

Twan Mollink

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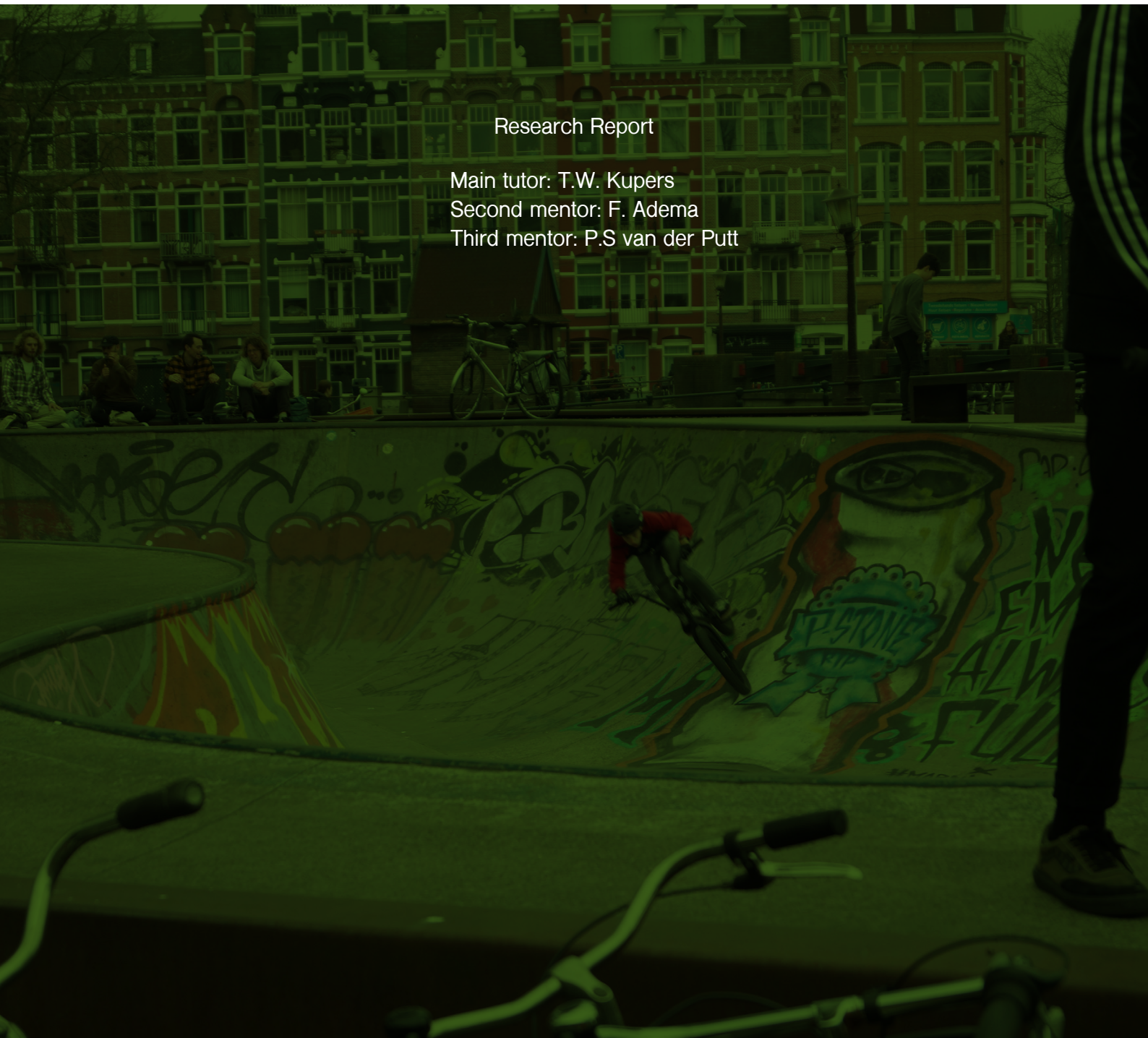
# THE PREVENTIVE MEDICINE

Research Report

Main tutor: T.W. Kupers

Second mentor: F. Adema

Third mentor: P.S van der Putt



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MANIFEST

Because the great migration of people to the cities resulted in an extremely unhealthy situation, health became one of the greatest topics for city planners and architects from the end of the 19<sup>th</sup> century. The very poor of society lived in dark and wet alleys around the back of the middle class houses and where not even visible from the public road. The lowest class of society could barely survive the living conditions of that time. The comparison of the nice constructed public roads and the muddy alleys in the slums illustrate the distinction between rich and poor in that time even more. Back then, it was totally normal to live in these alleys with more than ten households. It was absolutely normal that a single household contained at least seven or more people due to lack of birth control. As a matter of fact that household had to live and sleep in a place that is not bigger than a modern sleeping room. The houses of the poor were so extremely unhealthy, random placed and small that even the safety of the people could simply not be guaranteed.

As we all know the ‘Woningwet’ in 1901 has changed a lot in positive way to the design of dwellings in the Netherlands. This was the first time that basic regulations for dwellings came into the realm of the building environment. The situation in the end of the 19<sup>th</sup> century had let people realize that health in general begins with a healthy living environment. In this time houses were built with proper level of daylight, ventilation and space to meet good living conditions. From this time on, the inhabitants of Amsterdam did indeed become healthier. The age at which people died went up, and the city was a better place to be.

There can be no doubt that good health is the greatest possession one can have in life. Research has been done on many different diseases, all with the aim to keep humanity healthy. Nowadays, the Netherlands has one of the best healthcare systems in the world. Doctors are blindly trusted by the patients and carefully do what they have been told. People think that pills are going to make them healthier rather than adjust their lifestyle. Pa-

tients are totally comfortable with going for the simple solution and taking pills on a daily basis. They no longer look at what could be the cause of getting sick in the first place. Some diseases can simply be prevented with being more active during the day. Due to the fact that the Netherlands is a country with a knowledge economy, a lot of people are working at an office. These people are working with their minds. From 9 in the morning until 5 in the evening they spend the day by sitting on an office chair staring at a computer screen. It is funny to see that this office chair is designed to move around as if employees are too lazy to come out of this chair. As we all know, some offices are experimenting to encourage employees to be more active while they are at work. This change ultimately results in a healthier working environment and even more important a change in lifestyle. Even though we have one of the best healthcare systems in the world, there are some things that cannot be regulated with this system. Today, most urban health interventions are focused on bringing social services, primary care, economic opportunities and physical improvements to urban residents or their neighbourhoods. Interventions tend to focus either on people or places, but rarely both at the same time. Hospitals are in fact just large buildings in a city with optimal conditions for people to get better from a disease. After people are discharged from the hospital, they are exposed to the living conditions where they got ill from in the first place. The living conditions in the modern city can cause several different diseases. Urban air pollution is linked to thousands of premature deaths each year and noise pollution is associated with hearing impairment, hypertension and ischemic heart disease. If we implement the knowledge of modern time into the buildings and urban plan of the future, we could get a change to prevent a lot of diseases.

In the city of the future, we are going back to the core of the whole idea of ‘de Woningwet’ that was introduced in 1901. This idea was to make healthy living conditions available for

every single person in the Netherlands, so unhealthy living conditions could be eliminated from the Dutch housing market. With all the research done and the knowledge that we have obtained the buildings of the building law of 1901 does not meet our needs anymore. Should we just continue with building the same buildings? Of course not. With the second revolution of this law we push it even further and adjust the lifestyle of people. Banning the unhealthy lifestyle out of the city. In the future, buildings can have an interaction with its user. Unconsciously residents will change their daily lifestyle due to the design of the dwellings. We as architects all have a picture in our mind of what the future will look like. It is our responsibility to think about what the city of the future will look like. Should it look like the Asian cities with the high-rise buildings, a city that is very walkable because of the high density? Or should the city look like the American city, a city with very low-rise buildings and with a very large footprint? Somewhere in the middle is the answer to the question, we have to find a density that activates people to go for a walk instead of taking the car but also not so dense that the city becomes too crowded. A healthier society in the future starts with making the basic needs of people healthier. Shelter is one thing every person needs and someone cannot live without. With the research available, architecture can have an interesting influence on the daily lifestyle of residents. Buildings that encourage its users to live an active life, and control the urban layout around the building are some examples of what can happen in the near future. The city will be a pilgrimage for sick people to become healthy again.



HOME

3

38  
3



INVESTIGATION OF THE ASSIGNMENT

## Introduction

This research report is part of the graduation course Dutch Housing Studio 'Between standard and Ideals' and contains all the research done to support the design in a further stage in my graduation.

## Assignment

The assignment of the Dwelling Graduation studio is focused on the future city of Amsterdam. How do we want to live in the future and what kind of buildings do we need to allow for that? In this graduation studio we give an answer on what this might be. The location of this studio is Amsterdam. More precisely the part of Amsterdam that formerly held the fortification works that run around the inner city. This site is very close to the city centre and is not burdened with the Unesco World Heritage designation. As such, it allows for more experimental, visionary and eccentric spatial and programmatic development.

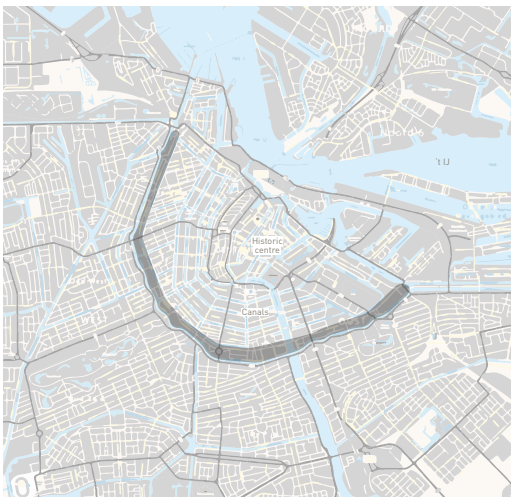


Fig1. Location of the site

## Topic

Cities in general have a lot to offer. These are the places where people provide themselves with knowledge, jobs and social contacts. Therefore the population in cities is increasing. It is predicted that in 2019 the city of Amsterdam will have 872.000 inhabitants<sup>1</sup>. The city is familiar with the problem of overpopulation. During the 1850's, the city had problems with the arrival of many people seeking for a job. In that time Amsterdam was the place to be and did really well in an economic perspective. On the other hand, the city had also very big problems, especially on the housing market. The lower class for example lived in slums with no comfort of light or running water. Despite the poor living conditions of the lower class, people kept on coming to Amsterdam. After people got very ill and the cholera had struck, governmental intervention took place, a building law specifically for all dwellings in the Netherlands was the result. Dwellings suddenly had to meet strict regulations. Of course this was done all to improvement of the health of the people.

Nowadays the Dutch building law is still operative. That being the case, our health should be great. In the last decades, doctors have done a lot of research to understand more about the human body. They found that we could extend the amount of years that we live in good health with an active lifestyle. News articles that I found, state that this lifestyle is the problem (fig. 2). Especially adolescents and kids are problematic and are not active enough during the day. Adolescents prefer to take the public transport to go to school and young kids are very limited in places to play.

## 'Kinderen bewegen te weinig'

26 jan. 2018 in WAT U ZEGT



Fig 2. Newsarticles that show the problem

## Amsterdamse puber beweegt veel te weinig

<sup>1</sup> Gemeente Amsterdam (2016, February 17) Bevolkingsprognose 2016

All buildings that have been built to live a healthy life have done their job. With the knowledge of today, research that has been done and the problems of chronic diseases in society, architects can now design buildings that cure the health problems we are dealing with in modern society. Buildings that help people to have an active lifestyle. The task of the future architect is to make housing schemes where people can live in good health. With all research in mind that means that we have to make housing schemes that contribute to an active lifestyle. This topic has my interest for the rest of my graduation studio.

## Relevance of topic

The relation between architecture and health kept my interest during my research and I gradually discovered more about it. The municipality of Amsterdam had already a vision of being a more healthy city. To be more precisely, Amsterdam is very keen to become a more active city. This is their interpretation of a healthy city. The need to have a more active city and how this can be managed has been published in a publication called 'Active City'. What if I could design a building that can contribute to a more active lifestyle? A building where children can play without having to worry for cars or bikes. A building that is good for your health and addresses the modern health problems in society, one that contributes to an active lifestyle.

We all want to live a long, happy and healthy life. Physical exercise is a proven condition to achieve this goal. Lots of studies show that physical activity contribute to a feeling of happiness and vitality. Activity contributes to the extension of years that we feel healthy during our life. This results in a better quality of life when you are older. Also, an active lifestyle, reduces the chance of getting obesity, school dropouts and has positive effects on test results in school and mental health. Doing sports and playing outside are in particular things that provide you a better health, both mentally and physically. Research states that

young people who have an active lifestyle are the ones with a better self-esteem, have a better social network and have less mental issues like depression, feelings of fear or aggressive behavior.<sup>2</sup>

Also suits this topic in the future city of the municipality of Amsterdam. They already want to make Amsterdam in the future an active city, and thus a more healthy city. My project suits this very well. Health is been a great inspiration for architects to design several projects. Therefore I expect to get a lot of information by analyzing other famous projects that have something to do with health and activity.

## Problem statement

In 2017, Amsterdam was listed in the top 10 of most attractive cities around the world<sup>3</sup>. This was due to the fact that Amsterdam is a small scale city and therefore very user friendly to cyclists. The small scale of Amsterdam has also positive influence on the quality of life inside the city. Supermarkets and other shops are closeby and this stimulates inhabitants to walk or go by bike.

On the other hand, the small scale of Amsterdam has also a downside. The public space for example, has to be shared with all different users. People who live in Amsterdam, tourists or entrepreneurs everyone wants to claim a piece of this public space. If we look at a random street in the city different target groups are using the public space in an other way. The businessman who has to go to cities around Amsterdam is using his car to get him from A to B as quickly as possible. People who have there destination inside the city are using a bike or a electric-bike. Then you have the tourists who are exploring Amsterdam on foot, so they can see as much as possible. They move very slow because they are not well-known with the city. At last we have the target group of the playing child. It is a necessity for this target group to have a safe place to play without being a burden

2 Gemeente Amsterdam.(2016). Beweegatlas, p7  
3 Ipsos Top Cities Index. (2017).

the other users of the public space. It is very important to take care of the quality of life inside cities. Having enough active spaces for young and older people keeps the inhabitants more healthy.

Amsterdam wants to be a city with an active appearance, a city that evokes people to have an active lifestyle. Nowadays the people of Amsterdam are not active enough and do not meet the Dutch physical exercise guideline.<sup>4</sup> The current lifestyle of people is not without any consequences. The decline in regular daily walking and cycling is resulting in increased obesity and risk of diabetes and cardiovascular diseases<sup>5</sup>. People with a less active lifestyle are more sensitive for diseases like: Obesity, Depression, Heart and vascular disease and Dementia.<sup>6</sup>

## Research question

In search of the Amsterdam of the future, Urban planners and Architects must take the lead in this matter. We have to design buildings that are more active and make the inhabitants of Amsterdam more healthy. In this research a few questions help me to make a good structural story.

**How can a architectural plan contribute to a more active lifestyle, and make Amsterdam a more healthy city?**

This main question of my research is supported by sub-questions to define, and to give structure to it. The first sub-question is: **What is the need to have an active lifestyle?** To make clear what the problem is and to give more information about the history of Amsterdam related to this topic. Secondly, **Which target groups are in need to change their lifestyle?** This question gives a guideline to design for a certain target group. There are targetgroups that need a little help.

4 Gemeente Amsterdam (2016) Amsterdamse beweglogica, De bewegende stad.

5 Franklin et al., 2003

6 The Active City, 2017, p8

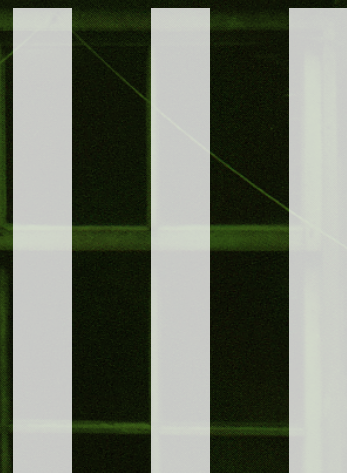
And finally, **How can the target groups be activated in a architectural plan?** This question is answered in the plan analysis part of the research. Six buildings are analyzed on different topics. The conclusions show a similarity between the buildings.

- Location of the assignment is the fortification work around the inner city of Amsterdam.

- During the 1850's liveability for the very poor was very poor, this resulted in the Dutch Housing law of 1901.

- Nowadays chronic diseases are problematic due to the lack of activity.

- Amsterdam is very keen to become an active city.



Analysis of the topic | Historical

## Historical analysis

The population of Amsterdam increased rapidly during the 19<sup>th</sup> century. Since 1810 until 1900 the population grew from 180.00 to 520.000 people (fig. 3). The main reasons for this giant increase of inhabitants were the renewal of trade, new forms of business and decades of birth surplus. The city was not prepared on such an increase of population and became overpopulated. Due to the fact that the housing market in Amsterdam had not enough dwellings to offer for the lower income, they started to build very low quality houses for themselves often in the middle of a building block. The lower income population lived often in very unhealthy slums with almost no sunlight and were not connected to a sewage system. This unhealthy situation was the cause for several epidemics (fig. 4). The situation of the slums kept unchanged with social unrest as a result. In other parts of Europe the wealthy population started an initiative to build good affordable housing for the less fortunate of society.

Otto Heldring (1804–1876) was one of the first to notice initiatives about building good affordable housing for the poor in London, Paris and Berlin. He wrote a book about the poor inhabitants in 1844. In his book he calls for help to do the same in the Netherlands. His call was answered by several of his friends who lived in Amsterdam. This group of people among which a banker called C.P. van Eeghen (1816–1889) founded in 1852 the first social housing association: De vereniging ten behoeve der Arbeidersklasse (fig. 5). With the founding of this social housing association the quality of houses had improved. The projects built by this association had their own sewage system and running water. The houses had separate cooking and laundry rooms. If people wanted to apply for an apartment they had to sign a contract with strict regulations.

