this person was convinced that the landmarks were well translated into the design. The coloured trees were considered as a very good idea. To improve the design, it was indicated that the secondary circle is not directly visible from the main ring. Here trees could be used to steer people. Moreover, the signage is also important here.

This representative even spoke about the next step. For example, who is responsible for the pavilions? Are there volunteers present and should they all become coffee tents? Can we ensure that only residents of a flat have the key to prevent unsafe situations? It is important to give substance to this in the next co-creation step with the power and the knowledge network so that the ideas become feasible and realistic.

The representative from the knowledge network was positive about the new plan. The themes accessibility, comfort and safety are well developed. The wide

footpaths were experienced as good. Although the pavement might have to change. It is not clear whether someone with dementia will recognize this tile as a footpath. The contrast between road and pedestrian path is well designed. This representative was also enthusiastic about the coloured trees and is convinced that it could strengthen recognition.

This conversation has shown that the lighting is even more important for this network than has been worked out in the maps of the design. On the level of detail, things should be illustrated better to convince this group their ideas have been applied in the plan. In this case a map with the lighting plan should be realized by the urban designer & planner (figure 91).

10.7 CONCLUSION

This chapter answers research-question 1: How to adapt Ommoord to improve the quality of life for people with dementia?

Ommoord must be a connected neighbourhood in 2030. A better pedestrian infrastructure must be realized, new facilities must be added and places where people can meet must be realized. Furthermore awareness for dementia must be created. Besides being connected, Ommoord must also be a more recognizable neighbourhood. A second focus point is to add more wayfinding points in the neighbourhood.

This can't be realized in one day, but this plan has to be developed in different phases. In the first phase the cars will be removed from the courts. The Romeynshof will function as an information centre for the inhabitants. Hereafter the ring can be constructed, which stimulates a better connection between the different sub-neighbourhoods. It will be a recognizable object with coloured trees. In the third step, pavilions will be added in the courts and situated on crucial places. These courts are places to meet, to drink a cup of coffee or to go to the toilet. All courts are owned by the residents. Next the secondary ring can be constructed, so that the courts are better accessible. In the fifth step the plinths of the flats will be transformed into active plinths, so that there is a stronger connection between court and building. After this, the courts will be transformed. Inhabitants can decide together on the design of an adjoining court. So the courts can be developed in accordance with their wishes. Finally, the heart is furnished with basic facilities and care facilities. These developments will ensure that Ommoord becomes dementia-friendly.

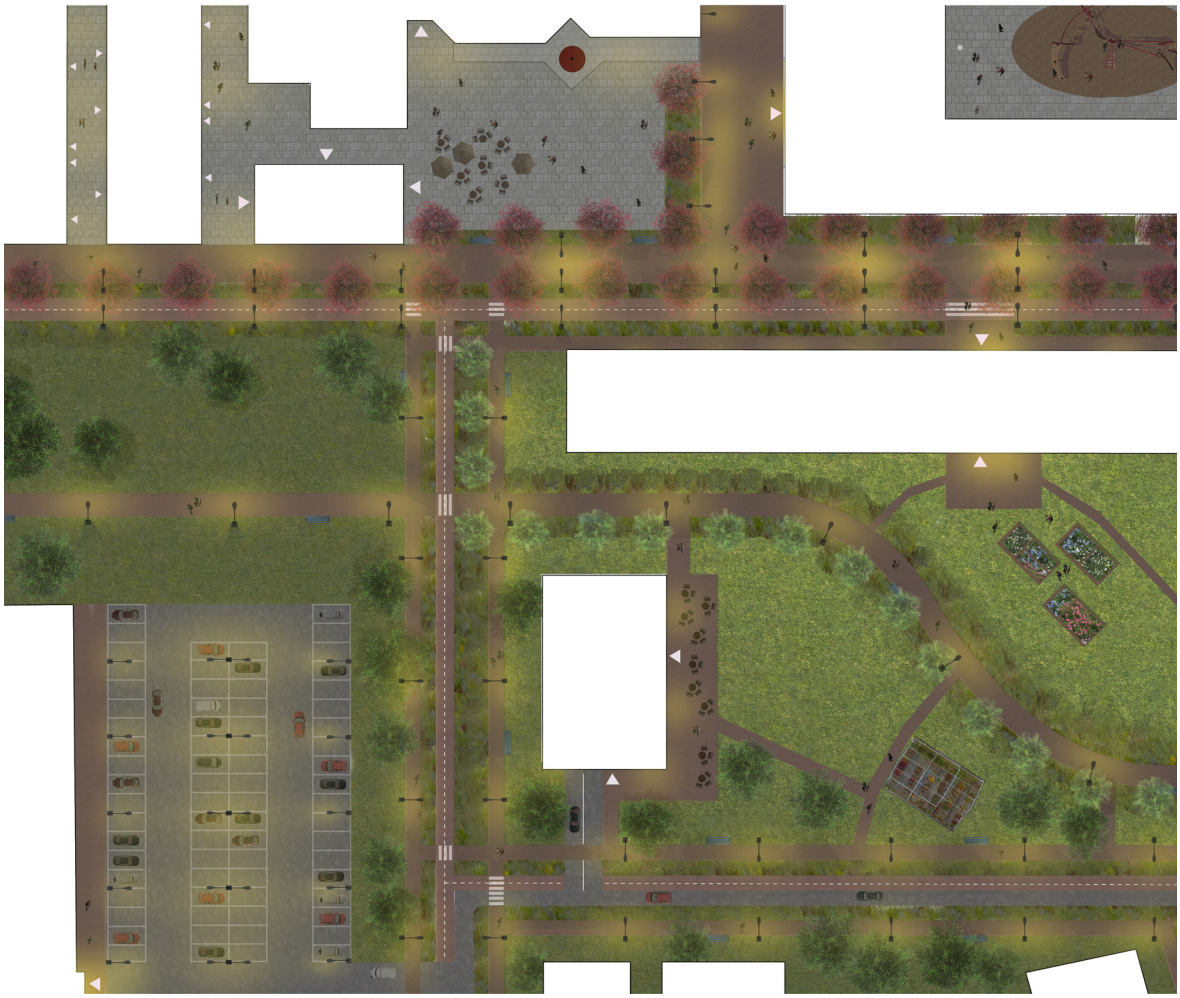


Figure 91: Lighting plan, 1:1000

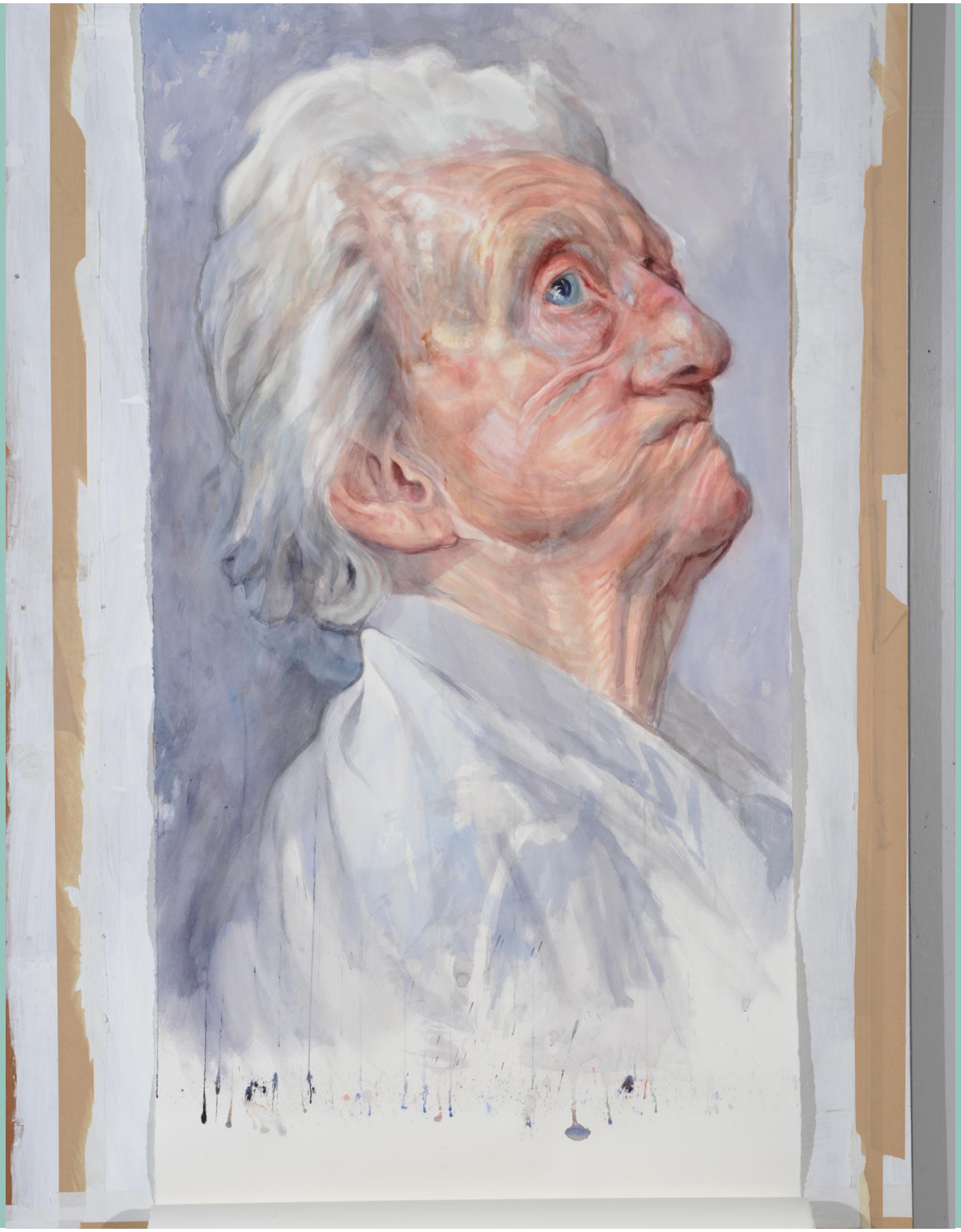


Figure 92: Portrait of someone with dementia (IV) (Struik, 2013)

IV: CONCLUSION, DISCUSSION & REFLECTION

The final part of this graduation thesis answers the main research question:

MRQ: How can Ommoord be adapted to improve the quality of life for people with dementia with the help of involved stakeholders?

Chapter 11 concludes on the main research question. In chapter 12 the outcomes of this research will be discussed. Finally chapter 13 reflects on this graduation process.

11.
CONCLUSION

The population of the Netherlands is aging enormously and because of that trend, more people will experience a form of dementia. Dementia is a syndrome that is caused by a brain disease or brain disorder, which makes it difficult for someone to function independently. The Netherlands hold the ninth position in Europe with the number of people with dementia. At the moment the health care costs are very high in the Netherlands and that's why the government wants people with dementia to stay at home for as long as possible. This is in line with the wishes of the elderly. Our neighbourhoods are not ready to support this vulnerable group and if we do nothing, the elderly with dementia will become housebound and the quality of life will deteriorate.

This thesis focuses on creating dementia friendly neighbourhoods, where Ommoord was chosen as the test case. Ommoord is aging rapidly and the inhabitants of Ommoord like to continue their live in their own house and environment. There is an enormous number of parties involved in the subject and it is therefore important to join forces to find a suitable solution. The main goal of this thesis is to develop a communication tool that on the one hand helps an urban designer / planner to develop dementia friendly neighbourhoods and on the other hand helps the urban designer to communicate with involved stakeholders. Therefore the main research question of this project is:

How can Ommoord be adapted to improve the quality of life for people with dementia with the help of involved stakeholders?

This chapter puts forward the final conclusions, derived from the research results presented in the different chapters of this report.

1A. What makes a neighbourhood dementia friendly?

We have to change the way how our neighbourhoods are designed and planned, so that people with dementia can live in society instead of separated

from society. For people with dementia it is important to remain connected to and participate in their local environment. Urban designers & planners must develop neighbourhoods that are "age-proof", where people in every stage of their life can function. Dementia friendly neighbourhoods are welcoming, safe, easy to access, visit, use and enjoyable for people with dementia and others. There are six design principles that can contribute to realizing dementia friendly neighbourhoods, namely accessibility, comfort, distinctiveness, familiarity, legibility and safety.

An accessible neighbourhood ensures that people are able to reach, enter, use and move around the places and spaces they need or wish to visit, regardless of any physical, sensory or cognitive impairment. This means that people can easily move through the neighbourhood, have access to local facilities and have social contact. In a comfortable neighbourhood people feel at ease and are able to visit, use and enjoy places and spaces of their choice without physical or psychological discomfort. Comfortable neighbourhoods contain green spaces, informal spaces and resting points. Moreover the different traffic flows are separated and extra facilities are offered, like more public toilets. People's attention and concentration are captured by the distinctiveness of the various parts in a comfortable neighbourhood, which aids orientation and wayfinding. It is important to have wayfinding points, varied urban form and different architecture to fulfil this principle. A familiar neighbourhood helps people to recognise and understand their surroundings, which helps to prevent and alleviate spatial disorientation and confusion and to aid short-term memory. Different types of streets can be distinguished in a catalogue of streets. Use of different colours is very helpful to see differences and regularity with the same places and people which is good for the familiarity. Legible neighbourhoods create better understanding of people where they are and help to identify which way they need to go, helping to prevent and alleviate spatial disorientation, confusions and anxiety. Designing the right street profiles helps a lot to achieve this theme. Moreover adding landmarks and signs will also contribute. Finally in a safe neighbourhood people are able to use, enjoy and move around the neighbourhood without fear of coming to harm. Social communities play a crucial role in this aspect. A better lighting system improves the safety of a place and traffic risks can be reduced by designing readable and frequent crossings.

These principles together can be bundled into a theoretical framework. Remarkable is that there is a lot of overlap in patterns between the different principles. This can be explained because there is a lot of overlap between the goals that each principle wants to achieve. Accessibility, comfort and safety are connected because all three argue that the neighbourhood can be used better. Familiarity and legibility both focus on better understanding of the neighbourhood. Distinctiveness is the only principle that has a kind of unique purpose.

There are relations between the different groups of principles (ACS, FL and C cloud), because some patterns can reinforce or supplement each other. If someone with dementia can concentrate better, it is easier to identify where he or she is and which way to go. The same goes for better understanding and entering. Understanding where the entrance is, helps to enter a place. It is possible to order the different patterns in a diagram, where a distinction is made between scale and tangibility.

1B. How dementia friendly is Ommoord?

Applying this framework to the neighbourhood Ommoord gives an overview on how dementia friendly the neighbourhood is at the moment. Ommoord scores very well on the aspect of comfort. There is a lot of green present and the neighbourhood is decorated with many trees. These trees provide enough shadow spots. Besides that these green spots can function as meeting places and stimulate social interaction.

However the accessibility of the place can improve significantly. The neighbourhood is developed with the idea that people only live in the neighbourhood, but use facilities outside the neighbourhood. For people with dementia this is not the case, because they do not drive a car and have difficulties using the public transport. It is good that the neighbourhood is not designed for cars, but now the structure is based on dead ends which is very confusing for a demented person. The closed plinths in the neighbourhood are a missed change for people with dementia. They do not have the possibility to make easy contact with people on the ground floor, because the ground floor is dominated by garage boxes. Moreover Ommoord is not distinctive, there is a lot of repetition in urban form and architecture. Adding more variety would be helpful because this would trigger people with dementia constantly so that they become concentrated. Using landmarks and viewports can help to improve the legibility of the place. The scale level of Ommoord is large and it must be researched if it is possible to bring the human scale back in the area. Finally there are not enough designed pedestrian crossings which causes unsafe situations.

This analysis resulted in a development area within the ring of Ommoord. The middle heart of the neighbourhood has to deal with the most problems. Besides that it deals with the general problems; closed plinths, no variety in building styles, non-active zones and a dead end structure, it also has some specific problems. The metro separates the middle part in a north and a south, but also in a south-west and south-east which makes it a barrier to cross. The connection with the other two neighbourhoods is not so strong designed. Furthermore not all the buildings in the middle heart have access to basic facilities and the park is a barrier in the connection north-west and north-east.

The heart has opportunities as well. Courts are formed by the position of the different flats, this can be stronger designed. Art objects can function as wayfinding points and the Romeynshof can develop into a new centre for the area within the ring. Finally better connections between the two other parts of the neighbourhood can be realised. The middle heart serves as a test case for the developed game.

2A. How can urbanism and non-urbanism professionals cooperate in the planning process for dementia friendly neighbourhoods?

Urban designers and planners will be confronted with very large challenges and that's why they need a team of specialist to come up with better solutions. For the challenge dementia in the neighbourhood different parties are involved.

A distinction can be made between power and knowledge network. Stakeholders in the power network have the means to change something, but also the status to block something. The stakeholders in the knowledge network are often the experts in the field. It is important that both networks cooperate. The power network includes the municipality (urban development and social development), care institutions, housing associations, Alzheimer Nederland and an urban designer & planner. The knowledge network consists of residents, people with dementia and (informal) caregivers.

Co-creation can play a role in different parts of the project. For setting up dementia friendly neighbourhoods it is important to focus on the beginning stage of the planning process, whereby the personal vision will be strengthened by other group members. Sharing personal visions helps to learn and to understand the problem better. A deeper problem exploration will lead to better ideas in the next steps. After this problem exploration a proposal can be realized.

This idea of co-creating in the beginning phases of the design process can be compared with the double diamond from the British Design Council. The process of discovering yourself, discovering together and defining together fit in the diverge (discover) and converge (define) steps in the first diamond. After this a joint problem definition will be achieved. Next, the urban designer & planner can think of different solutions in the develop step. Hereafter it is important to ask the involved stakeholders if all their ideas are translated in the right way to complete the delivery step (first proposal).

2B. How to use knowledge from non-urbanism experts to reinforce the urban design and planning principles?

Before knowledge from non-urbanism professionals can be used it is important to translate the urban design and planning patterns. Some patterns will be understood, but there are patterns that are less familiar. A way to do this is to create a visual language, which consists of word and images. This ensures a better comprehension of the patterns.

To come to the deeper knowledge layer of people it is recommended to use tools, because generative sessions ensure that you get to know what people know, feel and dream. Using tools stimulates the collaboration between stakeholders, because games motivate and engage people to intensive interaction. Moreover it helps to keep everyone on the same page. Using tools gives players the opportunity to do something out of the ordinary and freely within the boundaries of time and space. Besides that it helps stakeholders to think critically when solving complex problems. Each game should have a goal which is not that simple, so that the players are challenged and use a higher order of skills. The focus from the players must be kept by using the focus curve. First interest must be stimulated. The next step is to make the players curious about what they can learn. If they do not stay in this round, they will certainly miss something. In the final phase the interest is the lowest, but one has to leave with the idea that something beautiful will come out.

Another idea is to combine all the knowledge fields into a network. It helps stakeholders to see the problem as one system and where they are dependent on each other. Some of the problems will also play a role in other knowledge fields. Connecting problems helps the stakeholder to organize the data and learn from it. Finally it gives discussion material to talk about. The group should not be larger than 5 to 7 people, because otherwise not everyone will give his input. In a small group the introverted people will be more active.

During the game, it is possible to work with the two knowledge systems that every person possesses, namely inspirational and experimental thinking, so that people can learn from each other. Each person has a preferred system, but using both ensures that creativity takes place. Inspirational thinking gives people the opportunity to break from reality and generate ideas where everything is possible. People fall back on other situations if they think from the experience.

2. How can various stakeholders with the help of a tool contribute to creating a dementia friendly neigbhourhood?

The answers to the various sub-questions have led to requirements for the tool. Moreover, this is supplemented by the feeling of the designer about

the case. The feeling of ignorance was the guiding theme, because the stakeholders do not know who is doing what and how, and someone with dementia sometimes does not longer has control over situations.

This resulted in the game "Hersenspinsels". "Hersenspinsels" can be played by stakeholders with expertise in different knowledge fields, but all having the same goal making the neighbourhood dementia friendly. The aim of the game is to stimulate co-creation between the relevant actors by exploring the challenges for a specific neighbourhood in the Netherlands.

The tool will be used when someone in the power network notices that there is an increasing amount of people with dementia (to be expected) or experiences that a neighbourhood is not dementia friendly anymore. Hereafter the power and knowledge network are invited to take part in two different sessions. Next the urban designer & planner can use the output to create a first design (which is target group and location specific). This first design will be evaluated by the two networks together to finalize it. Moreover other goals within the neighbourhood could be used to strengthen the design. Hereafter it is possible to create a final design.

There are three rounds in the game: an individual discovery phase where all participants develop their own vision, a connection phase where the participants look for the broader perspective and a conclusion phase where new insights can be achieved. The discussion in round 2 and 3 is recorded, so that no valuable information is lost. In addition, a photo must be taken of the game board after these rounds.

