CITYPEDESTRIANIZED

CREATING URBAN ENVIRONMENTS FOR PEOPLE TO WALK

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MASTER THESIS | P5

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FOREWORD

This master thesis contains the result of the graduation project '*City Pedestrianized*', as part of the Urbanism track for the University of Technology Delft at the faculty of Architecture, department of Urbanism.

This graduation project focuses on the city center as a place for people to walk. Everyone knows that walking is the most primary form of mobility in the city. And the most of us do it every day. It is the most essential way for us to move around. It gives us the opportunity to explore and experience the surrounding environment. But, most certainly, everyone have experienced that some urban environments are less attractive or more difficult to travel through by walking compared with others. Did we ever made the decision not to walk, because of the urban environment? Maybe you felt unsafe or it was just too far to walk or any other reason? At that moment the urban environment could not provide the conditions for you to walk. To be able to walk safely, conveniently, directly and comfortably, you will need an urban environment that corresponds to your needs, as a pedestrian. This graduation project researches the required conditions for the urban environment to facilitate and encourage people to walk, especially for city centers.

I would like to thank Remon Rooij, Stefan van der Spek and John Westrik for guiding my graduation project. I also want to thank Roberto Rocco and Ana Maria Fernandez-Maldonado for the lectures, related to the course. And BVR for giving me the opportunity to work in a stimulating environment with professionals, especially Liliane Geerling.

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SUMMARY

The condition of the urban environment has a great influence on people. The decision of people to walk depends on personal and environmental factors (Handy et al 2002). The urban environment has a great influence on the decision to walk (Gehl 2006, Handy 1996, Southworth 2005). The environmental factors should correspond to the needs of pedestrians. If the urban environment does not provide the conditions to walk, people will decide not to walk or offered no choice to walk at all. In order to walk safely, conveniently, directly and comfortably pedestrian require an urban environment that corresponds to their needs (Toronto City Council 2002). The urban environment should encourage and facilitate people to give them the opportunity to make the decision to walk.

This thesis considers the walkable urban environment by studying the needs of people to walk and the required conditions in relation the urban environment. The focus of the thesis is on the urban environment of the city center. The objective is to develop a design instrument that helps designers and planners to enhance the urban environment of the city center for pedestrians.

The main research question of the thesis is:

HOW COULD THE CITY CENTER BECOME AN URBAN ENVIRONMENT THAT FACILITATES AND ENCOURAGES PEOPLE TO WALK?

To create an urban environment that facilitates and encourages people to walk it is necessary to do the following actions:

1. A literature study on the existing body of knowledge results in a wide variety of conditions from different standpoints. This resulted into a *Pattern Catalogue* (Bellen 2010) with patterns to create urban environments for pedestrians.

2. A diagnosis on the city center with the pattern reveals problem areas in the city center that could be fixed from the standpoint of pedestrians.

3. A design for the Wijnhaven, an urban environment that needs to be enhanced for pedestrians.

1. Literature study & pattern language: Part II
The objective of the literature study is to review the existing body of knowledge on conditions for the urban environment in relation to walkability for people. This resulted in a wide variety of conditions from different standpoints and levels of scale. To order this complexity of conditions, the theory of pattern language is introduced to understand the urban environment for pedestrians as a whole. A *Pattern Catalogue* (Bellen 2010) is developed to order the found conditions and to give practical solutions to enhance the urban environment of the city center.

2. Diagnosis: Part III
The diagnosis is carried out with use of the Pattern Catalogue, which reveals the conditions for pedestrian in relation to the urban environment. This resulted in a collection of maps that reveal problem areas in the area, which are shown in conclusion maps. On these maps are areas that work well and areas that need to be fixed to facilitate and encourage people to walk.

3. Design: Part IV
From the diagnosis it becomes clear that the area of the Wijnhaven needs to be fixed to become an urban environment for people to walk. The diagnosis has revealed which problems occur within the area of the city center and the Wijnhaven. The Pattern Catalogue also provides practical solutions to solve these problems, both for planning and designing the area.

To show the potential of the Pattern Catalogue, the design instrument has been used in three diffferent perspectives. It reveals different levels of intervention for the area. This involves a reatainable, feasible and desriable perspective.

4. Evaluation: Part V
The graduation project resulted into a valuable design instrument that helps designers and planners to enhance the urban environment for pedestrians.

A design instrument that is able to evaluate, and help designers and planners to plan and design the urban environment for pedestrians.

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PART I INTRODUCTION

This part gives an introduction on the thesis. It explains why and how this graduation project is carried out. The problem field, the objective, the research questions, the methodology and the relevance of the graduation project are discussed and explained.

The first chapter describes the problem field. It explains why and what the problem is about the urban environment and walking. The second chapter describes the objective of the thesis. It clarifies the goal and ambition of the graduation project. It explains what must be undertaken to solve the problem described in the previous chapter. Chapter three discusses the research questions. First, it explains the main research question, followed by the sub research questions that are directly related to the main research question. The fourth chapter explains the methodology that is related to the sub research questions. An explanation is given of the theoretical, technical, and/or methodological means that have been used to answer these sub research questions. The last chapter discusses the scientific and social relevance of the thesis. It reveals how this thesis contributes to science and society.

Image on left page: Westersingel, Rotterdam (Flickr 2010)

CHAPTER 1 PROBLEM FIELD

This chapter will discuss the problem field. It will clarify and describe what problem occurs in the city center in relation to walking.

1.1 Walking in the city

Have you ever walked through the city center? Most likely, your answer will be yes. You have your own reasons and motives to walk through the city center. Maybe you walked here to get to work or to go to school? Or maybe you walked through the city center for shopping or to visit a museum? Or a combination of these different activities? The city center offers you a wide variety of overlapping and interwoven activities (Bromley, et al. 2003, Morris & Zisman 1962). Furthermore, you might travel through the city center on a daily basis or maybe less frequently? It depends on the activities you do at the city center. And although, you came by car, bicycle, public transportation or any other mode of transportation towards the city center. Afterwards, you probably walked through the city center to get towards your destination. Maybe a very short walking distance between where you parked your car or public transportation stop towards your final destination? Or a much longer distance, such as for shopping or sightseeing?

By walking, you have your own experiences in the city center. A walking trip through the city center can give you a wide variety of positive experiences. You are able to discover new and unexpected things that you never have seen before. You can be amazed by the beauty of places or buildings at different areas of the city center. Or maybe you just enjoyed the first day of summer or went outside to enjoy the beautiful colored leaves of the trees in autumn. Even a cold snowy day during winter can give a positive experience while walking through the city center. Maybe you meet other people that could inspire you. The city center can be an amazing place that offers a wide variety of things and activities to do and to see. At almost every instant, there is something different and perhaps unexpected to see, to hear or to do.

The city center is a highly dynamic urban area that attracts a diversity of people from different areas and regions. And we, all, have our own personal experiences, reasons or motives and opinions in relation to walking through the city center.

However, despite the positive experiences walking through the city center can give. It could give you negative experiences as well. Some areas are unattractive, unsafe or uncomfortable for people to walk. Maybe you experienced that a destination is not within the range of walking. Most likely, you decided to use a more efficient and faster mode of transportation to get there or you decided not to go there at all. Or you avoid certain places in the city center, because that place is deserted and empty. You could relate that place to criminal activities and so becoming an unattractive, unsafe area for you to walk. The building frontages that line the sidewalks could have been blinded, meaning no doors, no windows, and experiences along the way (Gehl & Gemzøe 2004). The urban environment could discourage you from walking.

1.2 The benefits of walking

But why should you walk? Walking is the most primary form of mobility. It is the most essential way for people to move around, enabling them to go from one place to another. Walking is done by the majority of the population, across all classes, including children and seniors (Forsyth & Southworth 2008). You could walk alone, together or in a group. And as seen before, there are different variable motives and reasons to walk in the city.

Walking is more than just a form of mobility, allowing you to go from one place to another (Gehl 2000). There are several benefits to walking, compared with other modes of transportation (see figures 1.1 - 1.6). You are more flexible by walking. The slow speed of walking positively influences the exchange of information and the quality of communication. If necessary or desired the pedestrian can easily and quickly change direction, stop to watch something or someone, even go back to have a better look. The interaction with the surrounding is much greater by walking. While walking you are close to buildings, vegetation and other people (Gehl 2006). Pedestrian have more social interaction with other people. A pedestrian does not only meet other people; he also encounters ideas and is able to act upon them spontaneously (Morris & Zisman 1962). Furthermore, like cyclist, pedestrians have a low environmental impact. Walking is an environmentally friendly mode of transportation, it is quietly and clean. By walking people do not only have a positive influence on the surrounding environment. Walking also includes enjoyment and exercise (Litman 2004). People can promote their personal health condition. The health benefits are reduced stress, stronger bones, weight control and mental alertness and creativity (Southworth 2005). Additionally, walking is an affordable mode of transportation. Walking combines all these qualities and options: transport, exercise, experience and pleasure (Gehl & Gemzøe 2004).

1.4 Planning and designing for pedestrians.
The last decades there is a growing interest in the planning and designing of pedestrian-friendly environments. With different types of pedestrian guides and strategic plans, city councils and developers, try to make city center more attractive for pedestrians. And this resulted in attractive environments for pedestrians on from specific standpoints and with specific aspects. Furthermore, there is done a lot of research on the relation between the built environment and walking. The studies have resulted into an emerging body of knowledge. A wide variety of conditions are derived from different standpoints and at different levels of scale, in relation to the walkability of the urban environment. However, there is no design instrument available which is able to deal with this complexity of conditions. No design instrument that enables urban designers and planners to deal with these complexity of a more walkable urban environment within their designs and plans.

Image on left page: Hoogstraat, Rotterdam (Flickr 2010)

CHAPTER 2 OBJECTIVE

This chapter explains the main objective, goals and ambition of the graduation project. It clarifies what must be undertaken to solve the problem described in the previous chapter.

2.1 Main Objective: Design instrument

The previous chapter made clear that the city center should be an urban environment that facilitates and encourages people to start walking. It should correspond to the needs of pedestrians to become a place that is convenient, safe, comfortably and directly for pedestrians. If the urban environment does not correspond to the needs of pedestrians, they will decide not to walk or offered no choice to walk at all.

Thus, the main objective of the thesis is to develop a design instrument that can help designers and planners to enhance the city center as an urban environment for people to walk. The design instrument should provide the conditions that correspond to the needs of pedestrians in relation to the urban environment. Furthermore, it should reveal the conditions on multiple aspects, such as safety, urban structure, comfort, etc. And it will show how this different aspects interrelate.

The design instrument that enables designers and planners to develop more complete, coherent and profound urban environments for pedestrians. As stated before it takes more than just good paving to produce an excellent pedestrian landscape. It is the whole environment around the person walking that has to be understood. This means that the designer or planner should be able to make an urban environment for pedestrians that makes sense to them on all aspects mentioned.

2.2 Contribution to the body of knowledge

Another objective of this graduation project is to contribute to the body of knowledge on this topic. As described in the problem field (see chapter 1), there is a need to understand the urban environment as a whole. To make urban environment for pedestrians it should correspond to the needs of pedestrians on all aspects. And as seen before, only good pavement will not make an attractive and encouraging urban environment for pedestrians. Several designers and planners have researched the influence of the urban environment on the decision of people to walk. A wide variety of conditions are derived from different disciplines and standpoints at different levels of scale. The knowledge for the planning and design of urban environment is available, however, it is difficult for planners and designers to fully grasp this body of knowledge. This graduation project will contribute to this body of knowledge by providing an order in the complexity of conditions for the pedestrian-friendly environment.

2.3 Understanding the theory of Pattern Language

Another objective of the graduation project is to try to point out the potential of Pattern Language (Alexander 1975, 1977 & 1979) as a design approach and attitude in urban planning and design, which is able to relate to people. By giving a better understanding, to the reader of these method, it could be used by other designers and planners on different kinds of topics.

Image on left page: Het Park, Rotterdam (Flickr 2010)

CHAPTER 3 RESEARCH QUESTIONS

This chapter is about the research questions of the graduation project. First, the main question is mentioned. Secondly, the sub research questions are introduced, assisted with a short line of thought. Each sub research question is related towards a method and a result. Furthermore, the sub research questions are related to the different parts of this thesis (figure 3.1).

3.1 Main research question: city pedestrianized

The main research question of the graduation project:

HOW COULD THE CITY CENTER BECOME AN URBAN ENVIRONMENT THAT FACILITATES AND ENCOURAGES PEOPLE TO WALK?

As stated before, an urban environment should correspond to the needs of pedestrians to facilitate and encourage them to walk. The urban environment should enable people to walk safely, conveniently, directly and comfortably. To achieve an urban environment for people to walk the main research question considers two main tasks in relation to the needs of pedestrians.

First, the main task, in relation to the urban environment, is to facilitate pedestrians in their basic needs to enable them to walk. For example, the basic condition of the presence of a designated path for pedestrians to get towards a destination. Without these basic conditions it would be impossible for pedestrians to go through the urban environment.

Secondly, the urban environment should attract and encourage people to walk. This depends on the attractiveness of the urban environment. For example, the presence of landscape elements or public arts could attract and encourage people to start walking in the city center.

3.2 Sub research question 1: walking conditions

To answers the main research question the following sub research question comes to our mind and should be answered:

WHAT ARE CONDITIONS FOR AN URBAN ENVIRONMENT THAT FACILITATES AND ENCOURAGES PEOPLE TO WALK IN THE CITY CENTER?

Result: PART II - Chapter 6 - conditions for pedestrians

Method: Literature study

To plan and design an urban environment that corresponds to the needs of pedestrians, it is necessary to get to know the conditions that are required to facilitate and encouraged people to walk. Several designers and planners have researched the influence of the urban environment on the decision of people to walk. Furthermore, research is done on the conditions that are required in relation to the urban environment to correspond to the needs of pedestrians. This resulted into a wide variety of conditions which are derived from different disciplines, standpoints and at different levels of scale.

3.4 Sub research question 3: tool for analyses

The result of sub research question 2, *Pattern Catalogue* (Bellen 2010), enables designers and planners to make more coherent, complete and profound urban environments for pedestrians. The following sub question comes to mind:

HOW COULD THE PATTERN CATALOGUE EVALUATE THE URBAN ENVIRONMENT OF THE CITY CENTER?

Result: PART III - Diagnosis

Method: GIS analyses + Mapping analyses + Pattern Catalogue

Each pattern, mentioned in the pattern catalogue, can be analyzed for the city center. The diagnoses reveals the quality of the city center for pedestrians on different topics.

The test case for this graduation project is the city center of Rotterdam.

3.5 Sub research question 4: tool for design

The design instrument should be tested and translated into a spatial design. An area of the city center, which in the diagnosis showed not to facilitate and encourage pedestrians, will be planned and designed. The following sub research needs to be answered:

HOW COULD THE DESIGN INSTRUMENT (PATTERN CATALOGUE) BE USED IN A SPATIAL DESIGN?

Result: PART IV - Design

Method: Pattern Catalogue + Sketches + Mapping + Cross Sections.

The result of test case will reflect the use of the design instrument. And it will provide valuable input for improvements and corrections of the design instruments.

The answering of these four questions will make it possible to develop a design instrument for the design of the urban environment for people to walk, especially for city centers. It enables designers and planners to improve the urban environment for pedestrians by making design decisions that make sense.

Image on left page: West-Kruiskade, Rotterdam (Flickr 2010)

CHAPTER 4 METHODOLOGY

In this chapter a description of the theoretical, technical, and/or methodological means that are used to answer the sub research questions.

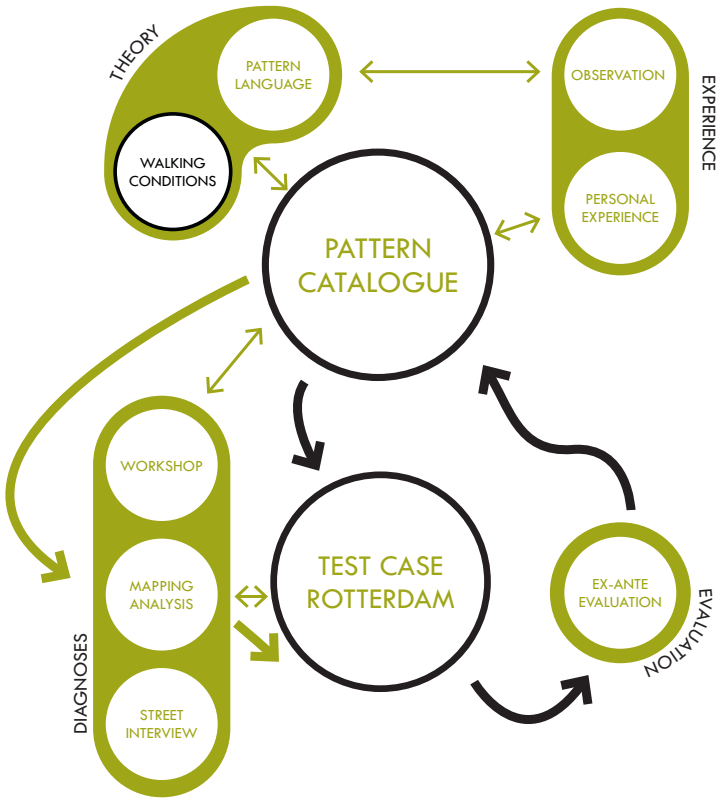


Fig. 4.1 Schematic representation of the methods and products (by author)

4.1 Methods: THEORY

In this part the methods for the theoretical part of the thesis are explained.

Literature studies

A wide variety of literature has been studied to provide a theoretical framework for underpinning the graduation project. The literature contains scientific writings, books of key-authors, pedestrian plans, pedestrian design guides. The purpose of the literature studies is to examine and explore the existing knowledge on the urban environment for pedestrians. This will be considered in chapter 6 *conditions for pedestrians,* which will review scientific literature of key authors which have researched or derived conditions for the urban environment in relation to walking.
The obtained knowledge will provide input for the formulation of the conditions for a pedestrian-friendly environment.

Next to the literature study there has been additional literature examined. This contains out of pedestrian plans and pedestrian design guide. Regardless of the scientific value, these documents could provide valuable input for the development of a pattern catalogue.

See chapter 6 *Conditions for Pedestrians* for the results of the literature study.

Pattern language

The theory of *Pattern Language* will be used for the development of a design instrument for the urban environment for pedestrians. Pattern Language enables to order the complexity of the urban environment for people to walk.

