

An aerial photograph of a city, likely Amsterdam, with a complex network of blue lines and shapes overlaid. These shapes represent water bodies, including canals, rivers, and various ponds, illustrating the city's extensive water infrastructure. The text "Where is the Exit?" is superimposed on a semi-transparent grey band across the top of the image.

# Where is the Exit?

Anne Kleine Staarman | MSc Thesis Landscape Architecture

**Cover Image: Map of Rotterdam**

*(Source: Layered data Google Earth Pro / GeoDesk)*

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# Where is the Exit?

Designing an urban escape route in Rotterdam,  
the Netherlands

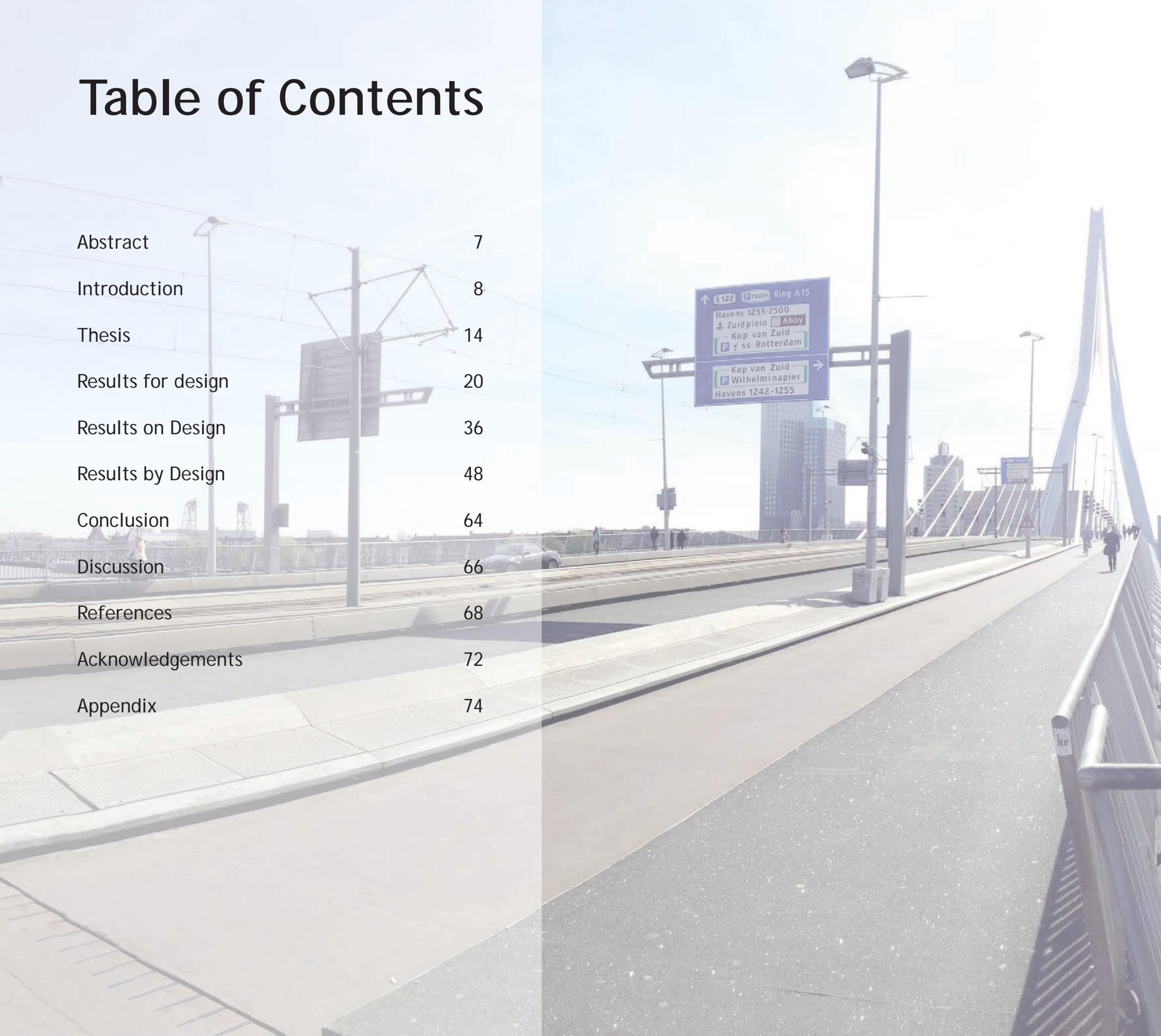
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# Abstract

This thesis aims to improve the quality of life in urban areas. The hypothesis is that people will feel better inside city when they have the feeling that they can escape the city at any time by an independent vehicle such as the bicycle. Three methods of design research are used to support this theory and examine how to design a sufficient escape route that can be used for bikers. The first method is research for design to research the relationship between physical connection between urban and rural landscape and the liveability of the city. The second method is research on design to find existing design innovations of successful escape routes. The last method is research by design to find out how such a route can be successfully implemented in Rotterdam. The three methods are used in a cyclic process to answer the main research question; in what way can a successful urban escape route be designed to improve the liveability inside the

city of Rotterdam, the Netherlands. The answer lies in the route design. The paper concludes with features for the route through the city and the design of the path. The conclusion is that a urban escape route can lead to liveability when it embraces specific elements and design features. The route should be running towards the natural or rural landscape and it should be passing by elementary schools, existing parks, varied neighborhoods and landmarks. It should be more than 20 km for recreational bike use. The path itself should not have motorized vehicles, stimulate biking and running, have vegetation to enhance biodiversity, absorb and filter water, trees to absorb CO<sub>2</sub>, human-scaled, paved for smooth rides, able to hold trucks for emergencies, have sufficient lighting to enhance safety, have an appealing name, reoccurring features for recognition and finally, it should be an urban escape for the accessibility of the natural and rural landscape.

## Terms and Definitions

**Bikers:** people riding bicycles /cyclists.

**Bike route:** roads allocated to bikers and other transportation forms that travel less than 40 km/hour such as electronic bikes, rollerblades and skaters.

**Urban escape route:** A route that leads one out of the city to the rural or natural landscape for runners, bikers, rollerblades, and independent forms of transportation.

**Liveability:** the measure of comfort an individual has in a city that improves the quality of life.

**Independent transportation:** Forms of transportation that do not depend on fuel, electricity or others; such as, walking, running, biking, skating, roller-blading, skating and sailing.

**Dependent transportation:** Larger motorized or electronic vehicles such as cars, trams, trains, metro and busses.

# Introduction

## Global Context

Globally, urban populations are growing rapidly. It is estimated that by 2050, more than 80% of our earth's population will be living in cities. The increasing human population is migrating from the countryside to cities. According to the UN, 3.2 billion people are living in urban areas today and this will rise to 5 billion people in 2030 (Ween 2014). This rapid urbanization pattern will cause many challenges for the growing cities in the near future. There will be an increasing stress on infrastructure and air quality will degrade. Without careful planning and innovation, for many, the quality of life will deteriorate. Urban design innovations are needed to improve the liveability in cities for a better quality of life for millions of urban dwellers. In this thesis, the case study of Rotterdam is taken to test such design innovations for potential implementation.

***Satalite View Earth***

***Altitude: 13381***

*(Source: Google Earth Pro / US. Geological Survey)*



*Randstad, the Netherlands.*  
(Source: Google Earth Pro / Landsat)

## Region

Rotterdam makes part of the Randstad in the Netherlands, which is located in the west of the country. It is a densely populated region of great economical importance. The larger Dutch cities of Amsterdam, The Hague and Rotterdam are located in this area. Most of the land in this region is below sea level, making it very vulnerable for flooding. Rotterdam is situated in the Rhine-Meuse delta, where major European rivers meet the ocean. The map shows the large harbor of Rotterdam in between two other harbors of IJmuiden and Antwerp.

In Europe it is estimated, that the balance between urban and rural populations will only grow by five percent (Ween 2014). The director of urban development Rotterdam, Martin Aarts also confirms in an interview; “the city will not increase in size horizontally in the upcoming decennia, only vertically” (Aarts 2014). This provides a great opportunity to make optimal use of the natural and rural landscape around these large urban areas for recreation.

10 km   N

# Introduction

## Case of Rotterdam

Rotterdam is the second largest city in the Netherlands and has the largest harbor in Europe and the fourth largest harbor in the world.

During the industrial revolution, the city of Rotterdam expanded quickly as the harbor gained great importance. The city became the economical center of the Netherlands. In 1940, during the start of the Second World War, the city center was bombed and burned, leaving little remains. After the war, a strategy for rebuilding the city was introduced. In 1941, urban planner W. G. Witteveen introduced his plan, however little was realized, as few building materials were affordable and available during the war (La Rivière 2014). The plan was also criticized for being too focused on restoration of the original city and not on renewal. In 1944, the plan of Cornelis Traa was chosen with a focus on renewal and modernization (Wagenaar 1992). During the implementation of this plan, other remaining buildings in the center were demolished. The new function of the city center became infrastructure, work and recreation. Large infrastructural squares were implemented for cars and other motorized vehicles. City planner, Lotte Stam-Beese designed housing outside the city center. She developed soviet-like flats in former rural landscapes, such as in the Alexander polder. The city center could be reached from these new neighborhoods by car. A total of 25,479 houses were bombed in Rotterdam during the second world war; and during the city renewal after the war, three times this amount of new housing was built (La Rivière 2014). The new focus was

economy and accessibility. Investments were mainly allocated to the harbor, the new city center and the building of new flats. This led to the degradation of the older 19th century city-neighborhoods that did survive the bombing (La Rivière 2014). This focus on making room for motorized infrastructure and renewal is still very visible in the city today. The streets are wider than any other city in the Netherlands and there are many buildings that are evidently built after the war with cheaper materials and uninspired structures for a faster build. Although there are car-free zones and since 1995, there is more housing in the city center, Rotterdam is still known for its problems regarding livability (Aarts 2014).