In 1854 the first link between health and housing was made in a report for the King of the Netherlands. This report was made by

the Royal Institute of engineers to bring the unhealthy living conditions under attention. There are many examples of the deplorable conditions in the slums. This is what one of the engineers wrote in the report: *“In the low, muggy and small room, the walls are spilled on and full of moisture. The rays of the sun can in no possible way penetrate this room. (...) The children with hollow cheeks and fat bellies carry their by water swollen bodies around on skinny legs. In the last year, two of those were treated for typhus.”*<sup>7</sup> Nowadays we can not even imagine how the situation must have been, but this quotation makes it a bit more imaginable.

In the last decades of the 19<sup>th</sup> century the higher class of the inhabitants in Amsterdam complained to the government to do something about the poor conditions of the lowest class in society. During this time, the government used a liberal way of working. This means that the government did not want to interfere with the problems in society. Also they strive for an as strong as possible individual. After the government heard rumors about the very poor living conditions in slums of the city, and the government had been pressurized by the higher class, the 19<sup>th</sup> century liberal attitude of low interference was no longer the way to go. In 1901 the government introduced the new building law. With this law, the government gave architects and construction companies strict regulations they had to meet. These regulations had in particular something to do with the health of people. After these problems in society, architects were more aware of the importance of the relation between architecture and health. From this point on, within the architectural discipline, the topic of health has often been addressed in experimental proposals.

One of those experimental proposals were the garden cities. The garden city is an urban planning concept that takes its name from the work of Ebenezer Howard, who in his book *To-Morrow: A peaceful path to realm reform* (1898) developed the idea of garden cities

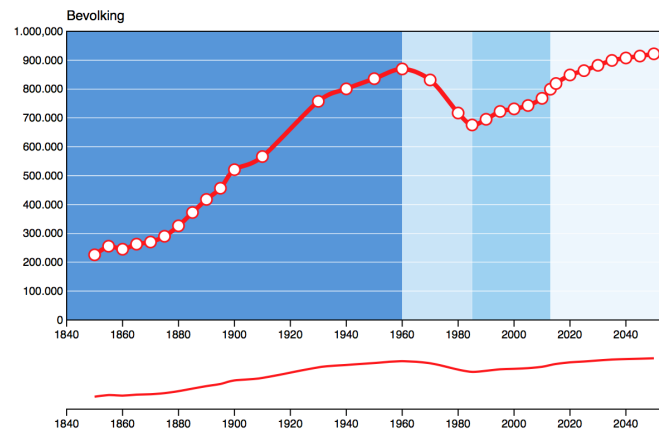


Fig. 3 Population growth Amsterdam

Year	Occasion	Amount	Amount of people
1602	Plague	10%	10000
1624	Plague	10%	10000
1636	Plague	10%	17500
1664	Plague	10%	20000
1833	Cholera	0.6%	1100
1849	Cholera	1%	2250
1855	Cholera	0.4%	1050
1866	Cholera	0.4%	1050
1901	Woningwet	-	-
1944	Hunger winter	10%	20000

Fig. 4 Epidemics in Amsterdam



Fig. 5 From left to right: Otto Heldring, C.P. van Eeghen and Jan Mes-schert van Vollenhoven.

as a way towards 'better, brighter civilization' (Freestone 1989b). Famous examples of garden cities are, Letchworth Garden City (1899) and Welwyn Garden City (1919). The principle of the garden city was explained with a famous diagram in his book (fig. 6). With this three magnets Howard wanted shows where people would like to go if they had the choice. The first two magnets illustrate the town and the country. Both had their positive and negative sides. The town with its lack of nature and high rents but on the other hand opportunities of social contacts and jobs. Whereas the country had a lack of society and low rents but also the positive elements of the beauty of the nature and fresh air. The last magnet represented the garden city, with the positive sides of both town and country. With this principle Ebenezer Howard thought about a healthy city with positive effects for the inhabitants.

After Second World War, cities all over the Netherlands were in very bad condition. Amsterdam was no exception in this case. There was a shortage of housing stock and the quality of the buildings that were still standing was also not so great. This problem combined with a dysfunctional infrastructure did city planners realize that they were confronted with an outright emergency. Besides this, a babyboom was on his way in the postwar period whereas there was no place for children, neither inside nor outside the house. At that time, there were some playgrounds, but almost all of them were based on membership and private ownership. The lack of space for children to play was noticed by the Dutch architect Aldo van Eyck. He built his first public playground on the Bertelmanplein in Amsterdam around 1947. After this first playground, hundreds more followed, in a spatial experiment that has (positively) made the childhood of an entire generation. Largely all the playgrounds have disappeared, but should be remembered as one of the most emblematic of architectural interventions in a pivotal time: the shift from the top down organization of space by modernist functionalists, towards the bot-

tom-up architecture of van Eyck. He wanted to give space to the imagination. These playgrounds had some positive effects on children but also on parents. Whereas the children got extra physical exercise with playing on the playgrounds, parents got a space where social contacts could take place.

After the war, urban planning in the Netherlands mainly consisted of the implementation of the prewar ideas of the modernist movement grouped around the CIAM (Congrès International d'Architecture Moderne). The work of the modernist movement is mainly identified with the work of Le Corbusier, Giedion, and Gropius. In Amsterdam, the General Extension Plan (Algemeen Uitbreidingsplan – AUP) of 1934 was implemented by Cornelis van Eesteren, longtime president of the CIAM. His plan was focused on the separation of functions. Housing, work, traffic and recreation were to be functionally separated and integrally planned. This principle was used during the large-scale construction of new post-war neighborhoods in the fifties. This principle resulted in open housing blocks with large amount of light, air, greenery and monotony<sup>8</sup>

An article from Hugh Barton about the healthy urban planning in European cities states that the environment has long been recognized as a key determinant of health. Furthermore he writes that all professions related to health increasingly recognize that promoting health solely through programmes of changing the behaviour of individuals or small groups is not very effective. These interventions are only reaching a small proportion of the population and do not work in the long term. According to Hugh Barton, a more fundamental social, economic and environmental change is needed. If we want to change something about the urban health in cities we have to begin with designing healthy environments. Urban planning as a mechanism of environmental control influences health in systematic ways. Barton developed a settlement health map (fig. 7). This map shows the various spheres

of social and economic life and the wider environment that are affected by the spatial planning of settlements<sup>9</sup>. Each outer sphere of the figure affects the well-being of *people*, represented by the inmost sphere. The *natural environment* for example, through the cleanness of air and water. The *built environment* through the availability of good pedestrian paths and cycling facilities or parks and playgrounds. *Local economy* through diversity in access to work and income. Community through the supportive social network (or their lack). The model can be used to understand the relationship between all the different spheres.<sup>10</sup>

9 Barton, 2005; Barton and Grant, 2006)  
10 Healthy urban planning in European cities, Hugh Barton, 2009

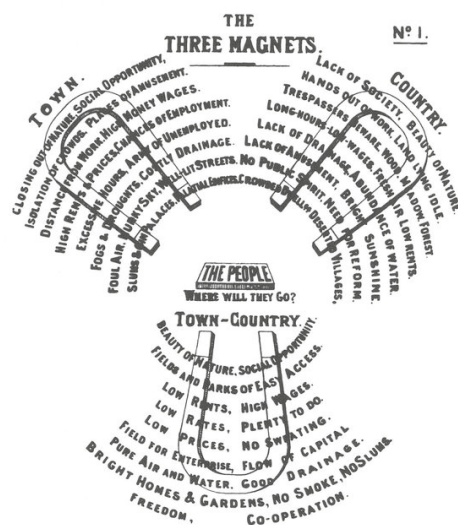


Figure 6

Diagram that represents the healthy Garden City

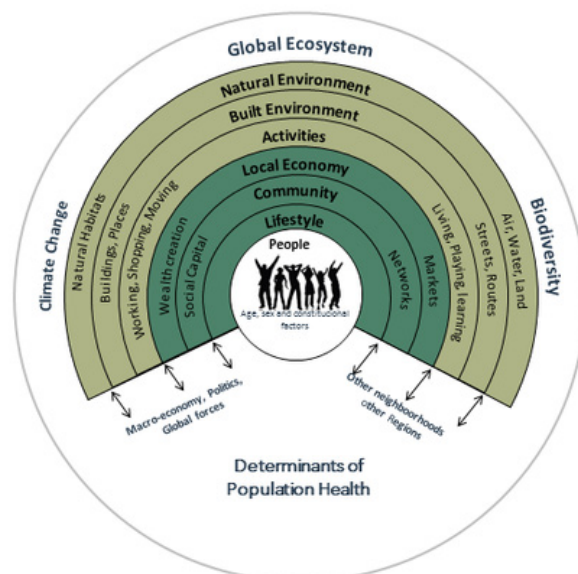


Figure 7

Settlement health map, shows the various spheres of social and economic life and the wider environment that are affected by the spatial planning of settlements

- Epidemic diseases resulted social unrest.
- Otto Holding introduced social housing in the Netherlands and founded in 1852 'De vereniging ten behoeve der Arbeiders-klasse.
- In 1901 the government introduced the Dutch building law.
- Garden cities such as Letchworth and Welwyn are examples of experimental proposals for healthy urban planning.

1800

Social housing was introduced by the rich people in society to do something about the humble situation of the poor.

**Aanbesteding**  
VAN  
**102 Arbeiderswoningen.**

Het Bestuur der Vereeniging ten behoeve der Arbeidersklasse te Amsterdam zal op **Maandag 30 October 1874**, des namiddags te 1 uur, in het Koffiehuis „De Roodde Leeuw”, Vijgendam, alhier,

**Openbaar Aanbesteden:**  
**Het bouwen van 102 Arbeiderswoningen, in de Jacob-van-Campen-sstraat, tusschen de Ruysdaelkade en Frans-Hals-sstraat alhier.**

De Teekeningen en het Bestek liggen terziede in genoemd Koffiehuis van af Maandag 5 October tot en met Zaterdag 17 October, van des morgens 9 tot 's namiddags 4 uren, alwaar tevens de Bestekken à /1 per exemplaar verkrijgbaar zijn.

Aanwijzing in loco Donderdag 15 October des morgens te 11 uren door de architecten **P. J. HAMER en W. HAMER.**

Het Bestuur voornoe  
**JA. VAN EIK, Voorz.**  
**C. E. HEYNSIUS, Secretaris.**  
**AMSTERDAM, 3 Oct. 1874. (7234)**

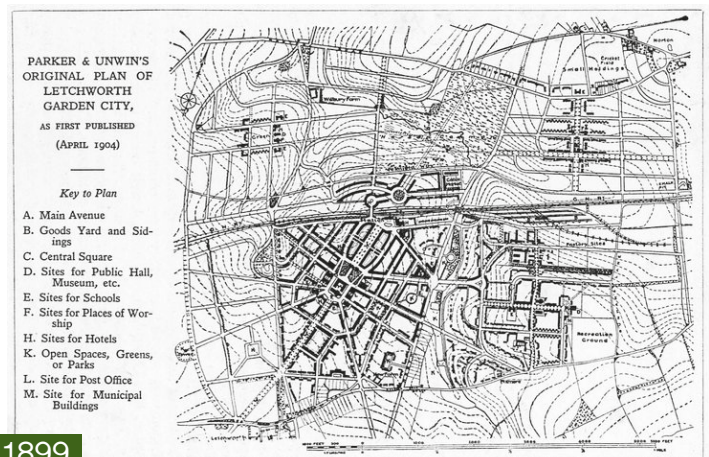
1852

Picture of the Amsterdam slums in the period that epidemic diseases where a danger to people.



1866

The plan of Lechworh Garden city, the first in a row of many to follow.



1899

[illegible]

1901

DE WONINGWET.

ONTLEEND AAN DE SCHRIFTELIJKE EN  
MONDELINGE GEDACHTENWISSELING TUSSEN  
REGEERING EN STATEN-GENERAAL.

OSTERBAAN,

. TE GRONINGEN BIJ I. B. WOLTERS, 1994

1918

1934

1940

1945

1947

1947

2000

2018

Timeline on the topic of health in the Netherlands.



Analysis of the topic | Present day

Whereas in the past mainly epidemic diseases were a danger to people, nowadays the number one cause of death are chronic diseases such as cancer, obesity or heart and vascular disease (fig 8). Many chronic diseases are directly or indirectly the cause of our economy. All the modern comfort, a passive working environment, high stress levels and bad eating and drinking habits are making us really unhealthy people. The 'Nederlandse Norm Gezond Bewegen' (NNGB), is a Dutch physical activity guideline and states that adults have to be active for a minimum of 30 minutes each day. The average Dutch man does not meet this activity guideline (fig. 9).

The consequences of an passive lifestyle are serious. Statistics from the CBS (Centraal Bureau voor de Statistiek) show that our life expectancy rises, but that our healthy years are in decline (fig.10). The life expectancy and the amount of years that people feel not healthy are related to the degree of education one had. Low educated people are feeling more years of there life unhealthy then higher educted people. Still, eighttousand people per year (6% of all deaths) pass away as a result of a passive lifestyle. On average a Dutchman lives thirthyeight years with a chronic disease. Research of the CBS shows that a passive lifestyle is directly linked to an increased risk of chronic diseases. Also our economy has a lot to suffer from our lifestyle. The Haverd School of Public Health expecting that the loss of gross national product (BNP) from chronic diseases will rise expotential from \$3 billion in 2015 to \$47 billion in 2030. Combined with the rizing healthcare cost and the declining labor force these figures are becoming an undesirable situation<sup>11</sup>.

The last 40 years the amount of people with diabetes is increased<sup>12</sup>. The cause of diabetes with children is a combination of genetic and social characteristics. Some hereditary genes make that childeren of parents with overweight are more likely to become the same

11 The Global Burden of non-communicable diseases, 2012  
12 CBS - Steeds meer mensen met diabetes, 2014

### Epidemic vs. chronic diseases in Amsterdam

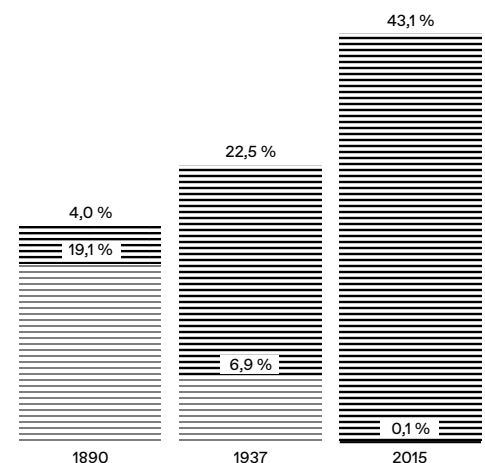


Figure 8

Percentage of all deaths per year

**Bold** = chronic diseases; cancer, heart and vascular disease, diabetes mellitus  
**Thin** = epidemic diseases; measles, scarlet fever, variola, typhus, coup, diphtheritis, whooping cough, cholera, tuberculosis, dysintaria, diarrhoea

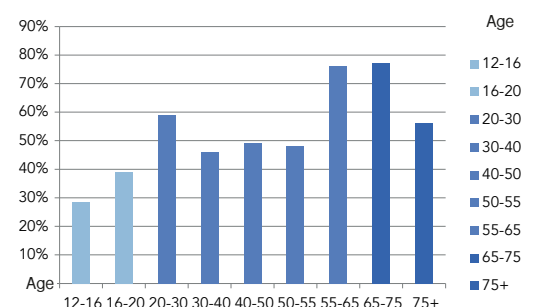


Figure 9

Percentage of people per age group that meets the Dutch physical exercise guideline.

### Healthy life expectancy in the Netherlands

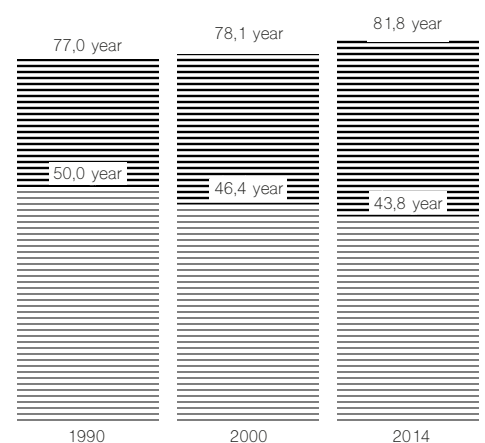


Figure 10

**Bold** = Years with a chronic disease  
**Thin** = Healthy life expectancy at birth

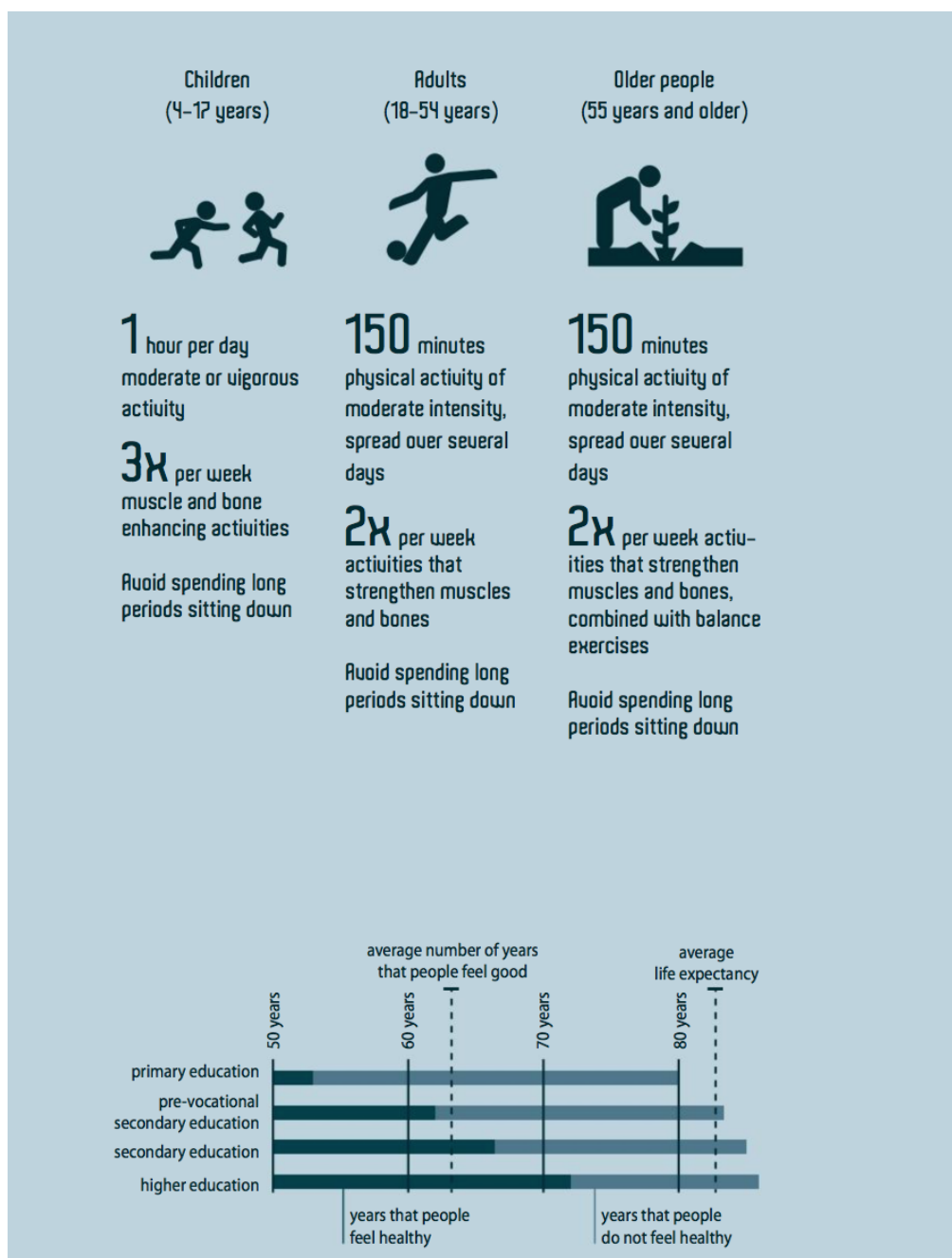


Figure 11  
 Above = Dutch physical activity guidelines  
 Below = Study of future public health (national Institute for Public Health, 2014)

as their parents. One major social factor that affects diabetes is the lack of physical exercise. There are multiple reasons why children do not meet the Dutch physical exercise guideline. First of all, a lot of kids grow up with a computer or television. They prefer to watch tv or play videogames then play outside. On the other side, if children do want to play outside, parents do not allow them without good supervision<sup>13</sup>.

