Running Amsterdam

Designing a runner friendly city

Mart Reiling & Thijs Dolders
MSc thesis Landscape Architecture
Wageningen University
2015

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For quality of life

In fulfillment of the requirements for the Master of Science degree in Landscape Architecture at the Wageningen University, Landscape Architecture Group

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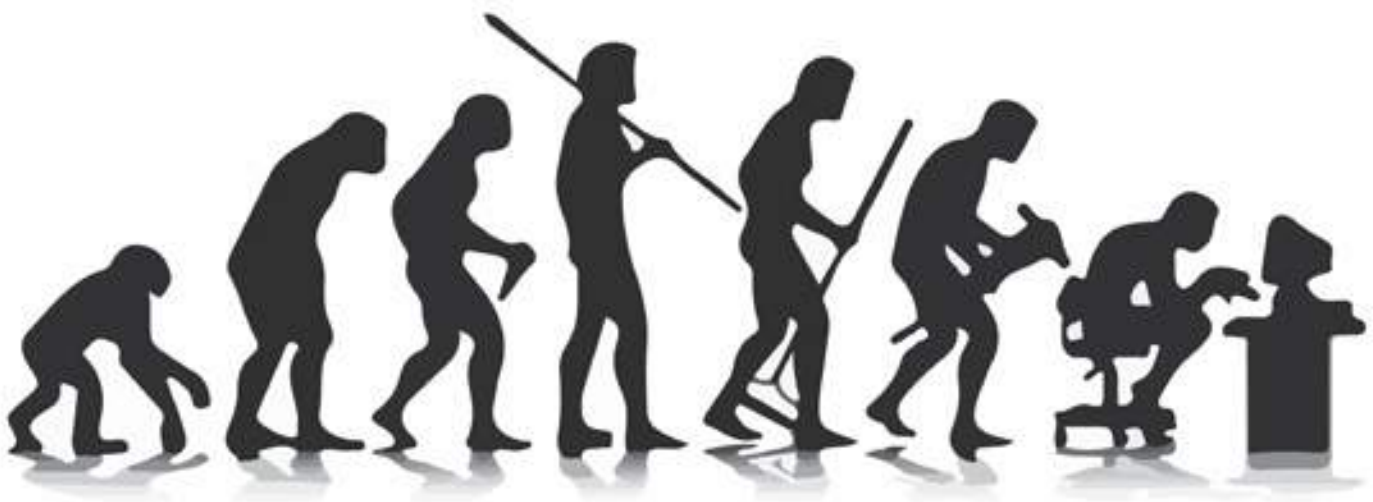
Start!

This master thesis focusses on a problem that is strongly related to what you are probably doing right now: sitting, being physically inactive. You are not alone as more and more people spend an increasing amount of time being still, behind a computer or television.

There is also an increasing chance that you will try to compensate this by exercising. You are likely to do this whenever you have free time: unorganised, in public space, likely through the activity of jogging. Like many, you track yourself through GPS on your smartphone, because you are interested in your performances.

This summarises the basis of this thesis by Thijs Dolders and Mart Reiling: Running, public space and technology. The lifestyle as sketched above currently has large effects on public life and public health, and it is changing our attitude and requirements of public space. We believe it is time for landscape architects to put forward a serious contribution to designing healthier cities. And ironically, we think it is possible for the same technology that created the problem, to also be part of the solution.

We would like to thank all the people who helped us with this research, the people we interviewed, colleague students, researchers at the congress for “Running and landscape” in Malmö (especially Simon Cook) and Sophie Entwisle. A special thanks to Nelleke Penninx as a support from the Municipality of Amsterdam. Finally we want to thank our supervisors Ron en Marlies for their important contribution.



Summary

This landscape architectural study aims to develop design principles that improve the spatial conditions of (sub) urban public space for running, thus contributing to designing healthy cities.

In order to be able to design for this specific active group, it has been essential to gain knowledge of two factors: the spatial behaviour of runners and the preferred spatial experiences/ spatial requirements that determine this behaviour.

By analysing data from mobile running apps, crowd sourced based data, which is a newly available source of data, knowledge on running behaviour was generated on a level that has not yet been possible before. In this study data was analysed from more than 110.000 running activities in Amsterdam, collected from the mobile running applications Runkeeper and Strava. This data includes where and when people have been running.

Differences in running locations are studied between: long and short distance runners, during different times of the day (light hours and dark hours), during different times of the week, during different seasons and during different outdoor temperatures. Based on this data, two locations in Amsterdam South-West have been chosen that showed concerning data-patterns.

In these regions, results were compared to a series of surveys in which runners were questioned in order to understand what spatial experiences were required to determine their preferred running route. The surveys also gave explanation of negative spatial experiences at the two ‘problem-locations’.
Through designing, possibilities to integrate these spatial requirements into the two problem areas were explored and visualized.

The possibilities to make Amsterdam a more runner friendly city frequently related to creating convincing slow traffic networks: well recognizable (belonging to a recognizable spatial entity), uninterrupted, fine-grained, with clear start/stop locations and integer/certain distances. In addition, finding a balance between tranquillity and vibrancy, directly relating to (lack of) safety or an (overload of) nuisance, were important design themes.

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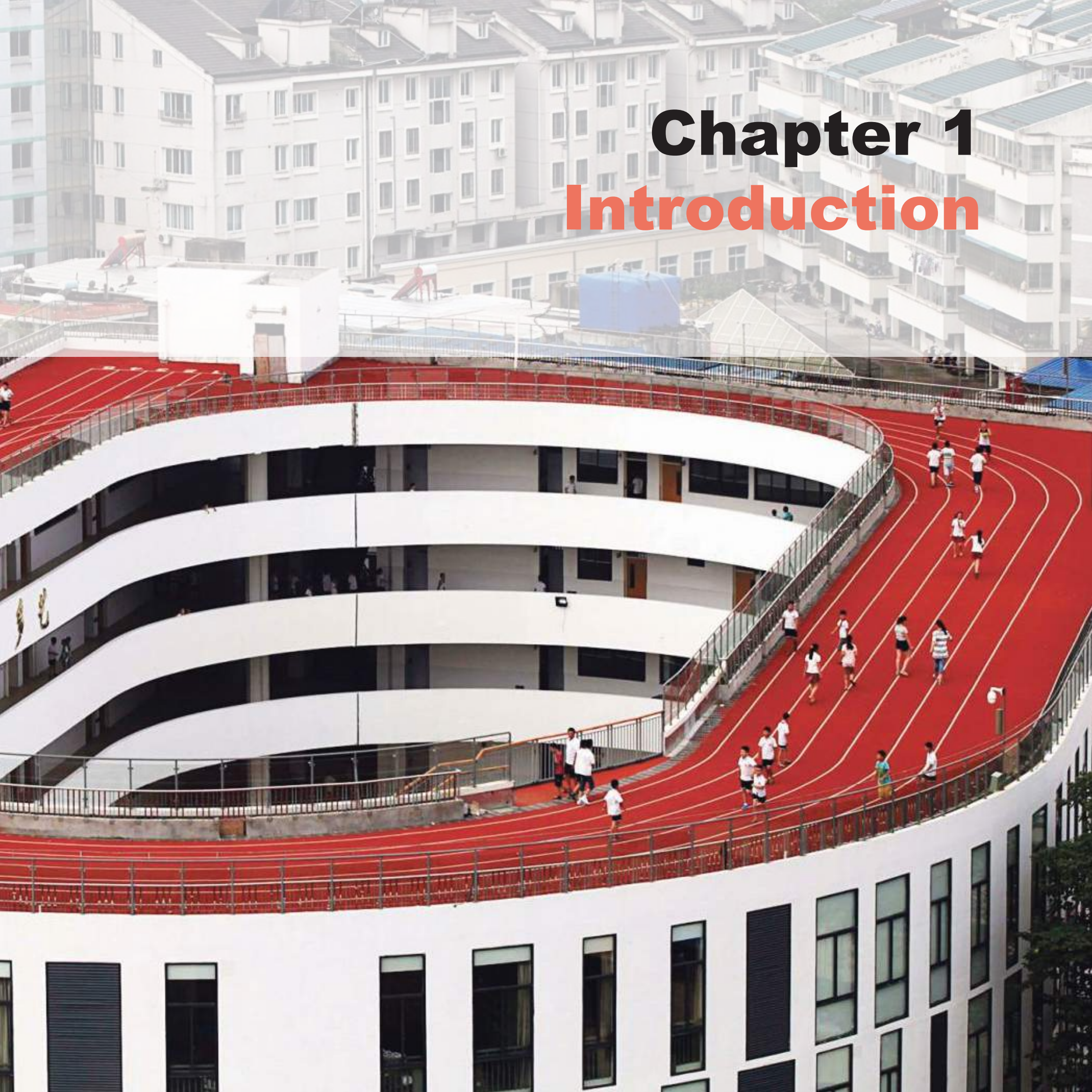
Introduction



1.1 Topic

Landscape design for public health

The number of people that spend their time inactive and inside, behind computers, tablets, smart phones or in front of the television is increasing (Ruiz et al. 2011). Sedentary time (time being still except for sleeping) is rapidly growing in Holland for all ages up to 64, both during work and free time (figure 1.1, Bernaards et al. 2011).

	2006-2007	2010-2011
4-11 year		
School day at school incl. transport	4,5	4,7
School day after school	1,9	2,2
Free day	3,4	4,1
12-17 year		
Work/school day at work/school incl. transport	5,7	5,7
Work/school day after school	3,1	3,5
Free day	5,0	5,9
18-64 year		
Work/school day at work/school incl. transport	3,1	3,4
Work/school day after school	2,9	3,2
Free day	4,3	4,8

Figure 1.1: Sedentary time in hours/day (Bernaards et al. 2011).

Together with increased food intake this trend can be seen as a cause for the rise of obesity in the Netherlands.

Two-thirds of people over 15 years in the EU are not physically active at recommended levels by World Health Organisation (WHO). Approximately 20% of children are overweight with a third of this figure declared obese. These children have an increasing risk of many chronic diseases, such as cardiovascular diseases, diabetes and cancer. Physical inactivity causes an estimated 600.000 deaths per year in the WHO European Region and leads to a loss of 5.3 million years of healthy life expectancy per year (Edwards et al. 2008). The WHO considers this as one of the largest public health epidemics in western societies (WHO 2003).

In addition, economic consequences of physical inactivity have shown to be substantial for health care costs but are there even larger indirect costs, which include the loss of economic value because of disease-related work disability, illness and premature death (Juel et al. 2007; Sorensen et al. 2005).

The physical inactivity that causes these problems is not easily changed by stopping sedentary lifestyle. It is difficult to fight the changing nature of jobs and our addiction to screen technologies. Although it is possible to have influence on physical activity level aside from this time, in for example leisure time (time free from obligations).
This is exactly what seems to happen when we look at trends in leisure time. Simultaneously, we are trying to compensate our increasing sedentary time by exercising more often in leisure time. The proportion of leisure time spent on sports/exercise has almost tripled in the last 35 years, with an anomaly in 2011 where there was a slight slight decrease (figure 1.2, Raaphorst et al. 2014).

Share of sports in total free time, age 12-79	1975	1985	1995	2005	2011
Measured amount	1304	3243	3211	2166	1702
Share of sports in free time	1,5	2,5	2,9	3,8	3,6
Time for sports (hours, population)	0,7	1,2	1,4	1,7	1,7
Time for sports (hours, Sporters)	2,8	3,5	3,4	3,7	3,7

Figure 1.2: Proportion of sports in total free time (Raaphorst et al. 2014).

Furthermore an increase in leisure time sport could be attributed to a simultaneous growth and decline of informal and formal team sports respectively. The proportion of people exercising in informal ways like running, cycling and fitness rapidly grew in the last 10 years, compared to the proportion of people who engaged in formal team sports like tennis, football, swimming and gymnastics which decreased (figure 1.3, Raaphorst et al 2014). The evidence suggests that these trends continue with the amount of runners/joggers increasing to 13% in 2012 (+ 500.000 people) and15% in 2014 (+300.000 people). (GFK 2014; and Hoover 2013).

Most exercised sports in NL (%), age 18-79

	2001	2004	2007	2010	2011
Measured amount	5338	6663	5146	6534	5694
None	51	50	50	48	48
Fitness	13	16	20	21	21
Hardlopen	4	6	7	9	9
Tennis	7	6	6	6	6
Swimming	10	7	6	5	5
Football	5	5	4	4	4
Gymnastics	4	4	3	3	3
Others	24	24	21	26	27
Walking	62	63	65	66	65
Cycling	54	54	56	59	58

Figure 1.3: Proportion of sports in total free time (Raaphorst et al. 2014)

Environmental relevance

The trend that informal sports have gained popularity is most strongly recognizable in urban areas. In figure 1.4, the relation between sports and urbanity is shown. Sports like fitness and jogging tend to be positively affected by increasing urbanity. This trend is closely related to the more individualized, flexible lifestyles of urban dwellers. Other Dutch studies also confirm that chances on performing a team sport decrease with increasing municipality sizes (Kuppens and Ebbers 2010).

The nature of these individual sports has certain demands from our environment; a considerable amount of informal sport activities take place in the public realm, right outside our front doors like roads, pavements, cycle paths, parks and city spaces instead of inside sports halls and formal sports facilities. By definition; cities are characterized by heavy (pressured) infrastructure and little open space.

The question arises to what extent these urban public spaces currently suit, stimulate or facilitate informal sports. Even in the small Dutch city ‘Den Bosch’ people think there is too little mown grass (10% of the population) and suitable paths (11% of the population) to perform sports in the public realm (Kuppens and Ebbers 2010).

Compared to the significance that sports halls and facilities receive in urban planning and policy, the meaning and functioning of urban public spaces for individual sports like running has not yet been seriously considered. Today it’s no longer sufficient to simply locate and develop sports and exercise facilities in (often sub-) urban zones. Instead, the urban public space of the entire city should be more strongly perceived as a sports facility, fulfilling the active needs of its dwellers.

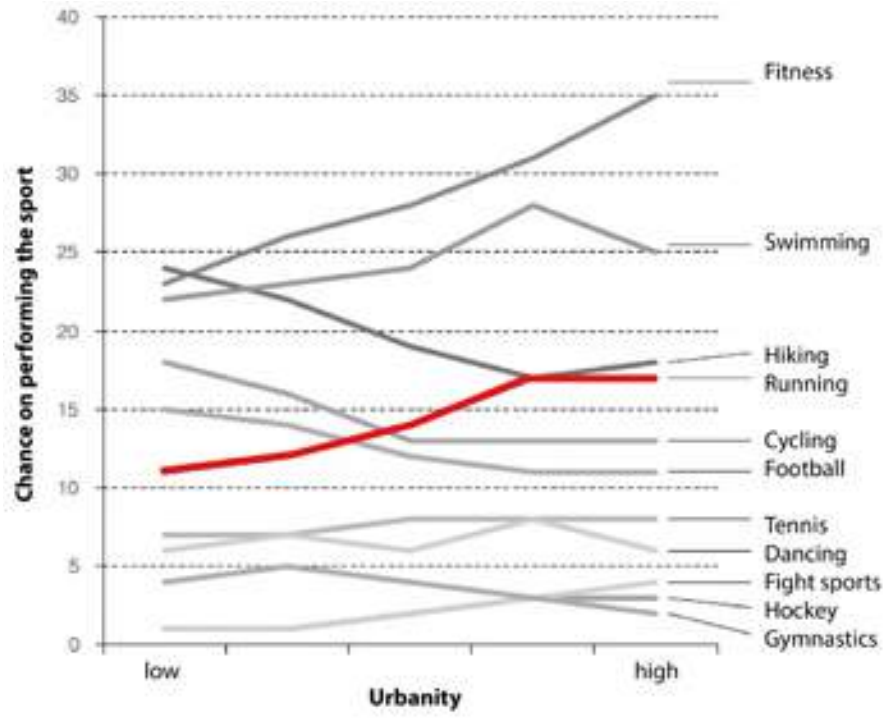


Figure 1.4: The relation/effect of urban density on the likeliness to perform unorganised sports as running and cycling ((Bernaards et al. 2011)

Healthy city

‘The healthy city’ is a term that has been adopted in the mid 1980s as an overall concept for the ambition to reduce the consequences of unhealthy lifestyles in urban areas. The concept strongly focusses on modernist ideas of the city as an organism, with components that need specialist expertise to be improved or recovered in order to vitalise a city. This is leaning on a set of indicators such as the ‘traditional health indicators’ like mortality and life expectancy, but also on ‘new health promotion’ like participation in physical exercise and dietary habits (Petersen. 1996) .

The WHO, initiator of the ‘Healthy City Project’, defines ‘the healthy city’ as “A healthy city is not one that has achieved a particular health status. Rather, it is a city that is conscious of health and striving to improve it.’’ (Edwards et al. 2008). Having physically active citizens is regarded as a key aspect within this ambition.

A healthy active city is one that is continually creating and improving opportunities in the built and social environments and to enable all its citizens to be physically active in day-to-day life.

(Edwards et al. 2008)

It is stated by the WHO that the extent to which citizens are physically active depends on two things: personal/intrinsic motivation and the environment we live in. Personal/intrinsic motivation is hard to influence, in contrast to the environment we live in. This ‘environment’ regards two aspects: a social environment and a built/physical environment.
Elements in the social environment that influence participation in physical activity include: income, equality, culture and social support. (Edwards et al 2008). These are hard to directly influence through landscape/urban design, unlike the built environment.

As such Kamper-Jorgense (2010) states that one of the elements of the healthy city is: “Access to physical exercise, facilitated by easy access to facilities, green space, and open places in the city”.

The need to ‘improve opportunities’ implies that the current built environment of cities does not yet fulfil the active needs of its dwellers. As landscape architects, we are concerned with understanding the needs of people towards their surrounding environments. This does not only regard functional needs (like active use), it also includes emotional needs.

To a degree, this meaning of public space is derived from the way we perceive and experience public space when making use of it. As such, public space should be the stage on which people can express themselves through the way they (inter)actively use it. It is as a vital place for people to have real contact, with each other and the real world around them.

As such the ambition to improve our built environment for active usage, goes much further than achieving just health benefits. Being active is an important ingredient of life that simply supports a happier one.

1.2 Objective

Regarding the trends mentioned above, the focus of this research will be running (often referred to as jogging) in urban public space, this is for several reasons. Firstly, the amount of runners in general has increased like no other outdoor sport in the last 10-20 years. In 2001, about 4% of the Dutch population were regular runners compared to now where 15% of the current population consider themselves regular runners (GFK 2014, norm =>12 times/year). In a European context 36% of people between 15 and 65 are running regularly (Synovate 2008, using a lower norm). Next to that, it takes place in all types of urban public spaces, often already under pressure from other forms of transport and recreational use. Whereas recreational cyclists have the option to cycle beyond the city boundaries this is less likely to occur for runners, another reason for selecting running as the optimum sport to use in this study. Although municipalities are willing to stimulate running, it is complex to facilitate this active group, as this sport is being performed at random places and little is known about what (spatial) facilitation runners require (Scheerder and Breedveld 2015).

The objective of this thesis is therefore to explore the possibilities to improve the spatial conditions of (sub) urban public space, as an environment for running/ jogging.

This is not regarded as a goal outright but as a potential contribution/ strategy for other improvements to public space. Runners bring important activity to public life in cities, and can therefore be a catalyst for bustling cities in general.This fits with the more broad ambition that many cities/ urban areas claim to have: creating ‘the healthy city’.

Chapter 2
Theory and research strategy

2.1 Introduction

The connection between landscape architecture and running (and sports in general) as a type of public space use is becoming increasingly strong. This chapter proceeds to explain the vision of the study: To connect sports/ running and landscape architecture. This starts with the development of running in the Netherlands.

Parallel, the knowledge gap that we just address will be further elaborated and specified. Other fields of science connected to this topic like physical activity and built environment (PABE, Koohsari 2013), sociology, phenomenology and behavioural studies will be introduced in relation to this -landscape architectural- knowledge gap. In addition current research conducted about running will be explored.

Finally we will elaborate on the design questions that will be adressed in this research.

2.2 Theoretical lens

Historic development

The importance of public space as a stage for sports is increasing. Up to the 1960s running was something predominantely performed by people in a hurry. Running in a park or forest was seen as a strange activity, running was done just by experienced athletes or achievement runners on a running track. This changed in the cultural and fitness revolution of the 60s and 70s. From this time on, running started to be performed outside of running tracks, on the streets, in parks and nature reserves. It slowly triggered less competitive runners to go running, independent from clubs. This was known as “the first running boom”, seen first in the USA. In the 70s it crossed the Atlantic to Europe, with the first Marathon of Amsterdam taking place in 1975. It was not until the 80s that running became popular for the the wider population as a leisure sport instead of a “solitary physical activity for fitness freaks”. This popularity increased by marathons which were not just available for athletes but also leisure runners alike. In the 90s, the growth of running as a mainstream sport stagnated, but, at the beginning of the 21st century the popularity started to increase enormously, all over the world, a trend which is known as the “second wave of running”. Today, we are still in this second wave (Scheerder and Breedveld 2015).

In addition to this second wave, sports have become integral to life, an activity to address who you are. Women and elderly people form a substantial proportion of total runners today. The first woman to participate in a marathon was in 1971 in the USA and the first women’s marathon for women at an Olympic games was in 1984 (Los Angeles). It took women however almost 20 years to become a significant part of the runner population. Though nowadays, so called ‘ladies-runs’ can account for thousands of participants (Scheerder and Breedveld 2015).

Despite the Netherlands having a succesful female runner in the Olympic games in the 40s and 50s (Fanny Blankers-Koen), it was not until 1968 that the Dutch government promoted running (often called jogging or “trimmen” in Dutch today), as a way to promote a healthy lifestyle. In collaboration with the Sports Foundation and Heart Foundation, the “Trimactie” was started to stimulate running. To facilitate this, “trimbanen” were implemented in forests and parks with a distance of 2-4 km and simple training equipment next to it. It was one of the first catalysts for the popularity of running (Scheerder and Breedveld 2015).

In summary, the four basic factors for the two waves of running are: The image that we should be slim/ muscular/ fit/ healthy, women’s increased interest in running, the development and number of running opportunities and the increasing professionalism and commercialisation of running events (Scheerder and Breedveld 2015).

The Role of landscape (architecture)

More than ever before, sports in general, but especially running, incorporate aspects of our lives including fashion and music. It has grown to a huge economy, represented by an intense amount of advertisements and events (according to Synovate (2008), 494 marathons just in Europe) (Kompier et al 2012). The visibility of sports has become increasingly vital, and it is public space that forms the stage where people can make themselves visible by the way they interact with it.
Landscape architecture is therefore highly relevant; the way in which this public space is configured/designed, influences the way in which people can interact with it. This configuration is therefore of vital importance to the extent to which public space has a positive or negative effect on us.
Landscape architects, architects, planners and designers alike, have a duty to succeed in creating, preserving and maintaining a city landscape in a meaningful way for different users. If not, there is a danger that people will become alienated from their outdoor environment, that is the world around them.
Impacts of city landscapes that do not optimize their configuration with respect to active uses, should not be underestimated. As designers we are equipped to design that stage well, designers first require a proper understanding of the interaction of people and space.

There are thereforentwo things that need to be thoroughly understood in order to be able to design that stage: What people prefer to experience when using it and how this experience influences their behaviour.
How people prefer to experience their surroundings is highly individual and specific. Generalisations about this should be treated with caution. In fact ‘the runner’ does not exist, within this sport there exists a large variety of individuals with varying experiences, needs and behaviour. Similarly, environmental aspects (for example: greenery) can hardly be generalised, it is different at every different location. Knowledge about this can only be constructed by using a qualitative and tentative approach.

Behaviour of runners can be studied through both quantitative, positivistic ways and qualitative, constructivist approaches. With this in mind, our worldview is pragmatic, it aims to solve problems that are very context specific (Creswell 2009). The methods that are used depend on what knowledge is needed to solve the specific problem.

Nevertheless, this study aims to create an approach that can be applied to other urban contexts with similar issues.

Field of science

This study is placed within a broader field of science that deals with factors that stimulate physical activity. One of these factors includes the Built Environment. This field is known as PABE, Physical Activity and Built Environment (Koohsari 2013).

In 2002, Humpel et al. observed that within all classes of factors, environmental attributes were regarded to be among the least understood of the known influences on physical activity. It is seen as a relatively new field of research, with a high need for high-quality empirical evidence supporting environment-behaviour relationships.

Despite this being discussed more than 10 years ago, Harris et al. (2013) demonstrated that this was still the case in 2013. Their research involved collecting 318 articles from the field. From these, only six articles were assigned as ‘delivery’ articles (empirical studies of implementation or evaluation of an intervention to increase physical activity through the built environment). In contrast, most articles were assigned to be ‘discovery’ focussed; aiming to find confirmation of an association between built environment and physical activity. This exemplifies how this theoretical field of science does yet weakly connect to applied fields of science.
Other studies (for example: Koohsari et al. 2013) also undermine this. They claim that the field of science is in general still relatively immature in that it does not yet result in knowledge that is directly applicable to design and planning (Koohsari et al. 2013). They demonstrate this by addressing issues with studies on walking as a mode of transport. They confirm that associations between built environment and walking as a mode of transport have been addressed frequently (discovery focussed), however they simply associate things that have little value for applied sciences:

Availability and access to destinations such as local shops, green spaces, services, and transit stations have been found as potential predictor factors in walking as a mode of transport. Although these associations exist, it remains challenging to create and retrofit built environments that support health and wellbeing outcomes. This is largely because prescriptive evidence for planners and policy-makers about ‘how much’ and ‘what types’ of infrastructure is required to support health and wellbeing is lacking.

(Koohsari et al. 2013)

Walking as a mode of transport is a theme within PABE that has been addressed in a number of studies. In contrast to this, running (for exercise) in relation to the built environment has rarely been addressed. It is therefore not surprising that the results from these studies are not yet applicable.

In contrast, landscape architecture is a scientific field that is built on application. Within this field, 'active living' and 'environmental design and urban health' are by the CELA (Council of Educators in Landscape Architecture) mentioned as two prominent topics within designing for health and well-being (Deming and Swaffield 2011).

As discussed, if certain behaviour needs to be stimulated (in this case running) by design, spatial requirements of this group need to be understood. However little research has already been carried out on spatial requirements and its relation to the spatial behaviour of runners.
In general; research on the influence of design on behaviour is a lacking aspect in (landscape) architecture as an academic discipline; well explained by Golicnika et al. (2008):

How well do designers predict use of the spaces they have created? How confident can they be that a place designed for certain types of activity and occupation will serve its users' needs well? The empirical basis for much design decision-making is lacking.

*(*Golicnika et al. 2008)

Present running research

Experience

The are very few studies that focus on the way people like to experience environments when running.

The first (master thesis in sociologie, van Andel 2009) is an interpretivistic, discriptive study, aiming for a very general understanding of environmental characteristics and running preferences. Although, it focusses on the specific place: the city of Rotterdam, some outcomes: personal statements of runners do give ground to understand the experience of spatial conditions when running.
Collinson and Hockey (2015) conducted a data analysis not deliberately focussing on the sensory experiences, but found three themes in their data. These address the importance of the sensory experience in everyday activities, with running used as an example. The themes were (1) hazardous places, (2) performance places, (3) time, space, place nexus. These themes influence where and when people run, for example in the theme hazardous places, people will avoid slippery roads and popular paths of people walking their dogs and choose to have a run which are even as possible. In performance places people will incorporate hilly roads in their route to do some additional exercises. Cook et al (2015) also provide a comparable article with some basic running-experience phenomenological concepts.

The second study, (Karusisi et al. 2014) aims to proof correlations between environmental determinants and running behaviour. The methods are postivistic in contrast to Van Andel:

To analyse associations between individual and neighbourhood variables and the probability of jogging, we estimated a multilevel log binomial model at the IRIS neighbourhood level and modelled the 4-category ordinal variable for the time spent jogging over the previous 7 days with a logit ordinal multilevel regression model.

(Karusisi et al. 2014)

The main result of the study showed that the probability of jogging is positively associated with the presence and quality of green and open spaces, the degree of social cohesion in the neighbourhood, and the presence of monuments and enjoyable places near the dwelling. The environmental and spatial aspects however are very general/ poorly specified.

These studies are minimal in quantity and too general to be of real value to this study. They have been however a useful staring point.

Behavioural science

(Spatial) behavioural research on runners is yet to be carried out. There is so far no knowledge on where and in what patterns people run and how this relates to the configuration and experience of public space. Such spatial behavioural research is only available from other types of uses, such as (recreational) walking, cycling and sitting.
Applicable knowledge exists for example on walking behaviour in relation to the configuration of public space, architects such as Jan Gehl are well known for their work in translating such studies into designing for pedestrian friendly cities. Comparable (design) studies however do not yet exist for running.

The notion that little research has been performed on runner behavior and experience is confirmed by other researchers in the field of 'running and environment'. At the seminar 'Running and landscape' (May 2015, Malmö, Sweden), other 'running researchers' like Simon Cook and Mattias Qviström confirmed that research on running behaviour and experience, rarely relates to the spatial configuration of the outdoor landscape. An email conversation with Simon Cook, confirms our experience in finding research on this topic:

There is so little known about where and why people run (I've been tangentially looking and this question in all my research) and any work about what make runnable cities is so useful and timely. The specific issue you point out in 'finding specific research on why people run where they run, what they find attractive and like to experience in their running routes.' is one I have also struggled with. Unfortunately there just isn't the research into it.

2.3 Knowledge gap

In order to consider ways of improving the spatial conditions for runners, more specific knowledge is needed on:

The spatial requirements of runners and the way this influences their spatial behaviour.

2.4 Research questions

From this knowledge gap and the design objective from the introductory chapter, the research can be distilled to a particular focus. In the next chapter the methods used to find the answers to these questions will be explained.

Main research question

What interventions could improve urban spatial conditions for running?

Research questions

RQ1: Where and when do people run?

RQ2: What spatial conditions determine this running behaviour?

RQ3: How can these spatial running requirements be efficiently integrated into the urban landscape?

2.5 Definitions

The definitions of commonly used terms in this research are described here. In *italics*, the formal definition derived from: "*http://www.merriam-webster.com/dictionary/*" is cited. Though, a definition does not always include all personal meanings of a word. If these include relevant aspects, they are mentioned underneath.

Aspects
- *The way a person, place, or thing appears.*

Behaviour
- *The response of an individual, group, or species to its environment.*

Addition: an environment can in this definition also refer to other environments than spatial environments (social environment for example). We use behaviour to refer to a spatial environment.

Characteristics
- *A special quality or trait that makes a person, thing, or group different from others.*

Conditions
- *Something essential to the appearance or occurrence of something else/ an environmental requirement.*

Experience
- *The state of having been affected by or gained knowledge through direct observation or participation.*

Addition: A spatial experience refers to an encounter between our senses and a certain spatial aspect/condition/characteristic.

Informal
- *Marked by the absence of formality or ceremony <an informal meeting>.*
- *Characteristic of or appropriate to ordinary, casual, or familiar use <informal clothes>.*
- *Non-committedly organised, in absence of an organisation.*

Intensity
- *The magnitude of a quantity (as force or energy) per unit (as of area, charge, mass, or time).*

Addition: the often mentioned term usage-intensity thus refers to how often a certain place is being used for running.

Leisure time
- *Taking place during time not used for gainful employment.Time aside of obligations.*

Public space
- *A boundless three-dimensional extent in which objects and events occur and have relative position and direction (space), accessible to all members of the community (public).*
- *Space outside of publically owned property (including houses).*

Requirements
- *Something essential to the existence or occurrence of something else.*

Addition: Runners' spatial requirements relates to what spatial aspects we prefer to experience in order to make us run. It thus also indirectly refers to spatial aspects we do not prefer to experience.

Route
- *A line of travel.*
- *The order in which parts of networks are connected by a user.*

Sedentary time
- *Doing or requiring much sitting <a sedentary job>*
- *Not physically active <a sedentary lifestyle>*
- *Time sitting/laying still, apart from sleeping.*

Space
- *A boundless three-dimensional extent in which objects and events occur and have relative position and direction (space).*

Spatial
Relating to, occupying, or having the character of space.

Urban
- *Cities and the people who live in them.*

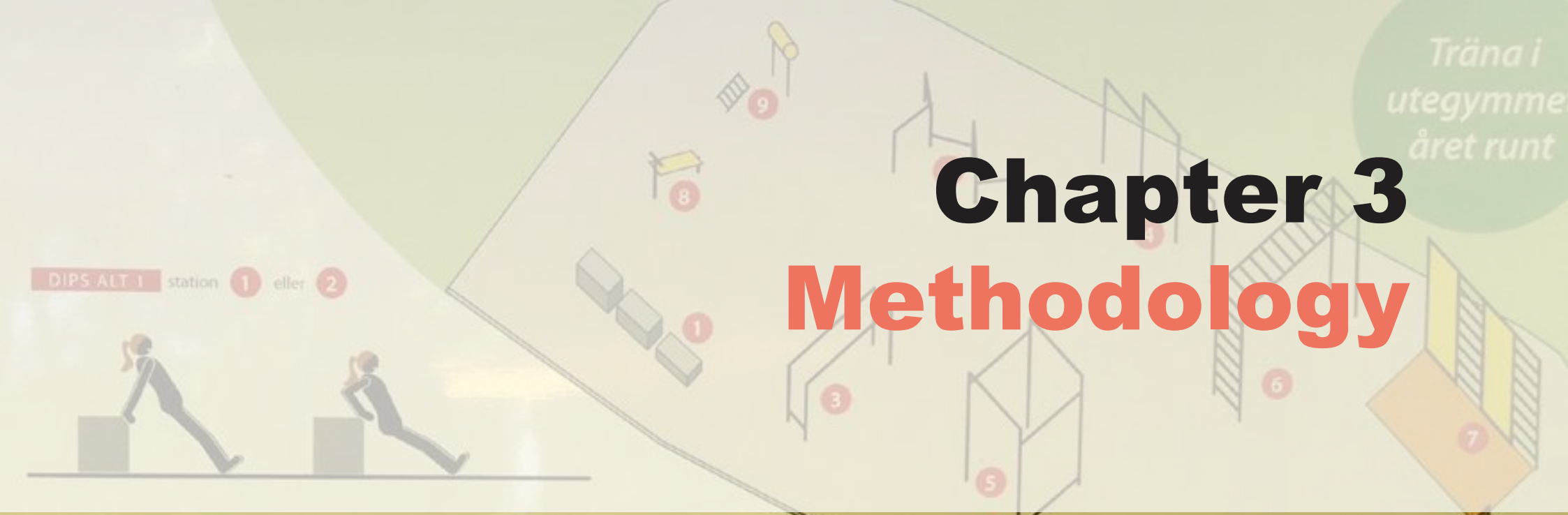
Addition: we refer to urban space as city aspects excluding natural features such as parks or water features. Even though they are present in cities, urban aspects refer to the built environment and traffic infrastructure.

Vigorous Physical activity
- *Physical activity, undertaken in leisure time undertaken for the pleasure of the movement itself and /or health reasons.*

Usage
- *Manner of treating.*

Addition: we see usage and behaviour as highly interrelating terms, with a slight difference. Usage in this study, refers to being somewhere, doing a certain type of activity. For example: running on the street. This is also a behaviour, but a behaviour can also refer to more. For example, changing your direction to another street is a certain behavioural action, that shifts the running usage to another street.

Chapter 3
Methodology



3.1 Introduction

The approach that will be used to answer the research questions will be explained in this chapter.

This includes:

- Describing aspects that have to be investigated to answer the (sub-) research question.
- The type research method/ approach that is used.
- Characteristics and specifications of data that is collected.
- How this data is analysed.
- Type of outcomes of the analysis.

3.2 Approach

RQ1: Where and when do people run?

The answer to this research question will be conducted in chapter four and five and exists of two parts: a spatial analysis and a crowd sourced data analysis.

1. Analysing spatial structure

In order to understand where people run, it is crucial to have knowledge of the space/ place in which this occurs. For this, an (urban) spatial analysis is conducted to understand the spatial structure and the appearance of places. This is achived through visualising the urban development of in this case the city.
The relationship between presence/ development of natural places (parks-like structures and water structures) and development urban places (buildings and infrastructure) is key.

2. Analysing runners' usage of space and time

One of the main reasons for choosing the active topic of running for this thesis, is that new sources of data are now available, making it possible to research spatial usage/behavioural patterns of active people (like runners) unlike ever before.

All this data is derived from the same source: GPS signals from GPS containing devices, provided by users of running applications. While being active and carrying such a device, the device repeatedly sends out signals, containing location updates (longitude, latitude) and time. Through the device, the user is informed about speed, distance and the route performed. Nowadays, the information from all users can be shared by the application owners, and be used for researching spatial behavioural patterns.
There are two app's in which we see various possibilities: Strava and Runkeeper. From these two apps, it is possible to have access to data that shows where and when their different users have been running.
Though, in order to fully understand the potential of the data it is first important to understand the characteristics of the app users.

Profile of the Dutch runner (app-user characteristics)

The profile of Dutch runners in general, vs Runkeeper and Strava users will therefore be described. This provides an understanding of Strava and Runkeeper users within the spectrum of different runners (and the extent of their usage). Two factors will be considered:

- *Demographic characteristics.*
- *Running motivation characteristics.*

Three important studies on runners were used:

1. Research by NOC NSF (2014) that surveyed Dutch runners and described some of their needs and characteristics.
2. Research conducted by the 'Hogeschool van Amsterdam' (2015) that surveyed runners at the 'Dam tot damloop'.
3. Research from Synovate (2008).
4. Outcomes of surveys performed in this thesis (described in RQ2).

Crowdsourced running activity data

The structure of the data differed significantly between Strava and Runkeeper. The possible applications of them are therefore also different.

Runkeeper
The Runkeeper data consists of running activities from users, that publically saved their activity between 2010 and 2015. These activities can be accessed online, by anyone. Often, a certain running route/activity is performed multiple times. Users can save these, to compare their runs to previous results. This principle was important for the data analysis, because what information we had about the activities, depended on this. If an activity was performed multiple times, information was present about when it was performed and in what time. If an activity was performed only once, this information was not available for this activity. All activities had in addition information about the distance of the run.

Strava
In contrast to the Runkeeper data, the Strava data is all running data from all Strava users in a city. Though, the data is anonymized by creating a 'group effect'. The Strava data does provide information to analyse how many people used a certain street in a certain timeframe. A street has a specific number and the Strava data provides numbers on how often this street has been used. A more thorough description can be requested at the Strava Metro website. The product bought from Strava was the most basic 'package'. With this product provides multiple ways of analysing the data. Buying the full package would have increased these possibilities.

Applications

By using the programmes R-studio and ArcMap, this GPS data can be mapped. This includes mapping where people run, it also includes data of when people run and how the location of where people run differs at different times. For the Runkeeper data (due to the individual data) it is possible make a distinction between different types of runners and start/ stop locations.

Subsets

These are different ways to visualise where people run, which can be achieved through dividing the data into data-subsets. Only subsets which show patterns relevant for design will be described in this report, the other results will appear in the appendix.

Temporal dimension: time usage patterns (Strava and Runkeeper)
This analysis shows at what moments in time both Strava and Runkeeper users run. This is analysed as temporal usage patterns which can also result in spatial implications. As such, this helped inform what spatial subsets would be interesting to develop.

Spatial dimension: unique activities/ all activities (Strava and Runkeeper)
This analysis shows the overall usage intensities of different places in the city from both Strava and Runkeeper users. It thus shows what areas are most intensely used by these runners. Indirectly, it also gives an image of where the Amsterdam running population is set. Finally, it can also be used as a base map, to which other subsets can be compared.

Routes in places/ range (Runkeeper only)
This series of maps separates Runkeeper activities to the location activities visited. It can function as another way of determining the value of certain places for runners. In addition, it gives an insight in the way a certain spatial structure is connected to other structures.

Distances (Runkeeper only)
It has been possible to make a sequence of three maps from the Runkeeper data, due to this dataset existing as routes (rounds) instead of segments of routes. The data is divided up into a map with all routes less than 4.5 km (short distances), a map with all routes between 4.5 and 9 km (medium distances) and finally with all routes more than 9 km (long distance). In these maps the differences in running locations between these types of runners (dependent on distance); will be shown.

Darkness vs. Daylight (Strava and Runkeeper)
Precense of daylight has in previous research showed to influence runners. These subsets will show where people run in when daylight is present or absent.

Week vs. weekend activities *(Strava and Runkeeper)*
These maps will show, from both Strava data and Runkeeper data, to what extent our week rythm has consequences for where we run.

Temperature (Runkeeper only)
This map will analyse if people run at different places with different outdoor temperatures.

Commute vs. non-commute (Strava only)
In the Strava dataset a subset was available of commuters and non-commuters. This dataset reveals which area is suitable for commuting to work and where missing links in this network can be found.

Start/ stop (Runkeeper only)
In the Runkeeper data, start and stop locations for individual routes can be detected. This singular maps illustrates what places are attractive to begin and end an activity.

All activities (Strava and Runkeeper)
In this map all activities run by all runners are displayed in one map. These maps do not show significant alternations compared to the ‘unique activities’, additional insight were derived from them. In addition, these maps contained data from big running events, having quite an influence on the total image. The maps can be found in the appendix.

4 seasons (Strava and Runkeeper)
This series of maps should show to what extent seasonal changes have consequences for spatial intensities. The consequences were found to be minimal, these maps are therefore to be found in the appendix.

Day segments (Strava only)
Strava provides data subsets from different parts of the day. These are mapped in order to see differences in running locations throughout the day. The differences in the maps were not significant, and are more suitable to visualise in a dynamic way (movie/ PowerPoint). They can also be found in the appendix.

Outcome

All above mentioned methods result in the recognition of two locations, that are not used convincingly (under-used), relative to other places that have a comparable structure/ appearance. This is thus an interpretation, based on what usage patterns were expected from these places.

RQ2: What spatial conditions determine this running behaviour?

Mapping runners experiences

To thoroughly understand the interaction between the way public space is designed (spatial conditions), and the way it is used (the factual usage/ behaviour), it is important to increase understanding of runners' experiences at these selected areas, and the extent to which this meets their requirements. This method aims to increase understanding in the experience of spatial conditions that drives people to go running where they do.

Surveys

Descriptive social surveys will be analysed to increase this understanding. In addition, this survey is used to gain knowledge of the profile of Dutch runners vs. Strava/Runkeeper users. This is done in part one of the survey. Part two and three elaborate on runners' experiences/ requirements. In part two, participant are assigned to value (on a 1-5 scale) a series of spatial aspects/ requirements for running. These are deriven from existing research/ literature. In addition, they are asked if these are easy or difficult to find in the area.
In part three, participants are asked to elaborate on these spatial requirements through drawing their experiences, experienced in a running activity, on a map. Here, runners have an opportunity to mention other requirements that may have been previously overlooked. Participants in the survey have been asked to:

Part 1:
- Note general information (age, gender etc.).
- Answer questions on running motivation(s).

Part 2:
- Value spatial aspects/requirements on their importance.
- Value these on their availability.

Part 3:
- Draw the route(s) they recently ran on a map.
- Note (at different parts of their route) the reasons they had to run in certain directions/ places.
- Note what they liked or disliked at route sections.

Appendix 2 shows the survey. A diverse panel participated, from young individual runners, to a 45+ running group.

Outcome

This research results in a series of runner requirements at different places, resulting from both positive and negative experiences, that explain why the two chosen locations are not used as thoroughly as expected. As such it explains the spatial problems/design aims that will be tackled through design in the next research question.

RQ3: How can these spatial running requirements be effectively integrated into the urban landscape of Amsterdam?

This contains the testing of the design aim, based on the requirements, on the selected site. This includes four aspects:

1. Site analysis

This requires a more detailed/ thorough understanding of the configuration of the spatial problems for runners. It requires in addition an explanation on the meaning of this spatial configuration for other users of public space, and the extent to which requirements of runners can also benefit other users. This also includes a more precise understanding on how this configuration developed in time.

2. Additional external knowledge

Additional literature, research or other documents can provide insight into strategies or principles that can be used to solve these problems.

3. Designing/ modelling

By sketching, models or concepts were produced that illustrate different ways of transforming the spatial conditions on site in favour of the found requirements. These models are worked out into a level of detail that allows us to reflect upon the effects/ consequences the transformation could have. This means not only the effect on the runner, but also on other user groups that can potentially benefit from the intervention. This process is done at different scale levels.
Preferred models are worked out into more detailed plan drawings (designs), between 1:5000 and 1:100, section drawings at 1:500 - 1:20 and artist impressions (testing visual impact).
It will only be these preferred models/ designs that will be included in the report, other design options are included in an appendix.

4. Assessing/ evaluating

Assessments of the designs are built up by assessment criteria: aspects that will be positively or negatively affected by the proposed designs. The effects on the aspects could either be determined by measurements or through evaluation.

5. Extract principles

The designs are analysed on the principles that have been used to solve the spatial running problems. These were categorised to their different design aims, creating a typology of possible measurements that can be taken to improve an urban environment for runners. These principles can be used in other western urban sites, where the specific context/ site characteristics would have to determine what principles would fit best.

Result

Two elaborated examples that improve urban spatial conditions for running, and a list of principles (a toolbox).

Research question	Method		Chapter	Data
1. Where and when do runners run?	('where'): analysing spatial structure		4	External Research
	('runners'): Profile of runner		5.1	
	Analysing runners' **behaviour**	in time	5.2	Crowdsourced running activity data
		in space	5.3	
2. What spatial conditions determine this running behaviour?	Analysing runners' **experience** of space		6	Surveys
3. How can these spatial running requirements be effectively integrated into the urban landscape of Amsterdam?	Designing: testing ways to integrate requirements		7	
Main: what interventions could improve urban spatial conditions for running?	Concluding		9	

3.3 Case: Amsterdam

Amsterdam, the Dutch capital, has been choosen as a suitable city for the objective to design a runner friendly city.

Running in Amsterdam has seen a huge expansion in popularity over the past few years. According the Sportmonitor of Amsterdam (Bosveld 2013), running has doubled in between 2009 (13% of inhabitants were a runners) and 2013 (in which 26% of the inhabitants were runners). An increase of 100.000 people on a population of approximately 800.000 people.
This makes running the second most popular sport in the city. The city of Amsterdam exemplifies a municipality that recognises the healthy city ambitions of the WHO in policies. In the 'sportvisie' (the policy about sports in the municipality) of Amsterdam (sportvisie 2009-2012), the societal trends and problems mentioned before are recognised (chapter 1.1). This policy document also addresses the potential to achieve improvements through interventions in the built environment.
An example of this is creating a network of sport and activity routes for runners, cyclists, skaters, rollerblades, etc. interconnected with each other and different nodes of green- and sport facilities. All these improvements are part of an ambition to host the Olympic games in 2028.
Another ambition for Amsterdam is to hold the European championchips for athletics will take place in Amsterdam in 2016. To create a bigger legacy for this event, the municipality and sport organisations want to make this event visible in the public space of the city to try and motivate people who are not already involved in athletics to get active. Scheerder and Breedveld (2015) consider this as well in their report on Running Europe:

The city of Amsterdam and the Athletics Federation consider the elite athletics event as a useful opportunity to stimulate both athletics and running in the Netherlands on a recreational level.

(Atletiekunie and gemeente Amsterdam 2011)

In additiion, according to the "Groot groenonderzoek Amsterdam (2013)" the amount of runners that visit parks has increased from 16% to 21% of the total Amsterdam population in between 2008 and 2013. The municipality in particular mentions the recreation areas at the edge of the city, historical landscape parks and sport parks as important organs of the city's body. Their function/ importance for active usage is underlined.

The built environment of Amsterdam is a highly diverse metropole (figure 3.1), that incorporates a diversity of green spaces, (sub) urban parks, surrounded by a high diversity of urban buildings (housing/ facilities) and infrastructure (car, bike, foot, etc.).This spatial organisation influences the way people can use it, and vice versa people's preferred way of using space has influenced how Amsterdam is designed and planned (Hameleers 2013).

The ambitions of the municipality mentioned in the first paragraph, the municipality of Amsterdam was willing to obtain data from Strava for our research. Data of around 90.000 running activities was received from Strava. In addition, we were able to extract data of around 20,000 activities from Runkeeper in Amsterdam, performed in the last five years. This amount was relatively large compared to other European cities. The Strava Data were performed in between February 2014 and February 2015. From Runkeeper, we accessed the spatial data of about 9800 'unique' routes in Amsterdam. Including activities performed multiple times (a bit more then

Figure 3.1: Case study area Amsterdam

2000 of the 9800), we came to roughly 20,000 additional activities.
At last the Amsterdam institute for Advanced Metropolitan Solutions (AMS) is collaborating with Wageningen University on metropolitan data challenges in Amsterdam. They were a welcome partner for our research purposes.

Chapter 4
Spatial structure of Amsterdam

4.1 Introduction

This chapter elaborates on the spatial structure of Amsterdam, in order to be able to relate running behaviour to the spatial characteristics of Amsterdam. It does so through visualizing the development of two spatial types of structures: Urban development and development of green spaces. These aspects are, in the case of Amsterdam, strongly related.
The first 600 years of the history of Amsterdam are not described in this analysis, because the relevant developments for this research can be explained by looking at maps from the 18th century until today. An incredible collection of historic maps exists from Amsterdam (Hameleers 2013), they serve as a main source for describing its urban developments. The collection of different urban and green structures which Amsterdam contains is in addition equally impressive. This chapter can therefore only highlight the most relevant developments and spatial structures. The green spaces that will be mentioned in here, are a selection from the in total 42 green that previous research (Kupershoek and Ligtelijn 2001) identified in Amsterdam.

4.2 Amsterdam on eye level

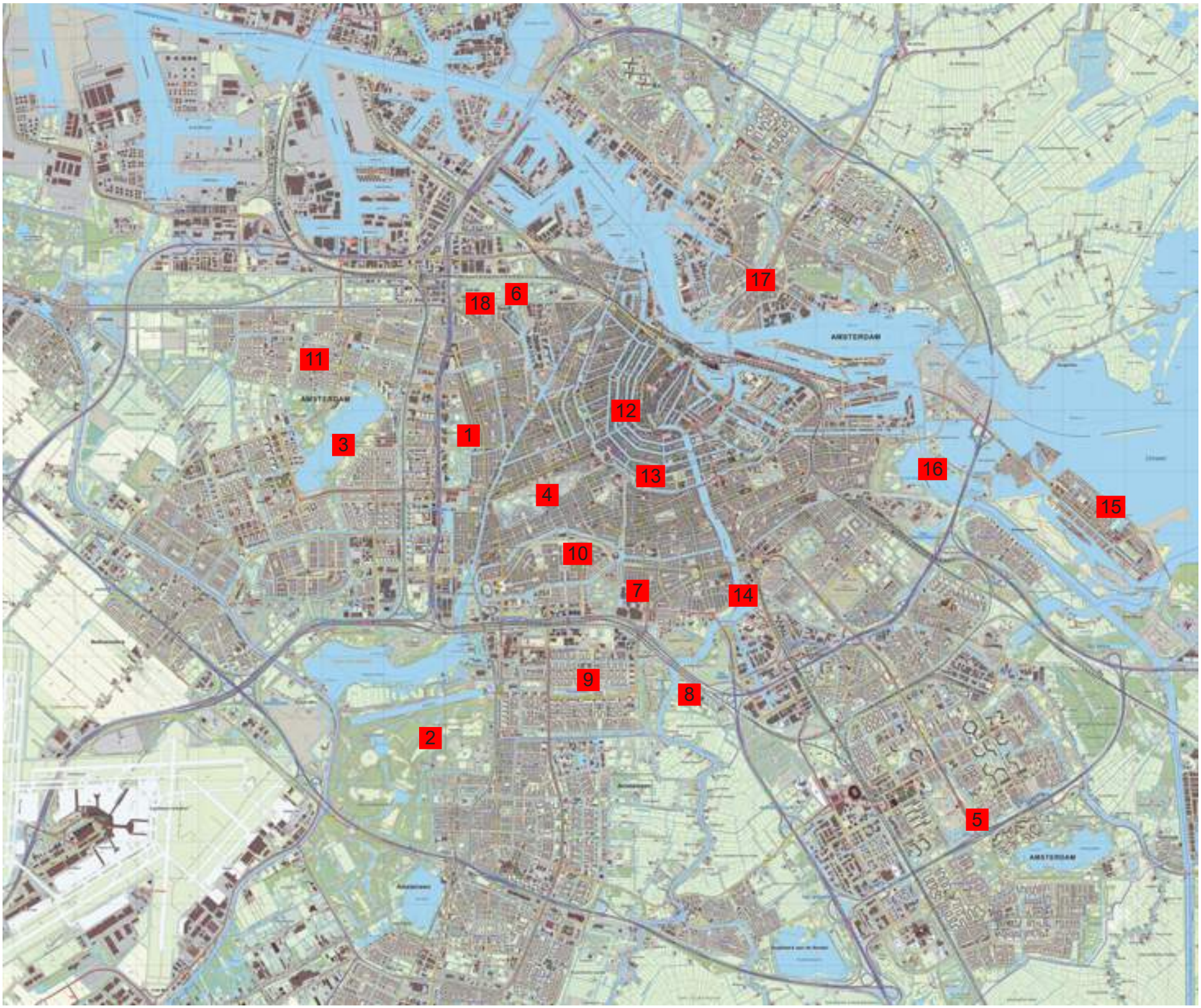


Figure 4.1: Map with numbers corresponding with the characteristic spatial structures in Amsterdam in figure 4.2

1. Rembrandtpark
One of the larger cetral city parks.

3. Sloterpark
Large recreational park in Amsterdam New-West.

5. Bijlmerpark
More recent park in the Southern sub-urbs.

7. Beatrixpark.
Smaller park on the edge of of the A10 highway.

9. Gijbrecht van Aemstelpark. Modern linear park.

11. Amsterdam New-West.
Sub-urban districts.

13. Stadhouderskade.
Amsterdams former city edge.

15. IJburg
Urban expansions in the waters of the ‘IJ’.

17. Noordhollandskanaal
The central water axis of Amsterdam North.

2. Amsterdamse Bos
The largest recreational area of Amsterdam.

4. Vondelpark
The large ‘backyard’ of Amsterdam centre.

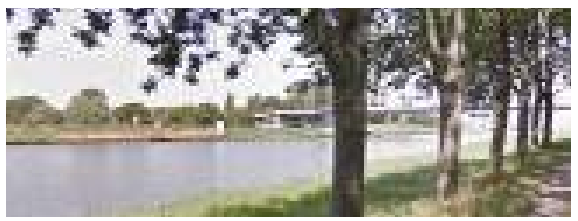
6. Westerpark
Diverse park along the Haarlemmertrekvaart.