Relative to other cities in the Netherlands, the percentage of people in the middle income class is lower in Rotterdam (Graaf 2013). The middleclass is however the binding agent of any society (Eijffinger 2014). The city, like any other, needs a larger working middleclass to build a stronger social and economic foundation. As Geuze describes; during the last decades, the middle class has left the city to live in suburbs with their children. They have abandoned the inner cities because it mainly facilitates high-rise apartments and the nearest neighborhoods have lost their quality since low incomes dominate. The restructuring during the sixties and seventies of the twentieth century have resulted in 'floating' urban planning and huge traffic solutions (Geuze 2006). As mentioned above, the focus and investments on infrastructure and economy has degraded the central city for the people.

## Problem Statement

The director of Urban Development Rotterdam, Martin Aarts confirms, Rotterdam has a history of finding it difficult to hold on to the higher-educated population. He explains that the city has a new strategy: to improve the liveability of the city to attract these higher-educated residents. Rotterdam has many higher-educated people working in the city, however a relatively small percentage of these people live in the city. Aarts explains in an interview: “people value a living environment on a human-scale” (Aarts 2014). He explains that the higher-educated people that they want to attract, do not want to live in flats but rather settle in a green attractive neighborhood from which they can bring their children to school and travel to work by bicycle. The governments’ new strategy is thus, to improve the 19th century neighborhoods that were once forgotten and degraded and implement a greening strategy. City councilor Joost Eerdmans agrees with this strategy. He refers to it as investing in ‘bakfiets’-neighborhoods, which implies middleclass resident neighborhoods (Marcus 2014). Also discussing the city center, Martin Aarts explains that this area should become denser and on a human scale with terraces, restaurants, entourage and room for people, not cars. With the thought: “People go where people are”, the urban planners in Rotterdam are looking to improve the city’s ambience for people, no longer for cars (Aarts 2014). Aarts acknowledges that there is a need to improve the liveability of the city to attract higher educated residents.

Rotterdam has clear shortcomings in liveability. The city wants to attract the educated working class to live in Rotterdam to provide a stronger social and economic base. To attract these potential residents however, the liveability of the city needs to be improved. “On one hand, the livability indicates the strong urban influence and attraction. On the other hand, the livability will further strengthen the urban connectivity and influence by capturing more investment, human and cultural resources” (Wang et al. 2011). An increase in livability could thus attract a target of middle class residents.

To measure the liveability in the city, several indexes exist. Examples are the Monocle’s “Most Liveable Cities Index”, the Economist Intelligence Unit’s “Liveability Ranking and Overview”, and “Mercer Quality of Living Survey”. For all indexes, numerous criteria such as the amount of sustainable and efficient transport are always key measuring parameters. Another key parameter that weighs when measuring liveability is the availability of green open space per capita. What is not often measured however, is the combination of the two. The sustainable efficient transport towards these recreational spaces and out of the city, into the rural area is not measured. While the focus of urban sustainability debates on cities and urban agglomerations however; the majority of urban dwellers continue to visit and recreate in rural areas (Cohen, 2006). We must therefore not forget the connection from cities to rural areas.

# Introduction

In this thesis the question is raised, whether a city can be called liveable if one cannot get out of the city. Dutch urban dwellers enjoy visiting the countryside by bicycle as a recreational activity (Steenbekkers et al. 2008). Due to the complex urban network of Rotterdam's historically altering and expanding city, [See Map Analysis Chapter] it is difficult to bike out of the city. Rotterdam has insufficient urban to rural bicycle connections.

In the past ten years, Rotterdam has doubled the amount of daily bikers with 70,000 bikers per day (Debat Ideale Fietsstad 2015). On the Erasmus Bridge alone, a total of 13,000 people cycle cross it daily. While the city's amount of bikers have doubled however, the facilities for bikers have not fully adapted. Rotterdam would like to become 'Fietsstad 2018' (bike-city of the year 2018), and according to traffic manager at the municipality of Rotterdam, Martin Guit; the city is willing to invest two million euros extra to do so (Debat ideale fietsstad 2015). By introducing accessible and sustainable routes for bikers leading out of the city, a greater opportunity to access the countryside and green recreational space by bicycle is created. Residents will have to freedom to access natural and rural landscapes by bicycle. This also minimizes the CO2 production within the city as well as on a regional scale. Improved access to to rural and natural landscape may thus increase the livability of the city.

## Hypothesis

The hypothesis is therefore; that the liveability of the city can be improved by designing an urban escape route that people can use to bike out of the city into the natural and rural landscape. The research assumes that people feel better inside the city when they have the feeling they can escape the city towards the countryside by and independent vehicle such as the bicycle.

## Theoretical Lens

The approach on this research is through Ian L. McHarg 's Design with Nature theory. In larger urban areas, people live with an addiction to economical growth and fossil fuels. As McHarg explains in Design with Nature 1967, *“economic determinism as an imperfect evaluation of the biophysical world is only one of the consequences of our inheritance. An even more serious deficiency is the attitude towards nature and man which developed from the same source and of which our economic model is only one manifestation. [...] Losing the fundamental relationship and balance with nature, attempting to rise above and control it, will eventually lead to our own destruction”* (McHarg 1967). This research design will aim to make a connection between the urban economic center and the rural natural landscape through green routes leading out of the city. As McHarg argues; “if we can create the humane city, rather than the city of bondage to toil, then the choice of city to countryside will be between two excellences, each indispensable, each different, both complementary, both life-enhancing.” Forming a linkage between the two worlds of urban and rural landscape may improve the liveability of the city.

The strength of a landscape architect is the ability to combine the knowledge from natural sciences such as hydrology, geology, ecology and botanic knowledge with design and creative thinking. This combination allows the application of this knowledge in our surrounding environment. It thus fits very well under the Wageningen University slogan: to explore the potential of nature to improve the quality of life. Improving and enhancing the space in which we live with knowledge of nature is improving the quality of life.



# Thesis

## Knowledge Gap

In recent years, quality of life and the liveability in urban areas has been a popular research topic from the perspective of varied disciplines and angles. From a health point of view, issues in cities have been researched, ranging from pollution hazards, the necessity of physical movement and the relationship between urban green space and psychological well-being. (Pucher et al. 2010; Lin et al. 2012; Bell et al. 2008; Ulrich 1981; Kaplan et al. 1989). From an ecological point of view, urban green corridors that enhance biodiversity in urban areas have been researched (Gill et al., 2007; Kong et al., 2010; O'Neil et al. 2014). From hydrological point of view, the importance of urban water storage through permeable and semi-permeable landscape to prevent flooding and other climate change effects has been researched (Escobedo et al. 2011; Maas et al 2006). Fields such as social geography, history, architecture and landscape architecture have approached the concept of urban liveability in varied ways. Until now however, no research has been done about the relationship between liveability and an urban escape. The importance and the design of clear routes that will lead one from inside the city to rural and natural landscape have not yet been defined.

## Research Questions

### **Main research design question**

The main research design question is thus formulated as follows: in what way can an urban escape route be designed to increase the liveability in the city of Rotterdam, the Netherlands?

This thesis looks for the link between liveability and urban lay-out, design and landscape. It first aims to find the relationship between urban liveability and the physical connection between the urban and rural landscape. This physical connection is also defined as an urban escape route for the bicycle or other independent vehicles. It then asks what such a route should look like to be successful and how it can be implemented in the urban landscape of Rotterdam. The following sub-research design questions aim to collaboratively answer the main research question.

### **1. Research for Design Question**

The first sub-question is: what is the relationship between the liveability of the city and the physical bicycle connection between the cities and the rural or natural landscape? (From central church to rural windmill). This question examines what is known in literature about the relationship between urban escapes and liveability.

### **2. Research on Design Question**

The second sub-question is: what are successful existing design innovations for urban escape routes? This question looks at the layout and existing designs of other cities to understand successful escape routes. Design guidelines

Research Design Method		
In what way can an urban escape route be designed to increase the liveability in the city of Rotterdam, the Netherlands?		
Sub-question	Method	Outcome
Research for Design		
What is the relationship between the liveability of the city and physical bicycle connections between the city and the rural or natural landscape?	In Theory	
	<b>Literature review</b>	Elements needed that are know to increase liveability
	<b>Regional analysis</b>	Potential locations for exit routes in Rotterdam
	In Practice	
	<b>Interviews</b>	Resident perspective on liveability and urban escape
	<b>Site analysis</b>	Temporary and long-lasting problems to be solved in design
Research on Design		
What are successful existing design innovations for urban escape routes?	<b>Reference studies</b>	Design innovations and guidelines
Research by Design		
How can a successful urban escape route be implemented in Rotterdam?	<b>Site sketches</b>	Indication of best appearance
	<b>Applied positions</b>	Twenty 1:250 trials on location
	<b>Detail design</b>	Urban exit route design in Rotterdam

are gathered from these examples for implementation in the third question.