In the discovery phase, the participants evaluate 57 urban patterns. A questionnaire can be used to indicate which patterns are poor or well-developed in the chosen neighbourhood. Sometimes there may also be a need for a pattern that is already present. The participants were given a dictionary, where the patterns are explained in images and pictures. At the end of this round, each player chooses 6 crucial game tiles to be used by himself in the next round.

Next in the connection phase the stakeholders will collaborate. In turn, the players lay a tile on the table, explaining why the tile was chosen. The next player tries to connect his or her tile to the ones already placed on the table. At the end of this round there is a cloud of tiles that are connected to each other, which stimulates the discovery of new relations.

In the conclusion phase, participants evaluate the network of tiles to gain new insights. At the end of this round the problem has been explored and there is a plan that needs to be focused on for the chosen neighbourhood.

3. How can the output of the tool be integrated in a design for Ommoord?

The tool was played in two sessions: one with the power network and one with the knowledge network. The power network likes to focus on three important aspects in Ommoord: improving the pedestrian infrastructure, realizing social communities and adding more basic facilities in the area. There must be more space for the pedestrian in the neighbourhood, realising round and wide paths. It is important to design places where people can meet and to make people more aware of dementia. Next, basic facilities must be situated in the heart of Ommoord, but also welcoming spaces and places of activity must be realised. Finally, the power group wanted to realize more wayfinding points to improve the distinctiveness of the area.

The knowledge network wants to create a pedestrian friendly Ommoord, with safe, frequent and readable crossings. The walking paths must be illuminated, wide, separated and not based on a dead end structure. In

addition, there must be sufficient benches, points of contact and public toilets. Adding basic services in the heart was also seen as a good solution. The knowledge network also wants to add wayfinding points to improve the readability of the area.

The different outcomes are structured in a new game board. This game board consists of tiles that have received a flag, star or that have been discussed a lot. This new board helps the urban designer & planner to develop a vision about the area. Furthermore, it provides guidelines on elements that can be developed easily and quickly and elements that can only be realized in the future. Finally it provides insights in the relationships between the different patterns.

1. How to adapt Ommoord to improve the quality of life for people with dementia?

Ommoord will be a connected neighbourhood in 2030, where there is enough space for the pedestrian. Basic facilities will be added in the heart of Ommoord, more awareness will be created for dementia and there will be spaces realized where people can meet each other. Furthermore wayfinding points such as landmarks will be added in the area to increase the legibility of the place.

The new plan "Remember Ommoord" will developed in 7 phases. In the first phase, the parking spaces are removed in the courtyards. In addition, there will be a meeting centre where people will be informed of the developments regarding the realization of a dementia-friendly neighbourhood. In the second phase, a better connection will be realized with the rest of the neighbourhood. This new ring is also the main connection for the heart of Ommoord. A number of pavilions will be placed in the third phase. In these pavilions, social interaction is stimulated and it is possible to ask for help. In the fourth phase, the second ring is constructed, which makes it possible to reach these pavilions. The fifth phase focuses on transforming buildings into a more transparent ground floor. In the sixth phase, residents are allowed to participate in decisions about the design of their courtyard, so that they become four unique places. Finally, stores and care centres are being added in the heart of Ommoord. These developments will make Ommoord dementia-friendly.

How can Ommoord be adapted to improve the quality of life for people with dementia with the help of involved stakeholders?

With the answers on the different research questions, the main research question of this project can be answered. Conclusions can be drawn on the process and the design side of this project.

Co-creating in the beginning phase has effected the results in a positive way. By joining forces at the start of the process the problem has become clearer. If the research only relied on the urban designer & planner, the area would have been developed in a different way. As a result, the design would not fit perfectly with the wishes and needs of stakeholders involved and would therefore not be the optimal outcome for the neighbourhood. The developed tool "Hersenspinsels" helps the urban designer & planner to facilitate co-creation with involved stakeholders, because on the one hand the tool stimulates collaboration between the involved stakeholders and on the other hand it explores the challenges for a chosen neighbourhood. In this approach the urban designer & planner plays an important role. This person is the only one involved in every step of the process. During the group sessions, he or she supervises the game and must ensure that the outcome is applicable in a design. Hereafter, the urban designer & planner is challenged to combine the different outputs into one vision and to use his creativity for a first design.

The outcome of "Hersenspinsels" has led to an initial design for a specific target group (people with dementia) and location (Ommoord). Furthermore, the outcome helps to decide on a timeline for the different development phases. According to the stakeholders of the two sessions, Ommoord has to be a more accessible, safe and comfortable neighbourhood in the future for people with dementia. Moreover, wayfinding points have to be added to increase the legibility of the neighbourhood. This has been translated in the plan "Remember Ommoord". "Remember Ommoord" focusses on the pedestrian. The basic facilities become part of the heart of Ommoord, there will be places where people can meet and moreover, more awareness will be created for dementia. Finally, recognizable objects are added to increase legibility.

12. DISCUSSION

The first part of this chapter discusses the results gained from this graduation project. In sub-chapter 12.1 the established framework will be discussed. Sub-chapter 12.2 analysed the developed tool "Hersenspinsels". Hereafter sub-chapter 12.3 describes the role of the design. Sub-chapter 12.4 evaluates the role of the urban designer & planner. Next sub-chapter 12.5 discussed if the tool is also applicable for other neighbourhoods in the Netherlands. Hereafter sub-chapter 12.6 evaluates the different methods used in this research. Finally sub-chapter 12.7 gives some recommendations for further research.

12.1 THE ESTABLISHED FRAMEWORK

To understand what a dementia friendly neighbourhood should look like, a theoretical framework has been set up. The principles of Mitchell and Burton served as a basis to complete the entire framework and is supplemented with patterns by the work of others. This without affecting the six principles.

In the first instance, it has not been proven that these principles and patterns work in practice, because a dementia-friendly neighbourhood has never been realized. Dementia-friendly neighbourhoods have been established, but every neighbourhood has been closed off so that someone with dementia does not have the ultimate freedom. Research should show whether these principles can alleviate the symptoms of someone with dementia and determine whether people with dementia can actually live longer at home by the application of these patterns.

During discussions with involved stakeholders, some patterns were designated as not suitable for people with dementia. For example realizing water elements causes more danger than comfort, because there is a chance that people will drown. People from the knowledge network were also convinced that the irregular grid would cause more confusion for someone with dementia. The sessions have therefore

resulted in two patterns that should be removed from the framework.

Moreover, the principles of Mitchell and Burton would change a subsequent step in the research. The safety principles have too much overlap with the accessibility and comfort principles. This means that this principle does not has its own goals for the realization of a dementia-friendly neighbourhood and in a next step the patterns can be divided between the accessibility and comfort principle. In this research none of the stakeholders have chosen for familiarity as an solution to upgrade the neighbourhood. On the one hand it is possible to conclude that neighbourhoods such as Ommoord need other principles to transform. But on the other hand by analysing the principle in more detail, there are only two patterns in this category that have a different purpose than the legibility principle (coloured streets and the use of colour). The patterns could be moved to the distinctive principle, because they meet the goals of this principle. This would result in four categories to realize a dementia-friendly neighbourhood: accessibility, legibility, comfort and distinctiveness.

However, when playing the game, some new principles were introduced. Places where people can have a drink or ask for help are valuable additions to the framework. The power network argued for more technical solutions to be added to the game. New gadgets for dementia could perhaps be facilitated in the public space, such as the realization of emergency telephones. It is the question whether the developed patterns for this principle fit in the existing themes, or that it is necessary to add a new theme. If there are other themes, the input of the total game changes, so that the outcome can be different.

It can be concluded that the goals within the principles must be further investigated in a next step. The principles have too much overlap, which means they cannot distinguish each other enough. Although it is advisable to continue to use the principles in the game, because they ensure that the tiles can be connected to each other.

12.2 THE DEVELOPED TOOL "HERSENSPINSELS"

I'm absolutely convinced that the use of the tool in the realization of dementia-friendly neighbourhoods is a valuable addition. In the case of this project, my ideas about the neighbourhood have changed, because if I only had to determine the new strategy and design, the neighbourhood would become more legible. The sessions with the stakeholders have shown that there is a greater need for improvement in accessibility which is enhanced by safety and comfort. Moreover, these sessions ensured that you as an urban designer & planner know what is feasible and what is not. Besides that different programs and themes are discussed, so that the developed strategy can respond to this. The result is that the design and strategy better meets the wishes and needs of involved stakeholders. The solution for a chosen neighbourhood is better studied and more fitting. The following paragraphs discuss the content of the various components of the tool in more detail.

12.2.1 The role of the tool in the planning process

The tool is designed to bridge the step between the individual problem and the collective problem. So that the urban designer and planner gets more information before he creates a first design proposal for a chosen neighbourhood. I believe that the tool is helpful in accomplishing this, because it provided good results for drawing up a vision and guidelines for the design.

It is important to mention the goal of the tool to the different stakeholders before the session starts, so that everyone understands the goals. Moreover the power network found it important that someone who started the process could demonstrate why the chosen neighbourhood is vulnerable. A short introduction before the game is played would therefore be a valuable addition. Both networks were enthusiastic about using a tool in a first phase of a project, because people clearly understand who is doing what and what the challenge is for a chosen neighbourhood. Instead of working alongside each other, they now collaborate to realize a dementia friendly neighbourhood.

It is not the case that the various parties do not come together in the current situation, but the sessions between them are not effective enough to ultimately get the right output according to one of the stakeholders in the power network (appendix I). The use of the tool ensures that effectiveness is achieved and that there are clear action points for the urban designer & planner. At the moment, the tool is only intended to help the urban designer & planner. When distributing tasks in the session with the power network, other stakeholders can also take up tasks. For example, in this case the power network would want to create more awareness for dementia, which is not directly a task for the urban designer & planner, but for one of them. It can be concluded that there are chances for the tool to use it as a starting point for other stakeholders. At the end of a session, the various tasks must be discussed and divided by the stakeholders. Dividing tasks applies less in the knowledge network, because they do not have the means or influence to take up tasks. However the people from this group could be deployed in a later phase of the process.

The game board of "Hersenspinsels" could be used to evaluate whether people from the power network have completed the tasks they agreed on after playing the game. With different flags can be marked what is done, where there is still work to be done or they even still have to start. This not only makes the tool an important part at the beginning of the process, but it also offers possibilities at a later stage in the process. Moreover, everybody is kept informed about the process so far.

12.2.2 The pattern language as a means of communication

The pattern language can be used to organize and structure the data. Moreover it is also a good way to discuss the data with involved stakeholders. The tool has taken this idea further, because the involved stakeholders realize their own pattern language, so that they can discover the relations and hierarchy in scales and abstractness between the different patterns. Realizing a network has many advantages for stakeholders. An advantage is that stakeholders see the relationships between different problems as a system, whereby they are dependent on each other. The tool helped the participants to realize a network by connecting the different tiles. In the evaluation after the game, the stakeholders indicated that they saw the problem in a broader perspective by connecting tiles and that they were inspired by the others (appendix O). Moreover, both networks saw it as a challenge to connect all tiles.

Using the pattern language has not only advantages for the involved stakeholders, it also give the urban designer and planner a lot of freedom to create a first design. The problem is fixed in the pattern language, but how the problem will be solved is free for interpretation. As a result, there are still challenges and opportunities for the urban designer and planner to use his or hers expertise.

The pattern language was set up in three steps. In round 1, the participants explore the problem themselves, which they experienced as very positive (appendix O). They had to determine which patterns they liked to see developed with priority in a chosen neighbourhood.

However, there are points of improvement for the first round. The participants from the power network found it difficult to choose the most crucial tiles, because the question how to choose was not clear. Some participants did a spatial analysis for Ommoord and evaluated what is good en not good developed. Others looked from their field of expertise. Moreover, not everyone was familiar with Ommoord, which made it difficult to do a thorough analysis. The evaluation form caused a lot of confusion. New research should show whether the use of an evaluation form is a good way to choose tiles.

Another point of improvement is that the participants are not aware of the different principles in the game. To make players more aware of this, it is an idea to link the patterns in the dictionary to the developed research principles. The participants are than able to consciously choose specific principles.

There is also room for improvement in round 2. In this round, the participants connected their crucial tiles to the other tiles of the other stakeholders. It is doubtful whether they considered the theme to which they connected the tiles. This is especially true if it is possible to connect the tiles with two possible themes. During the analysis of the video and sound recordings, it became clear that people are looking at the shading, but do not seem to think about the principles. This was confirmed by my observation during the game after asking the participants if they were thinking about the principles when connecting tiles. In a further development of the game, this should be explained more clearly. I recommend to add some critical questions about the shading to help players think about how the patterns could be connected.

In round 3 the different players evaluated their own pattern language, so that a clear vision was established. The power group discovered a hierarchy in the developed game board and had found clear themes that should be a priority. Participants from both networks agreed on the fact that the proposed ideas are analysed, structured and tested for feasibility. This gave everyone the idea that they were one step further in developing a dementia friendly neighbourhood (appendix O).

12.2.3 Learning from each other

The different learning systems can be triggered to learn from each other. In the theoretical framework, it has been determined for each round in the game which learning system should be triggered to achieve maximum results.

In the first and second round the inspirational learning system was triggered. What I've found is that connecting tiles ensured that people learn from and about each other (appendix O). This is because participants explain why they have chosen a tile. A participant from the power network was positive about the playful way of discussing. The stakeholders were inspired by each other's tiles, because some tiles became feasible and realistic. Moreover, the problem was viewed from a different point of view, which led to surprising new ideas (appendix O). In my opinion, this was also the best round for the designer, because his vision was enriched with new patterns. This has led to new inspiration for me to improve / strengthen the plan.

However a few things in the game could be improved in the second round. The inspirational learning system could be used more. The intention is to get rid of the real situation and look at the problem from new perspectives. On the one hand, the game meets the requirements, because the stakeholders surprised each other, but on the other hand the stakeholders should also be able to come up with new patterns. At the moment the blanc tiles are hardly used in the game, which is a missed chance. It could be considered to let the participants think about new patterns in

advance, before they have even seen a pattern from the framework to stimulate the use of the white tile. The developed tool did not trigger the stakeholders to generate new ideas. Another goal that I would like to see developed in the game is that stakeholders reflect on the game board and supplement new ideas in the pattern language with ideas from their knowledge field. I am aware that this is a very challenging goal. New research should show whether it is possible to add this to the game.

The use of this experimental learning system functioned very well in round 3. The players evaluated if their ideas are feasible and concrete. Sharing experiences ensures that the urban designer & planner will not focus on the wrong things when realizing a design. However sometimes the discussion fell silent in this round. Therefore it is important to add a few critical questions to evaluate the game board.

12.2.4 Design of "Hersenspinsels"

The design of the game "Hersenspinsels" can also be improved. The shading on the tiles consists of stripes and dots, which represent the different principles to design dementia friendly neighbourhoods. It was difficult to distinguish the different principles. Testing should prove whether using colours instead of black and white stripes and dots would create a clearer tile. In addition, the participants spent a lot of time reading the tiles, so they had less time to think about the content. Perhaps it is possible to use the drawings from the dictionary, but this can also cause a lot of confusion. Testing a larger font is also worth the effort.

Finally, it is important to add a manual on how the tiles can be connected, so that the participants will do this more consciously. It is also necessary to improve the developed dictionary. All denials and negative phrases should be replaced by positives phrases, so there are less problems with filling in the form.

12.3 ROLE OF THE DESIGN

The analysis phase becomes more intensive by using the tool, because a switch from research to design is not made directly. The input from stakeholders is used to gain more knowledge about the subject. The abundance of information ensures that the urban designer & planner is challenged when developing a first plan for Ommoord.

"Hersenspinsels" helps the urban designer & planner to make a preliminary dementia friendly design and strategy for a chosen neighbourhood. The design and strategy are specific to the target group at a specific location. From my point of view, the design is not finished yet, because other problems or qualities in the neighbourhood at that time should be tackled in a next step. In this step it is important to see whether certain goals and initiatives can work together with and strengthen the developed plan. Sub-chapter 10.5 stated a number of recommendations for Ommoord. The theme of sustainability can be part of the developed plan in several ways.

The preliminary design should be discussed by the involved stakeholders. In this phase of the project, it is important to bring both networks together, so that it is possible to evaluate whether their input has been correctly translated into the design. The preliminary design can generate new ideas, which enhance the design. This was not the case during my evaluations, but it is conceivable that if the groups are brought together they will come up with new ideas.

12.4 THE ROLE OF THE URBAN DESIGNER & PLANNER

12.4.1 Types of urban planners

There are different kind of urban planners; the advocacy planner, the communicative planner, the manager planner, the market planner, the process planner, traditional planner and the strategic planner

(Rocco & Rooij, 2018), but this game is mainly a tool for the process planner and the communicative planner. Process planners want to create democratic processes to integrate all relevant actors in order to make common decisions regarding the urban development. This will result in more involvement in the project, more responsibility of involved stakeholders and less resistance against the plan. Networking and communication skills are therefore very important. The communicative planner believes in participation and is convinced that sharing knowledge and experiences will create better urban developments. The process is as important as the final outcome. Communication skills are very important for this planner, because complex problems must be explained to non-urbanism professionals. Moreover consensus between the different stakeholders must be achieved. Both planners are convinced that bundling forces will lead to better plans.

The developed tool "Hersenspinsels" meets both types of planners, because it helps to establish a network to collaborate. On the other hand, it also helps to discuss the topic with the result that they jointly choose a solution direction. The urban designer & planner is supported by the developed tool "Hersenspinsels" so he does not has to be an expert on communication. In doing so, the urban designer & planner must recognize the importance of collaborating with other professionals otherwise the tool will not be used. Hopefully the game "Hersenspinsels" will make it easier for other planners to seek consultation with stakeholders, because solving complex problems requires collaboration.

12.4.2 The urbanist of the future

It can be expected that more and more complex problems will arise in the future. A person no longer has all the knowledge to solve such a problem. Complex problems require cooperation between different parties to achieve the best result.

In my opinion it is important that the urbanist of the future can set up collaborations between involved stakeholders. In this project gaming with a team of selected experts was used to facilitate the co-creation, but there are other forms of co-creating which can be useful in the future. To respond to this trend of more complex problems, I think it is valuable to teach current students co-urbanism, because an urbanist should have these skills.

12.4.3 Inviting stakeholders

Everyone in the power network can start the process to transform a chosen neighbourhood. In this project, the urban designer & planner started the process to transform Ommoord into a dementia friendly neighbourhood. As a result, I had to invite the different involved stakeholders for the game.

The first session with the power network was easily arranged, but to find the right persons in the knowledge group was a difficult task. The urban designer & planner is the only person who also participates in the knowledge session and must therefore invite the parties. In this case, the other parties in the power network have a bigger and a more complete network and the probably know who to invite for the knowledge network. It is advisable to make a list of potentially interested people at the end of the power group session, so that in the end it is easier for the urban designer & planner to approach the right parties.

It essential to invite inhabitants of the chosen neighbourhood for the knowledge session, so that someone looks "neutrally" at the neighbourhood. In this project, there was unfortunately no "neutral" player. He or she could have chosen tiles from another point of interest. This probably would have affected the results of the game.

12.4.4 The urban designer & planner in a group session

The role of game manager fits the urban designer & planner, because he or she is the only one involved in both sessions. Members of the power and knowledge network were of the opinion that it was nice to have a urban designer & planner present during the group sessions (appendix O). Despite the dictionary, there were sometimes questions about the patterns that the urban designer & planner could easily answer. The game already ensured that there was a clear focus on finding urban solutions, which meant that the urban designer had little to intervene. However a lot of guidance was needed while playing the game "Hersenspinsels", because the different rounds had to be explained.

During the sessions, the urban designer & planner must check if it is possible to create a first design with the developed outcome. If not, he or she is the one to ask in-depth questions to come to a better outcome. Moreover, ideas from the power network can be tested in the knowledge network. In this case this functioned very well. The power group wanted to make the facades transparent. The knowledge network did not come up with that idea immediately, but because I connected the tile they saw the value of this proposal and were convinced. They even put a star on it.

After the sessions with the knowledge and the power network, the urbanist must develop a plan for a chosen neighbourhood. In my opinion it is important that this is done by the same urban designer & planner who was present at these sessions. This person is the only one who can make links based on conversations that occurred during the two sessions.

An important finding is that the role of the urban designer & planner is different in both sessions. In the power session the urban designer & planner is part of the entire team and is one of the participants. The other stakeholders in this network have experience in making urban development plans, which means they need less guidance. In the knowledge network, the urban designer & planner is the only one with urbanism knowledge and helps the others to think of solutions in the field of urbanism, where they sometimes have to be challenged to translate ideas so they can be used in the public space.

In this study there were different dynamics in the two groups. There were conflicting interests in the power group, which led to much discussions. This made it less necessary for the urban designer to steer the discussion. In the knowledge network this was completely the opposite. The participants from the knowledge network were united, so there wasn't a deep discussion. In further development it should be examined whether some questions can be added to the game to generate a more in depth discussion. For the power group it is important that the discussion continues to focus on the design, because in this group the discussion was not always design-oriented. In the knowledge group the participants must be helped to acquire knowledge of urban design and to think out the box, so that they do not stick with the existing.