8. Amstelpark
Former flower-exposition park.

10. Amsterdam-Zuid
Popular affluent residential area.

12. Amsterdam Centre
Historic heart of the city.

14. Amstel
Main river of Amsterdam.



16. Merwedekanaal
Water structures bordering the IJ.

18. Haarlemmertrekvaart
Water connection to Haarlem.

Figure 4.2: Characteristic spatial structures in Amsterdam. (See list of figures for image sources)

4.3 Spatial analysis

1796

Figure 4.3: Kaarten van Amsterdam (2013)

Figure 4.4: Kaarten van Amsterdam (2013) (2013)

1896

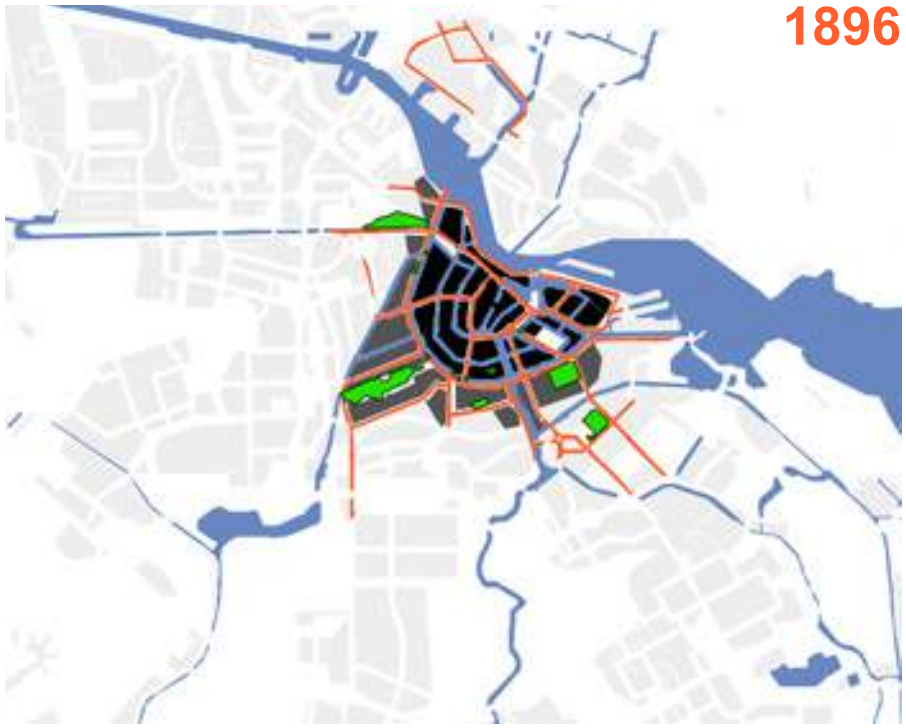


Figure 4.5: The basic layout of Amsterdam un 1896.

The main drive of Amsterdam's spatial development is like many other Dutch cities: water and the transportation possibilities of it. Two waterways determined Amsterdam's position: the **'IJ'** (connection to the 'Zuiderzee'), and the southern peat-creak: **the Amstel.** The radial inner-city developed around the dam in the Amstel; confined by defense works.

In the map of 1896, we see urban developments expanding beyond these "de grote stadsuitleg", mainly in the direction of another important (already existing peat-creak) water way: **the Schinkel.** Urban developments along the **'Haarlemmertrekvaart'**, which was already developed in 1631 as another water-extension (towards Haarlem), become visible in this period as well (Westergasfabriek terrain).

'Artis' and 'de Plantage' were the only recreational/ green facilities within the city until 1850. After 1850, the first urban 'parks' of Amsterdam become visible within the urban expansions, including the **Vondelpark, Westerpark, Oosterpark and Sarphatipark.**

Designed in the romantic English landscape style, these parks were primarily assigned/ designed for the wealthy dwellers of Amsterdam who built their villas around the parks. The possibility to walk an 'ommetje' (detour) in a 'natural'/ romantic landscape was a key characteristic in the designs, resulting in enclosed, winding, island-like urban parks. (Kurpershoek and Ligtelijn, 2001).

Figure 4.6: the appearance of Amsterdam (See list of figures for image sources)

Figure 4.7: Kaarten van Amsterdam (2013)

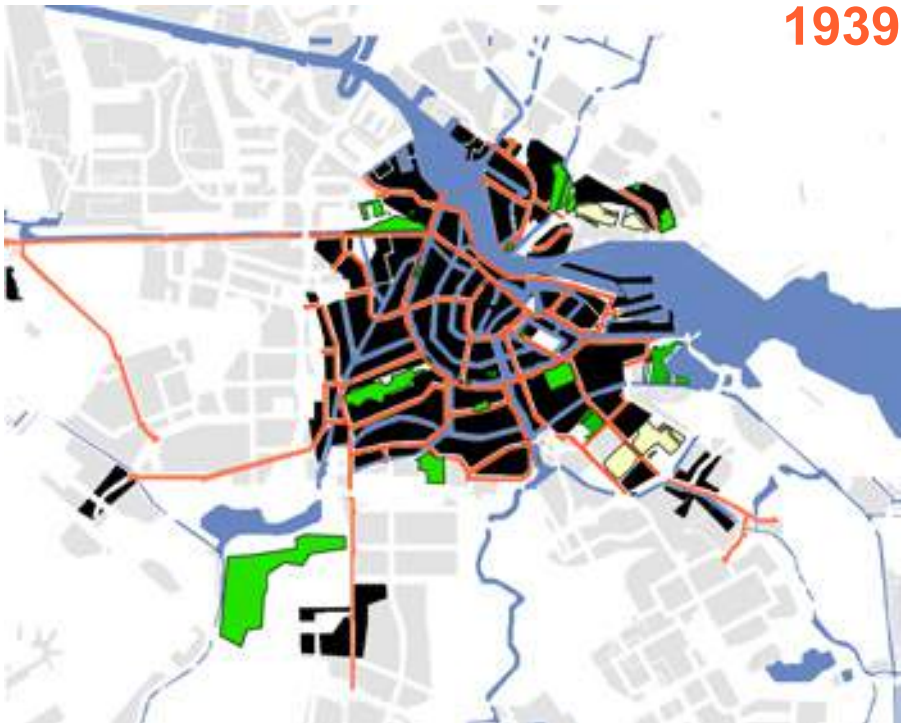


Figure 4.8: The basic layout of Amsterdam un 1939

The majority of urban expansions before and after WW I are situated directly southwards and eastwards, with '**Plan-zuid**' (designed by H.P. Berlage) as a major expansion between 1917 and 1925. The East of Amsterdam develops in between the Schinkel and Haarlemmertrekvaart, following the directions of the drains (Hameleers 2013).
Also 'Amsterdam-noord' develops in the beginning of the 20th century with the '**Noordhollands Kanaal**' (broadened in 1892) as a central entity. In the larger region of Amsterdam, additional (sub-) urban developments emerge. They show clear traffic connections, perpendicular to the city of Amsterdam.

The growing city results in an increasing demand for green spaces and tranquillity, driving the development of additional urban parks. The parks developed until 1920, still derive their style from the 19th century romantic parks **(Florapark/ Noorderpark, Flevopark)** (Kurpershoek and Ligtelijn 2001).
The provision for the growing recreational needs reaches its peak with the creation of the **Amsterdamse Bos**, firstly suggested by Jac. P. Thijsse. Five years after the start of building in 1934, only a 'small' part of its design was visible and it was not finished before 1947. It is designed for mass-recreation, a forest for the entire population of Amsterdam instead of facilitating one urban district. Its size is impressive; with 137 kilometres of walking trails, 4.5 million planted trees and being 20 times larger than the Vondelpark (twice central park New York) (Kurpershoek and Ligtelijn 2001).

Figure 4.9: the appearance of Amsterdam (See list of figures for image sources)

Figure 4.10: Kaarten van Amsterdam

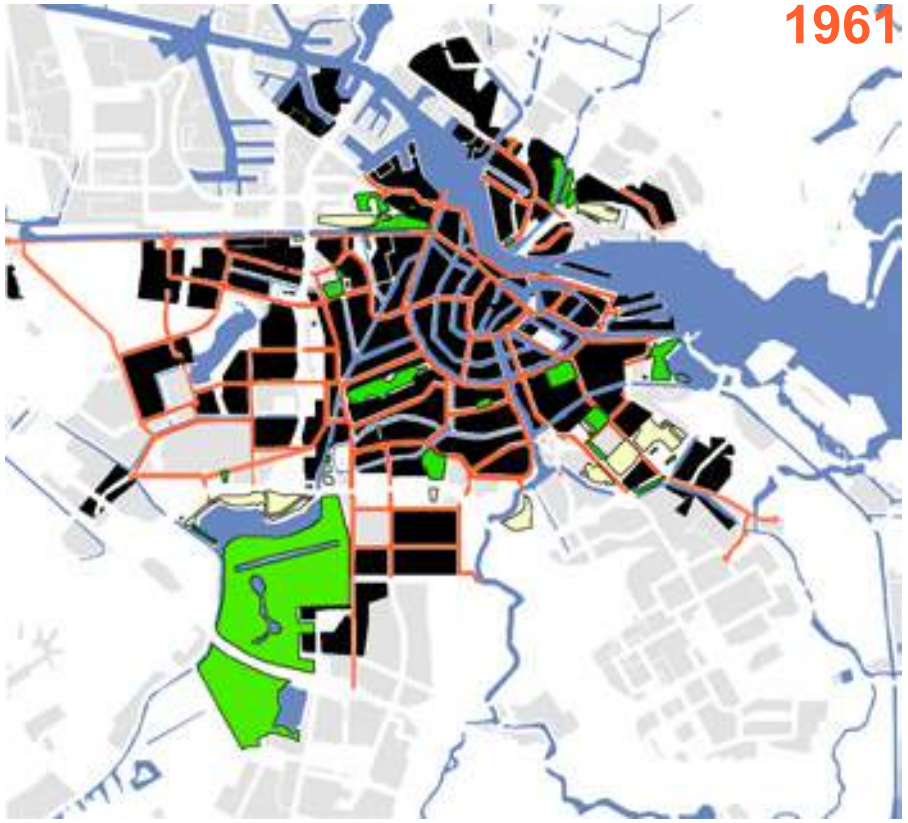


Figure 4.11: The basic layout of Amsterdam un 1961

After WW II, Amsterdam develops according to the Expansion Plan of 1934, which draws the framework of urban development. A **finger-structure** can be recognised in it, with 6 **green wedges** being spared from urban developments (**Florapark/ Amsterdam Noord, Muiden-Vecht, Amstel, Amsterdam Forest, Sloterpark/vaart/plas, Westerpark**). In the first phase, the Western (**Nieuw-West**) and southern part of Amsterdam gets developed according this plan. The infrastructure develops in the same directions, in a more or less perpendicular direction towards the radial inner city (Hameleers 2013).

The presence of air, light and space were primier requirements in the urban developments. Open space is more incorporated in the neighbourhood structures, nature becomes an integral part of the new (rather straight and symmetric) urban developments. (Kurpershoek en Ligtelijn 2001)
Green space was integrally developed, like the **Sloterplas** and **Rembrandtpark.**

Excavation of land was executed for the creation of recreational water, and gaining land for proper building and planting soil. In contrast to the nineteenth century romantic parks, the spatial structure of these parks is mainly based on a strong integration with surrounding urban infrastructure. In the Rembrandtpark for example, is characterized by intersecting car and bike streets. These large parks additionally had to facilitate space for urban facilities like swimming pools, petting zoo and allotment gardens. Even though the green structures of the Rembrandtpark and Sloterpark can be recognized in the 1961 map, their designs are not executed.
Also linear, straight-lined, ‘connection’ parks like the **Gijsbrecht van Aemstelpark,** connecting the Amstel with the Amsterdam Forest, are part of these more formal urban developments (Kurpershoek and Ligtelijn 2001).

Figure 4.12: the appearance of Amsterdam (See list of figures for image sources)

Figure 4.13: Kaarten van Amsterdam (2013)

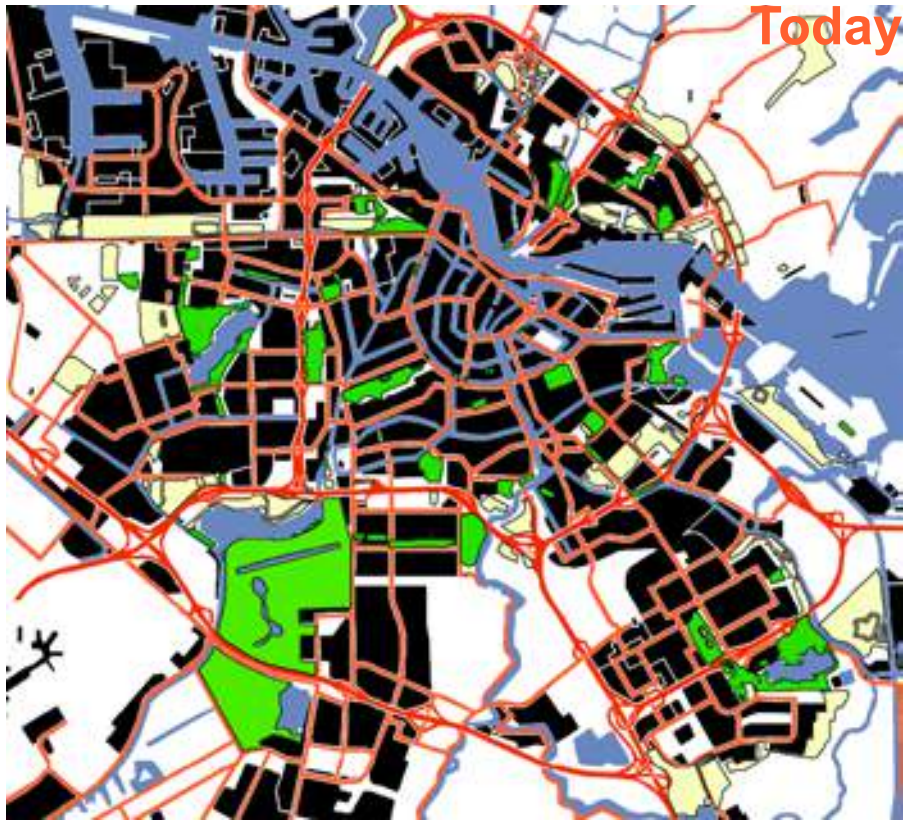


Figure 4.14: The basic layout of Amsterdam today

The speed of urban development was sustained in the following decades. The Expansion plan was finalized with the (further) development of **Amstelveen**, the **Bijlmer** region and **Amsterdam North**, again with a very spatial layout. This reaches its peak in the Bijlmer high-rise building development. Here, buildings hardly consume any surface and space and large green areas remain between (Kurpershoek and Ligtelijn 2001).

A second large urban development is formed by the highway-rings in and around the city (**A10**), positioned parallel to the old inner city rings. These highways mark a border which is often perceived as the edge between two parts of the city of Amsterdam (Groot Groenonderzoek 2013): the inner-ring neighbourhoods and the outer-ring districts.

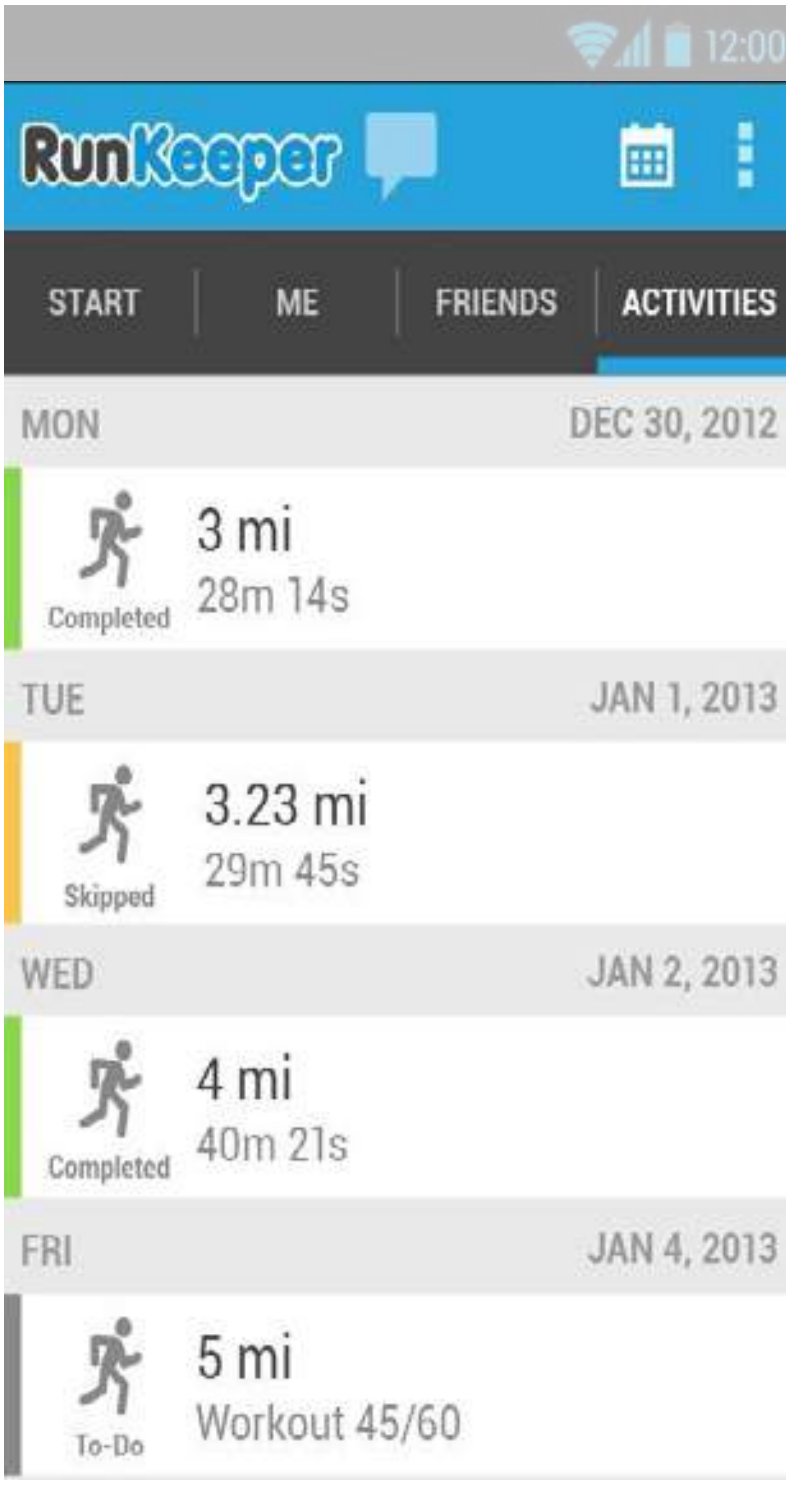
Along-side these outer-ring developments, new urban park-spaces are developed like the **Bijlmerpark** and the **Gaasperpark**. Also the sports facilities, allotment areas and golf courses are developed along these city edges.

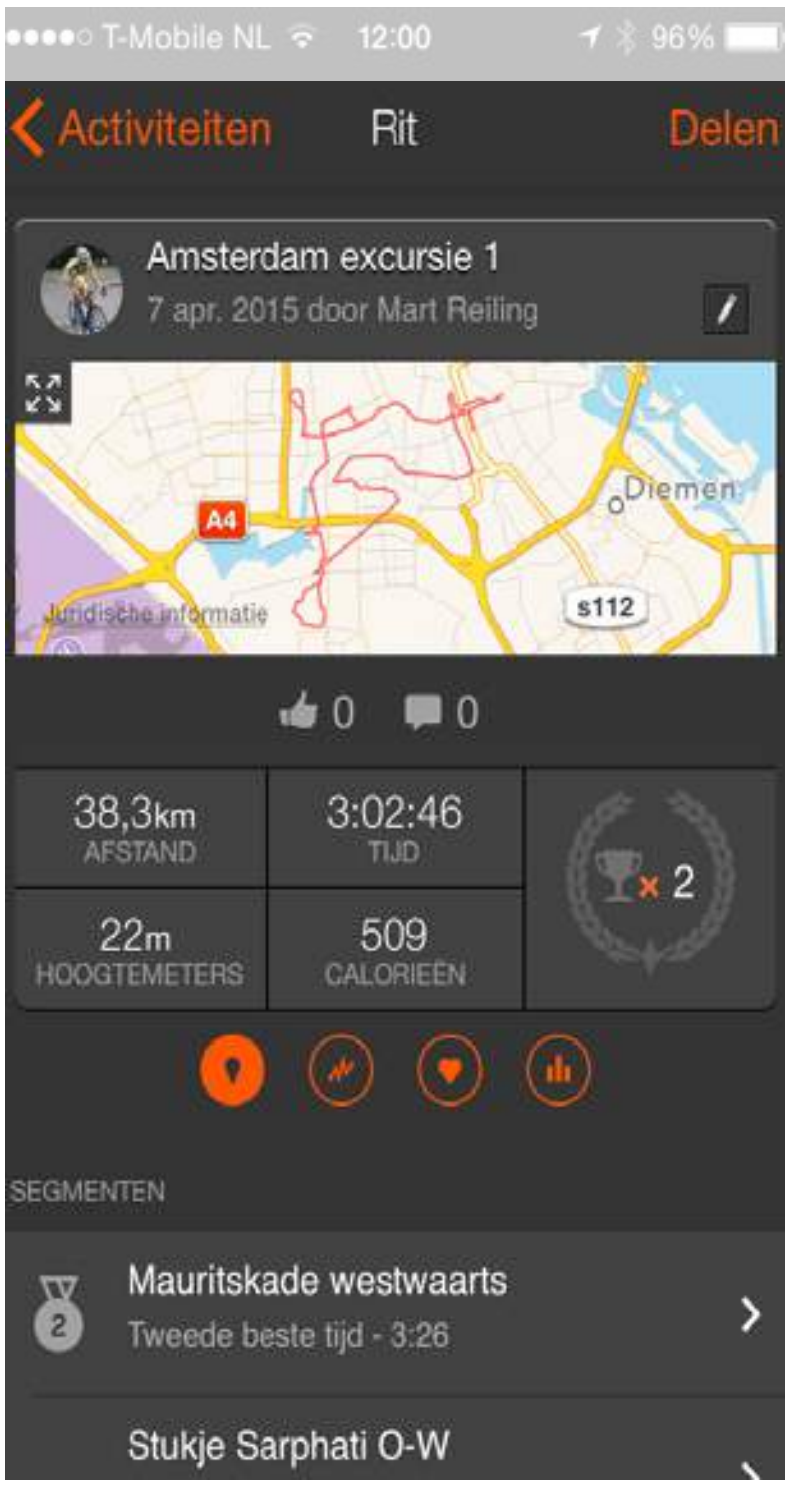
As a reaction to previously formal parks, parks like the **Gaasperplas** and **Bijlmerpark** are designed more ‘loosely’ / ‘playful’ (Kurpershoek and Ligtelijn 2001).

In addition, more thematic parks are being developed, like the flower-exposition park **‘Amstelpark’**, for which the **Beatrixpark** was also incorporated. The **Westerpark** gets extended in Western direction, manifesting itself as a place for development of cultural activities.

Figure 4.15: the appearance of Amsterdam (See list of figures for image sources)

Chapter 5
Running behaviour in Amsterdam





5.1 Introduction

This chapter deals with research question 1: the spatial behaviour of runners, derived from analysing the data from the apps Strava and Runkeeper.

In order to validate the data from the apps Runkeeper and Strava, we need to understand the users. The chapter therefore starts with sketching a profile of ‘the Dutch runner’ and the position of both Strava users and Runkeeper users within this profile.

The results of the crowd sourced data analysis follow this, beginning with temporal behaviour. The results of this analysis also inform what subsets will be interesting to make for the spatial dimension, which is the next step within this chapter.

Finally, two particular locations have chosen for their interesting spatial patterns, in relation to their spatial structure/ characteristics.

5.2 The Dutch runner: a profile

Characteristics: Personal

In 2014, sports organisation NOC NSF did a survey among 3000 Dutch people. The results give a good profile of the Dutch runners.
In the Netherlands, 2,5 million people run regularly (15% of total population, GFK 2014); which means at least once a month. Moreover, 31% of the Dutch population ran at least once last year. These are mostly people between 15 and 44 years old, with 22% of the population at this age regularly running. On average, 13% of women runs regularly, whereas 18% of men do so. From the 15 million Dutch people that do not run yet, 10% are planning to start running (potential runners). So potentially, Holland could contain more than 4 million runners.

The NOC NSF (2014) research has made a distinction of running performed individually, in a group (under the guidance of a trainer), or with a friend. 22% of the current Dutch runners run under guidance, of which 6% do so in athletic clubs, 6% at a fitness club, 3% with their work and 1% with their health care club. Almost 70% of the potential runners say they are not interested in running under guidance.

In the research executed by Synovate commissioned by Asics on 3500 runners in seven European countries in 2008, 32% of the current Dutch runners had started running just that year (see figure 5.1) (with the largest percentage of starting women: 40% of entire Europe). These numbers make the Netherlands a land of beginning runners according to Asics. Consequently, just 20% of the Dutch participants currently saw running as part of their 'life'.

Figure 5.1: People that started running last year per country, written in 2008 (Synovate, 2008)

		Runkeeper (44.4% of app users)	Strava (3.5% of app users)	Nike + (13.3% of app users)	Geen app (47.5% from total)
		N = 970	N = 78	N = 285	N = 1959
Sex	Vrouw	56.9%	35.1%	53.6%	46.0%
	Man	43.1%	64.9%	48.4%	54.0%
Distance @ DTD	10 EM	62.6%	75.6%	73.3%	72.0%
	4 EM	37.4%	24.6%	26.7%	28.0%
Age (years)		36.3 ± 9.5	37.0 ± 10.3	35.9 ± 9.4	41.8 ± 11.7
BMI (kg/m²)		23.5 ± 3.1	23.2 ± 3.0	23.6 ± 3.0	23.4 ± 2.7
Trainingamounts In training period	Less than 5 km / week	27.7	20.3	30.3	17.0
	5-10 km / week	34.6	33.5	23.7	25.6
	10-20 km / week	25.0	25.6	25.0	29.1
	20-30 km / week	10.0	12.4	14.5	17.1
	> 30 km / week	2.7	8.3	6.6	11.2

Figure 5.2: app use among Dam tot Dam participants (Provisional results: Dallinga et al. 2015)

App users

40% of Dutch runners takes their smart phone with them on their run, an additional 5% take other tracking devices (e.g. watch) along. 18% really use a running application to see their data, 35% say they would be interested in it but do not yet use it. From all potential runners, 50% say they would be interested in data on their running performances (GFK 2014).

Numbers on app users and non-app users depended highly on the sample that was being researched. The "Hogeschool van Amsterdam'' (Dallinga et al. 2015) performed a research on 4000 runners during the "Dam tot Dam" running contest in Amsterdam. Here, 52% of all runners showed to use an app to track running activities (figure 5.2).

App users are generally younger than non-app users. The average age of non-app users in the (Dallinga et al. 2015) research was almost 42, compared to app users who were on average about 36 years old. The deviation in gender was not very large, 54% of non-app users was male, and 46% were female.
In the research by HVA, 44% of the app- users told to used the application Runkeeper, by far the most popular app. 13% used NIKE+, only 3,5% used the application of Strava. The results from the surveys performed in our research, show similar proportions in app use (figure 5.3).

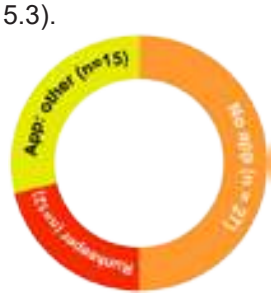


Figure 5.3: App use interviewees

Runkeeper users

In the research by Dallinga et al. (2015), the people that used the app Runkeeper showed to have significantly different running behaviour than both non-app users and Strava users.

57% of Runkeeper users were female (figure 5.2). The amount of kilometres they ran in their training period was much less than non-app users but also of Strava and Nike+ users. Almost 28% trained less than 5 kilometres per week, 35% 5-10 kilometres. In comparison, this is 17% and 26% for non-app users respectively. Not surprisingly, 37% off the Runkeeper users chose to run the 4 English miles instead of 10 English miles, where only 28% of non-app users did so. This does not seem to effect the BMI, which is about 23 for all groups.

These results are supported by the results from the research of our study. From the 12 Runkeeper users in this survey, only 1 assigned themselves as an ‘advanced runner, 5 as a ‘beginner, and 5 ‘in between’ these two. In all surveys, this is different: 8 ‘beginners’, 22 in ‘between’ and 24 ‘advanced’ (figure 5.4).

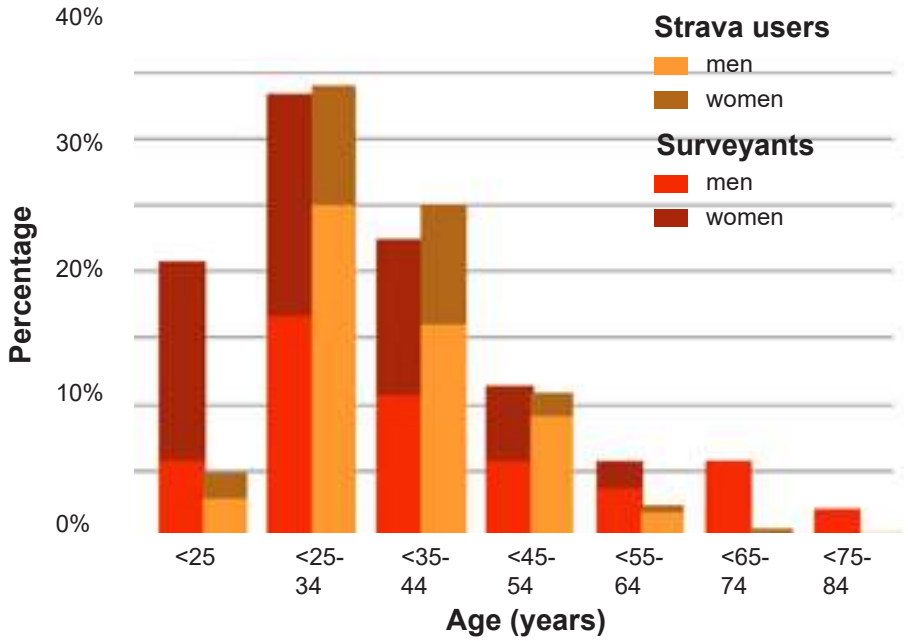


Figure 5.5: Age profile of: Surveyants (n =54) & Strava users Amsterdam (n = 10834)

Strava users

Runners who use the Strava app, are different to both the Runkeeper user and the non-app user (Dallinga et al. 2015). The first factor is a gender difference: 65% of Strava users were male (figure 5.2). In the available data sample that we received from Strava Metro, 72% were male, 22% female and 6% of unknown gender (figure 5.5). Concerning age, there is no real difference compared to Runkeeper users according to the Dallinga et al. (2015) research.

Though it does appear that Strava users are more advanced runners than Runkeeper users. Only 27% chose to run 4 miles. In addition, Strava users trained more kilometres on average. Only 20% trained less than 5 kilometre per week (even less for non-app users: 17%). Instead, most people trained more than 30 km per week.

The results of our survey also confirm that; all 5 interviewees that used the Strava app, assigned themselves to be ‘advanced’ runners.

Figure 5.4: level of runners (interviewees)

Characteristics: Motivation

Synovate (2008) shows the motivation to start running: in order to get fit (61%) and to lose weight (40%). They proceed with reasons for running: to have fun (40%) to relieve stress (29%) and spiritual satisfaction after exercising (26%).
According to this study, the Dutch are idealistic and run to loose weight and work on stamina. They want to loose on average 9.5 kg compared to the European average of 6.1 kg.
Another very important reason for the Dutch people to start running is that: *“running is an outdoor and financially affordable sport”* (Scheerder and Breedveld 2015).

The results from the first part of our survey describe the 54 participants motivations for running. Although this survey is too small to be statistically reliable (for example only 5 Strava users and 8 Runkeeper users), it does show some well explainable results to the Synovate research.
Note: the questioning to motivation is slightly different from the Synovate research. This survey ask current runners how important a certain aspect is as a motivation for running, on a scale of 1 to 5 (5= very important, 1=not important), where the Synovate research asked for the motivation to *start* running.

More than 90% of the runners said *being* fit (which is different than *getting* fit!) was important or very important. The mental aspect of running (‘clear the head’) and outdoor motivations (‘contact with nature’) were also assigned as important.

All participants, Strava users, Runkeeper users, non-app users.

The results of the surveys support the notion that Strava users are more competitive runners; competition with others scores higher with Strava users than any other, at Runkeeper users score it less highly (figure 5.6). No other significant differences can be noted, due to the small sample of data.

Beginners vs advanced runners

Clear differences in motivation can for example be expected between runners that categorise themselves as ‘advanced’ (n=24), ‘beginner’ (n=8) or ‘in between’ (n=22). ‘Being fit’, is recognised as the most important motivation for people to run, regardless of how advanced they are. Almost all participants either gave this aspect a 4 or 5 out of 5. Mental benefits and contact with nature were assigned to be important for all categories. Heart and veins (health) were assigned to be less important for beginner runners. Being socially active was not assigned as important, this is logic as all 8 ‘beginners’ were individual runners. Competing with others was not recognized as important for them, in contrast to more advanced runners. Though, ‘improving ones self’ was important for beginners, even more than for advanced runners. The advanced runners did find competing with others more important than the beginners.

Men vs women

Similar comparisons can be made between men (n=26 and women n=28). Here, the same factors are found to be important in general. Although women tended to be much more motivated by weight loss, while men generally seemed to find competition with others more important.

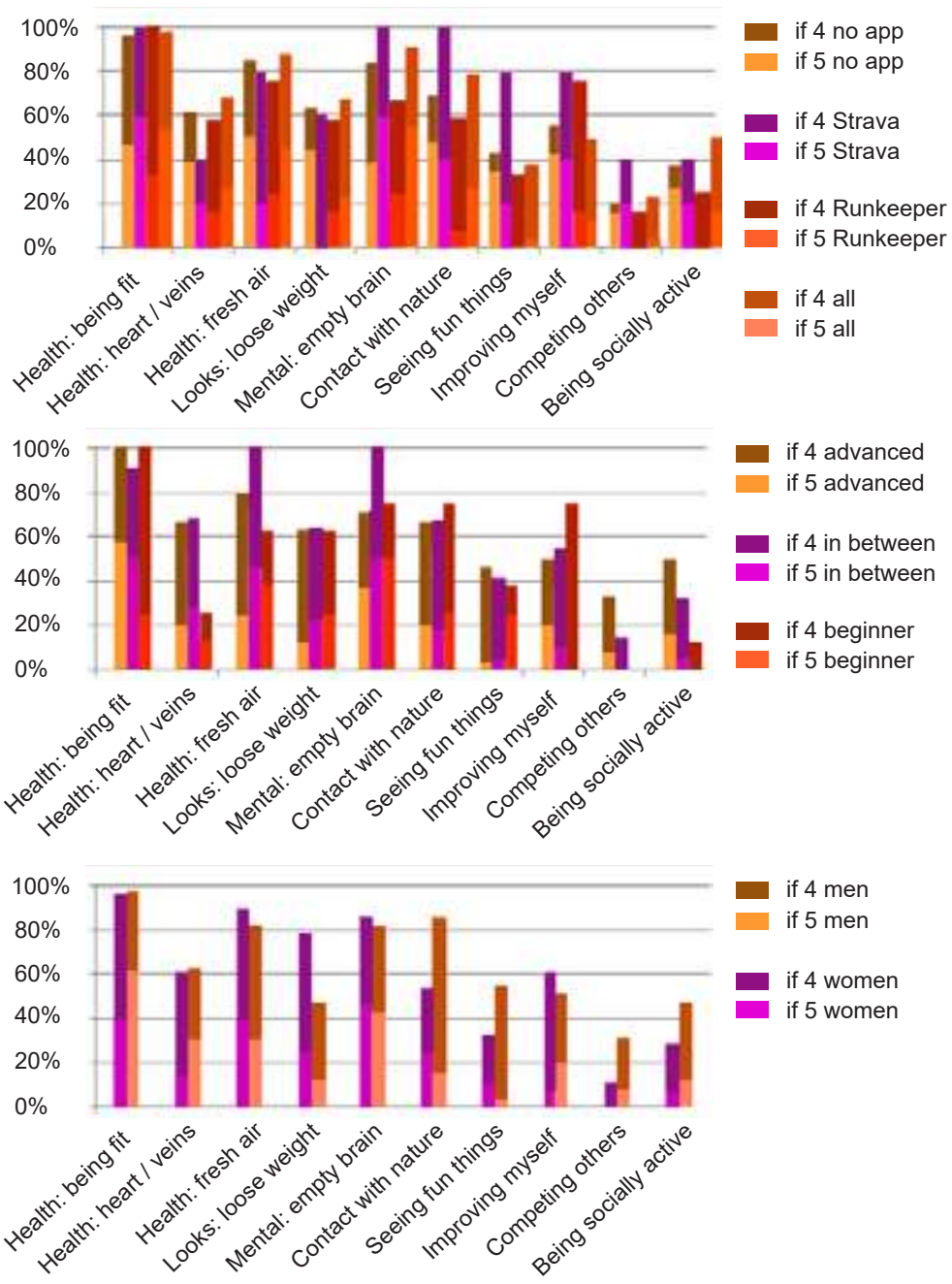


Figure 5.6: Differences in running motivation (1 = not important, 5 = very important)

Outcome

The above characteristics of runners, imply some relevant differences between Strava users, Runkeeper users and non-app users.

A large proportion of Runkeeper users, and a large proportion of ‘beginners’ within this group, suggests that Runkeeper is more mainstream, easily accessible application often used by beginning athletes.

In contrast, Strava users tend to be more competitive and advanced runners, with a large proportion being male. This is supported by the notion, that ‘competing with others’ was more often an important motivation for men compared to women.

The nature of the application is relevant in these differences. Strava is known for the possibilities to compare your results to other users, it is a platform of virtual competitions in both cycling and running. It would also explain the higher amount of training kilometres and long distance participants among Strava users at the ‘Dam tot Damloop’.

These results do support the notion that analysing running behaviour for these two ‘groups of runners’, will provide an image of running behaviour from two differing sides of the spectrum of runners. It is therefore a strong case that by analysing these two groups, together a representative image of ‘the runner’ is attained.

5.3 Temporal dimension

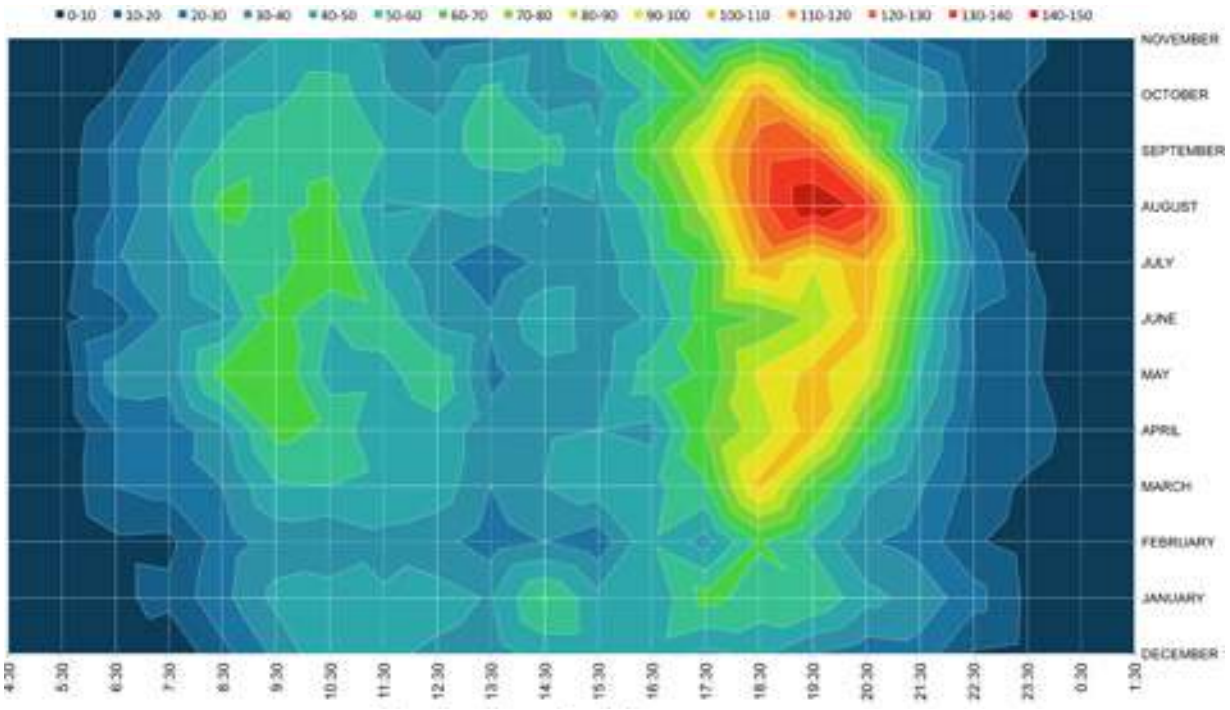


Figure 5.7: Runkeeper: amount of weekday running activities in Amsterdam 2010-2015

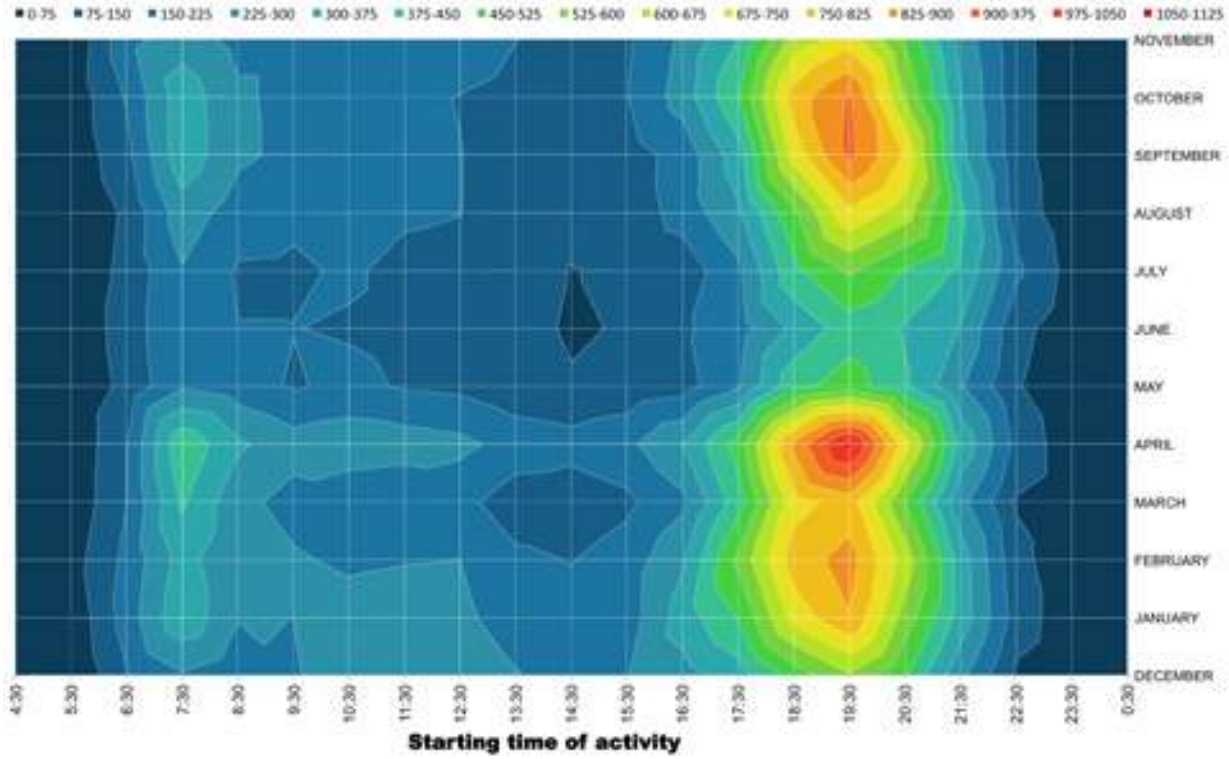


Figure 5.8: Strava: amount of weekday activities in Amsterdam feb. 2014 - feb 2015

Weekday patterns

Observation

The difference between Strava users and Runkeeper users seems to result in various running behaviour in time. On weekdays, we can see that the evenings are most intensely used for running in both apps (figure 4.7 and 4.8). The mornings are less often used for running, but still more often than the middle of the day. These intensity patterns can be recognised in the data from both apps. Though, there are two significant differences on a more precise level. First, in the Runkeeper graph, the intensity clearly 'follows' the times of the sunset and sunrise, which changes through the year. When it gets dark, the amount of people that run drops. Though in Strava data, the intensity is fixed in time through the whole year: around 19:30. This is similarly apparent in the mornings, where the intensities are fixed around 7:30. Secondly, the Strava data presents a 'gap' between May and September. This is not the case in the Runkeeper results.

Interpretation

First, the rough pattern of intense use after 17:00, can be easily linked to the end of the workday. It is supported by research from Synovate, that stated that Dutch runners prefer to run after dinner (Synovate 2008). Secondly, the fixed intensity of the Strava data at 19:30 could, as we imagine, have two reasons. First, 19:30 is a logical time for regular athletic evening trainings. It could mean, that Strava users often train with organised groups around fixed times. In contrast, the Runkeeper user would then be a more informal, individual runner. This is not a logical explanation; research from the HVA (Dallinga 2015), showed that Strava users at the Dam to Damloop, were more frequently individual runners (79%) than Runkeeper users (75%). An explanation which makes more sense, could relate to the male-dominated Strava data sample. Possibly, males have less trouble with running in the dark than women. Research from Van Andel (2009) supports this thought. For the May-August gap in the Strava data, there could be one simple explanation, that also tells us something of the Strava user. Strava is primarily an app for cyclists. The cycling season, starts in April and ends in September/ October. Users likely switch from running, to biking in this period.

Weekend patterns

Observation

Comparing the use in time of the two datasets gets harder when we look at the use in the weekends (figure 4.9 and 4.10). One thing does not really change in comparison to the week data: intensity follows the sunset/sunrise times through the year in the Runkeeper data.
Also, another peak to notice lies in January at 16:30. This peak is also present in the week-data. The intensity has already decreased in February. In March (spring), the intensity returns once more, and increases towards the summer. The intensity then further increases on until October; possibly also driven by training for some large running events (Amsterdam marathon and Dam tot Damloop). Though, this increase does not occur fluently; a shift on the day seems to emerge. Where in summer months (from June-August), the intensity lies around 9:30, this shifts to around 17:30 in autumn (September-November).
The Strava data shows more simple patterns. Again, intensities only slightly react on day-lengths. Also again, intensity is gathered until April, and from September. Third, January is here also a month with frequent runs. For the rest, the intensity is quite equally spread over the middle of the day.

Interpretation

A possible reason for the January intensity could relate to our 'new-years-good-intentions'. Possibly also the need to lose weight after Christmas.
If this is true, it is clear to see that we do not maintain this motivation longer than a few weeks. This motivation then seems to return when spring (nicer weather?) begins.
In this regard, the shift from summer-morning intensities, to midday-spring intensity could also be driven by outdoor temperatures; summers are either too hot at noon, or autumn is too cold in the morning. Also, summer holidays could play a role: we then have time to use the morning for running.

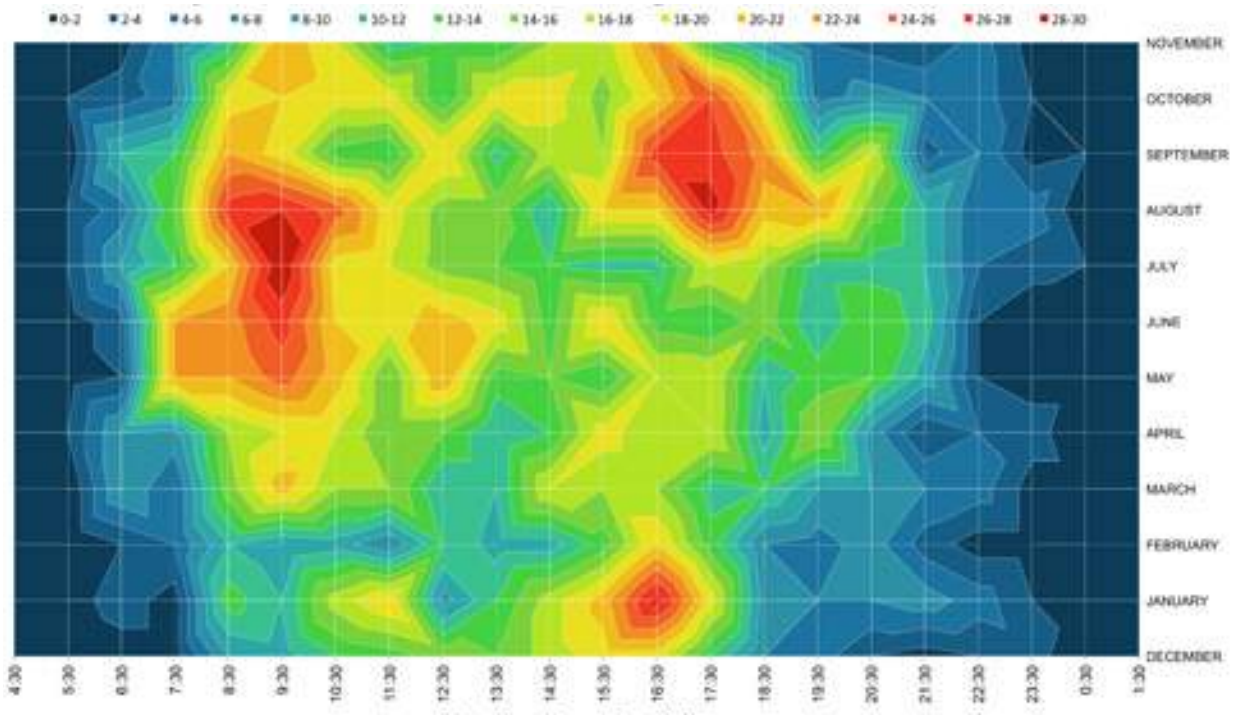


Figure 5.9: Runkeeper: amount of weekend running activities in Amsterdam 2010-2015

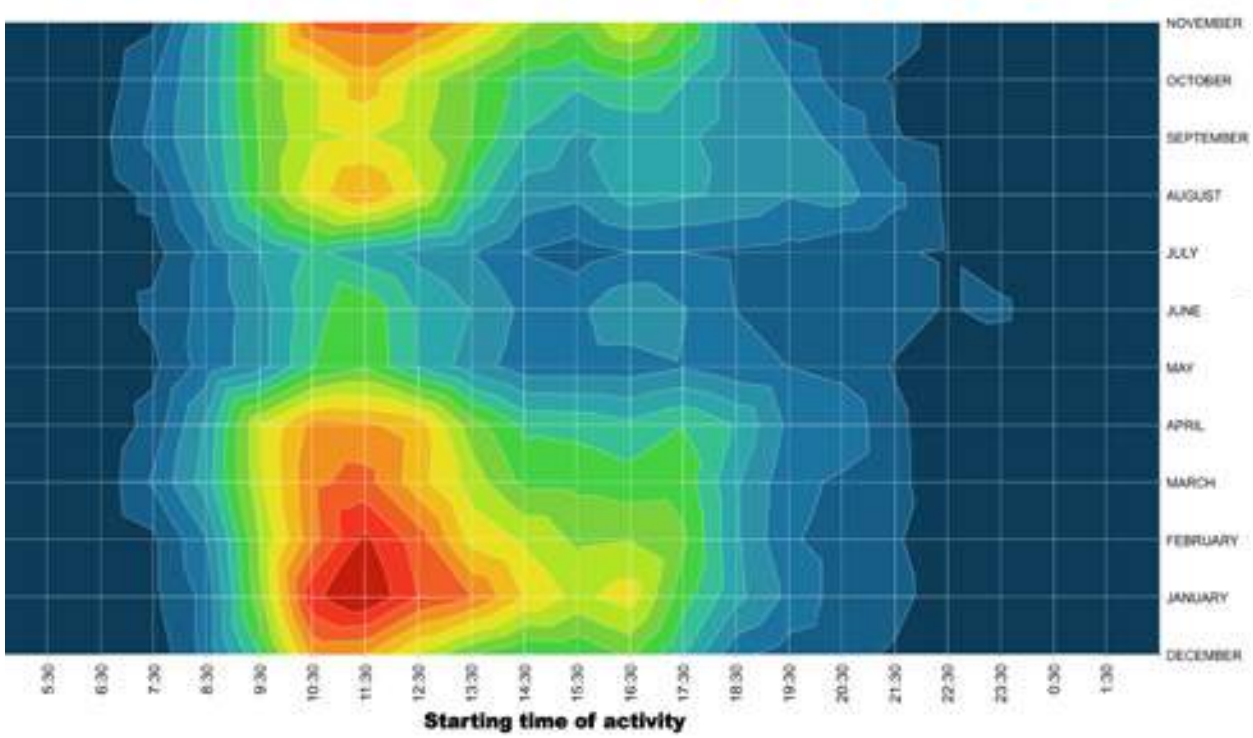


Figure 5.10: Strava: amount of weekend activities in Amsterdam feb. 2014 - feb 2015

Design challenge

The above mentioned patterns show that time is a highly relevant aspect/parameter of running (behaviour). Though, not all above mentioned temporal patterns, will necessarily have spatial consequences. Likewise, we can often not claim they are a consequence of spatial conditions (for example: avoid busy street-hours). And even if they do, they do not necessarily relate to a design challenge. Though, some patterns are potentially interesting. These are the temporal aspects that seem to prevent people from running. If such an aspect is (also) a consequence from certain (unpleasant) spatial conditions, it can result in a spatial design challenge. The avoidance of running in dark-hours seems promising in this regard.