### 3. Research through Design Question

The last sub-question is: how can a successful urban escape route be implemented in Rotterdam? This question is asked to research how the knowledge gained in sub-question one and two can be brought into practice and implemented in Rotterdam. The question is answered through design trial and error. The final design made through all knowledge gained in this thesis answers the main research question.

An overview of all questions can be seen in the table on the left. This table shows the research design questions, the method used for answering them, and the expected outcome. The outcome will be used in the succeeding research design phase. In the next section, the methodology of this thesis will be explained in more detail.

*Table Research Design Method*

# Thesis

## Methodology

As S. W. Filor has already concluded twenty years ago, “there are as many models of the landscape architecture design process as there are landscape designers” (Filor 1994). He continues by saying that the “pattern [of the design process] is cyclical rather than sequential” as design concepts are tested and validated against facts, previous designs and identified problems. The research and design model used for this thesis is naturally different from any other, being a unique and distinctive landscape designer. The design process model is illustrated on the right.

This thesis is written in a logical linear structure so that the results are easy to follow. The research design process is however more of a circular one. Starting with research for design, moving towards research on design and finalizing with research by design is the research design order of this thesis. In practice, this order tends to move back and forth, as illustrated in the second design process model on the right. For each research design phase different methods were used to answer the sub-research questions.

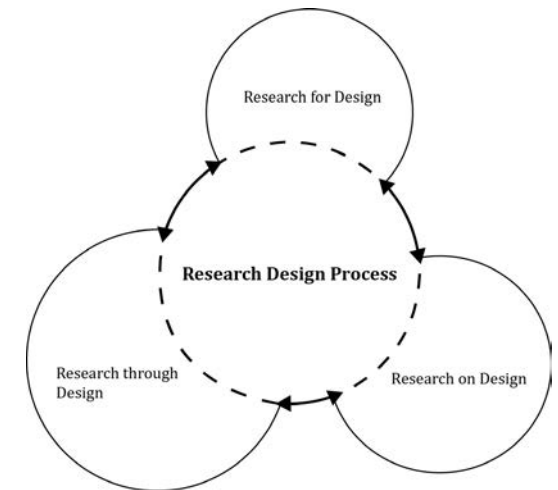
### Research for Design

The research for design question is answered through methods ‘in theory’ as well as ‘in practice’. In theory, a literature review and a regional map analysis is carried out. The literature review aims to answer, what the relationship is between the liveability of the city and the physical connection between the city and the rural or natural landscape. Articles are gathered

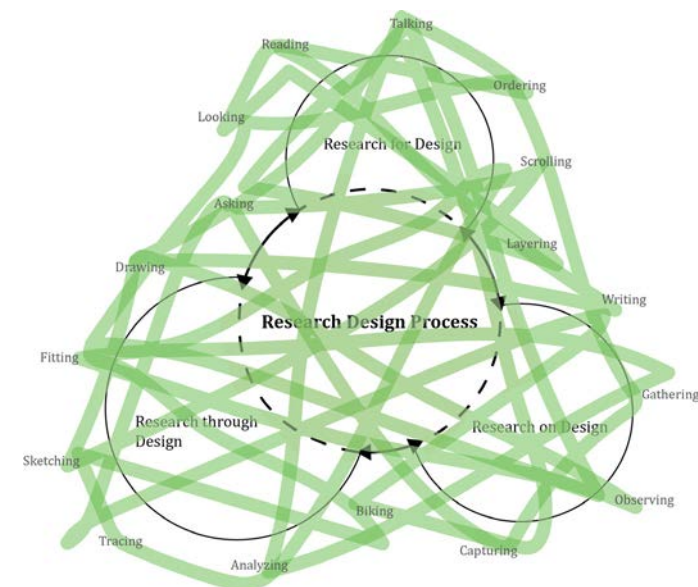
on the topics of ‘livability’, ‘liveable cities’, ‘green corridors’, ‘urban escape’ and ‘urban green space’. The information gathered is then organized in a large framework that specifically searches for the relationship between liveability and the urban to rural bicycle connections. This will give an understanding of what is known on increasing liveability through urban escape routes. Then, leading to the main design research question, literature is reviewed to find out what components such a route should have to increase liveability. This first research phase organizes and categorizes the existing knowledge on the topic to fit the framework of this thesis.

After this reading and the organization of literature, the regional map of the case of Rotterdam will be analyzed to understand which urban to rural connections exist, where the rural or natural green space is outside the city and where people are mostly biking now to get a greater understanding of the physical urban to rural connections of the case. Depending on what is found in literature, other components may also be analyzed regionally. The maps will be layered in GIS with mapping information gathered from GeoDesk, Strava, Google Earth Pro, Google Maps and Stamen.

For the research for design in practice, an interview intermezzo is carried out to get a general feeling of what the people of Rotterdam say on the topic. 52 Rotterdam residents are approached in the city. If people do not live in the city, they are discarded from the interview.



*Design and research process model 1*



*Design and research process model 2*

Questions are asked such as: “do you ever feel the need to escape the city in your free time? If so, where do you go and what form of transport is used? [The full interview can be found in the appendix]. People of all ages and race are interviewed with the only criteria that they live in Rotterdam. The interview is done from varied locations in Rotterdam in the five different neighborhoods of the City Center, Kralingen, Delfshaven, Spangen and Charlois. The interviews take two minutes each, with elaboration and extra in-depth questions asked when people have more time. Two weeks will be used to carryout this interview intermezzo. The answers are then analyzed in excel and important quotes are gathered. The information will aim to form an overall feeling and understanding of what the people in Rotterdam think. There will be no conclusions taken from this information for the research. This intermezzo is done to merely gain a general feeling for further research and design.

The last phase of the research for design is the site analysis. In this phase, the city is explored by bicycle to capture the chances and the problems in photos along the route. This overview is used to understand what can be used and what needs to be solved though the design of the route specifically for Rotterdam.

### **Research on Design**

The research on design part consists of five reference studies on other cities. The reference cities are Amsterdam, Eindhoven, s’-Hertogenbosch, Singapore and the island of

Manhattan in New York. Depending on the city, the escape route will be studied through urban layout and/or specific design innovations. The analyzing and comparing of the different design innovations will aim for an expected outcome of design guidelines for the next research design phase.

### **Research trough Design**

The expected outcome of this phase is to answer the question of how all knowledge and design guidelines gathered in the previous phases can be implemented in Rotterdam. It also aims to answer the main research question through a final detailed design. This is the detailed design of the actual path that will form the route out of the city. This route design is first formed though eye-level sketching. The concept design is then applied to twenty focus points along the route. Then, the detailed route design is drawn to construction detail scale 1:50 in AutoCAD. This is then applied to several focus points on the route that stand representative of the rest of the route. This is shown through 75 X 75 meter maps on scale 1:250 as well as sections drawn on the scale 1:150. The design shows the physical features of an escape route that stimulates bike use.

# Results for design

## Literature Review

### Physical and Psychological Health Benefits of Urban Green Space

Green space in large urban areas is of great importance for the liveability in the city. It promotes physical activity, psychological well-being, and the general public health of urban residents (Wolch 2014). When well-designed green space is created for physical activity such as walking, running and cycling, it will stimulate people in cities to use this space for physical activity. "Walking and cycling are the healthiest ways to get around in cities, providing valuable physical activity for people on a daily basis. Reducing the use of automobiles also generates public health benefits by diminishing air, water, and noise pollution and the overall level of traffic danger" (Pucher et al. 2010). If there are no cycle lanes, then less people will cycle to school or work. The physical environment is therefore associated with physical activity in the form of walking and cycling for transport (Saelens et al. 2003). Walking and cycling is however no longer healthy whilst breathing in CO<sub>2</sub> and other pollutants from vehicles. "Fossil fuel vehicles cause traffic pollution and safety problems, which adversely affect human health, the environment, and the livability of urban areas" (Lin et al. 2012). This is why walking, cycling and other outside activity must preferably be done in an environment that is separated from motorized vehicles and surrounded by green space. Green space may filter air, remove pollution, attenuate noise and cool temperatures (Escobedo et al. 2011; Groenewegen et al. 2006 via Wolch 2014).

Promoting physical activity through designing bike lanes and boulevards must therefore be combined with an apposite green environment.