Now we know which target groups are in need to change their lifestyle (lower educated people and children) the research goes further on how we can do this.

If we consider the article from Hugh Barton, (healthy urban planning in European cities) which I addressed before, urban planning can make a fundamental change in the lifestyle of these target groups. Barton is not the only one who is thinking in this direction. Jason Corburn wrote a paper about city planning as a preventive medicine. He states that nowadays most urban health interventions are focused on bringing all kinds of improvements to the residents or their neighborhoods. These interventions often focus either on people or on places, and not on both on the same time. This is what he calls the 'Health in city approach'. Having as much as possible places offering health care, more prevention and more services tend to be intervention targets. For most people life has become better with this approach, the strategy has largely failed to address the spatial inequities in health. A more integrated approach is the 'city planning as preventive medicine' approach. Whereas in the 'health in city approach' doctors try to do their best to treat people individual, and let them return to the living and working conditions that contributed to their illness in the first place. This integrated approach will combine Medical, public health and community development sectors together (Corburn, 2015).

The municipality of Amsterdam runs a plan conform the 'city planning as preventive me-

<sup>13</sup> Robert, S. Veltman, P. (2016) Ontwikkelings psychologie 325-327

dicie' approach. They want to be an active city, a city that encourages physical movement. In this future city cyclists and pedestrians have all freedom and there is place for sports, playgrounds and relaxing. Here is an active lifestyle part of the daily routine. The municipality of Amsterdam made a publication where they shine a light on their future city. This publication is called 'The Active City' (fig. 12) and contains research about why Amsterdam wants to be an active city and how they can do it in the future. This publication has been used throughout my research.

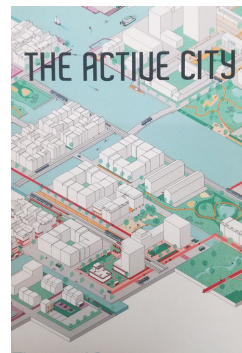


Figure 12

Publication of the municipality of Amsterdam about the active city they want to be.

## Active city

There are many benefits that come with an active city. The city becomes more healthy, attractive, the liveability improves and the city also becomes economically more vital. First of all, the health in the city improves because of fresh air and less noise pollution. Secondly, because the inhabitants become more active. It is really relevant that the municipality of Amsterdam wants to become an active city. Recent studies show that the inhabitants of Amsterdam do not meet the Dutch physical activity guideline<sup>14</sup>. Although more people pursue an active lifestyle still many people in Amsterdam are suffering from obesity<sup>15</sup>. Especially inhabitants with a low socio-economic status, as expressed by work and education levels (SES) fail to reach the exercise norm.<sup>16</sup> Therefore this group of people also have the lowest life expectancy.

<sup>14</sup> Urhahn, (2017), De beweegvriendelijke stad.

<sup>15</sup> Nederlandse Norm Gezond Bewegen (NNGB). [www.allesoversport.nl](http://www.allesoversport.nl)

<sup>16</sup> Nijland, H. (2017). Fietsen leidt tot langer en gezond leven.

The lifestyle of people has a great influence on the level of activity during the day. There are two important influences on the lifestyle of an individual: social environment and physical environment. Scientific studies show that the social environment had a great influence on the level of activity of an individual.

## Active space in the city

Amsterdam is one of the most popular cities in the world<sup>17</sup>. The reason why Amsterdam is so popular is because of the small scale of the city. Almost everything is reachable by bike and the liveability is great. On the other hand, this small scale does have a downside. The public space has to be shared with all the people in Amsterdam. This has as a result that the public space for pedestrians, cyclist and sports and play is continue under pressure. All people in Amsterdam want to claim a piece of this public space, as well inhabitants of Amsterdam as the visitors.

The 21st century is the century of the city, as the world's population now lives predominantly in urban areas. Where you live and how that place is governed can determine when and if you get sick, receive medical treatment, experience disability and die prematurely. Another way to think about city governance is called city or town planning, and this ought to be understood as a strategy of preventive medicine. Today, most urban health interventions are focused on bringing social services, primary care, economic opportunities and physical improvements to urban residents or their neighborhoods. Interventions tend to focus either on people or places, but rarely both at the same time. Interventions are generally conceptualized and led by experts, and focused on one disease, one risk factor, one hazardous exposure, one population group, or one suspected 'cause' of poor health, such as poverty.<sup>18</sup>

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17 Ipsos Top Cities Index (2017)

18 Corburn, (2009)

## Design for families and children

When an architect designs for an specific target group, research about this target group can help him to make a better design. In this case, my research states that children in the city are the target group that need the most of attention of designers. In this part of my research special attention is paid to designing appartments for families in the city. The publication 'Nestelen in de stad' is the result of a collaboration between the architectural office Heren 5 and the Bond Dutch architects (BNA)<sup>19</sup>. They did a research on how to improve the family appartments in the cities.

In the publication six points of attention are adressed. When designing, architects should pay extra attention to these six points.

1. Storage
2. Smart plans
3. Flexible apartment
4. Conditions for flexible use
5. Between inside and outside
6. The family-friendly living environment

### Storage

Almost all the morden families in the cities are facing the problem of the lack of storage. The modern architectural plans are lacking storage with as a result that seperate cabinets are places through the apartment. This space can not be used to play, sit, eat or to sleep. Smart solutions can help families to have enough storage and more space to use for other benefits.

### Smart plans

Flexibility in plans is key if an appartment is not so big. If spaces are that flexible that they can be used for different purposes, the liveability of the appartment increases. It is important that every appartment has a space to receive some friends, to work or study, to relax with the family or a place for the kids to play inside. At the same time, it is important that



Figure 13 Publication about designing appartments for families in the city.

the privacy of its users is optimally preserved. When this is the case, a small appartment can be a really nice place to be. The hallway in an appartment is often a really small space and acts as left over space. Architects can come up with smart solutions where the hallway is part of the whole plan, a space where you can actually stay for a while.

### Flexible apartment

Typical for families is that they are always in development. When kids are young they use a lot of space of the appartment to play. The plan of the appartment does not have to be fully adapted to kids. If there is enough space in the living room to play, they are free to use this space. When kids grow up, they will use less space for playing. On the other side, on a certain point they want a place for their own. A place where they can get some privacy. If a plan can react on this changes, families do not have to move out.

### Conditions for flexible use

The configuration of the plan in an appartment is often determined by the unchangeable parts of the plan such as; the bathroom, toilet, the kitchen but also the windows. This has often the result that the changeable parts of the plan ,such as the sleeping rooms and living room, are not flexible anymore. The sizes of

<sup>19</sup> Nestelen in de stad, (2012)

the spaces can make the difference between a apartment that is really flexible or not.

### **Between inside and outside**

Within an apartment building, the way to the apartment is often a space for communal use. This space is shared with all the other neighbors and can not be used as a place to stay for a while. Whereas this space is the ideal space for kids to play, it is often not allowed. With smart solutions, architects can accomodate both kids and adults. If the management, safety and interest of the neighbors are taken into account, architects can design solutions for kids to encourage activity close to the frontdoor of the apartment.

### **The family-friendly living environment**

Families do want to have the facilities such as green spaces, shops and schools on bike or walking distance. A place to play for the smallest kids does not have to be an playground. As long as there is an good occasion to play, kids will use it. The living environment is for families very important. Architects should take all the desires of families into account. They can do that by thinking about the living environment in and around the building. In relation to the municipality of Amsterdam this means that architect have to built active architecture.

### **Active architecture**

Architects can not instruct people to be more active during the day, but what they can do is seduce people to be more active by making it more attractive. If we want to design a building that is contributes to more activity, we have to set the human central in this design. Patrick Withney describes the 'human centered design' as an architecture where esthetics are a dominant part of the design to satisfy the versatility of humans. (Beweeglocatie in gebouwen)

Active architecture

Architecture that encouraged activity is one example of what 'human centered design'

is. Aswell the purpose as the means of this architecture are reasoned from the human body and his needs. According to a publication made by BETA, there are two ways of making active friendly buildings:

1. Discouraging passive behaviour; (Un)consciously making the passive choice unattractive.
2. Encourageing active behaviour; (Un)consciously making the active choice attractive.

### **Making the passive choice unattractive**

People who live in the center part of the city are unconsciously dealing with a lack of space to park a car. This results that these people are more often going by bike or go on foot to there location then people on the countryside.

On building level the elevator is an element that makes a lot of activity unnecessary during the day. If you want encourage people to be more active during the day, you should design the elevator on a less prominent place.

People are constantly making considerations between effort and efficiency; if the passive way to reach a goal is not efficient enough, people rather tend to choose the active way. For example, if the using the staircase cost less time then waiting on the elevator to bring you to the preferred floor, then people are rather pleased to take the staircase.

Some necessary functions in a building can encourage activity of its users by spreading these functions thru the whole building. Laundry rooms or central post boxes can encourage activity in residential buildings.

### **Encourage activity**

Encouragement of activity is interesting for architecture because almost all the interventions to reach this goal is associated with a certain extent of spacial quality.

People act in a rational and instinctive way. That is why the topic of encourage activity is divided in;

1. Conscious choice
2. Unconscious choice

### **Conscious choice**

The environment can trigger an impulse in the minds of people to make a conscious choice. For example, simple signs that lead the way to a destination or goals within a building can encourage activity within the building. People make a well considered choice if they want to go there or not.

Destinations in a building that are attractive to people are a nice rooftop terrace with a view over the city, a communal space or spaces where people can come to rest. On the other hand, active spaces are also nice spaces that encourage people to go to. These spaces can be a fitness room but also a space for bike storage.

### **Unconscious choice**

The brain of people can make choices on its own. This unconscious way of thinking is a result of a careful combination of observations of the senses. This unconscious choice can be provoked by designers. For example, research states that rhythmic music can make people walk faster. To reach this effect, a careful combination of the senses have to be triggered. We as designers can effect the de-

cisions that people make, however it requires some attention of the designer.

To encourage physical exercise within a residential building we can either discourage to be passive or stimulate to be active. To reach this goal different principles are used with buildings that encourage activity. These principles are divided into four different domains. The domains that encourage activity are;

1. Route
2. Goals
3. Active program
4. Building & Context

This knowledge comes from some precedents. The City of New York has done research about how architects can design buildings that encourage activity. This has resulted in an 'Active Design Guideline'. This guideline can help architects to design an active building. Another precedent is the 'Well Building Standard'. This label is almost the same as all the sustainability standards, such as the LEED or BREEAM certificate, however this label is only for really healthy buildings.

### **Routes**

Routes are the paths in a building that people follow to reach a destination in the building. The route contains a consecutive system of entrance, hallways, stairs and elevators. The principles within a route are mainly focused on the encourage of activity and to increase the intensity. Also the route is mainly focused on walking, the most common physical activity of people. When the different elements of a route are well designed, this can lead to an encourage of activity. However, this is depending on the quality, accessibility, safety and comfort of the space.

### **Goals**

Goals are the useful program in the building where people want to go. For a residential building this can be a courtyard or an apartment. If goals are strategically placed through the building this can lead to more activity and a more intense use of the routes that are connected with these goals. However,



Figure 14 The Active Design Guideline and The WELL Building Standard.

the routes towards these have to be short and the route towards these goals have to be rewarding to walk.

### Active program

Active program is all the program in the building that directly contributes to an increase of activity. Active program can be a gym, swimming pool, multifunctional spaces but also bicycle storage and communal showers. People will use the active program more often if it is clearly visible from the street or inside the building.

### Building & Context

Buildings have a direct influence on the surroundings. The volume of the building has an effect on the shadows that are formed on the surrounding streets. The exterior of the building and the use of human measures influences the walkability of the building. Research states that variations of activity in the facade contribute to more feelings of safety. The use of an overhang or stairs in the exterior of the building can contribute to a more active use of space in the surrounding environment.<sup>20</sup>

The analysis for my research takes these four different domains as a starting point.

- Whereas in the past mainly epidemic diseases were a danger to people, nowadays chronic diseases are a danger to humanity.

- Children in Amsterdam do not meet the NNGB

- Architects can use the research done by professionals and design the preventive medicine.

- The Active Design Guideline gives architects tools to design active buildings.

<sup>20</sup> BETA, (2016), Beweeglogica in gebouwen, p. 37-77



# IV

Plan analysis

## **Topic**

Design principles that encourage physical movement in urban buildings.

## **Relevance**

The relevance of this research is giving designers tools to design buildings for an active lifestyle, by analyzing principles that encourage physical movements in case studies.

## **Research question**

How are design principles that encourage physical movement integrated in the design of the case studies?

## **Hypothesis**

Buildings that are designed to encourage physical movement are designed by a set of returning domains. Within these domains, design principles that encourage physical movement are intergrated in different ways.

## **Method**

In 'Beweeglogica in Gebouwen' by BETA office for architecture and the city four domains of movement are defined as principles that encourage physical movement in buildings. These four domains are: Routes, Goals, Active program and Building & Context.

To analyse how these principles are intergrated in the case studies an axonometric reduction drawing is made for each domain. After this these drawings are combined to form one concluding drawing where we can see how the design principles that encourage physical movement are integrated in the design of the case studies.

## **Results**

The results of the plananalysis are visible on the next pages. The analysis begins after a brief introduction of the chosen buildings.



PROJECT  
ARCHITECT  
LOCATION  
COMPLETED  
APPARTMENTS  
FLOOR AREA  
PUBLIC AREA

Kalkbreite  
Müller Sigrüst Architekten  
Zürich, Switzerland  
2014  
88  
22.710 M<sup>2</sup>  
2.500 M<sup>2</sup>



PROJECT  
ARCHITECT  
LOCATION  
COMPLETED  
APPARTMENTS  
FLOOR AREA  
PUBLIC AREA

Mirador  
MVRDV  
Madrid, Spain  
2005  
156  
18.300 M<sup>2</sup>  
–



PROJECT  
ARCHITECT  
LOCATION  
COMPLETED  
APPARTMENTS  
FLOOR AREA  
PUBLIC AREA

Ohboy  
Hauschild + Sigel architecture  
Malmö, Sweden  
2017  
55 + 31 hotel rooms  
3922 M<sup>2</sup>  
–



PROJECT  
ARCHITECT  
LOCATION  
COMPLETED  
APPARTMENTS  
FLOOR AREA  
PUBLIC AREA

Via Verde  
Hauschild + Sigel architecture  
New York, USA  
2012  
222  
29400 M<sup>2</sup>  
–



PROJECT  
ARCHITECT  
LOCATION  
COMPLETED  
APPARTMENTS  
FLOOR AREA  
PUBLIC AREA

Medibak office  
HASSELL  
Docklands, Melbourne, AU  
2014  
–  
47750 M<sup>2</sup>  
–

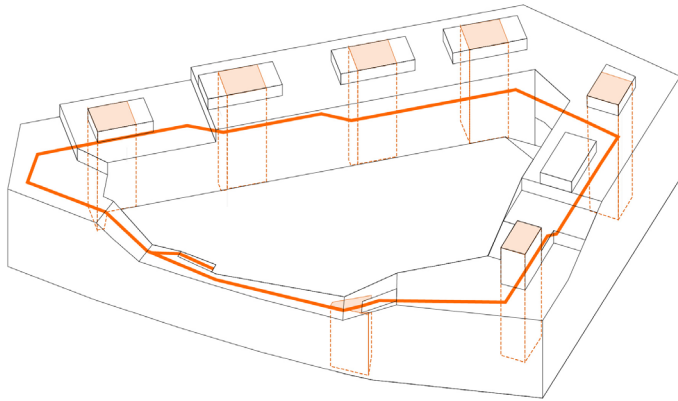





PROJECT  
ARCHITECT  
LOCATION  
COMPLETED  
APPARTMENTS  
FLOOR AREA  
PUBLIC AREA

Rotterdamse toren van Babel  
Laurens Boodt Architect / AM / Bartels  
Rotterdam, NL  
2018 (expectation)  
24  
3800 M<sup>2</sup>  
–