5.4 Spatial dimension

All activities/ Unique activities

This chapter explains what behavioural patterns can be recognized in the data. It will strongly focus on how these results relate to the spatial structure/ configuration of the city as described in chapter 4.

The most holistic way of showing where people run, is by mapping the data from all available activities, regardless of time, distance or temperatures. Analysing our spatial running behaviour can be done through such data subsets, but before doing so, we need a general image of spatial running behaviour to which these subsets can be compared. And many interesting and already rather complex spatial patterns can be recognized in this total data-set.

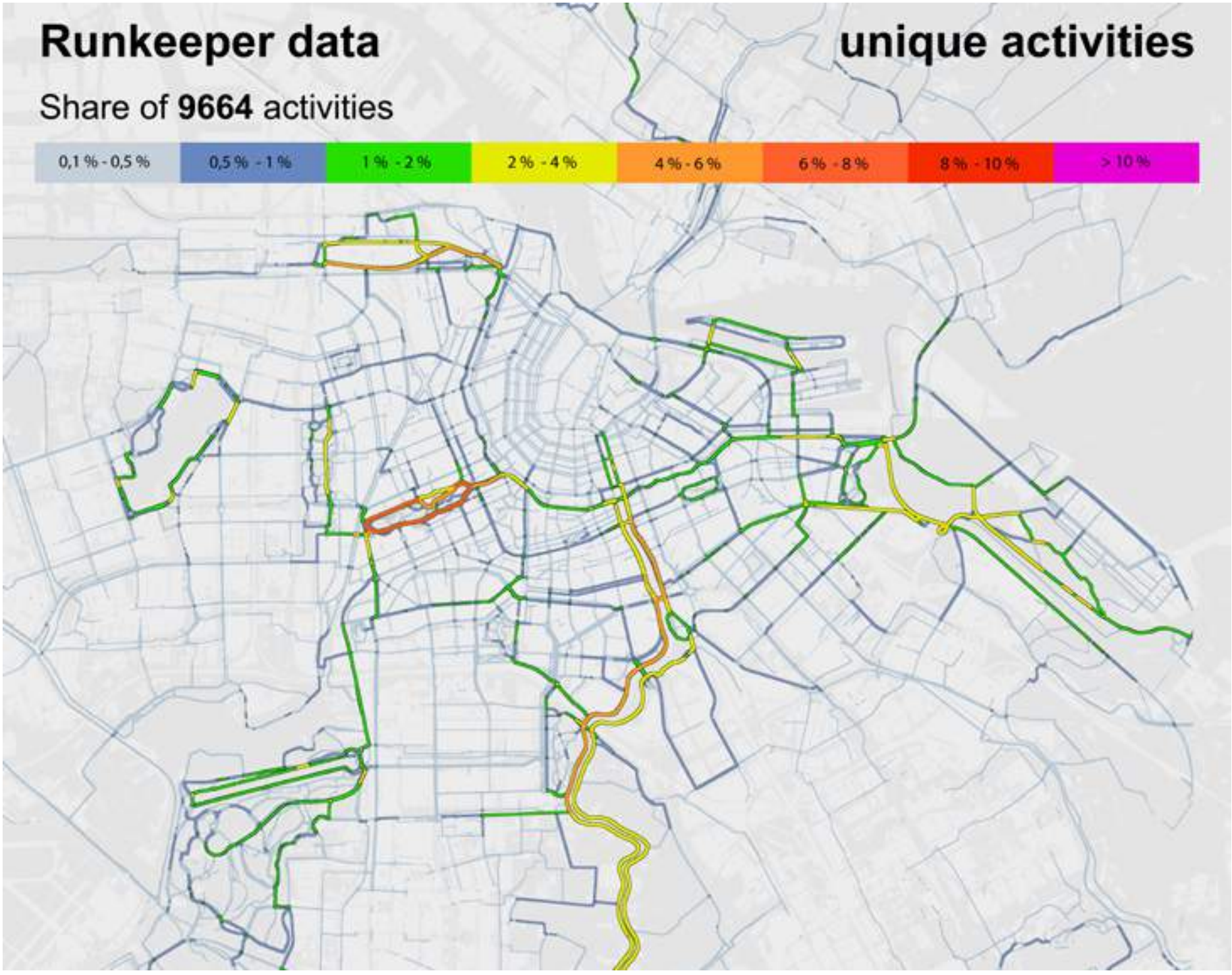


Figure 5.11: Usage intensity of Amsterdam space by Runkeeper users

Observations

The first question which arises when looking at figure 5.11 and 5.12, is: do the maps of Strava and Runkeeper show the same intensities? The simple answer is yes. To some extent, there are some differences found of 1-2%, but it hardly gets more than that.
Through one aspect in which they differ, is the presence of activities performed during large running events (mainly the Amsterdam marathon and Dam tot Damloop. Figure 5.13) In the Strava data, these activities were filtered out, which is not the case for the Runkeeper data.

Figure 5.13: Routes of Amsterdam marathon and Dam tot damloop

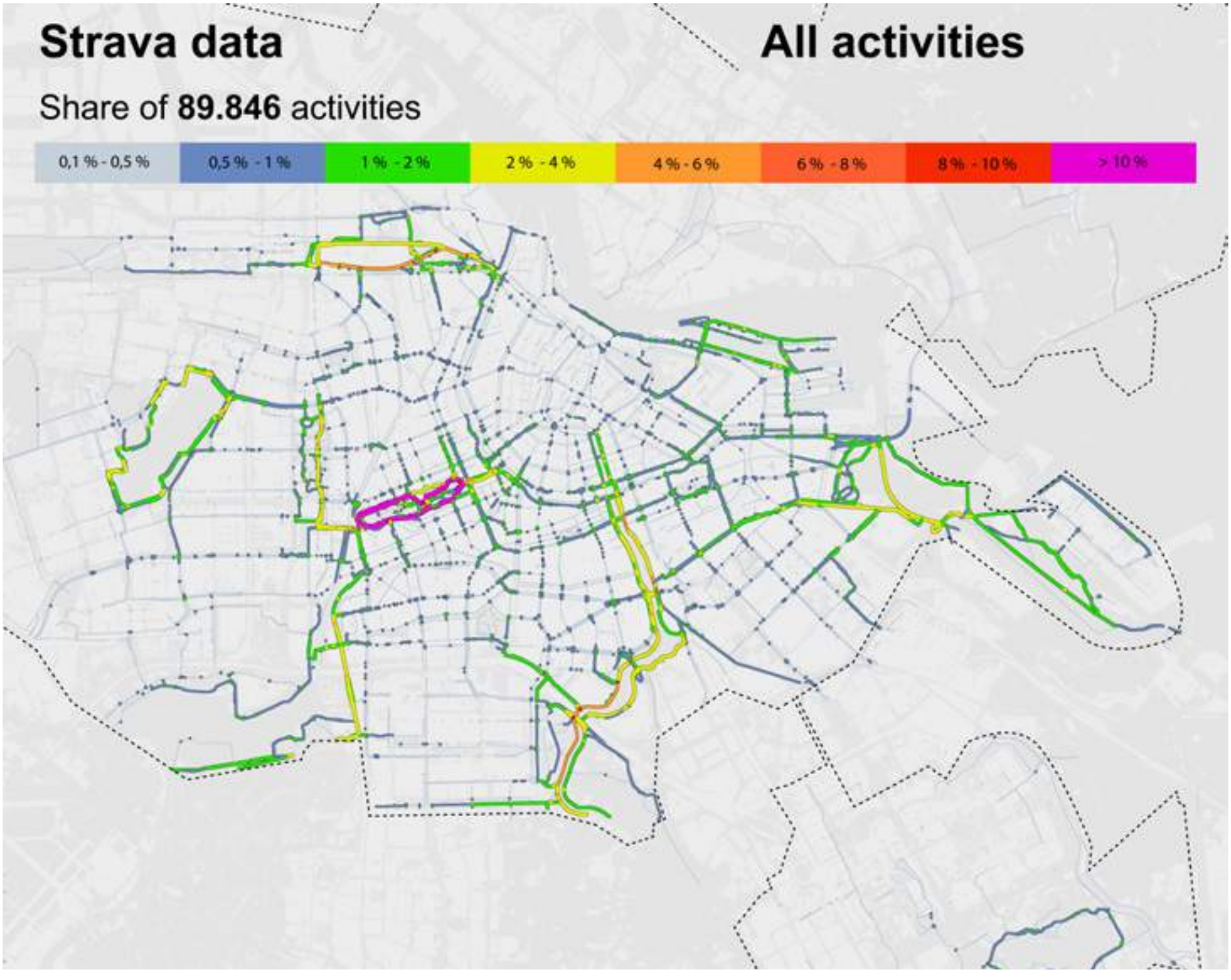


Figure 5.12: Usage intensity of Amsterdam space by Strava users

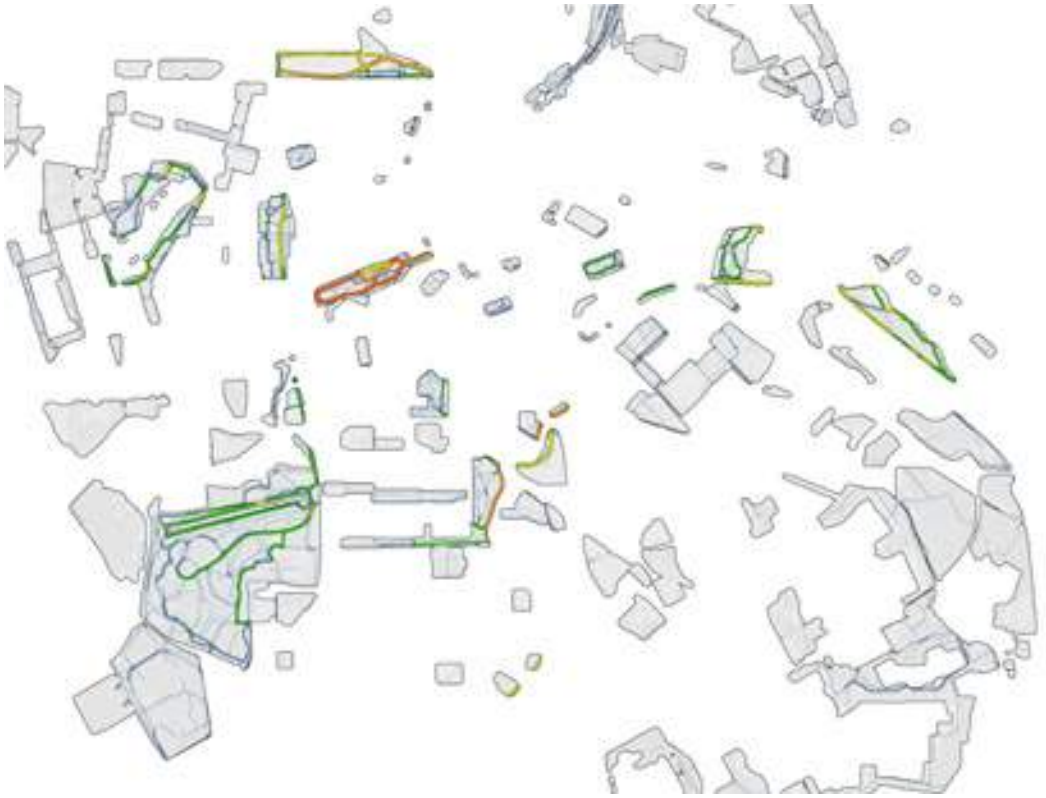


Figure 5.14: High usage intensities in most of the green structures of Amsterdam.

Figure 5.15: Amsterdam without green spaces; high intensities around waterstructures remain.

The first thing which we note, considering the spatial structure of Amsterdam, is the high intensities concentrating in and around the parks of Amsterdam (figure 5.14). Without any hesitation it can be stated that these green areas are the most important urban structures for runners in Amsterdam. These 'Running hotspots' are: Vondelpark, Westerpark/ Westergasfabriek, Sloterplas/park, Rembrandtpark, Amsterdam Forest, Flevopark and Oosterpark. Many are situated in the 6, so planned 'green wedges' of Amsterdam. Relative to their surrounding urban living districts, they all have higher intensities.

Even though most parks have these relatively high intensities, there are sometimes large differences between them. For example the difference between the Rembrandtpark and Vondelpark, is rather big even though they are in close distance to each other.
In addition, the 20th Century Rembrandtpark, Sloterpark, Beatrixpark and also Amstelpark, show less equal divisions in intensity at different sides of the park, in comparison to the (often older) English landscape parks like the Vondelpark, Oosterpark, Flevopark.

The second type of urban structure made visible by the data are the waterfronts (figure 5.15). Mostly the Amstel river, Bosbaan and the water edges at the 'IJ', are popular in their part of the city. One exception to this rule is formed by the Schinkel; one of the main waterways of Amsterdam. It hardly shows running activity at its edges.

Though, there are also places which 'disappoint' us in their intensities. The entire south-eastern part of Amsterdam and also Amsterdam North are 'under-used' in both the Strava and Runkeeper maps.

Interpretations

The high intensities in and around the parks and waterfronts do support the large value of the natural structures that were consciously preserved or developed while the city expanded.
The high, and equal divided intensities in the older urban parks could be a consequence of their central locations or strong connectivity to the dense-urban inner city. The difference in park design could contribute as well, the clear main 'lap', characteristic for the English landscape parks, can be strongly seen in Vondel-, Ooster- and Flevopark. The intensity is in addition equally divided over the lap. Though, this does not account for all English landscape parks, the Sarphatipark hardly shows any usage, the English part of the Westerpark seems to mainly function as a connection towards the more modern part of the park in the west.

Though, just looking at intensities, does not directly allow us to conclude that they are 'best used' urban structures. For example, some places have a more 'refined' network over which the activities are spread. The Vondelpark for example has one obvious main route through the park and almost everybody uses it. All intensity concentrates here, and the park colour becomes red easily. In contrast, the Amsterdamse Bos has much more paths (173 km), and thus more options for running routes. The intensities spread out over these routes and the paths then only show a blue or green colour. Though, the total amount of people that have visited these two places does not have to differ in equal ratio's.
As such, also unequally divided intensities in a park are not necessarily a problem, we can imagine it to relate to having multiple route options. Though it could equally easy relate to a bad 'readability' of a park's spatial structure, or only being used as a passage.

At last, the low scores of the 'outer-ring' urban districts surprises us, regarding the fact that these neighbourhoods were planned in a more spacious structure. We can hardly imagine that a lack of suitable public space is the reason here for it being unused, hardly any region of Amsterdam knows more 'green' or pedestrian friendly space.
Instead, we expect this to relate to the geographic composition. There is less 'wealthy' Dutch middleclass here, but instead a less wealthy population. They either run less, or do not use app's when running.

Design challenges

What these results mean in terms of the spatial challenges they address depends very much on how you interpret them. For example; we can conclude that parks are used intensely compared to their surroundings. We could see this as an argument to put large effort in making these places running paradises; this is where people want to run after all. But simultaneously, we can use it as an argument to put effort in making the surrounding neighbourhoods more runner friendly. These are apparently the places experienced as less attractive, is there as such not more work to do here? The truth may lie somewhere in the middle.

This dilemma can in two ways solve itself. Firstly, when a place that is supposed to be attractive/ important for runners, is not used intensely. For example, the Rembrandtpark scores significantly lower than the Vondelpark, even though other parameters as location and size, do not seem to differ as much. A similar comparison could be made between the Amstel river and the Schinkel river.

Secondly, at places where there was hardly any use visible at all (Bijlmer and Amsterdam Noord). To set future challenges here, additional research should first study: "Why do people not run here or do they not use an app?" If the first option is true, finding ways to stimulate running in these areas could be an important future challenge.

The data

The fact that the Strava data and Runkeeper data show very comparable results, does convince us that these intensities do rather well represent where people (or at least app users) run. It is notable to realize that even though the users of Strava and Runkeeper had significantly different characteristics, it doesn't seem to result in different locations being preferred for running.

Range

Figure 5.16: Range of large green and water structures in one map, piled into one image.

The previously showed heatmaps display how intensely streets/paths had been used. This is of course often equivalent to a certain urban structure. Though, it is not the only way to analyse/ visualize where people run and where they don't. We can also visualise it through another 'unit': the total amount of routes that went through a certain urban/natural structure (figure 5.16 and 5.17). Through this type of analyses, we lose the 'disadvantage' that the previous data visualized: the spreading or bundling of routes.
We did this for the largest parks and water structures of Amsterdam, in order to say something about their relative attractiveness. Through only showing the routes that went to the structure, we also get an image of the way in which the structure is connected to other structures by runners. In the next page, 12 places have been separated, showing only the routes that went through this place.

Observations

Interesting things could be said about all singular maps (figure 5.17); though here we will restrict our comments to general patterns that can be recognised. First, something could be said about the amount of routes going through these places in general, and the connectivity of these routes. The first pattern that can be recognised, is the increase of amount routes and connectivity with an increasing park size. Small parks like the Sarphatipark, Oosterpark, Beatrixpark, Noorderpark and also the Flevopark have relative low amounts of routes compared to parks like the Vondelpark, Westerpark, Rembrandtpark and Sloterpark.
Then, in contrast to the previous heatmaps, the Vondelpark is not the number 1 running location of Amsterdam, but the Amstel river is (1300 routes going through the Vondelpark vs 1360 routes along the Amstel). For both accounts, that the routes connect widely, reaching almost all far ends of the inner and outer city. They have the largest range, despite the fact that many activities start and stop within the park and at the Amstel.
On the second place, the Amsterdamse Bos is to be found. It becomes clear now, that the large amounts of paths in the park, did divide the intensities in the intensity maps. Through this analysis, the enormous value of this place for runners becomes better visible. Taking into account this large amount of routes in the Amsterdamse bos, its connectivity is relatively small. Instead, many routes start at the beginning of the 'Bosbaan'. It shows that many people use other forms of transport to get to the Amsterdam forest, and start their run here.
On the third place, the Westerpark and Rembrandtpark have a similar number of routes going through the parks. Though, they differ in their 'magnetic field', the Rembrandtpark owes a large extent of its routes to the Vondelpark, with which it is strongly connected.

Other analysed urban structures are the three main water structures of Amsterdam: the Amstel, the Schinkel, the Noordhollands kanaal and the IJ-shores. For these, only routes running along the structure were selected, not those that only crossed a bridge over it once.
Both amount of routes and connectivity of the Amstel and the IJ-shores are quite bigger than the Schinkel and also Noordhollands-kanaal, as was its 'score' in the previous heatmaps. The Amstel seems to 'serve' all the neighbourhoods that surround it, like an urban aorta. The Schinkel is running behind in this regard. It seems to be used mostly in a combination with the Vondelpark and/or Rembrandtpark 'lap' and hardly to be used as a single entity.

Interpretation

Through this analysis, size of parks seems to matter even more than became clear in the previous heatmaps. In addition it does in some cases provide a better image of the relative value of a place for runners. The Amsterdam forest for example turned out to be significantly more used than could be seen in the heatmaps, due to its fine-grained path system.

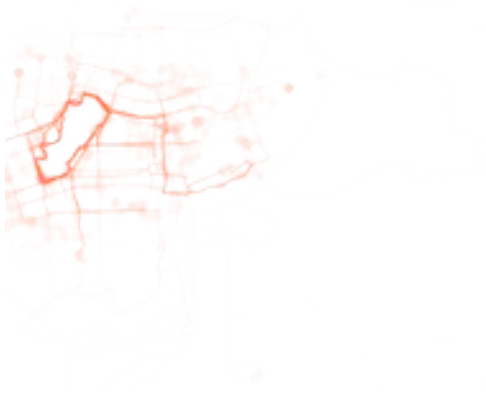
Design challenges

The value of the maps in terms of 'route amounts' is not different from the previous heatmaps, it just gives slightly different results. Added value mostly lies in the possibility to see how certain urban structures are interwoven with its surroundings. This can for example give insights in where attractive routes towards urban structures like parks, and in between these parks could/ should be created.

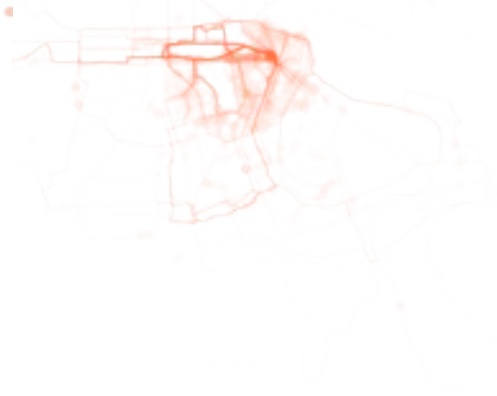
Data

Also here, every single map could have been turned into a heatmap, it would have increased the level of detail of which something could be said.

Sloterpark 431 routes

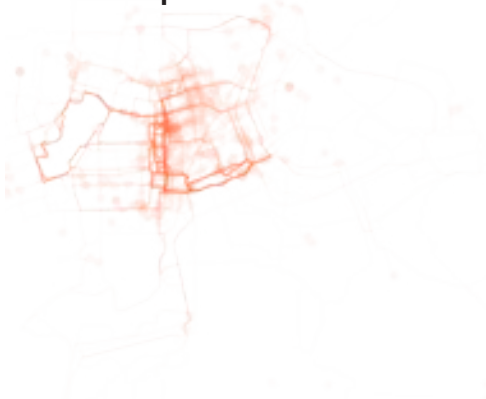


Westerpark 640 routes



Noord Hollands kanaal 240 routes

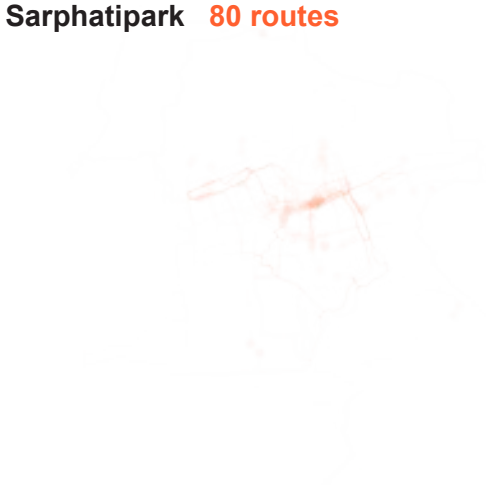
Rembrandtpark 690 routes



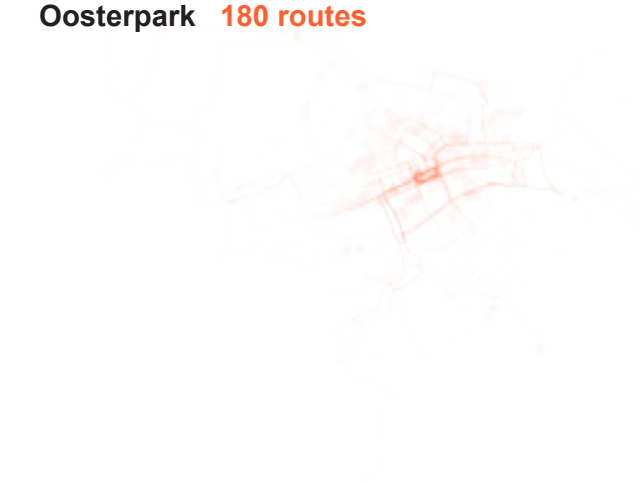
Vondelpark 1300 routes

Flevopark 320 routes

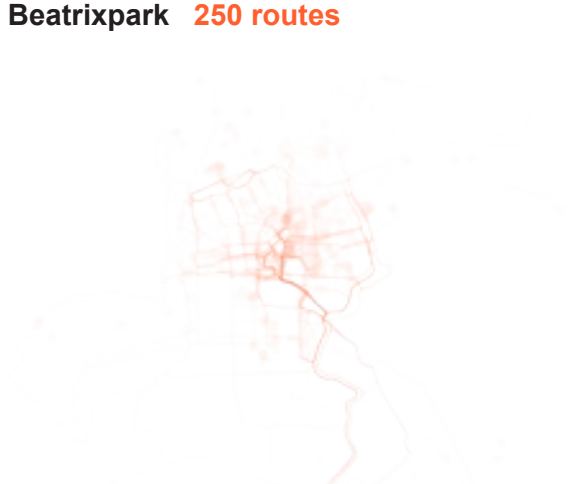
Sarphatipark 80 routes



Oosterpark 180 routes

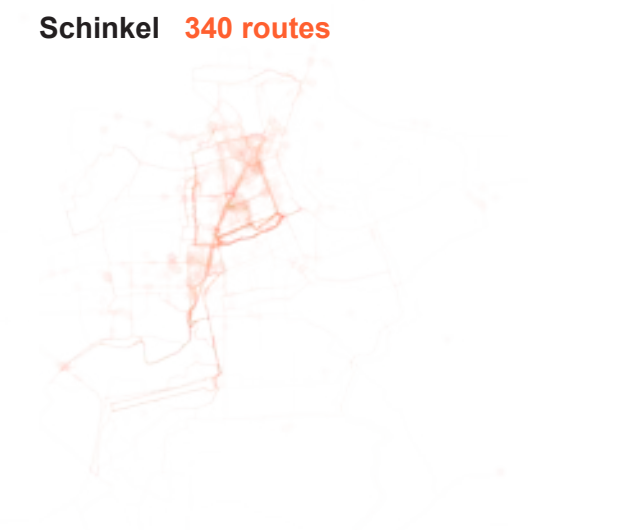


Beatrixpark 250 routes



Amsterdamse Bos 800 routes

Schinkel 340 routes



Amstel 1360 routes

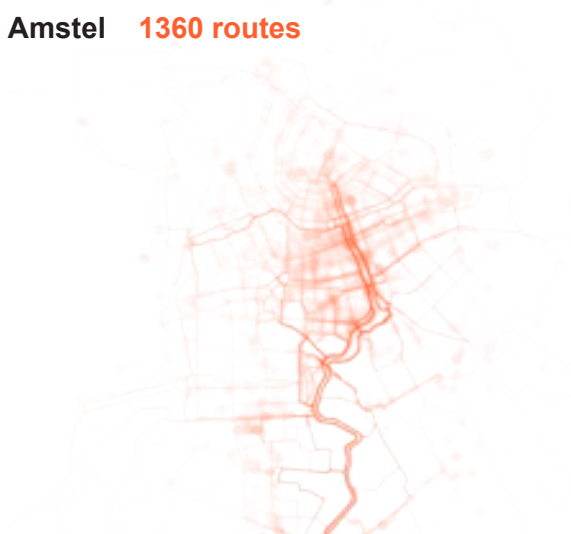


Figure 5.17: The range of large green and water structures separated in twelve maps

Distances (Runkeeper data)

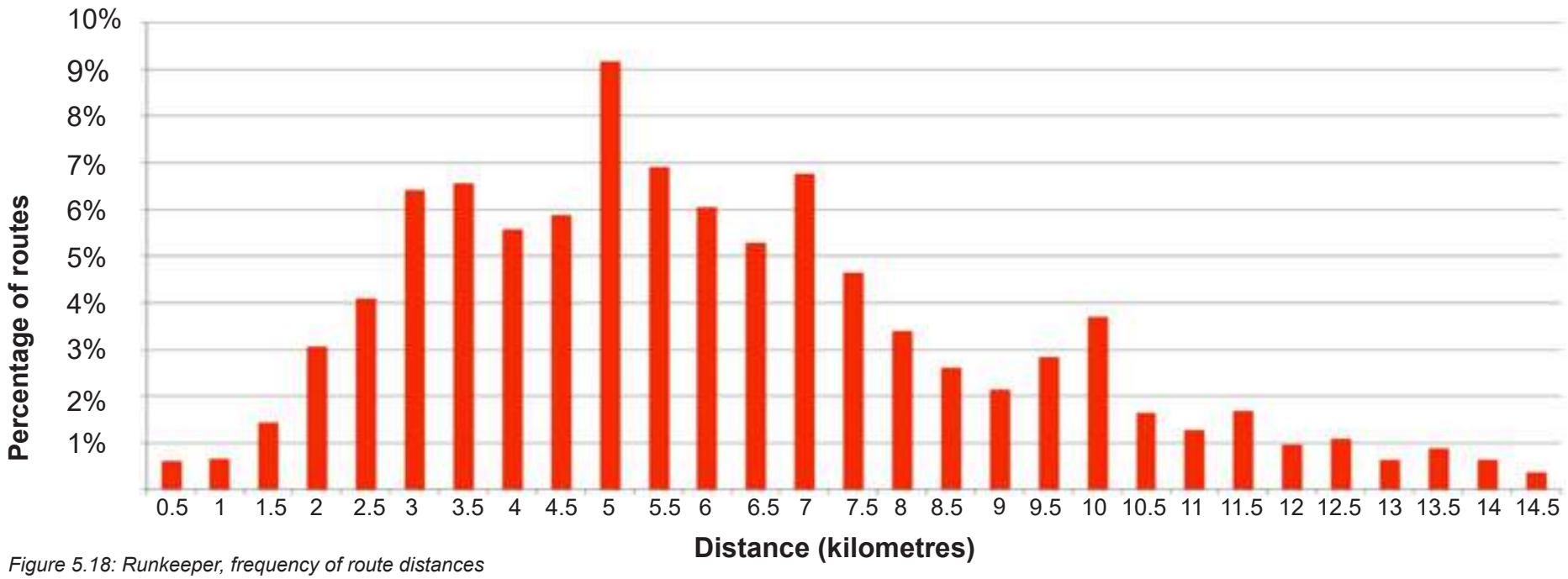


Figure 5.18: Runkeeper, frequency of route distances

Runkeeper users ran all kinds of distances, varying between 200 meters and over 50 kilometres. The distance someone regularly runs, tells something about the profile of the runner; beginning runners will not often run distances of 10 kilometres directly. Vice versa, advanced runners will more often run longer distances as they are physically capable of doing so.

The data also supports the assumption that advanced runners run longer distances than less advanced runners. If we analyse the relationship between average speed and route distances (figure 4.19), we end up with a positive trend (regression): the longer people run, the higher their average speed was. It can thus be said that in general/ on average: long distance runners are (physically) more advanced runners than short distance runners. Then, it is also very important to note that not every runners behaviour is average. Some people run short distances, with very high speeds (interval-training for example), while others will run very long and slow.

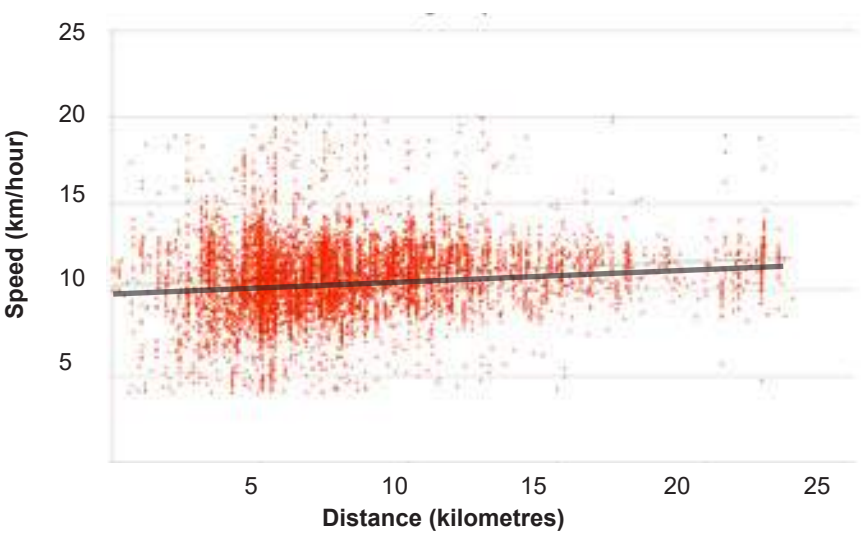


Figure 5.19: Runkeeper, Relation between speed and distance of running activities

This information is not only just interesting; it is an essential conclusion if we want to know something about where different types of runners run. It is not possible to separate the data in ‘beginning runners’ and ‘advanced runners’ directly, but it is possible to separate them by the distance of the activity. And as we know, this also discussed the level of experience of the runner, and inturn something about differences in running locations for these ‘categories’. So what must be determined next is: what is a short distance for running and what can be seen as a long distance? This can also be analysed in the Runkeeper data.

Figure 4.18 visualizes how often certain distances were performed in the Runkeeper data. Several things can be conducted from this image, first of all the most popular distances. Clear peaks can be seen at 3, 3.5, 5, 7 and 10 kilometres. These are the most popular distances. In Amsterdam, both the 3 and 3.5 kilometre peak is probably a consequence of the Vondelpark-lap distance, which is depending on weather you take the shortcut or not: 3.2 or 3.3 kilometre. Then 5 and 10 kilometres are popular distances for other reasons, they are nice round numbers and distances often performed in competition context. The distance of 7 kilometres is a surprise, but could also be a consequence of the Vondelpark distance (two laps).

This information was crucial in making subsets for the heatmaps. A distinction was made between short distance runners (the 4.5 kilometres or shorter) which included the 3/3.5 km, average distance runners (4.5 to 9 km) which included the 5 and 7 peaks and a long distance runners that included all activities of more than 9 kilometres (including the peak of 10 km). This resulted in the three maps in the category ‘distances’.

Observations

The map with routes less than 4.5 km clearly show the laps that people have been running. First to distinguish the popular laps in parks that clearly stand out. Some parks show very clear laps (Vondelpark, Oosterpark, Gaasperplas), while others show more diverse route options (Westerpark, Rembrandtpark).
In comparison to the maps with all routes, the small parks (like the Oosterpark and Sarphatipark) are more intensely used by short distance runners.
One lap which is distinctly different is the lap around the Amstelpark. People are apparently not running inside the Amstelpark park, but around it, on the regular streets.

Secondly, 'laps' are created around waterways like around the Amstel, but also around the Schinkel and in living areas like IJburg and Java-eiland. Bridges connecting different water sides are heavily used here. The Gaasperplas is also very clearly recognisable. Though for the Amstel and Schinkel accounts, only certain segments are used more intensely, often relating to the presence of a bridge.
In general we can see that even for small laps, urban environments with high urban pressure are hardly used. Here and there, streets light up blue (max 1%), but not on many places.

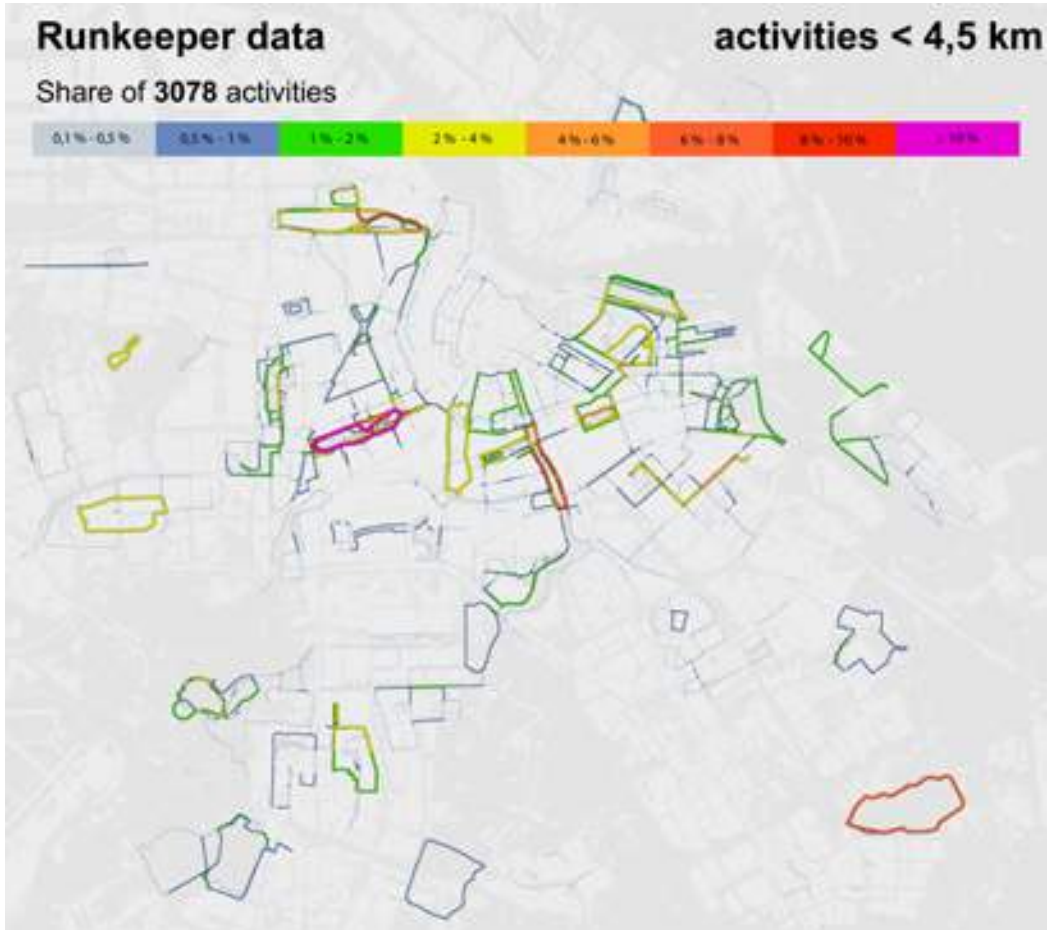


Figure 5.20: All running routes with a maximum distance of 4.5 km

On this map the most popular distances to run are shown (4.5-9 km, see distance table). The bigger laps like Sloterpark pop-up and also the Amstel becomes more intensely used further south. All large parks of Amsterdam now really reach high intensities. The Amstelpark however, remains a place where people tend to run around it instead of through it, just like the previous map showed.

In contrast to the short routes, the urban tissue gets more 'involved' now in the activities, although it does seem that they mostly lead towards different parks and water structures. Regarding the routes towards parks the research recognise a phenomenon which is applicable for Vondelpark, Westerpark, Java eiland and Oosterpark: they are attached to the urban network by a very intensely used 'string/ aorta', one intensely used street/path towards the park.

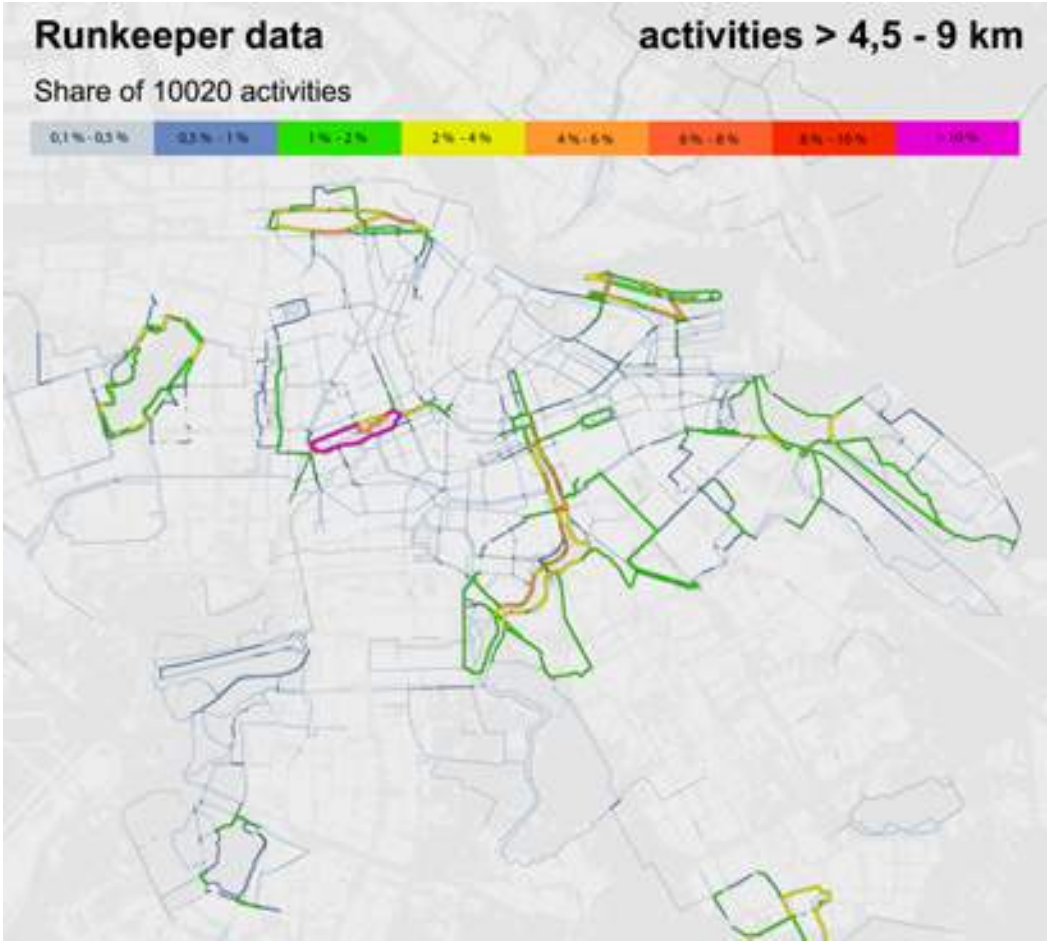


Figure 5.21: All running routes with a distance of inbetween 4.5-9 km

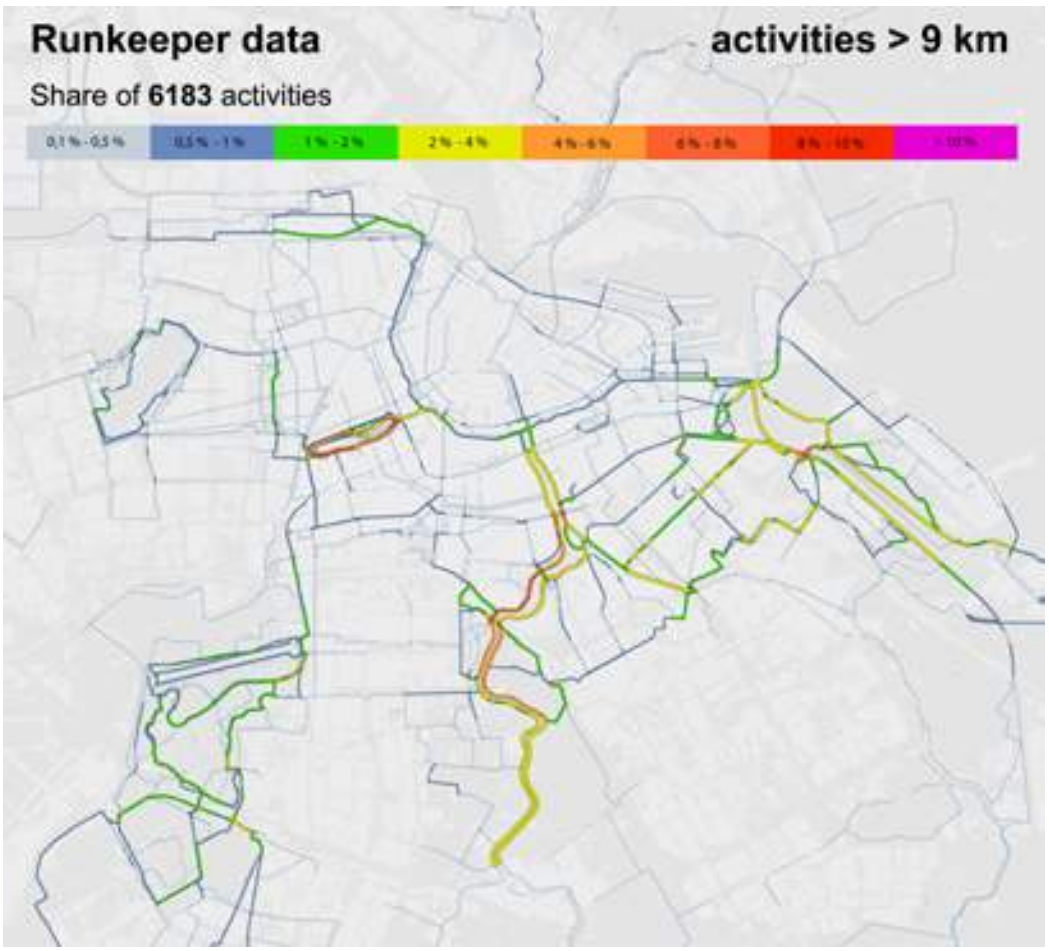


Figure 5.22: All running routes with a distance of 9 km and longer

People who are running more than 9 km seem use the city in a different way, according to this map. Routes seem to fade more into the outer areas of the city, mostly making use of the 'Green finger structure' on which Amsterdam was planned. The strongest green wedge to the countryside is clearly the Amstel, but also in other examples like Vondelpark-Amsterdamse bos, from Westerpark to Spaarnwoude, from IJburg to Muijden and even towards the north.
Urban structures which are sometimes used more convincingly now, are the long, straight infrastructural lines, often relating to the 'finger structures'. Examples can be found between the Rembrandtpark and Sloterplas, the Stadhouderskade (Singel of Amsterdam), and structures at the eastern and western side of the Amstel (parallel connections towards the Amstel 'finger').

Two places that are (again) unused by long distance runners: the eastern side of the Rembrandtpark and the Schinkel river. They do not seem to be streets facilitating the long distance runners, not as a destination or a connection.

It is at last notable to see, that the Amsterdam Forest, is a hot-spot for long distance runners. It proves that the decision to develop a park here, of such a large-size, turned out to be beneficial for certain user groups.

Interpretations

Reflecting on the three maps, it can be clearly seen that different urban districts, have different meanings/qualities for different (distance-)runners. Such knowledge is powerful, as it can provide a better understanding of the demands of users at a certain place, potentially having differing (spatial or non-spatial) needs.
In addition, it is interesting to see that some places attract both long and short distances: the Amstel, the Westerpark and Vondelpark for example. Network density seems crucial in this, as the presence of bridges over the Amstel shows. In contrast, the 'Sloterplas' does not serve short distance runners due to the absence of network density (lake).
Strong interconnection with surrounding urban or green structures appears crucial for parks are able to be used by both short and long distance runners, as seen in the Westerpark and Vondelpark. A park like the Rembrandtpark fails in this respect.

Design challenges

In terms of design challenges, there are two relating strategies. First, there are ways to better facilitate the type of runner that uses it. For example, parks like the Oosterpark and Sarphatipark, could focus on facilitating short distance runners. It should limit its focus to just these, if believed that due to the (small) size of these parks, they will not be able to seriously facilitate long-distance runners. Secondly, there are places that seem to only facilitate one of these groups, but are be expected to facilitate both, for example due to their size. A park like the Rembrandtpark, or a water structure like the Schinkel, would regarding their large size be expected to facilitate not only short distance-runners. A design challenge would be to find ways to make these places more attractive for this user group specifically.

Data

The findings are based upon a single source, the Runkeeper data. Strava data cannot be used to verify the results in this theme as this data doesn't show individual routes (and the length of them).
In addition, all (close to 20,000) activities had to be used for this analysis. This can increase the influence that individuals can have on the total image. This becomes visible in the maps of < 4.5 km. These small laps are sometimes created by a single person, that has performed the small lap many different times. Then, a very specific 'lap' stands out, which was not present in the unique route map at all.
Despite this, they often show comparable patterns, and can thus still result in valuable conclusions.

Daylight vs darkness

Figure 5.23: Running in the dark with a Nike+ interface

Light is a crucial aspect for running activities. Running is an activity full of potential threads and hazards. Different studies have already addressed the importance of light being present when running. The importance is referring to two aspects in previous studies: social safety (feeling safe) and traffic safety (being visible for other road users). In addition there is a third safety component: physical safety (seeing the ground on which you run).

A Dutch study (GFK, 2014) concluded that 62% of potential runners and 56% of current runners are interested or very interested in 'safe and enlightened routes through nature'. Even though it would have been helpful to see these aspects separated, it does suggest that safety is crucial for runners. This is supported by the temporal data analysis (Chapter 5.3) and research from Synovate (2008), concluding that 30% of Dutch people never run in the dark. Knowing that 30% of both potential and current runners, wants to run more often in the evening, aside from the weekend days (GFK, 2014), makes pleasant places to run in the evening (and thus the dark) increasingly relevant.
More phenomenological studies have in addition provided some ground to better understand the potential negative experiences that can be expected when running in darkness. Van Andel (2009) quotes some experiences from runners in Rotterdam which include:

"By using Google maps, I have made a route that cannot cause me trouble. In an environment that is unfamiliar, I am always cautious."

(Van Andel 2009)

"I do not run far away from my house, that would give me trouble when I injure myself."

(Van Andel 2009)

"Safety? For that only regards presence of light, seeing where I run, so I do not injure myself."

(Van Andel 2009)

Through these quotes, the importance of gender also becomes clear. Women deal with other problems and experiences when running, which are often strengthened by darkness:

"I face boys screaming sexual quotes to me (woman)."

(Van Andel 2009)

"That is a remote place where I could easily get raped, I don't run there (woman)."

*(*Van Andel 2009)

It is also worth noting, that darkness does not only exists in the evening hours. Places not well illuminated, can even during the daytime be experienced as unsafe due to a lack of visibility:

"For example, when training in our urban park, there is an underpass joining two sides of the park, which has steep slopes to either side before descending into a dark, dank and fetid tunnel. Narrow, badly lit, and with poor visibi ity, passing through this underpass demands. of the runner constant visual alertness and monitoring, so as to avoid collision with speeding cyclists, parents and prams, teetering toddlers, lounging groups of adolescents, and roaming, unpredictable dogs."