12.4.5 Use of the creativity of the urban designer & planner

After the two sessions the urban designer & planner is challenged to create a first design. The use of patterns from the different sessions gave the urban designer & planner a lot of freedom, because the "dementia" problem is established, but the solution space is not.

The knowledge of the urban planner is used to realize a first design, so it is necessary to have a background in urban design and planning. Creativity can be used to find suitable solutions. In addition, the urban planner can use the entire framework to strengthen connections between patterns or to make a link

between two thoughts. At the end of this step a first design can be presented.

12.5 USING THE GAME IN OTHER NEIGHBOURHOODS

The tool has a lot of added value for today's urban designer and planner, because collaboration is needed to solve complex problems. On the one hand the tool helps to connect people and on the other hand it helps to share knowledge between different knowledge fields. With this input a better first plan can be created by the urban designer and planner.

The participants from the two sessions were enthusiastic about the game and would like to use it in other neighbourhoods in the Netherlands according to the evaluation form. One participant of the power network even wants to use the game in other contexts, but that requires a lot of further development of the game.

Hersenspinsels has the potential to be used in other neighbourhoods in the Netherlands, because the established framework contains an overview of all possible solutions to make a neighbourhood dementia friendly. It must be investigated whether different patterns are chosen in other neighbourhoods. This seems plausible now, because the participants of the two sessions have chosen patterns that are specific to Ommoord. For example creating more green spaces is not relevant for Ommoord, but could be a valuable pattern in a city centre.

When testing the game it can be discovered whether the different networks give different answers in different neighbourhoods. I do have my doubts whether the knowledge network would actually throw up other tiles. The knowledge network has mainly used tiles that could be applicable to any neighbourhood, because they have chosen more general tiles. Further research must show whether this is actually the case if the tool is used in other neighbourhoods. If the results are actually the same, one might consider having a session with the power network, which outlines the greater vision for the area, which is supplemented by the fixed image from the knowledge network.

It is difficult to transfer the design for Ommoord to another neighbourhood in the Netherlands, because the design is neighbourhood specific. The ideas generated for Ommoord will not be similar for another neighbourhood, because the circumstances are always different in other places and situations. In addition, I believe that it is not wise to develop a set of patterns for similar types of neighbourhoods, because the social context can be different.

Another question is whether the tool can work if a vision has already been established by a composite group. In this case I think it is difficult to use the tool because the tool explores the general problem before a vision is determined. Sticking to a vision ensures that the added value of the tool is limited, because certain patterns will be excluded in advance. Of course patterns from the framework can be used to supplement the already established vision, but there is a good chance that you will not expose the real problem. Moreover, a fixed vision will ensure that certain groups no longer want to work together, because their input is no longer considered relevant.

12.6 DISCUSSION OF METHODS

In addition to the theoretical perspective, some remarks with regard to the methods and results can be made.

12.6.1 Testing with laymen

During this project I did several tests with laymen. In the beginning I did a fieldwork workshop with students and just started professionals to get a grip on how dementia friendly Ommoord is. These people were randomly selected and had no direct link with

Ommoord. The results could be different if residents of Ommoord had participated in this session, because they know their neighbourhood best.

The dictionary developed for the game has been tested by laymen who had no urban design and planning background. This dictionary is the result of three people who wanted to test it, where I made a selection between people who are visual orientated and people who are textual oriented. We went through the dictionary together. Notes and drawings were made. It may also be that I have interpreted the results differently than they were actually intended.

Finally, the game "Hersenspinsels" has also been tested with a group of urban design students, which may have affected the design of the game.

12.6.2 Selection of participants for the sessions with the tool

In the analysis part of this report, a distinction was made between a power and knowledge network, each representing a number of parties. Unfortunately, not all participants were able to participate in the session. Alzheimer Nederland missed the session of the power group, which was a pity because they are the experts on the subject. Moreover I think they would have had the possibility to convince the people to go for other tiles. In the power group, a large part of the group knew each other before the session started, making it easy for them to talk to each other and it became very friendly. With five strangers the ambiance would have been different.

The team that was set up in the knowledge network was also incomplete. Unfortunately there was only one resident present and no informal caregivers. The group of residents could also have ensured that the neutral opinion of residents could also be included as stated in sub-chapter 12.4.3. In addition, participants were asked to take part by other participants, which influenced the results as well. The selection of the participants for the two sessions for the game might have influenced the results of the game, which means that you always have to be critical on the results.

12.6.3 The urban designer & planner with too much background knowledge

In this project, I was the one who started the process to create a dementia friendly neighbourhood. By analysing statistics and applying the framework to a chosen neighbourhood, a risk area was found. As a result, the urban planner already developed knowledge about the neighbourhood. In another situation, someone else in the power network could start the process. In this case the urban designer & planner has no knowledge about the location, because he or she hasn't analysed the neighbourhood in advance. Nevertheless, it is useful if the urban designer & planner already has some prior knowledge about the neighbourhood. Time-wise it is not always possible to analyse the neighbourhood before a session, but existing analysis and documents can be used to understand the neighbourhood. Not all patterns will probably have been analysed in these documents, but it will give the urban designer & planner some insights in the problems of the neighbourhood. This can make the urban designer & planner biased but a true professional should always stay critical.

"Hersenspinsels" is intended for urban planners, who would like to collaborate and share knowledge with stakeholders. I played the role of urban planner myself and I already had knowledge in the field of communication. Moreover I am very well aware of the usefulness of co-creation. Another urban planner & designer can look at collaboration with stakeholders in a completely different way, which could have influenced the results of this thesis.

During this process, I have spoken with many people, who could have influenced my opinion in advance. Furthermore, I already had some knowledge about dementia in the neighbourhood in advance. An urban designer & planner does not necessarily has to have prior knowledge about the target group, because other parties will contribute this knowledge. As a result, even more could be learned from the stakeholders involved in the actual situation.

Finally I am more aware of the relationships between the different patterns that may have affected the choosing. Moreover, I think that choosing crucial tiles happens very differently if you have 30 minutes to think about it, or when you just have been studying the subject for half a year.

12.6.4 Evaluating the plan for Ommoord

As a final step, the design was evaluated by the stakeholders involved. Because it was timewise not feasible to bring both networks together, two volunteers from both networks evaluated the plan in this study. As a result, it was not possible to study the dynamics between the two networks.

12.7 RECOMMENDATIONS FOR FURTHER RESEARCH

The thesis has led to new fields for research. Some of them are already revealed in the previous sub-chapters. Sub-chapter 12.5 argues for testing the tool in other neighbourhoods. In sub-chapter 12.1 attention is paid to adjusting the framework. Sub-chapter 12.3 describes that there must be a next step for the knowledge and power network, where the two networks collaborate. Finally chapter 12.2.3 describes how more new knowledge can be generated. This sub-chapter explains these goals in more detail.

12.7.1 Testing the game in other neighbourhoods

First of all it is important to use the game "Hersenspinsels" in other neighbourhoods of the Netherlands. This makes it possible to find out whether different patterns are chosen in different neighbourhoods. It is important to investigate whether each neighbourhood has a specific problem. Moreover, organizing new sessions will lead to new ideas to add to the framework. In addition, it can be investigated whether it is important to use both networks, or whether the results of the knowledge network remains the same in other neighbourhoods.

12.7.2 Adapting the framework

If the game offers good results in other neighbourhoods, it is important to adapt the existing framework. First new research about the subject has to be added to the existing framework. Secondly, research should be done in the technical domain to create more pattern options. The development in the technical field is considerable Technical solutions could help people with dementia in the urban space or their caretakers. Can the public space be arranged to support these developments? At the moment there is no research into the possibilities. The next question is if there are new solutions, do they fit in the existing themes? A thorough analysis should show whether all technical solutions would fit under the six main themes that were set up. If this is not the case then there must be freedom to come up with new themes. The result is that a follow-up game can therefore have different principles.

12.7.3 Workshop for the testing phase

In this research project, two participants from two different networks evaluated the design to determine whether the ideas were translated correctly. To continue co-creation in the rest of the process of creating dementia friendly neighbourhoods, it is important that a workshop format is developed. In this workshop

the two networks will collaborate to elaborate the first design proposal. It is important that the opinion of both parties is of equal value. Moreover, at the end of this session a consensus must be reached between the two networks. Research is needed to develop the format for this workshop.

In this phase it is possible to discuss how certain elements from the plan can be realized, where consideration must be given to how residents can be involved in the development plan. Until this point, there were only two "neutral" inhabitants in the knowledge network involved and it is important to create as much support as possible for the plan.

12.7.4 Reflective participants

During the game, it became apparent that only a few new ideas were launched, because the involved participants mainly used the existing patterns. The game focuses on choosing the right patterns, whereby the opinion of other knowledge fields is requested. The result is therefore better thought through so that a better development plan is created for a chosen neighbourhood.

It is relevant to investigate whether the tool can help stakeholders to become reflective practitioners. Reflective practitioners can transform unknown concepts by improvising a reaction. In this case, the reflective practitioners can read the game board and are able to adjust the knowledge, contributing to their knowledge field. Hereby new knowledge is developed and as a consequence new patterns will be added to the game board (filling in the blank tiles). Further research should show whether this is feasible or whether this becomes too difficult for the participants.

13.
REFLECTION

Through this thesis, the development of setting up dementia friendly neighbourhoods has been studied, with a clear focus on using other knowledge fields to come to a better embedded and suited solution. In the last chapter of this graduation project, I want to reflect on a few aspects.

13.1 RELATION BETWEEN URBANISM AND SCIENCE COMMUNICATION

For me this thesis is the most ideal combination between both masters. This topic supports both fields and I'm convinced that they strengthen and complement each other constantly. Creating dementia friendly neighbourhoods supports vital urban designs, where people can live in every phase of their life.

Realizing dementia friendly neighbourhoods is complex and the help of experts is needed, because they know exactly where people with dementia have to deal with in the everyday life. Connecting experts with an urban designer & planner ensures that the solutions are better embedded and suitable for the chosen neighbourhood. The designed tool is the outcome of studying these two fields. On the one hand it helps to give urban designers and planners guidelines how the neighbourhood can be adapted to become dementia proof. On the other hand it helps to communicate with involved stakeholders.

The result of using this tool is that there is more support for the subject by the other stakeholders. Besides that they are also willing to share their knowledge and to collaborate with the others. Moreover it resulted that the idea for the transformation is changed from a recognizable Ommoord to a more accessible Ommoord. This new vision is better in line with the wishes of the participating parties. If I didn't combine both fields, the outcome had been a lot less relevant, because it was then only based on my personal fascination.

Comparing this thesis with the people, planet and profit diagram, you could conclude that it mainly focusses on the combination of people and profit. Realizing attractive living environments for the people, helps to keep them vital and social. To let them stay longer in the neighbourhood, the government will save costs on the health care budget. Planet cannot be excluded, because there are opportunities in the design to make it more sustainable. Because it was not in the scope of this research, limited attention was paid to this, but it can be strengthened.

13.2 RESEARCH VERSUS DESIGN, DESIGNER VERSUS ACTORS

This graduation project is conducted with two important lines: the research & design line and the designer & actors line. It is a way to structure the graduation thesis and to be aware of the interaction between the two different lines. They strengthen and complement each other constantly in every phase. During the project, a balance was constantly sought between the two lines (Appendix P).

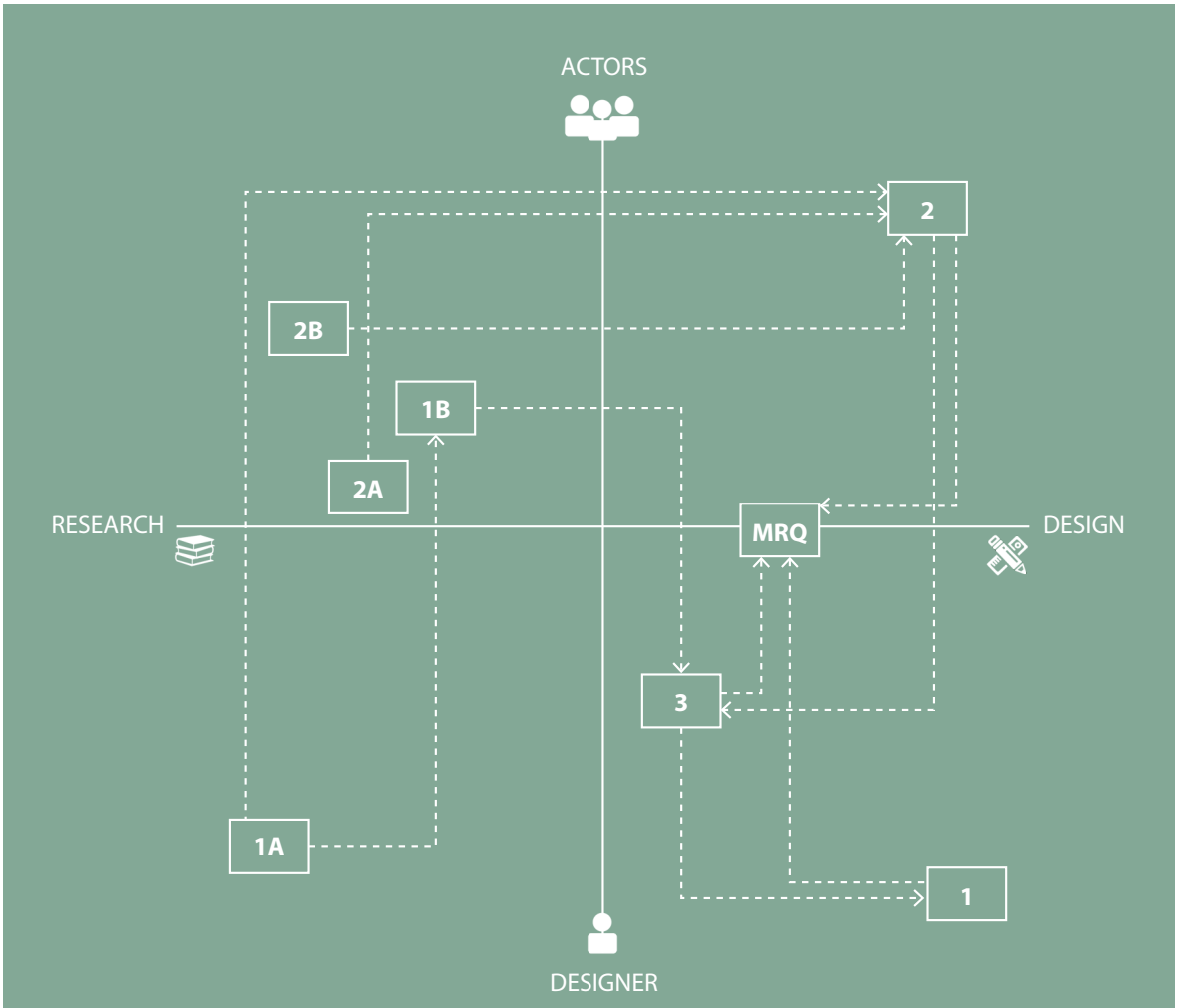
This sub-chapter evaluates how the two lines have influenced the project. Figure 93 illustrates the position of the different research questions on the two axis. There are some findings. In the analysis part of this project the study focusses mainly on research. On the one hand, the designer had to do research into the principles and patterns that a dementia-friendly neighbourhood should have (1A). The outcome of this question has been applied to Ommoord, to determine how dementia friendly the neighbourhood is (1B). In this step, involvement of the actors was needed to be able to analyse all patterns. The same applies to research into processes & stakeholders (2A) and co-creation (sharing knowledge & setting up a joint problem, 2B). In the first phase it is therefore important to constantly test ideas from research with actors to improve them.

In the design & strategy part of this project the first switch to the design side is made. The gained knowledge from the analysis part has resulted in a design for "Hersenspinsels" (2). To play "Hersenspinsels" stakeholder involvement is needed to achieve the maximum result. The output of the game should be organized in the answer of research question 3. In this step, a switch was made from involving actors to processing by the designer. Ultimately, this ensured that the designer could make a preliminary design to realize a more dementia friendly Ommoord (1).

The most important conclusion from this research is that a step from research to design has not been made immediately, but the involvement of stakeholders is necessary to facilitate this step. Secondly, The interaction between designer and actors is important, but there was a phase in the project where the designer had to process the results himself (figure 94). The first loop is used to strengthen research through the knowledge of actors. The second loop ensures that the tool could be developed and used. Then it is up to the urbanist to process the results and convert them into a strategy and design. The third loop can then be started, in which the designed plan is evaluated by stakeholders. The design is reinforced and supplemented with other themes (not necessarily aimed at dementia). Finally, the interaction between designer and actors has ensured that theories could be tested in practice, which has improved the result of the developed products.

13.3 SCIENTIFIC GAP

Design guidelines for dementia care homes have been studied for several years. The research has shown that the internal environment plays an influential role in the capabilities and emotional wellbeing of people with dementia (Mitchell et al., 2003). In the future the majority of older people with dementia live at home, around one third of them on their own (Mitchell et al., 2004). Although people will live in their



MRQ: How can Ommoord be adapted to improve the quality of life for people with dementia with the help of involved stakeholders?

1. How to adapt Ommoord to improve the quality of life for people with dementia?
   - A. What makes a neighbourhood dementia friendly?
   - B. How dementia friendly is Ommoord?

2. How can various stakeholders with the help of a tool contribute to creating a dementia friendly Ommoord?
   - A. How can urbanism and non-urbanism professionals cooperate in the planning process for dementia friendly neighbourhoods?
   - B. How to use knowledge from non-urbanism experts to reinforce the urban design and planning principles?

3. How can the output of the tool be integrated in a design for Ommoord?

Figure 93: Interaction between the two lines

own neighbourhood, similar research does not exist in relation to the outdoor environment (Mitchell & Burton, 2010).

In 2003 (Mitchell et al.) a literature study has been done on the needs of older people with dementia and on current knowledge of best practice for internal environments. Six design principles have been set up, namely familiarity, legibility, distinctiveness, accessibility, comfort and safety. These principles enable older people with dementia to continue to be a part of their neighbourhood. Another paper provides some preliminary recommendations for these principles for designers, at all scales from urban design to the design of street furniture. These criteria can be considered in developing dementia-friendly urban areas (Mitchell et al., 2004). In 2010 Mitchell and Burton expanded their research and defined dementia-friendly neighbourhoods as welcoming, safe, easy and enjoyable for people with dementia and others to access, visit, use and find their way around. A number of new recommendations for designing and adapting neighbourhoods to become dementia-friendly arose from the research (Mitchell & Burton, 2010). A paper in 2017 presents new and distinctive insights into the relationship between neighbourhoods and everyday life for people with dementia that has important implications (Ward et al., 2017).

Mitchell & Burton did a lot of research to find applicable design and planning patterns for a dementia friendly neighbourhood. Other researchers have tried to supplement the framework of Mitchell and Burton, but the applicability of the framework on an existing neighbourhood has not been researched. This thesis focused on that aspect. The patterns of Mitchell & Burton are mainly researched from the urban perspective. In this research these urban patterns will be used, but the patterns are supplemented and strengthened with knowledge from other involved disciplines, which has led to a great emphasis on

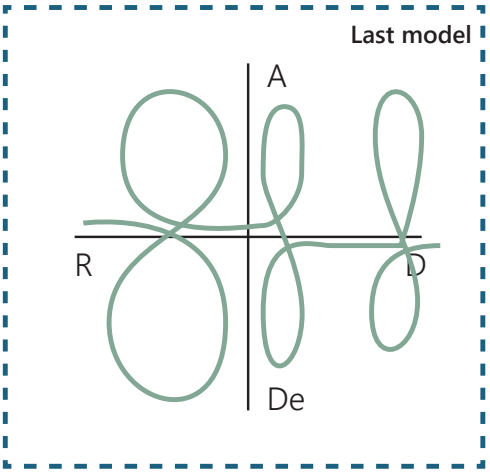


Figure 94: Last model

involving stakeholders in the development of a dementia friendly neighbourhood to create the best solution. This research will be a valuable addition to the fields of urbanism, communication, social wellbeing and healthcare.

13.4 SOCIETAL RELEVANCE

The Dutch population is aging and an aging society brings new challenges (Robertson et al., 2015). An aging generation ensures that chronic illness will become more widespread (Ward et al., 2017). Dementia is a disease that is expected to affect one in five elderly people (Alzheimer Nederland, n.d.-a).

"The global action plan on the public health response to dementia. The main goal is to increase public awareness, acceptance and understanding of dementia and making the societal environment friendly will enable people with dementia to participate in the community and will maximise their autonomy through improved social participation. Alzheimer's disease international supports that view and believes that dementia friendly communities can change the way people think about dementia and improve the quality of life of people with dementia (Alzheimer's Disease International, 2017, p.2)."