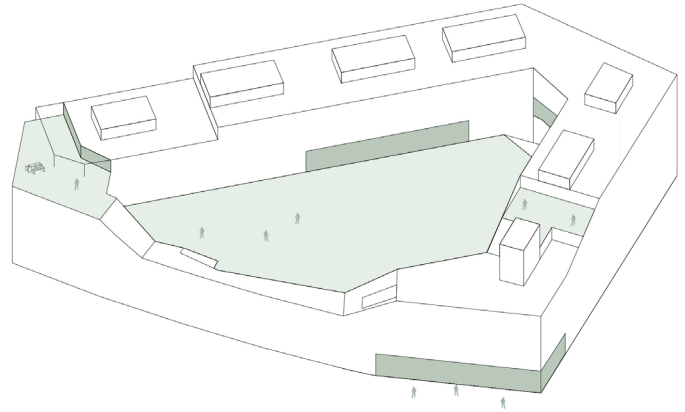
## Results




### Routing



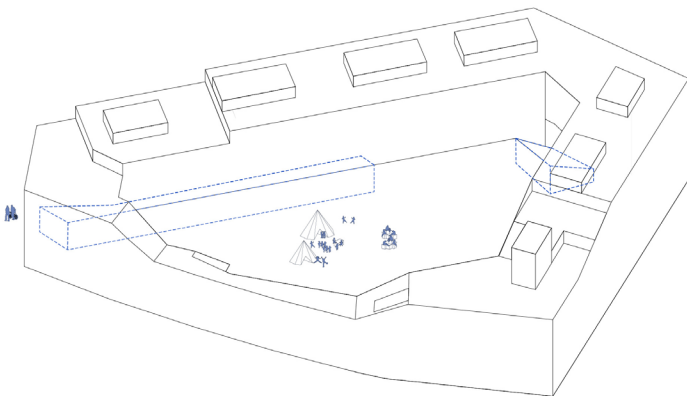
-  Contiguous route around the building
-  Stairs on the route
-  Route runs over the rooftop



### Goals



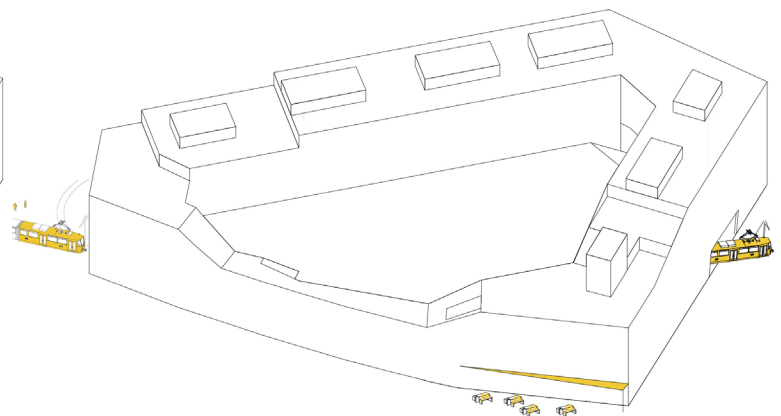
-  Playground on the roof
-  Café on the groundfloor and second floor
-  Shops on the groundfloor




### Active program

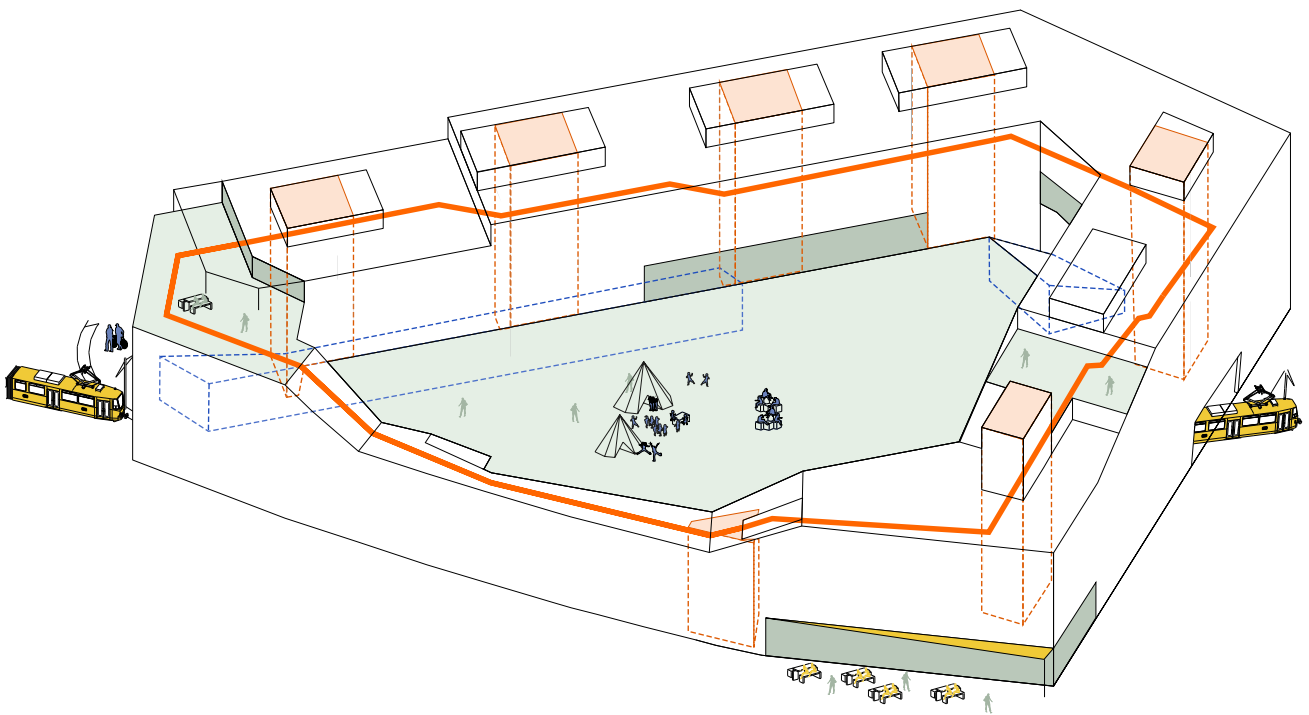


-  Bicycle storage on the groundfloor
-  Active program on the roof

### Building & Context

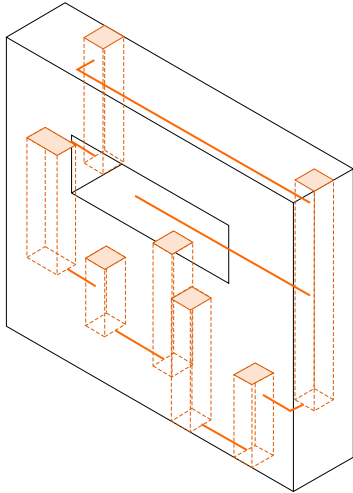


-  Public transport facility goes through the building
-  Overhang to accentuate the goal
-  Project allows sunshine in the courtyard



The route runs aswell external as internal around the building and is interrupted with different goals. The route runs around the goal in the middle. The active program is located in the ground floor and under the staircase. The building is located on a former tram station and allows to run trough it. To accentuate a goal little interventions in the facade are made.

Routing

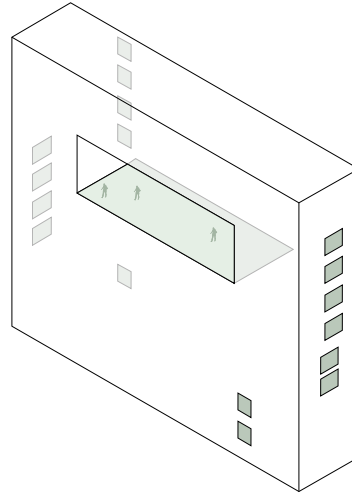


Contiguous route in the building



Route runs over the roof of the building

Goals

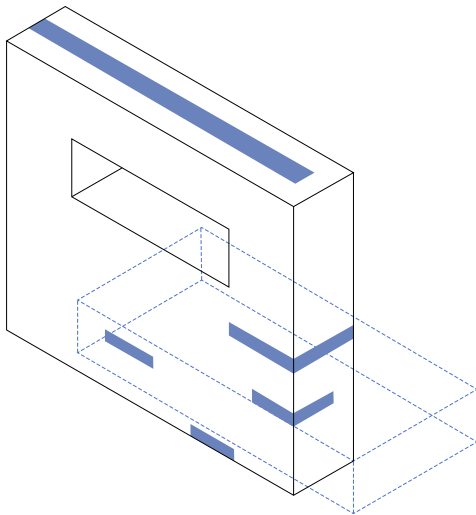


Roofterrace with a view



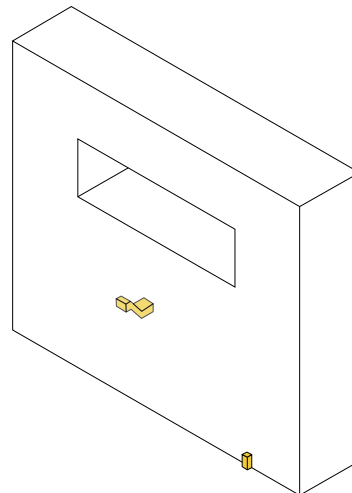
Collective space on platform in the middle

Active program

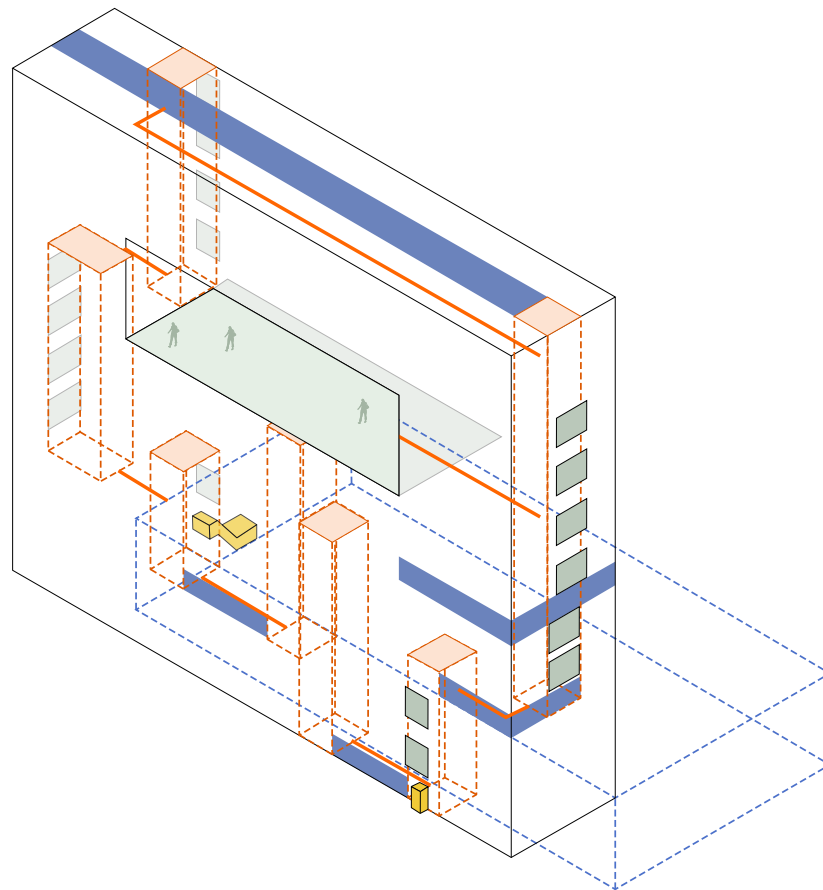


Car paring under the building

Building & Context

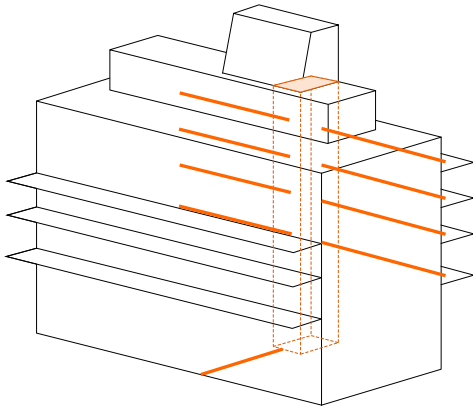


Sun orientated building

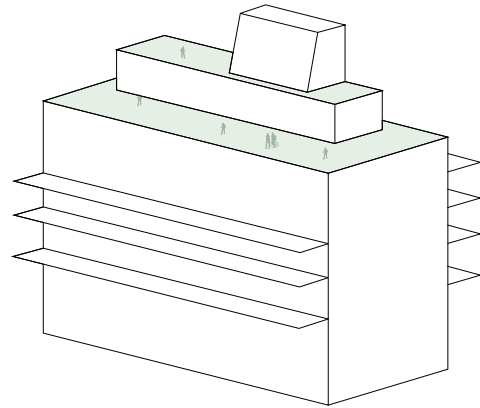


A network of staircases and corridors results in a consecutive route inside this building. The route is only for people who live in the Mirador and is therefore not public. On the route different viewpoints are there to simulate the user.

Routing



Goals



Route with one central staircase and acces to appartments on gallery



Roofterrace with a view

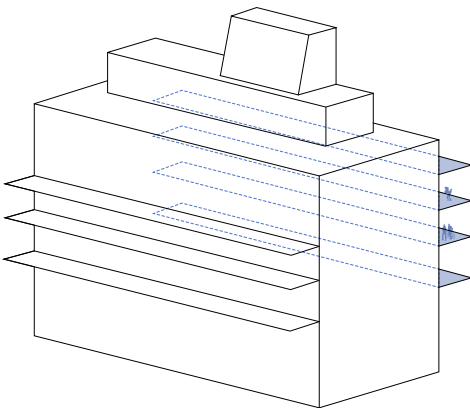


Collective space on the ground floor

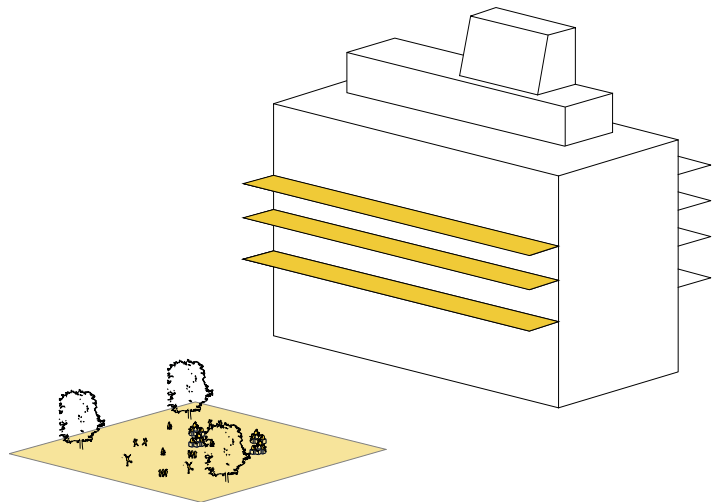


Collective outdoor space on the rooftop

Active program



Building & Context



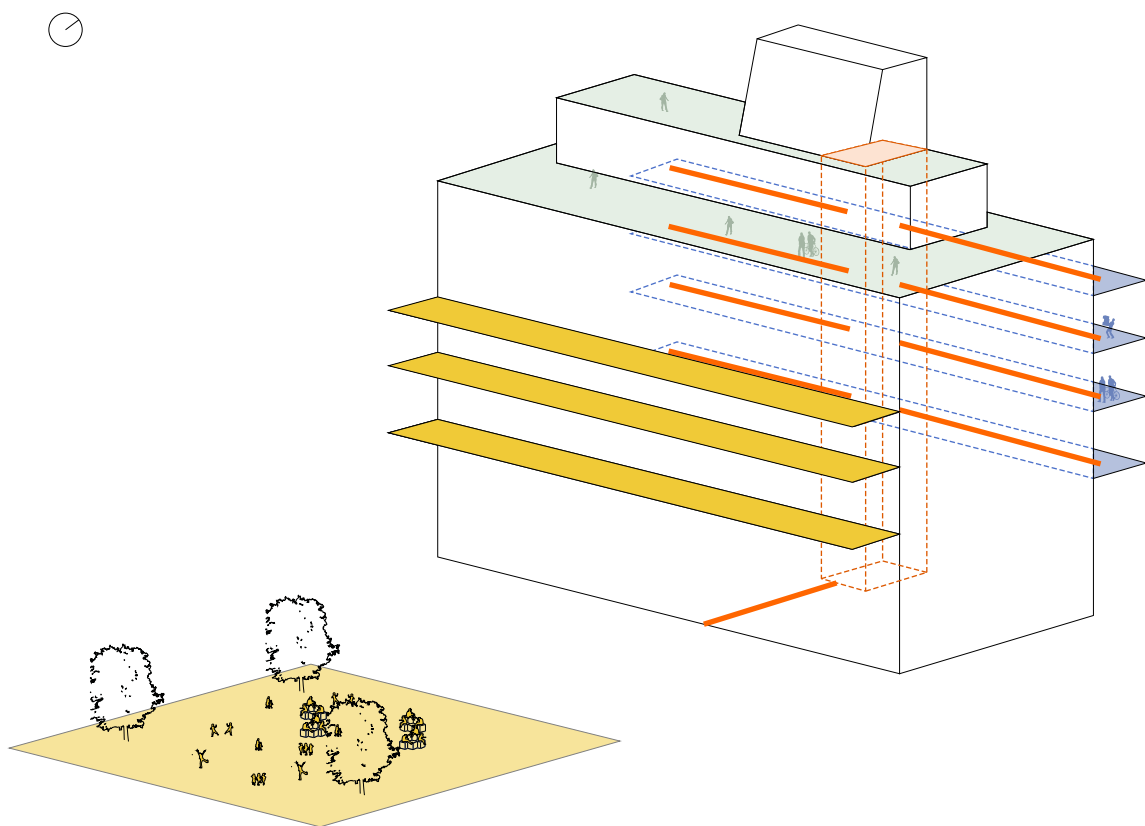
Bicycle storage on the gallery



Privet outdoorspaces orientated on the sun

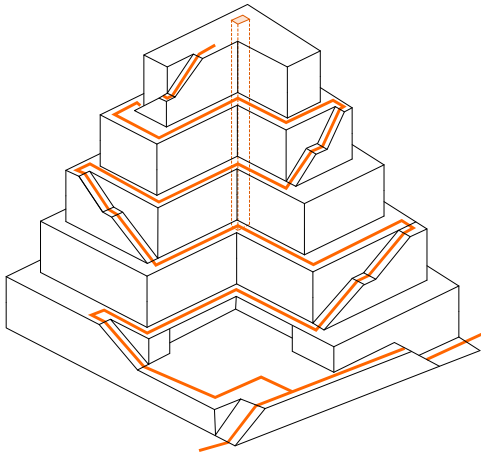


Skatepark directly near the building



The Ohboy hotel is situated next to a skatepark. If you enter the building a central staircase would lead you to one of the galleries on the north side of the building. You can park your bike on the gallery next to your front door. All the private spaces of the apartments are orientated towards the sun. On the roof is a collective outdoorspace where people can chill.