Besides physical movement and pollution reduction, green space can also provide significant psychological and physiological benefits (Bell et al. 2008 via Moseley et al. 2013). Having green space accessible from within the city will endorse these benefits. Wolch 2014 also refers to other studies when he concludes, "a park experience has been shown to reduce stress" (Ulrich 1981; Woo et al. 2009 via Wolch 2014). Stress, like pollutants, being a health threat, can also be reduced by an experience in green space. Green space; also referred to as 'urban ecosystems', have proven to create an oasis where people can recover their mental strength and vitality (Kaplan and Kaplan 1989; Andersson et al. 2014; et al. 2008 via Buchel et al. 2014). Evidently, access to green space such as parks, urban ecosystems and vegetated routes promote benefits in health. In the first chapter 'City and Countryside' in the book *Design with Nature*, Ian L. McHarg's states: "*There are many people who look to nature for meaning and order, peace and tranquility, introspection and stimulus. Many more look to nature and activity in the outdoors as the road to restoration and health*" (McHarg 1967). Designing with nature in the city and providing access to green space will thus lead to healthier lifestyles, improving liveability. As mentioned above however, the planned green space or route promoting walking and cycling, will have to be designed carefully, so that people are not running in

pollutants or biking through dangerous traffic situations to reach the healthy green space.

### **Ecological Connection and Water Retention of Urban Green Space**

In addition to the health benefits, green space also supports ecosystems, biodiversity and water retention. Green space may infiltrate storm water, and replenish groundwater.” (Escobedo et al. 2011; Groenewegen et al. 2006 via Wolch 2014). Implementing more green space increases the ratio of permeable to impermeable area, which allows more infiltration of water into the soil. This is important for the prevention flooding. With the increasing effects of climate change and the situation of Rotterdam in a delta area, too much surface runoff from large paved areas can lead to flooding. With more permeable space, more water can be absorbed into the ground, contributing to the prevention of flooding. The vegetated permeable space will also filter out pollutants from rainwater. This filtering of water stimulates healthier growth of trees and more attractive water bodies in parks and in canals. Vegetated surfaces and trees also create habitats for insects and birds, increasing the biodiversity of the city. If these green spaces are connected throughout a route, then it can form an ecological network for varied species. An urban green space network can thus make an important contribution to the conservation of biodiversity and in adapting to the adverse effects of climate change (Gill et al., 2007; European Environment Agency, 2010; Kong et al., 2010 via O’Neil et al. 2014).

### **The Importance of Access to Nature**

The urban escape biking route will thus provide biking routes and green space inside the city. The main purpose of the escape route however, is to lead people out of the city to provide access to the natural or rural green space that lies outside the city. As Meijer et al. recommends; “save the green space outside the city which city-dwellers use for leisure activities” (Meijer et al 2011). Providing access to this natural or rural landscape can be very beneficial for people in cities. “Contact with and access to nature is beneficial to the people’s quality of life” (Comber et al. 2008). The interaction with nature and animals is important for child development and well-being (Kahn et al. 2002 via Wolch 2014). It is thus important for urban families to be able to access these rural and natural areas for recreational visits. The urban escape routes will allow people to access the countryside by bicycle, so that there are no dependencies on fossil fuels by car or public transport time schedules. Having an independent and boundary-less route will aim to increase the feeling of freedom. One will be able to move through the city and out of the city by bicycle as one pleases. As McHarg explains in his book, *design with nature*; “it is not a choice, either the city or the countryside: both are essential, but today it is nature, beleaguered in the country, too scarce in the city, which has become precious (McHarg 1967).” Being able to combine the urban life with natural and rural landscape experience is essential. The access to the natural or rural landscape is therefore important for all beings.

# Results for design

## Urban Layout and Design

An urban green space network can therefore make an important contribution to people's quality of life (Gill et al., 2007; European Environment Agency, 2010; Kong et al., 2010 via O'Neil et al. 2014). It is however difficult to introduce a new network layer in a complex already functioning infrastructure that is mainly focused on the accessibility of cars – especially on the urban to rural borders. The design and layout of the route is however very important for the use and potential success. The design of the street network, in both geometrical and topological sense, can be expected to influence the evolution of land use patterns and consequently the whole pattern of life in the city (Hiller et al 2005). It is therefore very important to position oneself in the perspective of the user. Changes to the spatial arrangement of different green space typologies, their quality, and points of access can contribute to initiatives to promote active travel and increase public use of green space (Moseley et al. 2013). A poorly designed route could therefore have great consequences on the use and the accessibility of the green space. Jan Gehl's theory of the human dimension explains this issue well. In his book *Cities For people* he explains that making the city viable, will require careful work with people's conditions for walking, bicycling and using the outdoor city space (Gehl 2010). He provides three main criteria concerning a good human scale in cities. These criteria include: protection, comfort and delight. Examples of protection

include eliminating fear of traffic, good lighting, overlapping functions, and protection against wind, rain, pollution and other unpleasant sensory experiences. The comfort criteria includes room for walking, room for cycling, good surfaces, accessibility, interesting facades, supports for standing and waiting, zones for sitting and resting, view experience of sun and people, unhindered sightlines, social furniture and seasonal adaption in design. And lastly, delight, includes scale, opportunities to enjoy the positive aspects of climate such as a breeze, shade or sun and also positive sensory experiences such as well-detailed design, long-lasting efficient materials as well as the use of plants, trees and water (Gehl 2010). Design and layout of space is of great importance as “environmental factors affect people's sense of subjective well-being” (Silva, de Keulenaer, & Johnstone, 2012). It is thus also an important aspect of an escape route for efficient and for the greatest use by people through protection, comfort and delight.

In a study done this year by Honold et al., results showed, that people who used a vegetated trail along a canal regularly had significantly higher life satisfaction than less frequent users. Vegetated routes or paths play an important role in restorative activities and daily commutes of the people that participated in the study (Honold et al. 2015). It shows the importance of designing vegetated routes that promote walking and cycling in urban areas. The study also refers to an older study by Takano et al. in 2002, which showed that “a lack of pleasant

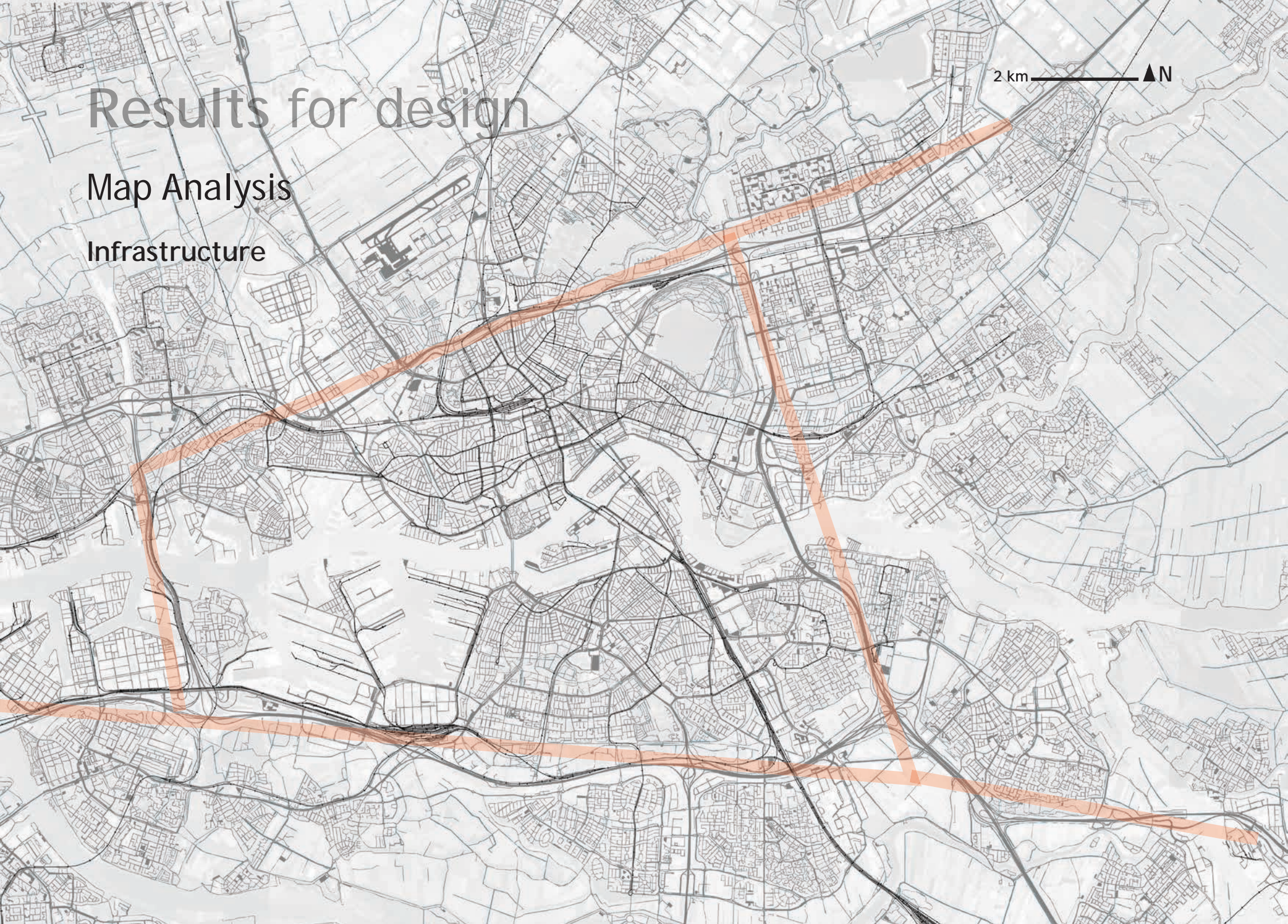
connections impeded people from visiting attractive parks especially when they were off daily routes” (Takano et al. 2002 via Honold et al. 2015). This shows that people may not even visit important parks or green spaces when there is no pleasant way to get there. Honold also concludes in her study that participants chose diverse green routes for healthy and sustainable modes of daily mobility rather than just selecting the shortest path. This is another indicator that people desire vegetated walking and cycling routes. The study then suggests that a motivation to visit a park may emerge from a desire to escape urban environmental stressors (Hartig 1993 via Honold et al. 2015). Looking back at the question: whether people feel better inside the city when they feel like they can escape the city? This research argues ‘yes’. The research recommends “more consideration of greenways in urban development” (Honold et al. 2015). This is also what the urban escape route in this thesis aims to achieve: designing greenways to escape the city.