In the Netherlands a lot of awareness is created for people with dementia. Alzheimer café's organize workshops, where different themes are discussed. These workshops are available for all people with or affected by dementia. Different trainings are organised on how to deal with someone who has dementia. There is also a program in which the talents of people with dementia are better utilized (Alzheimer's Disease International, 2017).

The Dutch government has changed their health policy. Elderly people have to stay at home for as long as possible (Doekhie et al., 2014), which is also in line with the wishes of the elderly people (Boer & Vriens, 2014). The focus of the government has mainly been on creating awareness by the Dutch population, while the power of the design of the neighbourhood is almost neglected. This is a missed opportunity as academic research has shown that the built environment is one of the aspects which influences the quality of life for people with dementia. The outside environment is essential for the successful performance of activities of daily living (Mitchell et al., 2003) and for stimulation, exercise and health (Mitchell, 2004). This thesis responded to realizing dementia friendly neighbourhoods.

13.5 ETHICAL DIMENSION

Every citizen should be able to participate in society even when they have physical or mental disabilities. This project focuses on people with dementia, because people with dementia are now locked up in nursing homes. The future perspective of people with dementia will be different, because elderly people with dementia have to live at home for as long as possible. It must be prevented that people with dementia will get housebound, because the urban environment does not fill their needs.

This thesis ensures that the outdoor environment is attractive for people with dementia without being anxious. In Ommoord there is a need for the realization of a more accessible, safe and comfortable neighbourhood. People can move around easier in an accessible neighbourhood. A better pedestrian structure will contribute to this. The safety is increased by establishing contact points and better designed crossings. Finally, benches and toilets will increase comfort.

However it is important to keep in mind that not only people with dementia live in the neighbourhood, but that other citizens use the same neighbourhood as well. Moreover it is proven in literature that people with dementia like to have contact with other city

users. People with dementia, just like children, can be seen as vulnerable groups. Designing for the most vulnerable people in the city, also ensures that the neighbourhood is useable for the others. This design ensures that it can serve all kind of groups.

It is important to asks the opinion of non-demented people to create support to realize this dementia friendly neighbourhoods. The tool "Hersenspinsels" tackles this problem. In the power network different stakeholders from different companies discuss a chosen location. For example, the municipality does not only considers Ommoord, but sees the neighbourhood in a broader perspective. Housing corporations represent all residents and not just the people with dementia. In the power network someone was missing which represents the people with dementia. Alzheimer Nederland could not be there, but in my opinion this is a crucial stakeholder. There are many stakeholders in the knowledge network who have direct links to the clinical picture, because also "neutral" inhabitants are invited for this session.

Another important pitfall which must be prevented is to generalize the population and ignore the diversity of people within the group. There are many kinds of elderly people and they have different wishes and needs. The different wishes and needs of elderly people must be researched to have a better underpinned solution. Elderly people with a different backgrounds should therefore be invited to participate in the knowledge session. It is important to remember this when re-using the tool and to use it for the best result.

13.6 PERSONAL NOTE

This report has enriched me in many ways. At first I learned many new things about urban design & planning, communication and dementia, but on a more personal level it was also an interesting process. I have been searching for a long time for what I enjoy doing and who I am as a professional.

You are hardly given any guidance on this during the Master of Urbanism and I think you are being educated too much as a traditional designer & planner, while not everyone wants to go that way. The subjects on communication differ so much that it was sometimes difficult to choose a specific field of knowledge.

This graduation thesis has enriched me, because finally my two passions came together: urban planning and co-creation. It was fantastic to discover that there are so many opportunities and challenges to better connect these fields. Moreover after this project I can express what my qualities and interests are. The neighbourhood medicine was my first challenge to show others that it is valuable to connect these two fields. Hopefully in the (near) future many more of these challenges will follow.

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APPENDICES

Appendix A: Hogeweyk

Hogeweyk is the first and only dementia village in the Netherlands which can be compared to the mentioned principles and patterns to see if they are applicable. The neighbourhood consists of 23 houses with a total of 152 elderly people who have a form of dementia or Alzheimer's in different stages. A sliding door at the reception, where someone is always present, forms the connection with the outside. The residents cannot just leave the neighbourhood (De nieuwe praktijk, 2016).

Hogeweyk has been designed in such a way that the demented residents can freely move through the neighbourhood. The residents can move freely, but stay in a protected environment. The Hogeweyk is very diverse in design with different outdoor spaces (figures 1, 2 & 3). Every outdoor space serves a different purpose. The theatre square, for example, is ideally suited for street theatre. There are several shops along the boulevard, but there is also a general practice and a physiotherapist. The green has various functions for the well-being of the residents. Green means relaxation, experiencing the seasons, and health. Various gardens and parks are present in the Hogeweyk (Hogewey, n.d.). Everyone who works in the neighbourhood keeps an eye on things. Seven lifestyles are recognized in the Hogeweyk complex: traditional, urban, Gooise, cultural, Christian, Indian and domestic. These lifestyles make people feel at home (De nieuwe praktijk, 2016). Besides that Hogeweyk has different facilities, like a theatre, restaurant, café, supermarket, internet café, hairdresser and a beauty salon (Vivium zorgroep, n.d.).

How dementia friendly is the plan of Hogeweyk?

Literature search has confirmed that aging in the neighbourhood is the best medicine for people with dementia. This is not in line with the recently designed dementia village, because people will live there later in life if they reach a certain stage of dementia. In the case of Hogeweyk people must learn to live in unfamiliar surroundings, which is challenging. Besides that people are also locked in their own neighbourhood, so that people with dementia never are really endangered. Moreover, there is always staff in the area and they are less dependent on their environment.

As a result, Hogeweyk has missed a number of opportunities in the field of accessibility, comfort and safety. The public spaces are not that informal as in other neighbourhoods. Because only people with dementia are living in the area, they will be very noticeable. Moreover there is not a lively atmosphere provided by other non-demented residents. Demented people like to live in social communities which do not apply to this concept. Finally, there are no intergenerational places where people with dementia can meet young people. However, the enclosure of Hogeweyk has also provided a number of advantages. Hogeweyk, for example, is designed to be a pedestrian friendly neighbourhood. The fact that no other road users use the area is another advantage, whereby many harmful situations are prevented. The intersections are also a lot safer.

If Hogeweyk is examined on the level of street and place, then it meets the requirements of a dementia-friendly neighbourhood very well. In the field of accessibility and safety, the paths are well-defined and the footpaths are wide. There is an active ground floor and all the levels are accessible. The crossroads are readable and people regularly meet the same people in the public space, creating trust to walk around the neighbourhood. What is remarkable in the design of Hogeweyk, is that there are many dead ends, which leads to losing the way for people with dementia. Not all gardens are part of the main route and some of them are more hidden than others, which makes it difficult to understand and to find them. Also, there are many junctions where a person with dementia

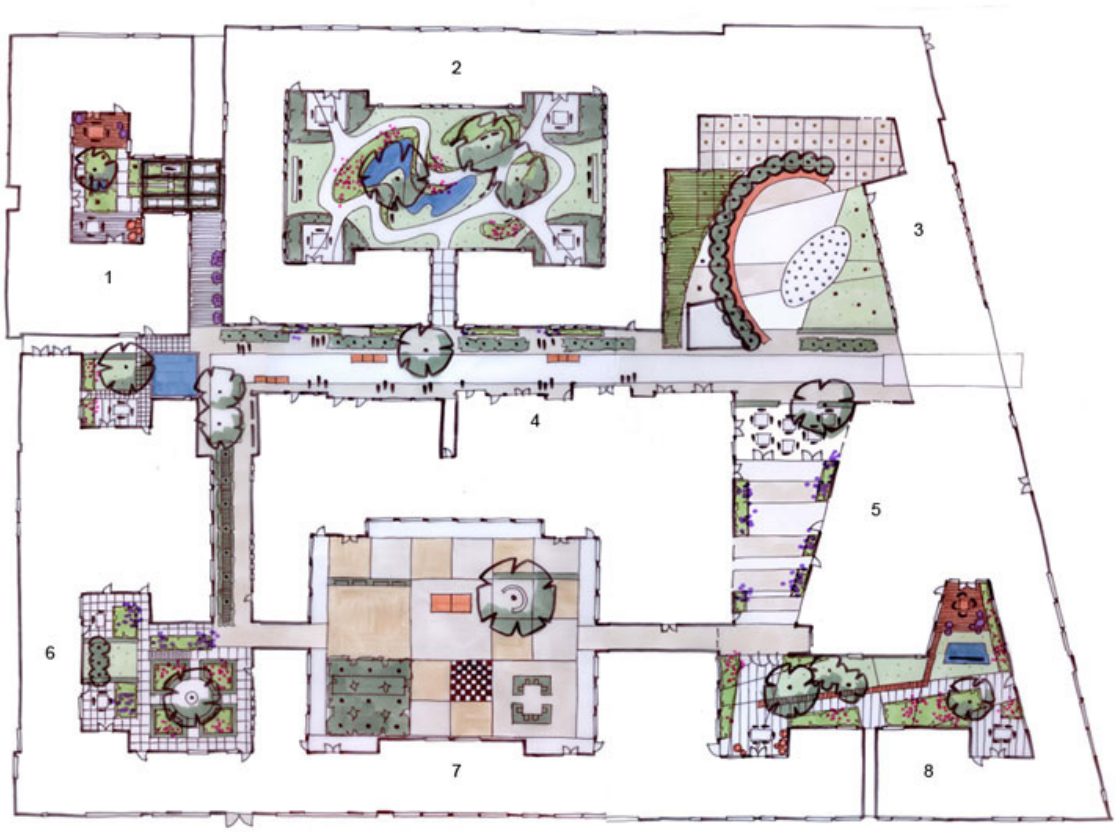


Figure 1: Map of the public space in Hogeweyk (Hogewey, n.d.)

Figure 2: Restaurant (Roozen, n.d.)

Figure 3: Enjoying Hogeweyk (Tolenaar, 2018)

has to choose which paths he wants to take. The road structure is not that clear for this vulnerable group.

Fortunately, this has been solved to a large extent by the use of landmarks. The buildings have different facades, there are trees that can show the way and there are sightlines. It can be concluded that legibility, familiarity and distinctiveness are very well incorporated. The streets are short and narrow. Furthermore, buildings follow the building line. Through the different lifestyles, which are realized by Hogeweyk, different public spaces have been designed. There are different types of street furniture and there is also variety in colour use. The different parts of the neighbourhood are very distinguishable.

Finally, there are also enough green areas to create comfort. There are trees and there is a water element. There are enough shaded places and benches. In addition, there are enough toilets available.

It can be concluded that Hogeweyk meets most requirements for becoming a dementia friendly neighbourhood. The principles that have been applied make life easier for demented elderly people. Yet it remains to be seen whether Hogeweyk is a real neighbourhood, because it is closed off from the outside world, so that elderly people with dementia still live very protected.

Appendix B: Mapping (Dutch)