## Routing



A linear route leads over the building

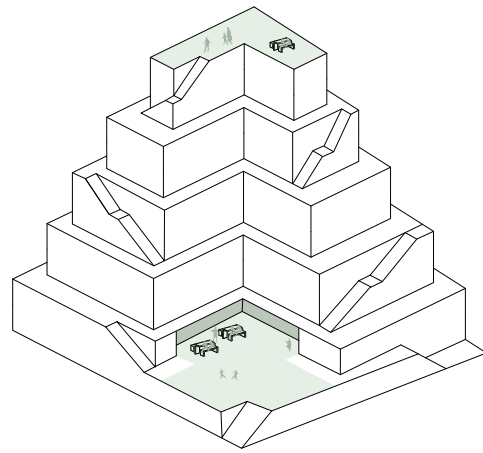


The route includes stairs and climbs up the building



The route ends on the top of the building

## Goals



Roof terrace with a view

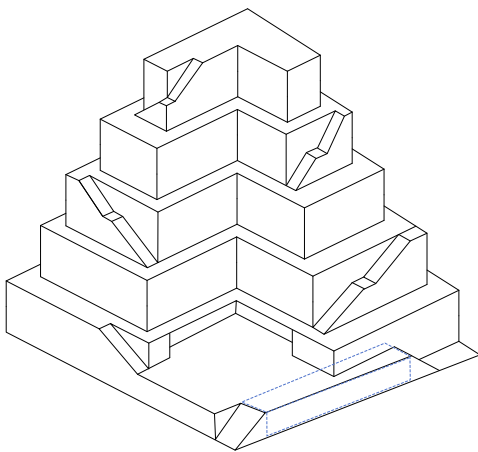


Collective outdoor space



Collective living room and kitchen

## Active program

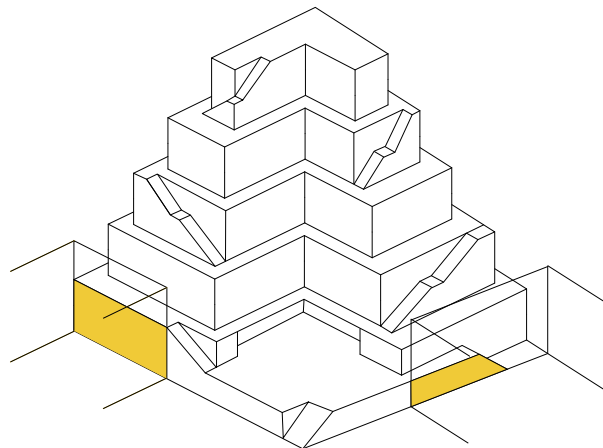


Space for bike storage is located on the ground floor



Cars can be parked in the basement

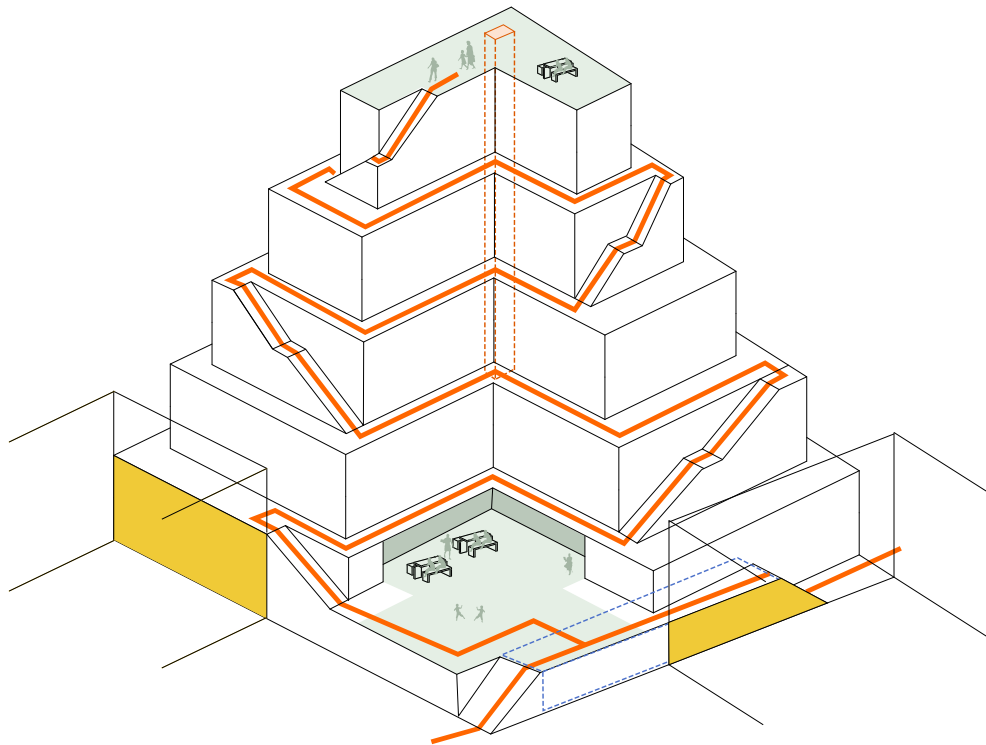
## Building & Context



The building is connected to the adjacent buildings

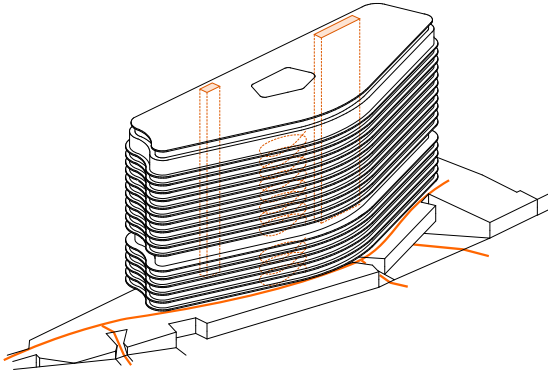


The collective outdoor space is oriented towards the sun



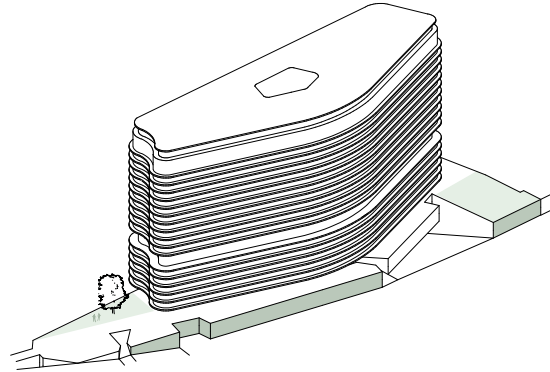
If you would follow the route up the building, you would first pass the collective outdoor space and then climb up to the rooftop terrace. The collective living room and kitchen is on the route, but you will not go through them. The parking places for bikes and cars are not connected to the route.

## Routing



The route leads over the plinth of the building and connects to a core from which the different floors can be reached

## Goals



The plinth of the building contains public program

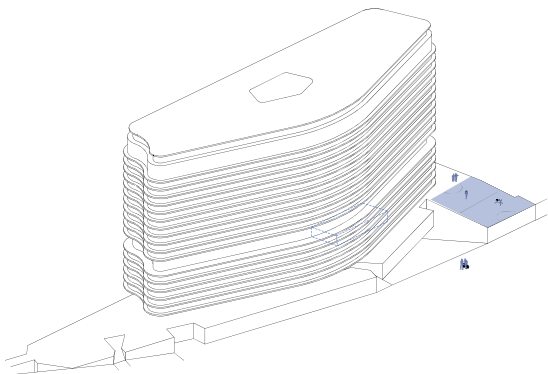


On top of the plinth a restaurant is located



On top of the plinth a green park is located

## Active program

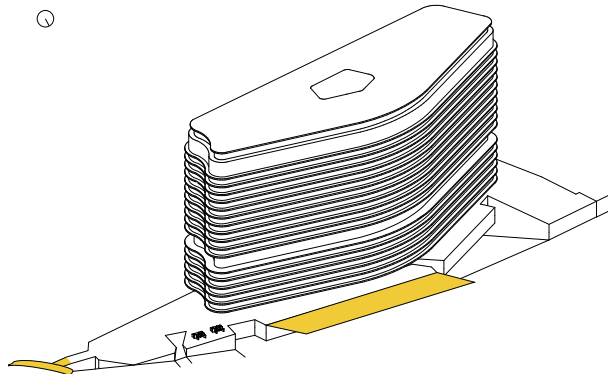


Space for bike storage is located in the basement

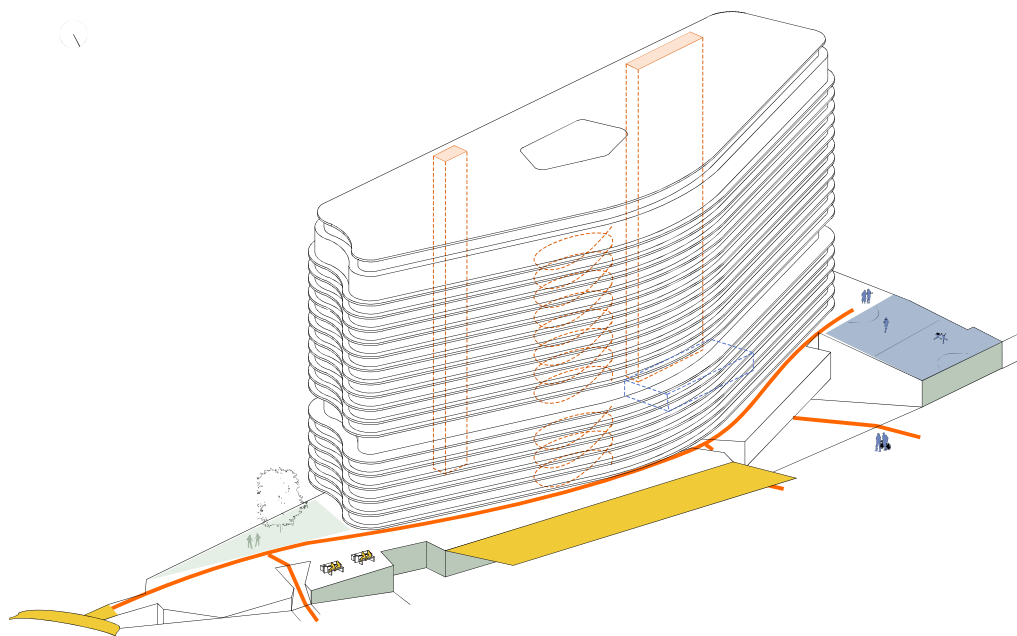


A sports field is part of the public program on the plinth

## Building & Context

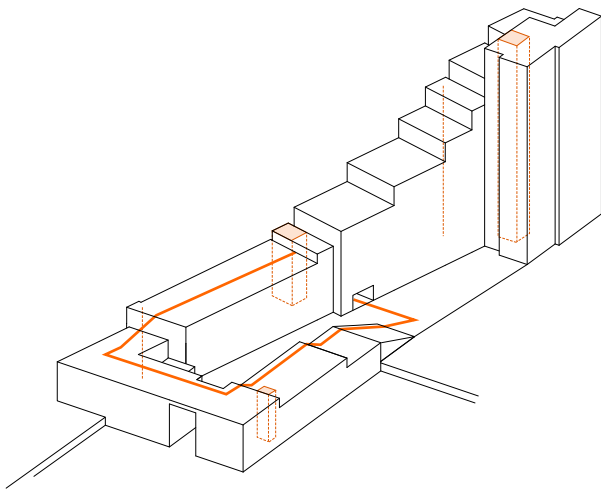


Part of the design is an overhang over the street



Most of the elements that encourage physical movement in this building are situated in the plinth. The route over the plinth connects the goals and active program to each other. The plinth is designed to connect to the context of the building, including a covered street and a connection to an existing pedestrian bridge. On the office floors of the building the spiralling staircases in the atrium are the elements that encourage physical movement.

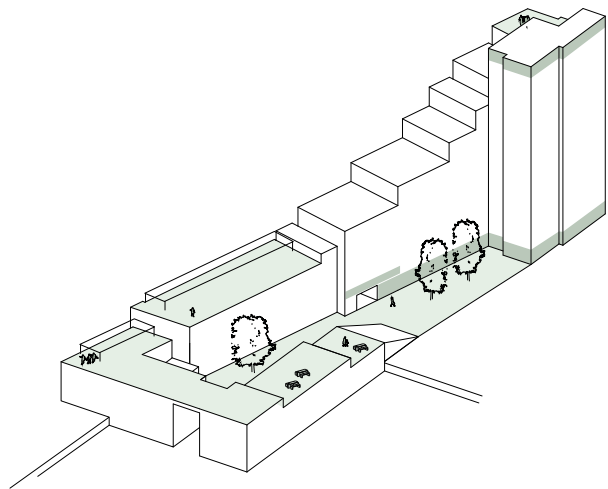
## Routing



A route leads through the central courtyard and over the roof

The route includes stairs and leads up the building

## Goals



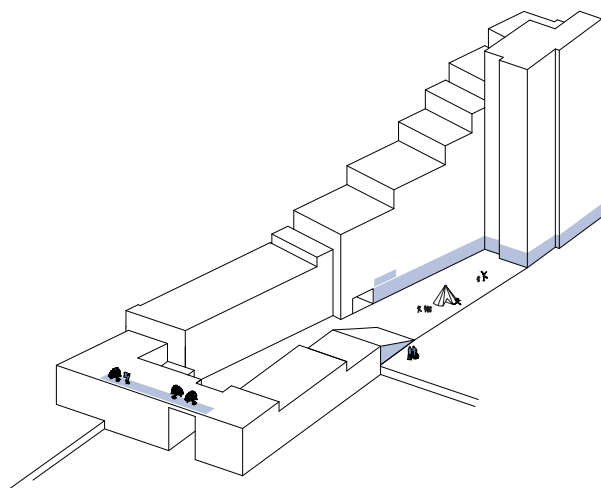
On the topfloor is a collective roofterrace with a view

Collective outdoor spaces in the central courtyard and on the roof

Collective spaces are located on the top- and ground floor

Both in the central courtyard and the flat roofs are gardens

## Active program



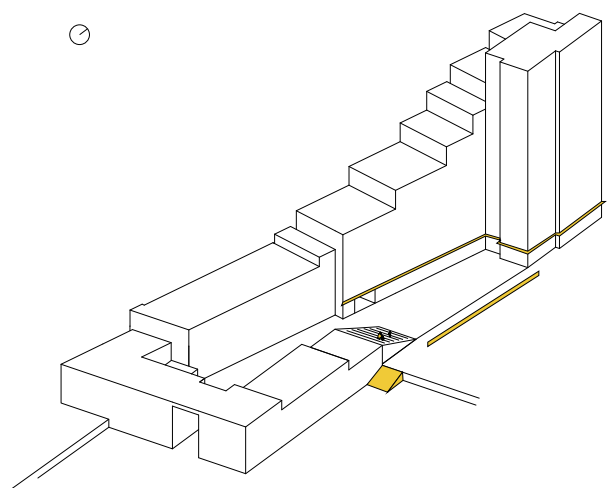
A health centre is located on the ground floor

Residents can grow their own food on the roof

In the central courtyard is a playground

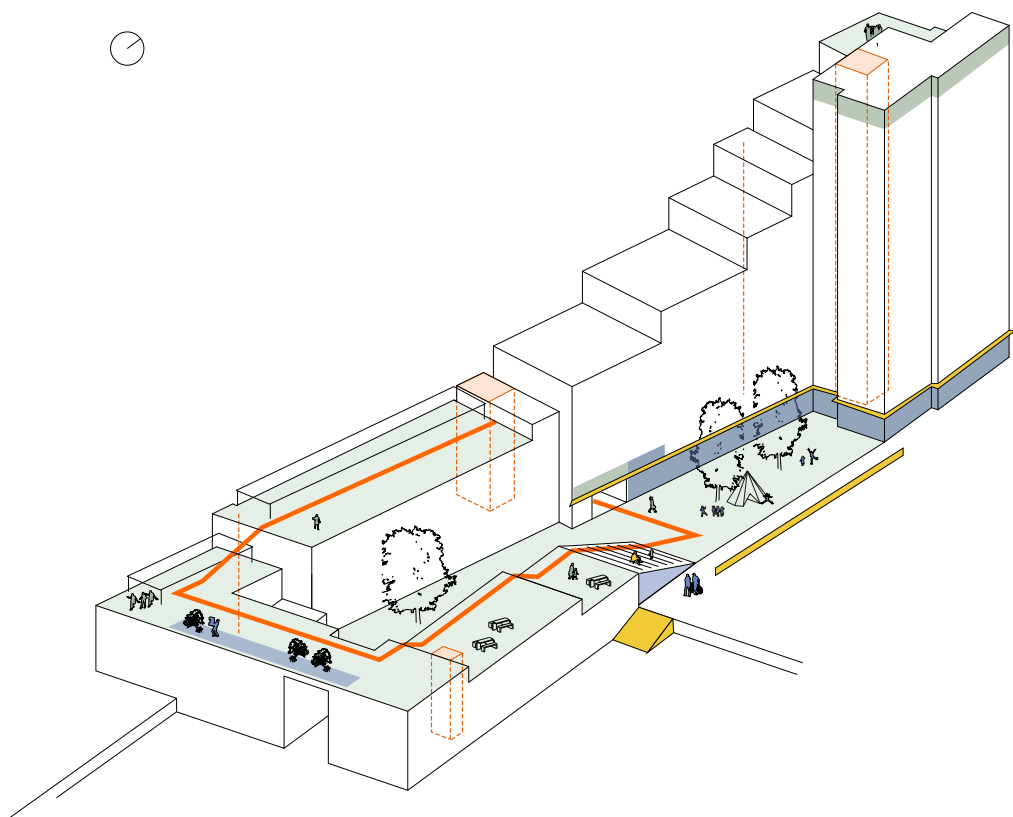
Space for bike storage is underneath the stairs

## Building & Context



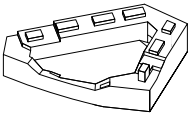




























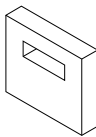




























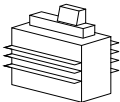




























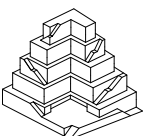




























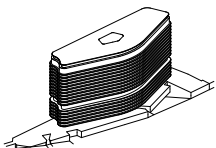




























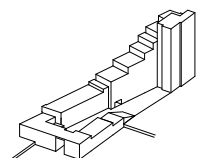




























An overhang accentuates the program in the plinth

The courtyard and roof gardens are oriented towards the sun



In Via Verde a route connects the plinth, the central courtyard and the roof gardens. In these parts of the building the most of the goals and the active program are situated. The roof terrace on the top floor of the building is not connected to this route and can only be reached by using an elevator.