To conclude, the relationship between the physical connection between the city and the rural or natural landscape and the liveability of the city is that the connection increased the liveability. To increase the liveability of the city however, this physical connection between urban and rural landscape should include aspects that are known to increase liveability. These include the above mentioned factors such as vegetated space, accessibility, human-scaled, no motorised vehicled and form a connection between neighborhoods, schools and green space.

# Results for design

## Map Analysis

### Infrastructure



This map shows the complication of the Rotterdam infrastructure. Trains, trams, highways, subways, streets, bus lanes all have separate routes and networks. There are plenty of ways to get around by these varied transportation methods and the organization of these forms of transportation is very good. The many networks do however, form many boundaries for the simpler independent infrastructure such as biking. In the layered map below, the complexity of the infrastructure is shown and the main physical boundaries are marked.



## Waterways

Waterways are also an important part of the infrastructure of Rotterdam. The Maas River is used mainly for harbor activity. When the waterway layer is turned on without any others, one can observe that the waterways in the city do not connect and seem randomly dispersed. On the edges of the city in the North however, three clear waterways are present. This provides opportunity for potential escape routes.

# Results for design

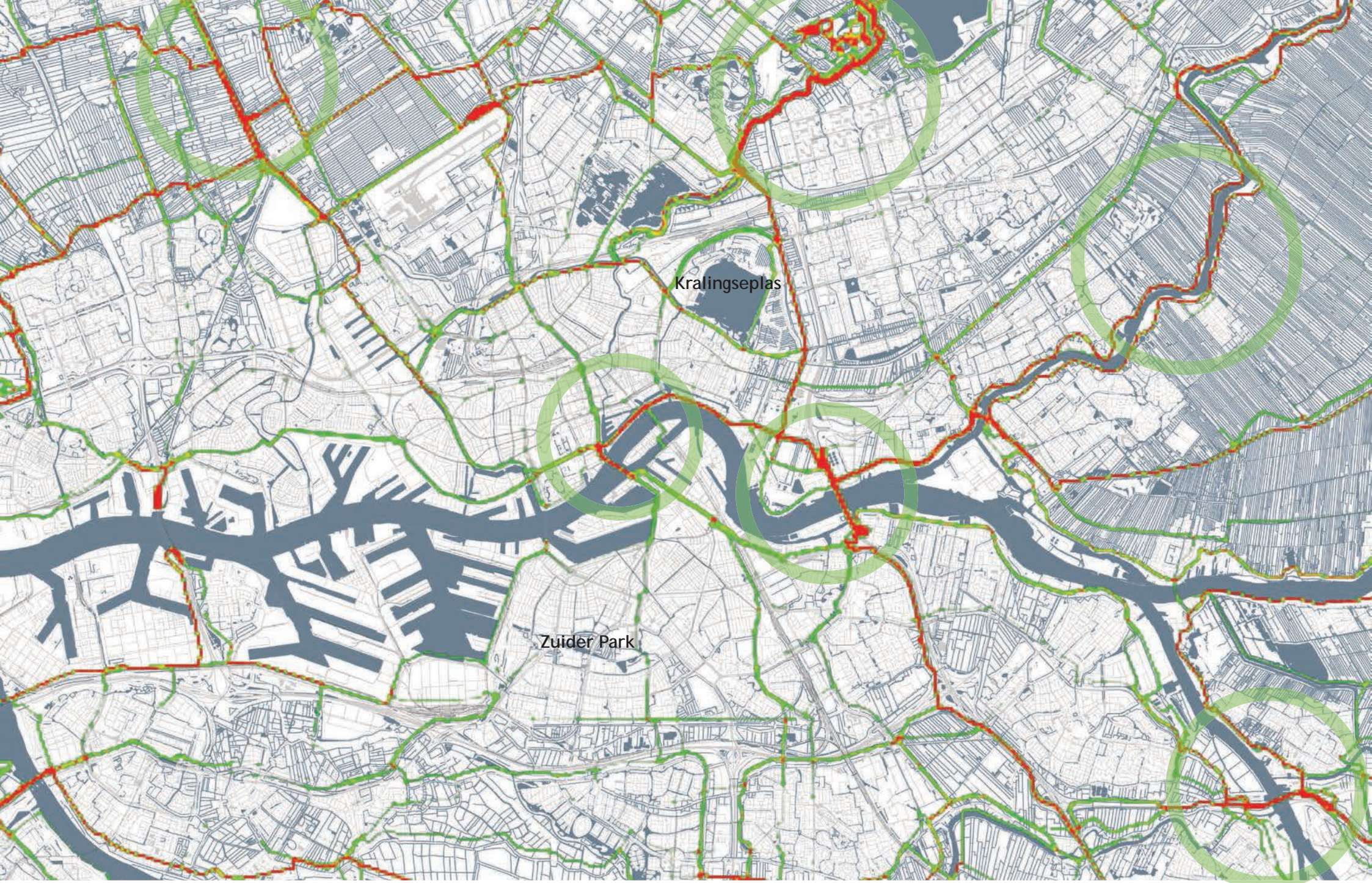
## Landmarks & Education



In this map, the Rotterdam historical landmarks and touristic sights are located in orange. In the pictures below, some of these sights are shown. It is important for the urban escape route to run by these landmarks for potential use by visitors and tourists. People biking the route or even parts of the route will then pass by various important landmarks in Rotterdam, gaining more insight into the city. This may lead to the interest of middleclass visitors to settle in Rotterdam.

Portrayed on the map in yellow are also the many elementary schools in Rotterdam. It is important for the bike route to link neighborhoods with elementary schools for safe bike travel to school. This will also motivate parents to let their children bike to school and also make cycling a habit for kids. Four of the schools on the map are Muslim schools. These children, of which a percentage may not have

grown up with bikes, will then get the opportunity and extra incentive to bike to school when it is made more convenient and safe. The route should therefore have right of way against cars or other motorized vehicles that could make the route unsafe. The route should also include as much vegetation as possible to absorb emissions that make it unhealthy to bike. With a healthy and safe route to school motivating children to walk and cycle to school, will also increase the amount of exercise children have per day, leading to healthier lives and thus the improvement of liveability inside the city. Besides using the route on the way to school, it can also be used for school excursions to visit the natural or rural area outside of the city. With routes leading directly to these areas, teaches can be stimulated to organize these excursions for outside learning.



— Bike paths used intensively  
 — Bike paths used often

2 km —▲N

## Bicycle Use

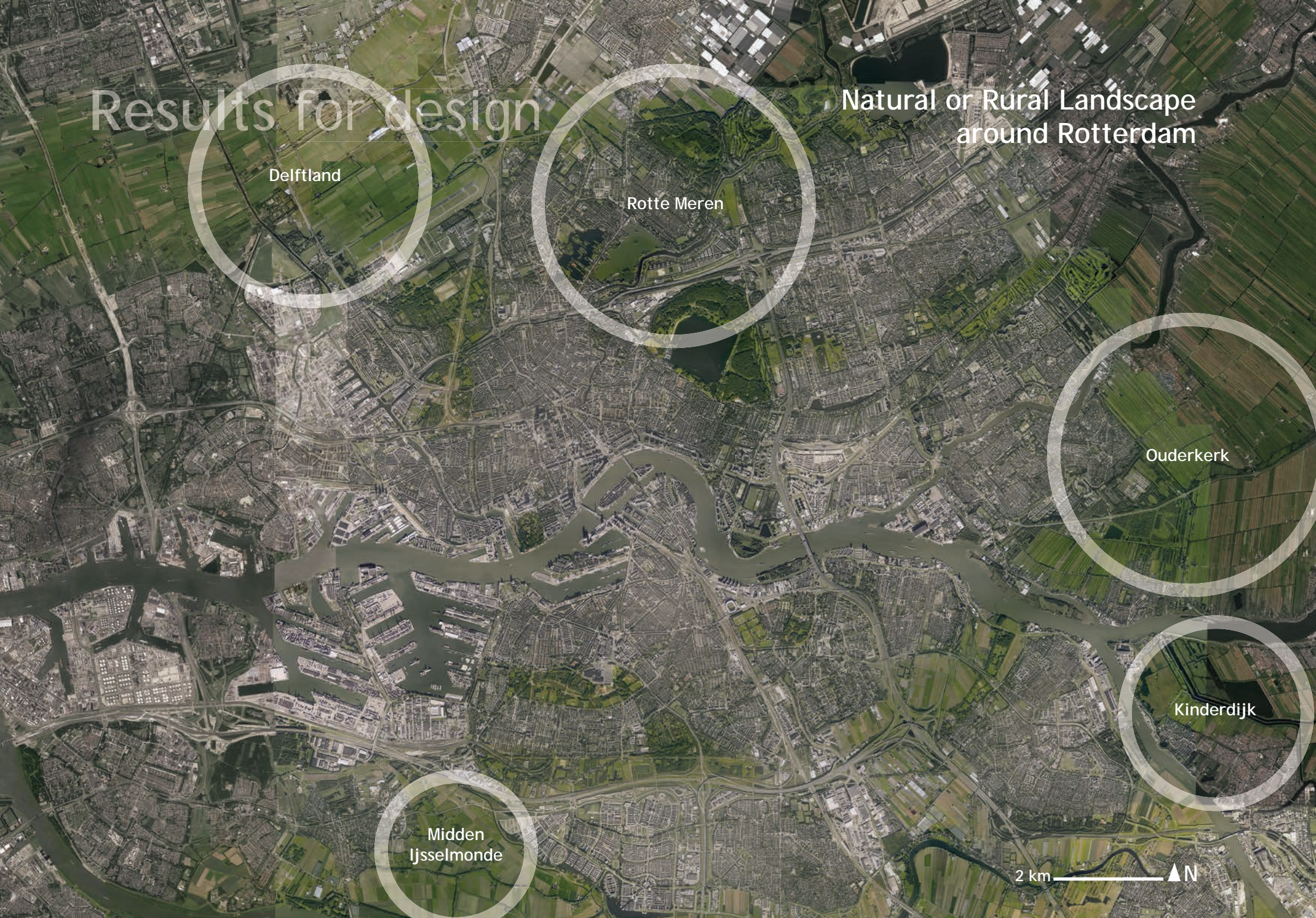
Looking at the current use of bike routes in the city, it seems that the northern part of Rotterdam – especially following the rivers – are used more regularly than the south of Rotterdam. This is marked by the green circles on the map. The two bridges over the Maas river are also used intensively by bikers.