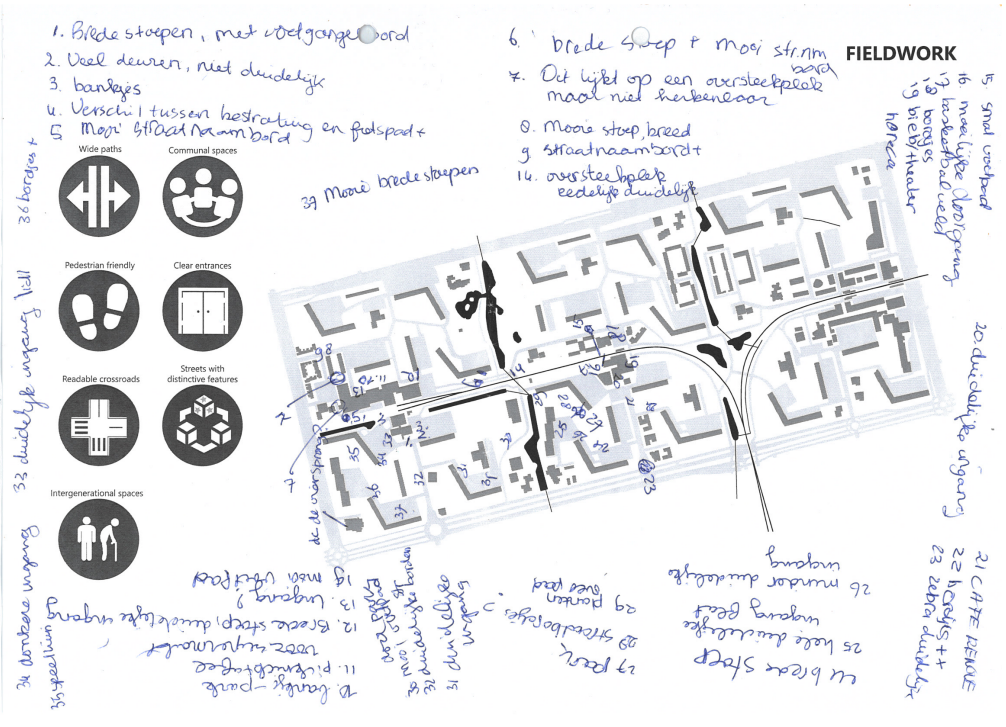


Figure 4: Medical student

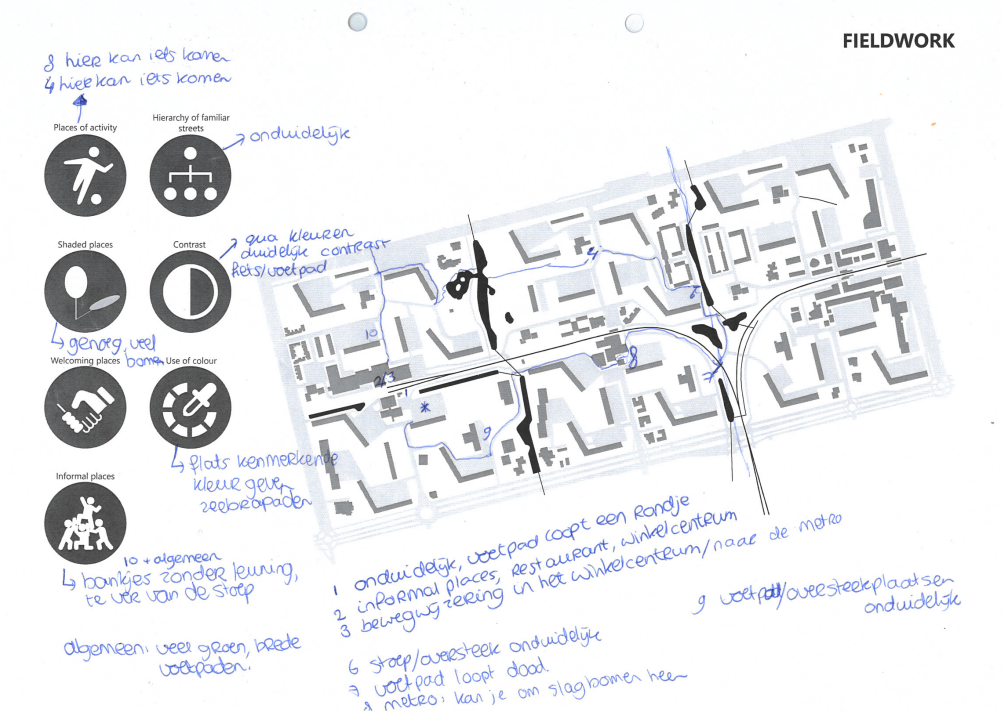


Figure 5: Physiotherapist

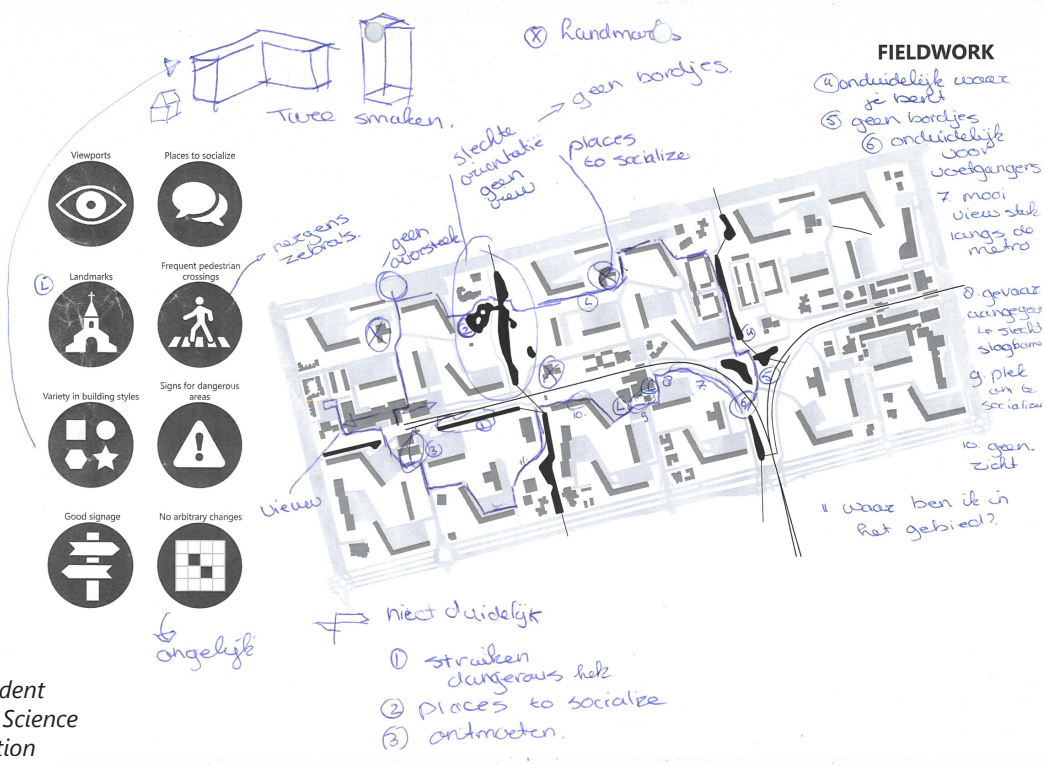


Figure 6: Student Urbanism & Science Communication

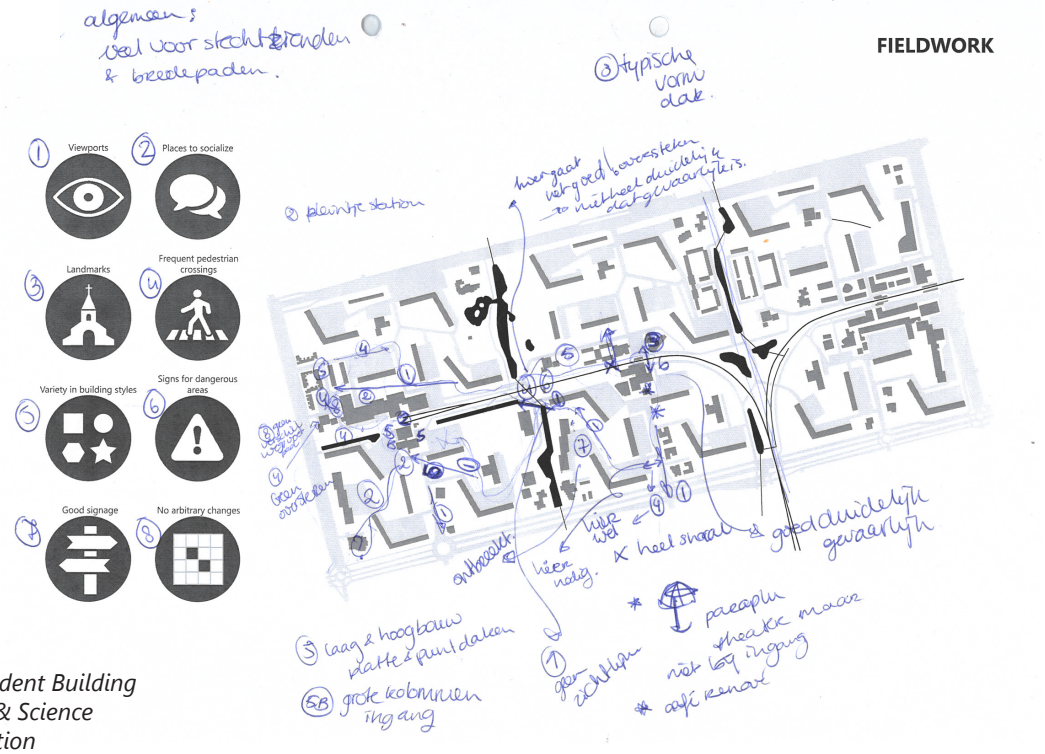


Figure 7: Student Building Technology & Science Communication

Appendix C: Ranking

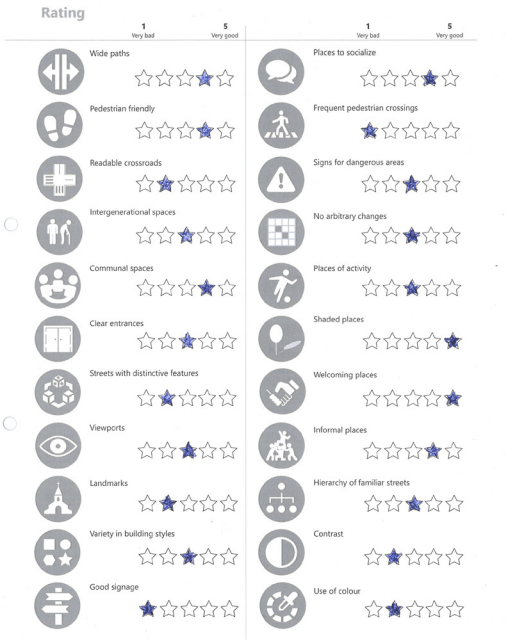


Figure 8: Medical student

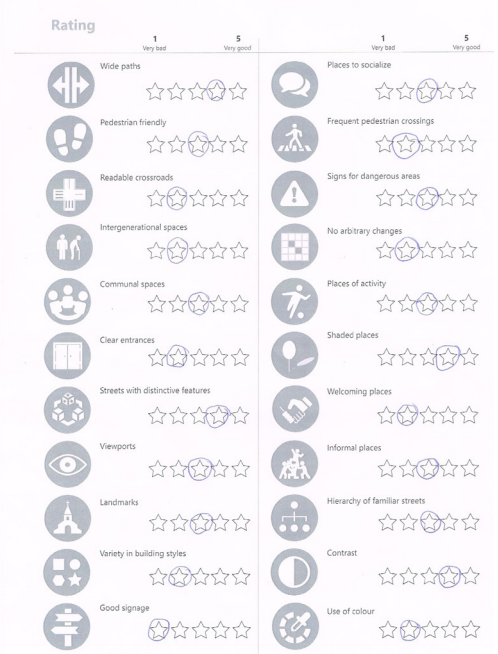


Figure 9: Physiotherapist

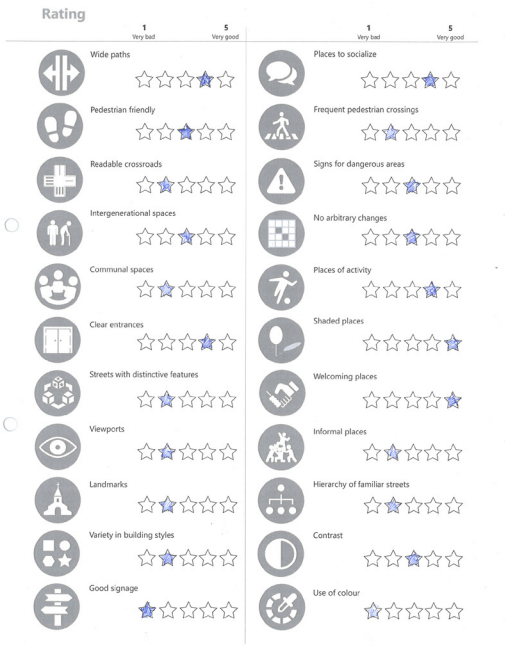


Figure 10: Student Urbanism & Science Communication

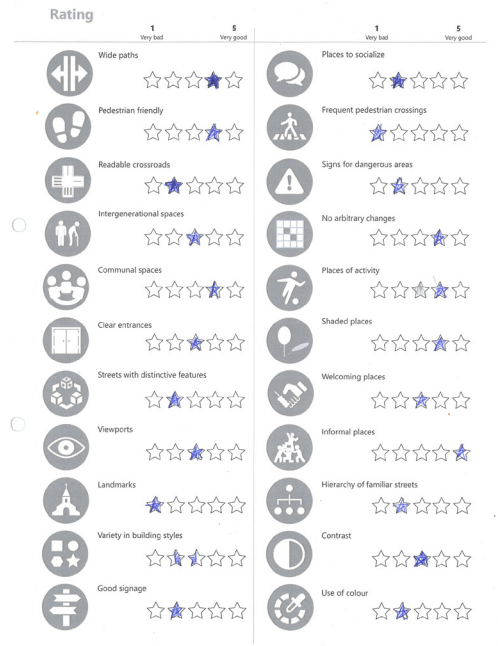


Figure 11: Student Building Technology & Science Communication

Figure 12: Total Ranking

Appendix D: Game rules (Dutch)

Hersenspinsels is een spel bedoeld voor verschillende stakeholders, die hetzelfde doel voor ogen hebben, namelijk het realiseren van een dementievriendelijke wijk. Mensen met dementie moeten en willen graag in dezelfde wijk blijven wonen voor zo lang als dat mogelijk is. Op dit moment zijn de meeste wijken niet adequaat ingericht voor mensen met dementie. Deze ziekte zal de komende jaren een steeds grotere rol in de stedelijke omgeving gaan spelen door de toenemende vergrijzing. Verschillende kennisvelden aan elkaar koppelen zorgt ervoor dat de bedachte en ontworpen oplossingen beter passen en het zorgt ervoor dat de maatschappelijk-ruimtelijke wijkopgaven die gepaard gaan met dementie beter worden uitgediept.

Het doel van dit spel is om de samenwerking te stimuleren tussen de relevante actoren door de opgave te verkennen voor een specifieke woonwijk in Nederland. De stedenbouwkundig ontwerper kan vervolgens met de output van het spel aan de slag om inrichtingsvoorstellen verder uit te werken. Het spel bestaat uit drie ronden: een individuele 'ontdekkingsfase', waar alle deelnemers een eigen persoonlijke visie ontwikkelen; een 'verbindingsfase' waar de deelnemers op zoek gaan naar het bredere perspectief; en een 'conclusiefase', waar tot nieuwe inzichten kan worden gekomen.

Voor het spel zijn de volgende materialen nodig:

- 8 Spelregel bladen
- 8 vragenlijsten
- 8 Woordenboeken
- 8 Gekleurde doosjes
- 8 Jokers
- 16 Lege tegels
- 228 Speeltegels
- 8 zwarte vlaggen
- 8 grijze vlaggen
- 8 witte vlaggen
- 8 sterren
- 8 driehoeken
- 64 pionnen in 8 verschillende kleuren
- 8 Krijtjes

Elke speler krijgt 1 doosje met 1 joker, 2 lege tegels, 1 zwarte vlag, 1 grijze vlag, 1 witte vlag, 1 ster, 1 driehoek, 8 pionnen in verschillende kleuren en 1 krijtje. De 228 tegels worden gesorteerd naast het speelveld neergelegd. Na ronde 2 en 3 zal er een foto worden gemaakt van het speelbord. Tevens wordt de discussie in ronde 2 en 3 opgenomen, zodat er geen cruciale informatie verloren gaat. Het spel bestaat uit drie ronden die hieronder kort worden toegelicht.

Ronde 1: Ontdekkingsfase – elke actor bekijkt de situatie

De eerste ronde is individueel, waarbij iedere speler een vragenlijst moet invullen. Hierdoor ontwikkelt iedereen een persoonlijke visie. In de vragenlijst beoordeelt elke deelnemer afzonderlijk 57 stedenbouwkundige begrippen om een dementievriendelijke wijk te ontwikkelen. Niet iedereen zal bekend zijn met deze stedenbouwkundige begrippen en daarom kan men gebruik maken van het woordenboek, waarbij elk begrip wordt uitgelegd door middel van een tekst en een plaatje.

Nadat het formulier is ingevuld mag elke deelnemer zes voor hem of haar cruciale stedenbouwkundige begrippen voor een dementievriendelijke wijk kiezen, die vervolgens in zijn/haar doosje opgeborgen kunnen worden. Een deelnemer kan bijvoorbeeld thema's kiezen, die zwak zijn in de wijk, die juist heel goed zijn en/of thema's waar een deelnemer zelf veel expertise over heeft. Deze keuze van zes tegels vormt het startpunt de tweede (interactieve) ronde van het spel.

Ronde 2: Verbindingsfase – de actoren leren van en over elkaar

In de tweede ronde is het de taak om de gekozen tegels te verbinden met andere tegels. Het doel is om het probleem in breder perspectief te gaan zien. Om de beurt leggen de spelers een tegel op tafel, waarbij ze uitleggen waarom de tegel gekozen. Het geven van uitleg zorgt ervoor dat spelers begrip krijgen voor elkaars visie. Spelers kunnen dezelfde tegels hebben, dan moeten deze op elkaar gelegd worden. De tegels hebben verschillende arceringen. De arcering geeft aan in welk thema de tegel hoort. Er zijn zes thema's, namelijk comfort, leesbaarheid, onderscheidenheid, toegankelijkheid, veiligheid en vertrouwdheid (zie voor de verschillende soorten de toelichting in de doosjes). Een tegel kan maximaal in drie thema's behoren.

Het kan voorkomen dat een speler een verbinding tussen twee tegels ziet, maar dat die door de arcering van de tegel niet mogelijk is. In dat geval kan de joker ingezet worden. Er is een nieuwe verbinding gecreëerd. Bovendien kan het leggen van tegels ook nieuwe ideeën oproepen. Spelers kunnen hun blanco tegel met idee verbinden aan een tegel in het speelveld. Aan het einde van deze ronde ontstaat er een wolk van tegels die met elkaar verbonden zijn. Niet alle tegels passen aan elkaar, dus het kan ook voorkomen dat er meerdere wolken ontstaan. Eventueel kunnen er nog extra tegels aan het speelveld worden toegevoegd.

Het resultaat is dat er nieuwe relaties worden ontdekt tussen de tegels en dat partijen inzien dat ze elkaar kunnen versterken door krachten en gedachten te verbinden.

Ronde 3: Conclusiefase – actoren reflecteren gezamenlijk op de gelegde relaties

In de laatste ronde worden de wolken geanalyseerd door de spelers gezamenlijk om tot nieuwe inzichten te komen. Tegels kunnen verlegd worden om meer of nieuwe verbindingen te maken. Daarnaast heeft elke speler beschikking tot een aantal pionnen:

- Een zwarte vlag: Een droom, die in de toekomst gerealiseerd moet worden en veel voorwerk vergt.
- Een grijze vlag: De oplossing op de tegel vraagt een klein onderzoek, maar moet zo snel mogelijk gerealiseerd worden.
- Een witte vlag: De oplossing op de tegel wordt direct toegepast.
- Een ster: Tegel met de beste oplossing.
- Een driehoek: Tegel met een minder goed idee.
- Verschillende pionnen, die de andere deelnemers representeren: Pionnen kunnen gebruikt worden om de verantwoordelijkheid aan te geven.

Het doel van de ronde is om een discussie op te roepen tussen de verschillende partijen. Wat valt er op? Op welke tegels moeten we nu of in de toekomst focussen? Welke tegels hebben veel connecties met anderen tegels? Waarom is dat? Aan het einde van de ronde is het probleem verkend en is er een plan waar er op gefocust moet worden in de desbetreffende buurt. Dit helpt de stedenbouwkundige om het plan verder te ontwikkelen.

Appendix E: Questionnaire (Dutch)

ER IS BEHOEFTE AAN:	HELEMAAL NIET MEE EENS	NIET MEE EENS	GEEN MENING	MEE EENS	HELEMAAL MEE EENS	MIJN 6 SPEELTEGELS ←
OBJECT 1. Duidelijke bewegwijzering						
2. Duidelijke ingangen						
3. Geen niveauverschillen						
4. Geen willekeurige wijzigingen						
5. Gemarkeerde hellingen / trappen						
6. Goede verlichting						
7. Kleurrijke plekken						
8. Openbare toiletten						
9. Rustplekken						
10. Schaduwplekken						
11. Toegankelijke verdiepingen						
12. Veel bomen						
13. Veilige oversteekpunten						
14. Verhoogde moesttuinen						
15. Waarschuwingsborden						
16. Water element						
STRAAT 17. Begrensde voetpaden						
18. Brede voetpaden						
19. Buffer zones						
20. Contrasterende objecten						
21. Gebouwen volgen de bouwlijn						
22. Geen doodlopende straten						
23. Gekleurde straten						

Figure 13.1: Evaluation form

	HELEMAAL NIET MEE EENS	NIET MEE EENS	GEEN MENING	MEE EENS	HELEMAAL MEE EENS	MIJN 6 SPEELKAARTEN ↓
24. Gescheiden wandelpaden						
25. Korte straten						
26. Leesbare kruispunten						
27. Opvallende straten						
28. Ronde wandelpaden						
29. Slingerende straten						
30. Smalle straten						
31. Transparante begane grond						
32. Zicht op het einde van de straat						
WIJK 33. Basis voorzieningen (500m)						
34. Bewustzijn creëren voor dementie						
35. Directe routes						
36. Doorkijkjes						
37. Gecentraliseerde winkels						
38. Gemeenschappelijke ruimtes						
39. Gevarieerde architectuur						
40. Gevarieerde stedelijke vorm						
41. Groene plekken						
42. Herkenningspunten						
43. Hiërarchie van verschillende straten						
44. Informele ruimtes						
45. Kleine straatblokken						
46. Levendige plekken						
47. Onregelmatig grid						

Figure 13.2: Evaluation form

	HELEMAAL NIET MEE EENS	NIET MEE EENS	GEEN MENING	MEE EENS	HELEMAAL MEE EENS	MIJN 6 SPEELKAARTEN ↙
48. Ontmoetingsplekken						
49. Open plekken						
50. Plekken voor jong en oud						
51. Secundaire behoeften						
52. Sociale gemeenschappen						
53. Uitnodigende ruimtes						
54. Verbonden wijk						
55. Voetgangersvriendelijke wijk						
56. Voldoende oversteekplaatsen						
57. Wijkmeubilair						

Figure 13.3: Evaluation form

Figure 14.1: Urban dictionary

Voorwoord

Dit woordenboekje bevat uitleg over de stedenbouwkundige begrippen voor een dementievriendelijke wijk die in het spel Hersenspinsels aan de orde gesteld worden. Deze begrippen vormen het startpunt van het spel om uiteindelijk tot een dementievriendelijk ontwerp te komen. In het boekje worden de verschillende begrippen toegelicht op volgorde van schaal, van klein naar groot: het object, de straat en de wijk. Het object niveau gaat over oplossingen op zeers specifieke plekken. De begrippen worden uitgelegd door middel van een kernzin en een plaatje.

Sommige begrippen zijn toepasbaar op verschillende schaalniveaus. Daarnaast is er onderscheid tussen hele concrete en abstracte begrippen. Abstracte begrippen bieden ruimte om eigen ideeën in te vullen.

Het woordenboek is een hulpmiddel om de vragenlijst in te vullen. In de vragenlijst moeten de 57 verschillende begrippen geëvalueerd worden, waarbij de vraag: "Is het begrip goed toegepast in de wijk" beantwoord moet worden. Er wordt gebruik gemaakt van een vijfpuntschaal. Na het invullen van de vragenlijst, mogen er 6 begrippen gekozen worden,die meegenomen worden naar de volgende ronde in het spel. Er zijn verschillende manieren om de 6 meest cruciale tegels te kiezen. Er kan gekozen worden op schaal, op abstractheid & concreetheid, maar ook op tegels die goed bij uw werkveld passen.

Figure 14.2: Urban dictionary

Begrippenlijst

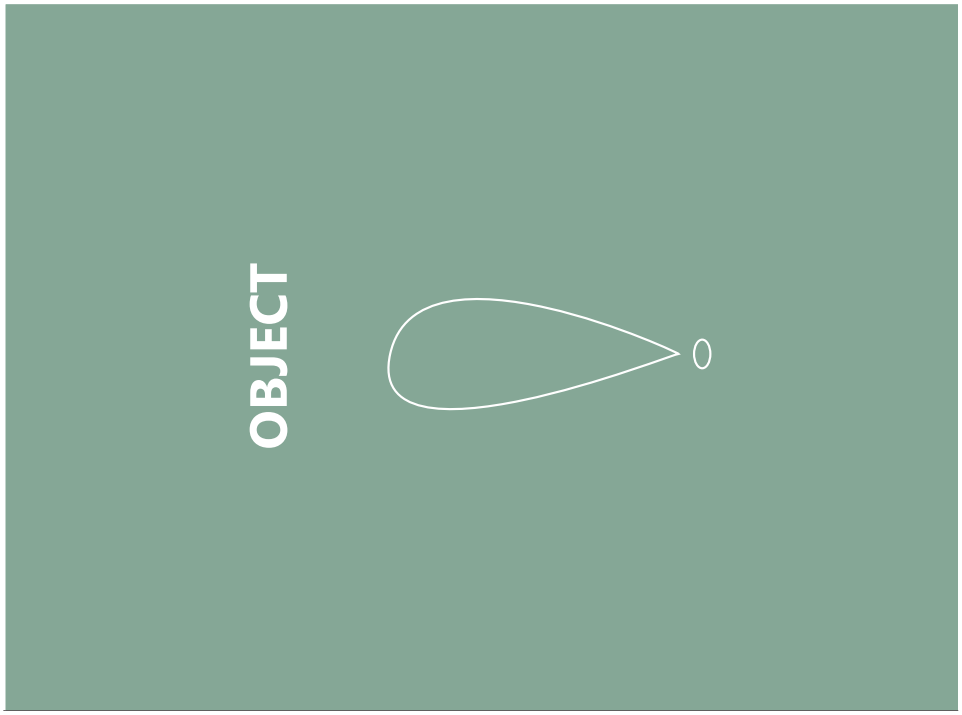
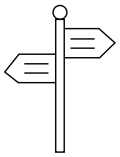


Figure 14.3: Urban dictionary

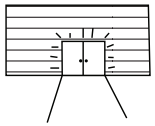
Figure 14.4: Urban dictionary

1



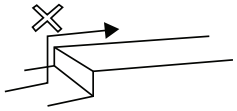
Duidelijke bewegwijzering
Bordjes om aan te geven hoe je op een specifieke plek kunt komen.

2



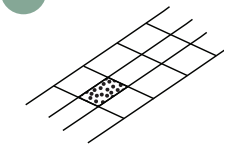
Duidelijke ingangen
De ingang is herkenbaar.

3



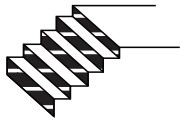
Geen niveauverschillen
Het gebied moet zoveel mogelijk gelijkvloers zijn.

4



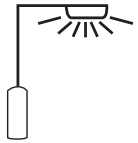
Geen willekeurige wijzigingen
Patronen moeten hetzelfde blijven. Er zijn bijvoorbeeld geen afwijkende stoeptegels.

5



Gemarkeerde hellingen / trappen
Opstapjes moeten duidelijk aangegeven worden.

6



Goede verlichting
Straatlantaarns verlichten de donkere plekken in de wijk.

7

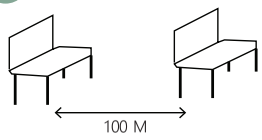
Kleurrijke objecten
Objecten bevatten verschillende kleuren.

8

Openbare toiletten
Het plaatsen van voldoende openbare toiletten, zodat men op elke plek beschikking heeft tot een toilet.

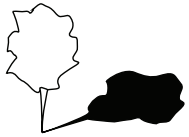
Figure 14.5: Urban dictionary

9



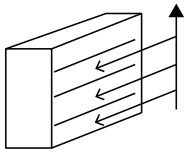
Rustplekken (om de 100m)
Bankjes moeten om de 100 meter geplaatst zijn.

10



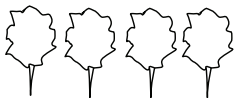
Schaduwplekken
Plekken waar minder zonlicht valt. Er moeten voldoende koele plekken zijn.

11



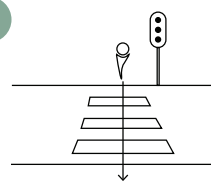
Toegankelijke verdiepingen
Snelle en duidelijke bereikbaarheid van verschillende etages.

12



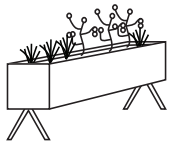
Veel bomen
De aanwezigheid van veel bomen in de wijk.

13



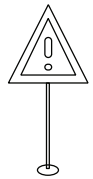
Veilige oversteekpunten
Het is mogelijk om op een veilige manier naar de andere kant van de weg te komen.

14



Verhoogde moestuinen
Een verhoogde bak waarin planten kunnen groeien, zorgt ervoor dat men makkelijker kan tuinieren.

15



Waarschuwingsborden
Gevaarlijke plekken worden duidelijk aangegeven.

16

Water element
Het aanleggen van vijvers, sloten, meertjes of het plaatsen van fonteinen in de wijk.