## Conclusion

	Rouing	Goals	Active program	Building & Context
	    	       	      	       
	    	       	      	       
	    	       	      	       
	    	       	      	       
	    	       	      	       
	    	       	      	       

There are different types of routing available for an active residential building. Not one type of routing is dominant in this research. The route is important because it connects the goals and the active program.

There are many goals, but some of them are applied remarkably often. Among them are the communal spaces and the viewpoints.

There are a lot of facilities as active program. Almost all the case studies of the research have facilities that encourage bicycle use, for example proper bicycle storage.

Almost all of the case studies are orientated toward the sun. This because lots of the active program and goals are outside or on the roof of the buildings.

## Discussion

The results of this research are based on literature and pictures of the projects. If we would have visited the projects, this may have led to other insights. How the buildings are actually used by its user can not be researched from paper. Furthermore, the project that have been chosen for this analysis are a small selection of projects available. To give this research more depth the same method could be applied to other case studies. Finally, the axonometric drawings are an abstracted version of the case study, which can lead to small differences with reality.



Site analysis

## Site

The site chosen for my graduation assignment is the plot above the marnixplantsoen. Currently, two building blocks are situated on the site. To be more precise, it concerns the buildings on the marnixkade (6–31) and on the marnixstraat (14–38).

The two building blocks on the plot are built in 1871 commissioned by J.F. Schutte and were part of another building block on the other side of the Marnixplantsoen. This project was founded by one of the early social housing corporations in Amsterdam. This is one of the reasons why these two building blocks are listed as monumental heritage of the municipality of Amsterdam. The buildings as a whole are registered as monumental heritage. Furthermore, these buildings have an important social status for the city of Amsterdam.

The reason why I prefer to build on this location is because of the potential of social interaction between the Marnixplantsoen and the future building. The site has two different faces, one directly near the active road of the Marnixstreet and the other one looking towards the water on the Marnixkade. The site is also very long, this has potential to make a route inside the building with goals and active programme. My vision for the future city of Amsterdam is that buildings should provoke activity. Despite the existing buildings on the plot are monumental heritage of the city of Amsterdam, the need for an active building that contributes to the health of the people is of greater importance.

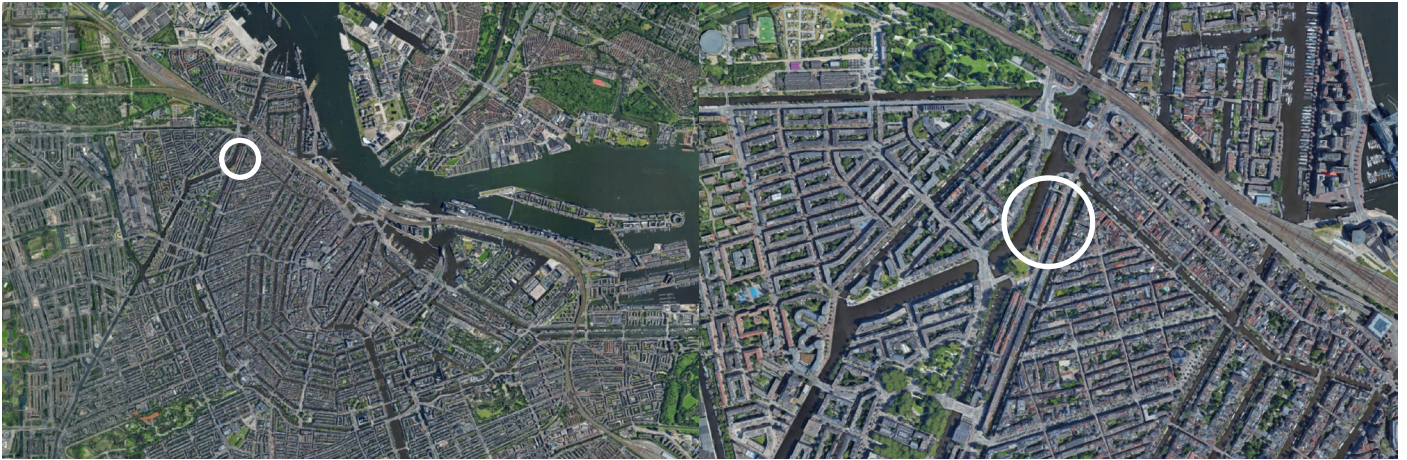
## Marnixstrook

The Marnixstraat is situated between the Lijnbaansgracht and the Singelgracht. The strip of land is part of the city expansion plan of 1613 and acted as a line of defense with ten bastions. On the map of Gerrit de Broen from 1725 is the line of defense from 1613 visible

as a geometric pattern of bastions connected by curtain walls. The line of defense between the Haarlemmerplein and the Leidseplein is a straight line with a bend at the Bloemgracht and the Rozengracht (fig 15.)

The Bastions on which the mills stood, got another function during the 19th century. Most of the bastions were used to build factory buildings that were not allowed within the city center. In the second half of the 19th century the line of defense underwent a transformation. At first, in 1856 only the mills and some of the curtain walls were demolished. Later in 1868 the whole line of defense from Haarlemmerpoort up to the Zaagmolenpoort was demolished. In 1875 the Singelgracht was further normalized. The only bastion that remains intact was the former Noorderkerkhof, now also known as the Eerste Marnixplantsoen. Nowadays it acts like a park, pedestrian path and skatepark





Google maps, Amsterdam (NL), 2018

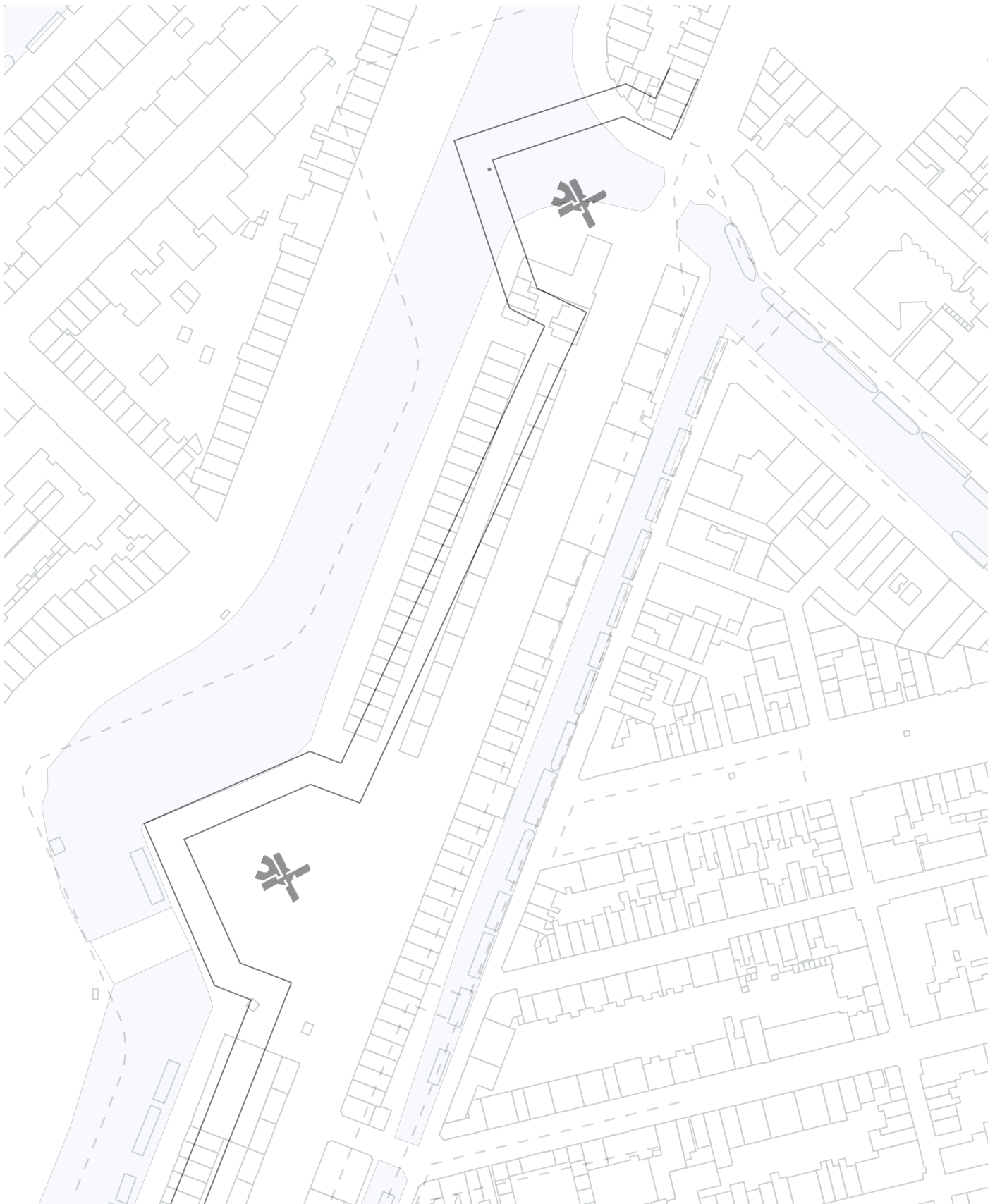
Google maps, Amsterdam (NL), 2018



Google maps, Amsterdam (NL), 2018

### Location

The site of the project is located in the west part of the inner city of Amsterdam next to the Jordaan. Half of the location is facing the busy Marnixstraat and the other half is facing the Singelgracht.

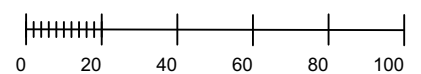


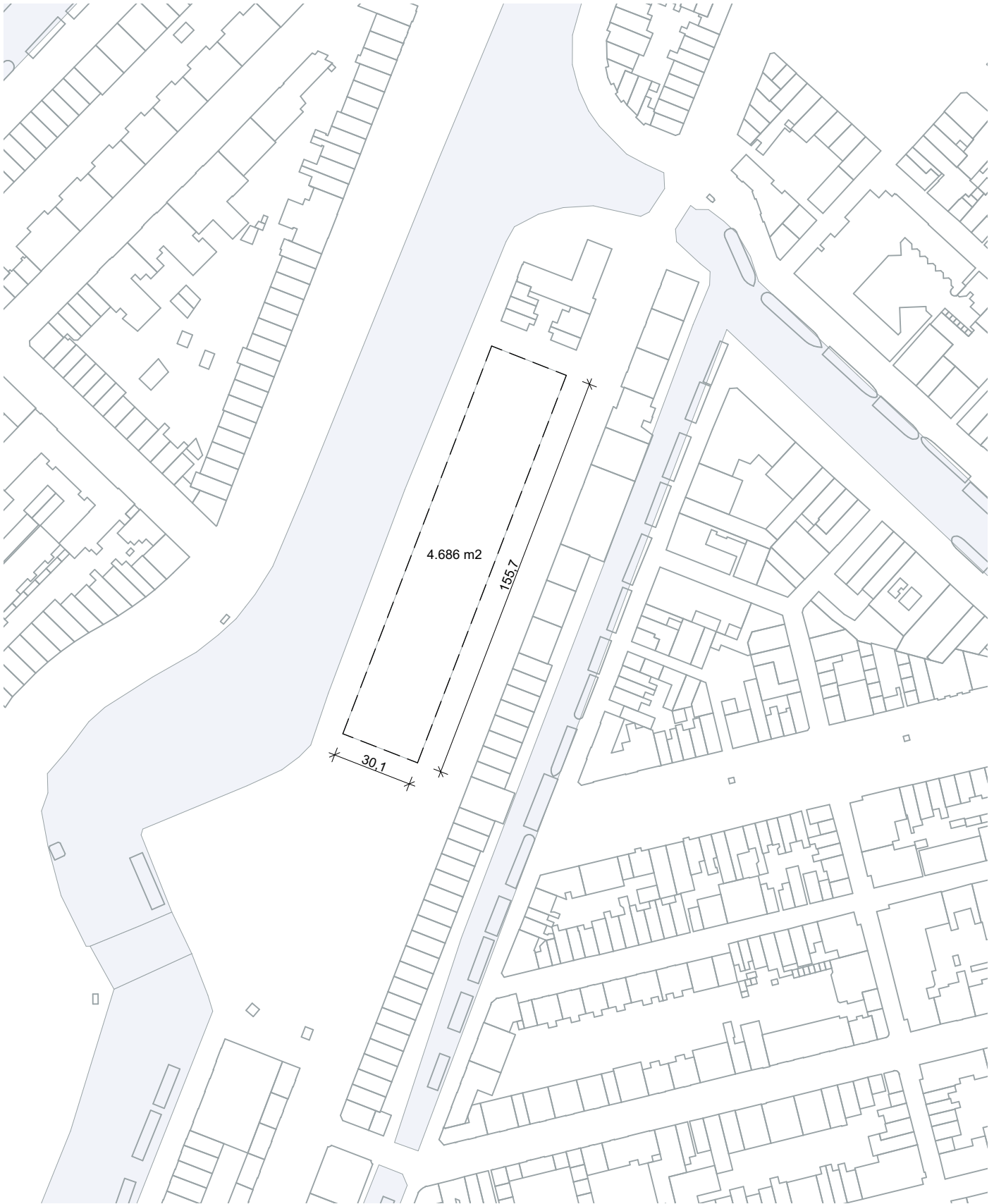
## History

The site is at the part of Amsterdam that formerly held the fortification works that run around the inner city.

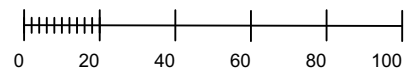


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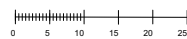
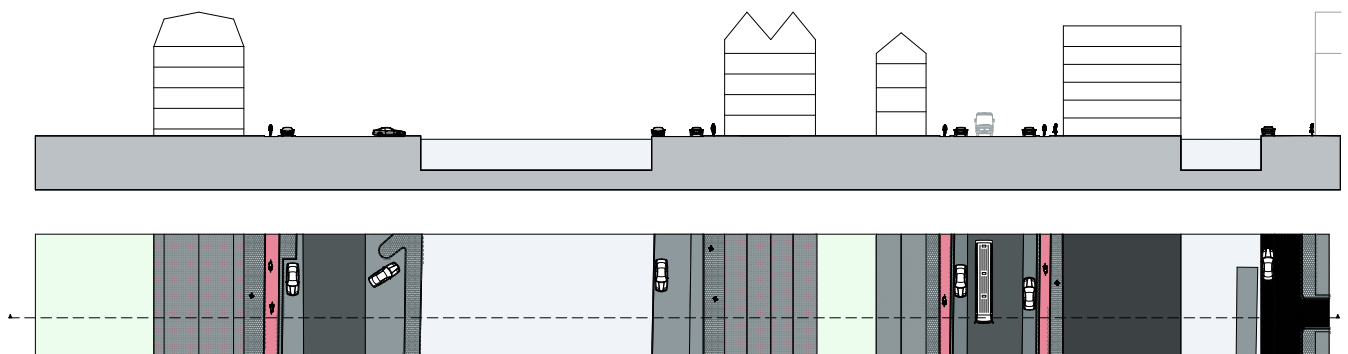
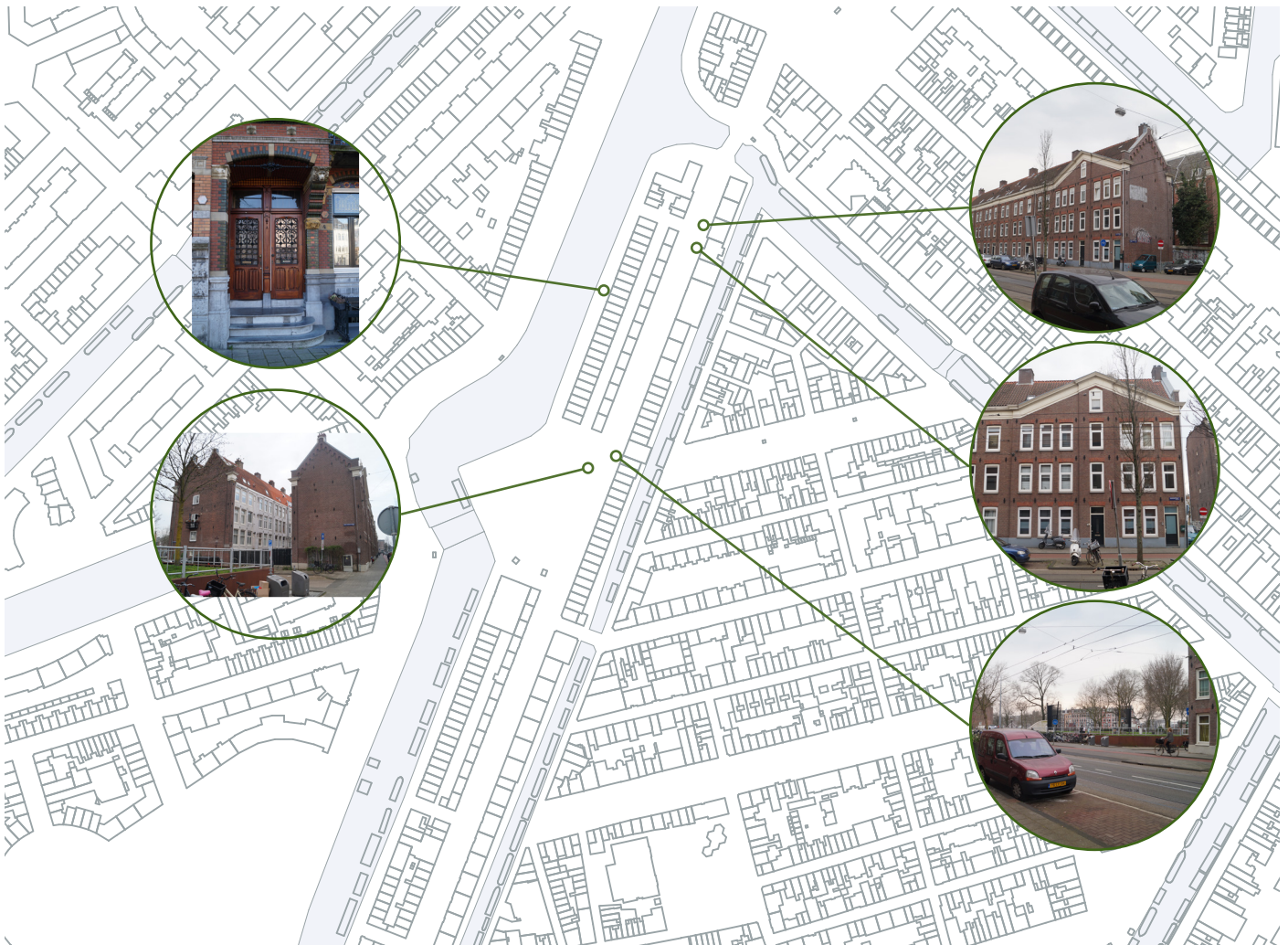