Some areas, such as the Zuider Park (southern park) for example, has a relatively low amount of cyclist while many opportunities for biking exist in this park. The Kralingse Plas Park in the north of Rotterdam however, does have many bike visits.

The main recreational areas outside the city do seem to have a lot of bike visits. When moving towards the city however, this amount decreases.

# Results for design

## Natural or Rural Landscape around Rotterdam



This map shows where the main natural and rural landscapes exist outside of the city. These locations are the potential destinations for the escape route. The green areas include: Delftland, between Rotterdam and Delft. This can be reached when following the Delfshavense Schie Canal. The Rotte Meren (lakes of the Rotte River), can be reached when following the Rotter River. The Ouderkerk landscape can be reached through following the Holandsche IJssel River. Kinderdijk lies south east of Rotterdam and can be reached by ferry or car, however difficult by bicycle. Lastly Midden IJsselmonde, “the agricultural area of

Midden-IJsselmonde is one of the few remaining large open spaces in the vicinity of Rotterdam. Its beautiful polder landscape in the delta with historic dikes and farmhouses has attracted the upper middle class with its rich social and cultural life, while retaining its rural character” (Dembski 2014) which is located south of the city. Dembski also confirms that middle class residents enjoy visiting the rural landscape for recreational purposes. The map also shows (in green) the main parks in Rotterdam, which could potentially be used as a part of the escape route.



## Elevation

Height differences in the landscape such as dykes, former railroads, highways or natural elevation can also be used in the location selection for an urban escape route. Marked in white lines are dykes that could potentially be used in the urban escape route. All of these dykes are very important functioning dykes for Rotterdam and can thus not be altered in its cross-section (Pleijster 2014).

# Results for design

## Map Analysis

### Route Options

Layering all regional map layers, four potential locations of the routes have been chosen. These are all routes leaving from the central church on the market square towards the northeast, northwest, southeast and southwest. The recreational destinations are labeled in the map below. The two northern routes both follow waterways the Delftsche Schie and the Rotte River. The southern routes both make use of the Zuiderpark and do not have clear waterways to follow. All routes, except the northwestern route encounter the boundary of a highway.

For this thesis, one route is focused on in the research through design section. To assess this, the four routes were biked and observed. During the impressions



gathered on site, combined with the regional knowledge gathered from maps, the southeastern route leading to Kinderdijk is chosen. This route is chosen for multiple reasons. Firstly, it is chosen because there are many elementary schools along this route. Secondly, many landmarks, such as Hotel New York, Erasmus Bridge, the Kuip stadium are situated along the route. Besides this, the route makes use of existing paths in the Zuiderpark. According to the current bike use regional map analysis, this park is currently not often used for recreational bike rides. There is thus definitely potential for improvement. Kinderdijk is a very popular recreational destination, however, it is difficult to reach here by bicycle. Due to the varied situations of this route, it stands most representative

for problems faced in all routes. This route passes along a remaining canalized part of the Rotte, the Steigersgracht, it runs over the Erasmus Bridge, over the Rijnhaven and Maashaven, through a 19th century neighborhood, Charlois, the through the Zuiderpark, then past difficult traffic situations towards the Oostdijk, following the dyke until the Ridderkerk ferry terminal, with a very short ferry ride to Kinderdijk across the river. This ferry leaves every 45 minutes. The entire route to the ferry terminal is 19 kilometers. This takes an average biker about two hours to bike from the starting point. If one would not like to take the ferry, one can bike 5,8 kilometers (about 20 minutes south to the bridge to Kinderdijk).

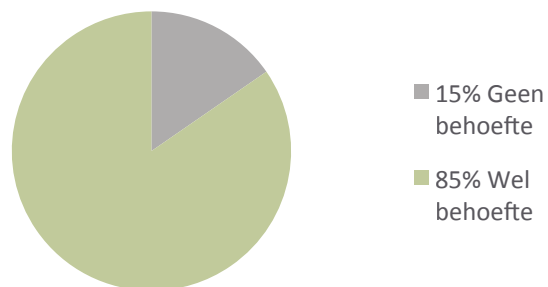


# Results for design

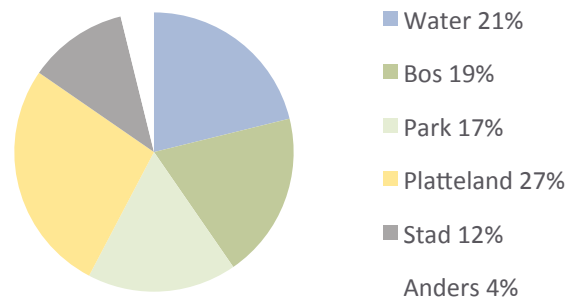
## Interview Intermezzo

In this interview intermezzo no research conclusions are drawn. This intermezzo is done to receive an impression of what Rotterdam residents think on the research topic. 52 Rotterdam residents of all ages, gender and ethnicity were interviewed. This was done in different neighborhoods in Rotterdam including the City Center, Kralingen, Delfshaven, Spangen and Charlois. Below are the different answers that the people gave divided in pie charts. The full interview that was used can be found in the Appendix.

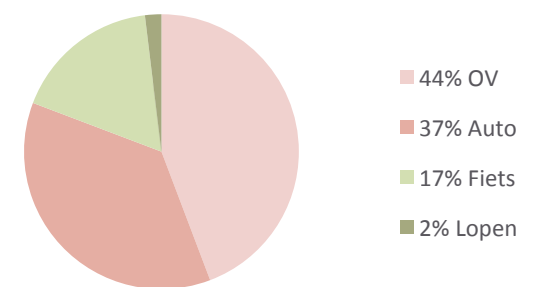
Percentage met de behoefte om de stad uit te gaan in vrije tijd:



Wat mensen zoeken buiten de stad:



Percentage met de behoefte om de stad uit te gaan in vrije tijd:



A few interesting quotes gathered from interviewees are listed below:

*"Omdat ik aan de rand van Kralingen woon, heb ik **niet het gevoel alsof ik midden in de stad zit.**"*

I live in Kralingen, so don't feel like I live in the center of the city.

*"Het Kralingseplas is te druk en **het strand is te ver.**"*

The Kralingseplas [park] is too busy and the beach is too far away.

*"Mooie fiets routes naar buiten zijn langs de gevangenis naar de Oude Maas of de Schie volgen naar Midden Delftland, of langs de Rotte naar het Bergsebos. De nieuwe fietsbrug bij Hotel New York is ook fijn, maar **je moet het allemaal wel net weten.**"*

You have to know where the bike routes are to use them.

*"Als ik klaar ben met studeren, **blijf ik niet in Rotterdam; er is geen frisse lucht.**"*

*"**Fietsen in Rotterdam is levens gevaarlijk!**"*

Biking in Rotterdam is very dangerous!

*"**Ik fiets niet in Rotterdam, het OV is goed geregeld.**"*

I don't bike in Rotterdam.

*"Ik fiets graag over de Erasmusbrug, mooi uitzicht!"*

I enjoy biking over the Erasmus bridge, nice view!