(Collinson and Hockey 2015)

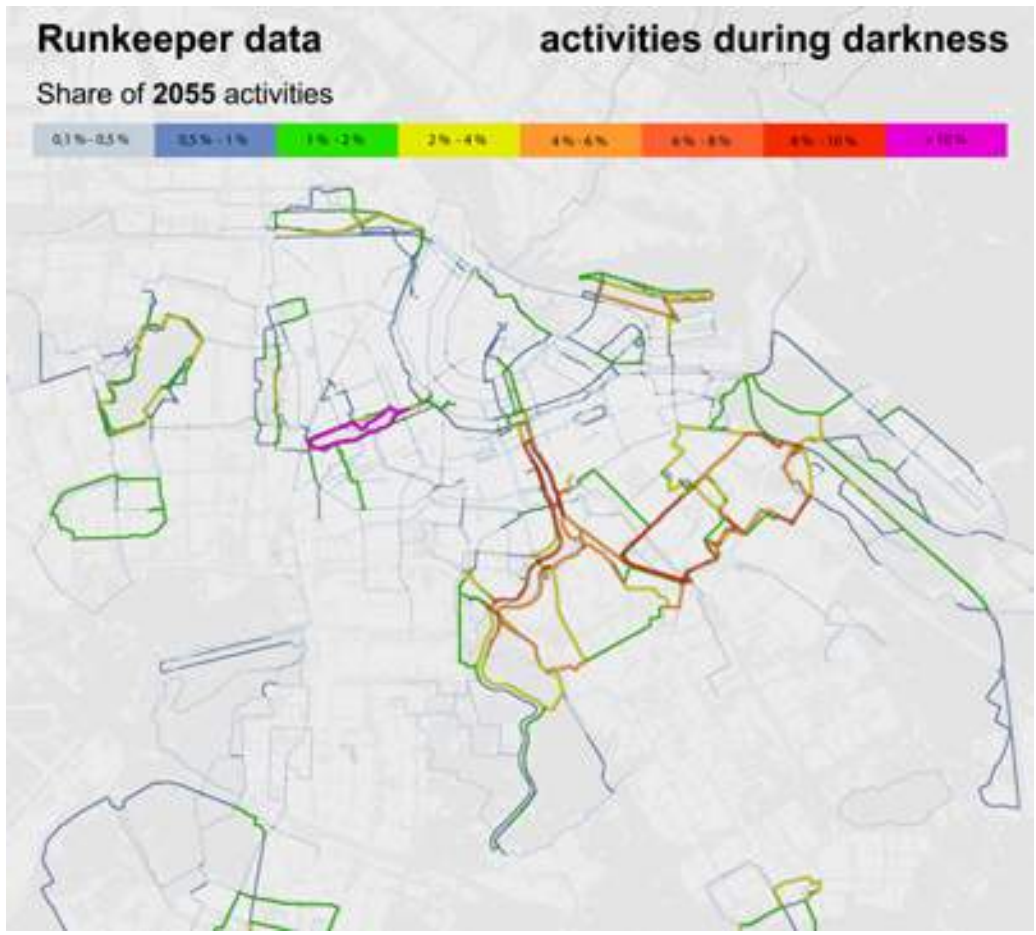


Figure 5.24: All running routes in the dark from Runkeeper

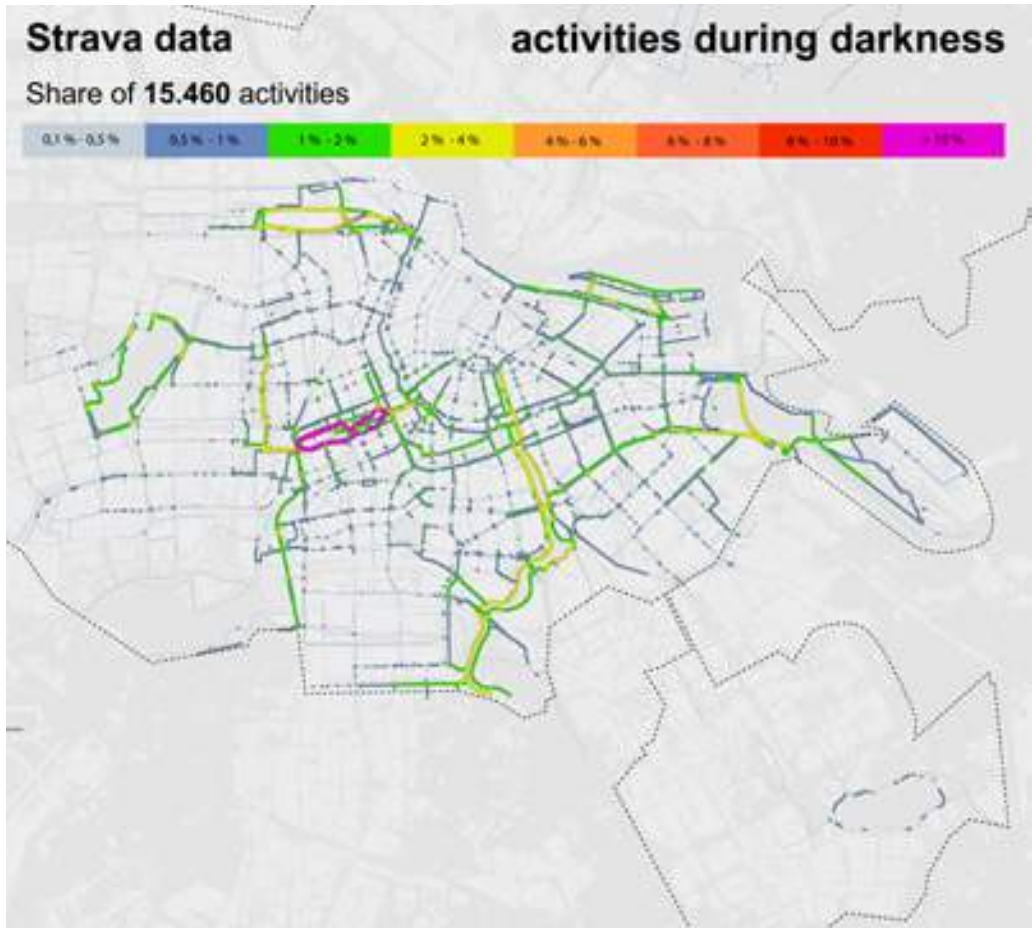


Figure 5.25: All running routes in the dark from Strava

Observations

In contrast to the daylight activities, activities performed in the dark shift towards the inner city. The first part of the Amstel becomes highly used during the dark, whereas the Amsterdamse bos is almost totally unused.
Also on a smaller scale, certain paths in the Sloterpark and Rembrandtpark for example, it becomes clear that there are paths which won't be used anymore.
The western side of the Rembrandtpark is unused, or better said shifts towards the car street outside of the park. In the Strava data, there is no activity anymore in the western region of the park, also not on the car street outside of the park. Also the Gaasperplas fades away in comparison to daylight activities.
Also the Oosterpark (known for the presence of junkies) is unused in this map. The Erasmuspark and Java Island are in contrast well used during dark hours.
Compared to Runkeeper, the Strava map shows a different image. People are running more closely to the city centre, but the activities are better distributed in the urban districts between the green wedges. Although, the places thath are unused in the Runkeeper image, also appear unused in the Strava image.

Most running activities are performed during daylight (about 80%). It is therefore not surprising to see that this map does not alter significantly from the maps that showed all activities or unique activities.

A small deviation can be seen in the image as a whole. The inner city is used slightly less intensely, this intensity seems to shift into the wedges at the cities edges. In other words, during daytime, runners tend to be more ‘outgoing’.

Interpretations

As described in the introduction of this chapter, running in the dark is related to issues of safety. The areas that decrease in use on this map, are highlighting which places are not (perceived as) safe. Whether this relates to a lack of social safety (either objective or perceived), traffic safety, physical safety or a combination of these, can only be assumed by doing additional research.

Design challenges

For some areas, a lack of safety in the dark is not automatically a problem; a large recreational area like the Amsterdamse Bos is perhaps too large and forest-like to be perceived as safe. Although, other more central urban spots (Rembrandtpark, Oosterpark) can in our view, not be accepted as being unsafe in the evening. Safety measurements could be undertaken here, based on the findings in the data.
The maps show that presence or absence of daylight does not only influence when we run, or if people run at all, it also influences where we run. As such, absence of pleasant places to run in the dark potentially prevent people from exercising in the first place.

Data

Some clear differences between the Strava data and the Runkeeper data emerge in the maps of ‘darkness’. The Runkeeper data only includes 2000 activities, so the data sample is relatively small. It has to be taken into account that these maps are based on all activities, not unique routes. Also therefore, behaviour of one individual can have a large influence on the image.
The Strava data can back up the results from the Runkeeper data. This also shows that many results in the Runkeeper data are quite representative; many parts that ‘disappear’ in darkness in the Strava maps, did so in the Runkeeper map.

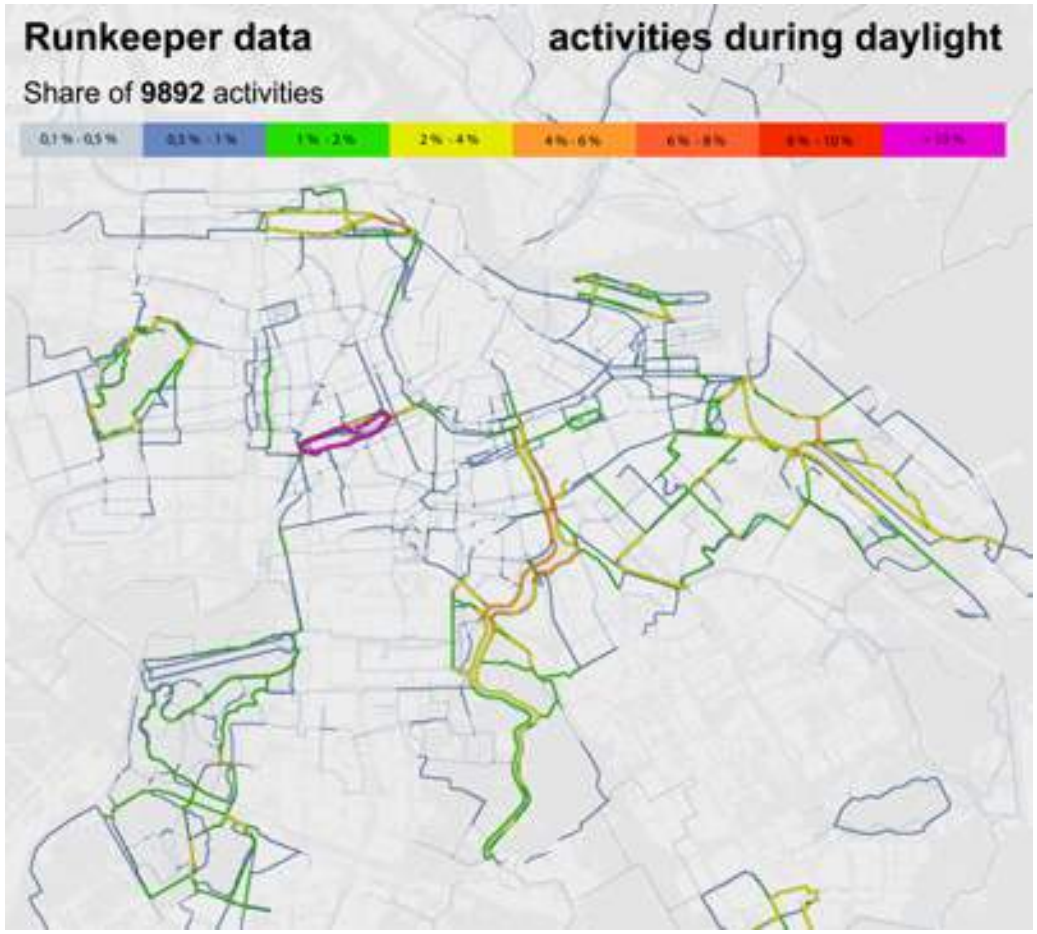


Figure 5.26: All running routes during daylight from Runkeeper

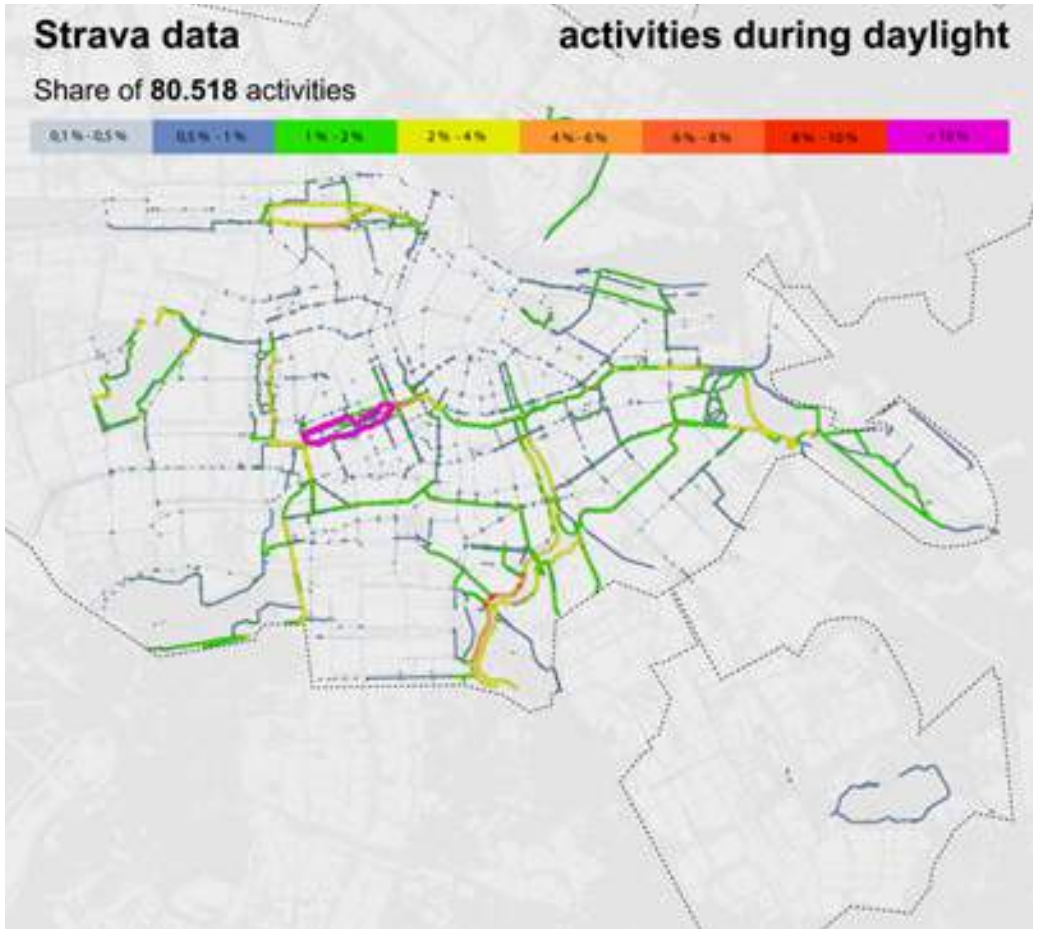


Figure 5.27: All running routes during daylight from Strava

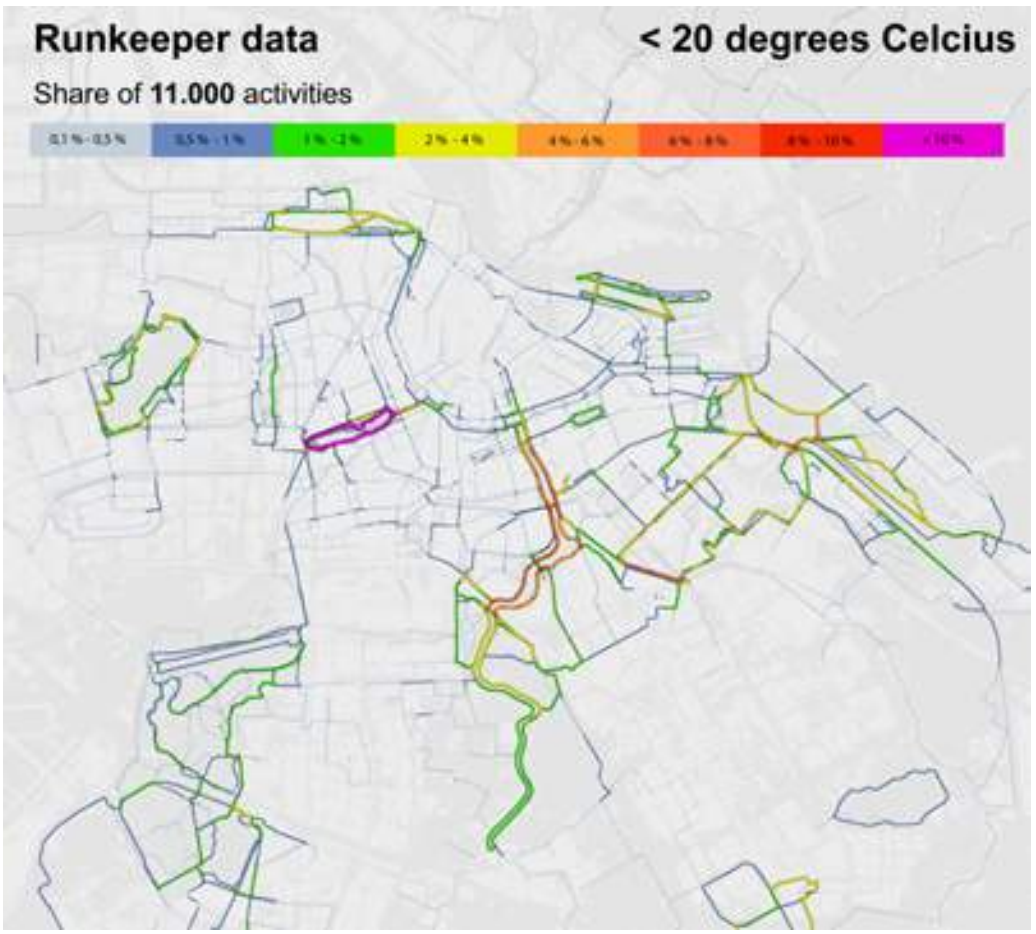


Figure 5.28: All running routes run with temperatures below 20 degrees celcius

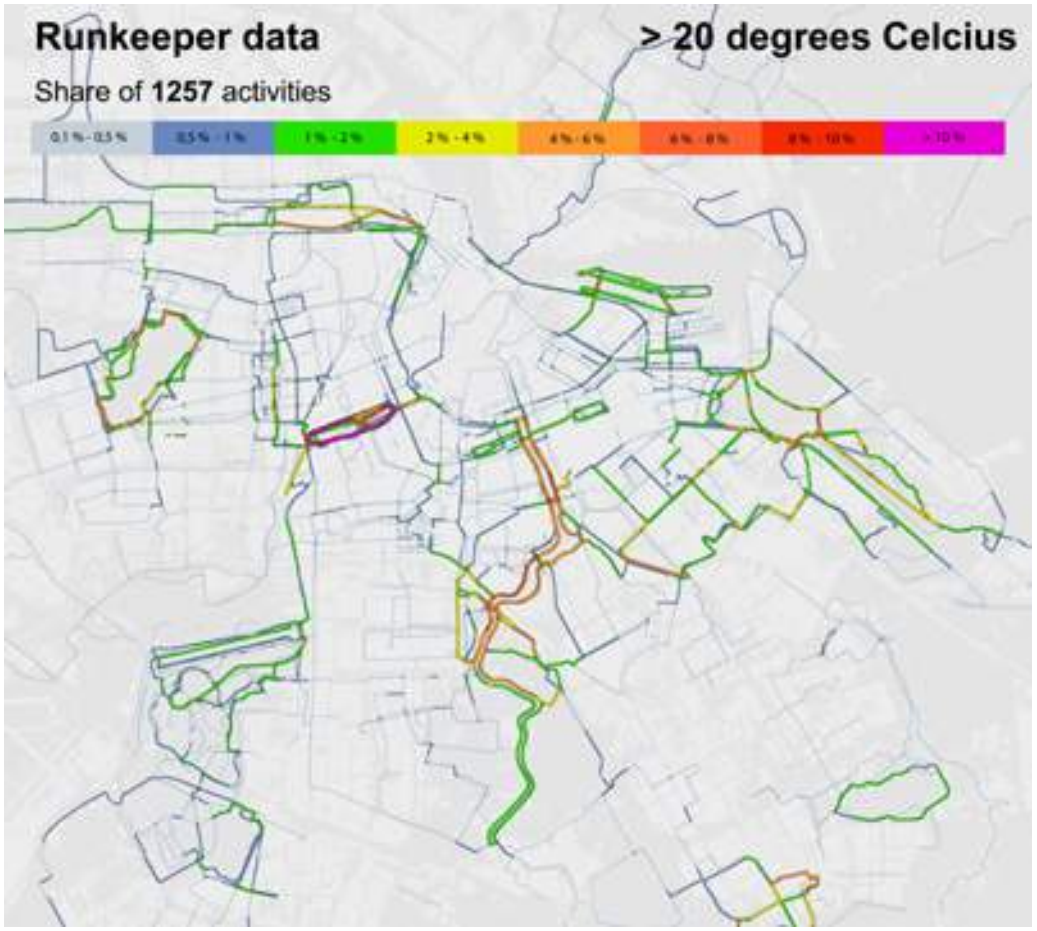


Figure 5.29: All running routes run with temperatures above 20 degrees celcius

Temperatures

The time diagrams (figure 4.7- 4.10) show interesting results in relation to outdoor temperature. In summer, people shift their run to the morning, possibly avoiding the hottest part of the day. The question arises whether this also has spatial consequences. The difference in spatial division of running activities between the two subsets is subtle, but it does suggest certain patterns.

Figure 5.30: Advertisement for awareness when exercising in the heath

Observations

The difference in spatial division of running activities between the two subsets is subtle, but it does suggest certain patterns. First, streets next to the water get more intensely used like the Schinkel, the Bosbaan, Java-eiland and Sloterpark. Secondly, parks (Sarphatipark, Oosterpark, Westerpark and even Amstelpark) are used slightly more used during hot temperatures. These differences are not very large, but they can be recognised.

Interpretation

It is likely to say that places with certain ‘cooling’ qual attract runners when temperatures are high. The place that are in this regards attractive stand out in the maps.

Design challenges

The possible relevance of these findings relates to a spatial problem: the urban heat island effect. This data could serve to show how places function in this regard. Running is in that regard an interesting activity to look at, as heat has a large impact on the activities experience.

Data

In terms of reliability, the question remains to what extent these results are representative. The amount of runs performed when temperatures have been higher than 20 degrees, is small. It could possibly be verified with the Strava data.

(non)-Commuters

In the research domain of Physical Activity and Built Environment (PABE), physical activity is often divided into two groups: physical activity performed for transportation reasons and physical activity performed for recreational (leisure) reasons (Brownson et al 2009). Although running can be done for pure fun, for pure transportation but also as a combination of these reasons. Strava has made a division between commuting activities and non-commuting activities which refers to the character of the run. If a run ends close to its starting location, it is a non-commuting run, if it ends far away from it, it is flagged as commuting activity (see appendix).

Observations

In the map with all the data of Commuters, the 'Dam tot Damloop' is pretty clear in the north as a commuting line. In contrast, the Amsterdam marathon can be recognised very clearly in the non-commuting map. This is due to the fact that the Amsterdam marathon finishes close to where it starts, and the Dam tot Dam does not.
The Sport-as is fairly strongly used as a commuting street. The same accounts for the eastern part of the Rembrandtpark, in comparison to the western side of the park.
The urban street network becomes more strongly present in the commuting activities, used as connections. This is supported by the non-commuting map, in which activities are more focussed in the parks.

Interpretations

For some mentioned areas high scores in commuting activities can be explained through the popular running areas to which they connect. The Sport-as is probably used as an important connection towards the Amsterdamse Bos and surrounding sports facilities. Likewise, the Rembrandtpark east seems to connect strongly to the Vondelpark and also Sloterpark in the north. This would mean that the Rembrandtpark east owes its intensity to a large extent to these places, and is in a lesser degree used as a destination.

Design challenges

Areas visited intensely in non-commuting activities, seem to be increasing as a destination, while streets used relatively intensely for commuting activities have more meaning for connecting origins and destinations. These can show what urban structures are not logically situated between other urban structures.

Data

The maps are based on data which is divided based on a definition set by Strava. Though, commuting and non-commuting is not a black and white phenomena.

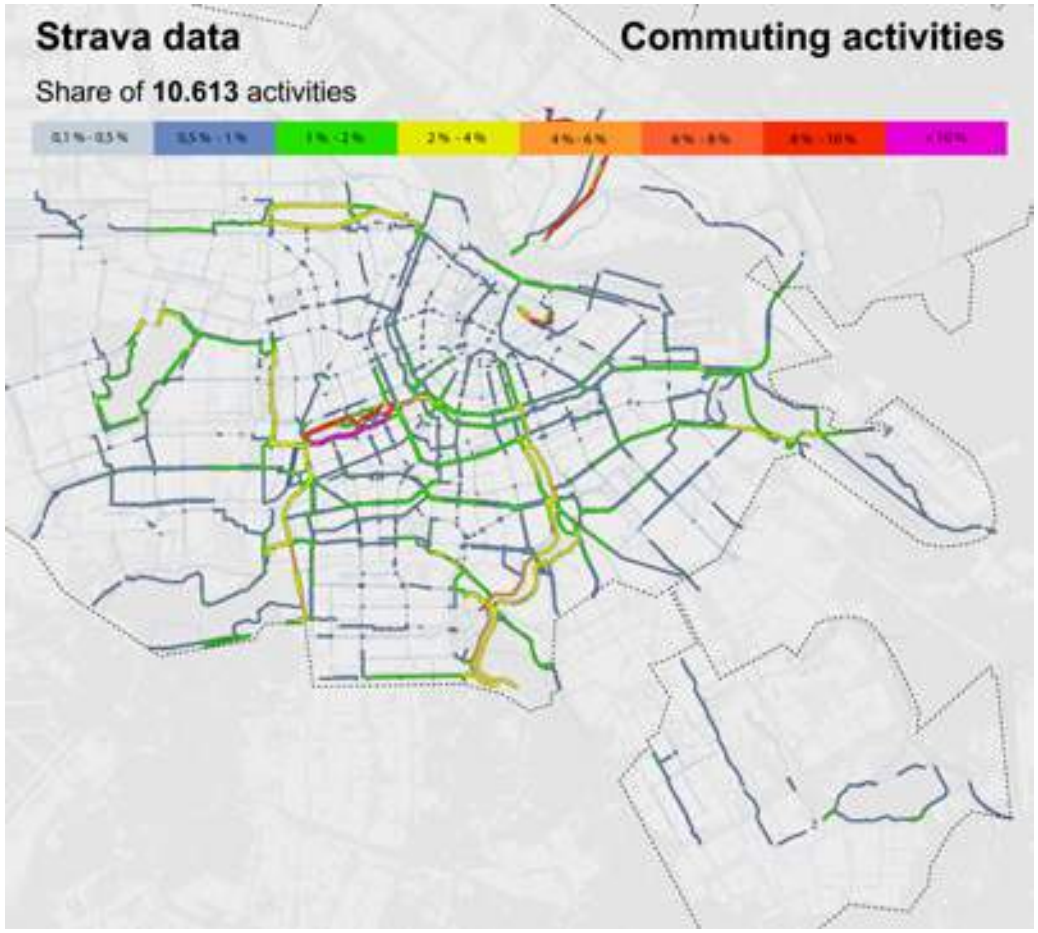


Figure 5.31: All running routes indicated as commuting activities

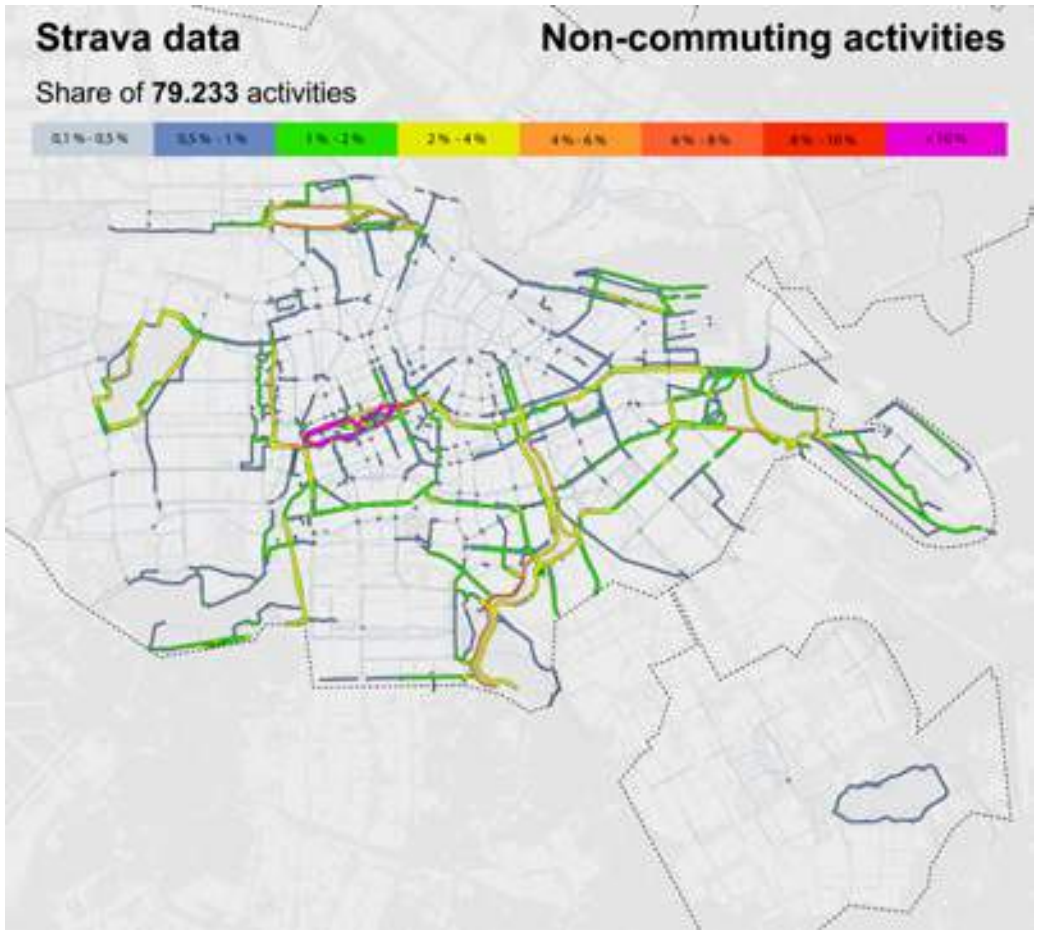


Figure 5.32: All running routes indicated as non-commuting activities

Start and stop

Regardless of distances and speed, running activities always start and stop somewhere. Although, they do not always start with the same activity. Sometimes, routes maybe start with a warm up for example. Activities can also be intervened with stretching, strength, agility or coordination exercises, which are by many seen as an indispensable part of the running activity. Some people perform these before their run, others start with a slow pace with a pause for these activities, and then start with the 'real', 'paced' run. So clearly, these start and stop locations, could give an indication of where additional activities relating to running will take place.

I include strength/ fitness exercises in my running activity

I include stretching exercises in my running activity

Figure 5.33: Answers of interviewees of including strength excercises in their running activity

The surveys were used to give insight in these aspects. 54% of the interviewed runners mentioned they include stretching in their 'running activity', 20% also included strengthening exercises (figure 4.32). Running is therefore also an activity that not always starts and stops once. Although, there is always one place where people make the start of the entire activity.

In the research from GFK, both existing and potential runners (people that want to start running) were asked where their runs started, or where they prefer to start their runs (figure 4.33).

I (would be interested to) start my run from:

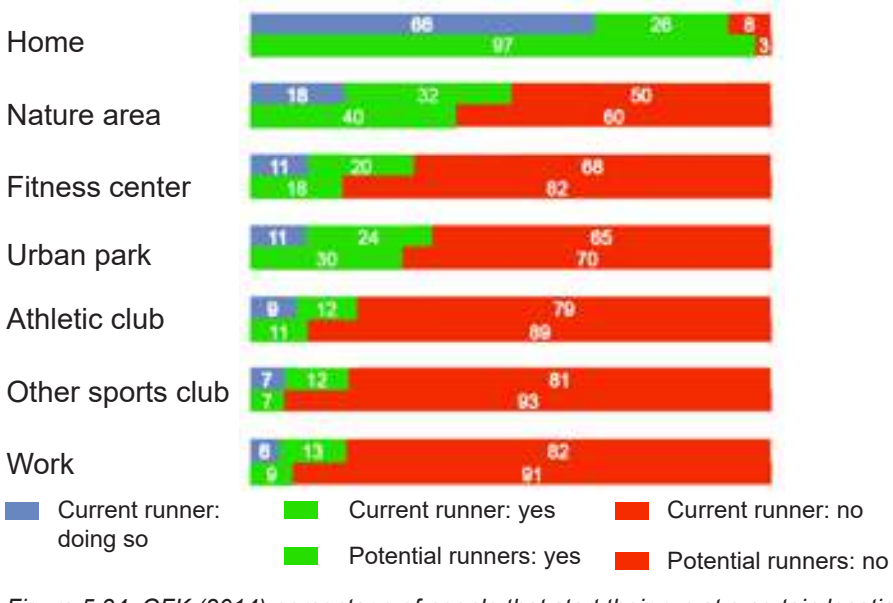


Figure 5.34: GFK (2014) percentage of people that start their run at a certain location

The most striking result here might be that 97% of potential runners are most interested in starting their runs from their house. Although a large amount of existing runners started from various other places. These results show how diverse running is integrated into day-schedules, and the diversity of places that facilitate a proper starting location for running. In addition to the 7 factors displayed, P+R locations, train stations, kid-schools, and even sport shops were all in 2-4% of the surveys seen as potential places to start running.

Figure 4.34 visualizes where Runkeeper users started and stopped their running activities. Every dot represents a starting point of one activity. About 9600 activities are displayed as such (unique activities). The darker a location is displayed, the more activities started at this point.

Observations

The diversity of places that can be used as a starting point for runs is well displayed in the image of start and stop locations of the Runkeeper activities. The inner city of Amsterdam shows very densely and evenly spread patterns when it comes to start/stop locations. This seems a logical consequence of residential density, and the fact that indeed many (or most) runners press their start and stop button at their front-door. This density of routes decreases in the more suburban regions from which less activities were recorded.
Apart from the starting points within neighbourhoods, several parks/ nature areas show specific locations where activities started/stopped. These places often strongly overlap with the before mentioned 'strings' from which these parks are attached to their surrounding urban tissue. This accounts for the Vondelpark (starting locations at the two entrances of the park, the beginning of the 'lap', and main intersections in the lap), the Amsterdamse bos (beginning of the Bosbaan), The Westerpark (most eastern entrance), the Amstel river (beginning of it, parallel to the Oosterpark) and the Sloterpark (corner in the South and north).
Also, there are parks that hardly show any start/stop locations even though they were intensely used running locations. The Rembrandtpark for example, only shows a more intense used start/stop spot in the north-east. The rest of the park does not have any, even though the park can be entered from many different locations. This also accounts for the Beatrixpark, the Flevopark and Erasmuspark.
In addition, most of the important water structures have certain start and end points. Along the IJ-shores, the Amstel and the Haarlemmertrekvaart, many activities start. With regard to this, the Schinkel and Noordhollands kanaal form an exception. For the Schinkel, this is notable as many activities do start/stop in its surrounding neighbourhoods. This is less apparent in the north of Amsterdam.

Interpretation

Places which do not show clear start and stop locations, either miss clear entrances or are not perceived as a recognisable entity. The Rembardtpark and the Schinkel are examples of such places. Although, this is hard to prove by only looking at the data, many other aspects could influence where people start/stop an activity.

Design challenges

The map displays valuable information for a number of possible purposes that could facilitate runners. First of all, it has been mentioned that start and stop locations also mark the transition to or from another activity: change clothes, start stretching, do exercises, hydrate yourself, meet running companions and so on. These activities can be supported by facilitations. If we achieve to do so, then there is direct support for the running activity as well. The type of facilities needed, is to be researched. Further research could also address whether a lack of start/stop locations, relates to a place being an unrecognizable entity, or having unrecognizable/ unpleasant entrances. If this is the case, a change in the appearance of the place could change this.

Data

In figure 4.34, the data is not yet quantified in the sense that we can see how many activities started on a location.
One way in which the map is ‘contaminated’, is the presence of running events (marathon van Amsterdam / Dam tot Dam). The Olympic stadium shows many start/stop locations, many of these will originate from this event. In addition, we have not made a distinction between start and stop points.

Figure 5.35: Distribution of start and stop locations of Runkeeper routes

5.5 Two cases

The strongest relation of usage and configuration of space was the high usage intensity found in and along the large ‘green’ (plantation) and ‘blue’ (water) structures of Amsterdam. The Rembrandtpark and Schinkel fall within these categories, but were relative to other ‘green’ and ‘blue’ areas ‘underused’ (in certain subsets). In these places, large challenges potential, in making Amsterdam a more runners friendly city. These spatial behavioural patterns can be seen on the next two pages.

In addition, the decision to choose the Rembrandtpark and Schinkel as the two cases for further research was not only based on their interesting data patterns. The appearance of these places are both contrasting and overlapping. They overlap in the sense that they are characterized by a natural feature: water and/or vegetation. Though, these differ in the sense that the Schinkel river is to a large extent directly bordered/ surrounded by a very urbanized/ infrastructural landscape. The Rembrandtpark is in contrast a large natural area.

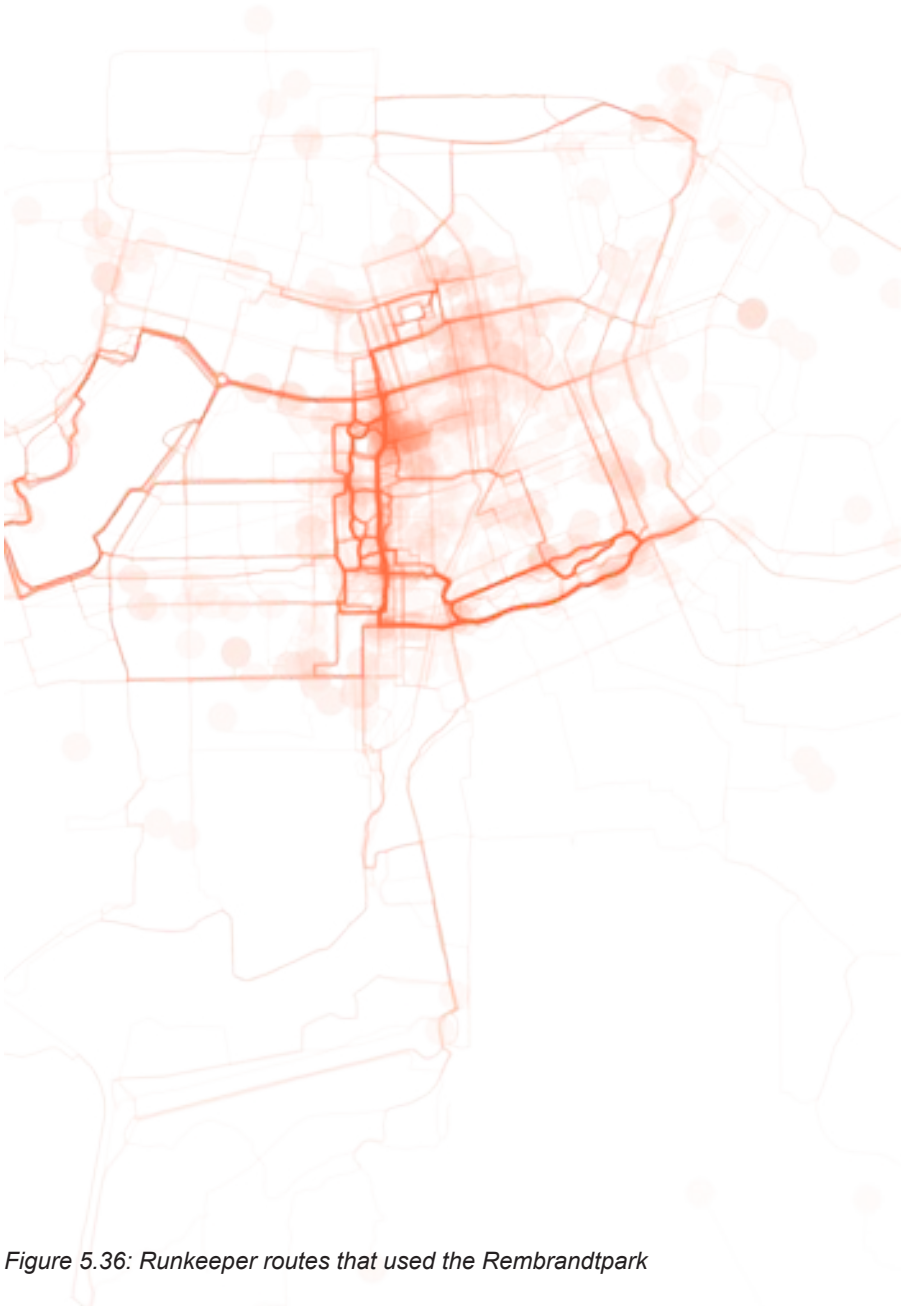


Figure 5.36: Runkeeper routes that used the Rembrandtpark

Figure 5.37: Runkeeper routes that used the Schinkel

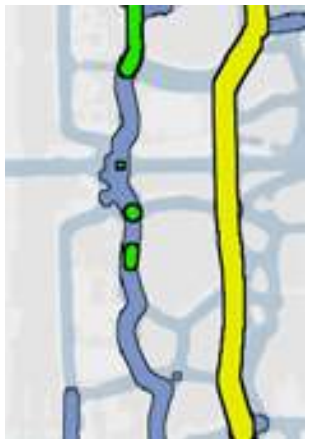
Rembrandtpark

Unique activity: under use

In the data, the spatial pattern that was recognised in the Rembrandtpark could be defined as ‘under used’. This is always a very relative pattern; what can be regarded as underused depends on the place it is compared to. On the scale of the entire city, the Rembrandtpark is one of the more intensely used places. Though, taking into regard the context and location of the Rembrandtpark, this place could be regarded as under-used. The Rembrandtpark is situated close to the Vondelpark, which in the entire park scores twice as high as Rembrandt-east, and up to 5 times higher than Rembrandt-west.

Unique activity: unequal division

So, the usage intensities in the western part of the park are very low compared to other places in the park. The intensity is thus, unlike most other parks, divided unequal. This suggests some parts of the park would be less attractive than others; and that the park does not function well as an entity. Possible causes can be explained through further research.



Long-distances: underused west

This unequal division is best visible in the >9 km heat map, the eastern side of the park is even less used by these types of runners. Only the east side functions properly for long-distance runners.

Commuters: underused west

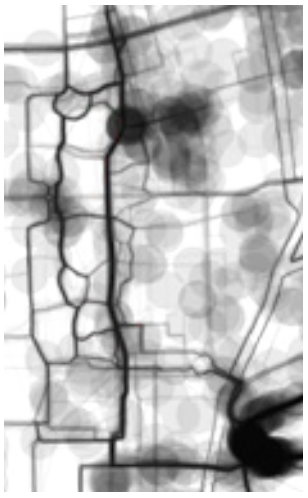
The exact same pattern can be recognised in the Strava commuting subset. The western side of the park is underused by commuters.

Darkness: under use west

The eastern part of the park disappears in the dark-hours of the day. The intensity then shifts towards the street outside the park.

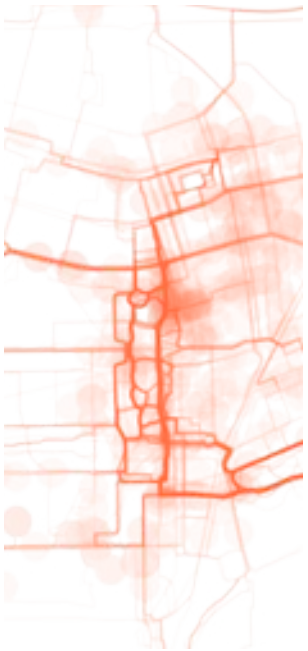
Start/stop locations: Absence

Basically all large green structures in Amsterdam had several clear places where many activities started or finished. These were often found at ‘string-like’ structures, structures that penetrate into its surrounding urban tissue. The Rembrandtpark has this to a minimal degree (only in the northwest at one entrance).



Range: strongly connected

The east part of the park owes a large extent of its intensity to the connectedness with the Vondelpark. In the first place, we can regard this as a quality of the park. Though, we could also argue, that this means the park is relatively unfrequently visited only for its internal qualities.



The Schinkel

Unique activity: under use

Looking at the spatial structure of Amsterdam and the placement of parks at the West side of the city, the clear line of the Schinkel/Kostverlorenvaart can be considered a straight line from city centre to Amsterdamse Bos and close to all parks (Rembrandtpark, Vondelpark, Erasmuspark, Schinkeleilanden, Westerpark) in this part of the city. Regarding all the heat maps, it becomes clear that it isn't an obvious track for runners. In none of the maps it is displayed as intensely used.
In contrast, the Amstel, which has certain spatial communalities and characteristics in the East side of the city, is a very popular running route.

Commuters: unequal division

As seen on the maps, there is a lot of north-south movement close to the Schinkel. Unlike the Schinkel, The Amstelveense straatweg is for example a popular road to run along especially from the Olympic stadium towards Vondelpark. This road however, is a very busy traffic road.

Distance 4.5-9: Unattached strings

The Schinkel is surrounded by many running hotspots (Parks and running facilities) which only cross the Schinkel and not inlcude its waterfronts in routes. Also, as seen in the map with medium distances, these hotspots are often linked to the urban network by intensely used strings. Though, the Schinkel does not yet function as a backbone where these small strings can be attached upon, runners cross the Schinkel but do not run along.

Long-distances: under use

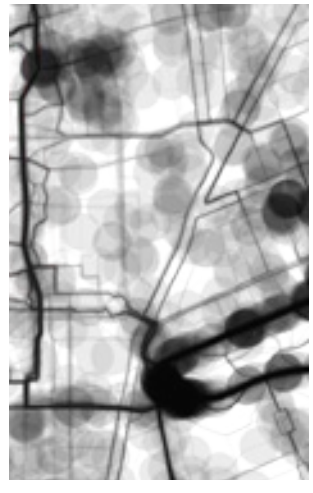
In the map with short distances, some parts of the Schinkel and Kostverlorenvaart are visible as part of routes. In the medium and long distances however significantly less people run along this route. This is a huge contrast with the Amstel, which is connected to running hotspots around it, and is simultaneously used as an entity, for both short and long distances, a connection track from city centre towards the cities outlying landscapes.

Darkness: under use

The Schinkel was also not used significantly more during dark hours. Although the Schinkel is an urban structure,this is a contrast to some other highly urban structures, where intensities did increase.

Start/stop locations: Absence

In neighbourhoods and parks around the Schinkel a lot of starting or ending points stand out. In the Neighbourhood in the south west the dots almost cover the entire neighbourhood. The most heavily used starting point closest to the Schinkel is the southern entrance of the Vondelpark.



Range: weakly connected

Looking at the reach of activities that went along the Schinkel it becomes clear that it is often combined with the Vondelpark and a route through the Rembrandtpark. The bridges are used intensively and the Schinkelhaven (southwest side of Vondelpark) appears to be an important crossing. The starting points in the neighbourhoods from the previous map however are no longer apparent.

Chapter 6
Running experiences

6.1 Introduction

As shown in chapter 5.5 two cases result from a series of interesting spatial patterns from the data analyses. Though, the (spatial) experiences of runners, that result in these patterns, are often not yet clear. The first aim of conducting the surveys is therefore to get more insight in the spatial experiences/ requirements that caused this behaviour.

This chapter elaborates on this aspect, and does so through analysing the results of part 2 and 3 of the surveys which were conducted. These surveys were mainly conducted in the area of Amsterdam South-West, where the Schinkel and Rembrandtpark can be found.

The surveys were then conducted in a second region of Amsterdam region, that has a significantly different spatial appearance/ configuration: IJburg, a much newer, more sub-urban district in the North-West of Amsterdam. Through analysing these two locations, we could also research the extent to which certain spatial aspects are specific to a certain location.

6.2 Spatial aspects

Categories

A list of possible spatial requirements that influence our running behaviour was developed, mainly based on aspect/ requirements that were before mentioned in other running-related research. They have often been touched on already in the introduction of the spatial data analysis, or relate to outcomes of these.
The requirements were devided into six categories: scene, nuisance, guidance, surface, safety, conditions. These categories will be described first, to explain in what context the requirements were mentioned.
The surveys were conducted in order to (1) order these requirements in importance and (2) verify whether we overlooked certain spatial requirements and (3) spatially locate these or other requirements.

Scene

Nuisance

Surface

Safety

Conditions

guidance

Figure 6.1: Spatial running requirements

Scene

The relation between ‘naturalness and running’ was derived from looking at previous research. It is most often focussing on ‘green space’, which is just an aspect of ‘natural space’. ‘Water’, another possible aspect of ‘natural space’, was not often considered separately.

First of all, the research of Karusisi et al. (2014) on jogging shows that: “*jogging is positively associated with the presence and quality of green and open spaces*”. In addition, other research has addressed the importance of green space for other, closely related forms of informal physical activity like ‘walking for exercise’. The characteristics of hills and enjoyable scenery (aspect: alternating environment) were associated, by Sallis et al. (1997) for example, to positively influence exercise for walking, and in general the ‘aesthetic nature of the environment’, was associated by Ball et al. (2001) with walking for exercise. These are aspects which both parks/ green spaces, but also water structures, could/should strongly contain.

In addition, evidence that distance from parks and open space is associated with other forms of informal physical activity is supported by American studies. For example, the study of Han B et al. (2013) concluded that:

Roughly 50% of vigorous physical activity time of the local population living within a half-mile radius of neighbourhood parks may have occurred in parks. This was smaller for those living within a one-mile radius (16%).

(Han et al. 2013)

Also studies from Kaczynski and Henderson (2007) suggest that “*creating more neighbourhood parks within walking distance to most residents could encourage physical activity participation in the population.*”
In the case of Amsterdam, these claims are supported by the ‘Groot groen onderzoek Amsterdam’ (2013). The importance of parks/green spaces for jogging and active uses in general is clear; 42% of park users in Amsterdam go to parks for the sake of being physically active (in contrast, 41% did so to find rest). So, supporting physically active use is maybe even the most important function of parks in Amsterdam. Within this, 21% of Amsterdam park visitors, mentioned jogging as an activity which they performed in a park in 2013 (figure 6.2). Almost no other park activity grew so fast relatively (15% in 2008), only ‘playing with children did (from 13 to 20%). As such, jogging is the number 7 in ‘park activities’ (see figure xx). The substantial contribution to park activity of joggers, becomes clear when we look at the method of transport people use to go to Amsterdam parks (figure 6.3). 43% used a bike, 39 % walked, 7% did so in a ‘different’ way, which was only 3% in 2008 (see figure XX). This growth was mainly caused by runners, which through ‘jogging to the park’, fell within this category.

activity	1996	2008	2013
walking/ hiking	79	69	70
biking	45	47	48
sitting (in sun)	49	46	45
meeting (friends)	-	-	32
picknick	-	20	26
observing vegetation	-	21	24
jogging/running	-	15	21
visit restaurant	32	19	20
play with kids	18	13	20
read	-	21	18
cultural facilities	-	16	15
observing animals	-	13	14
having lunch	-	10	12
neighborhood event	-	-	12
large event	-	-	11
barbeque	-	7	11
let the dog’s out	10	10	9
play footbal	-	5	9
special facilities	-	6	8
performances	-	7	8
feed ducks	-	9	8
meditate	-	5	6
study	-	5	6
skate	-	5	4

Figure 6.2: Activities park visitors undertook in Amsterdam in 2013. Jogging increased strongly. (Groot groenonderzoek Amsterdam 2013)

mean of transport	1996	2008	2013
walking/ hiking	45	43	39
biking	39	43	43
car / motor / scooter	10	6	6
public transport	5	5	5
different (incl jogging)	1	3	7

Figure 6.3: Mean of transport to Amsterdam parks (Groot groenonderzoek Amsterdam 2013)

In the first place, we would like to emphasize on the positive side of the relation between natural environments and jogging. Articles that reviewed studies which compared indoor with outdoor exercise in a natural environment, conclude that many studies support the positive effect of 'natural exercise' being beneficial for health. It is supposed to increase feelings of revitalisation, positive engagement, self-esteem and decreases feelings like tension, anger and depression. In addition, 'green' exercise is also supposed to have a decreasing effect on the perception of effort. It could positively influence the motivation and thus intensity of exercise, increasing health benefits (Gladwell et al. 2013).

But the fact that the health benefits of 'naturalness' is big and that the relation between jogging and green spaces is so strong, does not directly allow us to conclude that it is (only) the 'greenness'/ 'naturalness' that attracts/motivates runners to these places. Equally it could be an important consequence of other spatial aspects which are inherently present at park-like/natural places. We could even argue that 'naturalness' is just one characteristic of park-like places or water structures, just like a lack of cars, the presence of (relative) silence, (relatively) clean air and possibly many more things.

Nuisance

One of the largest surveys that has ever been performed on running (Synovate 2008), gives strong reasons to believe that nuisance factors are crucial in running behaviour. They did not focus on positive associations with running (like naturalness), but negative associations (figure 6.4).