- Site
- Water



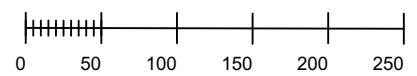
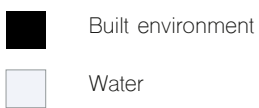
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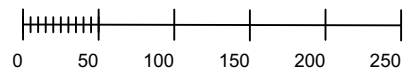
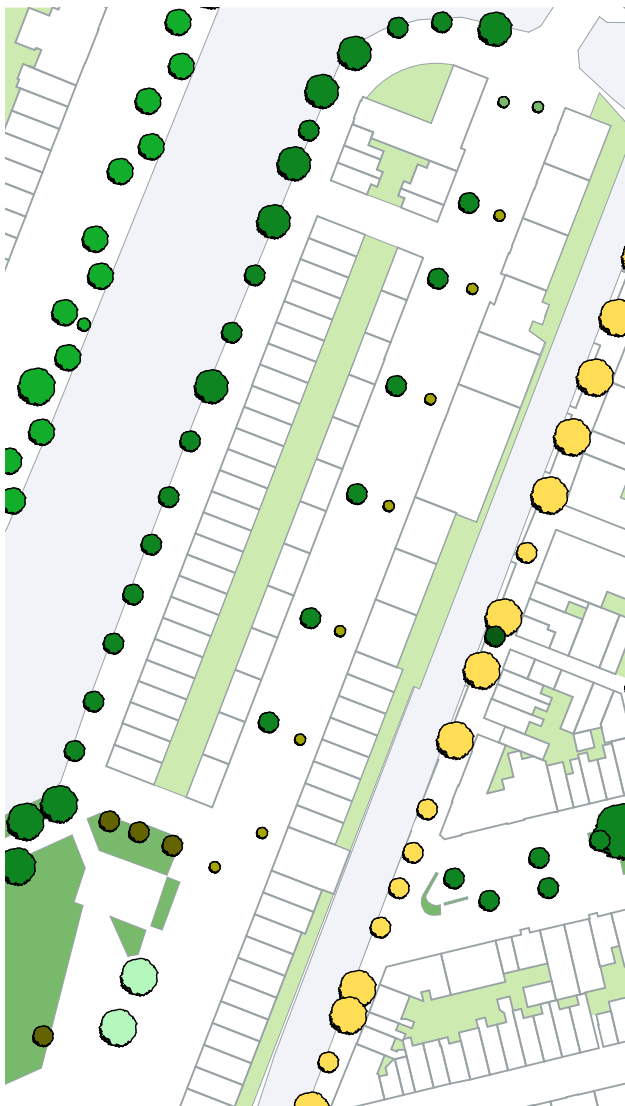
## Heritage

The facade of the existing building has a lot of details in the brickwork. The front facades have all kind of motifs in the brickwork.



## Morfology

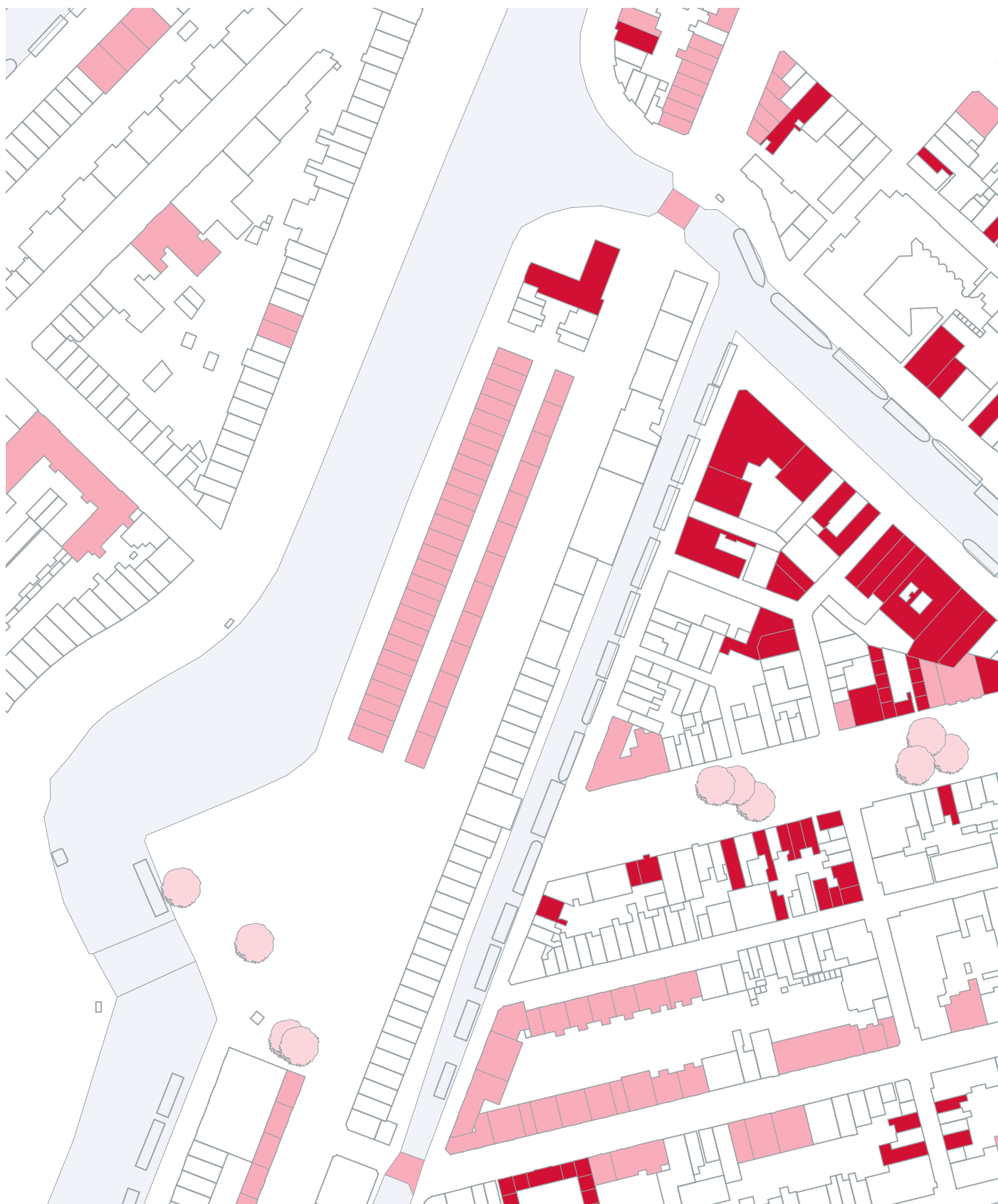
Whereas the surrounding buildings are building blocks, the typology of the site is a long strip. This ribbon separates two parts of the city and follows the old line of defense.



- Private green
- Communal green
- Water

## Green

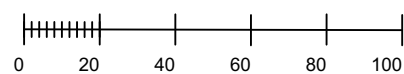
Because of the building block typology, all private green is situated on the inside of these blocks. On the south of the location the marnixplantsoen is available as public green. Trees are mostly placed on the transition between land and water, or to accentuate a long straight line.










- municipal heritage
- National heritage
- Water
- Monumental trees

## Monuments

Most of the heritage is situated in within border of the former fortification works. The two blocks on the site are municipal heritage. This because of it was one of the first social housing project in Amsterdam.

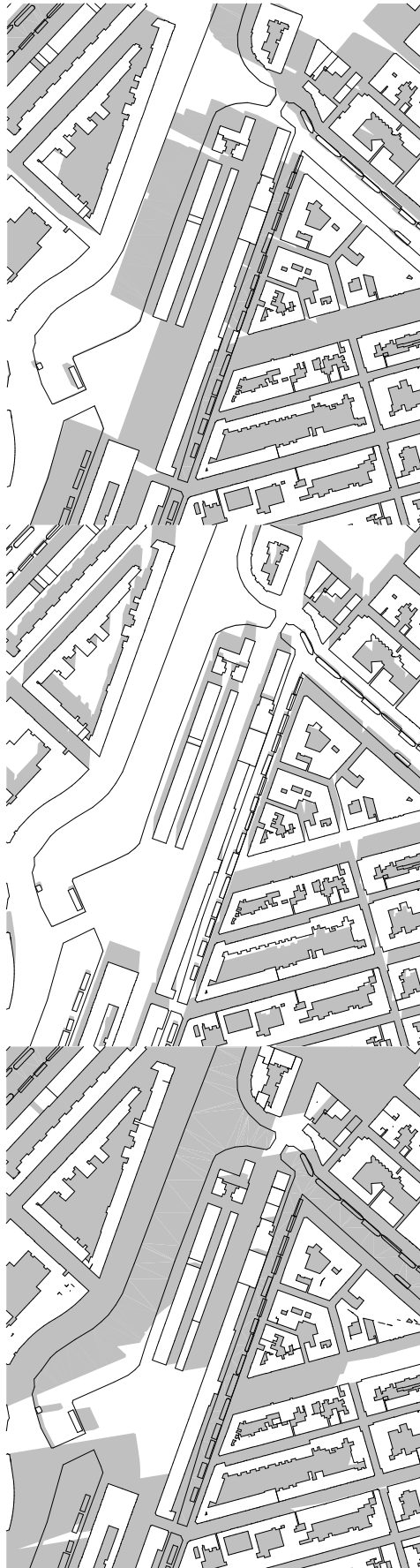




	Shops		Leisure
	Office space		Restaurant, Bar
	Schools		Non housing
	Health care		

## Facilities

Most facilities are clustered in the inner center of Amsterdam. Although next to the site is a park, there is a lack of facilities in the rest of the neighborhood for children.



21 March 9:00

21 March 13:00

21 March 18:00



## Sun orientation

The appartments facing the Mar-nixstraat have mostly the morning, and mid day sun. Appartments fa-cing the Singelgracht enjoy the eve-ningsun. The space in the middle of the two blocks is during the day mostly covered with shadow.



V

Brief of own project

Because Amsterdam is very keen to become an active city, the design of my graduation project will be an active residential building. There are several design tools to make an active building. In my design, I will make a combination of encouraging active behaviour and discouraging passive behaviour. Considering my research I will provide apartments for families that have a low soci-economic status, and have trouble to find a place in Amsterdam. The design will allow for small, normal and large families. The location of this project is on the marnixkade (6-31) and on the marnixstraat (14-38).

**The building will contribute to a more active lifestyle according to the following guidelines:**

Design contains of a route that contributes to more physical activity.



Design has several goals alongside the route (bar, restaurant or terrace)



Design has spaces with nature what is good for mental health.



The design has good public outdoor spaces that can be used by kids and their parents.



The design has active program both for kids (playground, sports) and for adults (gym, bike storage)



**With the design a specific target group is taken into account, to facilitate this target group the following guidelines are used:**

Appartments of will have enough storage space.

Appartmenst contains a flexible floorplan that is adabtable over the years.

Every apartment has an outdoor space.

There is a good connection between the outdoorspace and the apartment to allow kids to play in a safe environment.

**According to the results of the plan analysis the following guidelines are taken into account:**

Outdoor spaces are orientated on the sun.



**According to the sit analysis the following guidelines are taken into account:**

Elements of the present heritage on the site are visible in the new design.



### **Public program**

The building allows the following public program:

- Viewpoint over the city
- Bar, restaurant etc.
- Fitness
- Facilities for outdoor sports (bootcamp)

### **Collective program**

The building allows the following collective program:

- Parking
- Bike storage
- Possibility for extra storing space

### **Privet program**

The building will allow for small, normal and large families. Approximately 110 appartments.

- 1/3 of the program are small appartments (1-2 bedrooms) (<50m<sup>2</sup>)
- 1/3 of the program are normal appartments (2-3 bedrooms) (50-100 m<sup>2</sup>)
- 1/3 of the program are large appartments (3-4 bedrooms) (>100 m<sup>2</sup>)

Every appartment will have an privet outdoor space.

Option for additional storage space.



# AMSTERDAM.

# V

Summary

The assignment of the Dwelling Graduation studio is focused on the future city of Amsterdam. How do we want to live in the future and what kind of buildings do we need to allow for that? The location of this studio is Amsterdam. More precisely the part of Amsterdam that formerly held the fortification works that run around the inner city. The topic for the graduation studio is a result of an historical analysis of Amsterdam. From the 1850's onward, health has always been a topic in Amsterdam. In the middle of the 19<sup>th</sup> century, the city had problems with overpopulation. The lower class lived in very tiny houses that were badly constructed and had no comfort of heating or running water. This resulted in epidemic diseases and killed lots of people. In 1901 the government came with an intervention, the Dutch building law. This law improved the liveability of all the housing projects in the Netherlands.

Until today the Dutch Building Law is still operative. That being the case, our health should be great. In the last decades, doctors and professionals have done a lot of research to understand more about the human body. They found that we could extend the amount of years that we live in good health with an active lifestyle. Newsarticles state that our lifestyle is problematic for our health. Especially adolescents and kids are lacking in an active lifestyle. The municipality of Amsterdam sees this problem and strives for an active city in the future. All buildings that have been built to live a healthy life have done their job. With the knowledge of today, research that has been done and the problems of chronic diseases in society, architects can now design buildings that cure the health problems we are dealing with in modern society. Buildings that help people to have an active lifestyle. The task of the future architect is to make housing schemes where people can live in good health. With all research in mind that means that we have to make housing schemes that contribute to an active lifestyle.

Physical exercise contributes not only to the extension of years that we feel healthy. It reduces the chance of getting obesity, school dropouts and has positive effects on test results in school and mental health.

The small scale of Amsterdam has also positive influence on the quality of life inside the city. Supermarkets and other shops are closeby and this stimulates inhabitants to walk or go by bike. On the other hand, the small scale of Amsterdam has also a downside. The public space for example, has to be shared with all different users. People who live in Amsterdam, tourists or entrepreneurs everyone wants to claim a piece of this public space. As a result of this, some targetgroups in the public space are under pressure. One group who suffers the most of this development is the playing child.

Nowadays the people of Amsterdam are not active enough and do not meet the Dutch physical exercise guideline. The current lifestyle of people is not without any consequences. The decline in regular daily walking and cycling is resulting in increased obesity and risk of diabetes and cardiovascular diseases. People with a less active lifestyle are more sensitive for diseases like: Obesity, Depression, Heart and vascular disease and Dementia.

In search of the Amsterdam of the future, Urban planners and Architects must take the lead in this matter. In this research a few questions help me to make a good structural story.

### **How can an architectural plan contribute to a more active lifestyle, and make Amsterdam a more healthy city?**

This main question of my research is supported by sub-questions to define, and to give structure to it. The first sub-question is: **What is the need to have an active lifestyle?** To make clear what the problem is and to give more information about the history of Amsterdam related to this topic. Secondly, **Which target**

### groups are in need to change their lifestyle?

This question gives a guideline to design for a certain target group. There are target groups that need a little help. And finally, **How can the target groups be activated in a architectural plan?** This question is answered in the plan analysis part of the research. Six buildings are analyzed on different topics. The conclusions show a similarity between the buildings.

Within the architectural discipline, the topic of health has often been addressed in experimental proposals. One of those proposals where the garden cities of Ebenezer Howard. Famous examples of garden cities are, Letchworth Garden City (1899) and Welwyn Garden City (1919). Both the town and the country had negative sides. Howard wanted to combine only the positive things of both town and country to make a healthy environment.

Hugh Barton also thought of healthy urban planning. In his article he writes that the environment long has been recognized as a key determinant of health. Furthermore he writes that all professions related to health increasingly recognize that promoting health solely through programmes of changing the behaviour of individuals or small groups is not very effective. These interventions are only reaching a small proportion of the population and do not work in the long term. According to Hugh Barton, a more fundamental social, economic and environmental change is needed. If we want to change something about the urban health in cities we have to begin with designing healthy environments.

We as architects can design these healthy environments according to several guidelines. Publications such as, 'Active Building Guideline' and the 'Well Building Standard', help architects to design healthy buildings. In these publications several tools are established for making an active building.