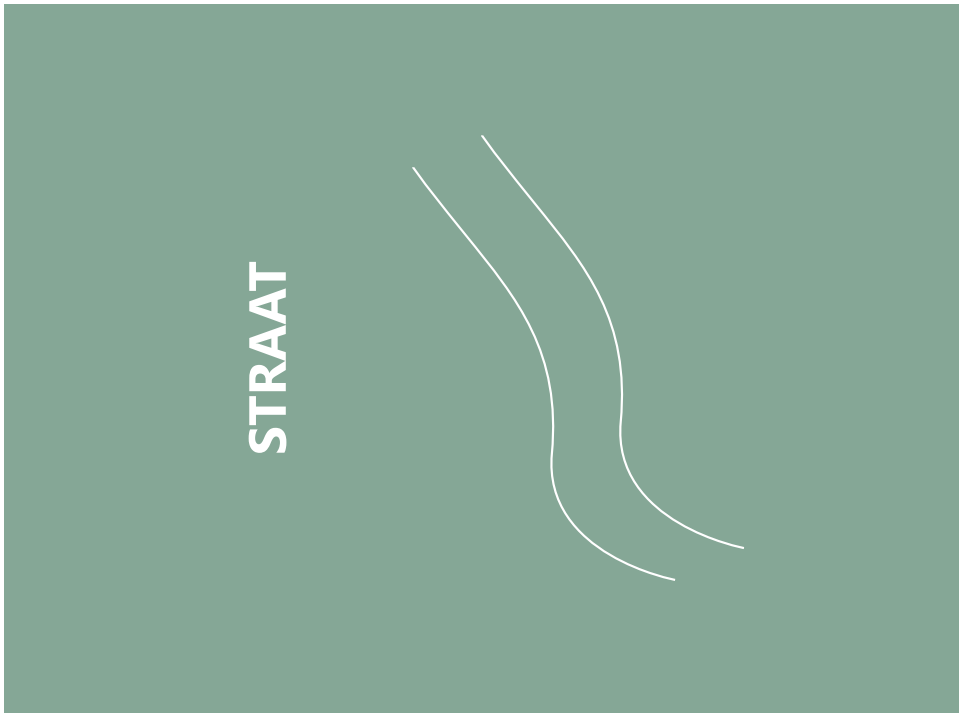


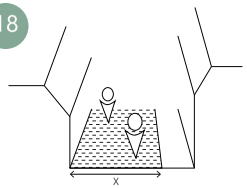
Figure 14.6: Urban dictionary

Figure 14.7: Urban dictionary

17

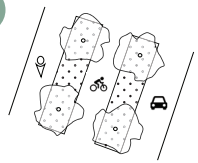
Begrensde voetpaden
Voetpaden zijn afgebakend, waardoor het duidelijk is waar men kan lopen en waar niet.

18



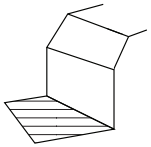
Brede voetpaden
Brede voetpaden zorgen ervoor dat mensen makkelijk met eventuele hulpmiddelen kunnen lopen en elkaar kunnen passeren.

19



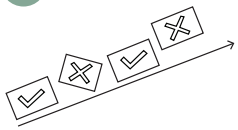
Buffer zones
Buffer zones zijn groenstroken tussen verschillende wegen, waardoor deze beter te onderscheiden zijn.

20



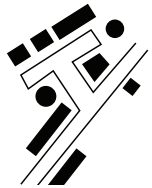
Contrasterende objecten
Contrast is het gebruik van verschillende kleuren en patronen, waardoor plekken beter begrijpbaar worden.

21



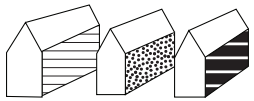
Gebouwen volgen de bouwlijn
Gebouwen volgen de lijn van de straat en wijken niet af van deze lijn.

22



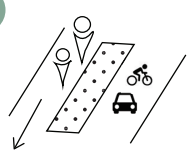
Geen doodlopende paden
Paden mogen niet plotseling ophouden.

23



Gekleurde straten
Straten hebben opvallende kleur kenmerken.

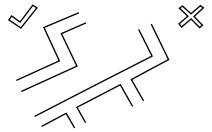
24



Gescheiden wandelpaden
De wandelpaden zijn uitsluitend voor wandelaars.

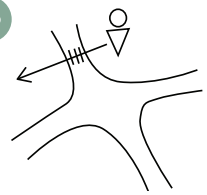
Figure 14.8: Urban dictionary

25



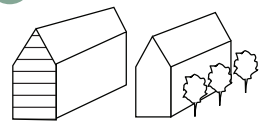
Korte straten
Straten zijn niet te lang, maar bevatten veel bochten.

26



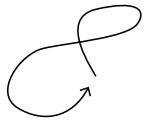
Leesbare kruispunten
Oversteekplaatsen zijn duidelijk en goed vormgegeven zijn.

27



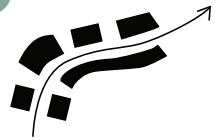
Opvallende straten
Straten hebben verschillende kenmerken, zodat niet iedere straat hetzelfde is vormgegeven.

28



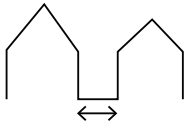
Ronde wandelpaden
Ronde wandelpaden zorgen ervoor dat men automatisch weer bij het begin terechtkomt.

29



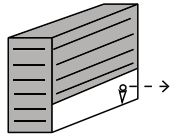
Slingerende straten
Straten maken lichte bochten.

30



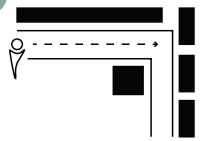
Smalle straten
De afstand tussen het ene huis en het andere huis aan de overkant is klein.

31



Transparante begane grond
Op de begane grond kan men door de glasgevel kijken.

32



Zicht op het einde van de straat
Men kan altijd het einde van de straat zien.

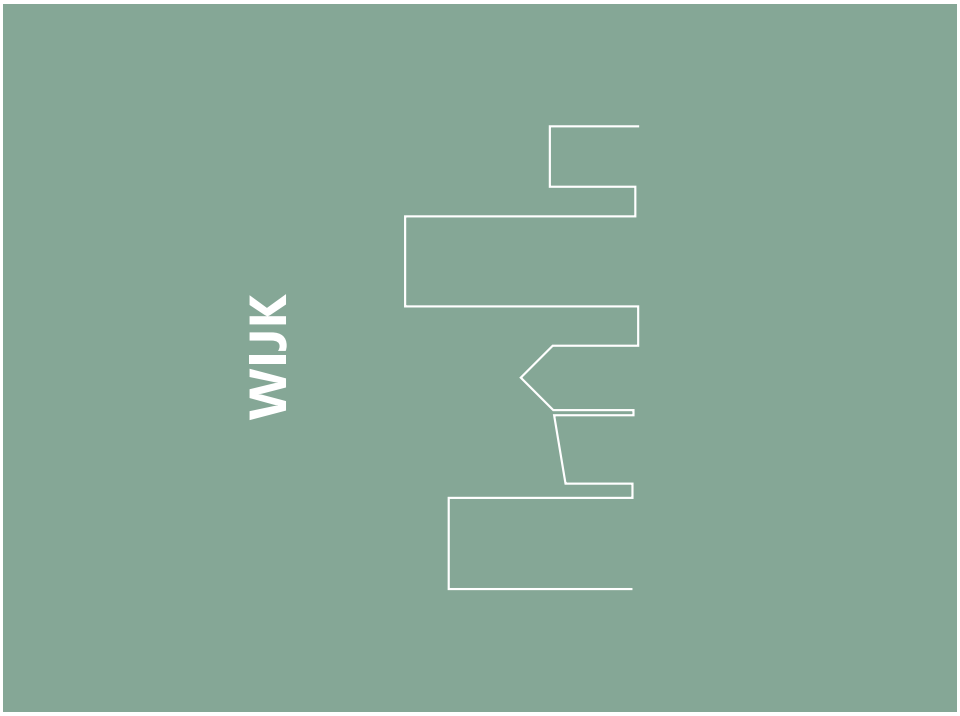
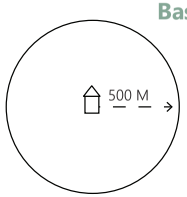


Figure 14.9: Urban dictionary

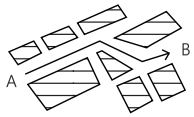
Figure 14.10: Urban dictionary

33 **Basis voorzieningen (binnen 500m)**
Eerste levensbehoeften zijn beschikbaar op maximaal 500 meter afstand van het huis.

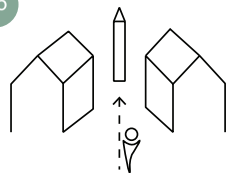


34 **Bewustzijn creëren voor dementie**
Mensen in de wijk weten wat dementie is en hoe ermee om te gaan.

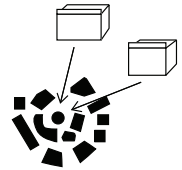
35 **Directe routes**
Routes om zonder omwegen van punt A naar punt B te komen.



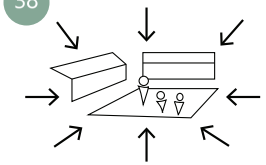
36 **Doorkijkjes**
Men heef zicht op andere gebouwen of elementen in de wijk



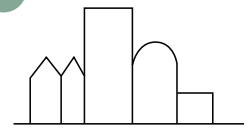
37 **Gecentraliseerde winkels**
Winkels worden bij elkaar gesitueerd, zodat er kernen met winkels ontstaan



38 **Gemeenschappelijke ruimtes**
Ruimtes zijn in eigendom van de buurtbewoners en zij bepalen zelf de bestemming van de ruimte.



39 **Gevarieerde architectuur**
Er is een verscheidenheid aan verschillende gebouwen.



40 **Gevarieerde stedelijke vorm**
De stedelijke structuur is willekeurig.

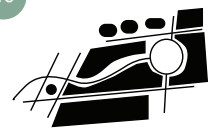
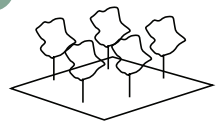


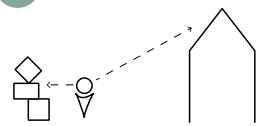
Figure 14.11: Urban dictionary

41



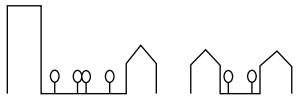
Groene plekken
Plekken waar groen de overhand heeft. Dit kunnen parken zijn.

42



Herkenningspunten
Opvallende punten kunnen een bestemming aangeven of helpen je te oriënteren in de wijk.

43

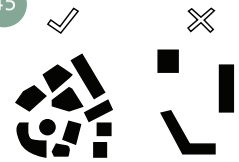


Hiërarchie van verschillende straten
Het ontwerpen van hoofd- en zijstraten. De vormgeving van beide straten is duidelijk anders.

44

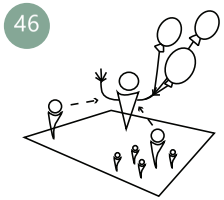
Informele ruimtes
Anoniem door de buurt kunnen bewegen.

45



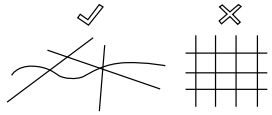
Kleine straatblokken
De stedelijke structuur is kleinschalig en intiem.

46



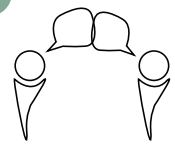
Levendige plekken
Plekken waar altijd iets te doen is.

47



Onregelmatig grid
Het grid (raster) heeft geen regelmaat en mag afwijken.

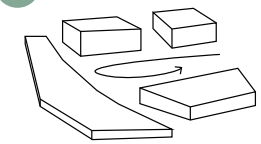
48



Ontmoetingsplekken
Plek om een praatje te maken met mede buurtbewoners.

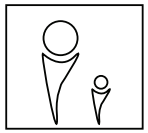
Figure 14.12: Urban dictionary

49



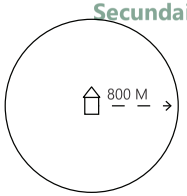
Open plekken
Plekken waar niet gebouwd is, zodat er ruimte is voor andere activiteiten.

50



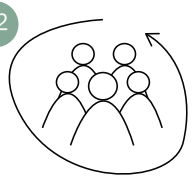
Plekken voor jong en oud
Een openbare ruimte die geschikt is voor de allerkleinsten en de alleroudsten.

51



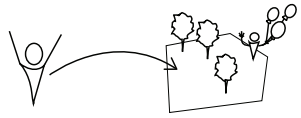
Secundaire voorzieningen (binnen 800m)
Voorzieningen die niet noodzakelijk zijn, maar het leven wel makkelijker maken zijn beschikbaar op maximaal 800 meter van het huis.

52



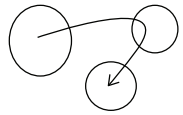
Sociale gemeenschappen
Groep mensen die bij elkaar horen.

53



Uitnodigende ruimtes
Mensen worden aangetrokken door de openbare ruimtes en willen er graag verblijven.

54

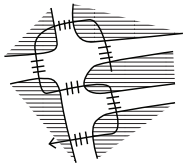


Verbonden wijk
Verschillende delen in de wijk worden met elkaar verbonden door routes.

55

Voetgangersvriendelijke wijk
In het ontwerp van de wijk krijgt de voetganger prioriteit.

56



Voldoende oversteekplaatsen
Het is op verschillende plekken in de wijk mogelijk om de straat over te steken.

Wijkmeubilair
Elke wijk heeft zijn eigen eigen straatmeubilair. Hierdoor worden de verschillende buurten onderscheiden.

57

Figure 14.13: Urban dictionary

Appendix G: Tiles in the game (Dutch)

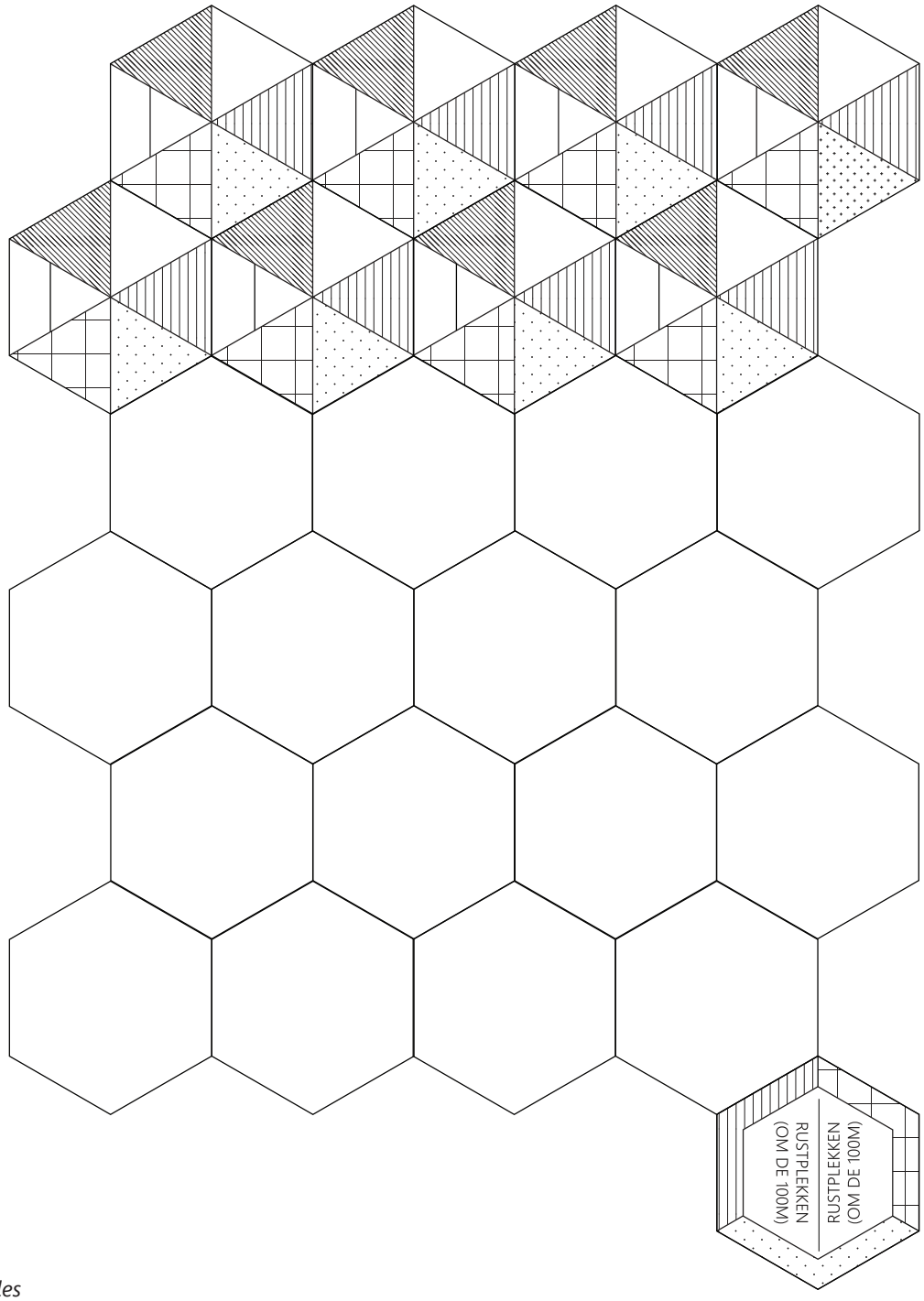


Figure
15.1: Tiles

Figure 15.2: Tiles

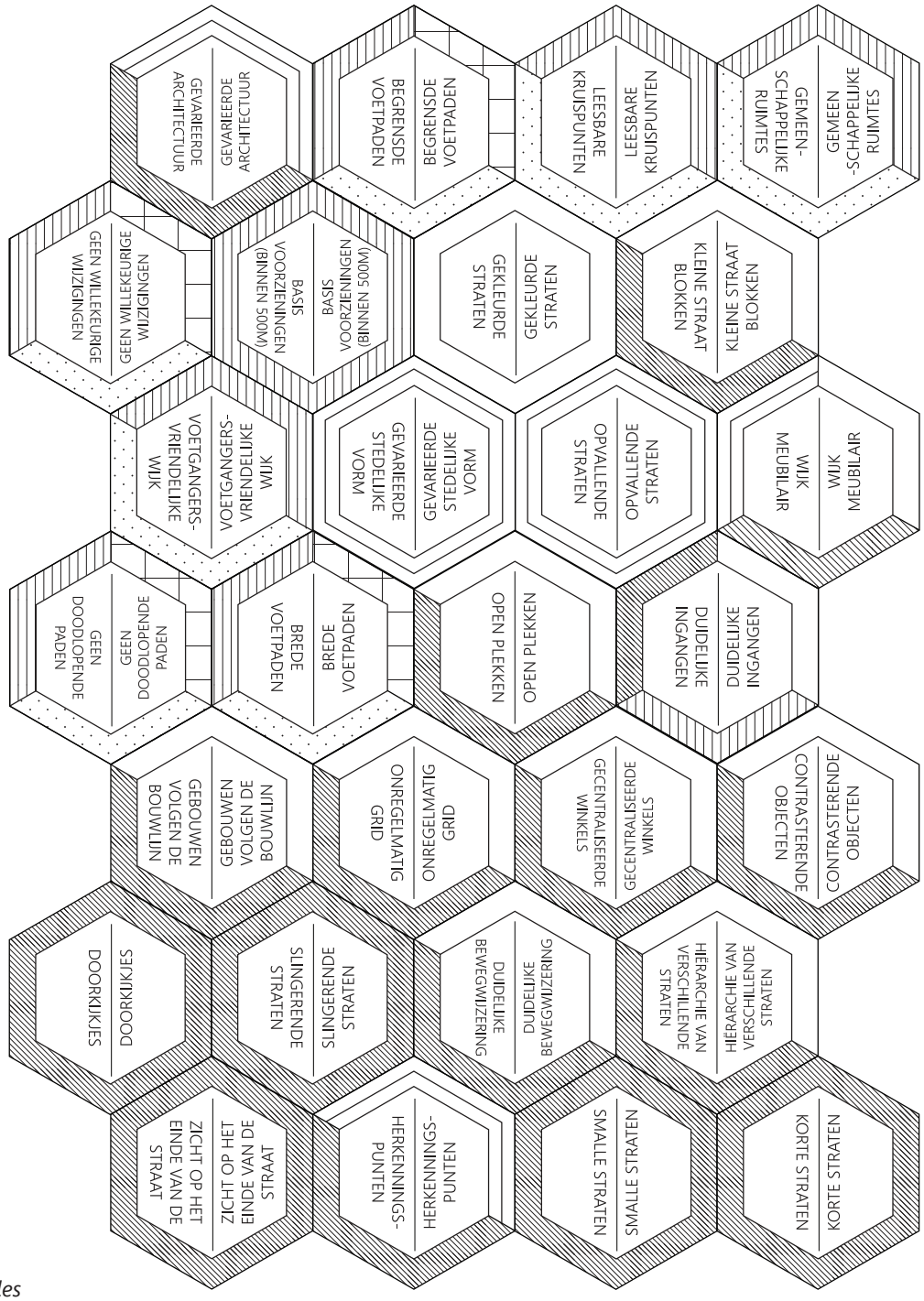


Figure 15.3: Tiles

Appendix H: Explanation in the boxes (Dutch)

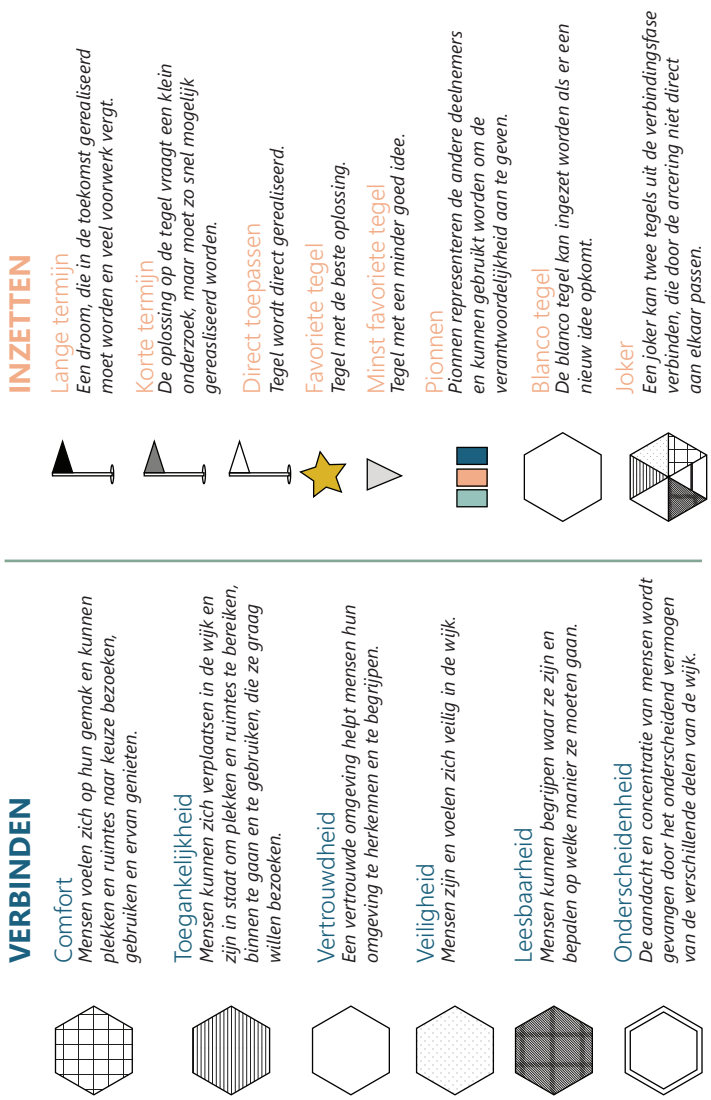


Figure 16: Explanation in the boxes

Appendix I: Session with the power network

Due to the Dutch privacy laws, the audio, video and transcriptions are not included in this report. My first supervisors are in possession of these files.