Within the graduation project, a pattern catalogue is developed for the urban environment for people to walk. It translates the conditions for the urban environment for pedestrians into patterns. The theory, which is derived by different authors, is translated into a practical design instrument. Enabling designers and planners to make more coherent, more complete and profound urban designs in relation to pedestrians. Like Alexander (1977) stated you cannot build a thing in isolation, you need the fix the world around it, and within it. For pedestrian this is also a fact, because you cannot only propose a pedestrian path, without connecting it to the environment around it and providing quality within it. Like stated before by Gemzøe (2006) it takes more than just good paving to produce an excellent pedestrian landscape. It is the whole environment around the person walking that has to be understood. Pattern language is capable to provide a tool to understand the whole urban environment for pedestrians, because the conditions are related to another.

See Chapter 7 *A Pattern Language* for further explanation about the theory of *A Pattern Langauge*.

problem of that particular street. Even new patterns were mentioned to become part of the Pattern Language. The *Pattern Catalogue* made it possible for them to make spatial interventions that made sense, since they were connected to other patterns that made it potentially more successful.

4.2 Methods: DIAGNOSES

This part will explain the methods that are used for the diagnoses of the city center, part III of the thesis.

Pattern catalogue

The pattern catalogue forms the basis for the diagnoses. The required conditions, which are presented in the pattern catlogue, can be diagnosed.

GIS (Geographical information system)

The use of GIS makes it possible to take the influence of the urban structure in account. In particular for patterns that involve the diagnoses of catchment areas.

Mapping analyses

Collecting and mapping data, which reveal the position of the pedestrian within the city center. An analyses will be done by mapping by making use of pattern language. Pattern Language provides conditions that can be observed or measured. This can be analyzed by mapping. A first the larger scale level will be analyzed, because design decisions are made at this level first.

Observation

By observing the behavior of pedestrians a lot of information is gained about the urban environment. It will help to examine the obtained knowledge of the reviewed literature. The observations translate the theory into practical and real life examples. It enables me to understand the pedestrian and the challenges which he has to face moving through the urban environment. Observation is also used to diagnose patterns in the urban environment. This is done in a form of a excursion towards the city center

Experiencing

Since everyone is a pedestrian, I am able to experience urban environments myself. Throughout the progress of the graduation project, more and more knowledge on the topic is gained. This knowledge will be reflected on a daily basis by experiencing the urban environment by own activities.

CHAPTER 5 RELEVANCE

This chapter discusses the relevance of the thesis, both socially and scientifically. It reveals how this thesis provides a substantial contribution to society and science.

Fig. 5.1 Cover of the plan for the city center of Rotterdam (Gemeente Rotterdam, 2008).

5.1 Scientific relevance

There is a growing interest for the design and planning of pedestrian-friendly environments. Several researchers, designers and urban planners have contributed to the search for vital and attractive urban environments for people to walk. Different criteria are derived for the urban environment for people to walk from diverse standpoints and at different levels of scale, resulting in a emerging body of knowledge on the relation between the conditions of the built environment and walking behavior. The diversity of these conditions illustrates the complexity of the pedestrian-friendly environment. Forsyth & Southworth (2008) stated that there is an need for better design and planning of the pedestrian-friendly environment is strong. Nevertheless, there is no design instrument available that is able to deal with this complexity of the urban environment for pedestrians. The challenge is to understand the relation between the different aspects of the urban environment for pedestrians. The graduation project will contribute to the body of knowledge by systematically ordering the existing body of knowledge, offering designers and planners a design instrument that enables them to make complete, coherent and profound urban designs for pedestrians.

5.2 Social relevance

The benefits of increasing walking are widely recognized, walking is seen as the foundation of the sustainable city (Southworth 2005). The position of pedestrians has increasingly become more important in the (re)development of an attractive and vital city center. Many cities, worldwide, have become aware of the importance of an attractive city center for people. Rather than discouraging people from walking, city policies has been to invite people there instead. This resulted into positive intentions to enhance the city center into a place which invites people to stay. For example, the city council of Rotterdam has developed a plan for the city center (see *figure 5.1*) . It contains a future vision for the city center, in which they state that the city center should become a place which invites people to stay. There are mentioned different approaches to reach this goal. Such as, intensification of the density of housing and providing more facilities. Moreover, the pedestrian will get a dominant role in public space.

PART II THEORY

This part of thesis discusses sub research question 1 and sub research question 2.

A literature study provides an overview on the existing body of knowledge in relation to the conditions for a walkable urban environment. Several designers and planners have researched the influence of the urban environment on the decision of people to walk. This resulted in a wide variety of conditions from different disciplines, standpoints and at different levels of scale. It shows the complexity of pedestrian-friendly environments, a wide range of interrelated conditions are involved. There is a need for understanding the whole urban environment for pedestrians.

SUB RESEARCH QUESTION 1
What are conditions for an urban environment that facilitates and encourages people to walk in the city center?

The theory of Pattern Language is able to deal with this complexity. It is introduced to provide order in the wide variety of conditions. Furthermore, it reveals the relations between the different conditions. The basics of the theory will be explained to get a good understanding of the method. The result of the method in relation to this graduation project can be found in the book *Pattern Catalogue* (van Bellen 2010).

SUB RESEARCH QUESTION 2
How to order the wide variety of conditions for the urban environment for people to walk?

Image on left page: Sketch by Doug Klotz showing the design decisions that have to be taken for the urban environment for pedestrian on the scale level of the street (City of Portland, 1998)

CHAPTER 6 CONDITIONS FOR PEDESTRIANS

This chapter studies the existing body of knowledge on the conditions for pedestrian in relation to the urban environment. The objective of this study is to provide an overview of the existing knowledge on the topic. The study has been written in the form of a review paper (van Bellen 2010b) as part of the graduation course at the University of Delft, faculty of Architecture, department of Urbanism.

6.1 Introduction

The link between the built environment and human behaviour has long been of interest to the field of urban planning, especially to the subfields of urban design and transportation planning (Handy 2002, Soutworth 2005). Urban planners and designers have become more and more aware of the importance of walking environments for the establishment of the sustainable city. During the last decades there is done a lot of research on the relation between the built environment and walking. The studies have resulted into an emerging body of knowledge. A wide variety of conditions are derived from different standpoints and at different levels of scale, in relation to the walkability of the urban environment. However, there is no design instrument available which is able to deal with this complexity of conditions. No design instrument that enables urban designers and planners to deal with these complexity of a more walkable urban environment within their designs and plans.

6.2 Method

By studying literature, an overview on the existing body of knowledge in relation to the required conditions for a walkable urban environment is provided. The results of this literature study will contribute to the development of a design instrument for urban environments for people to walk. To obtain the knowledge on the relation between the urban environment and walking, several scientific writings are examined. The writings should have a clear relation between the built environment and walking to be reviewed. The examined writings are ordered in chronological order. Each writing is introduced with a paragraph that explains the focus and context of the study or research. This is followed with a paragraph of the result of that particular study. At the end, each study is reflected to what extend this study contributed to the body of knowledge and how it can contribute to the deveoplment of a pattern language for pedestrians.

The following studies are reviewed in this chapter:

- The image of the city (Lynch 1960)
- The pedestrian, downtown and the planner. (Morris & Zisman 1962)
- Planning for pedestrians (Stuart 1968)
- Life between buildings: using public space (Gehl 1971)
- Designing the walkable city (Southworth 2005)
- Identifying and measuring urban design qualities related to walkability (Ewing et al. 2006)

Results

The study starts with problems in relation to walking and the urban environment.

A. The opening up of large gaps may deaden pedestrian movement, such as large parking lots.

B. The concentration or zoning of uses of one kind, particularly with massive buildings not having on-the-street activity, may deaden pedestrian use in an area.

C. The sidewalk could form a problem, because of its size, treatment and use.

D. The distance, scale and character of building and spaces could cause problems in relation to walkability. It includes parking lots, blank frontages on pedestrian streets, and pedestrian linkages on both sides of the street.

Next to these problems, the paper reveals solutions on five themes: routes and breaks, the boulevard and vista, pedestrian and vehicle, the sidewalk, the street. For each theme there are conditions mentioned in the paper.

Routes and breaks

1 visual connection – permit a view of the objective shortens the relative distance of a trip

2 choice of route – on trips of more than a block or two, the pedestrian is frequently offered a choice of route. In this choice he may be governed by factors of time. Familiarity, objectives, convinience, safety or attractiveness. Although the shortest route may be generally preferred, these other considerations enter the route-making decision.

3 Attractive pedestrian routes – will attract even people who must go out of their way to use them. Saving in time and energy compete with more pleasant atmosphere of the sidewalk. Careful planning will determine the predominant pedestrian routes.

4 The spacing of squares and oases depends on local requirements. A good location would be midway between two large department stores. Pedestrian havens should be spaced about ¼ mile (400 meters) apart along the mainstreams of movement.

The boulevard and vista

1 The pedestrian boulevard can make good use of dominant structures. It may be best not utilize these as major traffic arteries.

Pedestrian and vehicle

1 The main question here is how to get great numbers of pedestrians to areas of heavy concentration. The current resurgence of concern of mass transit in the transportation system is healthy in this respect.

2. Large number of foot-travelers can mix with smaller amount of vehicles quite compatibly.

The sidewalk

A high degree of activity is essential to the success of a pedestrian-way. Activity can take many forms. Any kind of activity – the flower vendor, the crowd around a bookstall, the sidewalk café – lends a vitality that makes downtown's street unique. For the width of the sidewalk is no simple answer.

The street

The internal circulation of downtown depends on streets for both pedestrian and vehicular movement. Even though, there are proposal of segregation between vehicle and pedestrians it must be taken into account that service vehicles, taxis, fire protection either use the same surface or occur on a different level.

Reflection

The study of Morris and Zisman provides findings that are related to the walkability of the urban environment. The character of the study is an exploration of different themes that are important to consider for the planning and designing for pedestrians in city centers. The paper gives a few concrete criteria of conditions. But not enough to provide designers and planners a good understanding of the urban environment for pedestrians.

This paper does contribute to the development of a pattern language to the extent of considerations that should be taken in account.

Reflection
This study of Stuart reveals the two most important scale levels for the design of the urban environment for pedestrians. At first there is the level of circulation planning, the network of generators and the in-between links. This occurs on the level of the city center as a whole. Secondly, there are the physical details of this network, the urban design of the pedestrian space within this network. However, the relation between these two scale levels is not mentioned in the study.

The study contributes with valuable input on both scale levels. Although, the connection between these two scale levels are not clear.

6.6 Life between buildings: using public space (Gehl 2006)
The purpose of the book is to point out the shortcomings of the functionalistic architecture and city planning. A concern is needed for people who move around in spaces between buildings. The subtle qualities, which were part of the history of human settlement, needs to be understand. The book pointed to the life between buildings as a dimension of architecture, urban design and city planning.

The study considers the required conditions of the built environment to encourage public life in public space. The study mentions city and site planning, as detailed planning as well. Walking has a positive influence on sociability in public space. The book presents principles which make it possible and encourage walking.

Results
The conditions for walking derived by Jan Gehl:

Room to walk
Walking demands space; it is necessary to be able to walk reasonable freely without being disturbed, without being pushed, and without having to maneuver too much. Per situation the dimension of streets varies. Large pedestrians flows need more space, in comparison with pedestrian streams that are very limited. In those situations streets could be narrow.

Wheeled walking traffic
'Wheeled' walking traffic: baby carriage, wheelchairs, shopping cart, etc. have special demands for space. It means more ample dimensioning

Paving materials and street surface conditions
Pedestrians are sensitive to pavement and surface conditions. Cobblestones, sand, loose gravel and an uneven ground surface are not suitable for walking especially those with walking difficulties.

Walking distances – Physical distance, experience distance
Acceptable walking distance for most people in ordinary circumstances has to be found around 400 to 500 meters. For children, elderly, and disabled people the acceptable walking distance is often considerably less.
Experience distance, long strait dull paths are experienced as very long, while the same length could be experienced shorter of the route is perceived in stages.

Walking routes
People prefer direct routes and shortcuts. Only great obstacles seem to be able to interrupt this pattern.

Spatial sequences
Planning of long straight pedestrian routes should be avoided. Winding or interrupted streets make movement more interesting.

Differences in level
All large movement upward or downward requires more effort and an interruption in the walking rhythm.

Reflection
The conditions mentioned in this study occur both on the larger scale level and the detailed scale level. The study of Gehl considers the basic needs for pedestrian to enable them to walk in the city. It does not mention anything visual quality, such as landscape elements or variety of architecture.

6.7 Designing the walkable city (Southworth 2005)
The study of Southworth considers the needs of pedestrians in urban and suburban areas, focusing on the performance dimensions and criteria for the walkable city. Southworth states that simple measures of distance to destinations are not on equate predictor of walkability. The quality of the path network is the

6) Path context

To encourage walking we need to deal with more than connectivity, land use patterns, safety, and quality of the path itself. A safe continuous path in a monotonous physical setting will not invite pedestrians. The path network must engage the interest of the user. Many aspects of the path context can contribute to a positive walking experience: visual interest of the built environment, design of the street as a whole, transparency of fronting structures, visible activities, street trees and other landscaping elements, lighting and views.

Reflection

The result of the study provides valuable input for defining a walkable environment. The study mentions two levels that play an important role for a walkable environment: the path network and the quality of the path itself. This reveals how these two scale levels should relate to another. Not only the path network plays a crucial role for a successful walkable environment, but it is the details of the path that influence the walkability of an urban environment too.

The criteria are not operational and not ready for practice, yet. Since some criteria cannot be measured properly. For example, block sizes could be revealing for connectivity. This could not be measured. To make use of these criteria for design it should have dimensions.

The criteria mentioned are mainly derived for residential areas. This makes it difficult to use for highly urban areas, such as city center areas, which have different and higher demanding requirements. However, with some adjustments it could be used for the development of a pattern language for pedestrian. Other scientific writings should assist to set the criteria for a walkable city center.

6.8 Identifying and measuring urban design qualities related to walkability (Ewing et al. 2006)

This study considers the urban design qualities related to walkability which are mentioned frequently in literature. The goal of the study is to develop operational definitions and measurement protocols for key urban design qualities of streetscapes. By examining different literature, the panel of experts looked for qualities that were most frequently discussed and that empirical evidence showed are important to users of urban space. From that list, they combined similar concepts and identified distinct concepts.

Results

This study led to the selection of nine urban design qualities for subsequent study. These are:

Imageability

Quality of space that makes it distinct, recognizable, and memorable.

Legibility

The ease with which the spatial structure of a place can be understood and navigated as a whole. This could be improved by a street or pedestrian network that provides sense of orientation and relative location and by physical elements that serve as reference points.

Enclosure

This refers to the degree to which streets or other public spaces are visually defined by buildings, walls, trees and other elements.

Human scale

Size, texture and articulation of physical elements that match the size and proportions of humans. Building details, pavement texture, street trees and street furniture are all physical elements contributing to human scale.

Transparency

Refers to the degree to which people can see or perceive human activity behind the edge.

Linkage

Refers to physical and visual connections from building to street, building to building, space to space, or one side of the street to another which tend to unify disparate elements.

CHAPTER 7 A PATTERN LANGUAGE

The previous chapter shows that *A Pattern language* is able to give order the complexity of conditions. This chapter explains the theory of *A Pattern Language*. For the graduation project a *Pattern Catalogue* (Van Bellen 2010a) is developed for the planning and design of urban environments for pedestrians.

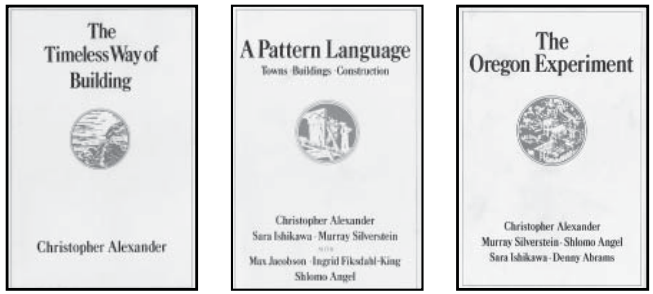


Fig. 7.1 Covers of the books by Christopher Alexander (Alexander 1975, 1977,1979).

7.1 The theory of Pattern Language

A Pattern Language: Towns, Buildings, Construction (Alexander 1977) describes a practical architectural system *(named: Pattern language)* for building and planning. The book contains the detailed patterns for towns and neighborhoods, houses, gardens, and rooms. It is one halve of a single work. The other book *The Timeless way of Building* (Alexander 1979) provides the theory and instructions for the use of the language. It explains the discipline which makes it possible to use these patterns to create a building or a town. The third book *The Oregon Experiment* (Alexander 1975) describes in full detail how this theory may be implemented in practice. The University of Oregon takes on a new planning proces for the future planning and design.

The fundamental thought of the work of Alexander, is that towns and buildings will not be able to become alive, unless they are made by all the people in society. And unless these people share a common pattern language, within which to make these towns and buildings, and unless this common pattern language is alive. In other words, the theory suggests that the design of towns and buildings should correspond to the common needs of humans.
Alexander (1977) states that when you build a thing you cannot merely build that thing in isolation, but must also repair the world around it, and within it, so that the larger world at that one place become more coherent, and more whole; and the thing which you make takes its place in the web of nature, as you make it.

The authors have developed one possible pattern language, which they distilled from their own building and planning efforts. And it could be used, by anyone, to improve their own town or neighborhood. It could be used to design a house with your family. Or at work with other people to design an office or workshop or a public building like a school. It enables people to make more coherent, more complete and profound designs in relation to towns and buildings.