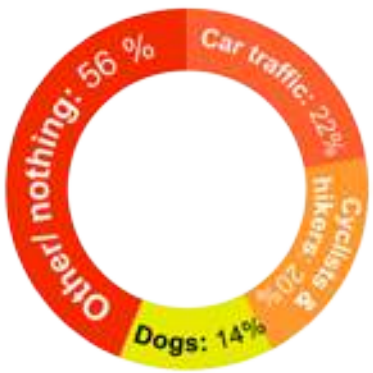


Figure 6.4: Dutch participants of the Synovate research (2008) were asked to name the top three aspects that offended them during a run.

These results do make clear that different nuisance factors are important for runners. It is then likely to assume that the (relative) absence of car traffic streams (meaning you don't have to stop your run) is an important motivation to go to natural places for running. Having said this, parks can be places where collision with bikers/hikers can occur easily:

"Some routes are problematic due not to vehicle hazards but rather to their usage by human and animal traffic. For example, when training in our urban park, there is an underpass joining two sides of the park, which has steep slopes to either side before descending into a dark, dank and fetid tunnel. Narrow, badly lit, and with poor visibility, passing through this underpass demands of the runner constant visual alertness (not to mention olfactory stoicism) and monitoring, so as to avoid collision with speeding cyclists, parents and prams, teetering toddlers and lounging groups of adolescents".

(Collison & Hockey, 2013)

Though, all this research does not yet give us ground to conclude how relatively important the two categories (absence of nuisance or scene) are for what share (or type) of runners. But, it is now likely to say that for most people it will be a combination of the two aspects.

The result of the Synovate (2008) research also generates another, not to be underestimated, spatial aspect that can bother runners: dogs. These animals can cause severe problems:

"The path at the bottom of the park is narrow and I spy a woman (dog-walker) approaching with a narky-looking Jack Russell terrier tugging against its lead. So, based on previous experience I slow right down to barely a shuffle so as not provoke the thing. To no avail, for as I pass, the creature with a snarl seizes my left foot in its mouth and proceeds to try to bite! With barely repressed anger, I tell her to: "pull it off or I will damage it." She eventually does so, making the usual bleated excuse that "he is not normally aggressive," as if somehow it were my fault that her dog has attacked. I give a weary look and run on with sore foot and a hole in a new pair of expensive training flats".

(Collison and Hockey 2013)

Surface

The importance of the surface for runners is (aside of logic reasoning/ personal experience) addressed in an academic context through a new 'field' of running research: bare foot running (for example Gary et al. 2011). It is often treated through a more medical or physiological lens (injury prevention) instead of an environmental lens, though it does refer to a relation between the runner, sense and surface. Likewise, soft surfaces are in athletics common, also for the prevention of injuries. The structure (equality) and softness of the running surface is therefore expected to be of meaning to runners.

Safety

The data theme 'darkness', and the time-heatmaps, highlight the importance of the safety aspect. Though, the Synovate (2008) research also assumes traffic safety is highly important. This is supported with examples in Collison and Hockey 2013:

"I'm slightly ahead, looking into the middle distance to gauge how far the downhill section will last . . . when suddenly, without warning, I'm aware via my runner's peripheral vision that out of a concealed drive-way to my right is suddenly appearing the sleek, hard, glistening bonnet of an expensive, family saloon car! I jam on the anchors, flinging my outstretched arms against the body of the car in a desperate attempt to stop my hurtling body, wrenching and jarring my shoulders with the impact of the force."

(Collison and Hockey 2013)

Conditions

In the research of Synovate (2008), Dutch participant assigned air pollution as the least important factor relative to the other European countries (France, Greece, Spain, Italy, Belgium, United Kingdom). For 7% of Dutch participants, this was regarded as the thing that bothers them most during running. In contrast, 51% of Italians assigned this aspect to be important. For runners it can form an important aspect.

Guidance

Research from GFK (2014) in the Netherlands, shows that the presence of designated running routes is appreciated by a significant amount of runners. 36% of current runners state either ‘interested’ or ‘very interested’ in designated routes. This is even more for potential runners (not running yet but willing to start): 50%. Designated running routes often include two aspects: route guidance and sometimes also distance information.

6.3 Survey

Importance

The survey results provide us with some understanding of the relative importance of the before mentioned spatial requirements for running. Interviewees were asked to grade (1-5) spatial aspects in importance for running, where one is not important and five is very important.

The 34 people surveyed in Amsterdam southwest, rated aspects that related to 'nuisance' (cars/interruptions/traffic safety) as the most important spatial aspect (figure 6.5). Almost all participants graded these aspects with either a four or five. A 'natural environment' was not far behind with almost 90% four/five scores. Also other aspects relating (absence of) nuisance scored relatively high, like nuisance from bikers, pedestrians or dogs.

The results from the participants in IJburg (figure 6.6), does in addition show that 'what considered important', also depends on the residential location. In IJburg, mainly 'traffic safety', 'nuisance: bikers' and 'nuisance: hikers' scored significantly lower than in Amsterdam southwest. Often, aspects are regard as 'not important' if we are unfamiliar with it. People will often regard something as 'important' when they have experience with the negative side of the aspect.

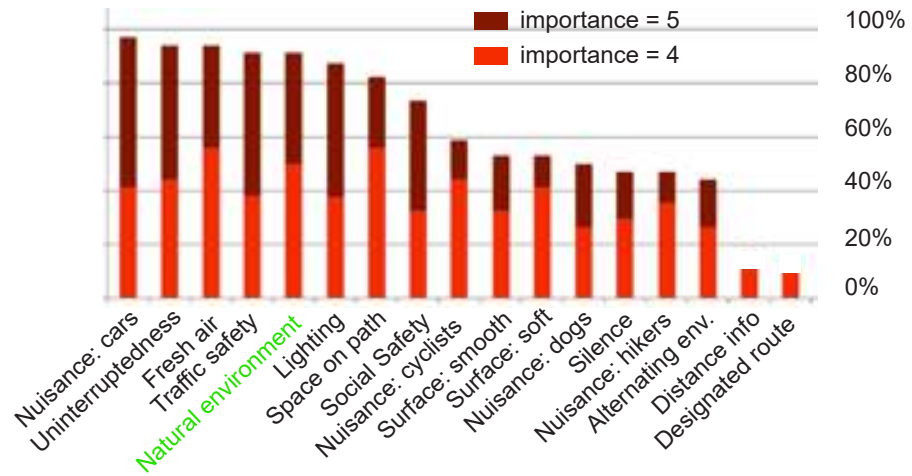


Figure 6.5: spatial aspects ranked to their importancy in Amsterdam South

Figure 6.7: spatial aspects ranked to their urgency in Amsterdam South

Availability

This becomes more clear when we combine the grades of 'is this aspect important?' with grades on 'is this aspect hard to find?' (availability). Combined, the score of the aspects tells us something about the 'urgency' of the spatial aspect for a better running environment. Arising from this, we more clearly see what aspects people associate with certain locations. Now, a 'natural environment' scores much less high in Amsterdam South-West (figure 6.7). It means people found it important, but are capable of finding it sufficiently and easy. In contrast, the 'nuisance' aspects were regarded as less easy to find and therefore more 'urgent'. The top 6 'urgent' aspects all regarded something related to nuisance from other people (driving in a car, on a bike, or with a dog).

The surveys conducted in IJburg show a very different image (figure 6.8): hardly any aspect is both hard to find and important. Nuisance from cars is still number 1, but now also illumination shows to be very relevant here. In addition, the nuisance of bikers and hikers is close to zero; which is a possible explanation for their low grades in 'importance'.
Besides the 'nuisance' aspects, the aspects of 'fresh air', 'silence', 'social safety' and 'lighting' scored higher urgency rates than 'natural environment' in both Amsterdam South-West and IJburg. Mostly fresh air and silence are aspects expected to be found in green spaces. Although these aspects were not regarded equally important as 'natural environment', the absence of these aspects in the rest of the city would also be a reason to run in green spaces.

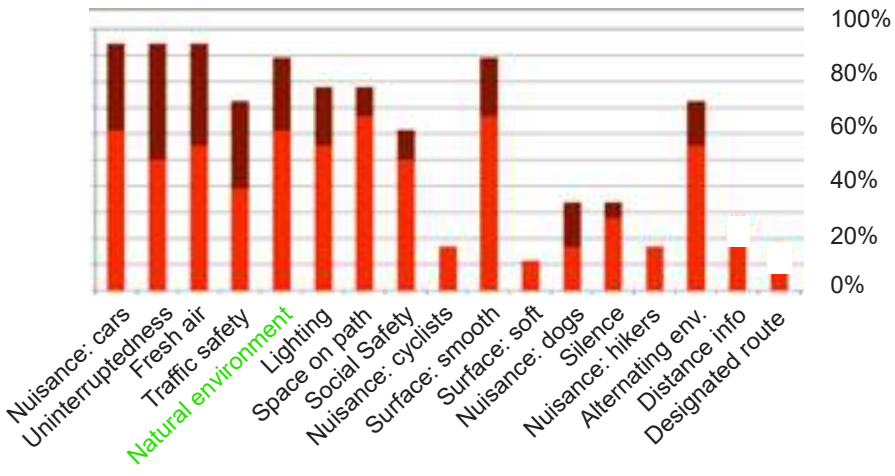


Figure 6.6: spatial aspects ranked to their urgency in IJburg

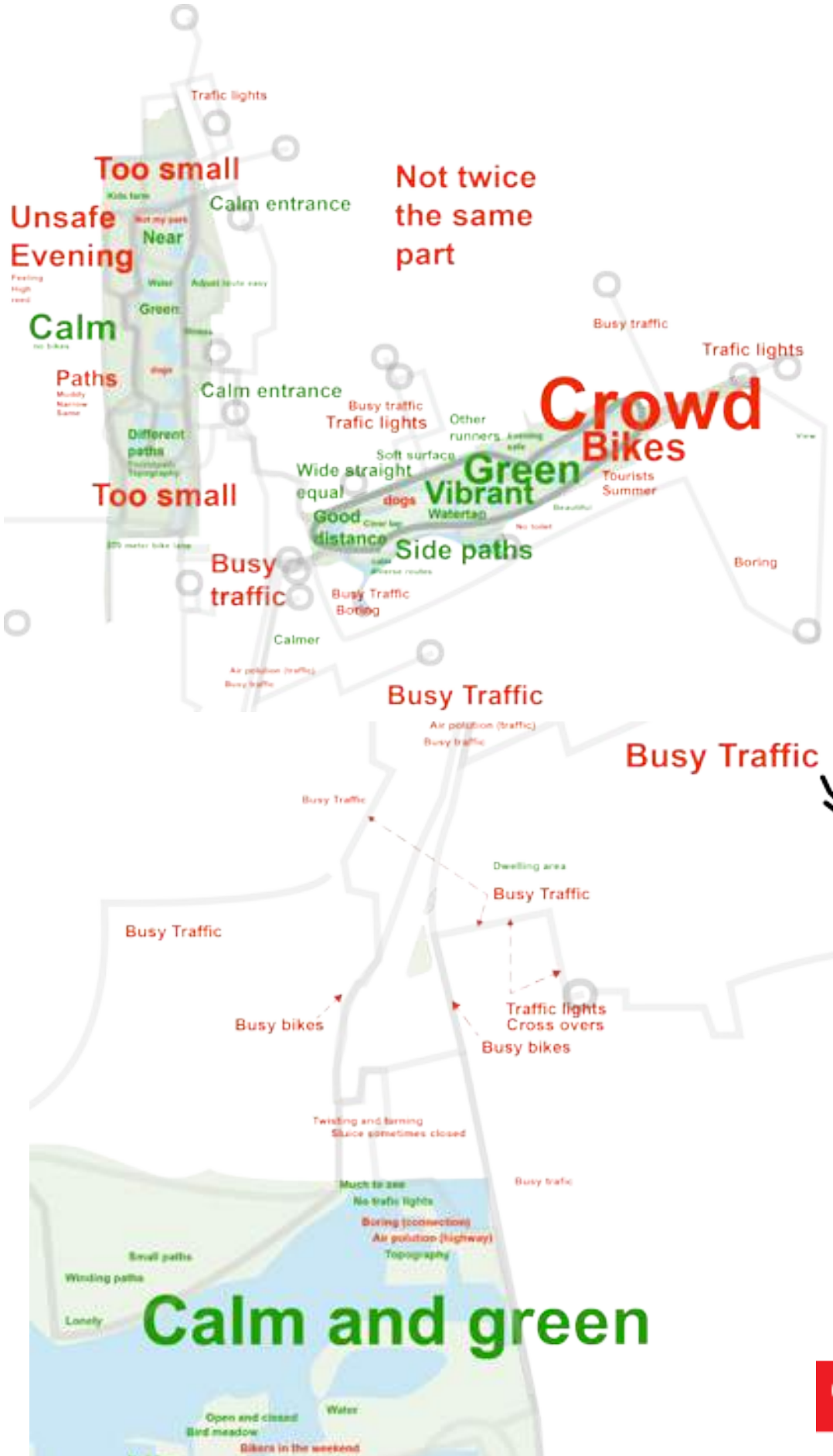
Figure 6.6: spatial aspects ranked to their urgency in IJburg

6.4 Geotagging exercise experience

Additional requirements

In part three of the survey, runners were asked to note and locate any spatial aspect that they found important, regardless of being mentioned in part two. As such, it also shows requirements that were ‘overlooked’. Four requirements were mentioned in this regard, though all of them mentioned by only one (different) person:

- Presence of water-taps (present in the Vondelpark); making it possible to drink during a run without taking bottles along.
- Presence of hills/ topography; making a run/training heavier.
- Size of certain spatial structure; the Rembrandtpark was by several runners found too small, and runners mentioned to dislike running a route segment more than once.
- Presence of a toilet facility; making it possible to go for a toilet visit during or after the run.



Geotagging (locating)

In all the spatial remarks mentioned, a division can be made between remarks that relate to spatial structural aspect or aspects relating to atmosphere. These are very much interrelated aspects, but some remarks tend to be covered by just one of the two.

Atmosphere

In the perception of the runners, the area can be divided into four areas: the three parks and the (Schinkel) area in between. In terms of atmosphere, the three parks have some essential and significant differences. In the Vondelpark, the liveliness/ vibrancy was often mentioned as its most positive aspect. Runners mentioned there is ‘always something else to see’, it is about ‘seeing and being seen’. Simultaneously, liveliness/vibrancy easily transcends into the park getting ‘overcrowded’, an aspect which was often mentioned. It mostly referred to presence of too many tourists, bikers, pedestrians, or worse: tourists on bikes. This phenomenon was most often pinpointed at the node at the east side of the Vondelpark; the most crowded part.

In contrast, the Rembrandtpark was mostly appreciated by its tranquillity. It is a much less crowded park, an aspect which many runners appreciate. The famous Dutch football player Frank Rijkaard explained us that running in the Rembrandtpark could be done more ‘anonymously’, something he appreciated. Here a division in runners almost emerged regarding the two parks; some said to adore the Rembrandtpark for its tranquillity, some adored the Vondelpark for its vibrancy.

One girl explained that in her view, the Rembrandtpark was used by serious runners, that do not want to be interrupted by other park users, and go for a nature experience. She stereotyped Vondelpark runners as the ‘Nike-bright-coloured-shoes-runners’, wanted to be seen. Of course the division is not that sharp, but we can say that both parks are appreciated by different runners, for their differing core characteristics.

The tranquillity of the Rembrandtpark goes hand in hand with the more natural character of the park. The forested area at the west side of the park was mentioned several times in this regard. Here, having the experience of ‘running in a forest’ was mentioned several times as an important feature. The presence of topography (height difference) was in addition mentioned as a positive training aspect, and also enhances the natural/ forest character. But, even though the natural character of the Rembrandtpark was appreciated, it is still experienced in the context of being an urban park: a relatively small scale pre-planned pleasure place, that we intended to give a natural character for pleasure reasons in the first place.

This is where the Amsterdamse bos and the Oeverlanden, slightly but significantly differ from the Rembrandtpark. The scale of the area is significantly larger, for example strongly experienced by the Nieuwe meer water. Running along this water provides an experience of space and emptiness like one unexperienced in urban context. Breeding places for birds, small sandy paths and presence of hardly any buildings. Although in reaching this place, the noise and pollution of the highway have to be taken for granted.

Though, in order to get here on (running) foot, runners felt like having to ‘get through’. At multiple locations in between Vondelpark/Rembrandtpark - Amsterdamse bos, runners mentioned ‘busy traffic’ as the (only) thing they experience. At certain places, having to cross a (busy) street was experienced as problematic, at other places (the Sport-as for example) busy bike paths and very little space for runners or people on foot were mentioned as annoying aspects. Streets like the Amstelveenseweg are mentioned as very busy with cars and traffic lights.

This is where the Oeverlanden and Amsterdamse Bos do slightly differ. The Oeverlanden are often reached by running into it, while the Amsterdamse bos is an area which is more often reached by bicycle or car. Not only from the other side of the city but also people from neighbouring districts are getting to the Amsterdamse bos by car or bicycle instead of running there. This is also a consequence of scale; the Amsterdamse bos is large enough to run more than 10 km easily without exiting it. This is harder in the Oeverlanden; extra kilometres from your house to the entrance are more welcome.

Safety

In the Vondelpark, liveliness during daytime transcends/ seeps into the evenings. There are always people, mostly bikers and other runners, using the Vondelpark. Safe running possibilities in the evening are therefore an often mentioned positive aspect of the Vondelpark.
But, like the vibrancy of the Vondelpark can transcend into over-crowdedness, the tranquillity of the Rembrandtpark can transcend into under-crowdedness and as a consequence: unsafe situations/feelings. This aspect was mentioned by almost everybody that was surveyed in the Rembrandtpark: the western/forest part of the park was in the evening hours regarded as unsafe. This is not only a subjective experience, this specific part of the park is known for its unsafe situations; incidents have happened and people know about that.

Structure

Paths

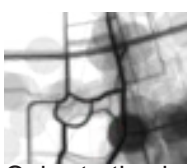
Both the Rembrandtpark and Vondelpark were several times mentioned for their path structures, both in a positive and negative context. The broad profile and clarity of the main ‘lap’ in the Vondelpark was mentioned as very clear and a beautiful path. First of all, the width (8-12m) allows all types of parks users to freely move over it. Also, the soft loamy side paths were appreciated by multiple people due its injury-preventive softness. The width of the main path, works as long as the parks is not ‘overcrowded’. Though, it does get overcrowded at times and at certain places. With good weather, the eastern part of the park (where the tail meets the lap), gets too busy for many. (Drunk) tourists and (drunk) cyclist then get too much for many runners. In addition, barbeque smoke makes it even worse. The west side of the park suffers less from this; it is slightly less crowded. In addition, the north western part of the lap, is characterized by a long and straight part. The trees are planted in a pattern, several runners named this part to be the best part of the park. The repeating trees get you in a good rhythm, Frank Rijkaard said that his pace always increases slightly here.
In contrast, the paths in the Rembrandtpark were by several mentioned to be too narrow, problematic when meeting pedestrians or cyclists. These small paths tend to get muddy easily, which is not much appreciated as well. In contrast to the Vondelpark, the park entrances in the west were mentioned to be pleasant and calm, and allow an easy, undisturbed transition between the neighbourhood and the park.

Size

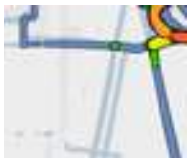
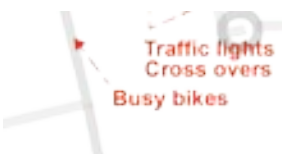
The often mentioned argument of the Rembrandtpark being too small; is one that could be regarded as strange: the park is in size larger than the Vondelpark, which was by many mentioned as having a nice distance.

6.5 Usage + experience = design requirements

Rembrandtpark

Behaviour	Relating experience	Resulting Design aim
		
West: Less use in general (compared to east-side and Vondelpark)	Tranquillity; forested Paths too small	Preserve forested area Adapting paths
		
West: No use in evening (West)	Unsafe park area in evening	Safety improving measures
		
West: No long distance runners	Park too small	Enlarge park routes
		
Only starting location in east	East is (the only) pleasant entrance	Improve existing entrances in north, south and west

Schinkel

Behaviour	Relating experience	Resulting Design aim
		
Hardly used (compared to other water structures) Hotspots nearby, only crossing Schinkel	Other traffic	Change lay-out road beneficial for runners, with clear separation of traffic and recognisability
		
Few long distance runners	Too many obstacles (crossings)	Solve obstacles
		
Busy roads around it used for commuting	Although people complain about traffic, they keep using these roads as well	Schinkel as alternative for busy roads and connect hotspots around it
		
Starting locations around the entire length of the Schinkel, but not at it	Perceived as, least bad option to reach Amsterdam Forest	Create attractive starting points

by
Mart Reiling

Chapter 7
Rembrandtpark

7.1 Introduction

This chapter focusses on one of the recognised problem areas in Amsterdam: the Rembrandtpark. This includes describing the ideas behind the development of the park, the appearance of the park and relating running behaviour/ experience within the park.

The Rembrandtpark is on the agenda of the municipality as a park that needs a spatial transformation in order to support the needs of urban dwellers today. Several policy documents have addressed ambitions and spatial strategies for the park, but solid design proposals/ masterplans have not yet been confirmed.

A unique first attempt will be executed in this chapter, based on the experienced problem of the Amsterdam runners. Two different design options are proposed for the Rembrandtpark. Both will be explained, vizualised and assesed.

7.2 Context

History

The first contours of the Rembrandtpark can be recognised from 1927 onwards, the edge of Amsterdam-West later forms the parks border (Orteliuskade, figure 7.1). Until then, the area existed of vegetable nurseries and meadows. From 1930, plans were developed to make a modern, provincial road towards Schiphol (Cornelis Lelylaan). In order to preserve and guarantee a certain degree of naturalness in the area, a park was planned, for the first time in 1929 (Kurpershoek and Ligtelijn 2001). In the 'Algemene uitbreidingsplan Amsterdam (AUP, figure 7.2), the park can be identified.

Through, it took until 1959 that sand supplementation started with sand from the Sloterplas (figure 7.3). In the sixties, the sand planes are described as an 'infinite play garden' by former inhabitants of the area (Figure 7; Nostalgiekrant.nl). Only by 1971, the actual realization of the park started, which took until 1973 to complete (figure 7.4; Kurpershoek and Ligtelijn 2001).

Figure 7: the Rembrandtpark area before and during the development (Nostalgiekrant.nl)

1939

Figure 7.1: The Orteliuskade as western city edge (1), later becoming the eastern park edge (kaarten van Amsterdam 2013).

AUP: 1934

Figure 7.2: The park as part of the AUP, with Cornelis Lelylaan (2), Postjesweg (3) and Jan Evertsenstraat (4). (kaarten van Amsterdam 2013)

1961

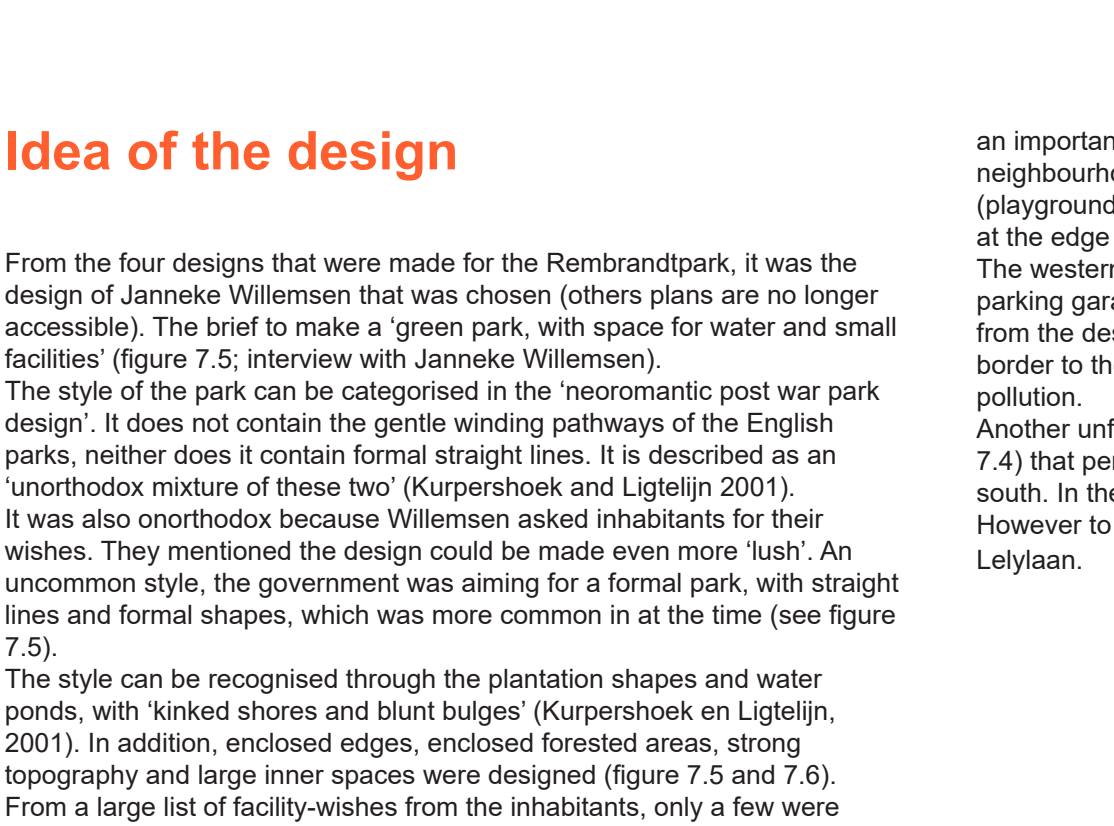
Figure 7.3 (kaarten van Amsterdam): Still only green contours visible in 1961. (kaarten van Amsterdam 2013)

1981

Figure 7.4: 8 years after the park was finally realized. (watwaswaar.nl)

Idea of the design

From the four designs that were made for the Rembrandtpark, it was the design of Janneke Willemsen that was chosen (others plans are no longer accessible). The brief to make a ‘green park, with space for water and small facilities’ (figure 7.5; interview with Janneke Willemsen).
The style of the park can be categorised in the ‘neoromantic post war park design’. It does not contain the gentle winding pathways of the English parks, neither does it contain formal straight lines. It is described as an ‘unorthodox mixture of these two’ (Kurpershoek and Ligtelijn 2001).
It was also onorthodox because Willemsen asked inhabitants for their wishes. They mentioned the design could be made even more ‘lush’. An uncommon style, the government was aiming for a formal park, with straight lines and formal shapes, which was more common in at the time (see figure 7.5).
The style can be recognised through the plantation shapes and water ponds, with ‘kinked shores and blunt bulges’ (Kurpershoek en Ligtelijn, 2001). In addition, enclosed edges, enclosed forested areas, strong topography and large inner spaces were designed (figure 7.5 and 7.6).
From a large list of facility-wishes from the inhabitants, only a few were developed, this was due to a lack of financial means. Only a petting zoo, a construction playground, school-allotments and a playground were developed.
Another starting condition for the design was aid to be the unfavourable position next to the A10. The continuing cycle paths were assigned as an important aspect of the design. The connections to its surrounding neighbourhoods were essential to the park designs. The facilities (playground, benches, football field), were therefore (in the east) designed at the edge of the park, near to the many park entrances.
The western part of the park was developed differently. High rise flats with parking garages were developed here to finance the park. This deviated from the design plans, which focussed on creating a thick plantation border to the west, to separate the park from the traffic and resulting noise/ pollution.
Another unfavourable factor is formed by the three roads (see figure 7.2-7.4) that perpendicularly intersect the park, and divide the north from the south. In the east, tunnels were created to pass underneath all three roads. However to the west side of the park, this only occurs under the Cornelis Lelylaan.



In gesprek met de ontwerpster van het Rembrandtpark

Het Rembrandtpark | Een oase van groen, op de grens van West en Nieuw-West. Een park waar bewoners joggen, de hond uitlaten, langs het water lopen of kamperen tijdens de Buurtcamping. Het Rembrandtpark is relatief jong. Tot eind jaren 60 behoorde het tot het tuinbouwgebied van Van den Broek (jawel, die van de supermarkt) en werden er kombotmens verbouwd. Ook was er een ruig rietlandschap. Totdat een jonge landschapsarchitect (27) ermee aan de slag ging. Haar naam? Janneke Willemsen. De opdracht? Ontwerp een park voor de buurt.

Janneke Willemsen (Tweden-Willemsen) ontwierp het Rembrandtpark in de jaren zestig, met – nieuw voor die tijd – inspraak van bewoners | Foto Marcel Hanipaf

Figure 7.5: Interview with the original designer of the Rembrandtpark (Rembrandtpark.org).

Figure 7.6: Satelite image of the Rembrandtpark in (Google Maps 2012).

A criticized park

Clearly, the Rembrandtpark had obstacles to deal with during its development. Relative to its size and location, the Rembrandtpark is nowadays perceived as one of the poorest functioning parks in Amsterdam. There has been severe criticism of the park in the past few decades, both directly and indirectly referring to the weaknesses of the park as a consequence of wrong decisions in the past. They also (in)form important notions for the current ambition document of the municipality of Amsterdam.

The critique can be divided into three main categories that show an overlap with the problems derived from the research on running behaviour and experience. This includes path structure problems, usage problems, safety problems and appearance/ state/ maintenance problems. They strongly interrelated.
Critiques and facts from four different sources do clearly refer to these:

The Rembandtpark has failed, is being said. The park is not developed in balance and finds itself in a deplorable state. The location is not bad, but usage of the park is basically limited to visitations of the petting zoo. The park is percieved as unsafe, relatively many incidents have happened here recently. Due to the Elevated A10 and C.Lelylaan, the park badly connects to its surrounding urban district.

(Kurpershoek and Ligtelijn 2001)

In almost all parks in Amsterdam, the amount of respondents that find the park has become increasingly attractive is much greater than the amount of people that find it decreasingly attractive. There are three exceptions however in Amsterdam: the Gaasperpark, the Oosterpark and the Rembrandtpark.

(Groot Groenonderzoek Amsterdam 2013)

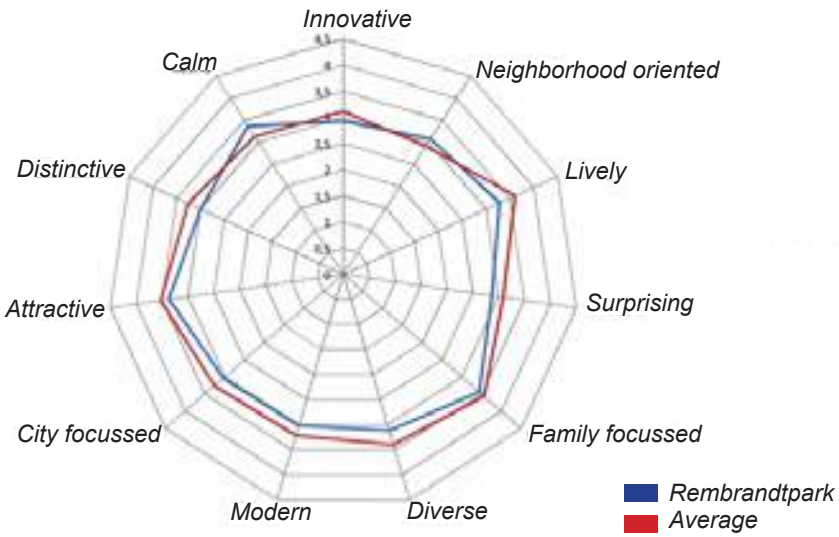


Figure 7.7: Scores of Rembrandtpark compared to the average of Amsterdam parks (Groot Groenonderzoek Amsterdam 2013)

This fact is supported by the scores of the image of the Rembrandtpark (figure 7.7). In almost all aspects, The Rembrandtpark scores lower than average for Amsterdam parks, except for the aspects of ‘tranquillity’ and ‘neighbourhood-focussed’.

Walking around in the Rembrandtpark is not something you do for pleasure. A dead-end path leads us directly into a ditch, an entrance sign has been bleached in time. A drunk rover empties his beer, while a group of youngsters is smoking drugs at a bench. The park is not well connected to its surroundings and it is an unclear mess.

(Onderwater 2015)

These statements show that the Rembrandtpark could improve dramatically, in many different ways. The next chapter will visualise and explain how this lack of quality is a result from flaws in the spatial configuration of the park.

7.3 Spatial analysis

In this exploration of the spatial configuration of the Rembrandtpark, a devision is made between (infra-)structure and athmosphere, themes that strongly interrelate.The runners requirements and formulated design aims to which these configurations relate will be explained first. After elaborating on this, opinions of other experts will be provide support to the explained claims.

(Infra-)structure

Runners requirement: connectivity

Looking at the heatmaps, it was mainly the west-side that seemed to disfunction. First, both commuting and long distance activities (figure 7.8) did use the west-side of the park even less then non-commuting and short/ average distance runners. It suggests this part is not well integrated into its surroundings urban networks. Negative experiences of the paths likely effect its use.

Figure 7.8: Lack of commuting and long distance activities in the West-side of the park, in contrast to the east side of the park, assuming that the west-side is not logically connected to other urban networks.

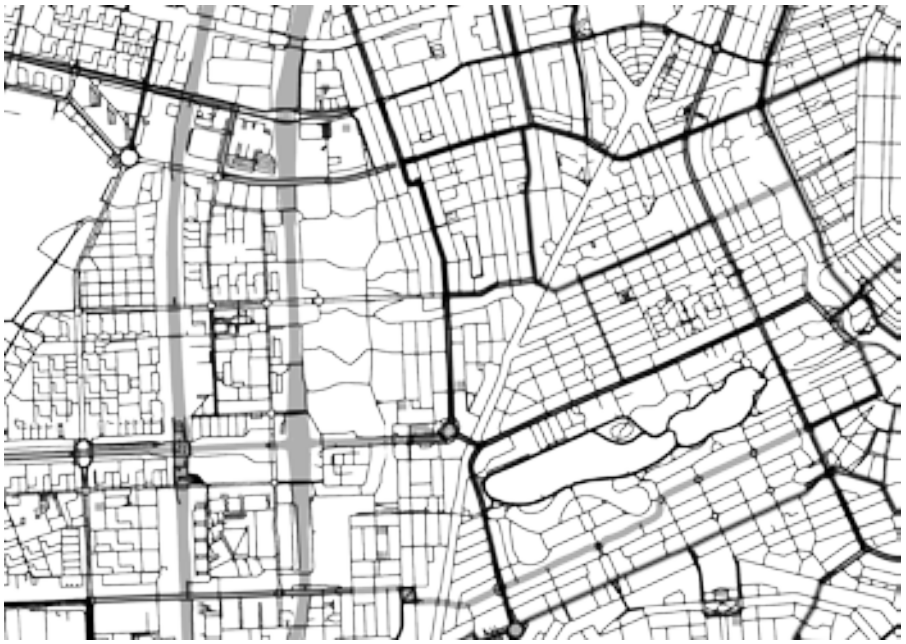


Figure 7.9: Bicycle paths in the Rembrandtpark region.

Figure 7.10: Current path structure of the Rembrandtpark.

Configuration

There is a large contrast in the directions, appearance and connectivity of the bike and pedestrian network between the East- and West of the Rembrandtpark. The runner can make use of both these cycle and pedestrian paths.
In the east (see figure 7.10), a five metre wide bike path goes through the park (north-south orientation), underneath the Postjesweg (vehicular road that perpendicularly crosses the middle of the park).
This is the path, that was rather intensely used in all heatmaps. It appears as a wide, asphalt (red) bike lane with (grey) walking strips on each side. This idea of having a central (red) asphalt bike lane, that has an additional parallel, bordering pedestrian path, seems to be an important concept of the path-structure in the Rembrandtpark. This was also carried-through in the surface of the bridges and east-west connections.

Although, it has been carried out rather poorly. For example (figure 7.11.1), underneath the Potsjesweg, the profile is recognisable. Although, going 100 metre to the south (figure 7.11.2), the pedestrian strip kinks sharply to both right and left, and after a few metre kinks back again to run parrallel to the bike path, now with a stroke of grass in between (figure 7.11.2). 200 meters further south, the pedestrian path on the left suddenly disappears, and returns 200 metre further south again (figure 7.11.3). An extra 100 meter further to the south (figure 7.11.4), an additional parrallel pedestrian path appears, which runs parrallel to the parrallel pedestrian path (and leads to a dead-end). Not a 'clear' structure for the park user.

Figure 7.11: The red (cycle) gey (pedestrian) path profile of the Rembrandtpark, unclear layed-out (see figure 7.10 for picture locations).

In contrast, Rembrandt-West does not contain a north-south cycling path, but only a narrow path dedicated to pedestrians (figure 7.13). Cycling should be done on the (shared) vehicular road bordering the A10, outside of the park (figure 7.12).
The eastern (cycling) path is rather straight and direct, serving as a connection between Amsterdam South-West and Amsterdam North-West. The western road bordering the A10 (figure 7.12), is more devious.

Figure 7.12: The vehicular road around the park, bordering the A10. (see figure 7.10 for picture location).

The western pedestrian path is not only more devious, it also bends sharply at a variety of places (figure 7.13.6).
The consequence for runners becomes painfully visible in the images. The kinks leave the runner with two choices, either let it interrupt their rhythm or choose to run through the (often wet) grass.

Figure 7.13: Too narrow paths resulting in a messy appearance (see figure 7.10 for picture locations).

The sharp bends in combination with the small width of the path, make it impossible for maintenance vehicles to stay on the path. They destroy the grass, choke the water penetrating capacity of the soil, and as such, leave a wet and muddy park behind (Figure 7.13.7). An aspect that annoyed several interviewed Rembrandtpark-runners.

In the east-west direction, the Rembrandtpark does not always serve a strong connection. The connection possibilities are very fixed to the tunnels under the A10, and the bridges over the Postjeswetering. Between point 10 and point 11 (figure 7.10), no convincing bike connection is present, even though these are main entrances/ exits to the surrounding neighbourhoods.

Runners requirement: Lap-size and entrances

A second network connecting runners requirement referred to the size of the park: it was experienced as being too small. This is ironic: as the park is in size almost equal to the Vondel-park (45 ha vs. 47 ha). This park was in contrast appreciated for its good distance-lap (figure 7.14).

Figure 7.14: Lack of long-distance runners in Rembrandtpark west, and a lack of starting points in Rembrandt-park South.

Configuration

By analysing the network-structure in the Rembrandtpark, it becomes clear that here, the area is (for a runner) not fully usable in accordance to its size. Several years ago, the connection furthest south between the east part and the west part of the park, was broken due to a new water connection; this results today in a dead end (figure 7.15 and 7.16).
The largest lap one can now make in the park, is 2.3/2.4 kilometres (3.3 km in the Vondelpark). Though in the past, the 'rondje Rembrandtpark', was 2.5 kilometres.

Figure 7.15: Broken park connection between south-east and south-west (see figure 7.16 for location).

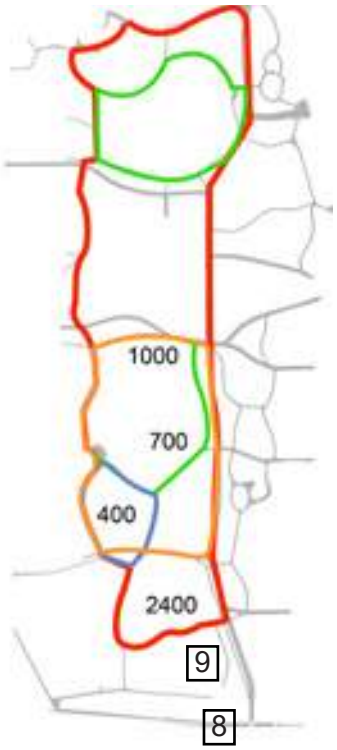


Figure 7.16: Current lap-distances in the Rembrandtpark.

This difference might not seem large on the first hand, but it could be a crucial 150 metre. Running 2.5 km twice, exactly results in the most frequently performed running distance: 5 kilometres. Figure 4.18 showed how runners strongly and precisely aim for these distances.
This problem can also be detected when we look at the Runkeeper data. Between the years of 2010-2015, 35% of all (Runkeeper) running activities that connected the east and wester part of the park, took the furthest southern connection. This connection was deleted in 2012.

Figure 7.17: The deleted southern connection used to be intensely ran.

This means that in the past, it had been the most intensely used running connection between the east and west of the park. Through looking at this data, we can easily argue that this intervention has rather negatively influenced the running qualities of the Rembrandtpark.
The fact that the only slightly longer Vondelpark lap was regarded as a very pleasant distance (figure 7.14), supports the notion that such small distances can be very significant for runners: the negative effect of the removal of the southern connection on runners should thus not be underestimated.
In addition, the northern end of the park is filled by allotments. Running around this area is not possible without leaving the park. Also in this location, it leaves a few potential extra hundred metre are unused. Apart from the loss of lap distance, the park looses the only direct connection from the Cornelis lelylaan into the park, which is the main connection towards Amsterdam centre (see figure 7.9).

Confirmation

The weak links and inconvenient structures in the slow-traffic networks are being noticed by the municipality and other experts.

Due to the lifted A10 and C. Lelylaan, cycling from the city centre of Amsterdam towards the Sloterplas region is an enormous task. Entering the park to enter before or at the Potsjesweg is challenging. Getting from inside the park to the right exit in the north-west, is another challenge. A proper cycling-infrastructure would benefit the park.

(Kurpershoek and Ligtelijn 2001)

The park is locked-off, it does not yet connect strongly to its surroundings. The park can learn from clear path structure in the Vondelpark, with a clear main lap and overview. People should not get lost in a park.

(Onderwater 2015)

There is no clear path-structure in the park, the hierarchy of different paths is not clear, and there is no overview on the paths.

(Ontwikkelingsplan Rembrandtpark 2015)

It is contrary to realise, that the pathstructure as anlysed in this chaper, stands 'orthogonal' to the philosophy with which the park was once designed: connecting to surrounding neighbourhoods. This was not only an important initial functions. According to the Grootgroenonderzoek Amsterdam; its main usage is still 'a connection to another place'.
Though based on the just explained findings, it does not succeed in doing this properly. Note: all other parks that have a large size like the Rembrandtpark, do have a main function as an 'active' or 'rest seeking' park (figure 7.18).

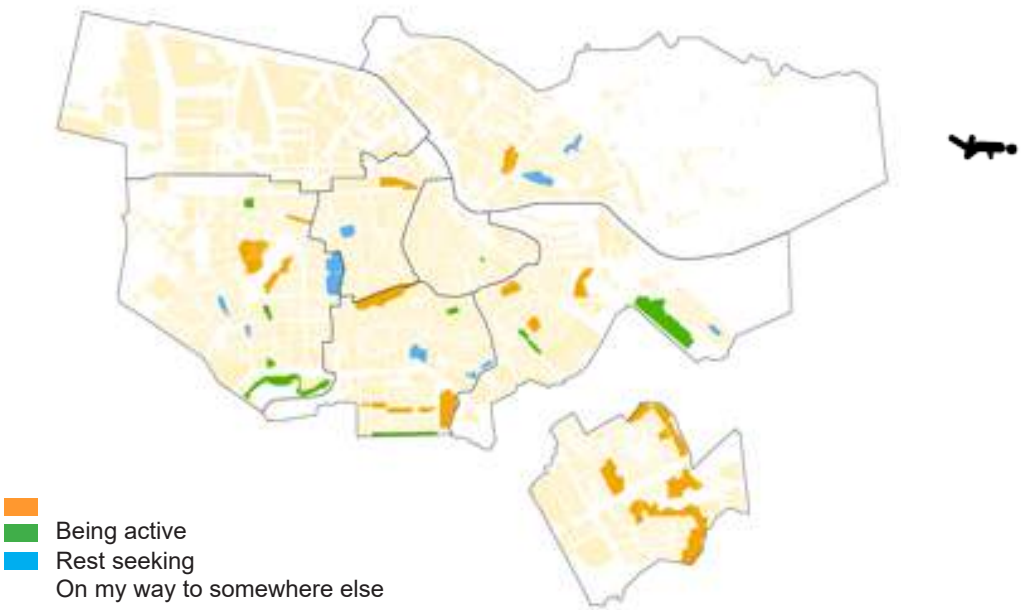


Figure 7.18 (groot groenonderzoek 2013): Main reasons to visit parks in Amsterdam. The Rembrandtpark as the largest park with 'on my way to somewhere else' as a main function.

Atmosphere

Runners requirement: Safe running experience

Improving the safety in the west part of the Rembrandtpark is one of the primary opportunities to improve its functionality for runners. It was the most often mentioned negative aspect of the park, and one with huge consequences: runners avoid the west-side of the park completely in the evening. Though, darkness is not always a reason for a park to be unsafe: other parks in Amsterdam were well used in the dark.

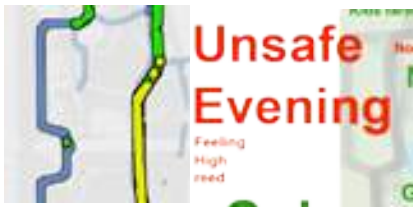


Figure 7.19: Avoided west-side of Rembrandtpark due to unsafe experiences.

Spatial principles to enhance safety

The relation between the configuration of space and (social) safety has frequently been a research topic. These studies can provide insight in the design principles that can be used to enhance the safety in the Rembrandtpark (either factual or experienced). The book of Jane Jacobs *'The death and life of great American cities.'* (1961) is a well known example.
She dedicates a seperate chapter to the urban parks specifically, and their needed spatial characteristics in order to be a pleasant and safe place.

Jacobs claims we often expect too much from city parks, they will not automatically lift up neighbourhoods, the opposite is often more true: neighbourhoods lift up a park or fails to do so. Few parks yet function as wished: delightful features of city districts. Parks are not automatically 'real estate stabilizers', as often claimed.
Often, if parks are not where the people are, people are not where the parks are. If that is the case, parks can often be troubling, their negative effects go further than the waste of space. According to Jacobs, we can consider them as streets, potentially unsafe when there are 'eyes' on it or a diverse life in it. In the case of parks, this can even spill over to surrounding/ bordering streets and neighbourhoods, leading to dangerous places to be avoided. Unseen parks (and their equipment) then often suffer from vandalism. Instead, a park needs certain physical arrangements from its surrounding neighbourhoods: a mixed use of buildings surrounding it, producing a mixture of users that enter and leave the park at different times of the day due to their differing day schedules. As such, parks should be lively at differing times of the day. They cannot function upon the presence of a mother with kids alone, workers alone or dog-walkers alone. If the diversity of users is not present, Jacobs claims that *'into parks will come what usually comes into city vacuums: a form of blight'* (Jacobs 1961).

In addition, those that are successful never serve as barriers or interruptions to the functioning of the city around; rather they help to knit together diverse surrounding functions, the park should give them a pleasant joint space. The worst problem is when parks are located precisely where people do not pass by (commuters) and likely never will.

Other research that has been conducted on safety and configuration of space, primarily present principles that strongly confirm Jacobs analysis (examples: van der Voort 1991, van Soomeren 1980, or ministry van volkshuisvesting 1988). Geuze (2005) for example mentioned that designing a pleasant park, requires some simple conditions:

All you have to do is turn the bike route junction into a beautiful spot; this is the main condition of a good park: the park is part of a route just like the Vondelpark, no more than that. If you have a bike route junction in a park, it cannot go wrong, there must be a pleasant bustle of people coming and going through the day. A square must be built at a junction.

(Geuze 2005)

Bundling and connecting of routes is thus an important potential spatial strategy in this regard. At the same time, having choices to change routes can increase safety, as it provides us with the possibility to change direction when an 'unpleasant confrontation' seems to emerge (werkgroep vrouwen veilig buiten, 1988).

Apart from these required conditions, other spatial aspects are mentioned in different sources. The ministerie van volkshuisvesting (1988) for example concluded that bike routes surrounded by high vegetation, score high on the list of unsafe places in diverse places in the Netherlands. 17% of (a total of 900) rapes and sexual abuses in Amsterdam happened in parks in 1985. It is not limited to darkness, green spaces without the right spatial configuration can be easily perceived as unsafe.

An unsafe perception also increases by inability to orient at places. A clear structure and overview in a park increases this feeling of control and safety. Having said this, it does not mean all planting at eye level should be removed; different clearly defined spaces can also contribute to clear structures and thus orientation. Though, most important is that entrances/ exits and nodes are clearly visible (ministerie van volkshuisvesting 1988).

Based on the research described above, we can make a list of principles that could enhance the safety experience in the Rembrandtpark.

Help: Eyes in/on the street; continuous presence of people.
- Presence of commuting (bike and pedestrian) traffic
- Mixed usage through mixed functions in and around the park.
- Visibility from and to surrounding housing.

Escape: (Over)view and orientation
- Clear/ readable (planting and network) structures.
- Visible exists and entrances.
- Ability to watch through and over planting.
- Lighting (CBS 1984)

Avoid:
- Having an alternative route option (bypass).

With this knowledge, the precise spatial configuration that contributes to the unsafe experience in the Rembrandtpark-West can be analysed.
Looking at the principles, we can first of all conclude that the most important principle directly relates to the already explained flaws in the infrastructure: the absence of commuting cycling traffic. As such, this aspect is already covered in the previous analysis. Though, the other principles referred to are not yet explained park characteristics, these will therefore be spatially analysed now.

Configuration

The western zone is characterized by dense vegetation that does not allow views through or over (figure 7.20 and 7.22). It leads into dark and enclosed scenes (7.24), without alternative route options.

In some places, where planting is absent, views between flat apartments and the path appear (7.22 and 7.25). Still, blind walls edge the park, surrounded by underground parking garages above which no other function than half-public gardens are situated (7.21 and 7.26).
In more open areas paths twist and turn, not allowing to see where paths lead to (7.22 and 7.27). Lighting is unlike the eastern part of the park, in that hardly present.

Figure 7.20: Plantation

Figure 7.21: Functions

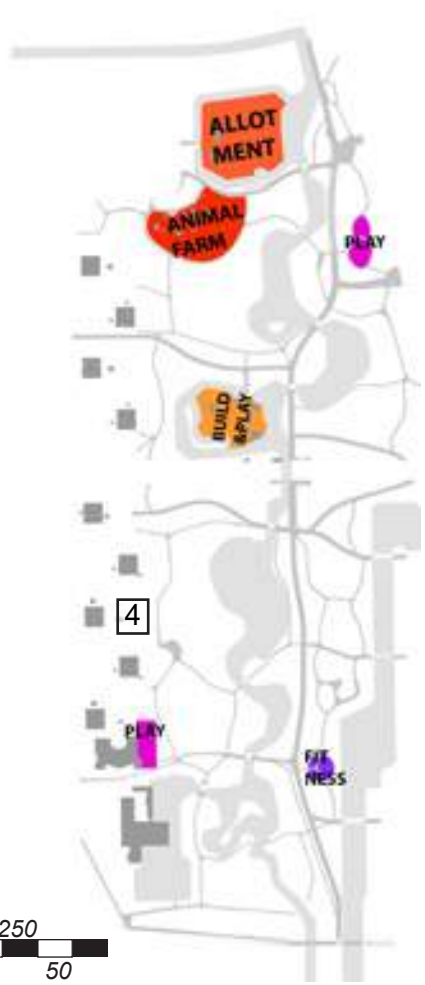


Figure 7.22: Views

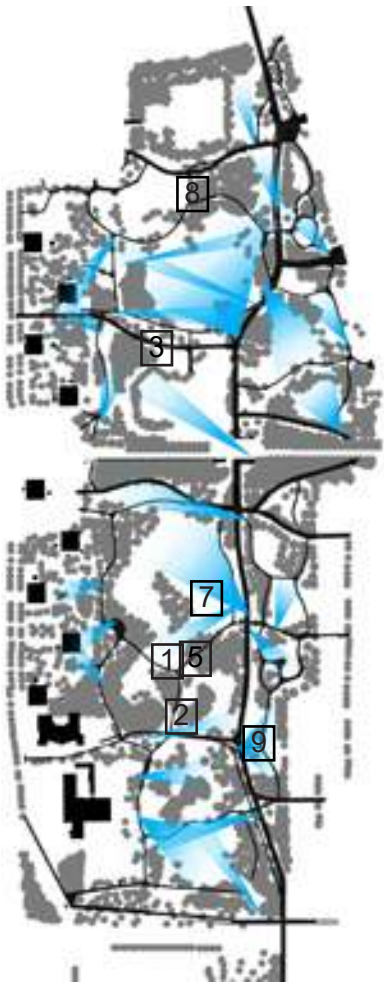
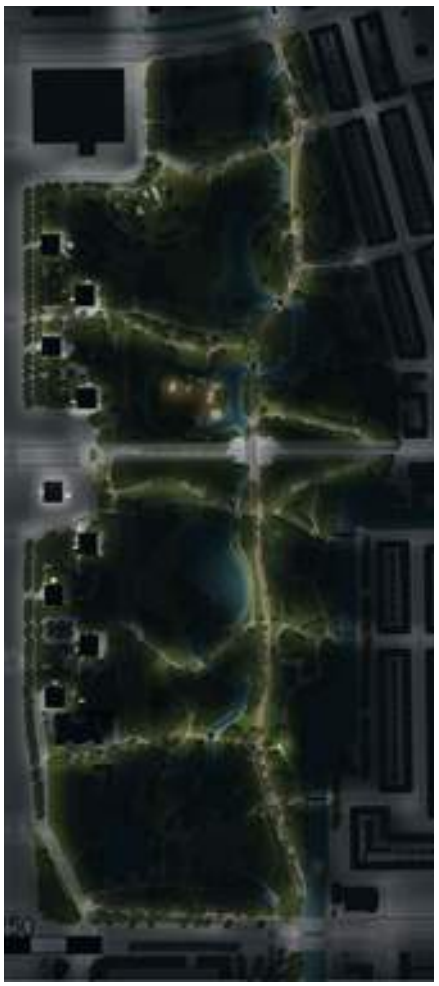


Figure 7.23: Lighting



Figures 7.24: Enclosed, forested Rembrandt-west (see figure 7.22 for picture locations).