Appendix J: Session with the knowlegde network

Due to the Dutch privacy laws, the audio, video and transcriptions are not included in this report. My first supervisors are in possession of these files.

Appendix K: Gameboard combined with the strategy (Dutch)

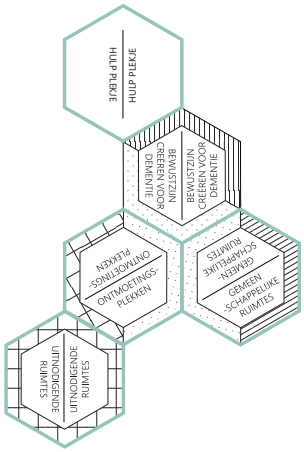


Figure 17.1: Phase 1

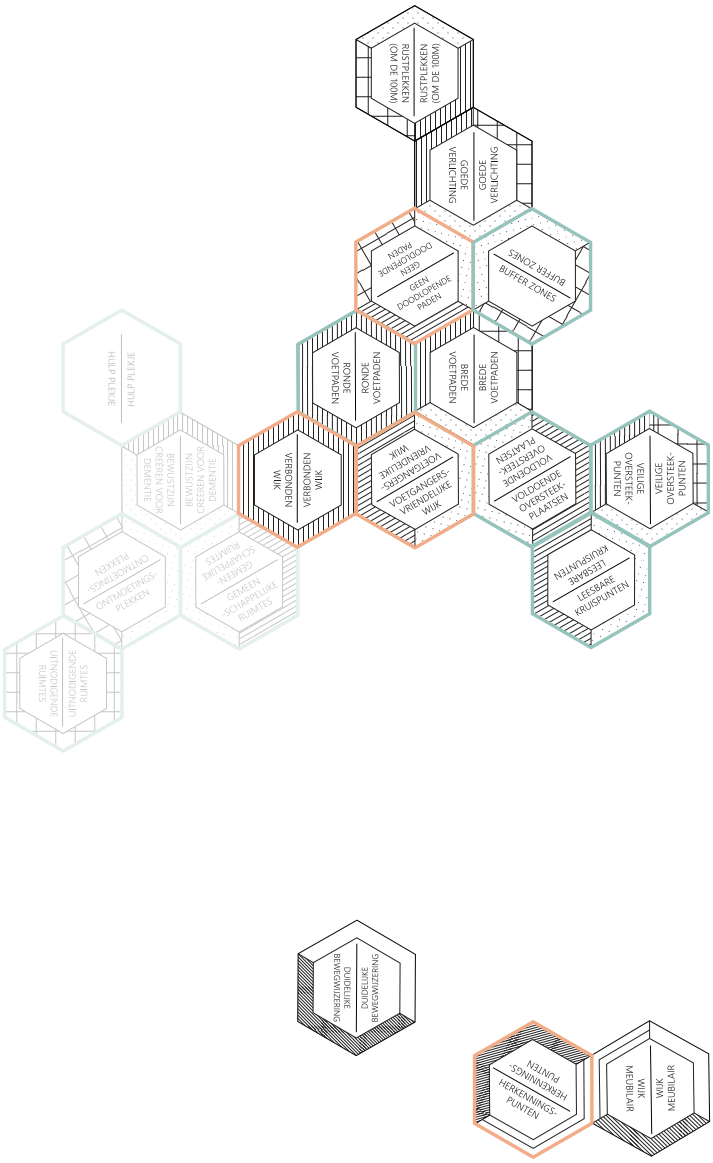


Figure 17.2: Phase 2

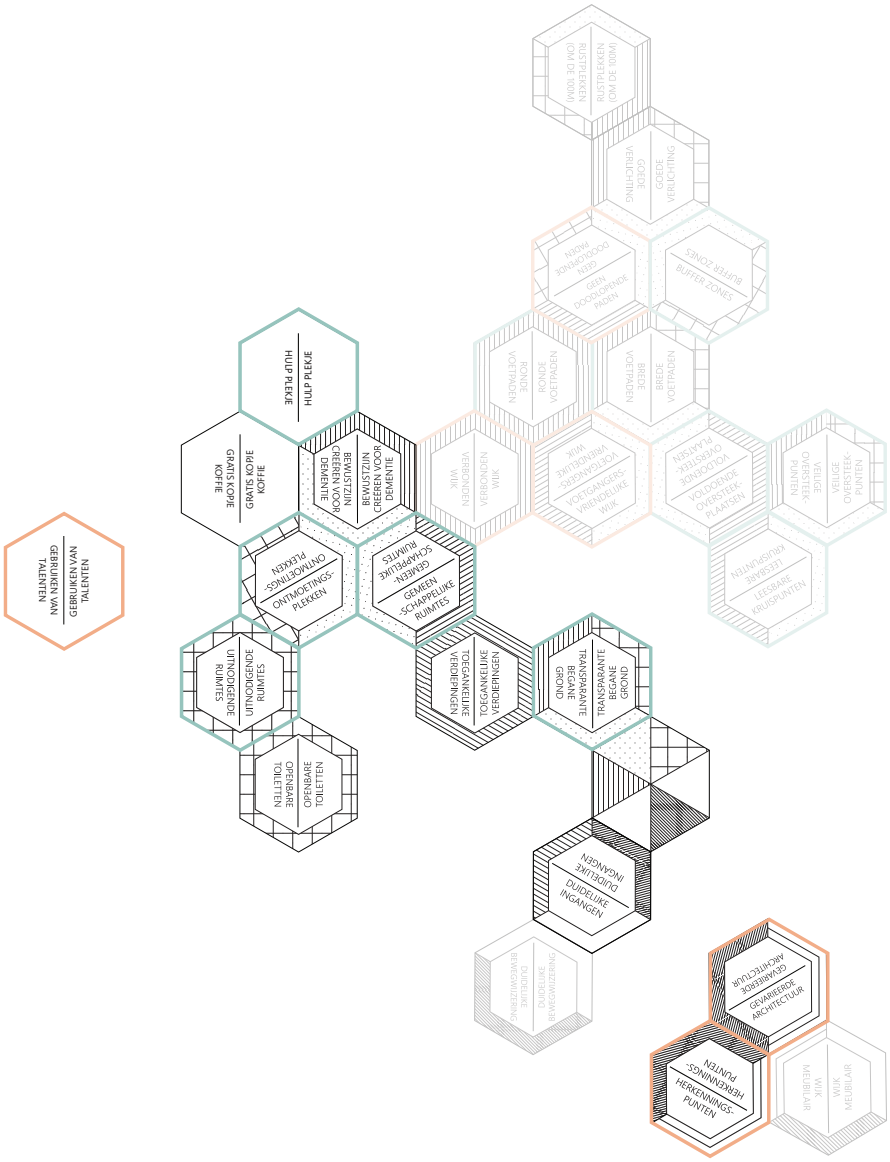


Figure 17.3: Phase 3

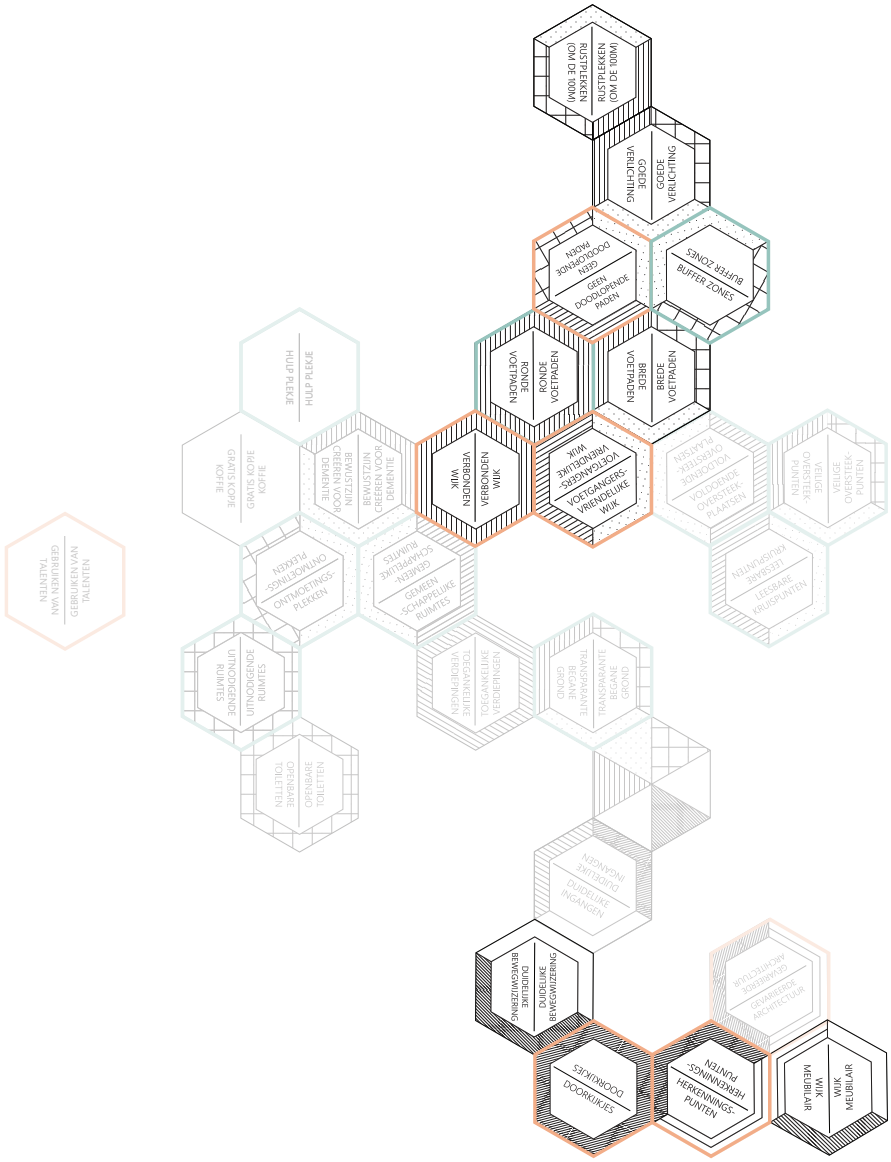


Figure 17.4: Phase 4

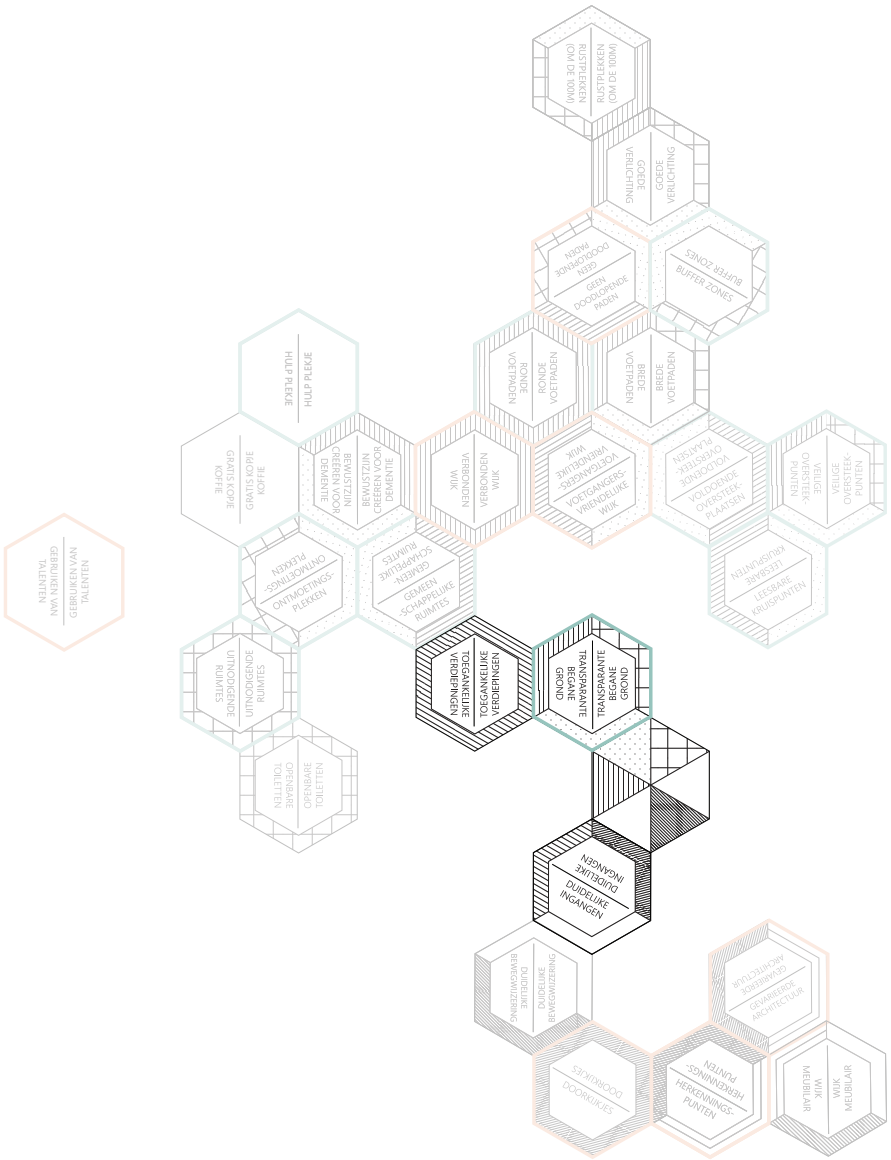


Figure 17.5: Phase 5

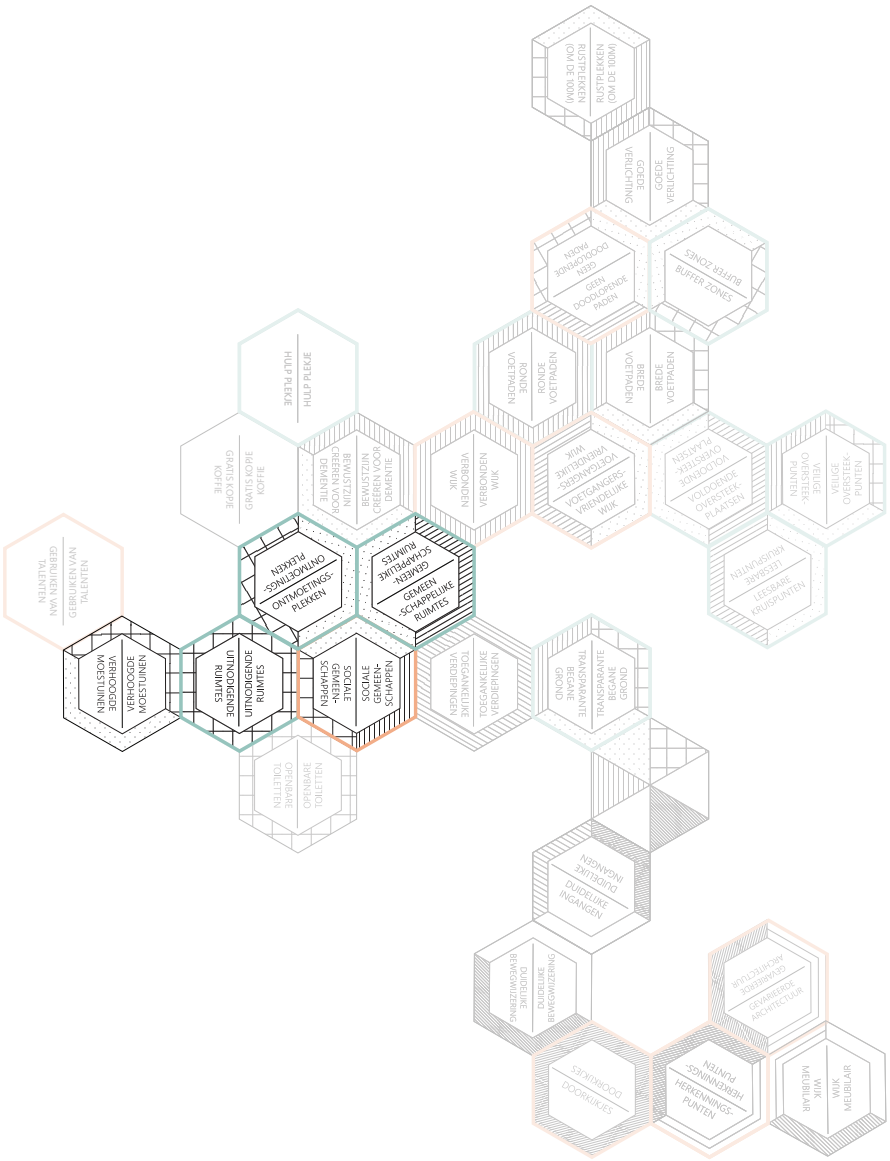


Figure 17.6: Phase 6

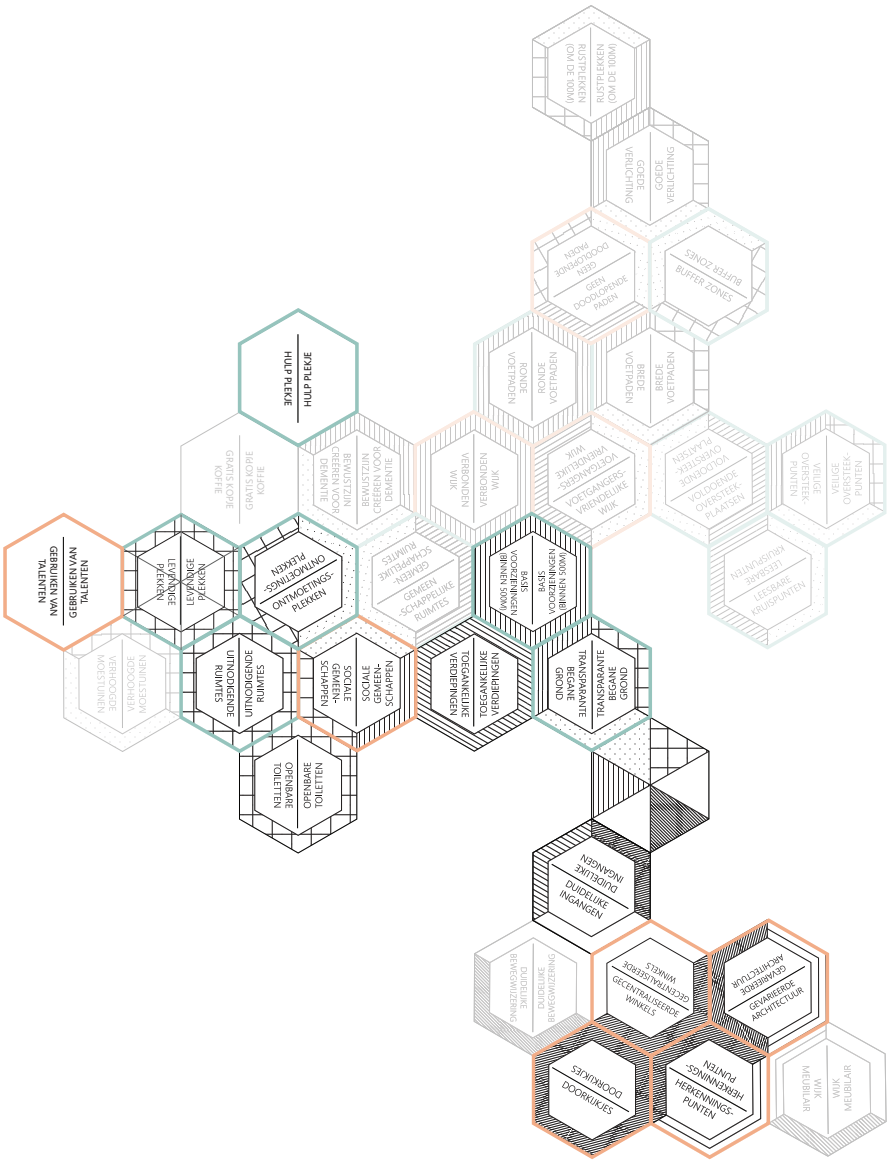


Figure 17.7: Phase 7

Appendix L: Trees (Dutch)