7.2 Format of a pattern

A pattern language is build up by singular patterns. Each pattern describes a problem which occurs over and over again in our environment. For convenience and clarity, each pattern has the same format. First, a clear title, with a picture which shows a typical example of the pattern. Second, each pattern has a introductory paragraph, which sets the context for the pattern. Followed by a statement with the essence of the problem and after that a clarification of the problem. It describes the empirical background of the pattern, the evidence for its validity, the range of different ways the pattern can be manifested in a building, and so on. Thirdly, the solution to solve the problem in the form of a instruction, clarified by a sketch or diagram of the solution. The solution is stated in such a way that it gives the essential field of relationships needed to solve the problem, but in a very general and abstract way – so that you can solve the problem for yourself, in your own way, by adapting it to your preferences, and the local conditions at the

"… this pattern forms the core which makes an ACTIVITY NODE (30); it can also help to generate a node, by its mere existence, provided that it is correctly place s along the interaction of the paths which people use most often. And it can also help to generate a PROMENADE (31), a WORK COMMUNITY (41), an IDENTIFIABLE NEIGHBORHOOD (14), through the action of the people who gather there. But it is essential, in every case, that it is not too large." (Alexander 1977)

The pattern SMALL PUBLIC SQAURES (61) will help to complete the pattern ACTIVITY NODE (30) and the other patterns mentioned in the introductory paragraph. If you will examine the pattern ACTIVITY NODE (30), you will find out that this pattern is connected with other 'smaller' patterns. The pattern SMALL PUBLIC SQUARES is merely one part to complete an ACTIVITY NODE (30).

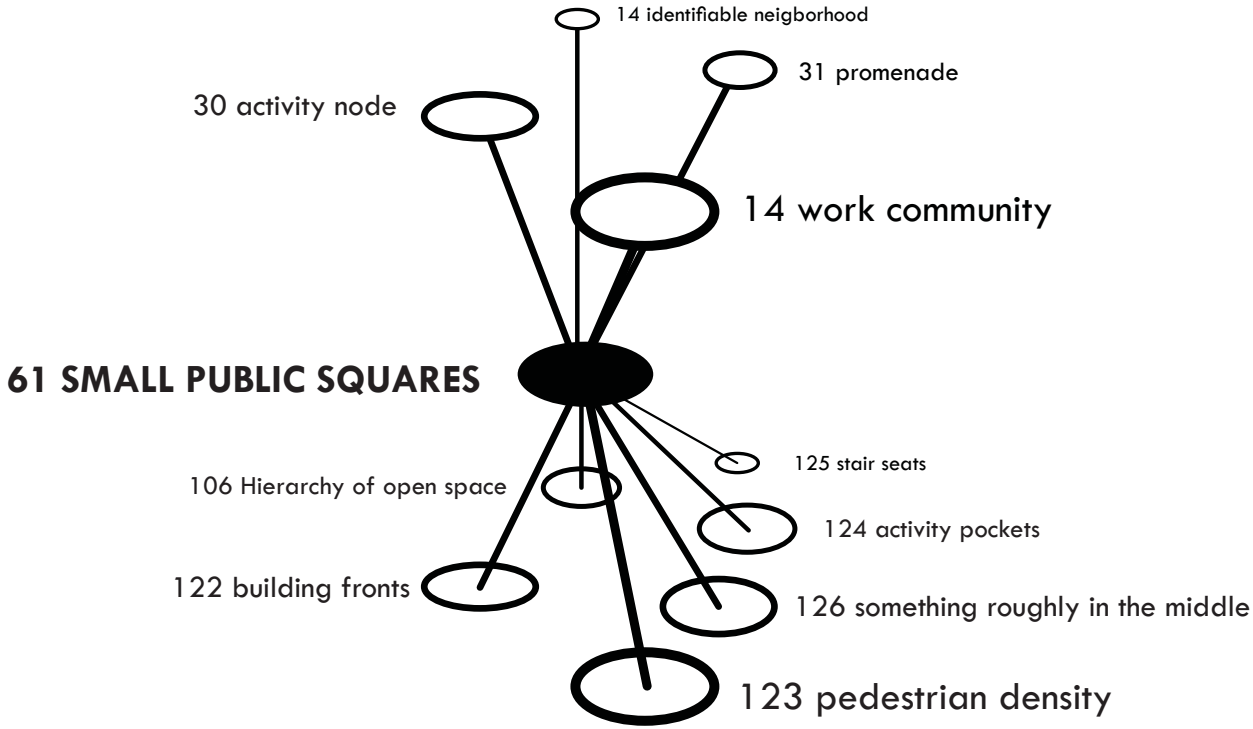


Fig. 7.5 3D representation of 61 SMALL PUBLIC SQUARES and its relation to other patterns (by author).

The pattern catalogue will enable designers and planners to understand the complexity of the conditions and make decisions that correspond to the needs of pedestrians.

The pattern catalogue does the following for the user:

- The pattern catalogue explains the separate patterns that construct a pedestrian-friendly environment.
- The pattern catalogue shows the connections between the different patterns. It reveals the connective structure of the pattern language which enables it to become a language.
- The pattern catalogue operates on multiple levels of scale. Not only detailed conditions on the local scale level are revealed, but also the conditions needed at the scale level of the city center.
- The pattern catalogue is able to operate as a communication instrument between the users and planners or designers. The user, the pedestrian, provides valuable input and can determine the required conditions for a walkable environments. For planners and designers, it becomes clear what is needed from the standpoint of the pedestrian and are able to apply it in the design.
- The pattern catalogue reveals potential solutions for planners and designers. However, the solution could be used in numerous ways. Patterns reveal possible solutions, but no ready-to-use designs. The end result is still determined by the planner or designer.

The pattern catalogue could be used differently. The use will differ between projects, designers or planners. The reader should determine which of the different uses fits best. This could depend on the type of project, stadium of the project, the design process of the project and much more. Even though, none of the uses is incorrect.

The following uses are possible:

- Flip through the pages. As a source of inspiration or for random ideas.
- Search for a problem, a topic or an interest. Use the indexes to deal with a specified theme. Related patterns, which are dealing with the topic of the theme, could be found easily.
- By a specific problem within designing. Use the word index to find a specific pattern dealing with the certain problem.

Inspired by the work of Van Dorst (Dorst 2005) and Van Duijn (Duijn 2004), there is are differences within the format of a pattern presented by Alexander (1977). Alexander opens the patterns with a critical statement on the existing situation. However, to inspire and motivate users of the pattern catalogue, the patterns in the catalogue does not state problems, but are positively formulated. Furthermore, the introductory paragraph and statement of the problem are replaced by a statement of the pattern. This is underpinned in the clarification of the pattern.

The format of a pattern within the pattern catalogue:

TITLE

In a title of a few words the condition is described. If a condition could be described with different names, both should reoccur in the title.

STATEMENT

A clear and informative statement describes the condition needed for pedestrian in relation to the urban environment. The statement gives a spatial description of an non-spatial perspective of the user.

CLARIFICATION

The statement is clarified, underpinned by academic literature and research results.

SOLUTION

A solution for the stated condition. It should be able to be used in numerous ways. It does not give a ready-to-use design proposal. The solution could be interpreted differently resulting in different designs.

RELATION

A pattern is related to patterns ‘below’ it, which complete the pattern. And also to patterns ‘above’ it.

SOURCES

If available, literature that help or give examples in relation to the problem are mentioned here.

PART III DIAGNOSIS

This part of the thesis corresponds to sub research question 3. It shows how the pattern catalogue can be used to evaluate the urban environment of the city center. The city center of Rotterdam is chosen to experiment with the pattern catalogue.

A diagnoses is carried out for the city center of Rotterdam. It analyzes the current situation of the city center from the perspective of pedestrians. Although the diagnosis is carried out for the city center of Rotterdam, it can also be done for other city centers.

The diagnosis also contains diagnosis maps for the area of the Wijnhaven. This area will be the focus area for designing with use of the Pattern Catalogue, which will be presented in Part IV.

SUB RESEARCH QUESTION 3
How could the pattern catalogue evaluate the urban environment of the city center?

Image on left page: Satellite photo of the city center of Rotterdam (Google Earth, 2010)

CHAPTER 8 COLLECTION OF DIAGNOSIS MAPS

This chapter shows how the city center can be diagnosed by using the Pattern Calalogue (Bellen 2010). The objective of the diagnoses is to reveal how the quality of the city center is as an urban environment for people to walk. Another objective is to collect data, which later can be used as a source of information for the actual planning and/or designing of the city center.

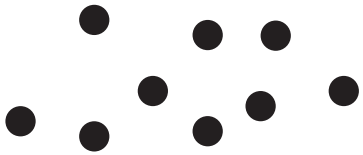


Fig 8.1 Each pattern can be examined in the urban environment, resulting in a collection of diagnoses maps on the city center.

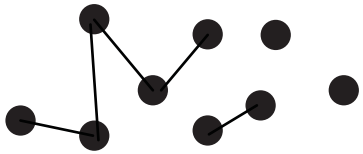


Fig 8.2 Patterns are related, meaning a selection of maps that relate to another. (by author)

The Pattern Catalogue contains individual patterns that can be examined in the urban environment. The question that should be asked with each pattern: "To what extend is this pattern present in the urban environment?". Each pattern is diagnosed over the city center resulting in a collection of maps. These diagnosis maps reveal the condition of the urban environment in relation to the needs pedestrians on a certain aspect.

Even though, the diagnoses maps seem to be apart from one another (see fig. 8.1 & 8.2). This is not the case. Within the pattern catalogue the patterns are clearly related to each other.

Not all the patterns are diagnosed for the city center of Rotterdam, some patterns can not be mapped or diagnosed that easily. It could be that data is not accessible or that the pattern is not easily defined to be represented on paper, such patterns are wind comfort, diversity, etc. However, the designer or planner should be aware that these patterns are important as well. Observations in the field and interviews with users can be made to provide this valuable information.

The main colors that are used within these maps are green, orange and red. If a certain pattern is present it can get the color green (in some cases the green color is left out for readability reasons of the map), in doubt or deficiency if a pattern is present orange and if not present red.

The city center of Rotterdam is chosen to experiment with the pattern catalogue. Even though, this city center is chosen as an experiment, it would also be possible to this diagnoses on other city centers, as well.

P07 PLACES OF INTEREST

This maps shows the places of interest within the city center. This includes public squares, accesible green (parks), waterfronts and public buildings (theaters, public libraries, cinema's, museums, churches, governmental buildings and warehouses).

The white areas on the map reveal places that do not provide interesting places for people to go to.

P09 ACCESIBLE GREEN

This maps shows accessible green within the city center. This includes parks, green strips. It offers people a place where they can sit and enjoy outdoors with landscape features.

The white area on the map reveal areas that are not provided with accessible green within the reach of 250 meters.

Orange and red areas reveal accessible green that do not correspond to the criteria set in the Pattern Catalogue

Fig 8.3 Catchment area of transportation by train

Fig 8.4 Catchment area of transportation by metro

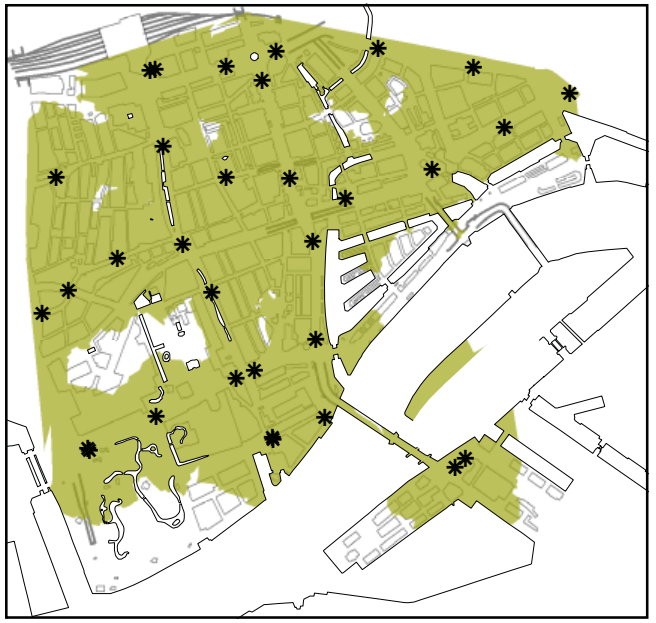


Fig 8.5 Catchment area of transportation by tram

Fig 8.6 Catchment area of transportation by bus

Fig 8.7 Catchment area of transportation by water

Fig 8.8 Catchment area of transportation by car

P18 LANDMARKS

This map reveals buildings that form a landmark. These buildings include churches, high rise buildings, bridges, stations, etc. These buildings must be clearly visible and recognizable. It are buildings that stand out from their surroundings or are higher than other surrounding buildings.

Landmark

Water quay

Building / Building block

Railway

N

0 200 300 400 m

P25 SHORT BUILDING BLOCKS

This maps shows building blocks that should be considered to long for pedestrians. Too long building blocks leads to long uncomfortable walking distances for pedestrians.

Building block > 150 m

Building block > 90 - < 150 m

Building block < 90 m

Water quay

Building / Building block

Railway

N

0 200 300 400 m

P27 HEIGHT OF BUILDING

This maps shows buildings that have a height that is too large for pedestrians. This buildings effect negatively human scale and climate conditions.

Building height > 6 floors

Building height 5/6 floors

Building height < 5 floors

Water quay

Building / Building block

Railway

N

0 200 300 400 m

AREAS THAT NEED FIXING

1. Open space is dominated by vehicle traffic. No human scale by large scale buildings and architecture result in unattractive and uncomfortable environment for pedestrians. Lack of connectivity by public transportation.

2. Mono functional area, no places of interest, lack of connectivity by public transportation.

3. Large scale buildings, a lot of blank unattractive walls.

4. Heavy vehicle traffic, large scale buildings, area forms a barrier.

5. Large scale buildings, car dominated.

6. Large scale building unattractive walls, a lack of functions, no interesting places to go, surrounding area dominated by vehicle traffic.

7. Large open area, no landscaping, no human scale.

8. Large scale buildings, no mix of functions, lack of enclosure, unpleasant climate conditions.

9. Barriers by heavy vehicle traffic, car dominated areas.

AREAS THAT WORK WELL

A. Lot of functions, a lot of activity during different periods of the day, mix of functions.

B. Pedestrian orientated area, Places of interest, no vehicle traffic, human scale. Good connectivity by public transportation.

C. Route with landscaping, something to see by public arts and enough places to rest. No heavy vehicle traffic. Enough crossing opportunities for pedestrians.

D. Accessible green with public buildings, Acoustic comfort.

E. A green open space with a diversity of public buildings. Landscaping. Pleasant climate conditions. Something to see and places to rest.

F. Human scale, mix of functions. Interesting views.

G. Public buildings, something to see.

H. human scale, lot of functions, walkable distances.

I. Mix of functions, no barriers, narrow building frontages.

J. Pedestrian orientated area, night activity.

Image on left page: Satellite photo of the area of the Wijnhaven.
(Google Earth, 2010)

CHAPTER 9 DIAGNOSIS MAPS: WIJNHAVEN

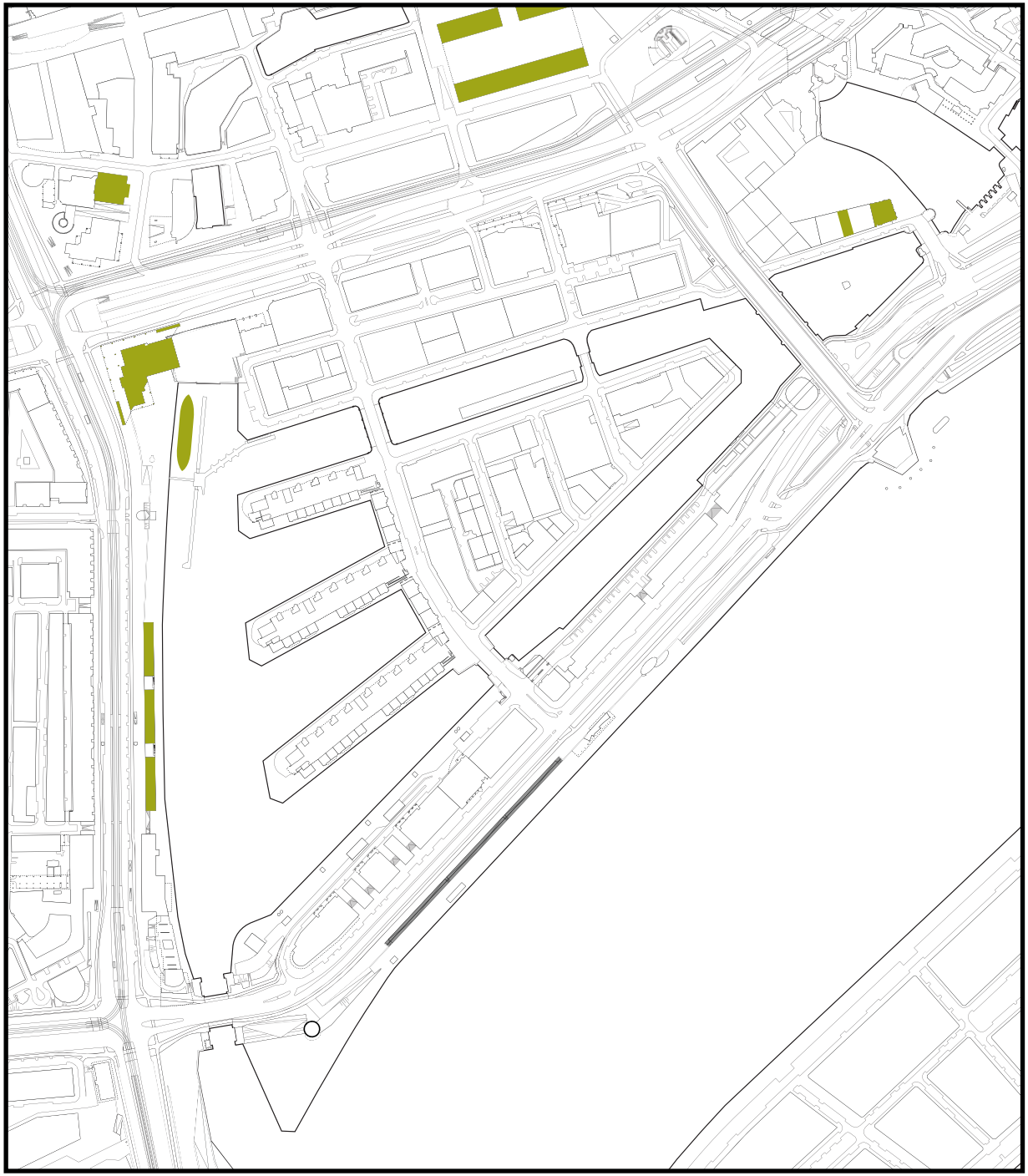
On the scale level of the city center, it is not always easy or possible to diagnose certain patterns. As soon it is clear what area to develop, it is necessary to examine the more detailed patterns.