# Results for design

## Site Analysis

### Problems

Insufficient bike lanes and discontinued bike lanes



Barriers temporary



Barriers long-term



Car-based environments



Poor water quality



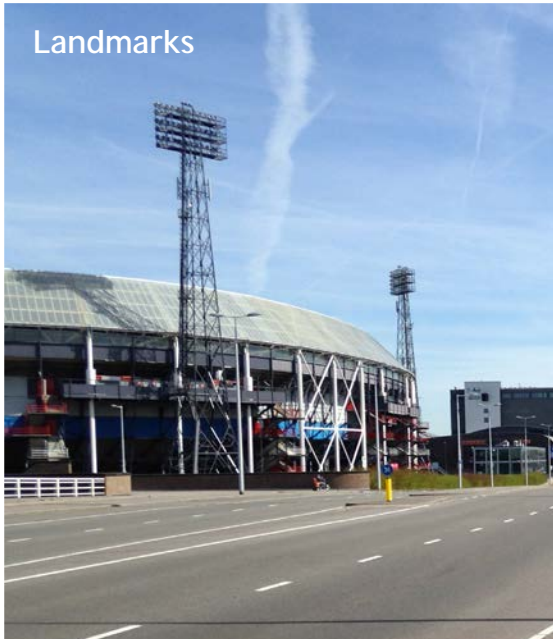
Insufficient bike path materials



# Results for design

## Site Analysis Opportunities

Landmarks



Existing facilities for bikers



Existing space for escape route



# Results on design

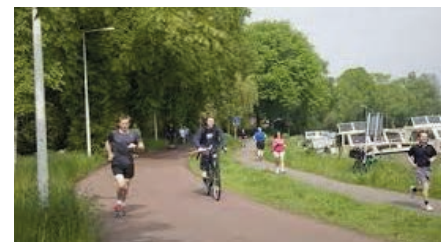
## Amsterdam


Amsterdam is an important reference for this research as it is of similar size to Rotterdam and has the same original urban layout. Both cities started off as building a dam on a river. In Amsterdam's case, this river is the Amstel and in Rotterdam, the river is called the Rotte. In the illustration below, it is shown what both cities looked like in 1340, established around the dam on the river; the Amstel – dam and the Rotte – dam, hence the city names.

Now 675 years later, the two cities are incomparable in urban layout. In Amsterdam, a large area of the original layout is clearly visible in the city center. Whereas in Rotterdam's city center, being bombed in the Second World War and afterwards restructured with the vision of modernization, has very little evidence of being built around the Rotte – dam.

In Amsterdam the Amstel is thus clearly visible within – and leading out of the city. It forms a clear route from the urban to the rural area with bike paths along each side. In the city the river is a landmark, with popular destinations such as museums, theaters and cafés alongside it. As one moves out of the city alongside the river, the environment becomes more open and greener. The river also has several rowing clubs alongside it as well as diverse boat traffic, contributing to the dynamic experience. Passing the green Amstel park and afterwards the traditional Dutch polder landscape, one unquestionably feels like they have escaped the city.

In this case, it is not innovation that has endorsed benefits for runners and bikers; it is leaving things as they were originally planned. With the addition of broad bike paths close to the water and plenty of bike-racks for parking, the biker is stimulated to use the Amstel route. Disadvantages however, include the abundance of houseboats, making it difficult to experience the river and some of the bridges are quite steep for bikers.

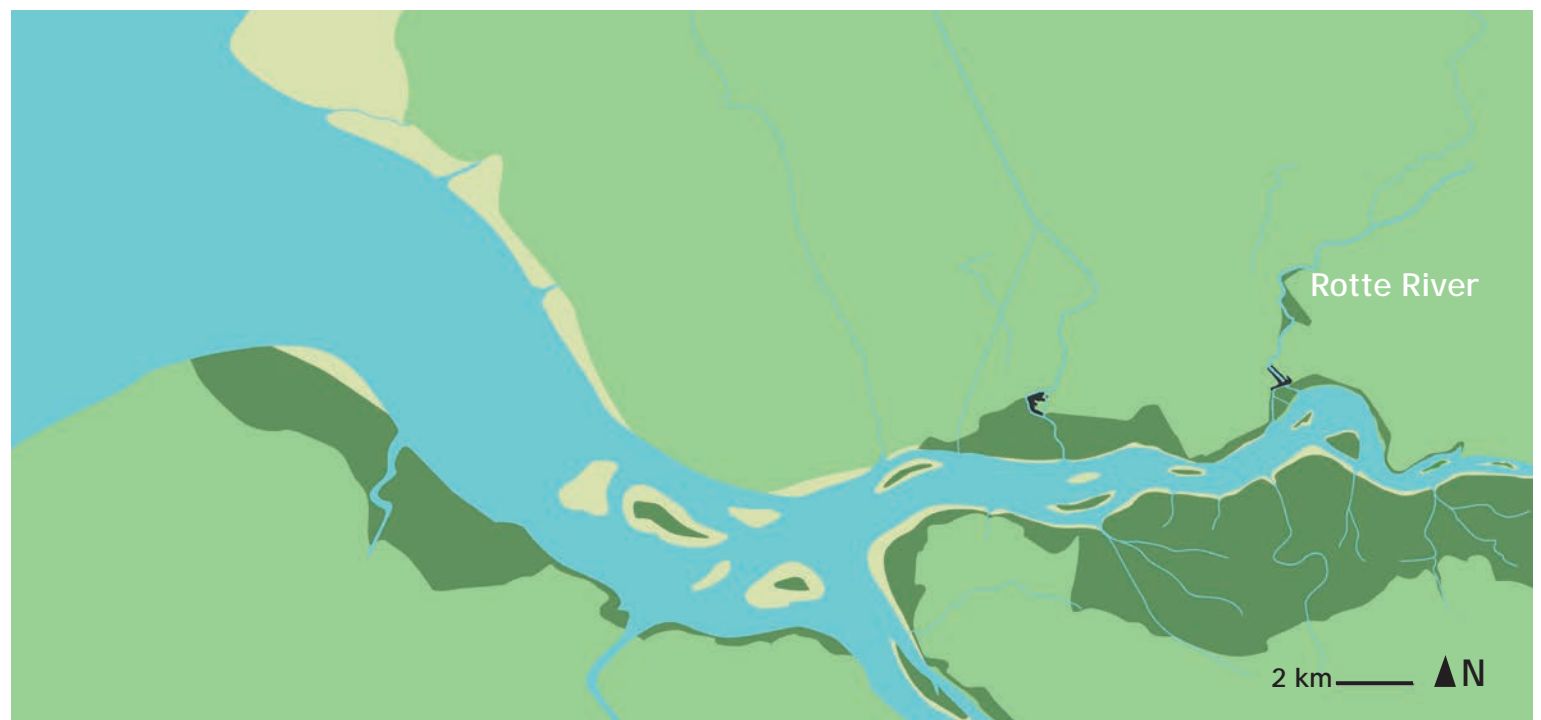


2 km 

**Map Amsterdam 1350**  
**Population: 3000**  
(Source: Amsterdam  
Museum, Mapping History)



**Map Rotterdam 1340**  
**Population: 2000**  
(Source: VU Beeldbank,  
Mapping History)



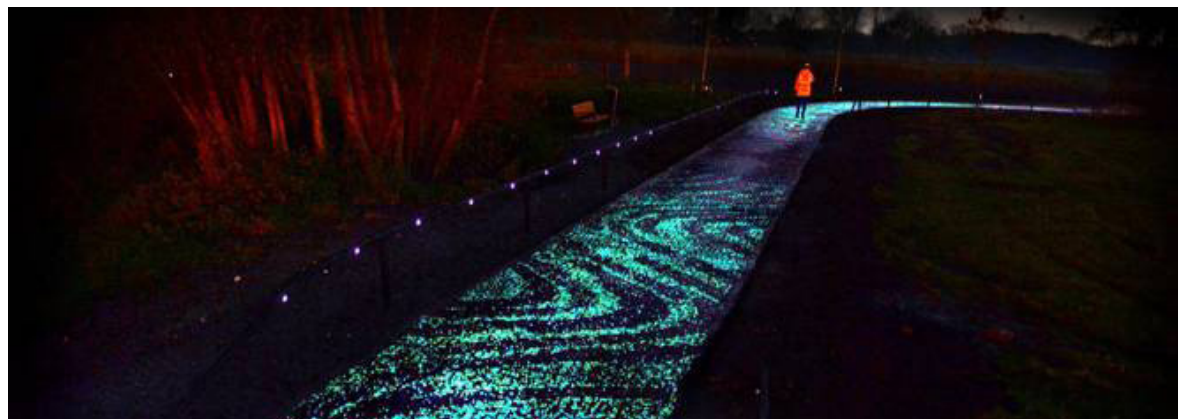
# Results on design

## Eindhoven

The first reference is the Green Corridor, a bike route vision that was initiated by Adriaan Geuze and currently being implemented by the municipalities of Eindhoven and Oirschot. The route runs from Eindhoven into the forrest of Oirschot and is meant to be a connection between the two cities as well as an urban escape from the city of Eindhoven. This is not only a good Masterplan example. The case of the Green Corridor also shows how difficult it can be to implement such a route and remove cars from an existing car-used space. Due to citizen protests, it was not possible to take away cars from this route. The car-speed was however reduced. This case shows the complications involved in implenting a design.