Figures 7.25: Views between apartments and pedestrian paths in the west where vegetation opens up (see figure 7.22 for picture location).

Figures 7.26: Monofunctional garage decks (see figure 7.21 for picture location).

Figures 7.27: Invisible path destinations (see figure 7.22 for picture location).

At many places, vandalism in combination with a lack of maintenance deliver an untidy appearance. Benches are set on fire, glass bridges get broken, entrance plans removed and the homeless create a home in remote areas (figure 7.28).

Figures 7.28: Vandalism in the Rembrandtpark (see figure 7.22 for picture locations)

Confirmation

Also the unsafe atmosphere is being recognized by the municipality and other experts. The 'Ontwikkelingsplan Rembrandtpark' (2015), claim that in contrast to the experiences in the 70's, paths completely enclosed by vegetation are not perceived as surprising anymore but as 'socially unsafe'.

Onderwater (2015) confirms this by saying that in a park like the Rembrandtpark, people feel unsafe. She thinks that at least 30% of the vegetation should be removed in order to create more overview and therefore a safer park.

Kurpershoek and Ligtelijn (2001) also mention that many incidents (two rapes in 2009 for example) have occurred in the Rembrandtpark. Some claim this is just a coincidence, others blame the layout of the park, that allows criminal behaviour. It does at least prove that there are factual reasons to feel unsafe in this area, it is not only a experience/ perception.

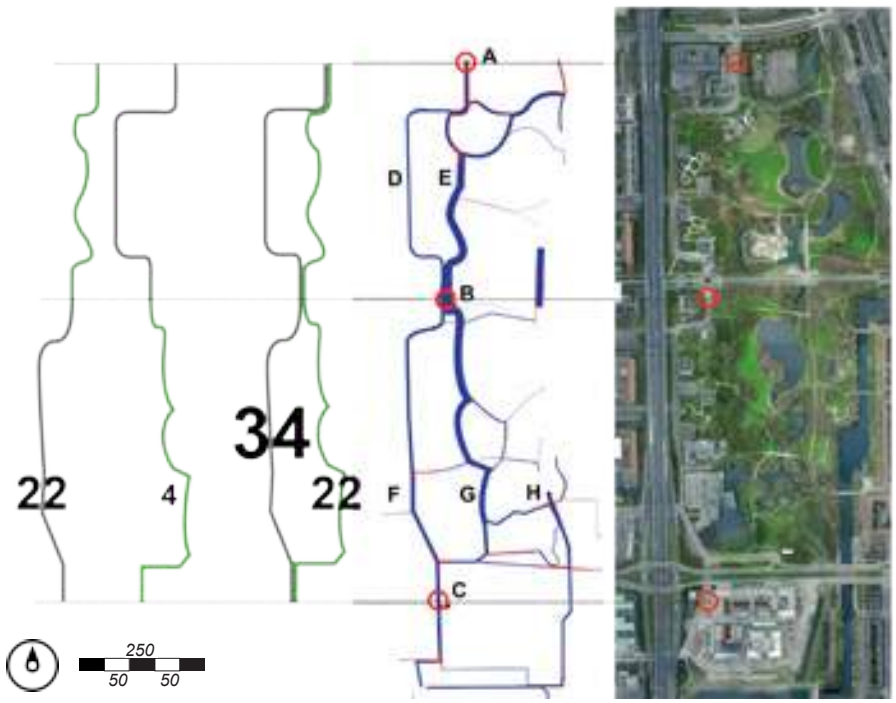
A contradiction was found in addition found through additional analyses on the crowdsourced data (Runkeeper). Because, if the eastern forest pedestrian path is also perceived unsafe during daytime, why was it in both the Strava and Runkeeper heatmaps (daytime/ all activities, figure 4.11 and 4.13) more intensely used than the road next to the A10 (outside of the park)? There is much more overview on this road, there is more continuing traffic, plenty of space on the pavement.

There is a variety of reasons that possibly contribute to this pattern. First, the road next to the A10 might be avoided for health reasons (fine-dust particles from the A10 traffic). Also, the forested route through the park might be a more logical continuation for those that come from the east side of the park. It might as such not be a conscious decision, but a lack of experience with other options.

Through analysing the Runkeeper data in a different way than was done in the heatmaps, some insight is created. In this analysis, only the routes were selected that went through both point A, B and C (figure 7.29). Regardless of what directions these routes came from, they had a clear choice to go either through or around the park. All three points are places where the roads splits up in these two options. The two options are in addition rather symmetric in shape.

It is remarkable to conclude, that between A and C, most of the routes did not go through, but around the park (34 of 82). Also, from the 44 routes that went through the park between A and B, 22 decided to go around between B and C.
Through this analysis, we can also see that Segment G did not owe its intensity from those that had a clear choice, but from the routes coming from point H. From H, G is the first path you 'run into', going in north-western direction. The same pattern can be recognized for segment E. It thus does confirm the notion that intensities are 'owed' to connections from the east.

It is hard to fully grasp what is happening here, but the fact that most runners chose to not go through the park between A, B and C, is not a positive conclusion. It can be seen as a strong argument to believe that this part of the park needs a serious change of appearance in order to be experienced as very pleasant by all users, even during daytime.



Figures 7.29: Runkeeper users running around Rembrandtpark-west, instead of through the park

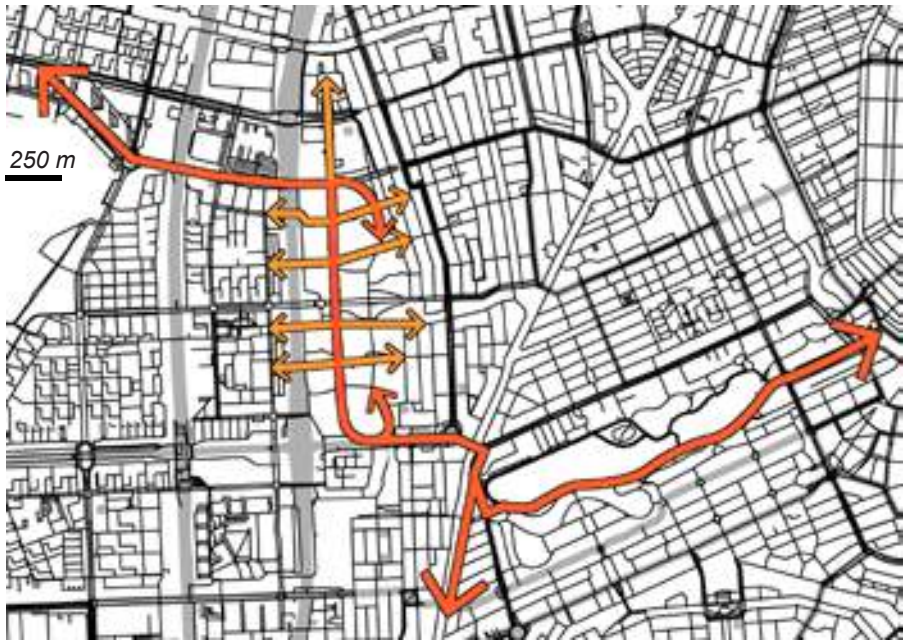
7.4 Strategy

The previous analysis has spatially speficified different runners requirements.The overall design strategy opposes a structural change in the park that tackles multiple concerning and urgent requirements at the same time.
This strategy is as follows:

A cycling path through the west side of the park, will give the west-side of the park a ‘rainson d’etre’. This path would be welcome for commuting runners, pedestrians and cyclists as a connection between Amsterdam Nieuw West and Amsterdam Centre and therefore create an always present flow of people through the park (figure 7.30). It would enhance the safety, and thus benefit all evening users of the park. The new path connects to the Cornelis Lelylaan in the south and to the Jan Evertslaan in the north, and therefore re-establish the most southern and northern park connections. This simultaneouly stretches the park-lap to the park its maximum size and creates new, recognisable entrances in the north and west. It thus solves the three most urgent requirements through one intervention. In addition, this also means vegetation will be removed to increase transparancy and overview This will further enhance the feeling of safety and orientation in the park.

Though the western part of the park was also appreciated for its tranquillity and forest experience during daytime by many runners. The above mentioned strategy would conflict with the requirements of this group of runners.
This is where the design challenge is found: where spatial requirements conflict with each other.
The main design challenge within this strategy is therefore to find ways to execute the two mentioned strategies, and at the same time preserve the possibilities to run in a tranquil, forested environment. In addition, several runners’ spatial requirements could be achieved without conflicting with other requirements:

- Lighting
- Additional (mixture of) functions
- Smoothening kinks in paths
- Clarify path structures.
- Diversity in paths



Figures 7.30: improving commuting possiblities through the Rembrandtpark as a starting point of design models

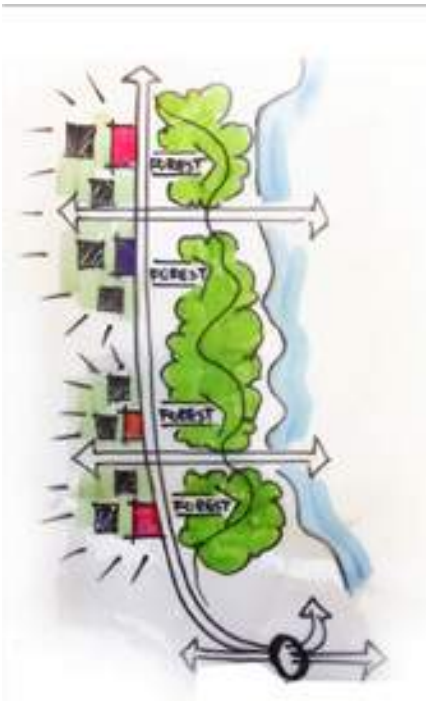
7.5 Design

Option 1: ‘A false start’

Model

This design model aims to adjust and improve the flaws in the original design. It can be seen as modernised version of the original, that had ‘a flase start’.
The new north-south bicycle, pedestrian and runners path is developed parrallel and along the flat buildings, replacing the current pedestrian path here. Also perpendicularly, bike paths will be shaped with clear direction.

On top of the underground parking garages in between the flat buildings, a series of new active urban functions could be developed, in which activities could take place which are also usable after sunset.



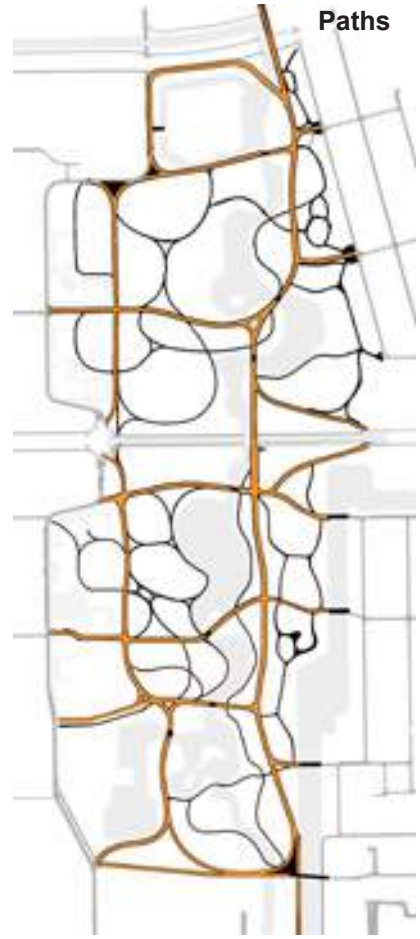
A substantial amount of trees must be removed to develop the new path. Through removing some extra trees at strategic locations, much more open space will be created. Users will have good overview of their route ahead and the park. As such, the western forest part transforms from a remote forest zone into a more open strip of diverse urban activities.

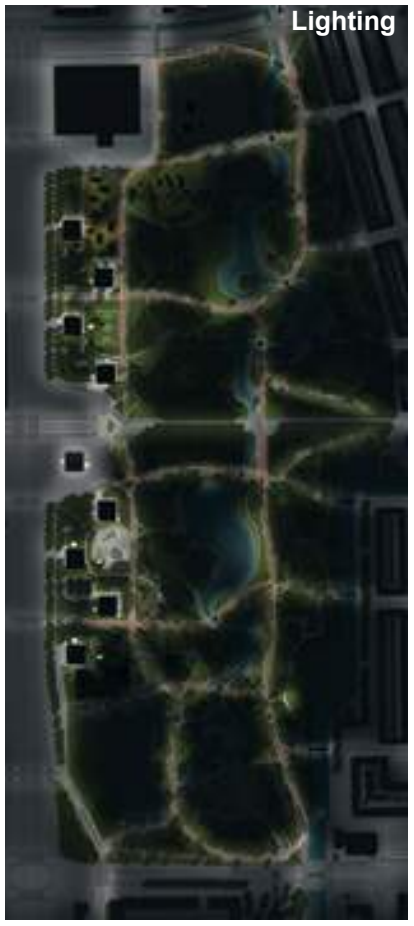
The loss of forested area will be compensated by creating new pathways in the west side of the park, bordering the west side of the central water. Forested parts were already preset here, but a lack of pathways in it prevented users from seeing it. By adding some additional trees at strategic locations, an alternative forested zone could be developed here.

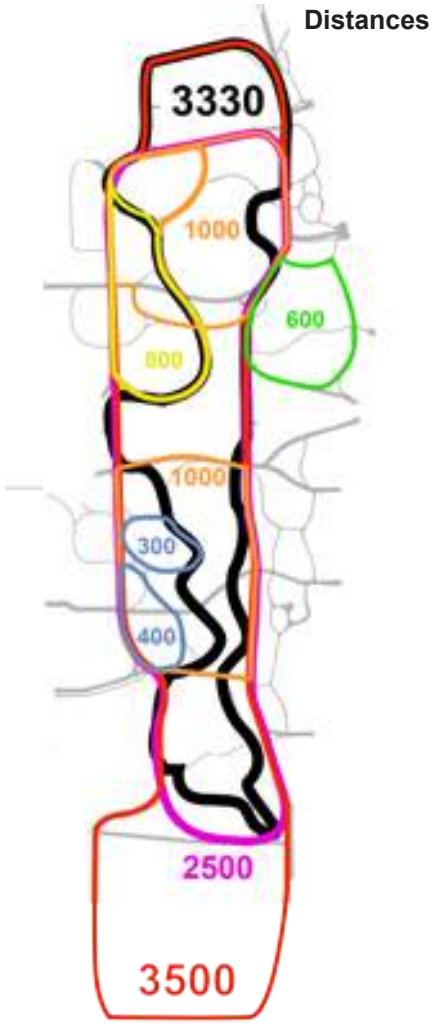
Design (1:5000)

A grid-structured commuting network forms the main structure of the park and creates a clear park-lap. It consists of a wide (red) bike/ run/ skate lane, bordered on both sides by a (grey) pedestrian/ runner strip. The current path profile/ structure does not have to be completely replaced, it just makes the current profile more consistent through the entire park.
The paths of this commuting network are rather straight and direct towards their destinations. Though where paths cross one another, wide bends are shaped to avoid short-cuts and allow smooth turns for runners, bikers and skaters.
In between these main commuting paths, a network of recreational paths is layed-out in more curved shapes. This shape prevents commuting traffic to use it, resulting in more traquil pathways. These paths also enclose the areas inbetween the apartment buildings, making them part of the park. The small recreational laps are knitted together in central points; one can fluently string together multiple short-distance (300-1000 m) interval trainings sessions.

Layers

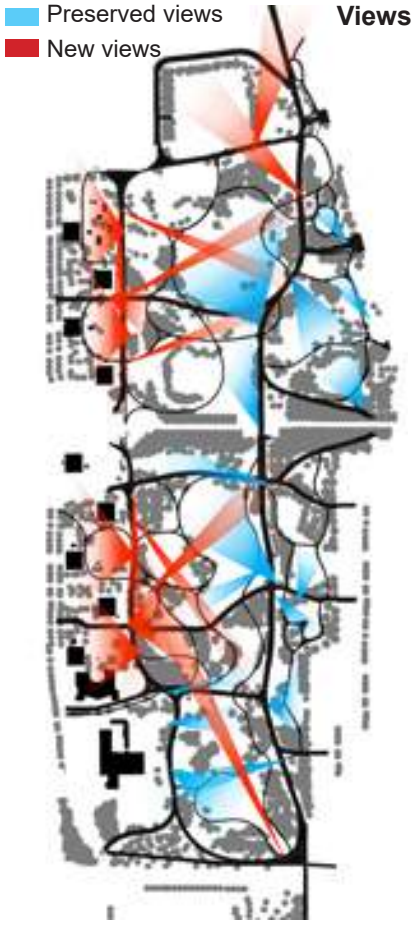


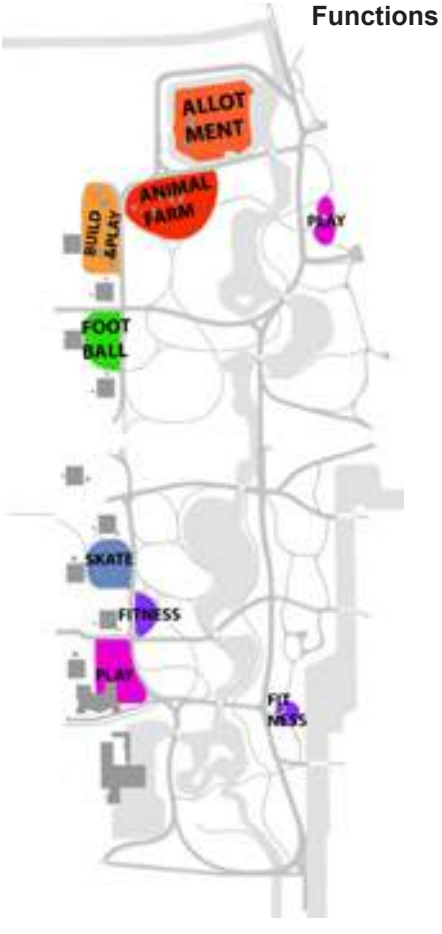




The commuting traffic network is provided with illumination to enhance safety (experience). The recreational network is not illuminated, in order to bundle all evening park activity to the commuting network, and prevent people from going to remote areas in the dark.

Both the recreational paths and the commuting paths are designed in such a way that it results in integer/ certain distances. A lap of 2500 meters can be made (5000 meter if run twice), 3500 (two times is 7km) and 3330 (three times is 10km).





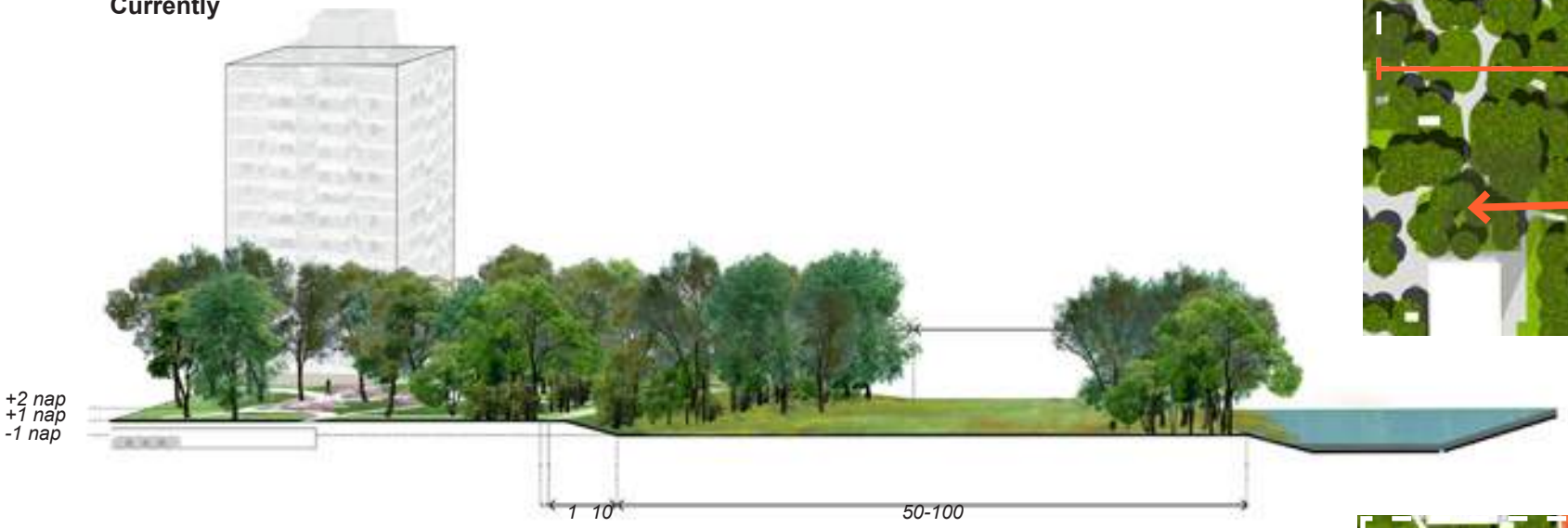
The forest experience is strengthened through adding forest on the right side of the new western path. It is added in such a way, that it creates more clear open and enclosed spaces. The spaces here will be experienced as openings in a forest, instead of an open space with some tree groups.

From the new western path, open views to the new functions and the apartments will emerge. Additional long-distance views are created from this path, focussing on the birdges, nodes and exits of the park.

In between the flat apartments, parallel to the new western commuting path, new urban functions such as a football field, an urban gym, or playgrounds could be facilitateted. They enhance the liveliness along the new axis.

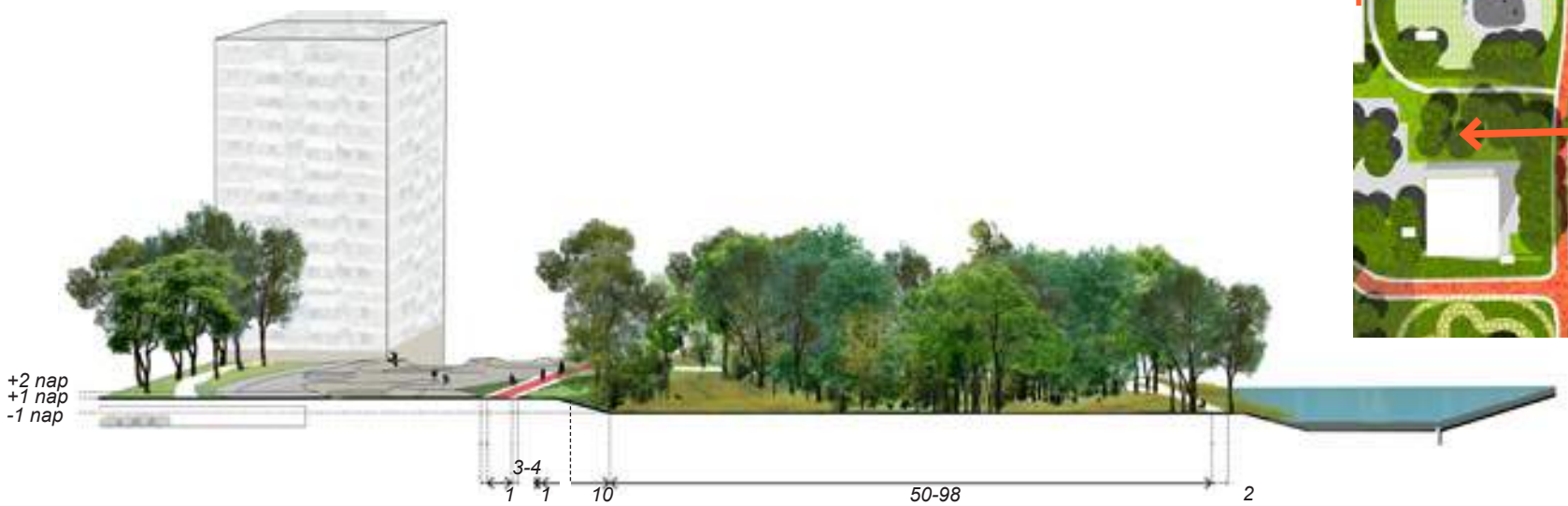
Sections (1:1000)

Currently



1:2500

Design 1



Details

The requirements of runners have also been translated into specific design details. The previous 1 meter narrow path through the forest will be 2 meters wide in the new design. It does not only prevent the paths from becomming muddy, it allows runners to normally pass pedestrians and dogs.
Where the recreational circling paths meet, a central oval has been designed, which could well function as a group activity circle.

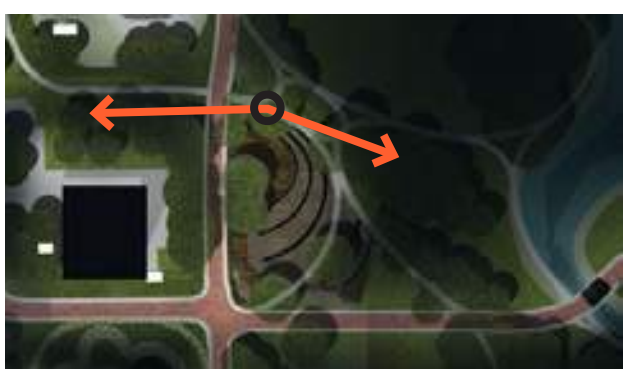
The new commuting path is wide enough for shared use by cyclists, pedestraians and runners. The runners can choose between the bike and pedestrian lane, depending what confrontations emerge where.

New active facilities (urban gym in this case) can be designed with respect to the parks character; for example by making use of natural materials.

The urban gym is placed over a hill platform. It can therefore naturally step-down with the current topography. The created steps provide possibilities for many spontaneous strength exercises.

In the dark

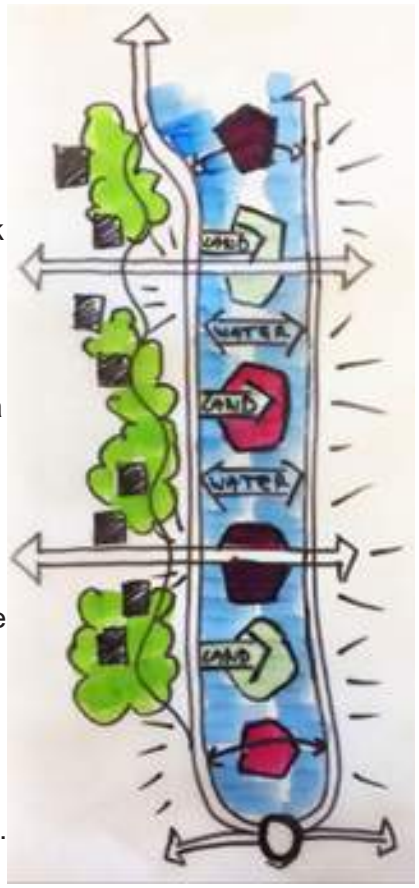
Illumination should light up the complete surface of the path, allowing the runner to see where the foot is being placed. In the new functions, other forms of illumination could provide special charcteristics in the dark, making these places well known for their eveing usability. Lights in stairs, or glow in the dark materials can create such effects.
As both the apartments, the new path and the new functions, together create a well illuminated zone instead of only an illuminated pathway.



Isolated places in the forested areas, no visible connection to surroundings and the sun. Illumination is not present and deserted benches are set on fire.

Option 2: ‘What goes around..’

Model



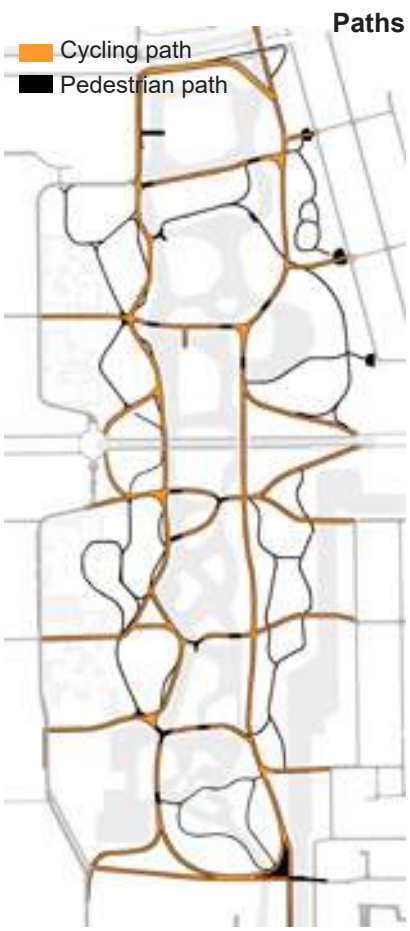
The second design starts with the belief that the (design) mistakes of the past, should not be solved by adjusting the original design, but by creating a design that develops a new character for the Rembrandtpark (because what goes around, comes back around).

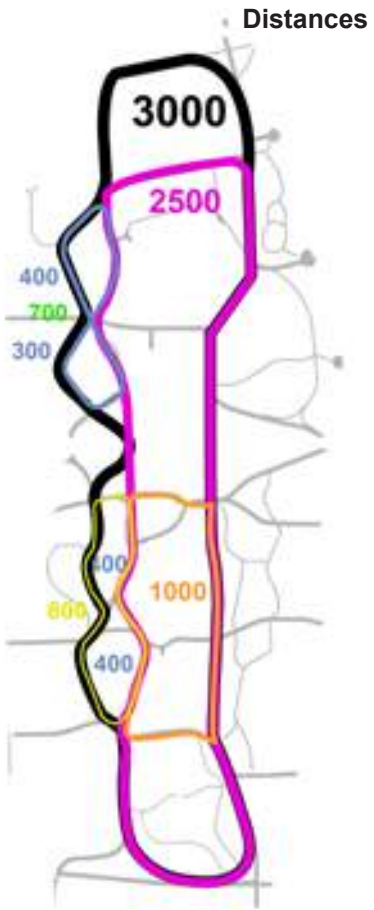
This model starts by creating an alternative route aside of the forest: a safe bypass.
Instead of removing the forest on the west-side of the park, a north-south bicycle, pedestrian and runners path is developed against the west side of the water body. This new route will be visually connected with the parrallel, and always busy easter commuting path, through removing vegetation in the center of the park (in between the two paths). In contrast, the eastern forest area can be preserved.
In order to create a connection that commuters will make use of, the path is designed with a clear north-south direction. The water edge has to straighten towards this path, to make the parks ‘lap’ clearly/ easily recogizable as lap around the central water body. Simultaneously, this gives the park a new ‘heart’.
The land that needs to be removed to create water along the path, can be shifted towards the center of the water body, where a series of islands can create recognizable entities of a varitay of urban and natural functions. The islands are simultaneously ‘hubs’, to reach the other side of the water easily, by making use of bridges (‘escape route’) and the east-west commuting paths, that simultaneously form routes for escape/ avoidence.
In this model, the center of the park becomes the open, buzzling zone of diverse human activity. This central zone is surrounded by forest, more tranquil environments in both east and west. The central water body forms the core of a new park identity.

Design (1:5000)

The new north-south commuting connection, is (slightly) less straight then the previous model, as it clearly follows the naturally appearing water body. This does result in direct oblique connections (northeast to southwest a more direct shape). ‘8-shaped’ recreational paths again provide possibilities for interval training.
Bridges in between the outside water edges and inner-islands are placed at strategic locations; they often connect three places at the same time. Not all islands are connected by paths to the shores; some might become natural islands only reached by canoes, others might only be reachable by playfull pull-pounds.

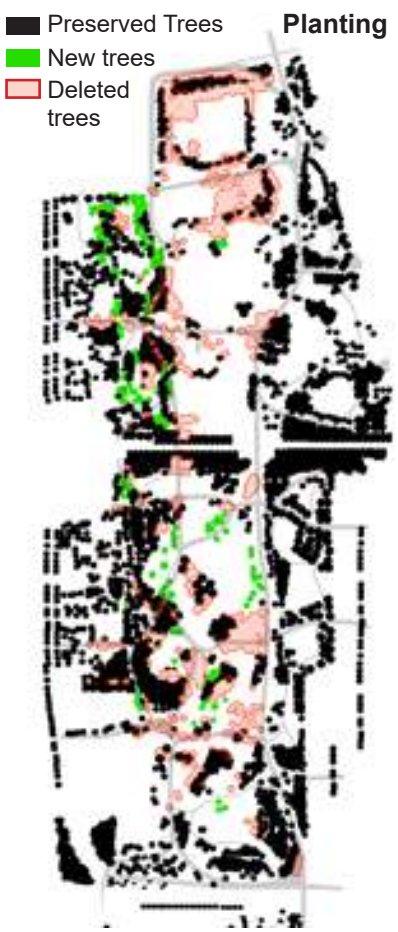
Layers

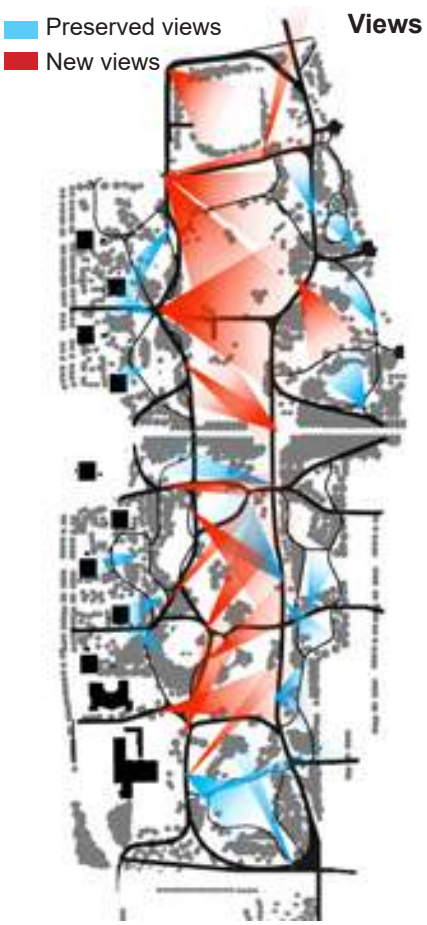


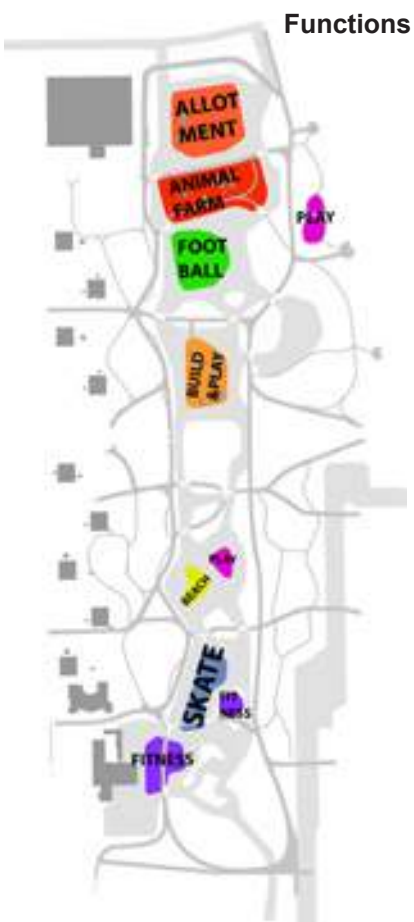


The center of the park will be a well illuminated zone, by light-poles around the main paths and around the new urban functions.

In the park, an exact 2.5 km and 3 km can be run. In addition, the recreational paths are shaped in exact distances of 300, 400 and 1000 meters.







The forest east and west-zone form a clear edge of the more open middle. Some copses stear views towards bridges, nodes and exits/ entrances.

The parks center is opened-up, through the removal of many trees. The natural qualities are instead more relating to water: open, wet-nature environments, like low reeds and grasslands and wet-lands.

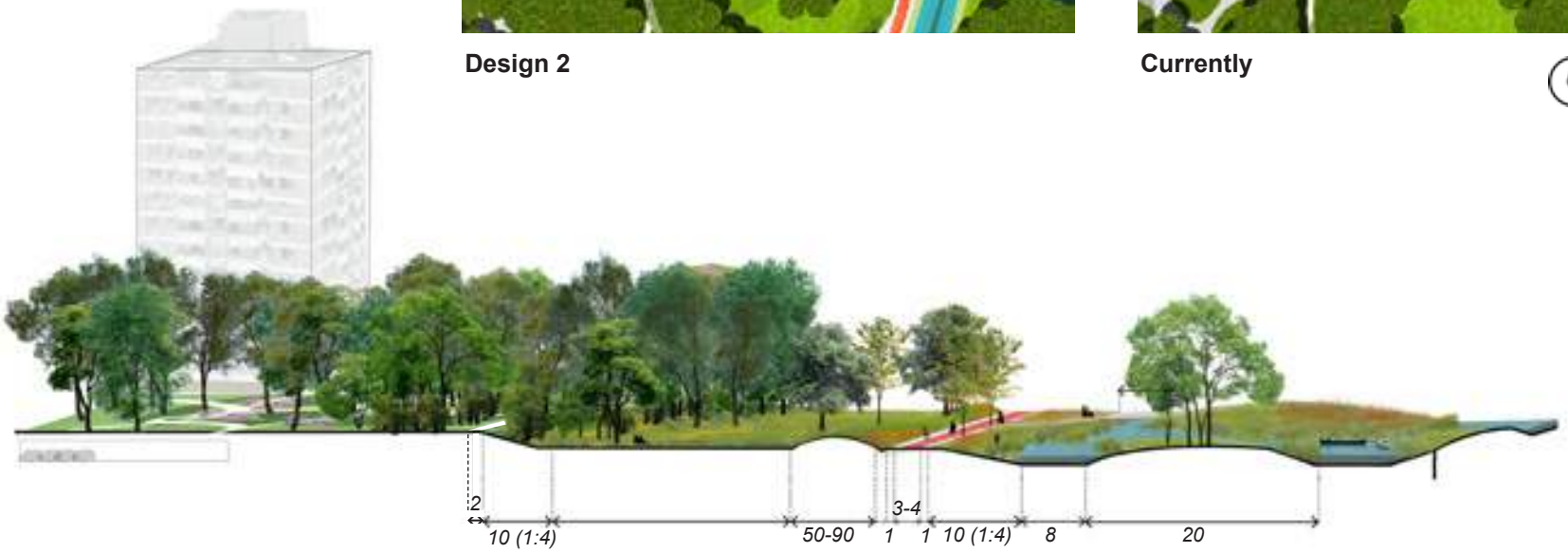
In the center of the park, new urban functions could be facilitated in the newly developed islands. The islands each get a thematic meaning, some being fully natural, another as beach, skate, play or fitness-island. These are examples of functions, but there could be many others. The islands just form a strong framework for them.

Section (1:1000)

Design 2

Currently

1:2500



In detail
The paths are assigned the same widths as design one. Through, they are designed to provide a fluent continuation to the connecting bridges.
The tri-pod bridges have angles of 120 degrees, allowing a fluent run and bike pass, and simulateously connect three points.
The water shores are also designed with fluent and varying angles. Gentle slopes (1:>3) allow a diversity of biotopes to develop in and around the water edges. The developing reed has filtering effect which will enhance the water quality.
How water edges are designed can depend on the function of the islands and connecting shores. Also the depth of the water can vary, providing both diverse usage possibilities and diverse biotopes.

In the western water edge, shores can be carried through in extra topography on land. These ridges frame the spaces between the forest and the water, and simultaneoulsy challenge runners to aggravate their exercise.

In the dark
As commuting paths on both sides are well illuminated, the parks center will be a very light zone. The illuminated routes between these also strengthen this.Bridges form a crucial identity in the park (as the strongly relate to the water character). The way of illuminating these, can also alter this special identity. Bridge railings or surfaces could be used for this purpose.

7.6 Assesment

The network

Design 1
The new north-south connection is straight, thus direct and thus provinding a convincing north-south (cycling-)connection, and also a clear directional structure for runners (gets you in a rythm).
The new cycling route network has a clear grid-structure, likely to be clear and readable for commuters.

Though, for diagonal commuting directions (north-east to south-west for example), it is less direct (no short-cuts).

The roundabout at the Potjesweg still needs to be crossed. The runner is still possibly interrupted in his park-lap (as are cyclists).

The main lap for runners does not circle around and through a similarly appearing environment. On the other hand, the new north-south-connection is a clear line that sets where the park begins and ends (east is park, west is urban).

Design 2
The new north-south connection is less straight than in model 1, and thus provinding a less convincing north-south connection.
This possibly makes the new network more complex (and thus possibly harder to understand, and orient).

Though, the slightly deviating directions does benefit east-commuting cyclists, as it often creates oblique short cuts.
These short cuts are often found around the new openned-up area, so at least they can be well overviewed.

The north-south connection does undertunnel the Potsjesweg; creating a fully uninterrupted park-lap (and a fast connection for cyclists too).

Additional notes
An overall important question is to what extent, the new north-west connection, is really filling up a missing link in the slow transport network of Amsterdam. The extent to which this is the case, will determine how intensely it will be used by commuting runners, cyclists and pedestrians.
If it will not do that with substantial amounts, it could be bringing only more potential victims to the scene. Also, the new north-south connection possibly devides cyclists over the two paths, where it might currently be bundled in the eastern connection.
If it will attract few extra commuter, and spread activity over both connections, we possibly end up with both connection having just not enough human presence to make it safe. Then, the designs would achieve the opposite of what they advocate to do.

Functions

Design 1
In terms of location, the new functions would be welcome in between the flat buildings and along the new connection; there is always a view of them. In addition, it fits the parks concept, in which functions are settled in the edge, as is the case in the east side of the park.
It adds new value to these currently monofunctional places. It leaves the full park size available for real park-functions: nature and recreation.
Though, construction-wise, building on top of these garages might bring restrictions to certain building-options (heavy structures possible on top?).

Design 2
The central location of new functions makes them an integral part of the park. Though, it might not always be rational to have them in a water-setting. Skateboards and footballs possibly end up in the water, children activities (kids animal farm, playground) might not be welcome in water setting.

Additional notes
In general, proposed urban functions could be developed, but there is no fixed idea for this. Many other kind of functions could be integrated as well or instead. Rather, it should depend on actual demands or requests.

More detailed measurements should solve potential problems of the water setting in combination with diverse functions.

7.7 Outcome

Image/ atmosphere of the park

Design 1
The design adapts some (failing) original ideas of the park through deminishing forst edge of the parks west side. But it also enhances some through adding functions in the edges and adding natural/ forest experience in the center.

Design 2
A clear symmetry can be recognised in the overall park image. The shapes of the new developed pedestrian and commuting paths are designed coherently to each other, but also suit the mainly preserved east part of the park well.
The park gets a feature that could strongly set a new main identity/ character of the park: water. It could provide the park with a new ‘identity’ which is currently missing.

Safety

Design 1
The appartments are lifted on top of a five meter high plints of stone only; the visual connection to the living areas is not on ground level. So, there is still quite a distance between the ground level and appartments.

Design 2
It is not fully certain if the new north-south connection will be used intensely enough for a safe athmosphere.
Also the new tunnel under the Potsjesweg is a potential new unpleasant pass.

Feasability

Design 1
As the design mainly seeks where adaptions and additions could be made, the design is rather feasable in terms of finance and possibly community support.

Design 2
The design requires rather large interventions, strongly changing the park’s center. It is only feasable if broadly supported and backed financially.

Only one design could be executed. As such, a choice will have to be made between both. In the virtual case that a decision has to be made on which design is best to be executed, this research could count.

In order to make such a decision, the assesment crtieria have to be assigned certain values. In this case, this is not done by assigning values to the criteria, summing them up, and counting what design was assigned most credits.
Instead, one argument can be seen as more important than all other; the argument that design 2 provides the park with a very new character. Personally, I think that if the Rembrandtpark has to be become a ‘truly’ vibrant place, with nothing but positive and ‘trending’ image, the park needs to significantly change its appearance.
As such, I see design one as an improvent of the orginal design, whereas design two adds very new characteristics.

In addition, the clear lap around the water is likely to be most appreciated for running. It also provides really different environments than other parks in Amsterdam, and the lap is more clear than design one. In this regard, I think this is mostly welcome for beginning runners that (as seen in both the data analysis and surveys) very much appreciate a simple, clear lap. Thinking in terms of health benefits, supporting beginning runners is likely more important than supporting experienced runners.

Having said this, knowing what design is best, does not directly tell what design is best to execute. Design two, is likely also the more expensive design. What design is best to be executed, depends on whether the possible additional value is worth spending the additional amount of money. This is a political decision, it depends on the relative value of other things the money could be spent on.

by
Thijs Dolders

Chapter 8
Schinkel promenade

8.1 Introduction

On basis of the spatial behavioural data and connected experiences from chapter 5 and 6, the Schinkel area in the west of Amsterdam, forms one of the individual case study test areas on how to design for running. This chapter covers the history of the area, the current spatial characteristics and their relationship to running. It also proposes strategies to enhance the attractiveness of this area for runners. This adds a new layer upon the various layers from the past, which might be more connected with the past than the current function.

This chapter starts with a paragraph that explains the historic context of the Schinkel. Next a spatial analysis is conducted, explaining the current spatial configuration of the area and that are relevant to the runners requirements. Thus focussing on the lay-out of the embankments and obstructions in the flow of the route. This paragraph is followed by a paragraph explaining the strategies to solve these. The design is a specific elaboration of the strategy.

This study is not the first one to be conducted in this area, which sees the Schinkel as a key element for slow traffic strategies in Amsterdam. The ‘Bloemenroute’ for example, a touristic city escape route for cyclists from the centre of Amsterdam towards Aalsmeer, also makes use of this trajectory. This study is just based on marketing strategies how to get people to use this route. In contrast, the research will focus on spatial interventions for runners.

8.2 Context

History

Figure 8.1: Origin Schinkel

The Schinkel originates from an old peat stream in Amsterdam. The exact history is not clear, but it is assumed that this peat stream was connected to the water of the IJ with the ‘wetering’ Kostverlorenvaart in 1413 and collectively this waterway formed the division between ‘hoogheemraadschappen’ Amstelland and Rijnland, connecting the IJ via the Nieuwe meer with the Haarlemmermeer. The division between municipalities ‘Amsterdam’ and ‘Sloten’ originates logically from this ‘natural’ barrier. This is especially the case where the Overtoom connects to the Schinkel (see the circle in figure 8.3) here, a very busy meeting point arose, with several taverns, like the (still existing) Aalsmeerder veerhuis and the Leidsche veerhuis (Bakker, 2012).

Figure 8.2: The bustle at the Overtoom in 1755, the exchange of people and cargo

An important fact to keep in mind in this story is that the waterways in the Netherlands were the fastest mean of transportation, for both cargo and people. Here a very lively and popular environment arose. This due to a ramp where ships were lifted into the higher ‘Overtoom’ and ‘Slotervaart’ water, people and cargo also had to be transferred and because of the waiting time to do this, the area became fertile ground for taverns. In 1599 a ferry connecting Amsterdam with the city of Leiden was initiated, with one of the taverns next to the ramp as the starting point. Followed in 1630 by a towpath ferry service, which was a revolutionary connection due to its punctuality, cheapness and speed (7 km an hour). This was a success with 250000 people using it each year between the cities of Haarlem and Amsterdam. Even up to the 1940s the ramp in the Slotervaart was still in use and from 01:00 AM on, the ships with cargo, especially between the vegetable nurseries in Sloten to the vegetable market in Amsterdam, were entering the city via this method, up to 100 times a day (Sickman & van Kooij, 1999).

This ramp or ‘overtoom’ in Dutch was meant as an obstacle so that this waterway wouldn’t become the most beneficial route towards other cities in the rest of Holland. In 1809 the ramp was replaced by a sluice, although this remained a very vibrant area and the hinge between the city (industrial Kostverlorenvaart) and the countryside (Bakker, 2012).
In 1921 the municipality of Sloten was annexed by Amsterdam, which was the turning point from being the hinge between rural villages and city, towards becoming part of city districts. At the beginning of July, 1942 the new sluice was built on the border of ‘Nieuwe meer’, making the Overtoomse sluice obselete. In 1949 a new bridge towards the Surinameplein was built, as part of the expansion strategy of Amsterdam with the new garden cities in the West of the city and new road system. These developments caused in just half a century this once very vibrant edge of the city to be consumed. What remains today are pictures and stories, some old houses and the water of the Schinkel itself (Sickman & van Kooij, 1999).

Figure 8.3: Map of Amsterdam from 1832 with a very clear diagonal line next to the city centre: Schinkel/ Kostverlorenvaart

The Northern part of the Schinkel, known as the Kostverlorenvaart has a different atmosphere. This has always been an industrial area, with a skyline of windmills. Parts still remain but the majority was transformed by the city in a very early stage by neighbourhoods strongly inspired by the canalhouses, apart from one windmill few ‘rural’ relics have survived (Bakker, 2012).

The difference between city and countryside was also visible in architecture. In the city the buildings had small, high fronts and deep rooms, the buildings in this part of the city were broad and low, mainly just one or two floors, but with the same ornamentality of the buildings in the city. Not just the estates that were found in this area, also the taverns had a monumental appearance.

The character of the embankments has always been connected with the industry on the water and around it. Although in a lot of places these embankments have been very narrow, it has been a lively mixture of boat workers, people transferring cargo and especially during the weekends and in the summer ‘tourists’ visiting the taverns and watching the spectacle of pulling the boats over the dam. As seen in figure 8.4 the embankments have been paved for a long time to facilitate the transferring of goods (Sickman & van Kooij, 1999).

Figure 8.5: Cotton factory ‘Het torentje’ 1727

Figure 8.4: Sloterkade with Aalsmeerder veerhuis 1920

Schinkelhaven

The square ‘Schinkelhaven’ also has an interesting history. In 1672 at the start of the Franco-Dutch war, Amsterdam made an entrenchment in this area where there had been a tavern and some industry for several decades, to protect the city from the south. In 1696 this area was sold and Cotton factory ‘Het torentje’ was built. In 1793 this building was demolished and remained unbuilt for half a century. The ground was the property of a charity who rented it as allotments. In 1854 the property was sold, and investors built an estate here. In 1878 this was sold again, and in 1904 this became a play garden for the people of Amsterdam with a café, a ditch with boats (where the name Schinkelhaven is derived from) and it was popular area that was demolished in 1954, to be developed into appartments (Sickman & van Kooij, 1999).

Figure 8.6: Advertisement for café and playground Schinkelhaven

Figure 8.7: Map of current buildings of importance and cafés along the Schinkel

Current situation

The Schinkel and Kostverlorenvaart waterfronts once were one of the main attractions of Amsterdam as read before (Sickman & van Kooij, 1999). Today some important monuments are still to be found next to these waterfronts of which some pictures are to be found on these pages. They range from houses and monuments of the time this was a rural area like ‘het Aalsmeerder veerhuis’ and windmill ‘de otter’, up to one of the main monuments from the architectural style ‘Amsterdamse school’ and historic industrial areas which still retain their charm, ending finally with the food halls.

Not just historic buildings are to be found here, many famous and notorious bars of Amsterdam are situated here as well. Mostly on corners near bridges and varying from very recent to well-established bars, cafes and restaurants.

Looking at the map on the left, it is clear that the southern part of the Schinkel offers most attractions, the more northern part exists mainly as living districts, which are related to the history of the southern part as the more vibrant are in the past.