The following diagnoses maps examine the area of the Wijnhaven. On this scale level it is easier to diagnose the more detailed patterns, such as trees, places to rest, public art, etc.

The following patterns are diagnosed on the area of the Wijnhaven:

- Public buildings
- Mix of land use
- places to rest
- Trees
- Public arts

At the end of this chapter a conclusion map is given on which is indicated what could be improved in the area of the Wijnhaven for pedestrian.



P10 PUBLIC BUILDINGS

This maps shows public buildings that attract pedestrians. This building are museums and the market hall that is under construction.

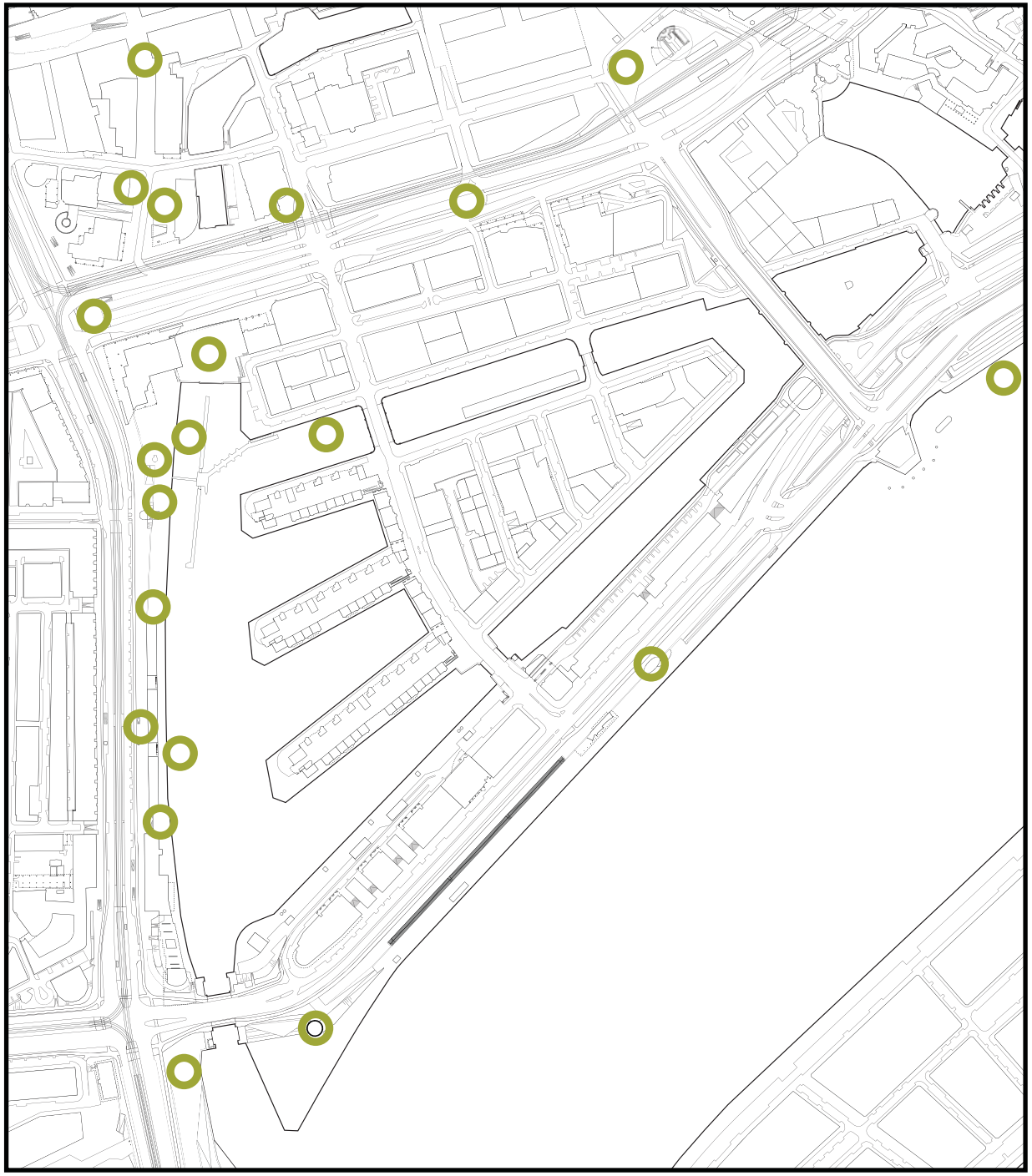
Public buildings

P34 PLACES TO REST

This maps shows all places to rest in the area. These are the locations where people can take a sit in public space.

Benches

Terraces



P27 PUBLIC ARTS

This maps shows all locations where pedestrians can see public arts.

Public arts

AREAS THAT NEED FIXING

1. This area forms a barrier that result in uncomfortable detours for pedestrians. There are not enough crossing opportunities.

2. This area forms a barrier and is dominated by heavy vehicle traffic. There are also not enough crossing opportunities for pedestrians.

3. An area, also know as a service street, that is dominated by parked vehicles and unattractive walls. No activity.

4. The ground floor of these building do not have public functions. Also long building frontages gives an unattractive facade for pedestrians.

5. No support facilities for pedestrians.

6. No room to walk

7. Not a lot of functions for pedestrians.

8. Large scale buildings. No mix of functions. Long building frontages make a unattractive facade for pedestrians and longer walking distances

9. Large scale buildings. No human scale.

10. No routes that connect existing interesting places for pedestrians. Especially the northern and southern parts are not connected with pedestrian routes.

AREAS THAT WORK WELL

A. Interesting place for pedestrian to go to, especially tourist, by the presence of museums and public art.

B. A mix of functions in a pedestrian oriented area. A lot of activity by the presence of bars, cafés and restaurants.

C. Route for pedestrians with interesting views on the cityscape of Rottterdam.

D. Places to rest with a interesting view on the harbor and its activities.

E. A route for pedestrians that enables them to stroll around in the area or the take the dog for a walk. Enough places of rest along the route.

F. Well-marked and safe route for pedestrians between two interesting places to go to.

CHAPTER 10 CONCLUSIONS OF THE DIAGNOSIS

This part of the thesis answered sub research question 3: "*How could the pattern catalogue evaluate the urban environment of the city center?*".

The patterns presented in the Pattern Catalogue (Bellen 2010) are diagnosed on the scale level of the city center. The results of the diagnosis revealed that there are areas that could be fixed in relation to walkability. These areas could be enhanced to provide pedestrians a city center that encourages and facilitates them to walk.

The majority of red areas showed that human scale is a major problem in the city center. This is caused by large scale buildings that do not offer functions for pedestrians on the ground floor. Also the mono functional character of these areas do not offer activity during the day, but high intensities of activity at a short period of the day. Therefore, it is recommended to ensure that the ground floor of building corresponds to the needs of pedestrians. This means narrow building frontages and a mix of functions.

Furthermore, the road network for heavy vehicles forms barriers in the city center. These roads divide the city into different areas that are not well inter-connected. This barriers could be fixed by tunneling or bridges. The Beurstraverse is a good example how this could be done at other major barriers in the city center.

Within the city center, the area of the Wijnhaven forms a red area that could enhance the city center of Rotterdam. This area forms the link between the shopping area of the city center and the waterfront. It is recommended to provide pedestrians routes between the Hoogstraat and the Boompjes to allow pedestrian to reach the area of the Wijnhaven and the river Maas more easily.

On the scale level of the Wijnhaven, there are more detailed problems that could be fixed. Such a problem is the lack of interesting places, there are not a lot of places for pedestrians to go to. Another major problem for the entire area is the lack of connectivity by public transportation. It is recommended to improve this, for example by introducing entry points or direct links with surrounding entry points towards the area of the Wijnhaven.

The diagnoses showed that the area of the Wijnhaven needs to solve problems both on planning and designing the urban environment. The diagnosis revealed that it is possible to analyze the urban environment of the city center and the district of the Wijnhaven by using the Pattern Catalogue. It is recommended that the patterns that where not possible to diagnose would be defined and examined further. This would make it possible to diagnose more patterns that have an influence on the walkability of the urban environment. This would give better and more design tasks for designing and planning the urban environment of the city center and the Wijnhaven.

PART IV DESIGN

This part of the thesis corresponds to sub research question 4. The question is answered with the help of a test case on the area of the Wijnhaven, which is located in the city center of Rotterdam. With the help of three design perspectives: a retainable perspective, a feasible perspective and a desirable perspective, the *Pattern Catalogue* (Bellen 2010) is tested. The design translates the theory of the developed pattern language for pedestrians into practice.

The first chapter gives an introduction on the what, why, where and how questions related to the case study. The following chapters discusses the three perspectives for the Wijnhaven. This part of the thesis ends with a conclusion for the area of the Wijnhaven.

SUB RESEARCH QUESTION 4
How could the design instrument (Pattern Catalogue) be used in a spatial design?

Image on left page: Satellite photo of the area of the Wijnhaven.
(Google Earth, 2010)

CHAPTER 11 INTRODUCTION

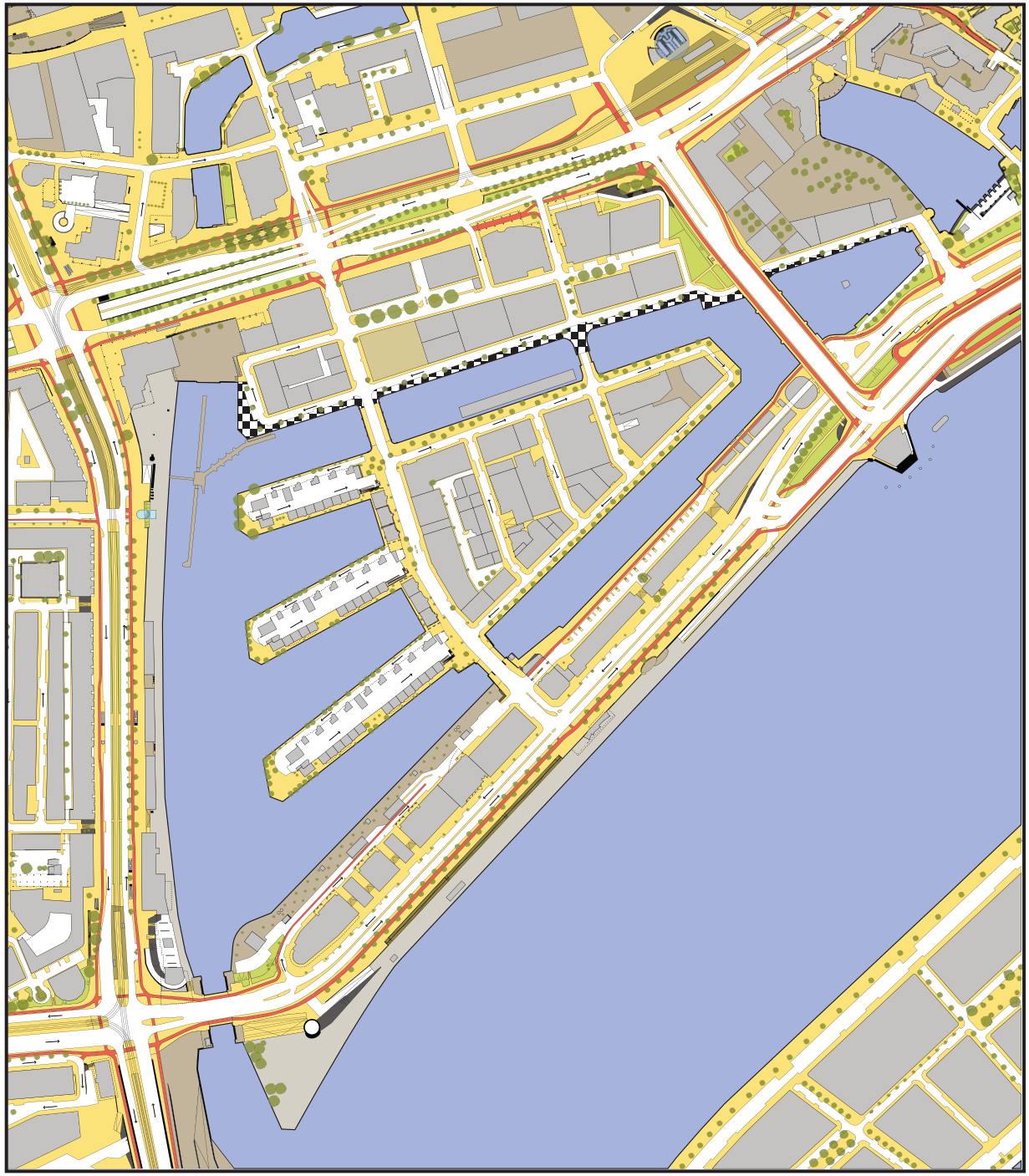
Within the city center of Rotterdam, the area of the Wijnhaven has been selected as a test case for this graduation project. At this location, the *Pattern Catalogue* (Bellen 2010) will be used and tested to enhance the urban environment of this area to correspond to the needs of pedestrians.

The area of the Wijnhaven is located between the boompjes, Leuvehaven and Blaak, part of the Waterstad. A location in the city center of Rotterdam that was a forgotten postwar area with outdated office buildings, that now has become an interesting area for developers.

The ambition of the city council, as described in '*Binnenstadsplan City Lounge*' (Gemeente Rotterdam 2008), is to transform this area from a mono functional office district into a more dense area with a mix of functions. The great challenge for this area is to provide a impulse for the quality of public space, including improvements for pedestrians. The recent development, consisting out of high density residential buildings within the area, has not let to an improvement of the quality of public space. Adding more housing will not automatically result into an attractive and vital urban environments for people to walk. Since there are more people living in the area of the Wijnhaven, there is a increased demand for positive outdoor space.

The diagoses on the city center (see part III) also revealed that the area of the Wijnhaven does not corresponds to the needs of pedestrians on a majority of the patterns. Not only detailed patterns on the street-level, but also patterns on a larger scale of the district, such as places of interest or direct routes, do not correspond to the needs of pedestrians. On both the level of design and the level of planning there are major improvements possible. The area of the Wijnhaven provides a thoroughly test case for the pattern language.

The test case of the Wijnhaven will reveal a possible design results for the area of the Wijnhaven with the use of the *Pattern Catalogue*. With an emphasis an 'a' design result, because the use of the pattern catalogue can be used differently within the hands of different planners or designers and by that result into a different design. The pattern catalogue does not instruct designers or planners anything about architectural style or visual appearance. But most certainly, the use and application of the patterns, described within the pattern catalogue, will enhance the urban environment for pedestrians in terms of the functionality. This test case will provide feedback on the functionality of the pattern catalogue. It means that the relations between patterns and the definition of patterns can be improved. The test case will enhance the new developed pattern language for pedestrians.



Legend

- Building
- Wasteland
- Pedestrian area
- Special pavement
- Bicycle path
- Quay
- Water
- Slope
- Green
- Tree
- Traffic direction

N

0 50 100 200 m

Fig. 11.2
Map of the current situation of the Wijnhaven and surroundings
(by author: based on Kadaster 2010)

The Wijnhaven is the focus area that is planned and designed within this graduation project. However, the Wijnhaven is part of the whole city center and not an isolated entity. To relate the Wijnhaven to the surrounding areas, it is necessary to include these areas as well. An overlap area will take account of the influences of the other areas for the planning and design of the focus area (see fig. 11.3 & fig. 11.4). An example of such an influence could be an entry point in the overlap area that has its influence on the focus area. Or an interesting view on something in the distance that is not actually part of the focus area.

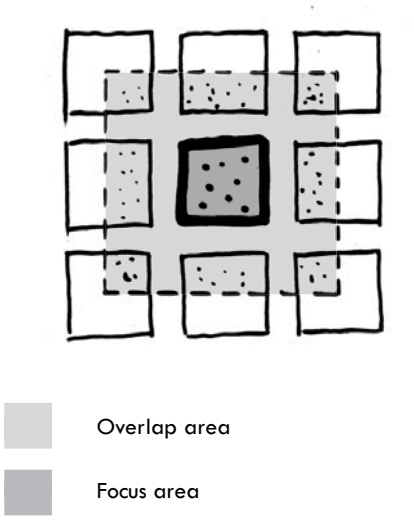


Fig. 11.4 schematic sketch of an area with overlap area and focus area

VIEW ON THE LEUVEHAVEN AND THE MARITIEM MUSEUM

CHAPTER 12 THREE PERSPECTIVES FOR THE AREA OF THE WIJNHAVEN

WIJNHAVEN: A RETAINABLE PERSPECTIVE
It could be that there are several factors that result into limitations for new future developments. Such factors could be political motives, financial resources, cultural values or physical limitations. This means that the possibilities for interventions are limited.

This perspective will limit itself to adjustments that only can take place in public space.

Limitations:
- No adjustments, removing or adding of buildings or buildings blocks.
- No adjustments or adding of new types of land use.
- No infrastructural or transportation adjustments.

See Chapter 13 for the retainable perspective for the area of the Wijnhaven.

WIJNHAVEN: A FEASIBLE PERSPECTIVE
This perspective takes the existing situation as a starting point for enhancing the urbane environment for pedestrians. This means that the area is improved by adapting the area, rather than replacing the entire area.

Limitations:
- No removing of buildings or buildings blocks.
- Adjusting or adding of buildings or building blocks is allowed
- Public space may be adjusted.
- Change of land use is allowed

See Chapter 14 for the feasible perspective for the area of the Wijnhaven.

WIJNHAVEN: A DESIRABLE PERSPECTIVE
There are no limitations for changes of the urban environment. All patterns can be used at their fullest, resulting in an new urban environment that corresponds to the needs of pedestrian on all fronts.

Limitations:
- None

See Chapter 15 for the desirable perspective for the area of the Wijnhaven.

VIEW ON THE SCHEEPMAKERSHAVEN

CHAPTER 13 WIJNHAVEN: A RETAINABLE PERSPECTIVE

In this chapter the design for the Wijnhaven with a retainable perspective is described and discussed.

The chapter is divided into four parts. First, a introduction is given and the perspective which explains why this perspective is carried out. The second part consist out of an explanation of the general design for the area of the Wijnhaven. It reveals which patterns of the Pattern Catalogue, within this perspective, are used to create an urban environment for pedestrians. After that, the details of the design will be explained and it shows what happens on the scale level of the street for pedestrians. And finally, the design with the feasible perspective is reflected by a conclusion. In this part it becomes clear which patterns are important within this perspective and what this means for the area of the Wijnhaven.