Rosaceae Malus

Malus ROYAL RAINDROPS ®

Sierappel

Malus ‘JFS-KW5’

Hoogte	6 m
Kroonvorm	spreidend-opgaand
Blad	paars, gelobd
Opvallende herfstkleur	oranjerood
Bloemen	helder rozerood
Vruchten	rood, 6 mm, blijvend
Giftigheid	niet giftig (gewoonlijk)
Grondsoort	kleigrond, lemige grond, zandgrond, zure grond, kalkrijke grond
Bodemvochtigheid	kan op droge grond, kan op natte grond
Verharding	verdraagt verharding
Winterhardheid	4 (-34,4 tot -28,9 °C)
Wind / vorst / zout	bestand tegen wind, bestand tegen vorst (WH 1 t/m 6)
Faunaboom	drachtboom voor bijen, voedselboom voor vogels
Toepassing	parken, pleinen, attractieparken, begraafplaatsen, daktuinen, grote tuinen, kleine tuinen, patiotuinen
Type/vorm	hoogstam boom
Herkomst	J. Frank Schmidt, Boring, Oregon (USA)
Synoniemen	Malus ‘JFS-KW5’

Deze sierappel met zijn dieppaarse gelobde bladeren, prachtige magentaroze bloesem, helderrode vruchtjes en schitterende herfstkleuren heeft weinig verzorging nodig en vormt in elk seizoen een ware blikvanger.
De boom is een aanwinst in elke tuin dankzij de zeer hoge ziekteresistentie. Hij is bestand tegen hitte en droogte en past zich moeiteloos aan de omgeving aan. De verfijnde, glanzende bladeren met hun opvallende vorm hebben een dieppaarse kleur die ze gedurende de zomer behouden. In de herfst verandert de kleur in geel, oranje en rood. In de nazomer verschijnen de kleine helderrode vruchten, de sierappeltjes, waar vogels dol op zijn en die uw tuin ook in de winter kleur geven.
Dankzij de opgaand groeiende takken hoeft u weinig te snoeien om een mooie kroon te behouden. Dit is een ideale boom voor in een winderige klimaat omdat de stevige takken niet verwaaien zoals bij andere cultivars wel het geval is. De Royal Raindrops® sierappel is sterker dan andere cultivars met paarse bladeren en ontwikkelt een zeer stevige, taps toelopende stam.

Figure 18: Malus Royal Raindrops (Van der Berk Boomkwekerijen, n.d.-b

Aceraceae Acer

Acer negundo 'Flamingo'

Hoogte	5 - 7 m, snelgroeiend
Kroonvorm	eirond, later breed eirond, halfopen kroon
Schors en takken	jonge twijgen glanzend groen en berijpt
Blad	oneven geveerd, zilverwit met roze rand, tot 20 cm, geveerd blad
Bloemen	in dichte bundels, voor bladontwikkeling, april
Vruchten	geen, vruchtloze cultivar
Stekels/doorns	geen
Giftigheid	niet giftig (gewoonlijk)
Grondsoort	geringe bodemeisen, ook voor kalkrijke bodem
Verharding	verdraagt geen verharding
Winterhardheid	5a (-28,8 tot -26,1 °C)
Windbestendigheid	matig
Wind / vorst / zout	bestand tegen vorst (WH 1 t/m 6)
Faunaboom	drachtboom voor bijen, waardboom voor vlinders
Toepassing	parken, attractieparken, begraafplaatsen, industriegebied, grote tuinen, kleine tuinen, patiotuinen
Type/vorm	hoogstam boom, meerstammige boom, solitaire boom
Herkomst	J. Bastiaansen, Oudenbosch, Nederland, 1976

Een snelgroeiende, middelgrote boom die een maximale hoogte van circa 7 m kan bereiken. Deze cultivar verschilt weinig van de andere bontbladige cultivars van A. negundo. De bladeren zijn groen met zilverwitte tot lichtroze randen. Jong uitlopend blad is mooi lichtroze van kleur. 'Flamingo' is te gebruiken in parken en tuinen. De boom groeit zowel op een natte als droge standplaats. Heeft een diepwortelende hoofdwortel met een sterke vertakking. Regelmatige snoei zal de ontwikkeling van fraai gekleurde jonge scheuten bevorderen.

Figure 19: Acer negundo 'Flamingo' (Van der Berk Boomkwekerijen, n.d.-a)

Appendix M: Costs calculation

			Total costs
Phase I	Removing and moving parking spaces	€	1.000.000
Phase II	Construction of the basic ring	€	800.000
Phase III	Adding pavilions	€	600.000
Phase IV	Construction of the secundary ring	€	500.000
Phase V	Designing the courts	€	1.000.000
Phase VI	Adding active plinths	€	1.500.000
Phase VII	Realizing the new heart	€	30.000.000
Total		**€**	**35.400.000**

	Number of inhabitants	**Change of getting dementia**		
Amount of inhabitants (Within the ring)	12.069			
Age (50 - 65)	2544	10%		254
Age (65 - 80)	3442	10%		344
Age (80+)	1931	20%		386
Amount of people with dementia (Within the ring)				985
Amount of people with dementia (In the heart of Ommoord)				325
Costs per patient per day (Starting rate)			€	154
Expectation 1 year longer living at home			€	18.323.102
Expectation 2 years longer living at home			€	36.646.203
			€	**36.646.203**

Figure 20: Costs calculation

Appendix N: Underground infrastructure

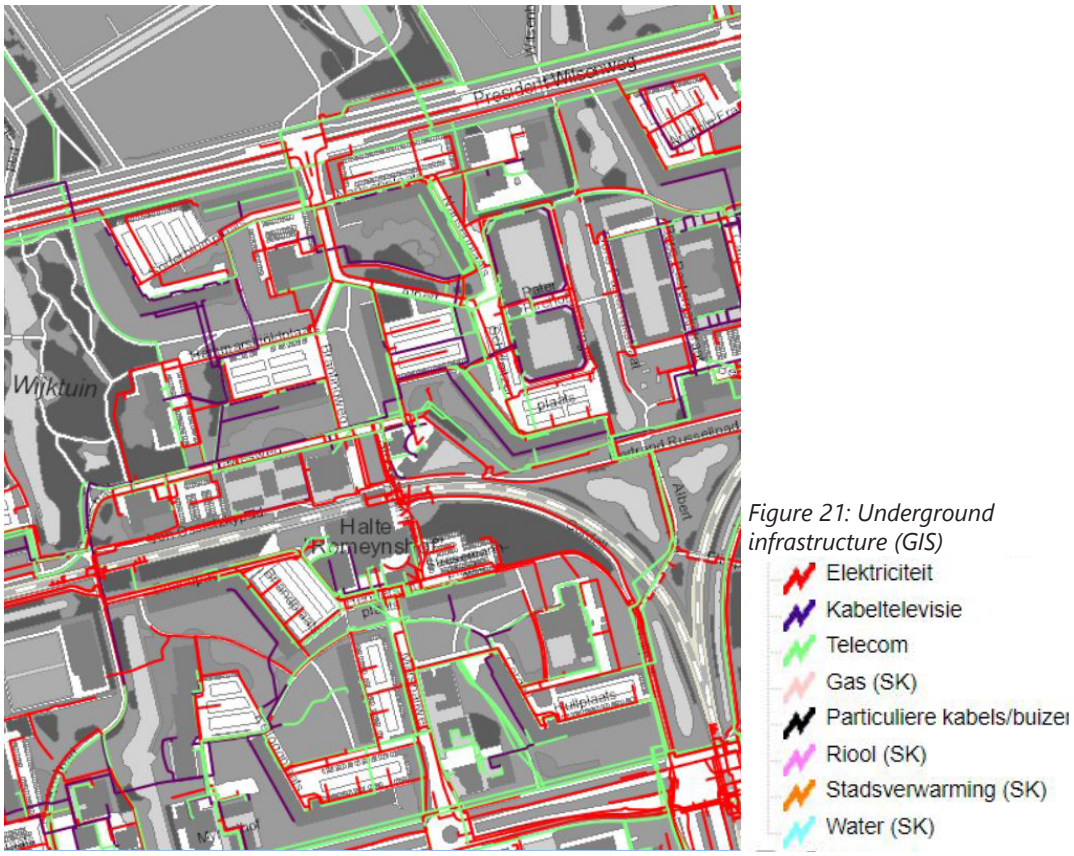


Figure 21: Underground infrastructure (GIS)

Appendix O: Evaluation form (Dutch)

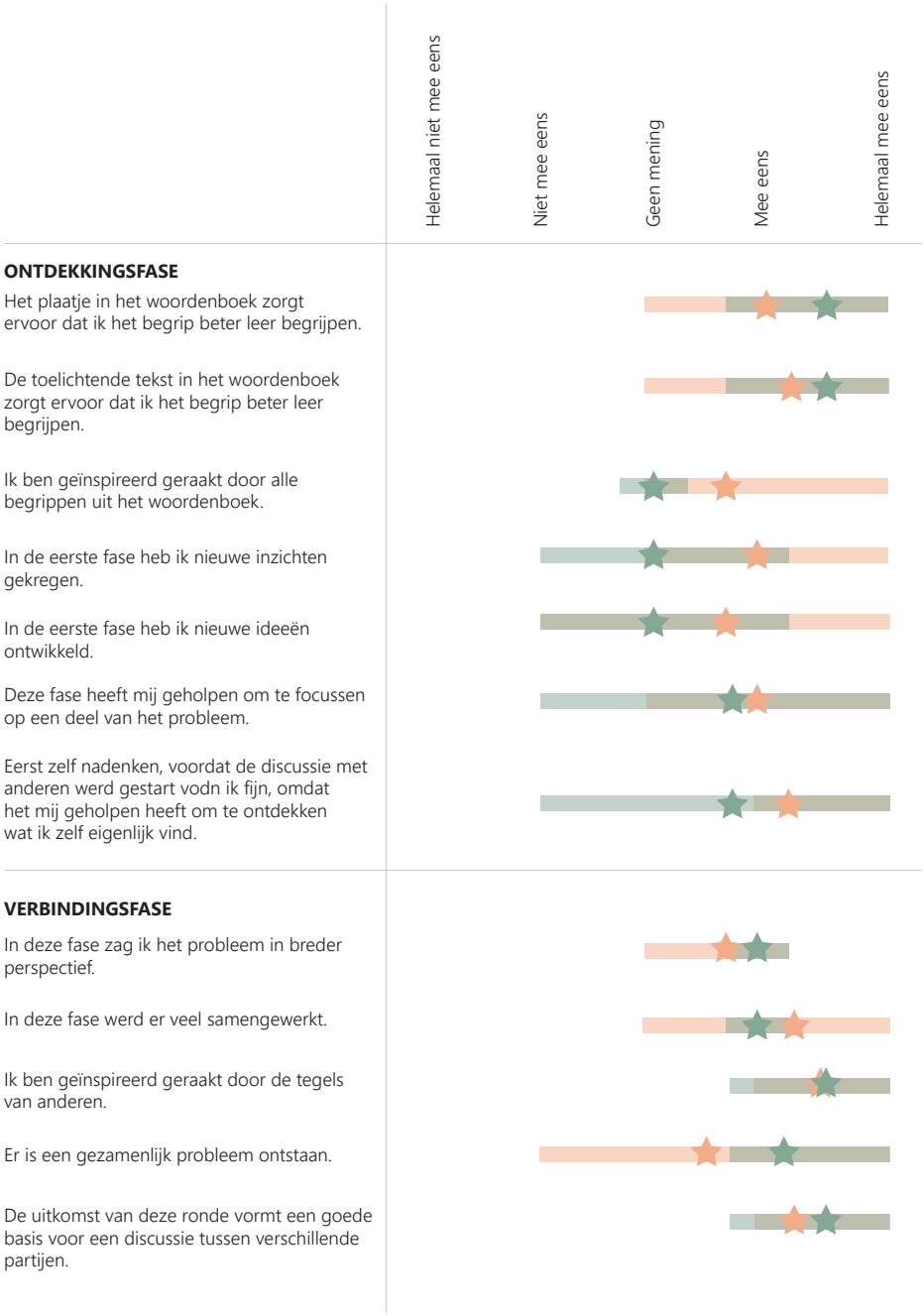


Figure 22.1: Evaluation form

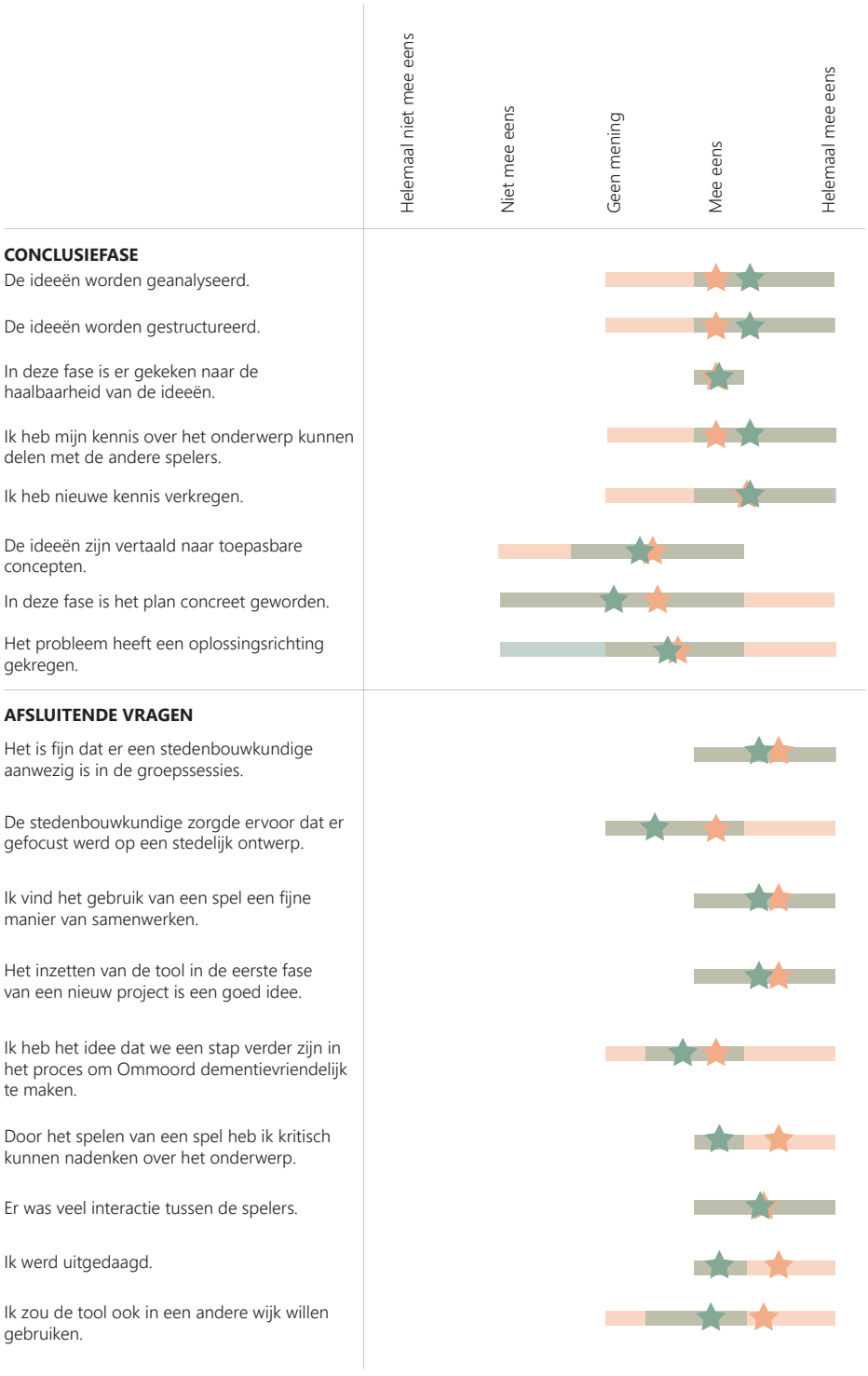


Figure 22.2: Evaluation form

Appendix P: Research versus design & designer versus actors

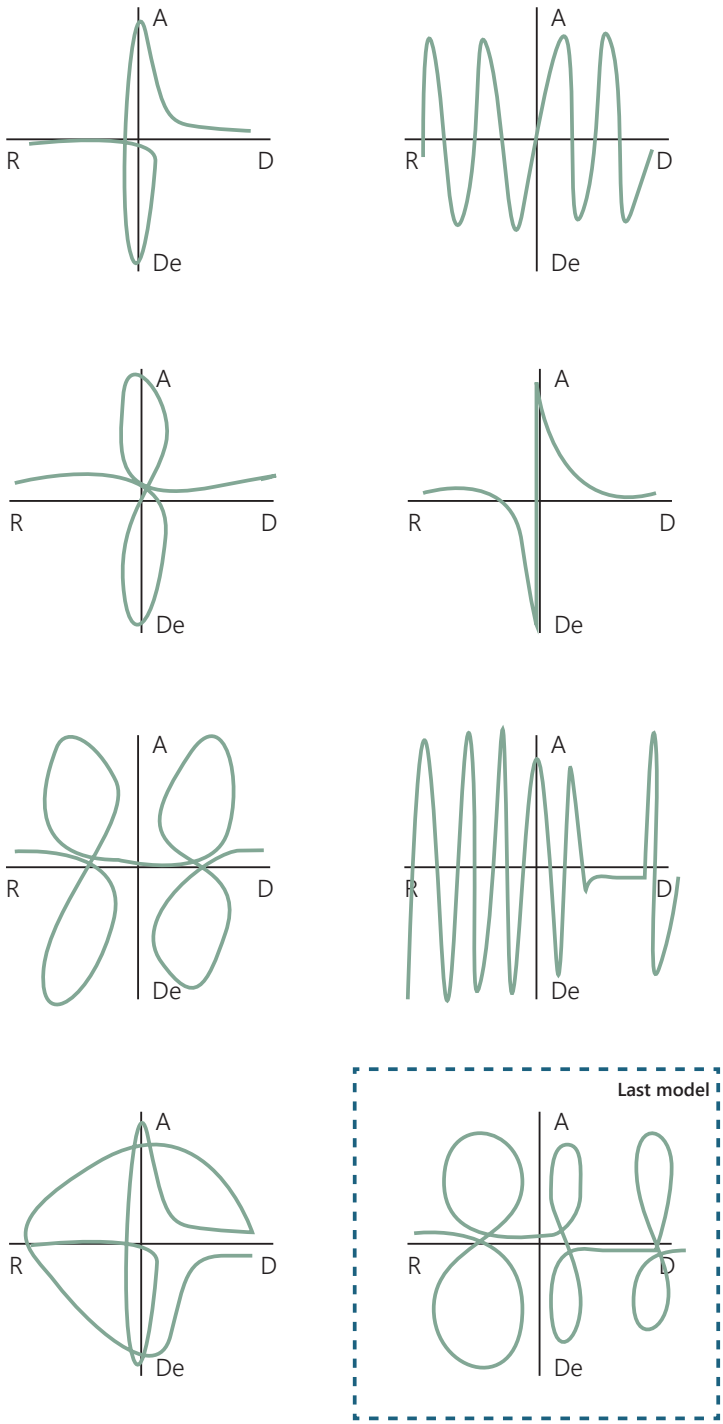


Figure 23: Interaction between the two lines