Figure 8.8: Schinkelhaven with Teatro Munganga in the old horse remise

Figure 8.9: Olympic stadium

Figure 8.10: Haarlemmerpoort at the beginning of the route

Figure 8.11: Remnants of vibrant past: Aalsmeerder veerhuis on the right

Figure 8.12: “Nieuwe meer” at the end of the route

Figure 8.13: Café Oslo

Figure 8.14: Café Gent aan de Schinkel

Figure 8.15: Café Schinkelhaven

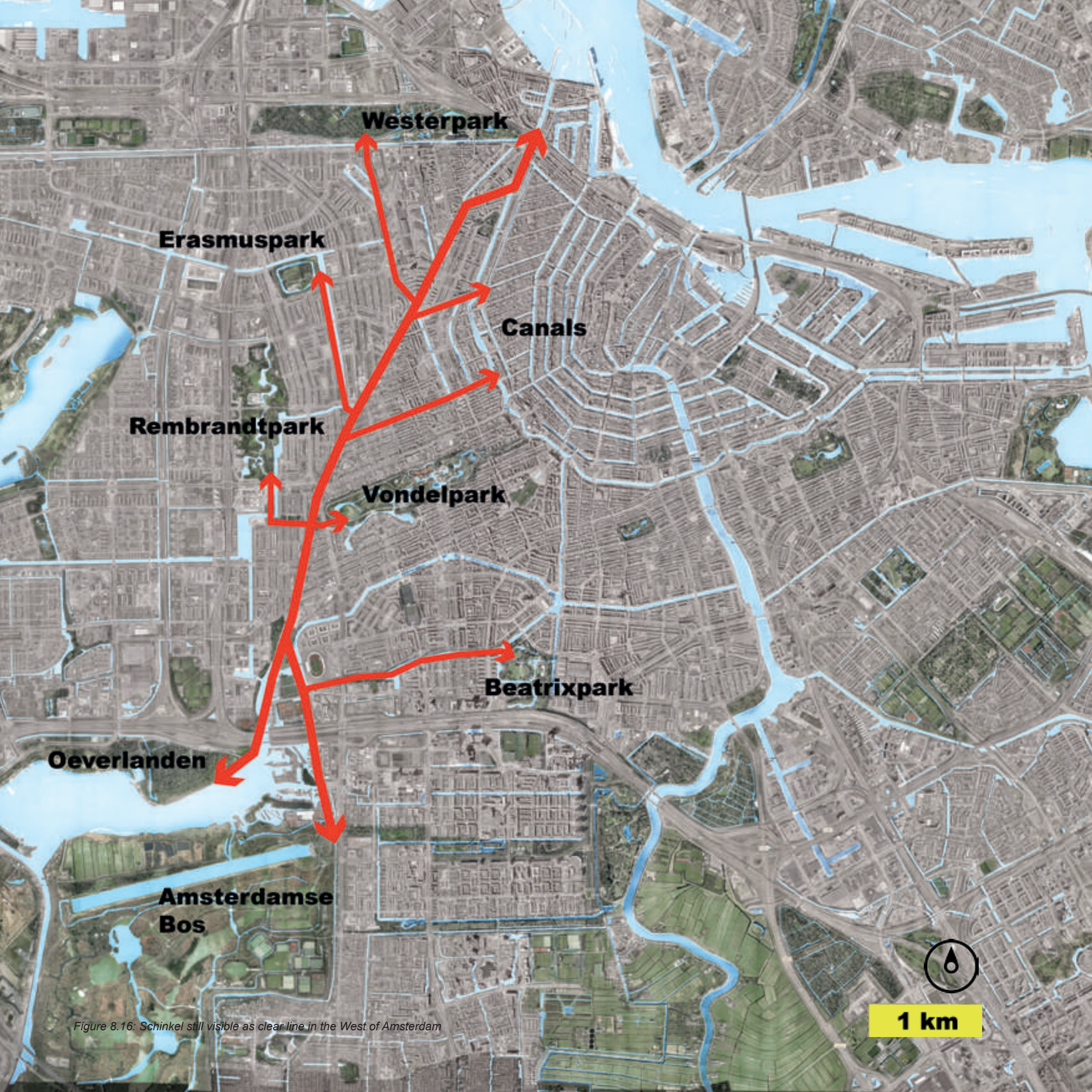


Figure 8.16: Schinkel still visible as clear line in the West of Amsterdam

8.3 Spatial analysis

Looking at the map of Amsterdam on the previous page (figure 8.16), the area of the Schinkel and Kostverlorenvaart still appear to have a strong spatial structure. The clear line connecting countryside (Nieuwe meer/ Amsterdamse bos/ Oeverlanden) to the city centre (Westerpark and Canals). But it is also a median in between some very important parks in the city, like Westerpark, Erasmuspark, Rembrandtpark, Vondelpark, Schinkeleilanden and Beatrixpark, as seen on the map on the previous page.

Figure 8.17: Short distances map

Figure 8.18: Geotech wordcloud

The clear line from the map however doesn't return in the usage of space. The data and survey research explained two main negative experiences of runners: the neccessary stops for perpendicular traffic and nuisance from other users of the Schinkels edges. These two aspects form the structure of spatial analysis and design strategies:

- Not having to stop for obstructions along the schinkel. Therefore, the obstructions that interrupt the route have to be understood.

- Reducing the experienced nuisance formed by other users on the Schinkel embankments (mostly cars and bikes). An analysis is made of the existing lay-out of the embankments of the Schinkel, to understand these nuisance factors.

Obstructions

An area that clearly stands out in the data is Schinkelhaven, an area used by runners to run from Vondelpark towards Rembrandtpark and vice versa. The map below shows for example a selection of the routes that run along the Schinkel (figure 8.19). On this map, as in other maps the Schinkel is crossed instead of run along. Looking at the spatial structure of the Schinkelhaven (figure 8.20), one can see that the route from Vondelpark to Rembrandtpark is free from obstructions. The adjacent streets however are inferior and lead to the Schinkel with straight curves almost hidden behind greenery and cars. Coming from the Vondelpark it only becomes clear you are close to the Schinkel when you are on the bridge over it.

Although this area is just in use by slow traffic, it is a perpendicular road crossing the Schinkel. The current spatial configuration is not inviting for people to run along the Schinkel, as the road has a clear direction from Vondelpark to Rembrandtpark.

Figure 8.19: Routes run along the Schinkel

Figure 8.20: Schinkelhaven is a connection space with few qualities to make it social space

Perpendicular roads

Even more obstructing the flow of the runner are the perpendicular (car) traffic roads that are crossing the Schinkel (see figure 8.23), which are part of the main system of roads in Amsterdam. Not only a huge amount of car traffic uses these roads, but also tramlines form part of the infrastructure.

From the data it was clear that the similar water structure of the Amstel is used as very popular running route. One of the factors for the success of the Amstel as a running route is the possibility to run without obstacles. Most roads perpendicular to the Amstel are higher and therefore easy to pass or have clear crossings with pedestrian crossings (see figure 8.21 for differences between Amstel and Schinkel).
This causes that the road next to the Schinkel gets interrupted and no long distances can be run without overcoming these obstacles.

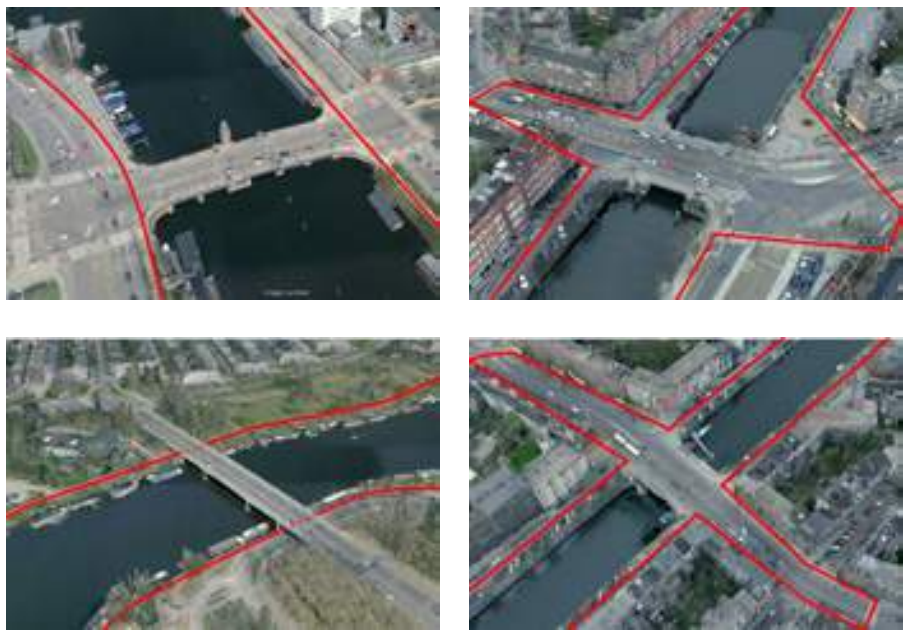


Figure 8.21: Maps on the right show the detour you have to make at perpendicular roads at the Schinkel (to get to traffic lights) where at the Amstel you can keep moving

Figure 8.22: Images corresponding with the Schinkel maps on the right: Overtoom on top and Zeilstraatbrug below

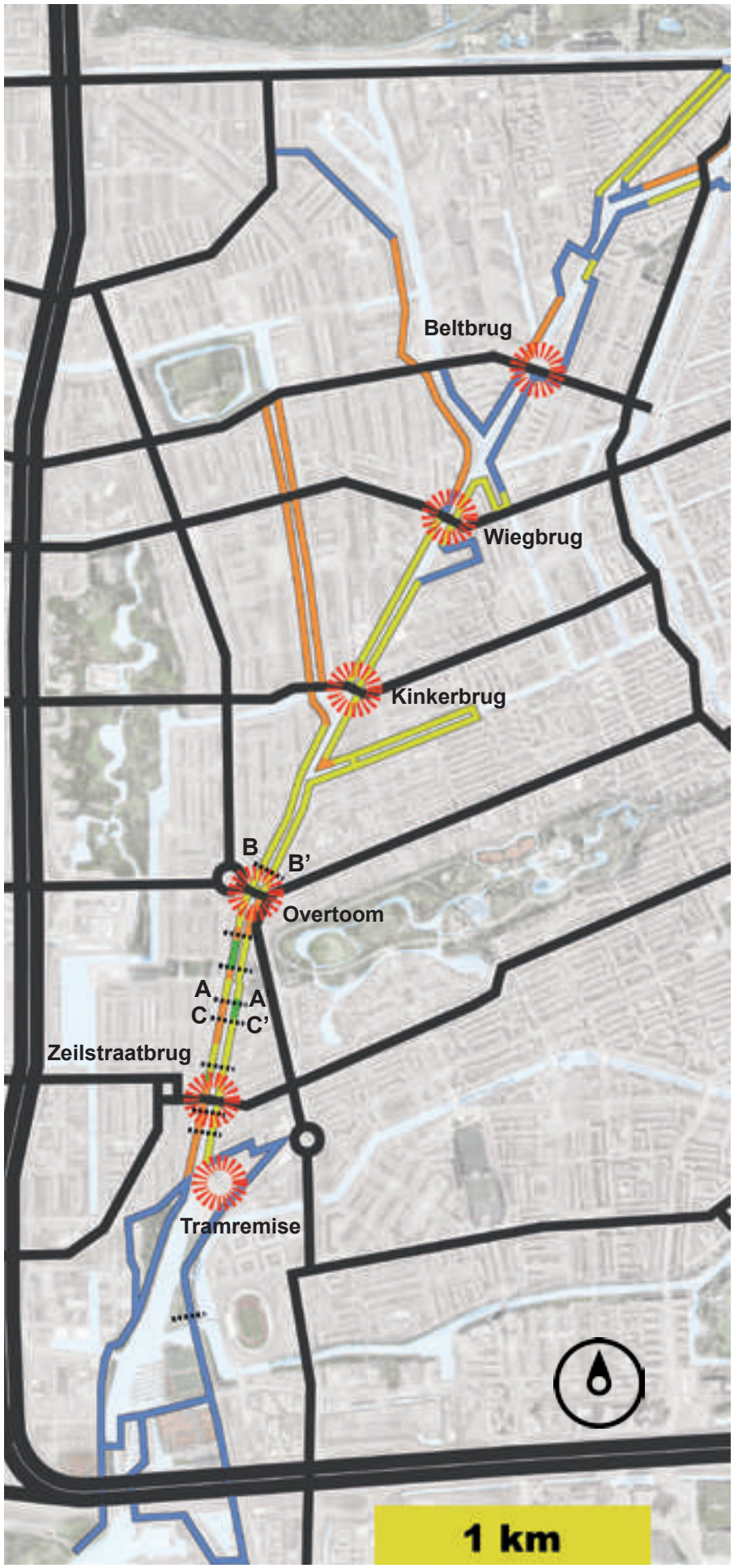
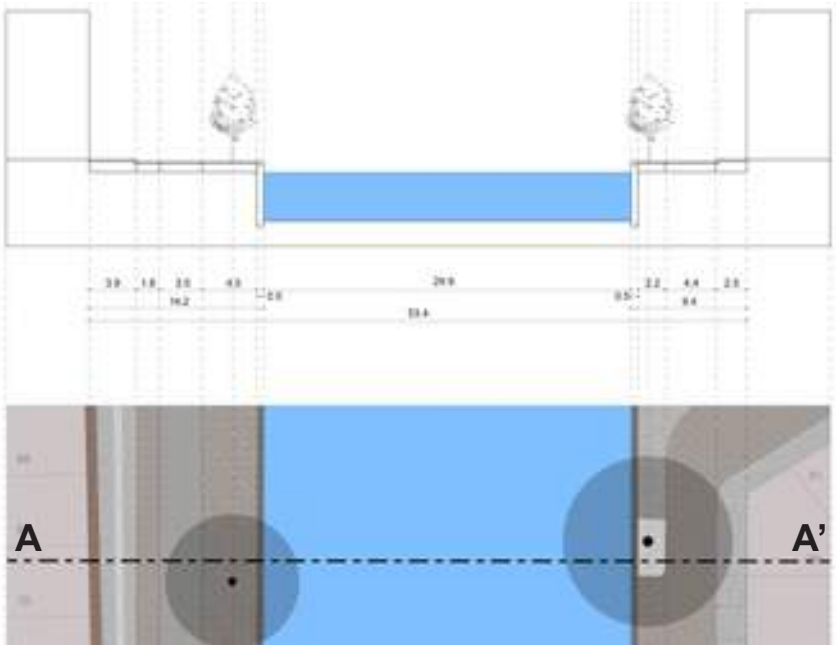


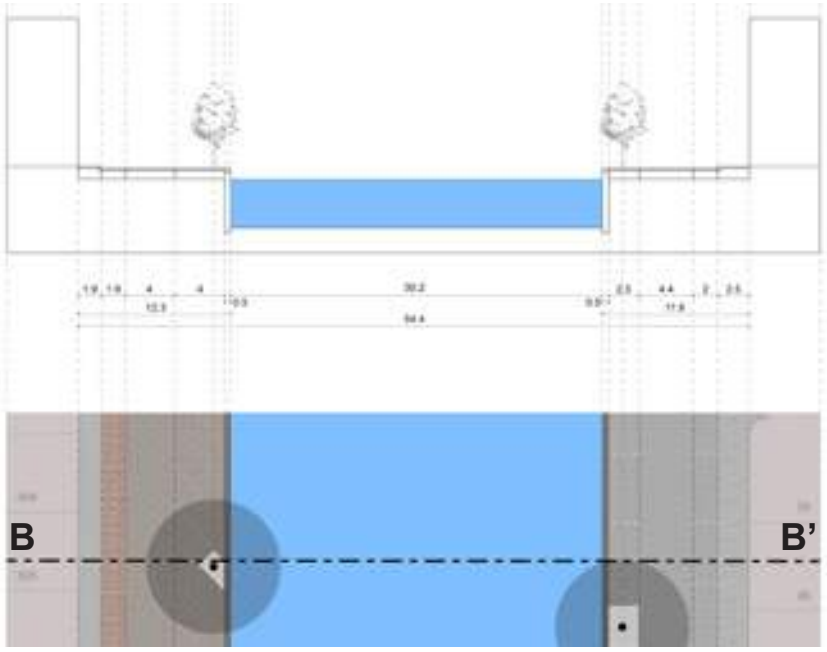
Figure 8.23: Map with the perpendicular roads and indication of the profile of the embankment corresponding with map 8.24-8.25 and in blue a devious profile

Nuisance on the embarkments



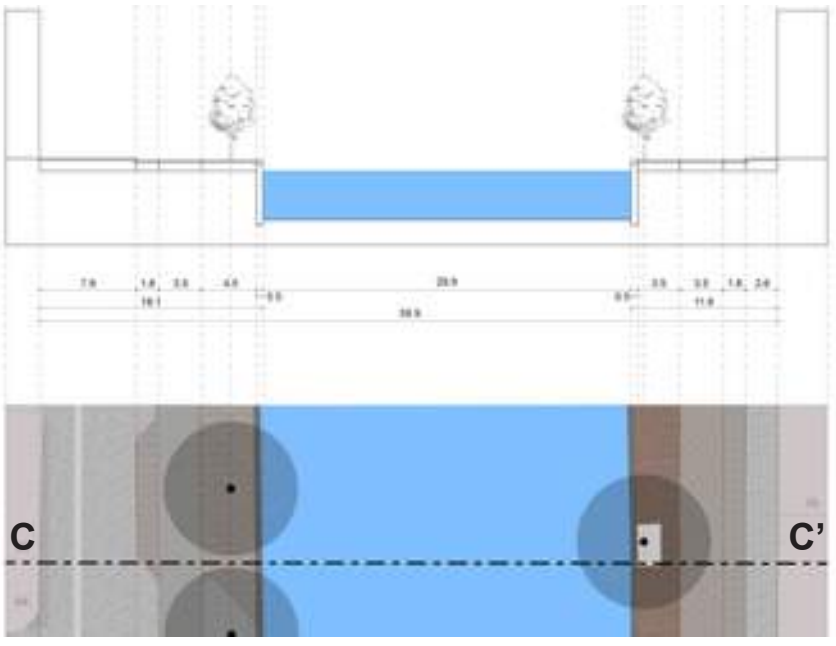
Smallest profile

This small profile occurs in just a few locations. Although it is just 9 metres wide, a pavement, 4 metre wide street and a parking strip are placed in the profile. The street is a one way street and a shared space for cars, bicycles and runners. The view towards the water is obstructed by cars (vans) and there is almost no possibility to sit next to the water or walk along it. Runners have to dodge other users as there is no room reservated for runners.



Most common profile

This medium profile occurs most frequently next to the Schinkel and Kostverlorenvaart. Although there is more space, this is just used for parking, not just putting cars along the road but also perpendicular to it. Although the profile is broader, the view gets even more obstructed by cars for the majority of the time, as you are running or walking further away from the water there are more cars between you and the water. There might be more meters here, but not more meters for slow traffic (runners).



Widest profile

The widest profile offers not just a very broad pavement, but space also offers place at the water for walking. Unfortunatly there are still a lot of obstructions, like bicycles and dog faeces. Again a lot of place has been reserved for cars. The sur plus of space is not effective as it are just short areas.

8.4 Strategy

From the spatial analysis it becomes clear that the main obstructions are on the one hand the perpendicular roads which make it impossible to have one uninterrupted route along the Schinkel and on the other hand the current lay-out in which cars are dominating the street and there is barely room to walk, run or cycle left. To make this space meet the requirements of runners, these problems have to be solved. In this chapter strategies to solve these problems are explained.

Improving the lay-out of the embankments for slow traffic just gets worthwile if the route is uninterrupted for a longer stretch. Therefore there has to be found a solution for this problem first. Second, the actual lay-out has to be improved. As most people on this road drive just there to park their car, finding a solution to place cars somewhere else has to be solved first. This not only creates room where the cars had been parking first, it also effects the amount of cars driving here.

Solving perpendicular roads

The crossing caused by the big perpendicular roads are the first obstacles to solve. Easy flow along the route is a crucial element as seen from cases like the Amstel (and similar the Lakes in Copenhagen). This also ensures that people don't lose their orientation because they have to leave the line of the Schinkel and move into a neighbourhood to pass the crossings.

There are a couple of possibilities researched in this study regarding about how to overcome these large crossings. Because they are all part of very important roads it is not possible to solve this problem on the level of traffic, by prioritising slow traffic on the crossing for example, or designing green flows for pedestrian and cyclists placing traffic lights on these places.

The next option is to make a bridge over the existing bridges. Because of the kind of traffic (tramlines, trucks) this bridge has to be relatively high. The short regular calculation on how long ramps should be for cyclists to use (Length = ((h-0.1)x11.1+10) x h) and taking the optimistic height of 3.5 metres to cross, the result is a ramp of (**167.09** = ((3.5-0.1)x11.1+10) x 3.5) on both sides of the bridge.

The last option is the most realistic one. The water of the Schinkel is already narrow and therefore the municipality do not want it to be made more narrow through the use of decks for example. Just in front and after bridges there is a small piece of water in the lee of the bridge, rarely used by boats. This model makes use of this space by adding a path to the quay at the point where the quay ascends towards the bridge (in Amsterdam the bridges always lie higher than the surroundings so it is needed to let the quays ascend towards the bridge). The bypass stays horizontal and at the point where no overview is necessary the path descends towards the water and the bridge head (see figure 8.26).

Figure 8.24: Large bridge heads at Zeilstraatbrug with (1) functional and (2) aesthetical

These bridge heads however appear fairly solid. The bridges in this route are all designed with two large 'bridge heads'. This is done because of the aesthetics for the urban design. Just one of these heads is important (number one in figure 8.24), because of the mechanics, weights, etc. in this part (D. Jauslin, personal communication, 2 Sept 2015). The other side of the bridge (number two in figure 8.24) just needs as resting point where the bridge can be lowered upon. So by creating a reinforced tunnel on this point the bridge head can become a surpass of the bridge, giving plenty of space for runners and cyclist to pass without having to stop or find their way to pass the crossings. The different options that people have to cross the bridge are displayed in figure 8.25.

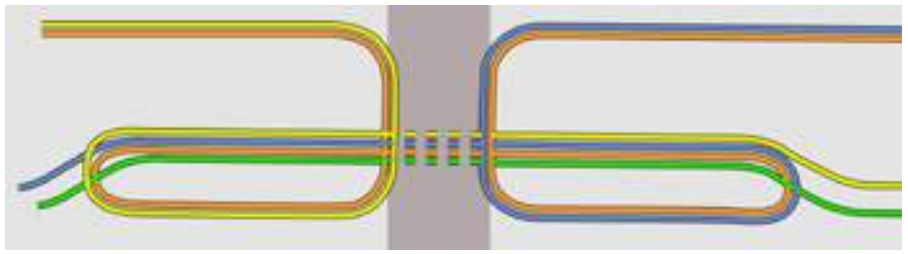


Figure 8.25: Flow of runners underneath the bridge, no dangerous passing of roads or waiting, one movement

Figure 8.26: Ascending embankments, descending bypass

Figure 8.27: The circles with a radius of 500 metres indicates the range of the parking garages connected to the main roads

Figure 8.28: The lowest circle in figure 8.27 where a parking garage gives space to 250 cars on a vacant plot

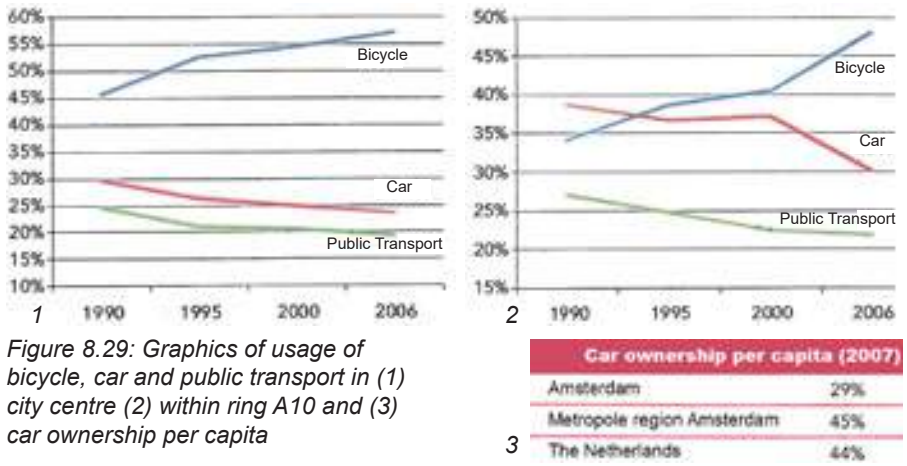


Figure 8.29: Graphics of usage of bicycle, car and public transport in (1) city centre (2) within ring A10 and (3) car ownership per capita

Solving parking and driving along Schinkel

As seen in the graphics in figure 8.29, car traffic was reduced in Amsterdam over the last few years, whereas cycling has strongly increased. This is on the city scale however and the statistics of the population in the different neighbourhoods next to the Schinkel might show different outcomes, although it is likely that also here people are getting less dependent on their car.

In the publication by the municipality of Amsterdam “De auto en de stad, op weg naar een autoluw Amsterdam” (2008), the municipality already gives some visions on how to tackle the dominance of the car in the city. In this publication the placement of central parking garages is mentioned, a strategy which fits approapriately into this area, taking into account that the streets in this area are all one way streets and the policy is just local traffic. By clustering parking facilities not only will most of the parking in the streets be removed, but also the traffic in these streets becomes minimised as most traffic drives here to park.

Most perpendicular roads to the Schinkel are major roads and part of the main car infrastructure of Amsterdam and therefore cannot be removed. Close to these roads however, a couple of vacant plots can be found, suitable for placing parking garages. By making use of this strategy, one parking garage every 500 metres will facilitate parking for all people in that area of the Schinkel (figure 8.27). This means that people will have a parking garage within 5 minutes walking distance from their homes. Also good accessibility for bicycles and the parking of bicycles in these garages will be essential. These parking garages are all close to major roads, close to highways, which is the main reason for people to use a car: to get out of the city. So people have their cars not just in a covered parking garage but within easy reach by foot or bicycle from their house, especially as there could be a new slow traffic corridor in front of their house, people also have the opportunity of leaving the city swiftly without the irritations of one way narrow streets.

Some space has to be reserved for elderly people and disabled people to park close to their houses, as well as some space for short term parking in front of shops, deliveries, etc.

8.5 New profile

Concept

The aim of the design is to create a recognisable structure for runners in the city, for orientation, unity and image. The concept is based on the idea that the running track is the most recognisable structure for runners as a place which is designed for running. As runners don't like to be interrupted the concept of the running track is used to separate three different groups of users of public space. The track of the user groups are separated by concrete kerbstones and the materials are based on preferences of the user group, but all in red.

Figure 8.28: Concept with in 1 Graustabiel for runners, in two smooth tarmac for cyclists and in three bricks on the pavement for pedestrians

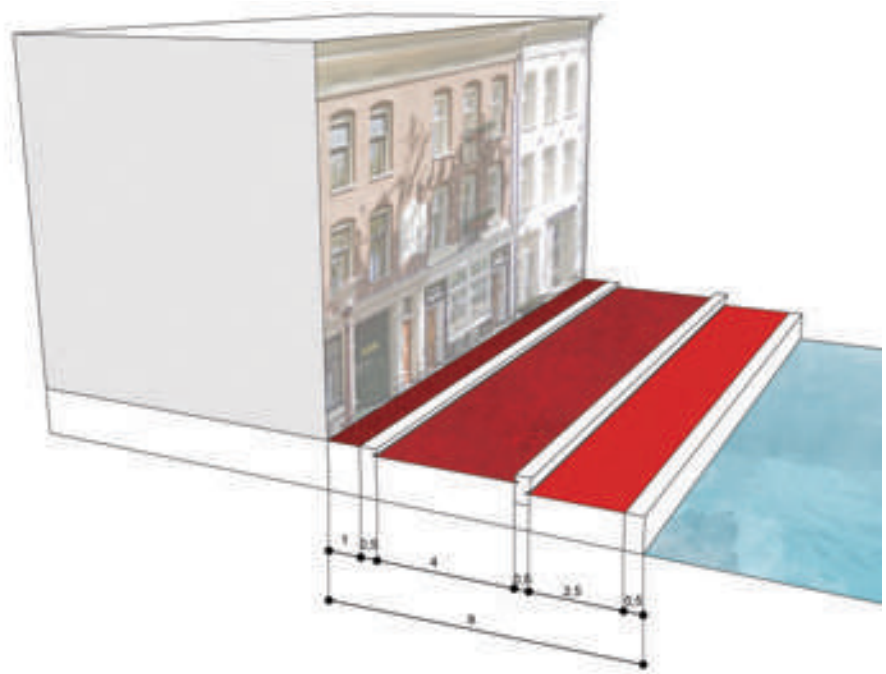


Figure 8.31: 3D section of the smallest profile

Structure

Because of the strategy described in chapter 8.4, most of the cars have now been removed from the quays of the Schinkel and there is now space for other functions, forming a slow traffic corridor connecting the entire west of Amsterdam.

The underlying thought of the profile of the quays is connected and derived from the very narrow space on both sides of the water. In the first place it has to become a transportation space, especially on the most narrow parts of quay. Next to that, there should be a social space on areas which offer more space.

One of the main annoyances of people from the surveys, is the obstruction by other space users. Therefore traffic flows will be separated. This is achieved by height differences and the usage of different materials. Runners and pedestrians however are able to bridge these height differences.

The profile of the quays on both sides of the water differs from 9 metres to 18 metres, although most of the quays have a width of 12 metres. In this profile space is reserved for:

- Pedestrians
- Local traffic/ emergency services
- Cyclists
- Runners
- Parking

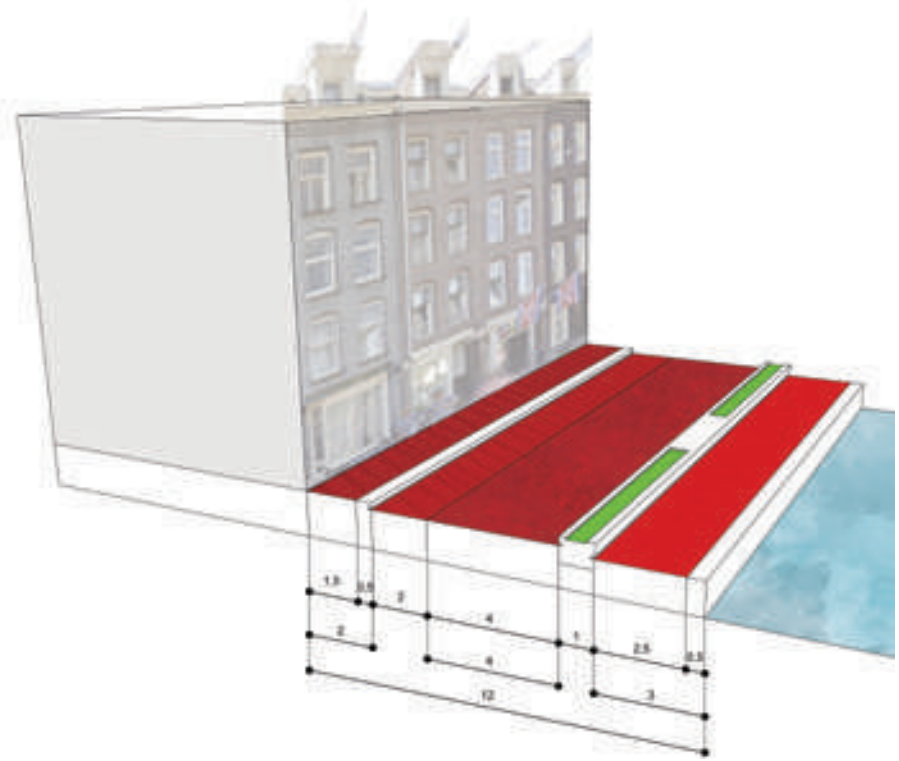


Figure 8.32: 3D section of the average profile

A major distinction is made between the smallest profile and the main profile of 12 metres. In the small profile there is no space for parking and vegetation, whereas on the main profile there is space for parking along the street (for disabled and elderly people as well as for short term parking in front of shops) and the edge between the quay and bicycle path is formed by a planter divided by 5 metre benches every 20 metres.

Close to the buildings is the pedestrian pavement (1) executed in typical Amsterdam red bricks in a perpendicular pattern to the Schinkel (Stretcher bond). Including the kerbstone this path is always 1.5 -2 metres wide. The kerbstones are made from concrete and always 0.5 metres wide. This is the space to enter homes and shops, where people walk with prams/ wheelchairs and dogs and where the typical Amsterdam mentality of sitting in front of your house or having a small front garden can be embraced.

Next, in the profiles from 12 metres on, there is a parking strip (2). This piece of street lays 0.2 metres lower than the sidewalk. It is made from the same material: red bricks but here in a 90* herringbone bond. This strip is 2 metres wide and is giving space to cars, but doesn't form a continuing strip. Sometimes it is interrupted by a ramp towards garages or some bicycle parking.

Connected to this parking strip on the same level is a bicycle path made from super smooth red tarmac (3). This is a shared space which can be used by bicycles and skaters in the first instance, but also by local traffic and emergency services for which it forms a one way street. This path is always 4 metres wide.

The separation is made by a planter divided with benches (4) which lays 0.2 meters higher than the bicycle path and is 0.5 metres wide in the 9 metres profile, 1 metres wide in the 12 metres profile, and can get up to 4 metres wide in the widest parts. This planter and benches are also made from concrete and collect rain water. The size of benches along the Schinkel will deviate and are not just for sitting and enjoying the scene with boats and runners, but also function as a robust platform to perform exercises on. An indirect light close to the ground is installed in all kerbstones, lighting up where to run and giving a feeling of safety without making it too bright a place at night.

The plants in the planter exist mainly consist mainly of a perennial grass called *Stipa pennata* which is a robust grass with a lot of motion in the grey seed heads, adding even more motion to this area. Some colour is added by bulbs and perennials for year round attractiveness.

The piece of the quay adjacent to the water is reserved for runners (5), but because it is always at least 3 metres wide (including the 0.5 metres embankment) there is plenty of space for other pedestrians as well. This path is laid 0.2 metres lower than the bicycle path which not just separates it from the other users, but also forms a subtle reference to the former worn towpaths. The material of this part is a semi permeable loam (red Graustabiel) which makes it pleasant to run on.

The existing trees remain, as they are mature and there is plenty of space on the path left to run around them. Because of the semi permeable surface the material can be laid up to the trunks of the trees.

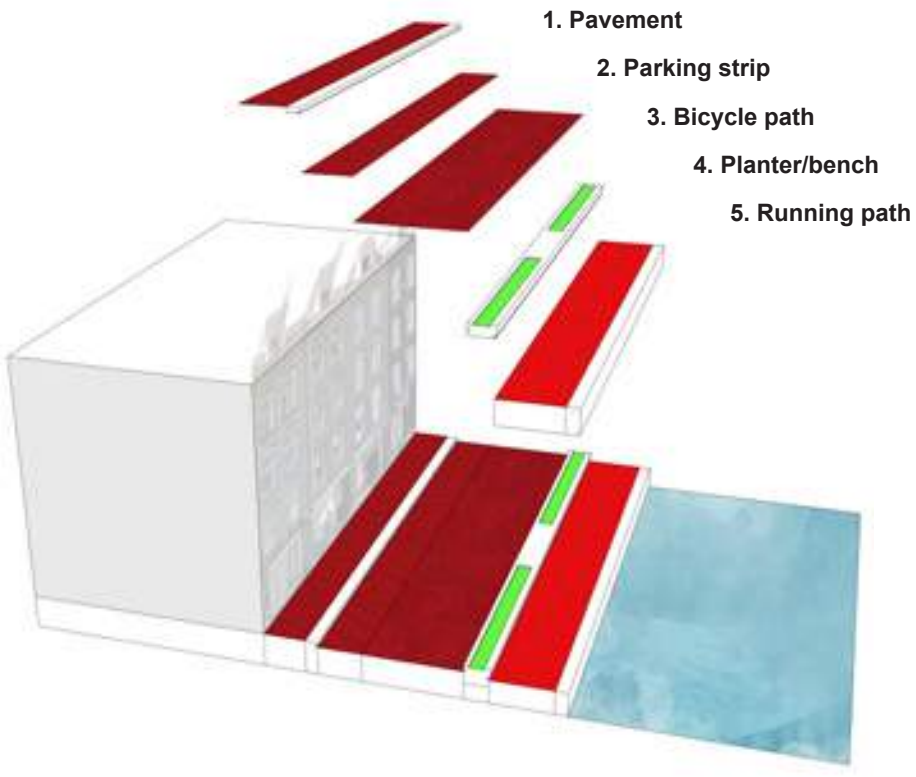


Figure 8.33: Exploded view of broadest profile

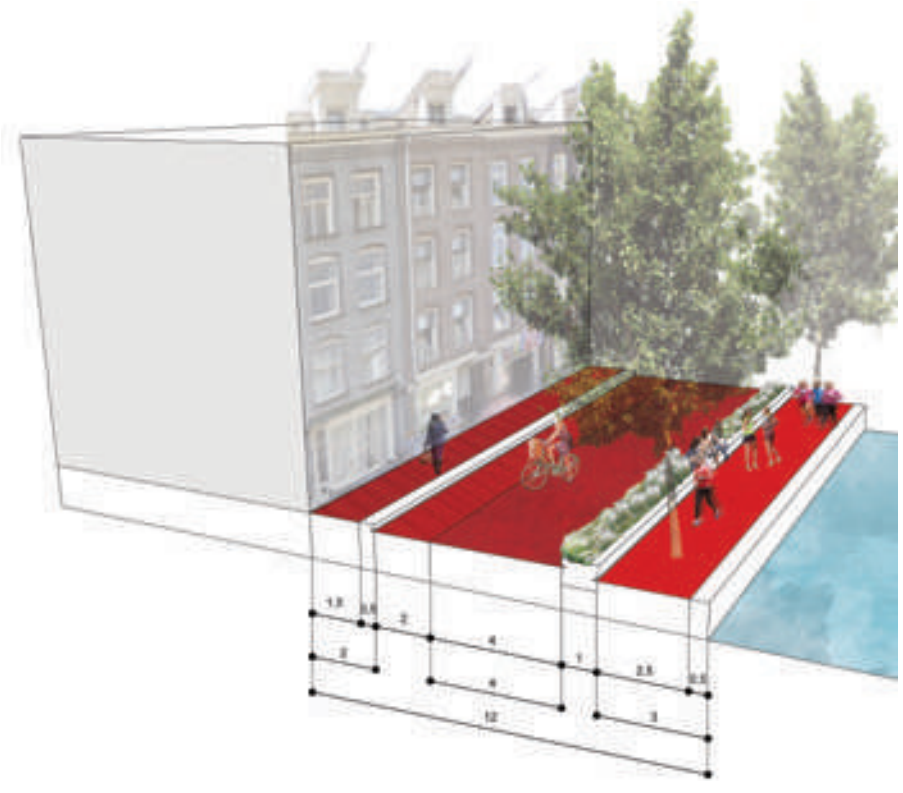
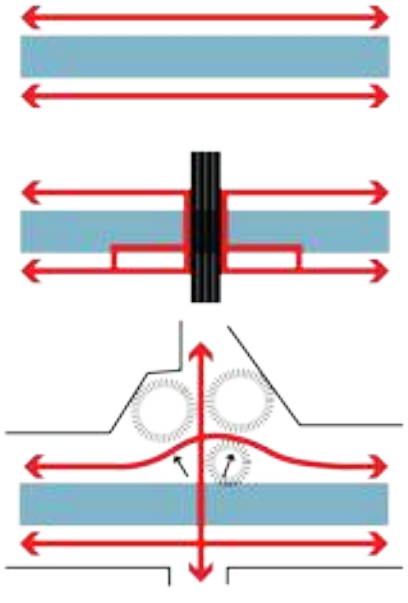


Figure 8.33: Schematic impression of the atmosphere on the average profile

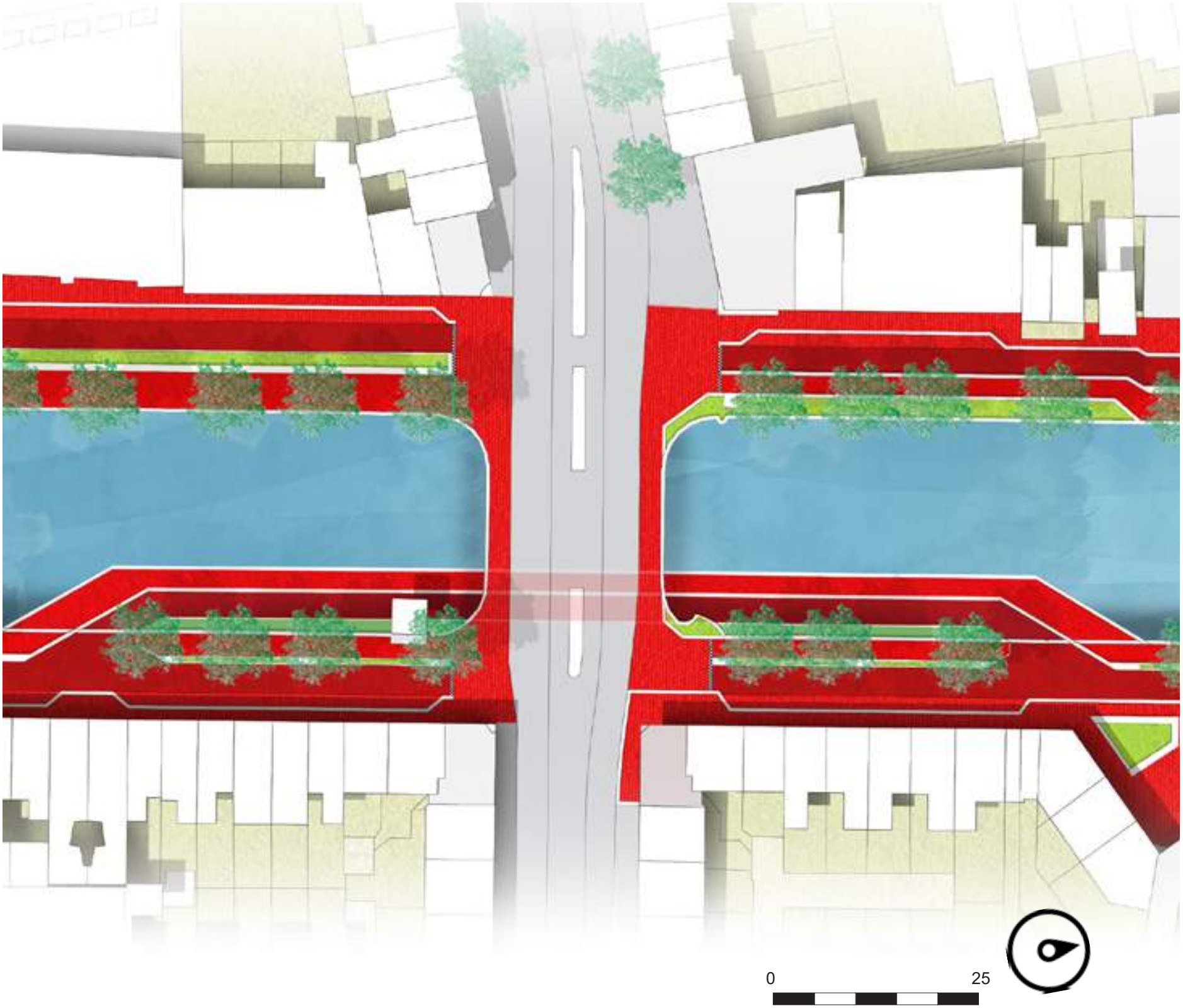
8.6 Design



The actual implementation of the profile is based on three main ideas. First, the path for runners should always follow the embankments of the Schinkel, giving it a clear orientation and entity. Second the perpendicular roads are no obstacles anymore as they are surpassed by tunnels. And third when there is mores space on the profile the profile widens and makes space for other functions.

The first detail on the next page shows how one of the main obstacles, the Zeilstraatbrug, is crossed by passing under it through a tunnel. Because runners hate stopping most, they have the possibility to cross to the other side of the bridge to cross without slowing down. This will make the lap longer, but this removes the irritation of stopping and crossing a dangerous road. The tunnel itself is open towards the water and the bridge is on this point just supported by posts. The walls are lit with stripes of bright light, visualising speed and there is room for bright LED advertisements of sport brands. The lowest point of the tunnel goes 0.5 metres through the water, improving the experience of going down the quay and adding fun to the route. This makes an attraction and therefore people are more likely to use it. The paths for runners and cyclists stay divided in the tunnel so no one is obstructing the other.

The area has very broad waterfronts in this part. Therefore much space has been given for benches and vegetation. The running path itself is 6 metres wide here, providing a nice view of the bridge. The running and pedestrian path have a clear finish line so that it becomes very obvious this is one of the crossings that cannot been done easily. According to research carried out about cycle highways (Bendiks & Degros, 2013) safer situations arise at the moment paths gets broader at crossings, because people have more space to dodge other users and have more options.


0
25

Overview: Red carpet for slow traffic

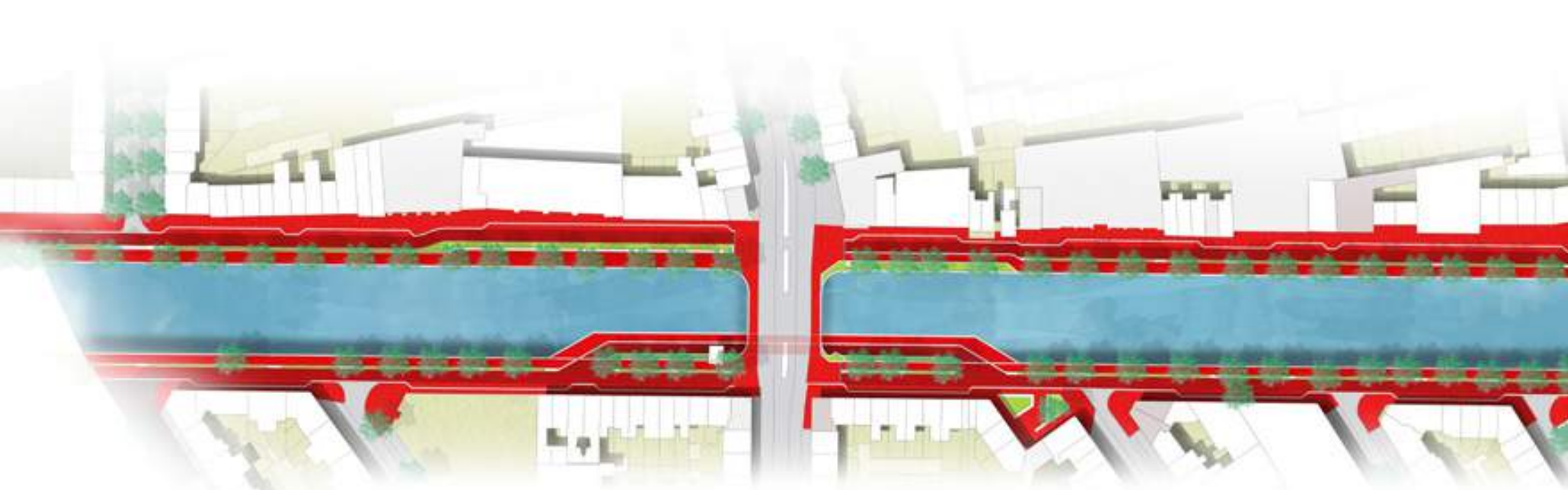
The standard profile is the most ideal situation and therefore never one to one to be integrated into the real world. The map below is the standard profile implemented in the lower part of the Schinkel, from Overtoom towards tram remise. In this part of the Schinkel a lot of design challenges are present. There are two crossings to be solved (Overtoom and Zeilstraatbrug), the smallest, medium and broadest profile had to be adapted and there are squares of which the ‘Schinkelhaven’ is an important starting point according our data and next to form an important route from and towards the Vondelpark.

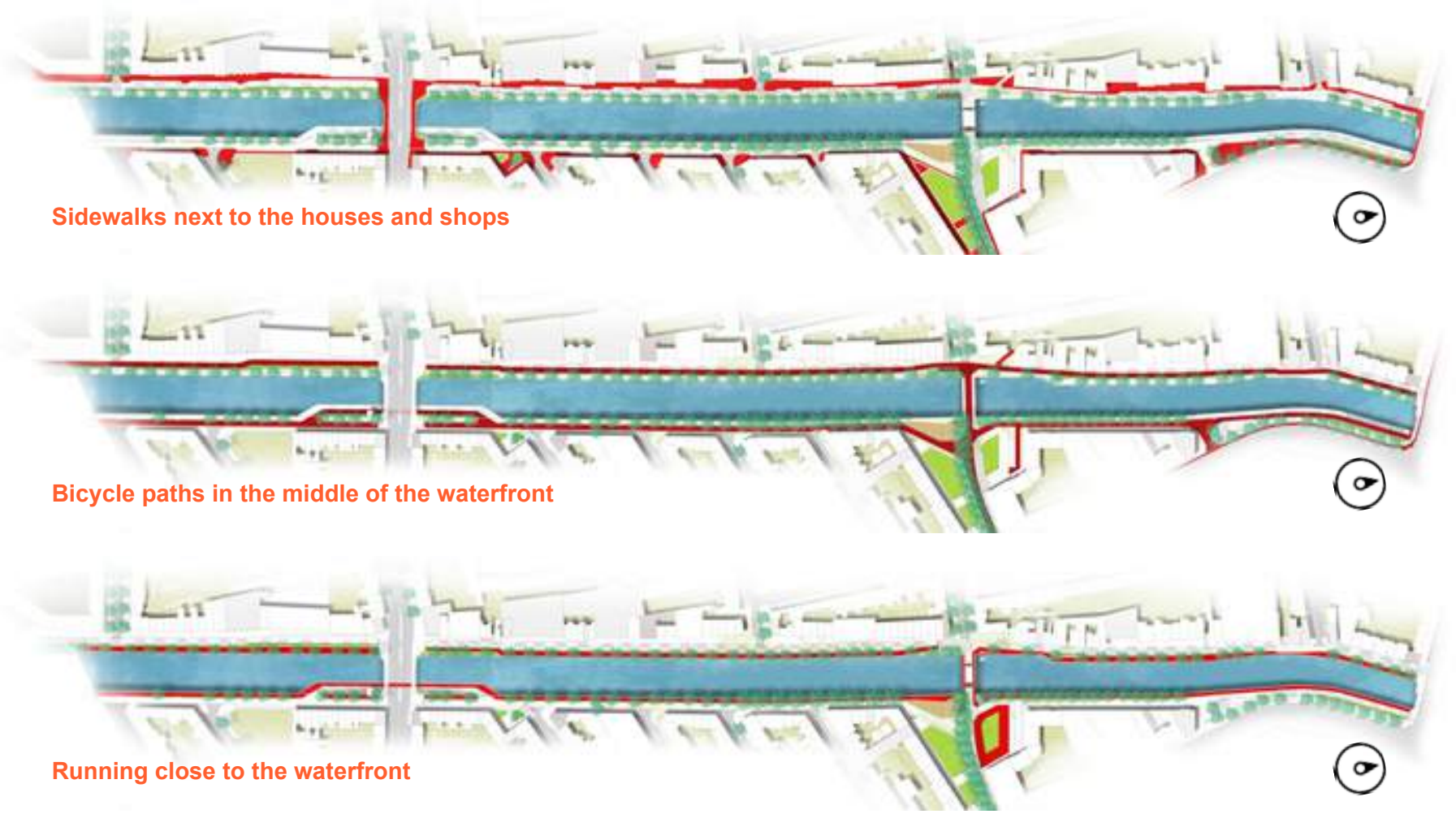
The original character of this part of Amsterdam is reinvented in this design. Although the rolled out red carpet looks like a large implementation on a large scale and is looking very bold, it creates recognisability and coherency. On eye level however, it becomes a human centred environment. The waterfronts of the Schinkel become an identity on the scale of the city by using the same materials on the entire trajectory. These materials and implementations make it clear for whom this area is designed. The materials added in this layer are not connected to a certain time frame or style which makes this a timeless and simplistic design. The design does not aim to add something spectacular to the urban environment, but tries to facilitate runners and just becomes a success if it is used by them.

At the moment it is a parking strip with several key features in between districts with different characters in Amsterdam. The design connects these key features, making space for activities to make this a vibrant, bustling area again. The ability to sit next to the water without cars obstructing your view or parked on the place where you actually want to sit, make the connection with the water and the life upon this water restored. Water is not only part of the DNA of Amsterdam, it is also a strong tool for orientation and in the summer a cooler place to run.

The design unleashes possibilities for long distance runners to run all the way from the Westerpark or the canals in the centre towards the Amsterdamse bos, without being obstructed, which is one of his primary necessities in enjoying the route. Next to that the runner has something to see, not just the diversity in architecture but also the vibrancy on the water and on the slow traffic paths next to him.

This design also facilitates the short distance runner, as there are many more possibilities of routes to run rounds, not just along the water, but also in combination with the adjacent parks. The possibility to run along the water and adjust the route according to stamina makes this the ideal place for starters who want to extend their routes.