13.1 Introduction on the perspective

The design, within this chapter, reveals a *retainable perspective* for the area of the Wijnhaven. The retainable perspective shows how the urban environment of the Wijnhaven can be improved with limited opportunities for interventions. It reveals how the urban environment can be improved for pedestrians with small changes.

It could be that there are several factors that result into limitations for the enhancement of the urban environment for pedestrians. Such factors could be political motives, financial resources, communal concerns, cultural values or physical limitations. These factors result into restrictions for interventions.

Therefore, the retainable perspective is in particular interesting for developers and municipalities that encounter areas that reveal major limitations for improvements of the uban environment for pedestrians. The perspective reveals what is still possible to enhance the urban environment with these limitations. Furthermore, this perspective shows what is possible to enhance the urban environment for pedestrians within a short period of time.

The retainable perspective contains the following limitations and opportunities for the enhancement of the urban environment of the Wijnhaven for pedestrians:

Limitations

- No adjustments, removing or adding of buildings or buildings blocks.
- No adjustments or adding of new types of land use.
- No infrastructural or transportation adjustments.
- User of streets must kept the same.

Opportunities

- Street profiles may be adjusted.

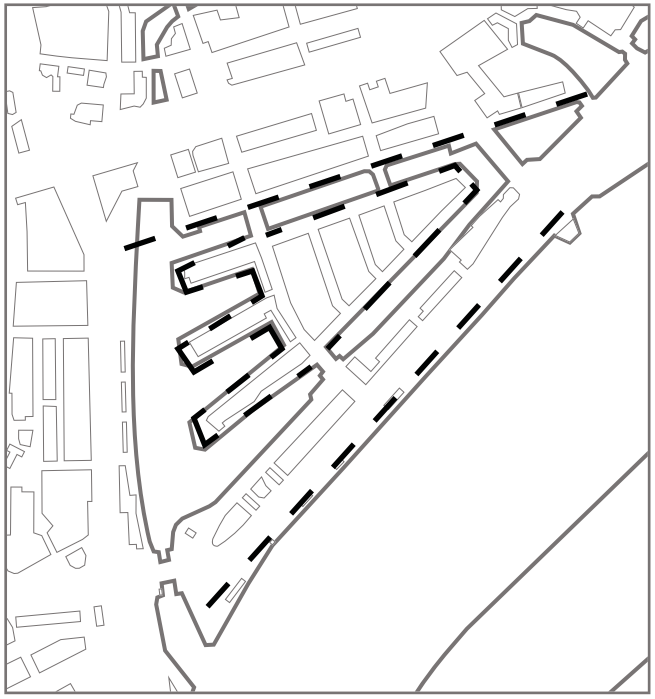


Fig. 13.2 Dashed line represents routes for pedestrians

By reducing the room for vehicle traffic, there is the possibility to make more ROOM TO WALK [P43] for pedestrians. This automatically solves the problem of NO OBSTACLES [P44] in the area of the Wijnhaven, since there is not sufficient room to park bicycles in the area, which end up on the path of pedestrians.

Another aspect of safety is to provide enough CROSSING OPPORTUNITIES [P29]. This will reduce dangerous situation, whereby pedestrian take risk by crossing the street with no use of a SAFE CROSSING [P30]. If detours are too long, pedestrians will take risk not using the crossing opportunities. This is important in the area of the Wijnhaven, and in particular for the location of the Boompjes.

DETAIL 1 WIJNKADE, JUFFERKADE & SCHEEPMAKERSKADE

Fig. 14.4 Existing situation of the Jufferkade

Fig. 14.5 Proposed situation of the Jufferkade

The Wijnkade, Jufferkade and Scheepmakerskade are mostly used by residents of the surrounding buildings. The main functions of this area is living.

To enhance the urban environment of the Wijnkade, Jufferkade and Scheepmakerskade the following patterns are used:

Firstly, more ROOM TO WALK [P43], since the southern quays of the piers do not have a lot of room for walking (see fig 14.4 & 14.5). By doing so, a route is created which can be used to walk the dog or to enjoy outdoors. The route is well-lighted by STREET LIGHTING [P49], to make it possible to walk at night and the make the route SAFE AT NIGHT [P20].

Secondly, there are PLACES TO REST [P34] created (see fig. 14.6 & 14.7). The exisiting open spaces along the piers are not being used nowadays. These places can be transformed into places to rest for pedestrians. This means that there need to by benches places to sit. But without SOMETHING TO SEE [P39] people will not use them. The activities in the harbor will contribute in something to see. But also PUBLIC ARTS can be situated to provide something to see, such as statues, wall paintings or fountains. The orientation towards the south gives these places PLEASANT CLIMATE CONDITIONS [P35]. People can sit in the sun at these places. Lastly, to make these places different from the route, SPECIAL PAVEMENT [P51] makes them recognizable and special for pedestrians.

Fig. 14.6 Existing situation of a place to rest

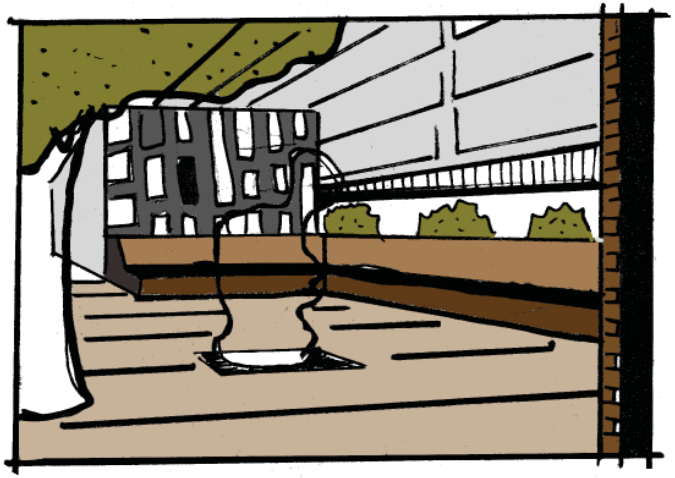


Fig. 14.7 Illustration of a place to rest

DETAIL 2 GLASHAVEN & POSTHOORNSTRAAT

Fig. 14.11 Existing situation of the Glashaven

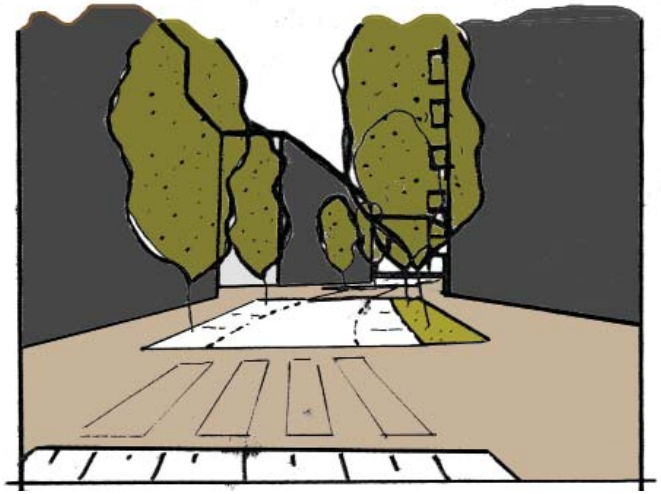


Fig. 14.12 Proposed situation of the Glashaven

The Glashaven and Posthoornstraat are the main streets on which vehicle traffic travel through the area. It is a busy street and vehicle traffic drives with high speed. This is caused by the width of the road, that allows drivers to go this fast.

The patterns that are used to enhance the urban environment of these streets (see fig. 14.11 until 14.16) for pedestrians are as following:

At first, the SAFETY OF OTHER TRAFFIC [P21] is an important issue to solve. The pattern SLOW TRAFFIC [P31] helps to make it safer for pedestrian to cross the streets and to walk here. This is done by making the road for vehicle traffic less wide. This makes it more difficult for vehicle traffic to drive at high velocities. The parked vehicles along the street are maintained, because these also help to slow traffic. Furthermore, there are speed bumps proposed at crossings with pedestrians. Vehicle traffic is required to slow down.

Secondly, there is more ROOM TO WALK [P43] for pedestrians. By making the roads less wide, there is more space available for walking. This makes it more comfortable for pedestrians to walk, because nowadays a lot of bikes are places against the facades of the buildings. These bicycles make the path for pedestrian to narrow and cause obstacles. In the proposed situation there is a designated place to park bicycles. This makes the path for pedestrians free of obstacles.

Fig. 14.13 Existing situation of the Posthoornstraat

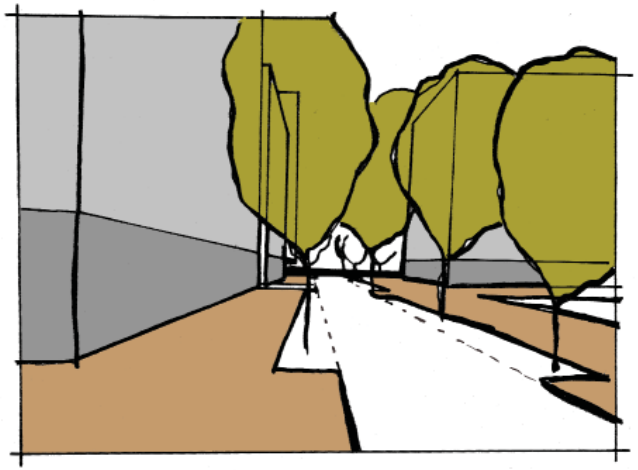


Fig. 14.14 Proposed situation of the Posthoornstraat

13.4 Conclusions & Recommendations

This design for the Wijnhaven, with a retainable perspective, showed small design interventions that are possible to change the urban environment. These small design interventions enhanced the urban environment for pedestrians tremendously.

To enhance the urban environment of the Wijnhaven for pedestrians the following recommendations can be made.

Safety from other traffic.
This is probably the most important recommendation for the entire area. Within the area of the Wijnhaven there is a lot of room designated for vehicle traffic. The dimension of the roads do not correspond to the intended use of the street. For example, a one way street has the dimensions of a two way street. The extensive width of the street result in high speed by vehicle traffic. A dangerous and hazardous sitaution for pedestrians.

It is recommended to reduce the speed of vehicle traffic by giving them less room. An one way street should have the dimension that fits the particular use of the street. Vehicle traffic will move with a lower velocity, if the street are less wide. Furthermore, it is recommended to use refuge for pedestrian at crossings, especially at the area of the Boompjes

Room to walk.
Another recommendation involves room to walk for pedestrians. At a lot of streets, pedestrians encounter a lot of obstacles along the path. This obstacles consist out of bicycles, street furniture, street trees, etc. These obstacles could be places in a designated area, so that they do not form obstacels for pedestrians.

Places to rest.
To enhance to urban environment as a place to enjoy the outdoors, the area of the Wijnhaven needs more places to rest.


WIJNHAVEN

CHAPTER 14 WIJNHAVEN: A FEASIBLE PERSPECTIVE

This chapter clarifies and discusses the design for the area of the Wijnhaven with *a feasible perspective*.

The chapter is divided into four parts. First, a introduction on the perspective which explains why this perspective is carried out. The second part consist out of a explanation on the general design for the area of the Wijnhaven. It reveals which patterns of the Pattern Catalogue, within this perspective, are used to create an urban environment for pedestrians. After that, the details of the design is explained and shows what happens on the scale level of the street for pedestrians. And finally, the design with the feasible perspective is reflected by a conclusion. In this part it becomes clear which patterns are important within this perspective and what this means for the area of the Wijnhaven. And to summarize the findings for the area of the Wijnhaven there are recommendations given for future developments of the area of the Wijnhaven.

14.1 Introduction on the persective

The design, that is explained in this chapter, reveals *a feasible perspective* for the area of the Wijnhaven. It shows how the urban environment can be improved for pedestrians.

The feasible perspective improves the urban environment of the area, by taking the existing situation as a starting point. However, in comparison with the previous chapter *Wijnhaven: A Retainable Perspective,* this perspective provides more possibilities for changes in the area. Within this perspective it is possible to change the land use of buildings and to adapt buildings to correspond to the needs of pedestrians. For example, the ground floor could be changed by dividing it into smaller units or the change the use of the ground floor to provide more functions for pedestrians. In other words: this perspective prefers to adapt buildings instead of demolish them and start constructing new buildings.

The perspective presented in this chapter will take more effort, financial resources and time to realize, in comparison with the retainable perspective. But it will show a perspective that is not impossible to realize, because the interventions to not intent to change the urban environment drastically, as seen in the desirable perspective (see chapter 15). This perspective could be seen as a perspective with a realisation period of about 10 to 15 years.

To provide a clear framework for this perspective, the following limitations and opportunities for changing the urban environment within the feasible perspective are set:

Limitations
- No removing of buildings or buildings blocks.
- No changes of the position of the quay.

Opportunities
- Adjusting or adding of buildings or building blocks is allowed.
- Public space may be adjusted.
- Change of land use is allowed.
- New entry points are allowed.
- New connections are allowed.

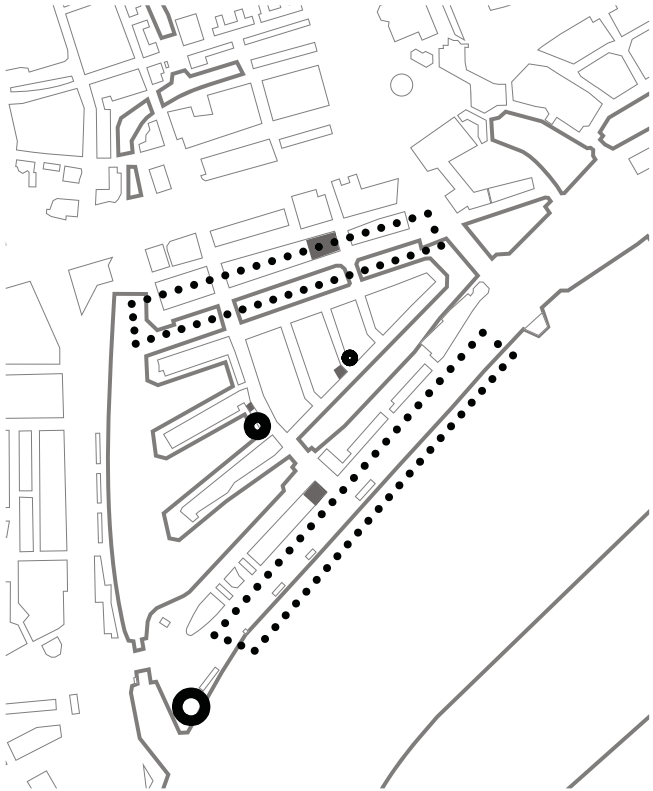


Fig. 14.2 Scheme with proposed new places of interest

Public Square
Waterfront or Harbor
Public Building

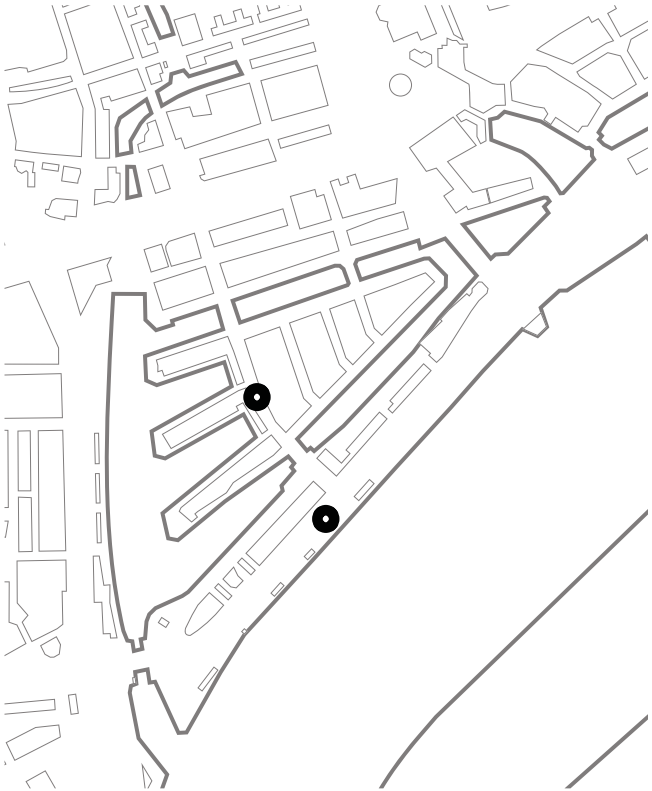


Fig. 14.3 Scheme with proposed new entry points

Bus stop

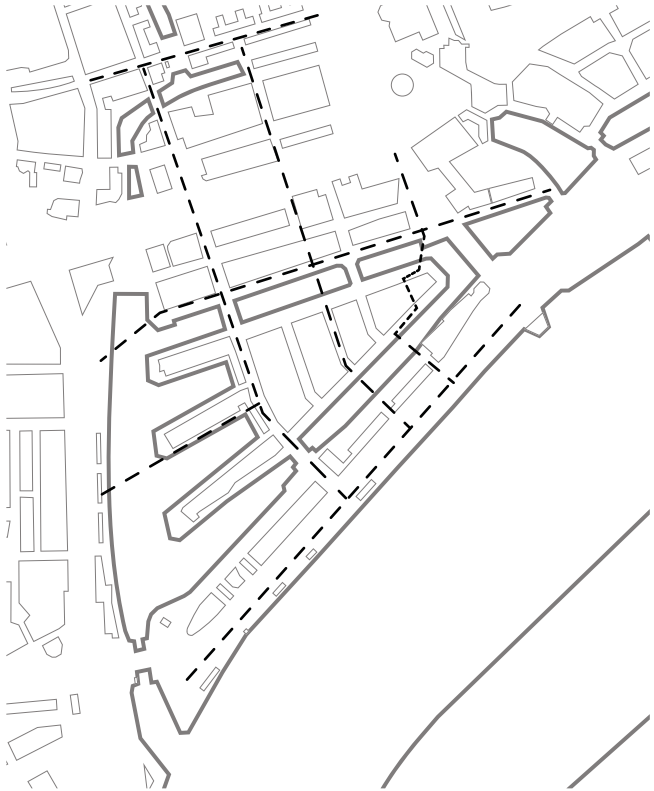


Fig. 14.4 Scheme with proposed new pedestrian routes

Route for pedestrians

The following design interventions help to solve issues that occurs in the urban environment of the entire area of the Wijnhaven.