Architects can not instruct people to be more active during the day, but what they can do is seduce people to be more active by making it

more attractive. There are two ways of making active architecture.

1. Discouraging passive behaviour; (Un)consciously making the passive choice unattractive.
2. Encouraging active behaviour; (Un)consciously making the active choice attractive.

People are constantly making considerations between effort and efficiency; if the passive way to reach a goal is not efficient enough, people rather tend to choose the active way.

Encouragement of activity is interesting for architecture because almost all the interventions to reach this goal is associated with a certain extent of spatial quality. People act in a rational and instinctive way. Therefore, the encouragement of activity is divided in the conscious choice and the unconscious choice. Whereas with a conscious choice, people make a well considered choice if they want to go there or not, is the unconscious way of thinking a result of a careful combination of observations of the senses.

Within a building, different principles can be used to encourage physical exercise. These principles are divided into four different domains. These domains act like tools that the architect can use for the design of the building. The domains that encourage activity are; Route, Goals, Active program and Building & Context.

Routes are the paths in a building that people follow to reach a destination in the building. The route contains a consecutive system of entrance, hallways, stairs and elevators. The principles within a route are mainly focused on the encouragement of activity and to increase the intensity.

Goals are the useful program in the building where people want to go. For a residential building this can be a courtyard or an apartment. If goals are strategically placed through the building this can lead to more activity and a more intense use of the routes that are connected with these goals.

Active program is all the program in the building that directly contributes to an increase of activity. Active program can be a gym, swimming pool, multifunctional spaces but also bicycle storage and communal showers. People will use the active program more often if it is clearly visible from the street or inside the building.

Buildings have a direct influence on the surroundings. The volume of the building has an effect on the shadows that are formed on the surrounding streets. The exterior of the building and the use of human measures influences the walkability of the building. Research states that variations of activity in the facade contribute to more feelings of safety. The use of an overhang or stairs in the exterior of the building can contribute to a more active use of space in the surrounding environment.

When an architect designs for a specific target group, research about this target group can help him to make a better design. In this case, my research states that children in the city are the target group that need the most of attention of designers. The publication 'Nestelen in de stad' is the result of a collaboration between the architectural office Heren 5 and the Bond Dutch architects (BNA). They did a research on how to improve the family apartments in the cities.

In the publication six points of attention are addressed. When designing, architects should pay extra attention to these six points.

1. Storage
2. Smart plans
3. Flexible apartment
4. Conditions for flexible use
5. Between inside and outside
6. The family-friendly living environment

Almost all the modern families in the cities are facing the problem of the lack of storage. In the design of plans for families extra storage space should be taken into account.

Secondly, flexibility in plans is key if an apartment is not so big. If spaces are that flexible that they can be used for different purposes, the liveability of the apartment increases. It is important that every apartment has a space to receive some friends, to work or study, to relax with the family or a place for the kids to play inside. At the same time, it is important that the privacy of its users is optimally preserved. When this is the case, a small apartment can be a really nice place to be.

Typical for families is that they are always in development. When kids are young they use a lot of space of the apartment to play. When kids grow up, they will use less space for playing. On the other side, on a certain point they want a place for their own. A place where they can get some privacy. If a plan can react on these changes, families do not have to move out.

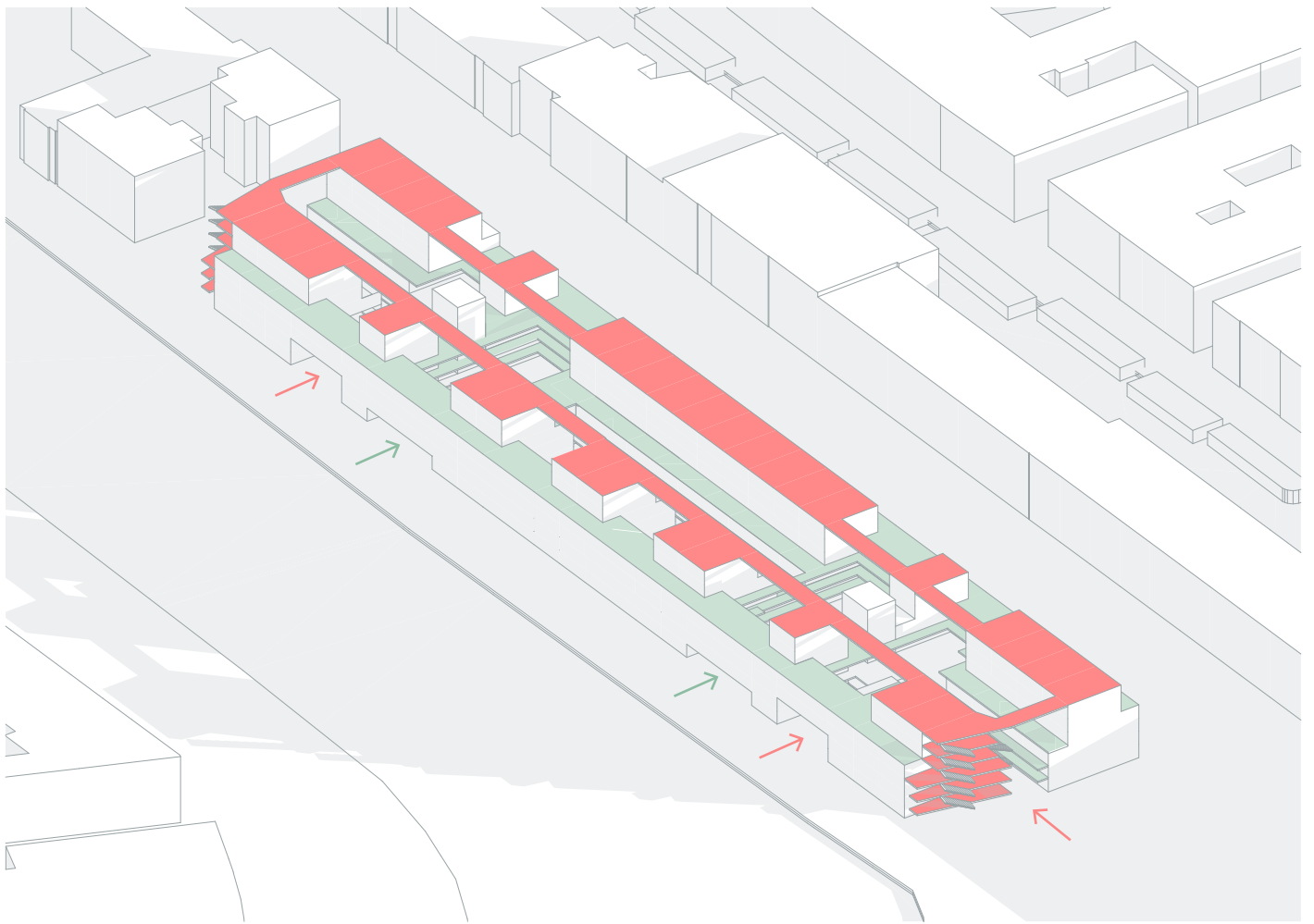
The configuration of the plan in an apartment is often determined by the unchangeable parts of the plan such as; the bathroom, toilet, the kitchen but also the windows. This has often the result that the changeable parts of the plan, such as the sleeping rooms and living room, are not flexible anymore. If an architect uses smart sizes, the plan can still be flexible.

Within an apartment building, the way to the apartment is often a space for communal use. Whereas this space is the ideal space for kids to play, it is often not allowed. With smart solutions, architects can accommodate both kids and adults. If the management, safety and interest of the neighbors are taken into account, architects can design solutions for kids to encourage activity close to the front-door of the apartment.



AMSTERDAM.

Concept





# AMSTERDAM.

# VIII

Appendices

## Literature:

Appelman, S. Beekers, W. Custers, J. Lans van der, J. Pflug, M. (n.d.) Canon volkshuisvesting

Barton, H., Grant, M., Mitcham, C., Tsourou, C. (2009) Healthy urban planning in European cities. Retrieved on march 8, 2018 from [https://academic.oup.com/heapro/article/24/suppl\\_1/i91/609303](https://academic.oup.com/heapro/article/24/suppl_1/i91/609303)

Barton, H., Tsourou, C. (2000) Healthy Urban Planning

BETA. (2016) Beweeglogica in gebouwen.

Boyce, C. (2010) Walkability, social inclusion and street redesign Retrieved on march 8, 2018, from [http://www.ingentaconnect.com/content/alex/benv/2010/00000036/00000004/art00006?utm\\_source=trendMD&utm\\_medium=cpc&utm\\_campaign=Built\\_Environment\\_TrendMD\\_0#](http://www.ingentaconnect.com/content/alex/benv/2010/00000036/00000004/art00006?utm_source=trendMD&utm_medium=cpc&utm_campaign=Built_Environment_TrendMD_0#)

Centraal bureau voor de Statistiek (2016, 12 september) Groei steden zet door  
Retrieved on march 8, 2018 from <https://www.cbs.nl/nl-nl/nieuws/2016/37/pbl-cbs-prognose-groei-steden-zet-door>

Choay, F. (1969) The modern city: planning in the 19th century

Corburn, J. (2015) City planning as preventive medicine  
Retrieved on march 8, 2018 from [https://ac.els-cdn.com/S0091743515001498/1-s2.0-S0091743515001498-main.pdf?\\_tid=8f57fe03-4790-4554-98f2-860a5ba1fc47&acd-nat=1520518144\\_02a965183b657de0683a4e425d41d24e](https://ac.els-cdn.com/S0091743515001498/1-s2.0-S0091743515001498-main.pdf?_tid=8f57fe03-4790-4554-98f2-860a5ba1fc47&acd-nat=1520518144_02a965183b657de0683a4e425d41d24e)

Corburn, J. (2009) Toward the healthy city – People, Places, and the Politics of Urban Planning  
Retrieved on march 8, 2018 from [https://mitpress.mit.edu/sites/default/files/titles/content/9780262513074\\_sch\\_0001.pdf](https://mitpress.mit.edu/sites/default/files/titles/content/9780262513074_sch_0001.pdf)

Cornelissen, H (ed.). (2005) Dwelling as a figure of thought  
Duhl&Sanches (1999) Healthy cities and the city planning process [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0009/101610/E67843.pdf](http://www.euro.who.int/__data/assets/pdf_file/0009/101610/E67843.pdf)

Franklin, T. et al., (2003) Walkable streets. New Urban Futures, 19, 5–7

Gemeente Amsterdam () balans tussen dichtheid en kwaliteit van leven in de stad  
[https://issuu.com/gemeenteamsterdam/docs/plan\\_amsterdam\\_city\\_in\\_balance](https://issuu.com/gemeenteamsterdam/docs/plan_amsterdam_city_in_balance)

Gemeente Amsterdam (2016) Beweegatlas

Gemeente Amsterdam () Duurzaam Amsterdam van droombeeld naar werkelijkheid  
[https://issuu.com/gemeenteamsterdam/docs/plan\\_amsterdam\\_de\\_stad\\_duurzaam](https://issuu.com/gemeenteamsterdam/docs/plan_amsterdam_de_stad_duurzaam)

Gemeente Amsterdam () Een stad die uitnodigt tot bewegen  
[https://issuu.com/gemeenteamsterdam/docs/plan\\_amsterdam\\_een\\_stad\\_die\\_uitnodi](https://issuu.com/gemeenteamsterdam/docs/plan_amsterdam_een_stad_die_uitnodi)

Gemeente Rotterdam (2016) Rotterdam a healthy city  
<https://www.rotterdam.nl/wonen-leven/vitale-stad/Rotterdam-A-Healthy-City.pdf>

Gorden, M. (1963) Sick cities

Harper, C. ( ) Density, productivity and propinquity in New Urban Configurations

Het schip ( ) Expositie 'van Krot tot Woningwet'

<https://www.hetschip.nl/exposities-museum-het-schip/permanente-exposities/782-van-krot-tot-woningwet>

Hoek Ostende van den, J.H. (1969) Amsterdam vroeger en nu

Hood, E. (2005) Dwelling disparities: how poor housing leads to poor health

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1257572/>

Howells, G. (2017) growing healthy cities [TED TALK]

Ipsos Top Cities Index (2017). accessed on 14 may, 2018 on [www.ipsos.com/ipsos-mori/en-uk/ipsos-top-cities-2017](http://www.ipsos.com/ipsos-mori/en-uk/ipsos-top-cities-2017)

Kent, J. (2015) higher density living can make us healthier – but not on its own

Kenzer, M. (1999) Healthy cities: A guide to the literature

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1308727/pdf/pubhealthrep00022-0177.pdf>

Keulartz, J. (2002) 'van tuinstad tot ecopolis' in Utopie – Utopisch denken, doen en bouwen in de twintigste eeuw

Keulartz, J. (2002) 'Ordering Le Corbusier en het Plan Voisin' in Utopie – Utopisch denken, doen en bouwen in de twintigste eeuw

Nai Rotterdam. ( ) Team 10 in search of a utopia of the present

Oudenampsen, M. (2013) Aldo van Eyck and the city as playground

Larson, K. (2012) Brilliant designs to fit more people in every city [TED TALK]

Robert, S. Veltman, P. (2016) Ontwikkelingspsychologie. p. 325–327

Rydin, Y et al. (2012) shaping cities for health: Complexity and the planning of urban environments in the 21st century

[https://ac.els-cdn.com/S0140673612604358/1-s2.0-S0140673612604358-main.pdf?\\_tid=fe511214-9c12-4cda-8446-d3c1288fdc09&acdnat=1520521241\\_2e82118b3c80a3c5efb38a-fa08c78d7d](https://ac.els-cdn.com/S0140673612604358/1-s2.0-S0140673612604358-main.pdf?_tid=fe511214-9c12-4cda-8446-d3c1288fdc09&acdnat=1520521241_2e82118b3c80a3c5efb38a-fa08c78d7d)

Saalman, H. ( ) Haussmann: paris transformed

Safdi, M. (2014) Reinvent the high-rise building [TED TALK]

Samuel, F. Blundell Jones, P. (2012) The making of the architectural promenade: Villa Savoye and Schminke House [https://www.cambridge.org/core/services/aop-cambridge-core/content/view/675C807549E326C1374610EDF5628790/S1359135512000437a.pdf/making\\_of\\_architectural\\_promenade\\_villa\\_savoye\\_and\\_schminke\\_house.pdf](https://www.cambridge.org/core/services/aop-cambridge-core/content/view/675C807549E326C1374610EDF5628790/S1359135512000437a.pdf/making_of_architectural_promenade_villa_savoye_and_schminke_house.pdf)

Speck, J. (2013) The walkable city + 4 ways to make a city more walkable [TED TALK]

Stevens Curl, J. (1970) European cities and society

Unwin (1918) Nothing is gained by overcrowding (available in centre library)  
Wiebenson, D. () Tony Garnier: the cite industrielle

World Health Organization (n.d.) Publications on the 'healthy city project' (online)  
<http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/publications>

World Health Organization (n.d.) Healthy Urban Planning (online)  
[http://www.who.int/kobe\\_centre/interventions/urban\\_planning/en](http://www.who.int/kobe_centre/interventions/urban_planning/en)

World Health Organization (n.d.) Urban health (online)  
<http://www.euro.who.int/en/health-topics/environment-and-health/urban-health>

Woud, A van der (1983) Het nieuwe bouwen: CIAM volkshuisversting  
<https://repository.tudelft.nl/islandora/object/uuid:9cd83a5c-5957-4516-9f6c-71cb7e1b5eb6?collection=research>

Woud, A. van der (2010) Koninkrijk vol sloppen – achterbuurten en vuil in de negentiende eeuw  
Zoetbrood, R (1984) Jan Duiker en het sanatorium Zonnestraal

Visual colofon:

P1. Own illustration

P2. Own illustration

P4. Own illustration

P7. Own illustration

P8. Projectlocatie, Amsterdam (NL), Course Guide Dutch Housing Graduation Studio spring 2018

P8. Kramer, A. 26 January, 2018. Kinderen bewegen te weinig. accessed on 10 May, 2018 on <https://www.telegraaf.nl/nieuws/1586783/kinderen-bewegen-te-weinig>

Couzy, M. 21 March, 2017. Amsterdamse puber beweegt te weinig. accessed on 10 May, 2018 on <https://www.parool.nl/amsterdam/amsterdamse-puber-beweegt-veel-te-weinig~a4477096/>

P11. Own illustration

P13. Growth population of Amsterdam. accessed on 28 May, 2018 on [http://www.amsterdamconjunctuur.nl/visualisaties/amsterdamincijfers/slides/slide\\_demo\\_overzicht.html](http://www.amsterdamconjunctuur.nl/visualisaties/amsterdamincijfers/slides/slide_demo_overzicht.html)

Own illustration

Illustration of the founders of the first social housing cooperation. Canon volkshuisvesting

P15. Diagram that represents the healthy Garden City. accessed on 28 May, 2018 on <https://www.mindomo.com/nl/mindmap/urban-design-1898-ebenezer-howard-the-town-country-magnet-0479875179244e378e98df49fac9e59d>

Settlement health map. accessed on 28 May, 2018 on <https://www.uc.pt/en/fluc/gigs/GeoHealths/project/review>

P16. First public tender in the newspaper. Canon volkshuisvesting

Situation in the slums. Canon volkshuisvesting

Welwyn Garden City. on <https://stavbaweb.dumabyt.cz/recenze-knihy-spoilov-15542/clanek.html>

P17. Diagram that represents the healthy Garden City. accessed on 28 May, 2018 on <https://www.mindomo.com/nl/mindmap/urban-design-1898-ebenezer-howard-the-town-country-magnet-0479875179244e378e98df49fac9e59d>

Woningwet 1901. on <https://archive.org/details/degezondheidswet00oostgoog>

Amsterdams Uitbreidings Plan. on <https://www.archined.nl/2017/09/leren-van-het-aup>

Playground by Aldo van Eyck. (2013) Aldo van Eyck and the city as playground

P18. Own illustration

P19. Epidemic vs. chronic diseases in Amsterdam. (2016) Beweeglogica in gebouwen

Activity people of Amsterdam. (2016) Beweegatlas

Healthy life expectancy in the Netherlands. (2016) Beweeglogica in gebouwen

P.20 Physical exercise guideline. (2017) Active city.