Sidewalks next to the houses and shops
Bicycle paths in the middle of the waterfront
Running close to the waterfront
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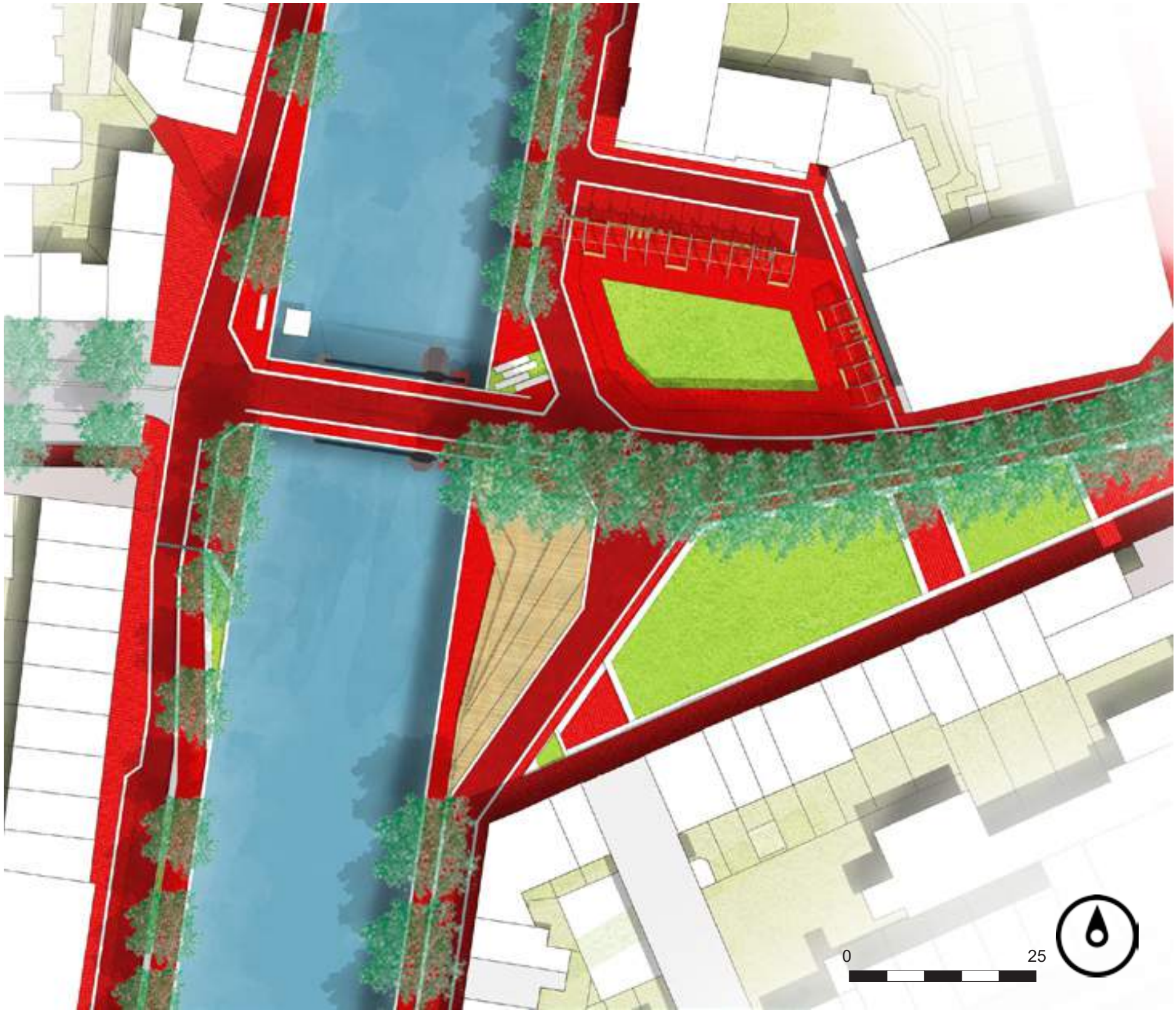
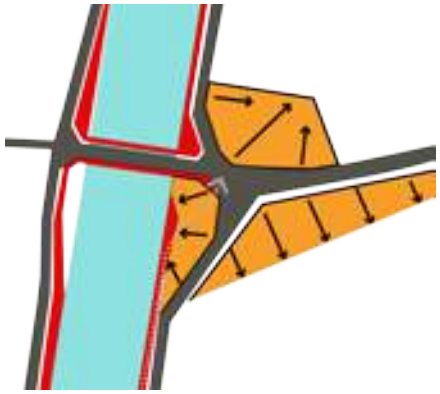
8.7 Detail Schinkelhaven



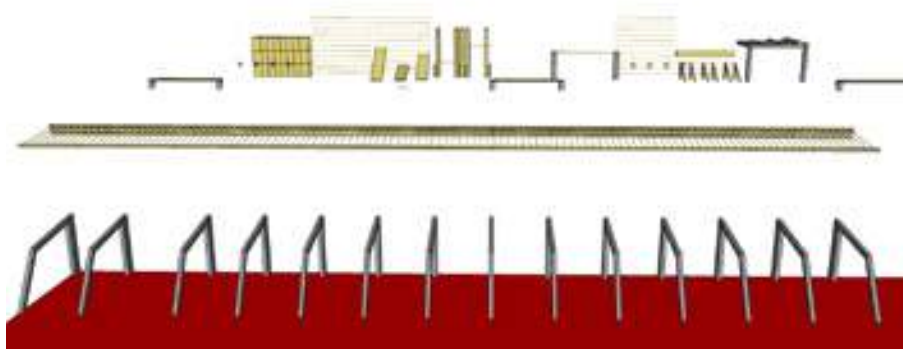
This area is currently just in use by slow traffic. The cycle path leaves a monolithic linear path on the square to take distance towards the bridge so more overview over the busy crossing is created and a logical flow from and towards other perpendicular parks. This also generates space for other functions in the three corners of the crossing as seen in the diagram. The current dominant path is maintained as well as the monumental Platanus trees which strengthen this line. The former hidden sides of the path however have been opened up, transforming the area in a social space. This area is primarely used for sports.



On the west side of the square towards the Schinkel the area that is created by moving the path away from the Schinkel, is furnitured with a deck of wood. Some trees at the water edge are removed so people can enjoy the evening sun. Interspersed low and high steps form the deck so runners can do exercises, move towards the square, or relax in the sun.

The corner in the south of the square is divided from the rest of the square by a 0.5 metres high sitting edge. At the side of the houses this edge has no height which connects the houses to this space. In front of the theatre and cafe the space is reserved for a terrace. On the corner there is a planter and the two large green areas exist as mown grass for children to play.

The top corner of the square is designed as an urban gym. Two high steps divide this area from the higher crossing. The width and height of these steps and the open field in the middle are ideal for training in larger groups. On the edge of this urban gym a pergola is situated, separating the parking from the square and enhancing the area. All urban gym equipment is integrated into this pergola, as well as benches, lockers and water taps. The urban gym is a modular unit placed in areas that appear in the data as starting points. The structure is adjustable and exist of steel ribs which are connected by a wooden frame made of ‘monkey bars’. The gym equipement can be attached between the ribs with all kinds of possible variations.

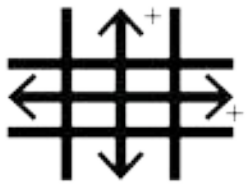


Chapter 9
Finish

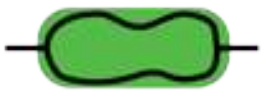
9.1 Principles

Below, an overview is given of design principles that have been used and tested in the designs to make Amsterdam a more runner friendly city. They form the final step of RQ3. The extent to which they can or cannot be translated into other urban environments, depends on the context of the case.

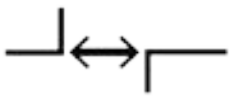
Principles Rembrandtpark & Schinkel



High ‘slow network’ density



Recognisable network -> recognisable entity



Connect missing links.

Clear hyarchy of paths and spaces.

Smooth & streamlined paths.

Entrance = start-stop hub

Additions Rembrandtpark

Exploit size to full extent.

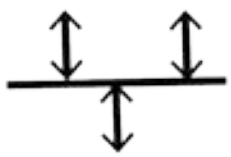
Bypass: avoid route

Integer/certain lap distance.

Safety:
Overview
Orientation,
Oision on path & people

Additions Schinkel

Creating uninterrupted slow network space



Backbone structure

Rings & Bridges

9.2 Conclusion

Concluding will be done through answering the sub-research questions, that together answer the main research question:

What interventions could improve urban spatial conditions for running?

RQ1: Where and when do people run?

The crowdsourced data analysis has provided a precise insight in the spatial and temporal behaviour of Runkeeper and Strava users in Amsterdam. First, the analysis of time usage (‘when do runners run?’), showed that running behaviour is strongly influenced by both personal and natural day-rhythms. For example, the presence of daylight and leisure time showed to strongly influence when people run.
In general, the spatial distribution of their running routes, park-like (natural) places and water edges strongly attract runners, in contrast to denser urban environments. As such, urban parks (mostly the Vondelpark and Amsterdamse Bos) and water structures (mostly the Amstel river and IJ) were the most intensely used. Alhough, exceptions to this were found in the Rembrandtpark-west and the Schinkel. They showed to be relatively underused compared to the Vondelpark and Amstel. In addition, distribution can shift when sub-dividing running activities in time, distance or temperature. The general pattern of more use in and around nature, water and open spaces stays, but usage either increases or decreases at specific locations. In the western side of the Rembrandtpark, hardly any running activity was performed in evening hours (darkness), the Schinkel river was used more frequently by short distance runners.

RQ2: What spatial conditions determine this running behaviour?

The causes of both these general and specific behavioural patterns could be explained well through surveying Amsterdam runners on their spatial running experiences and requirements.

The results of the surveys also confirmed hypothesised problems in the crowdsourced data analysis, and explained what spatial aspects of the natural land/water structures supported their required running experience. It turned out that in determining route choices, the relative absence of traffic (mostly car, but also bike and pedestrian traffic) was of even larger importance than the natural character of these places. These are often inherent characteristics of park-like places and water structures (like the Vondelpark, Amsterdamse Bos, the Amstel and the IJ).

The Schinkel was again the exception, its underuse was caused by the largest experienced problem by runners in Amsterdam South-West: nuisance from other traffic and too many crossings that interrupted runners.

Runners had more specific requirements from park-like environments. An attractive lap, formed by a clear path hierarchy, wide paths, a specific (integer) distance and a safe/vibrant day and evening athmosphere, were the reasons why many runners use the Vondelpark for their running activity. The Rembrandtpark in contrast was ‘running’ short on these requirements. A park lap was unclear, too short, paths were too narrow, and the (west-side of) the park was not experienced as safe.

One of the main conclusions, that was shown in this thesis was that spatial behavioural patterns derived from the used crowd-sourced data, can be a reliable predictor and detector of a variety of spatial problems for runners. ‘Under-used’ places by runners have been in the two cases a result of multiple spatial aspects/ experiences, that did not meet requirements of runners.

RQ3: How can these spatial running requirements be efficiently integrated into the urban landscape?

To effectively integrate these requirements, they first had to fit within the spatial requirements of other public space users like pedestrians and cyclists. This almost went naturally, the problems experienced by runners did not only effect them but other users in many cases, it often detected places that dysfunction for other user groups as well. Places underused by runners in the dark, for example, proved to be an accurate predictor of unsafe urban locations, effecting cyclists and pedestrians alike.

For this reason, finding ways to solve these problems (through designing) also simultaneously improved spatial conditions for other public space user groups. Designing a runners friendly city turned out to result in designing a pedestrian friendly city, a cyclist friendly city and a safe city. The runners’ perspective thus not only formed a strategically smart research lens, it was also an effective design lens.

9.3 Limitations and discussion

Starting position

There has been little research about running in combination with spatial behavioural patterns, spatial requirements and landscape architecture: The topic is new in the field of science of landscape architecture and existing designs for runners are mostly based on designated routes, sports facilities and running tracks. Taking into account the prevailing landscape architectural subjects of the Wageningen university chair group, we have been 'running outside of regular tracks' with this thesis. Within this there was a high uncertainty in whether we could succeed in executing the proposed methods at all. This considers both the uncertainty of the availability of the data and our capability of processing it. We might say our choice for this topic mirrors movements in current practice where (landscape) architecture is reinventing and exploring itself. We not only broached new problems, but we also succeeded by making use of new methods.

Limitations

Method

Analysing spatial running behaviour through crowdsourced application data is a two dimensional analysis (looking at patterns on a two dimensional map). Making time-subsets could be seen as adding a third dimension. Although, running behaviour is in essence a three dimensional activity. Location, direction and time are accounted for in the data but not the actual activity.
The results in the data often seem a logical consequence of the named requirements/experiences. This does not mean however that other (unconscious or unmentioned) aspects were also an influence of the behaviour. This also refers to our believe that deciding upon running routes is not always a completely rational decision. It includes intuition, habit and randomness. These can be important (hard to value) aspects, which are hard to gasp through conducting surveys.
Not all important problems that runners experience in urban environments were present in the research area of Amsterdam west. Therefore solutions were not developed for all requirements of runners in urban environments (for example the lack of running in the Bijlmer area).

Datasets

It is impossible to have all spatial data of all running activities performed in Amsterdam. The total amount of 110.000 activities appears to be a lot, but on the contrary this is just a small share of the total amount of running activities in Amsterdam, if you take into account that 26% of the people in Amsterdam runs, assuming at least one time a week, it represents only 1% of all running activities. Although, accessing more data is technically hardly possible. Just like the behavioural data, the surveys are also conducted on a selection of people willing to take part.
Not only the large volume of data, but also the data structures of Strava and Runkeeper themselves bring restrictions with them as they are not the same, which makes it impossible to always verify results from Runkeeper with Strava and vice versa.

Accuracy

Processing the spatial behavioural data, making use of various software is a job done by humans, human error will always be present. In addition, the Runkeeper data was filtered for 'pollution', for example on biking activities, coincidently saved as running activity. Though some pollution may always stay.

Time

It was impossible to analyse all the data attained from Runkeeper and Strava. There was much more potentially relevant types of running behaviour that was not analysed in this research. From Strava for example we received countless data subsets were received which have not been analysed. For the first research in this field however, were found a lot of applications of the data and made additional maps which are not used in the scope of this research and are therefore can be found in the appendix. Time was also a limitation in the amount of people, that could be surveyed.

Discussion

For both the crowdsourced data and surveys, it can be questioned to what extent it represents the larger group of runners (in Amsterdam). In this regard, Runkeeper using runners, Strava using runners and non-app using runners were compared in their personal and motivational characteristics. The fact that they showed to be on two different sides of the spectrum of runners, is combined with the fact that no significant usage differences were noted, this is a reason to believe that these data-sets do represent a large group of runners.

In addition, the Runkeeper data was a subset (only activities publically saved) of a subset (Runkeeper using runners). Though, the fact that the temporal dimension analysis, showed 'strong' and clear usage patterns, this is a reason to believe that the data-set was rather 'clean'. This means limitedly influenced by behaviour of deviating individuals, which would affect the overall image. Strava data is all data of users and therefore surely represents all Strava users in Amsterdam for the year between February 2014-February 2015.

Weaknesses of the data representations were considered, for example spreading of routes in a park with a fine grained running network and therefore spreading of intensity per path (Vondelpark vs Amsterdamse bos), by making additional analyses in which routes amounts were counted per structure instead.

In our surveys we tried not to deviate too much in age and gender from our interviewees and from the characteristics of Dutch runners in general. Therefore people of the 45+ age running group were surveyed, also because they are more often not using GPS applications for running. Because mostly short distance runners were found in the parks where the surveys were conducted, we tried to find long distances runners at the 10 km four days run, to broaden our group of interviewees.

At last, this reseach states that it is not sure how much the proposed design interventions will result in an increase of runners in Amsterdam, or an increase in amount of running activities per runner (per year).

Making certain places more attractive for runners might make their activity more pleasurable, and it is likely to expect that people will run more frequently or start running.

Likewise, seeing the seasonal spread that is linked to temperature and limited daylight hours alike, makes it likely that safer routes will lead to an increase in use. Though, it possibly also shifts our activities in time, and not always incease the amount of runners, and frequency in which they run.

9.4 Recommendations

In this thesis we tried to be as thorough as possible, even though there is still so much, such relevant research to be done considering running behaviour, experiences and design for running. Our first simple recommendation is therefore is to continue this research.

First of all, more analyses in Amsterdam can be conducted improving validity and generalisability of the outcomes. Not just more analysis of running behaviour but also on other places with the maps already made. There are still plenty of possibilities for this data. The foundations have now been laid for more studies to be done to gain a better understanding of running behaviour and experiences and the following design implications from them.

Secondly we see the world, the available data and the problems in this world with a landscape architectural lens. People educated in another discipline like industrial design or architecture might be able to use this data in a totally different way and come up with totally different design solutions to make a city a more runner friendly place, and even for relevant commercial applications like marketing and organisers of sport events can use this data.

What didn't fit in the scope of this thesis was to compare behavioural data with sources of big data. The intensity maps can for example be overlaid with maps that contain data on aspects which are relevant for runners health; for example maps showing intensity of fine dust particles. This can provide additional knowledge on where interventions for running could effectively improve public health. These maps however are not as easy to obtain as first expected.

In addition, other spatial (behavioural) differences (destination vs. connection) or problems (air quality, hydrological/ ecological problems) could be of importance for the selected areas.

Running is just one type of public space use from which data is available. The amount of data that can be received from Strava, from cycling activities, is ten times greater. The applied value of this data expectation even bigger than the value of running data has a much bigger price-tag than the running data.

The last recommendation lies within the possibilities to use the data to reflect on design. In the hypothetical situation that the design proposals would actually be executed, the effects on running activity after the interventions could simply be measured. It would be possible to evaluate the effect of our designs on (running-)usage through looking at factual numbers that show an increase or decrease. A design is then not an end-result, but becomes an element of a fully-circular scientific experiment. We first of all believe this would seriously contribute to the scientific development and credibility of landscape architecture. Secondly, it would be a mean, to convince investors (either government or other organisations) about the value of design interventions. They would be able to see whether their (financial!) investments actually had the expected effects, and with that knowledge decide to keep investing or not. We think this could have serious value for the market-position of designers.

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Figure 4.9

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Figure 4.15

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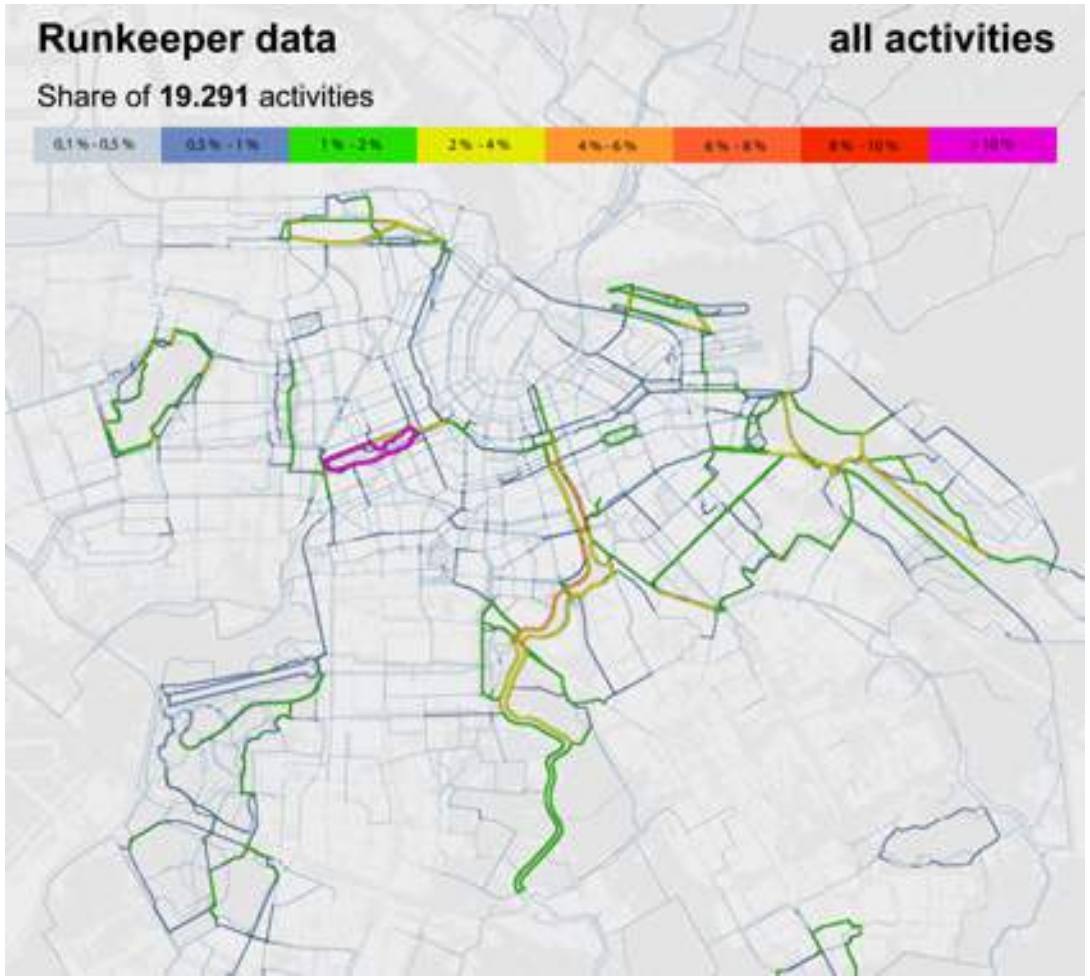
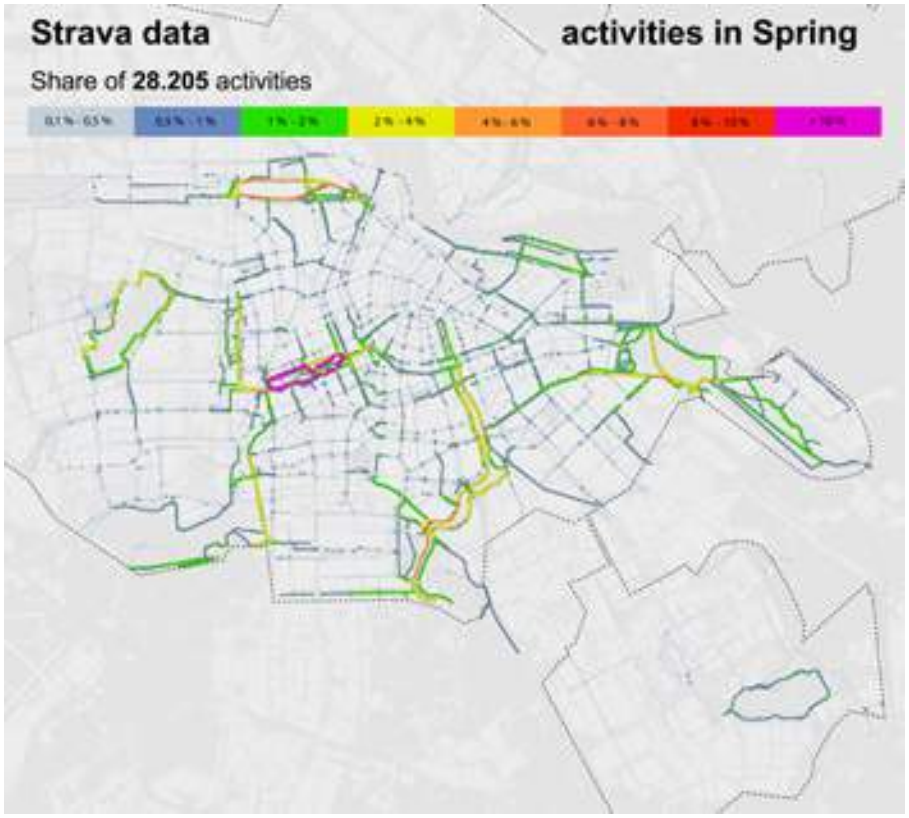
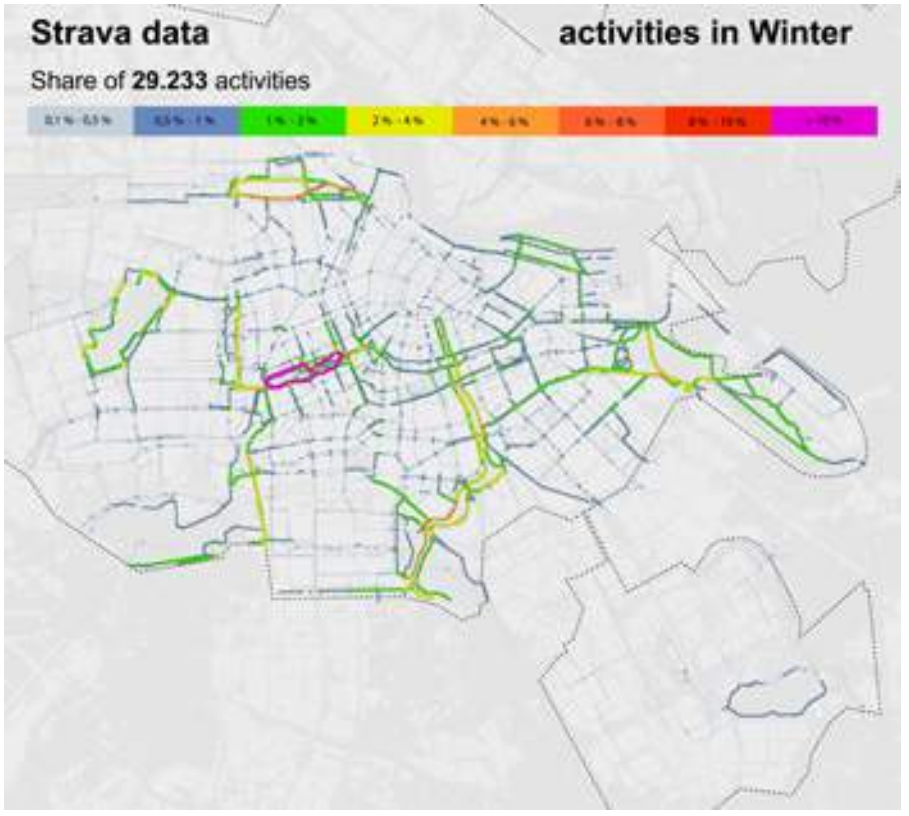
- Strava manual

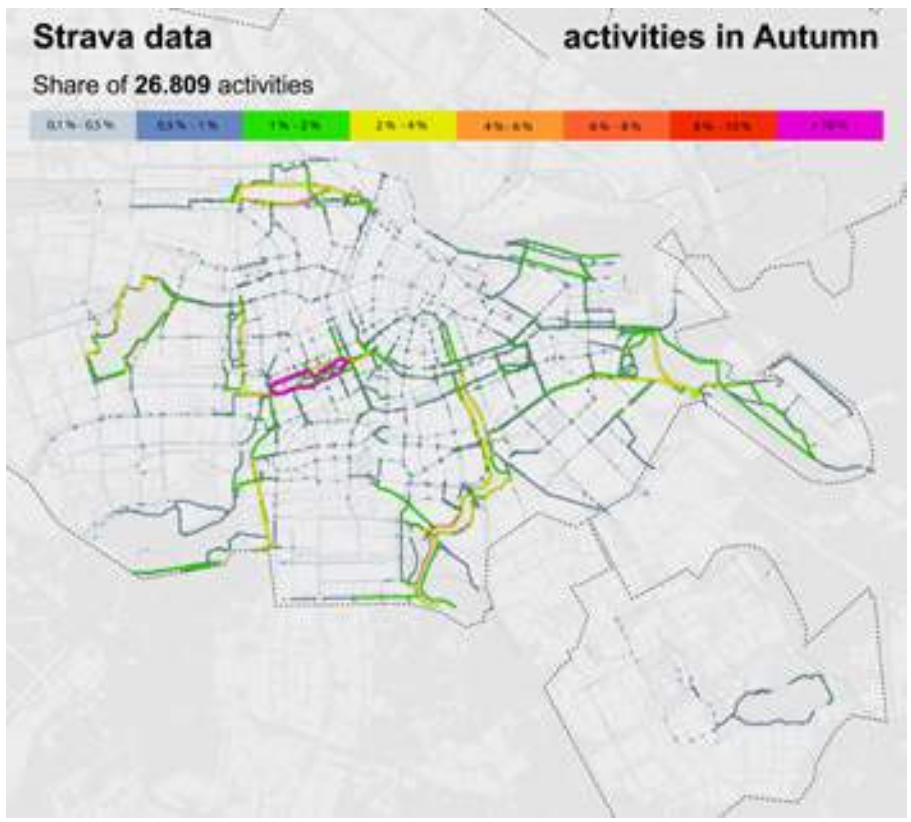
2. Additional maps spatial dimension

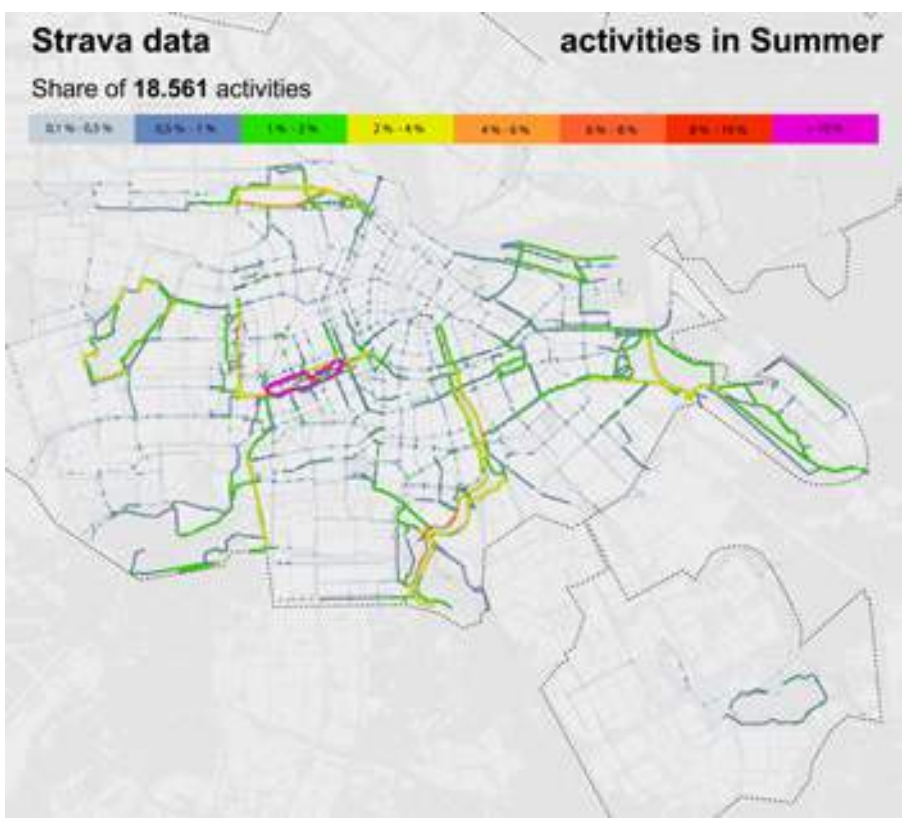


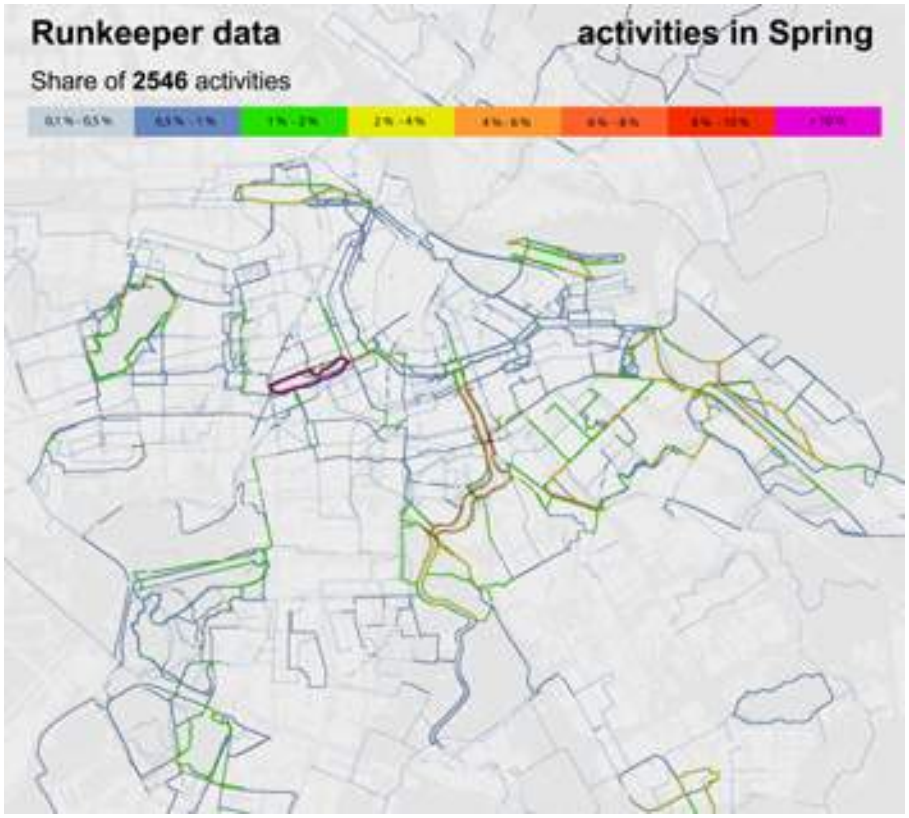
2.2 Seasons

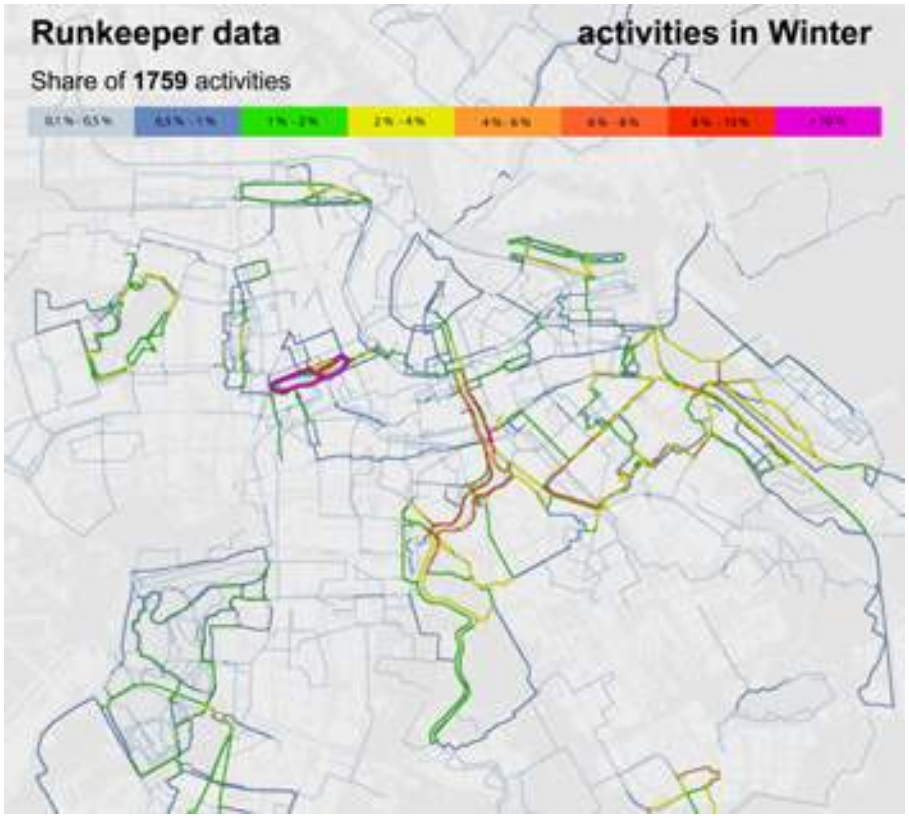

Strava data
activities in Spring
Share of 28.205 activities

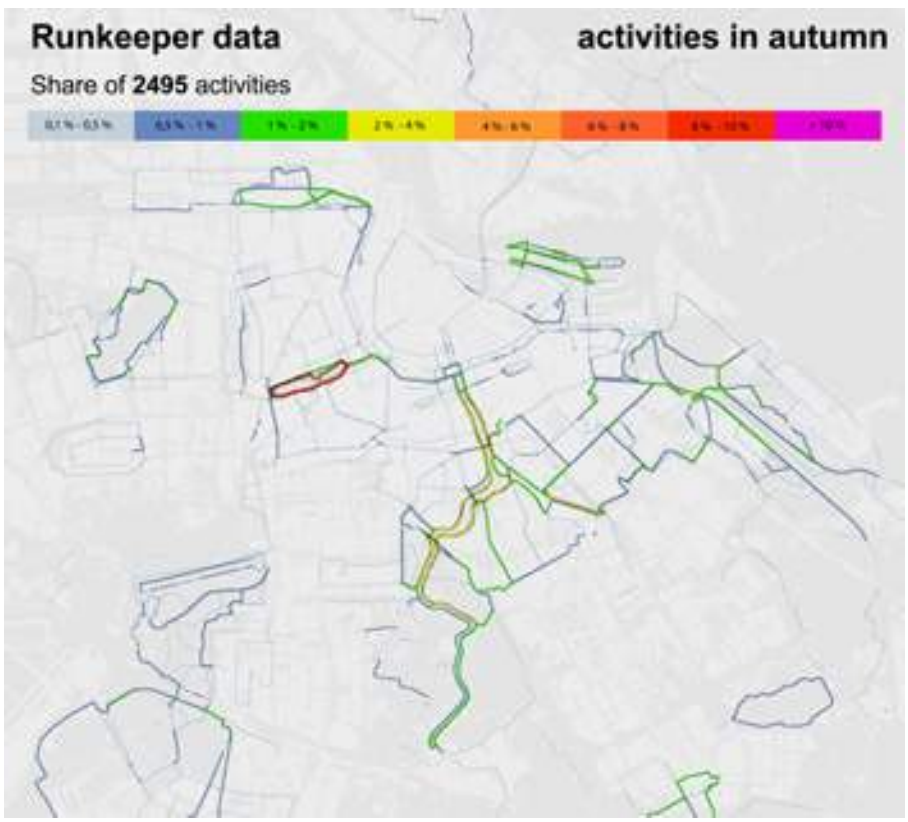

Strava data
activities in Winter
Share of 29.233 activities

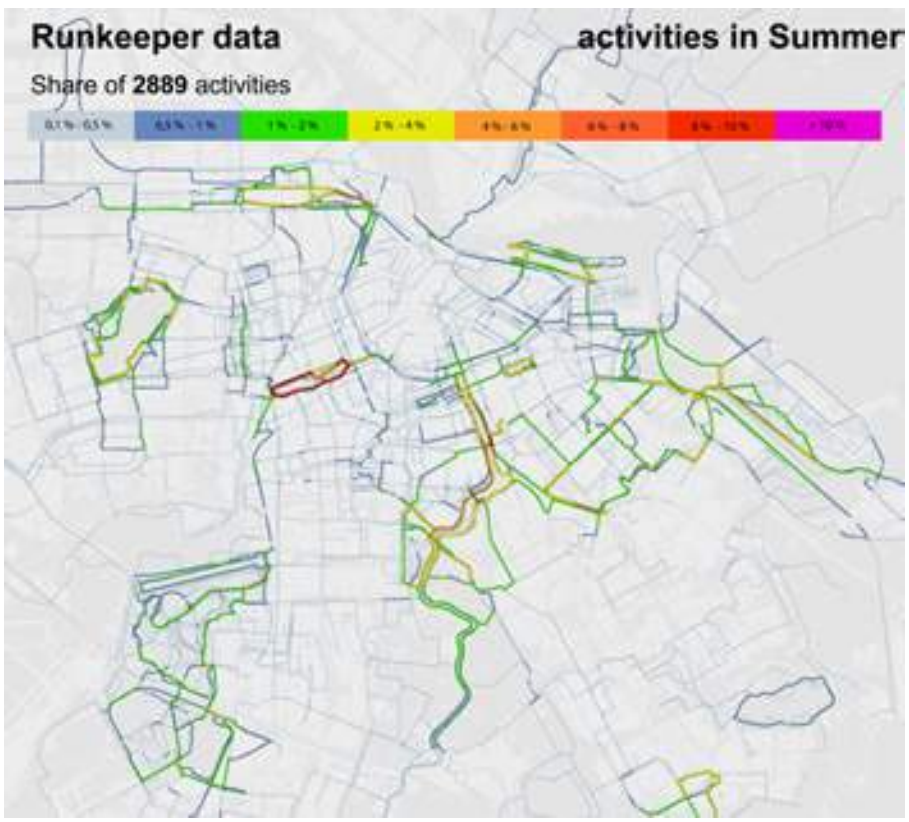

Strava data
activities in Autumn
Share of 26.809 activities


Strava data
activities in Summer
Share of 18.561 activities


Runkeeper data
activities in Spring
Share of 2546 activities


Runkeeper data
activities in Winter
Share of 1759 activities


Runkeeper data
activities in autumn
Share of 2495 activities


Runkeeper data
activities in Summer
Share of 2889 activities

2.3 Day segments

3. Survey

3.1: Part 1

Onderzoek naar hardlooproutes

Deze vragenlijst is onderdeel van een onderzoek naar voorkeuren in hardlooproutes van hardlopers in Amsterdam, uitgevoerd door Wageningen Universiteit ism AMS (Amsterdam Metropolitan Solutions). Hieronder vindt u een aantal vragen en een afsluitende opdracht. In totaal neemt dit 10 minuten in beslag. Succes en bij voorbaat dank!

Persoonlijke informatie

Leeftijd ☐

Geslacht ☐ m ☐ v

Postcode: ☐ ☐

Profiel van de hardloper

Vul in of vink aan wat van toepassing is.

1. Ik loop al ☐ jaar hard.
2. Ik loop: ☐ keer per maand, meestal tussen de ☐ en ☐ kilometer per keer.
3. Ik zie mezelf als een ☐ beginnende hardloper ☐ gevorderde hardloper ☐ iets ertussen
4. Ik maak gebruik van een hardloop applicatie ☐ ja ☐ nee . Indien ja, welke? ☐
5. Ik loop: ☐ alleen ☐ samen met een loopmaatje
   ☐ in georganiseerd verband. Zo ja; organisatie/vereniging: ☐

De volgende vragen gaan over hardloop activiteiten die je individueel doet.

6. Tijdens mijn activiteit doe ik ☐ wel ☐ geen rek-strek of loop-oefeningen.
7. Tijdens mijn activiteit doe ik ☐ wel ☐ geen fitness/kracht oefeningen.

Motivatie

Geef voor de volgende aspecten aan of ze voor u een belangrijke reden zijn om hard te lopen

	onbelangrijk				zeer belangrijk
Gezondheid: fit zijn/ conditie	☐	☐	☐	☐	☐
Gezondheid: hart en vaat	☐	☐	☐	☐	☐
Gezondheid: frisse lucht	☐	☐	☐	☐	☐
Uiterlijk: afvallen/ op gewicht blijven	☐	☐	☐	☐	☐
Mentaal: hoofd leeg maken/ er even uit zijn	☐	☐	☐	☐	☐
Omgeving: Contact met natuur/groen	☐	☐	☐	☐	☐
Omgeving: Leuke dingen zien/ beleving	☐	☐	☐	☐	☐
Prestatie: mezelf verbeteren/ verbazen	☐	☐	☐	☐	☐
Prestatie: competitie met anderen	☐	☐	☐	☐	☐
Sociaal: actief zijn met kennis(sen)/vriend(en)	☐	☐	☐	☐	☐

Mijn hardlooproute

*Geef aan of de volgende statements waar of niet waar zijn, wanneer u **individueel** gaat hardlopen*

	helemaal waar	gedeeltelijk waar	niet waar
Ik loop meestal dezelfde route	☐	☐	☐
Ik loop meestal verschillende routes	☐	☐	☐
Een deel van mijn route is meestal hetzelfde, en sommige delen varieer ik, omdat ik afwisseling in omgeving wil.	☐	☐	☐
Een deel van mijn route is meestal hetzelfde, en sommige delen varieer ik, omdat ik afwisseling in afstand wil.	☐	☐	☐
Ik bedenk mijn route meestal voor ik ga lopen	☐	☐	☐
Ik bedenk mijn route meestal pas tijdens het lopen	☐	☐	☐
Ik bepaal mijn route en afstand gedeeltelijk/globaal vantevoren, zodat ik mijn loopomgeving nog kan varieren tijdens het lopen	☐	☐	☐
Ik bepaal mijn route en afstand gedeeltelijk/globaal vantevoren, zodat ik de afstand makkelijk kan verlengen/ verkorten tijdens het lopen	☐	☐	☐

3.2: Part 2

Uw loopomgeving

In onderstaande schema vindt u een lijst met ruimtelijke aspecten/omstandigheden die mogelijk belangrijk kunnen zijn voor de keuze van uw hardlooproute.
Geef bij elk aspect aan of u dit een belangrijk aspect vindt,
en of dit aspect in uw omgeving moeilijk of makkelijk te vinden is.

	onbelangrijk				zeer belangrijk	makkelijk te vinden				moeilijk te vinden
Niet onderbroken route/ niet hoeven te stoppen	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ruimte op paden/ wegen.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Een aangegeven/ bewegwijzerde route	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Aangegeven afstanden	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Afgeronde afstanden (bv. 3 ipv 3.2 km)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Een groene, natuurlijke omgeving	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Schone lucht/ verkeersluwte	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Afwisselende omgeving	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ondergrond; zacht/ natuurlijk	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ondergrond; egaal	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Aanwezigheid van andere sporters	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Aanwezigheid van drinkwaterkraantjes	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Een rustige omgeving										
- Stilte	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
- Geen hinder van auto's	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
- Geen hinder van voetgangers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
- Geen hinder van honden	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
- Afwezigheid van fietsers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Veiligheid										
- verkeersveiligheid	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
- sociale veiligheid	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
- Verlichting	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Welk aspect vindt u het aller belangrijkst in uw individuele hardlooproute?
Waarom vindt u dit zo belangrijk? Dit kan een van de bovengenoemde aspecten zijn,
het kan ook een ander, nog niet genoemd aspect zijn?

3.3: Part 3

Opdracht

In dit onderdeel vragen we u naar de hardloop route die u voor het laatst individueel liep.
Hierin kunt u gebruik maken van de factoren die in de vorige vraag genoemd zijn; maar u kunt ook andere redenen aangeven.

- Teken de route die u het laatst gelopen hebt op de bijgevoegde kaart.

- Is het vertrekpunt van de route de plek waar u woont of gaat u ergens naar toe om daar te gaan hardlopen? Indien u in het gebied woont teken dat een huisje op de locatie.

- Selecteer maximaal 3 aantrekkelijke stukken van uw route.
Omcirkel deze delen in uw kaart en geef ze elk een nummer.
Beschrijf in onderstaande schema in kernwoorden waarom u dit een aantrakkelijk deel vindt.
Hebben deze delen ook onaantrekkelijke aspecten? Noteer deze in de kolom ernaast.

Route deel	Waarom aantrekkelijk?	Onaantrekkelijk aspect?
1		
2		
3		

- Maak een top 3 van de minst aantrekkelijke delen van uw route.
Omcirkel deze delen in uw kaart en geef ze elk een nummer (4, 5 en 6).
beschrijf in onderstaande schema in waarom u dit een onaantrakkelijk deel vindt.
Hebben deze delen ook aantrekkelijke aspecten? Zoja, noteer deze in de kolom ernaast.

Route deel	Waarom onaantrekkelijk?	aantrekkelijk aspect?

4. Seminar Scandinavia

4.1 Alnarp: the seminar

Our days in Malmö were completely filled by the seminar. After arriving Wednesday the seminar began Thursday morning 9 o'clock with a full follow-up program of interesting lectures to 18:30.

It was a mixed group of people that took part in the seminar, with landscape architects, architects, social geographers and anthropologists.

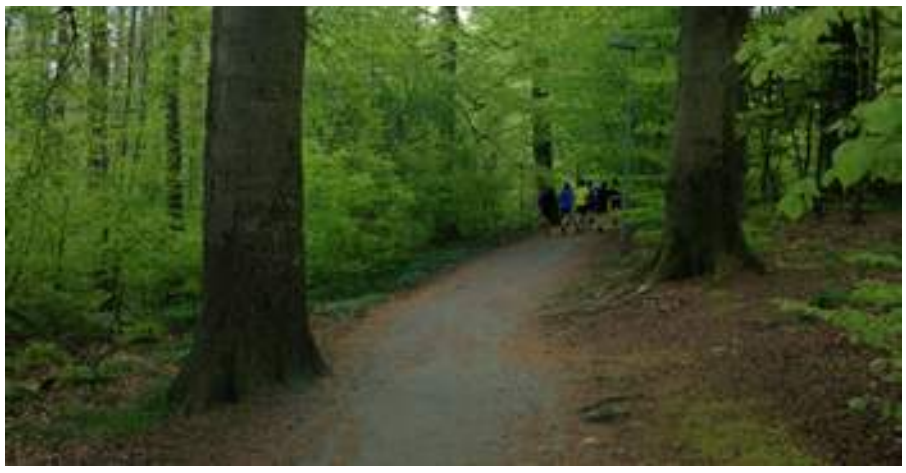
The lectures ranged from some mostly theoretical lectures about the experience that runners have in contrast to what some events offer, like the "Colour run", but also about running in the dark, storytelling in the landscape, history and development of running in Scandinavia and America to an analytic observation of marked trails in Copenhagen and a fund that encourages sports in the public domain and therefore funds projects in Denmark.

Our own presentation about the first part of our behavioural analysis was scheduled pretty late but added a very practical element to the day and the audience was therefore very enthusiastic. Immediately ideas were drained about how we could do even more analyses and if we had been thinking about this and that already. Almost all participants requested us to send the presentation and the final report which was obviously a huge compliment.

In addition to this formal feedback on our presentation there was also room for informal conversations about running in a public space during breaks, lunch and dinner. This has broadened our range of running and we have established contacts that have been useful in further research.

4.2 Malmo

Friday was certainly an interesting day for us with a number of excursion on the program. The first location had been discussed at one of the presentations on Wednesday. It is a 'Trimbos' from the beginning of the last century. A forest at a castle at least half an hour by car outside of Malmö, where people are going by car to go running and do exercises. Here the first urban gym came in use, made of trunks with hinges that were used for weight training exercises. The insurmountable Swedish sauna was also part of the complex. In the forest itself running routes of 2,3,7 and 10km had been designated, according to our data exactly the right distances where runners are looking for. And in this completely natural woods lampposts also had been placed so that people can as well run in the dark. This forest is purely meant for running (and walking), mountain biking and horseback riding are prohibited for example. The beauty of the urban gym is that you are really laying in the forest and look to the canopy of the trees if you are bench pressing for example.



The second location was a sports park linked with a public park where there was a well-used urban gym and designated routes. We then traveled to Malmö itself, where the largest park in the city center has undergone adjustments for running. Tall beech hedges of the original park form a round of exactly 500m in the center of the park. Adjacent to this there is a hill that people use in their training. Adjacent to these 'facilities' running routes are plotted from 1,2 and 3 km. Besides these routes urban gyms are situated in a natural environment. To put the attention to these devices, the municipality hired a personal trainer for four months to give advice to people unfamiliar with the devices of the urban gym on regular times every day. Also a variety of events are planned all year long to make people aware of the outdoor sporting facilities in Malmö.

At this location, the ambitious plans of the municipality of Malmö were explained about sports in the city. In a circle of 500m around each house (5 minutes walk) four ingredients must be present: an urban gym, grass clippings, an interval training route and a long-distance route. In this way they try to facilitate the population of the city to stay active.

4.3 Copenhagen

In Copenhagen we were especially interested in the quality of the public space. A lot is invested in the public space of the city that shares many features with spatial Amsterdam. Two of the presentations at the seminar also dealt with projects in this city and we have tried to visit these places with our rented bicycles.

The Copenhagen "Harbour path" and "Kalvebod waves" were inspiring by the incredible detail, the link with the history of this place and the creation of human scale in this world of big office buildings. The subsequent "Serpentine path", the bike path that winds through the office districts, shows that something as ordinary as infrastructure can still be a special place, bringing fun in the everyday functioning.

In terms of running "the lakes" as a similar used structure as the Amstel were very interesting and used a lot by runners. They walk along this ribbon of lakes until they are tired and can run back these lakes again in a circle. Paths along the water are too narrow for cyclists so that the runner is not obstructed and at the places where you have to cross the waters, major roads are underpassed so you never have to stop.

Another park in the city that has been adapted to runners is "Sondermarken". A gadget has been installed in this park at the palace of the Danish monarchy that makes it interesting. a LED light is incorporated in the low lantern poles along the route. On some points, you can start the route and indicate how fast you run. At this pace the light will light up one after another. Furthermore, there are also a number of urban gyms in addition to this route laid out in this park, in particular at the start points of the "LED-route".

All in all, it have been a very interesting four days in Scandinavia. Everything looks very similar to the Netherlands, though it seems as if they are doing things slightly better and just put a little more attention to public space. These days were an interesting introduction to Swedish and Danish design, other researchers who are working on running and probably initiated to the publication of an publication.

Runkeeper data

Share of **20.876** activities

unique activities 2020