A problem of the area is its monotonous character in relation to functions within the area. This has been solved by providing a MIX OF LAND USE [P24]. The ground floor of the building are divided into smaller units to provide NARROW BUILDING FRONTAGES [P26]. This ensures more and different functions within the area. It also improves the distance that pedestrians need to walk within the area. Another aspect that is related with this change of the buildings is more ACTIVITY [P28] in the area, which enhances the SAFETY OF CRIME [P19] in the area.

As seen in the previous chapter of the retainable perspective is it necessary to improve the SAFETY OF OTHER TRAFFIC [P21] in the area. This means that vehicle traffic should get less room and for pedestrians more ROOM TO WALK [P43]. Also vehicle traffic should be slowed down, as the pattern of SLOW TRAFFIC [P31] shows us. In the area also SAFER CROSSINGS [P30] and more CROSSING OPPORTUNITIES [P29] are proposed, especially at the Boompjes. The Boompjes is a BARRIER [16] and by providing more crossing opportunities pedestrians don't have to make major detours to cross the street.

The proposed design interventions form a network of paths and goals for pedestrians, that facilitates and encourages them to use the urban environments by foot. Now that this step is completed it is time for the next step, the more detailed elements of the network for pedestrians.

Fig. 14.5 Existing situation of the Wijnhaven

Fig. 14.6 proposed changes in buildings along the Wijnhaven

DETAIL 1 WIJNHAVEN

Fig. 14.8 View on the Wijnhaven

Fig. 14.9 View on the existing situation of the Wijnhaven

The Wijnhaven is a harbor within the area of the Wijnhaven. In the current situation the nothern side of the harbor is a route between the Oude haven and the Witte de Withstraat and Leuvehaven. The special pavement makes clear that the pedestrian walks on a special and primary route between places of interest. The northern side of the harbor in this perspective as also proposed as a route between the existing places of interest. However the route itself could contribute to the area of the Wijnhaven as well, by becoming a place of interest. The location and orientation of the Wijnhaven makes it suitable to become a harbor with bars, restaurants and pubs.

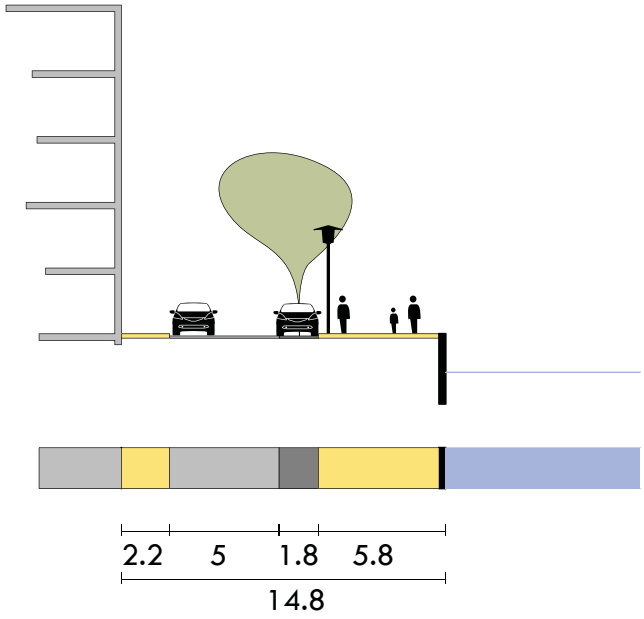
The following patterns helped to generate this place.

The first design intervention is to make this route a DESIGNATED PATH [P22] for pedestrians only. By this the pedestrian can walk comfortable and safely without being disturbed by other traffic. By this, there is enough ROOM TO WALK [P43]. Street furniture and other obstacles are placed so that they are NO OBSTACLES [P44]. By making sure that the PAVEMENT AND SURFACE CONDITIONS [P45] are easy to walk on, a comfortable route is created.

Furthermore, the crossing with the Posthoornstraat and the Zwartehondstraat are made with the same pavement as the path itself. This makes SAFER CROSSINGS [P30] for pedestrians, since vehicle traffic is aware of the path and its priority for pedestrians.

To make the route an interesting place, it is necessary to make room for other activities, such as PLACES TO REST [P34] in the form of benches and terraces. To make the terraces possible it is necessary to divide the ground floor of the building along the path into smaller units. By this there are NARROW BUILDING FRONTAGES [P26] with more functions, preferably a MIX OF FUNCTIONS [P24]. A PUBLIC BUILDING [P10] will attract people to go to this place, which provides more ACTIVITY [P28] at the harbor of the Wijnhaven.

To provide PLEASANT CLIMATE CONDITIONS [P35] the existing TREES [P48] can be retained to provide shade and some protection of rain.



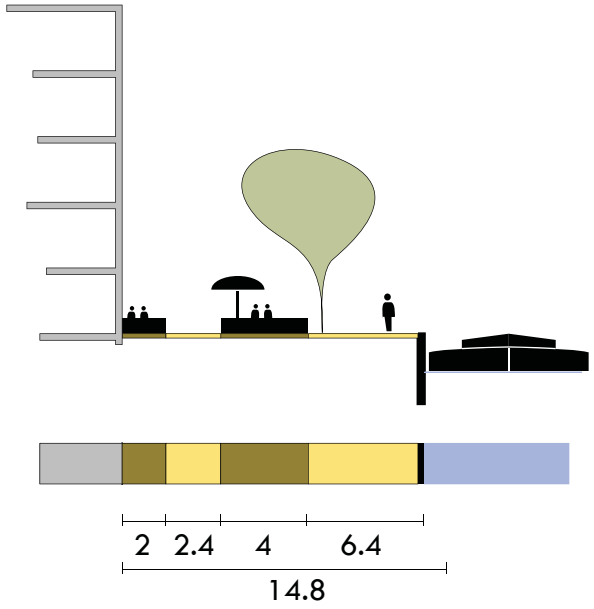


Fig. 14.11 Existing situation of the Wijnhaven

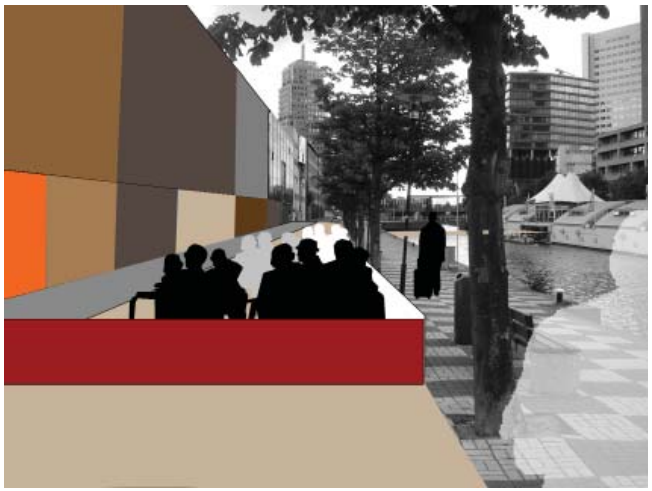


Fig. 14.12 Proposed new situation of the Wijnhaven

DETAIL 2 BIERSTRAAT

Fig. 14.14 View on the Bierstraat

Fig. 14.15 Proposed changes for the Bierstraat

The Bierstraat is proposed as a pedestrian route that connects the Wijnhaven and the Boompjes. Together with the Molstraat it forms a new connection accross the entire area between Blaak and the Boomples. A connection is proposed to cross the Scheepmakershaven, so this is NO BARRIER [P16] for pedestrians anymore. This means no detours for pedestrians to reach the waterfront at the river Maas.

The route is a DESIGNATED PATH [P22] for pedestrians only. This ensures that pedestrians can walk SAFELY FROM OTHER TRAFFIC [P21].
Along the route the ground floor of the buildings are proposed to be divided into smaller units. To provide more diversity in functions and activity in the Bierstraat. To path is divided in ROOM TO WALK [P43] and room for street furniture. This ensures there are NO OBSTACLES [P44] along the path, which could distrubed pedestrians walking. For this reason, the street lighting is attached to the facade of the buildings.

The AWNING [P46] enables pedestrians to walk protected from possible rain.

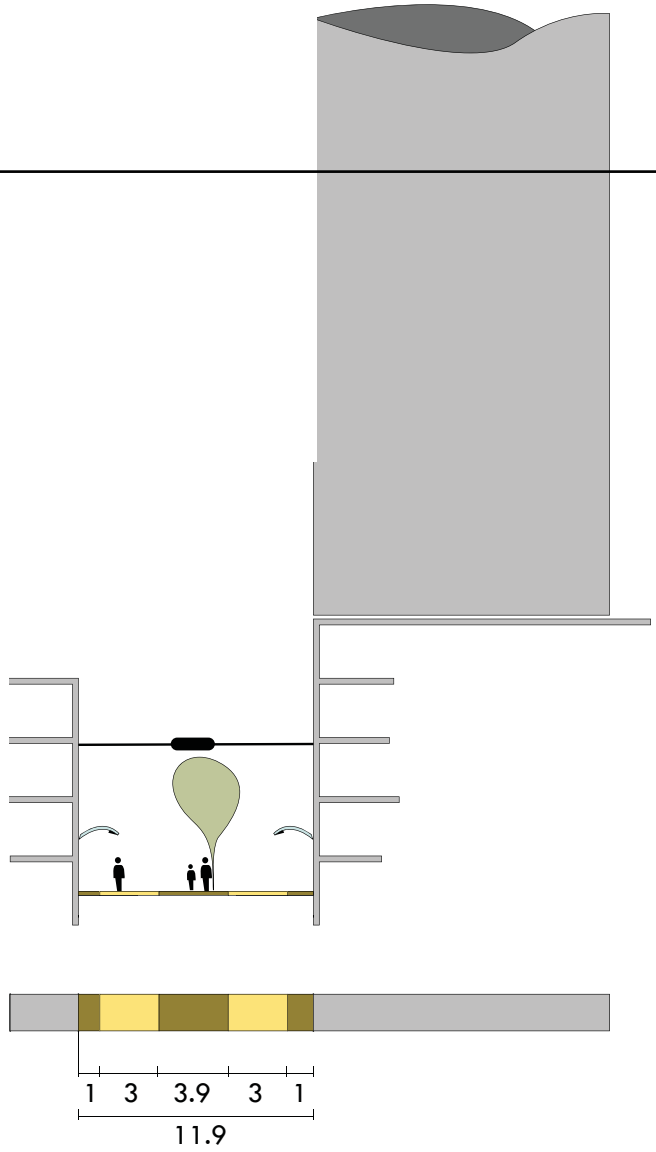


Fig. 14.16 Section of the new design for the Bierstraat

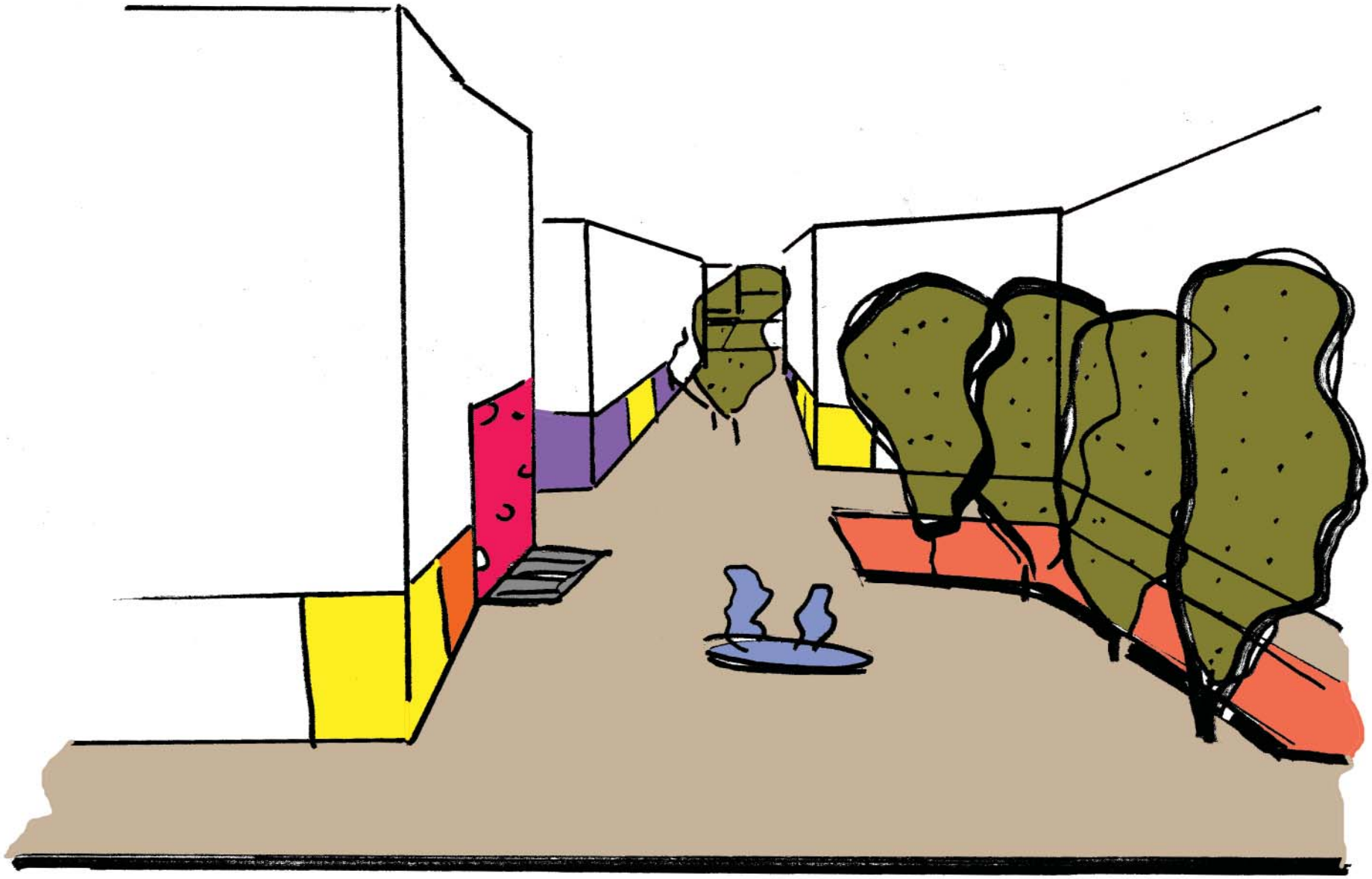


Fig. 14.18 A perspective sketch of the proposed public square at the Bierstraat (by author)

14.4 Conclusion & Recommendations

The design for the area of the Wijnhaven, with a feasible perspective, showed that the urban environment can be enhanced for pedestrians by adapting several aspects. The previous chapter revealed a retainable perspective, the recommendations that are mentioned there are also applicable for this perspective. The following recommendations are an addition the these recommendations.

Adapting buildings

By adapting the ground floor of buildings, it is possible to add more and different types of functions in the area for pedestrians. This means that the ground floor could contain shops, cafés, galleries, etc. By making use of narrow building frontages it is possible to have more functions in a building, which influence walking distances in the area. By this, the area of the Wijnhaven can contain a mix of functions. This intervention provides space for more commercial functions and more drinking and dining. It will also provide more diversity of activities within the area.

Improving accessibility

The area of the Wijnhaven is not easy to reach by public transportation. By adding entry points it is possible to enhance the accessibility of the area of the Wijnhaven. Also the use of direct routes between the area of the Wijnhaven and entry points in the surrounding area proves to enhance the accessibility of the area.

Designated paths for pedestrians

To enhance the connection between Hoogstraat, which is a attractive area for pedestrians, and the Boompjes it is necessary to provide clear connections. By transforming existing streets into pedestrian-only streets, these connections are more clear and attractive for pedestrians. It enables them to travel through the urban area more easily and safely. And pedestrian can navigate more easily by these routes for pedestrians between those areas.

Public buildings

The use of public buildings can make the area more interesting for other types of users than only residents of the area. Existing buildings could be transformed to provide space for galleries or museums or other sort a like functions. This provides the area with more and different activity during the day.

VIEW ON THE KOP VAN ZUID FROM THE BOOMPJES

CHAPTER 15 WIJNHAVEN: A DESIRABLE PERSPECTIVE

This chapter clarifies and discusses the design for the area of the Wijnhaven with a *desirable perspective*.

The chapter is divided into four parts. First, a introduction on the perspective, which explains why this perspective is carried out. The second part consist out of a explanation on the general design for the are of the Wijnhaven. It reveals which patterns of the Pattern Catalogue, within this perspective, are used to create an urban environment for pedestrians. After that, the details of the design will be explained and it will show what happens on the scale level of the street for pedestrians. And finally, the design with the feasible perspective will be reflected by a conclusion. In this part it becomes clear which patterns are important within this perspective and what this means for the area of the Wijnhaven. And to summarize the findings for the area of the Wijnhaven there are recommendations given for future developments of the area of the Wijnhaven.

15.1 Introduction on the persective

The design, that is explained in this chapter, reveals a *desirable perspective* for the area of the Wijnhaven. It shows how the urban environment can be improved for pedestrians.

The desirable perspective will show what the result is, f the pattern are used at their fullest. This means there are no limitations for changing the urban environment. The urban environment is designed as a clean sheet of paper, it will reveal what might be a possible result is of the patterns.

This perspective can only be realized if the area of the Wijnhaven would be totally demolished and reconstructed. This perspective could be seen as a perspective with a realisation period of about 75 to 100 years.

To provide a clear framework for this perspective, the following limitations and opportunities for changing the urban environment within the desirable perspective are set:

Limitations
- None

Opportunities
- Unlimited

Besides locating places of interest, it is also necessary to link these places with entry points, to LINK WITH OTHER MODES OF TRANSPORTATION. The design for the Wijnhaven proposes two public transportation stops within the area of the Wijnhaven. This serves the whole area with an entrypoint within WALKING DISTANCE. The mode of public transportation is proposed as tram. However, the mode of public transportation could be different. The stops are located at the Glashaven and at the Boompjes.

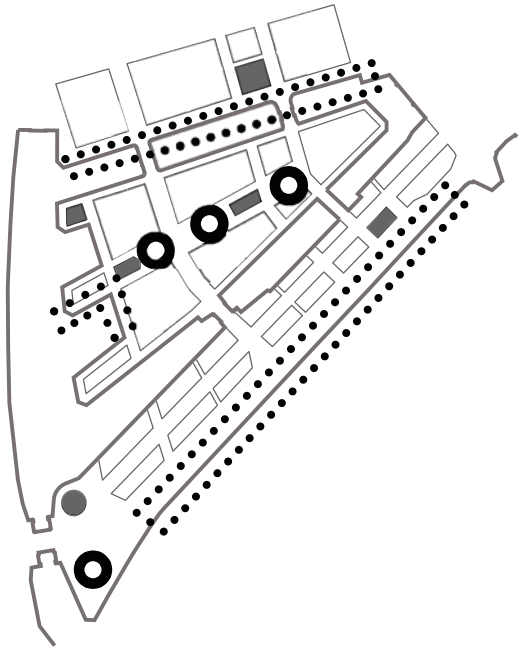


Fig. 15.2 Scheme with proposed new places of interest.

Public Square
Waterfront or Harbor
Public Building

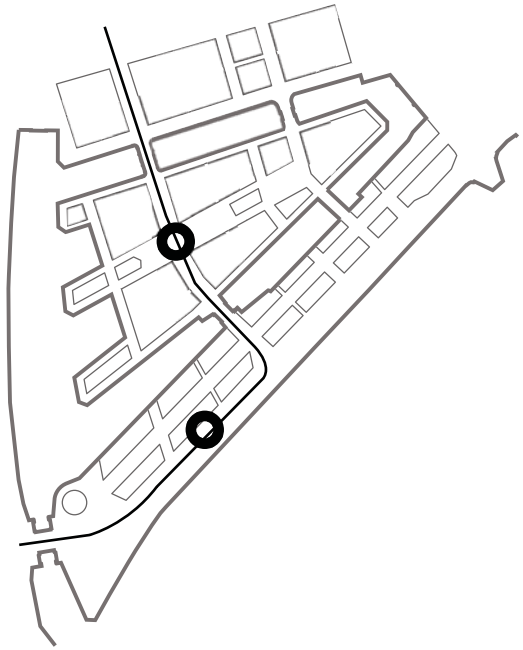


Fig. 15.3 Scheme with proposed new entry points.

Tram stop
Rail

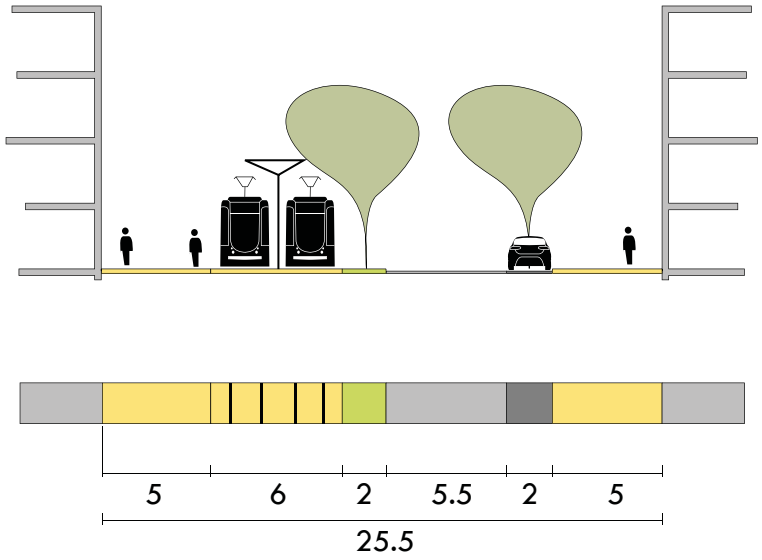


Fig. 15.5 Section of Posthoornstraat with tram

DETAIL 1 BUILDING BLOCKS

Fig. 15.7 View on Laurenskerk from the Molstraat.

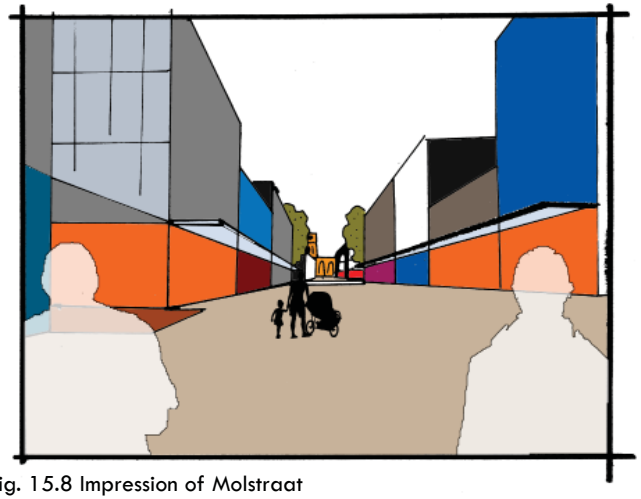


Fig. 15.8 Impression of Molstraat

The proposed building blocks within the area of the Wijnhaven are created with the following patterns.

The pattern SHORT BUILDING BLOCKS [P25] determines the foot print of the proposed buildings blocks. This may not be longer than 90 meters. If so, a passage way or ARCADE [P47] provides the opportunity to split building blocks to correspond to the pattern.

The pattern BUILDING HEIGHT determines the maximum height of the building facing the street of the building block. High rise building can be build, but the with setbacks to prevent uncomfortable climate conditions. It may not be TOO WINDY [P40] for pedestrians.

The pattern NARROW BUILDING FRONTAGES creates small units along the street. This makes the street correspond to the HUMAN SCALE [P03]. But also provides the opportunity for a MIX OF LAND USE [P24].

The pattern TRANSPARENCY ensures that there are eyes on the street and that pedestrians are aware of what is going on inside buildings. This enhances the urban environment in relation to SAFETY FROM CRIME [P19] and AT NIGHT [P20].

Fig. 15.8 Impression of a arcade going through building blocks

DETAIL 2 BOOMPJES

Fig. 15.11 Current situation of the Boompjes

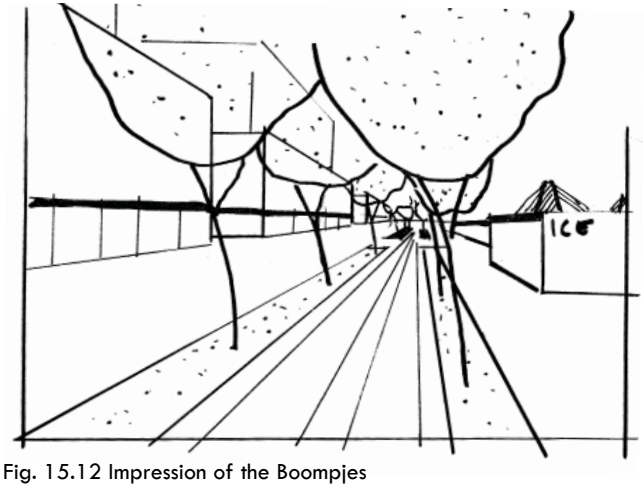


Fig. 15.12 Impression of the Boompjes

Within this perspective the Boompjes is proposed as a PLACE OF INTEREST [P07] for pedestrians. Within this perspective it is possible to take out the BARRIER [P16] of heavy vehicle traffic by creating a tunnel. The waterfront of the Boompjes has become a DESIGNATED PATH for pedestrians. An area that provides SAFETY FROM OTHER TRAFFIC [P21].

The connectivity of the Boompjes is improved by adding an ENTRY POINT which is part of a new tram line through the area of the Wijnhaven. By this the area of the Boompjes is LINKED TO ANOTHER MODE [P11] of transportation.

Furthermore, there are viewpoints proposed to provide PLACES TO REST [P34]. The river Maas provides these places with SOMETHING TO SEE [P39]. The pattern SUPPORT FACILITIES [P32] creates small scale kiosks that provide the necessary needs for pedestrian to stay at this area. It gives people the opportunity to buy drinks, food, a newspaper or other small products.

The buildings proposed for the Boompjes correspond to the building blocks presented earlier. This involves a MIX OF LAND USE [P24] to provide different types of ACTIVITY [P28] along the day. The buildings have AWNINGS [P46] to provide pedestrians with RAIN PROTECTION [42]. NARROW BUILDING FRONTAGES [P25] and limited HEIGHT OF BUILDING [P27] provide HUMAN SCALE [P03]

15.4 Conclusions & Recommendations

The design for the area of the Wijnhaven, with a desirable perspective, shows that the urban environment can be designed for pedestrians. The patterns are used at their fullest and revealed a possible design of the urban environment of the Wijnhaven.

This design does shows a result of the use of the pattern language. It does not take economical, social or other aspect in account. And probably the design would be impractical and unrealizable. It cannot be considered as an integral design for the area of the Wijnhaven. This test case is proposed to see what the result would be if the patterns would be consistently applied. By this we get feedback and find problems within the develop pattern language that could be corrected.

The design shows a new urban structure for the Wijnhaven. New places of interest, entry points and routes are introduced to enhance the urban environement for pedestrians.

Building Blocks

The typology of the buildings is differently from the existing buildings in the area. For the future of Rotterdam this could mean a other way of construction high rise buildings. The focus should not lay on the vertical aspect of the building, but rather on the things that happen on the street.

If compared with the existing situation, this design shows a finer grain in buildings. The building blocks are divided in smaller lots, in comparison with existing lots. This could be used in future developments for the city. Or it should be incorporated into the rules for building in the city.

More connections with the surrounding area

To connect the area of the Wijnhaven it is necessary to provide direct routes with it surroundings. By this, existing and new interesting places are connected with another. It also improves the accessibility of the area.

THE RIVER MAAS AND ON THE LEFTSIDE THE BOOMPJES

CHAPTER 16 CONCLUSION

This part of the thesis considered sub research question 4: “How could the design instrument (pattern catalogue) be used in a spatial design?”.

For answering this question three designs were made to enhance the urban environment of the Wijnhaven for pedestrians. By making use of three perspectives for the area of the Wijnhaven, it was possible to test the design instrument at three different levels of interventions. From very limited possibilities for improvements to unlimited possibilities to improve the area of the Wijnhaven.

For designing the area of the Wijnhaven, there are two main activities to be done. First, the planning of the area, this included locating existing and new goals, linking this goals with direct routes to another and provide accessibility by other modes of transportation. Secondly, the design of the proposed goals and paths. This consist out of designing paths and interesting places, to encourage people to walk.

In all three perspectives, it became clear that the area of the Wijnhaven can be improved. With limited intervention the public space becomes a important aspect for improvement. Nowadays, In the area of the Wijnhaven the public space is already being improved (see fig. 16.1). The quays are designated for pedestrians instead of parked vehicles. The next step could be to adjust the buildings and provide more space for different types of functions. With more possibilities the building blocks could be adapted to enhance the urban environment for walking. And with unlimited possibilities it gives a new type of building block and urban structure.

Fig. 16.1 Recent improvements of the quay of the Scheepmakershaven by the municipality.

The design instrument has proven itself that it could be used in different types of perspectives. It is able to find problems in relation the walking and the urban environment and to give spatial solutions to solve the problem that are found. The design instrument made it easier to make decisions for designing the area.

With the result and recommendations of the design for the three perspectives it would be possible to review the Urban Masterplan, by Kees Christiaanse in partnership with the municipality of Rotterdam. What aspects of the new urban plan do correspond to the needs of pedestrian and which not?

PART V EVALUATION

This part of the thesis gives a conclusion, recommendations and a reflection on the graduation project.

The first chapter of this part will summarize what is done in the graduation project. And what the related end products are. It gives conclusions and recommendations on the design instrument and for future studies. And the last chapter will give a reflection on the process of the graduation project.

CHAPTER 17 CONCLUSION & RECOMMENDATIONS

This thesis considered the urban environment of the city center as a place for people to walk. If pedestrians want to be facilitated and encouraged to walk, they need an urban environment that corresponds to their needs. It was stated that, if the urban environment does not correspond to the needs of pedestrians, people do not walk or offered no choice to walk at all. For people to walk it is essential that the urban environment of the city center corresponds to the needs of pedestrians. It should become an urban environment that facilitates and encourages people to walk. This means that the urban environment needs to meet multiple aspects that involve an attractive, facilitating and encouraging urban environment for pedestrians. The urban environment needs to be understand and designed as a whole to make sense for pedestrians.

The main research question for this graduation project therefore was:

"HOW COULD THE CITY CENTER BECOME AN URBAN ENVIRONMENT THAT FACILITATES AND ENCOURAGES PEOPLE TO WALK?".

To answer the main research question, there were three sub research question formulated. The answering of the three sub research questions have let towards three end products. These end products are: a design instrument, a diagnosis and a design. Each end product is related to a separate part of the thesis.

The first sub research question:

"WHAT ARE CONDITIONS FOR AN URBAN ENVIRONMENT THAT FACILITATES AND ENCOURAGES PEOPLE TO WALK IN THE CITY CENTER?"

The answering of this sub research question resulted into a wide variety of conditions that make an urban environment that meet with the needs of pedestrians. This conditions are derived by a literature study on a variety of writings. The result of the literature study revealed that there is a lot of knowledge available on this topic. Since, there is a wide variety of conditions from different standpoints and levels of scale, there is a need to order the complexity of conditions for the design and planning of pedestrian-friendly environments.

Sub research question two:

"HOW TO ORDER THE WIDE VARIETY OF CONDITIONS FOR THE URBAN ENVIRONMENT FOR PEOPLE TO WALK?"

For this research question the theory of Pattern Language (Alexander 1975, 1977, 1979) is used. This theory made it possible to order the derived conditions from the literature research. It reveals and makes it understandable that conditions are related towards another. The result is a design instrument, the Pattern Catalogue (Bellen 2010). This instrument enables us to understand the urban environment for pedestrians as

The result of the thesis are the following products:

1. Pattern Catalogue, which contains the conditions that create an urban environment for pedestrian, which is able to facilitate and encourage them to walk

2. Diagnosis, which is able to evaluate the urban environment of any given city center. It reveals the problem areas that could be fixed to improve the city center for walking.

3. A spatial design, which illustrates how the design instrument could be used to fix problem areas in the city center.

This thesis has considered that there is a need to understand the urban environment as a whole.
The results of this thesis is a first step towards understanding the urban environment for pedestrian as a whole. For the future, there is more need for research towards more knowledge on the conditions. The following recommendations show where more research or improvements could be done in relation to the topic.

1. PATTERN CATALOGUE

As we have seen in the literature study, the knowledge that is used to develop the Pattern Catalogue is just the tip of the iceberg. It is recommended to include more scientific literature and pedestrian plans & guides for the development of the Pattern Catalogue. Furthermore, as more research is done by different professional fields of urban design and planning, transportation and others, this could contribute to the further development of the Pattern Catalogue.

The previous recommendation also consist out of the following recommendation. Some patterns are very clear defined and unquestionable, there is no doubt about the content of the patterns. These patterns are easy to use and make design decisions relative easy to make. Remarkably, the patterns that are well and clearly defined are the patterns that mostly mention dimensions of a particular subject. Such patterns are related to dimensions of buildings or streets. These patterns enables you to measure a subject within the urban environment and conclude whether the pattern is there or not. However, there are also some patterns are not well defined or not able the define yet. This patterns could raise questions on their validity. This makes design decision not easier, since a design decision becomes questionable whether it enhances the urban environment. It is necessary to define these patterns better, therefore more research on these topics is necessary and need to be incorporated into the Pattern Catalogue.

Also practical experiences could contribute to further development of the design instrument. the Pattern Catalogue should be tested more elaborately. And also at different city centers. It would also be very interesting to test the Pattern Catalogue in another city in other countries around the world. This could lead to a worldwide design instrument for the urban environment for pedestrians.
To make sure that the Pattern Catalogue could improve the content more easily and quickly, it is recommended to change the form of the Pattern Catalogue. The Pattern catalogue is now presented as a booklet. This is not ideal, since a printed book becomes outdated

CHAPTER 18 REFLECTION

This chapter gives a reflection on the graduation project. The result of the graduation project is a valuable design instrument that helps designers and planners to enhance the urban environment of the city center for pedestrians. It gives them the conditions to create a walkable urban environment that makes sense for pedestrians on multiple aspects, such as safety, comfort, attractiveness and more.

Reflection on the methodology

The start of the project mainly contained out of reviewing literature to search for conditions for the development of a design instrument. The scientific writings were not always easy to interpreted, since different literature use different definitions for alike topics. Also the amount of knowledge available on the topic made it difficult to focus. Along the way, it became clear that this was a problem that should be solved. To try to understand the urban environment for pedestrians as a whole

Although other methods were not considered, the theory of *A Pattern Language* (Alexander 1977) made it possible to order the complexity of the wide variety of conditions. By developing the *Patten Catalogue* (Bellen 2010) the urban environment around the pedestrian could be understood as a whole. For future research it would be interesting to see if other methods or theories could be used to solve the complexity of conditions.

During the graduation project the Pattern Catalogue has gone through alterations, combining patterns that mentioned the same but slightly different word use and the interpretation of some conditions became clear during time.

The diagnosis is able to reveal the problems that occur in the urban environment of the city center. As stated, before some patterns are not easy to analyze or could not be measured. This makes that not all the diagnosed patterns are objectively measured. As seen before, this could be improved. Furthermore, it was hard to eliminate my own experiences in relation to the city center. I kept these personal experiences to give a clear image about the use of the Pattern Catalogue in relation to the diagnosis.

For the design part, a much less structured method was used in comparison with the other end products. The development of the perspectives helped to get started with design for the area of the Wijnhaven. During designing I had difficulty to make decisions which needed a strategy for the area, such as user groups. “For whom am I designing?” was not clear enough. The ambition of the municipality could have been incorporated to solve this problem.

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APPENDICES

- History of the Wijnhaven
- Section of the current situation

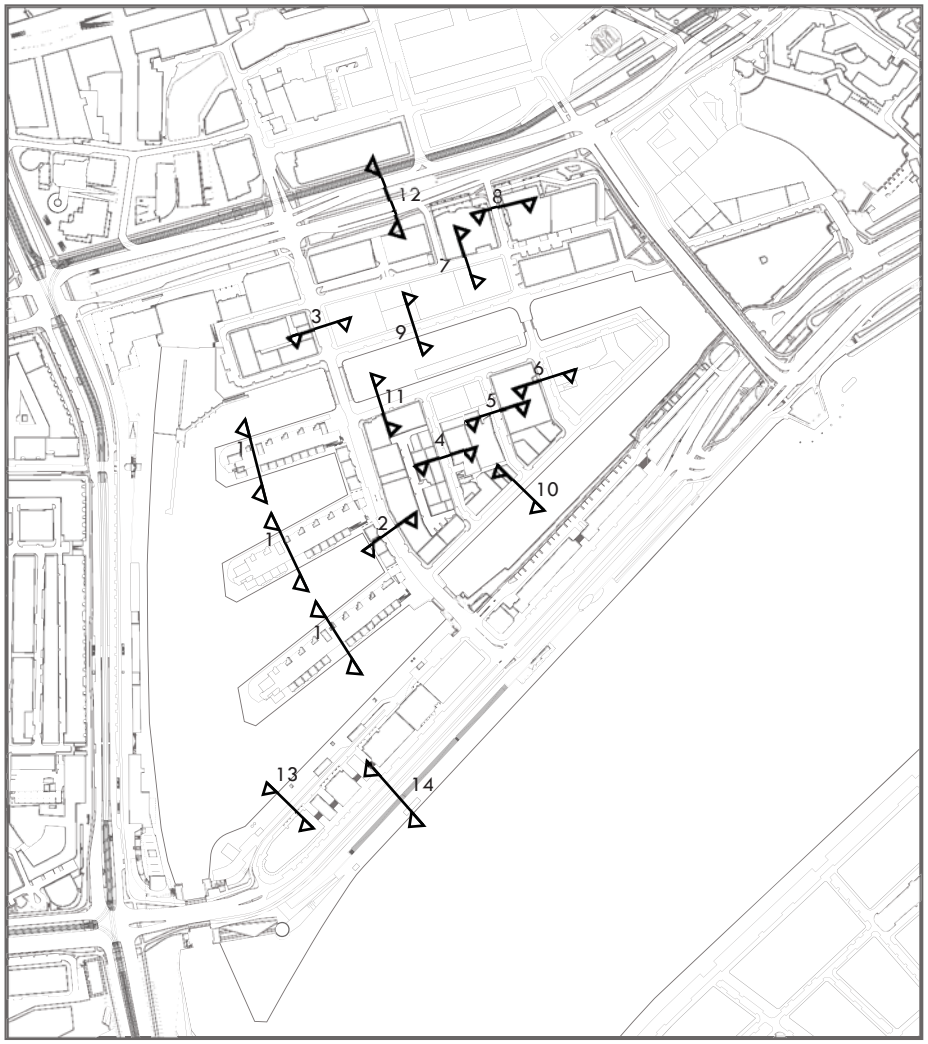
the exception of a few caretakers's residences above the offices, there are no other forms of residential housing in the area and hardly any shops, pubs, cafés or restaurants. The offices did have glass fronts which were suitable for accommodating shops, but as there was little demand for them the ground floors were usually kept simply as office space. In the shadow of the city center, the offices and business operated well for quite some time. Because of the individual set-up of the buildings and divided ownership, was extremely suitable for new development.

At the end of the eighties, there were several attempts to regenerate the area of the Wijnhaven. However, after twenty-five to thirty years, the buildings were in need of a thoroughly renovation and face-lift, but the owners showed little enthusiasm to carry out such work (Groenendijk 2009).

Renewal

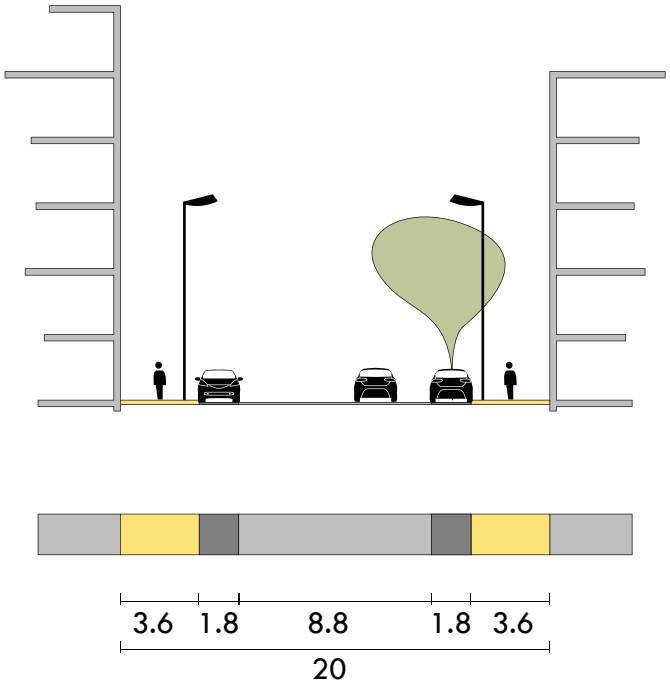
The first attempt for renewal was the construction of three stepped flats on the piers at Leuvehaven at the end of the seventies. The residental constructions, with underground car parks, on the pier was an important impulse to create more housing in the city center. The second attempt of renewal were the developments along the Boompjes at the end of the eighties. Here a increase in scale took place, high rise buildings were constructed up to 90 meters. This resulted in characteristic buildings, such as De Maas and the Willemswerf. A third impulse was the move of the Academy of Visual arts to the old Mees & Hope bank building. However, soon the building became too small andan extension was added. The presence of students was not limited to this building as some office builngs in the area were converted into student dormitories.

CROSS SECTIONS OF THE CURRENT SITUATION



Map of the current situation with the locations of the cross sections
(by author: based on Kadaster 2010)

POSTHOORNSTRAAT See map: cross section no. 2



GLASHAVEN See map: cross section no. 3

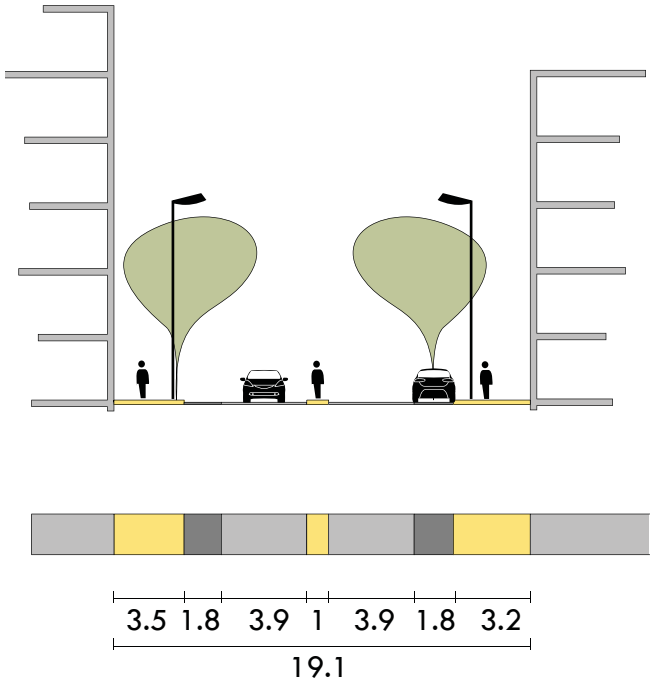


Photo of the Posthoornstraat

Photo of the Posthoornstraat

Photo of the Glashaven

WIJNSTRAAT See map: cross section no. 7

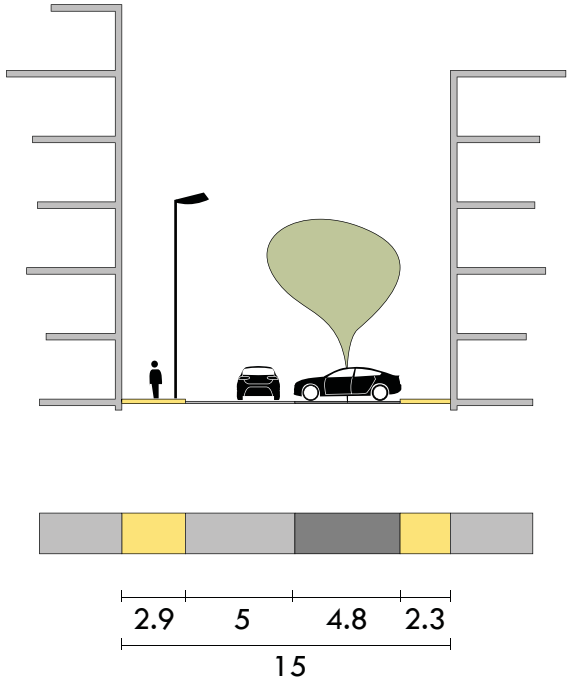


Photo of the Wijnstraat

ZWARTEHONDSTRAAT

See map: cross section no. 8

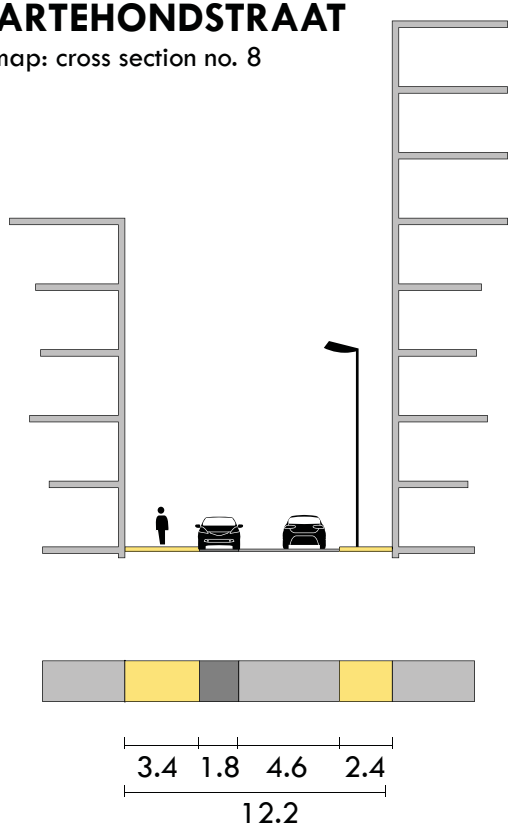


Photo of the Zwartehondstraat

WIJNHAVEN See map: cross section no. 9

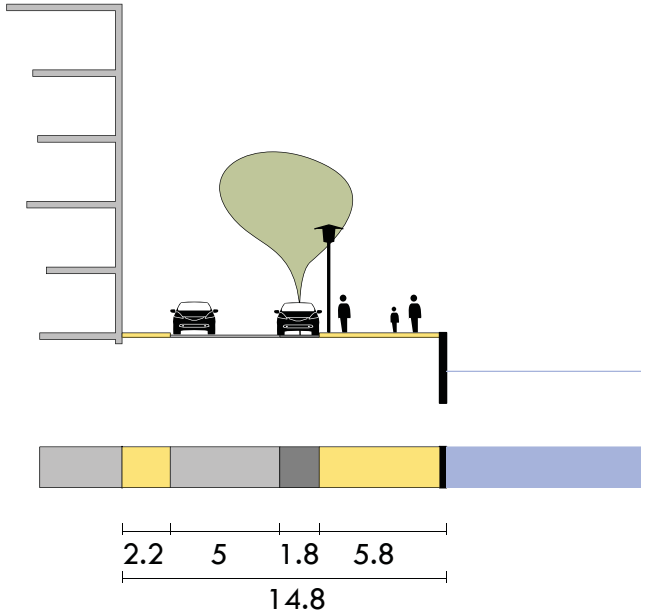


Photo of the Wijnhaven

BLAAK See map: cross section no. 12

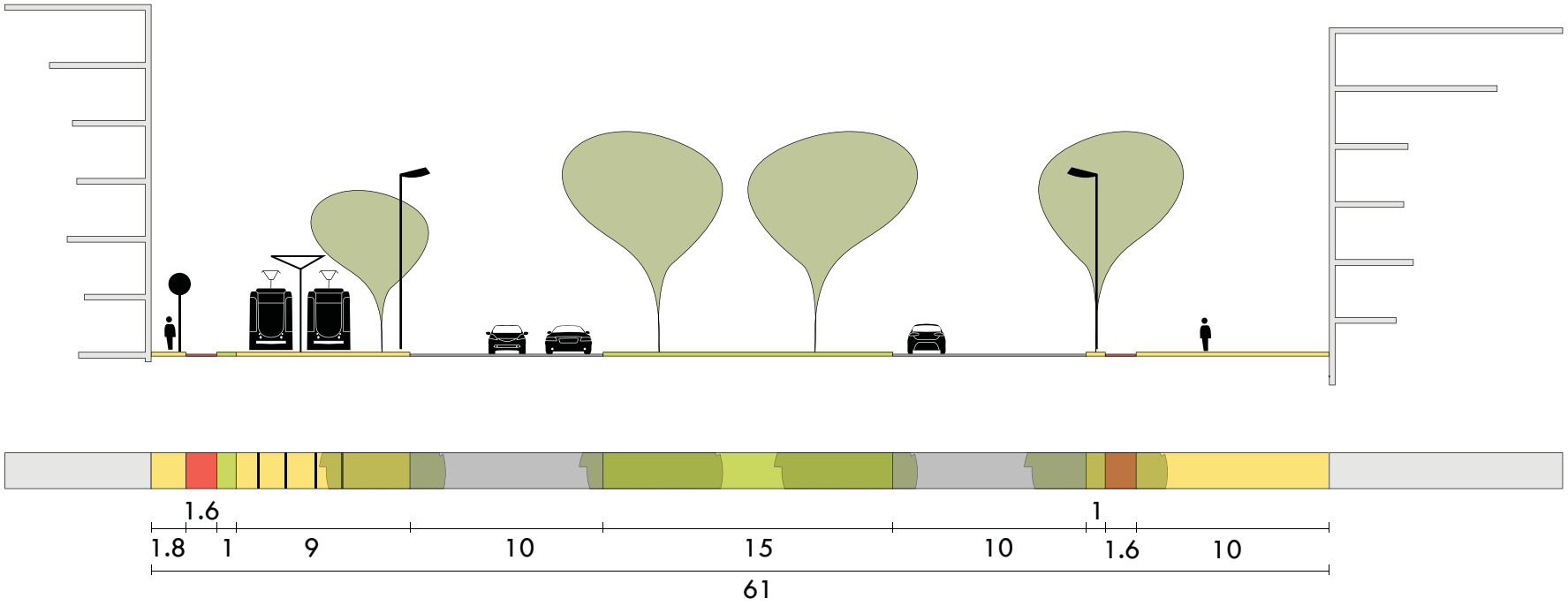


Photo of the Blaak

Photo of the Blaak

Photo of the Blaak

BOOMPJES/BOOMPJESKADE See map: cross section no. 14

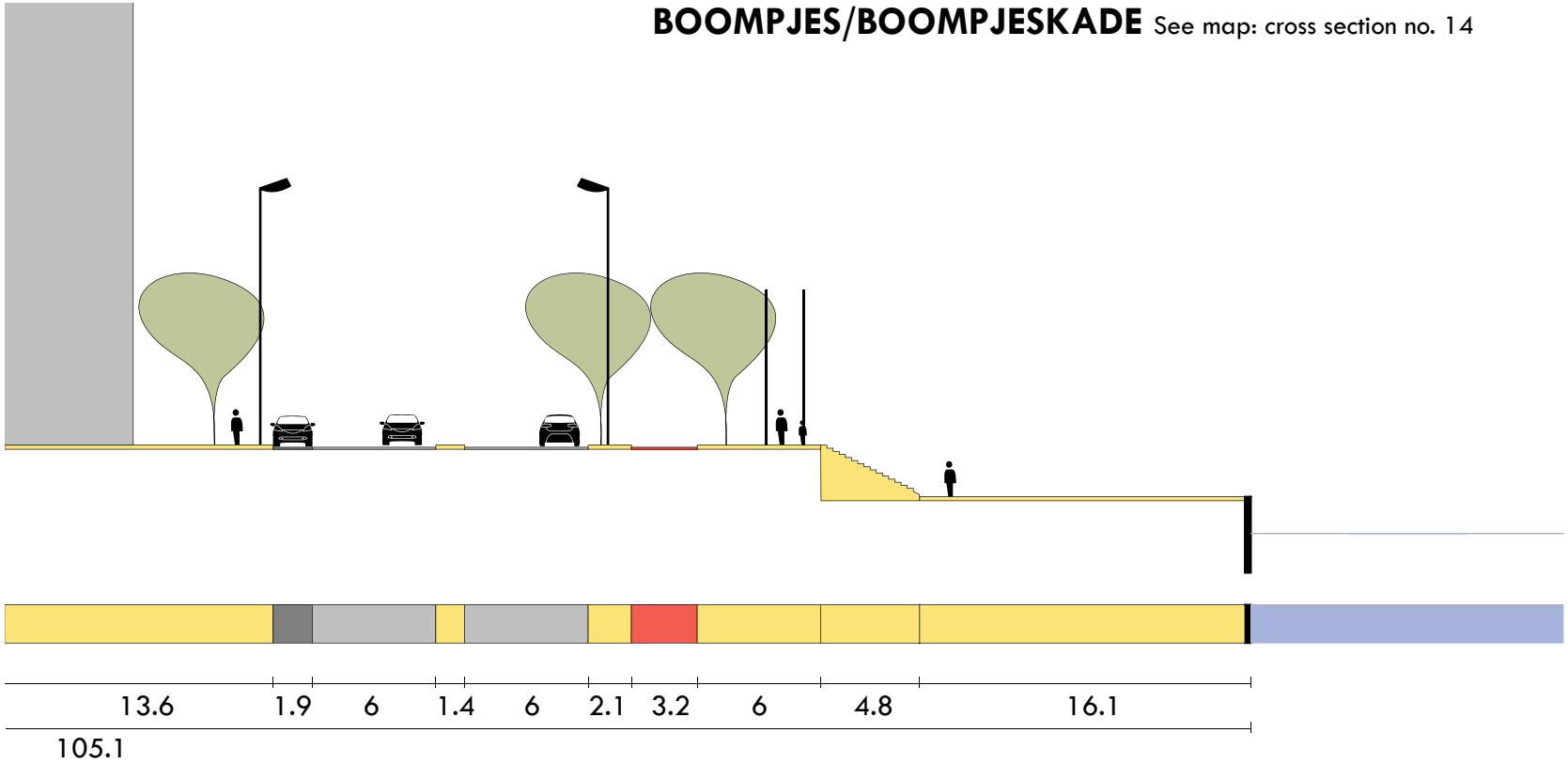


Photo of the Boompjes

Photo of the Boompjes

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