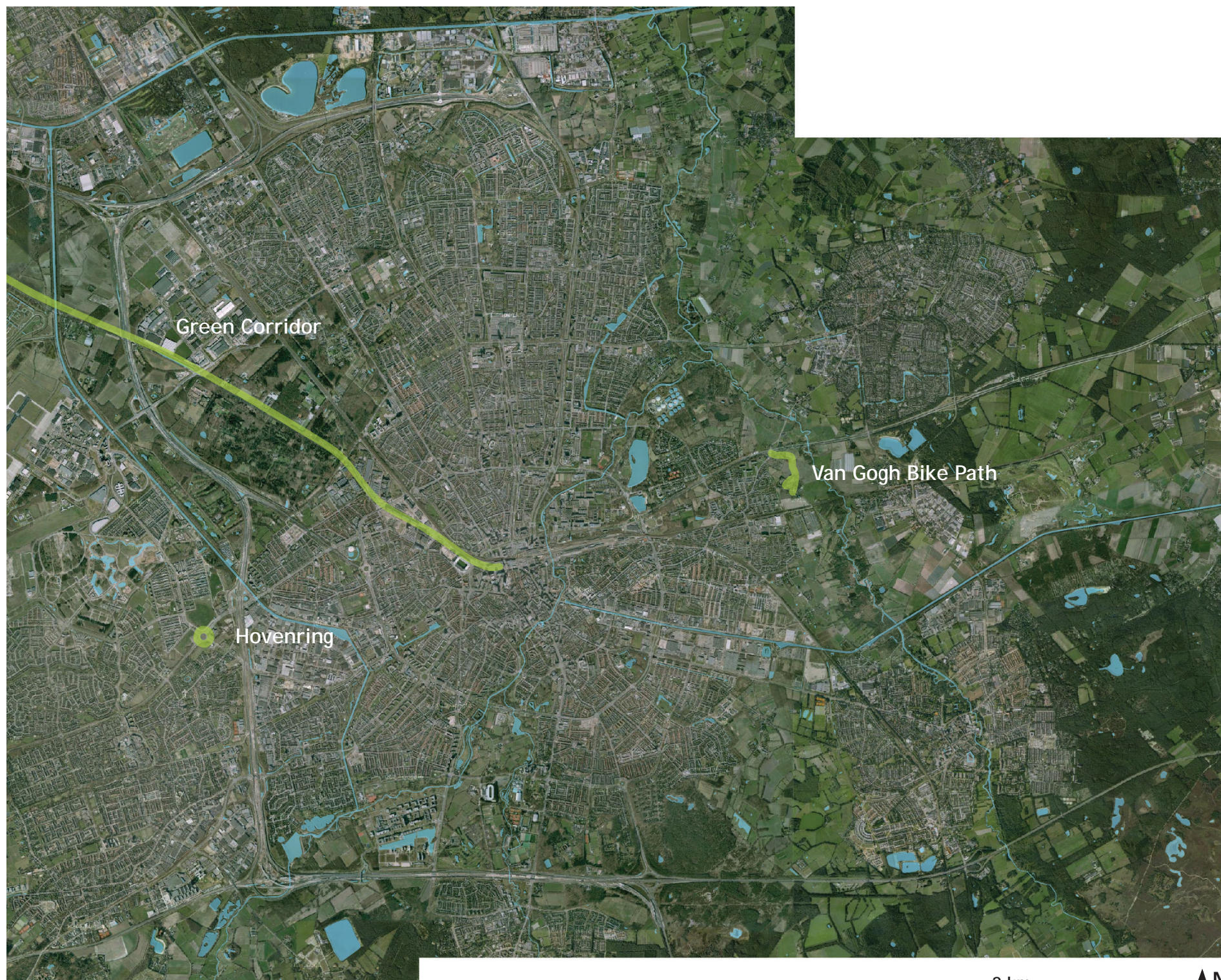


The second innovation highlighted in the map is the Van Gogh Bike path that runs between two water towers that have been portrayed in van Gogh's paintings. The beautiful addition to this bike path is that it is paved with small stones in patters of van Gogh's paintings that light up in the night. The experience of the bike path becomes a magical one as thousands of colored stones shine from the ground at night.



The last design innovation taken from Eindhoven is the Hovenring. This is an elevated bike path over large car-based roundabout. As shown in the photo, it is quite a large structure especially designed for bicycles. Solutions like these are only applied when there is a high urgency for intervention in infrastructure.





2 km   N

# Results on design

## 's-Hertogenbosch

Den Bosch is chosen as a reference for similar reasons to Amsterdam. The Dommel River is a river that runs from the south of the Netherlands through Eindhoven, Sint-Oederode and then through the city of Den Bosch. In the south of the city, it also forms a natural route out of the city. Compared to the Amstel in Amsterdam,

the Dommel has more natural edges and paths. It also reaches the countryside faster than the Amstel as this city is simply smaller. This is another great way of following the river towards the rural and natural landscape. In the images below the authentic and natural character of the riverside is shown.





2 km ———▲ N

# Results on design

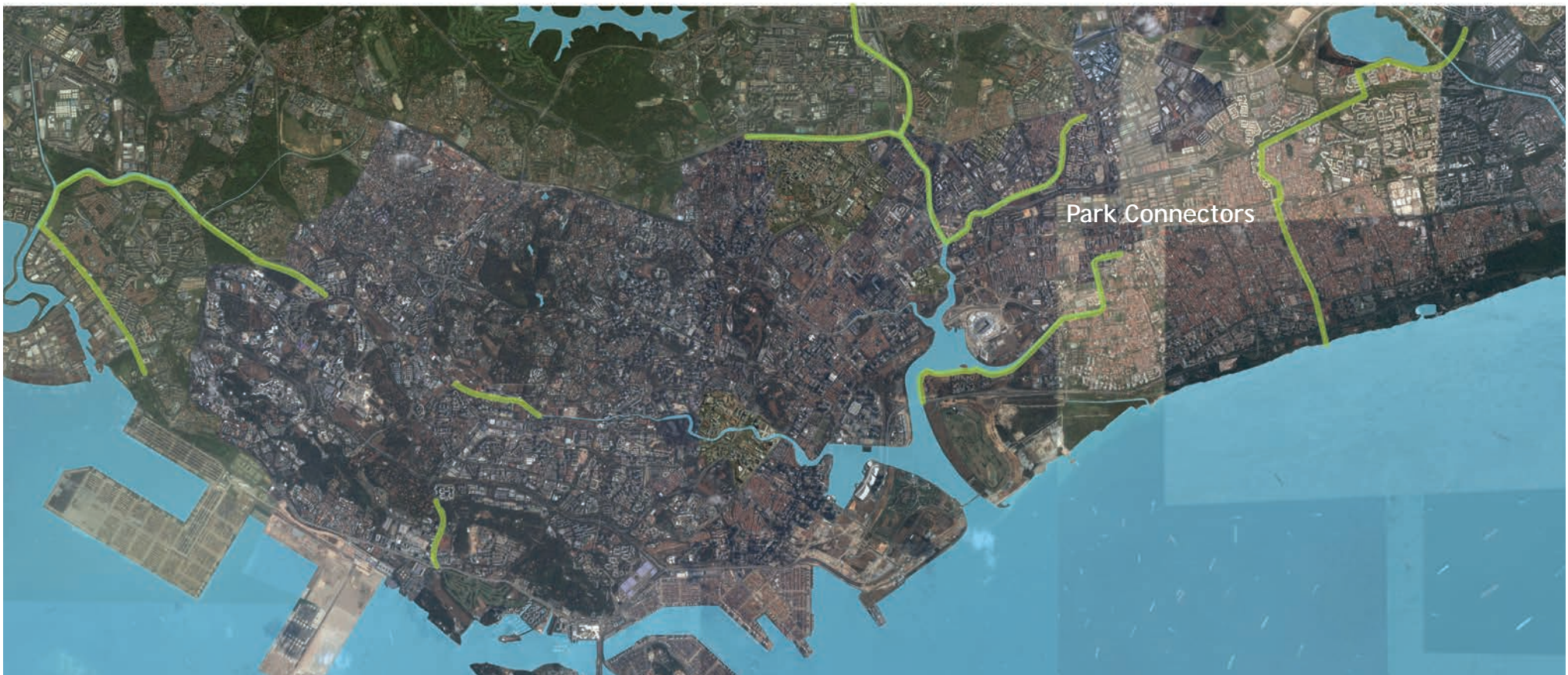
## Singapore

'Park connector' is a well-known term in Singapore. As the city calls itself 'the garden city' due to the many lush tropical trees and plants greening the city, it does not save money on liveable design. There are also some beautiful parks in the city as well as water reservoirs. Because the city no longer wants to be dependent on Malaysia for water, it has invested in reservoirs and water cleaning systems. The canals are therefore very well maintained. Due to the many tropical showers, the water management is taken very seriously with large

drains to prevent flooding. In the past years, the governments national parks division has implemented park connectors along these large canals and drains. The map shows how these connectors run along these waterways. Design innovations for bike lanes, tree top walks, and recreational routes are all tested here with great success. This reference is thus chosen as inspiration for creating connections in a large urban area.



2 km  N



# Results on design

## Manhattan, New York

The Highline in Manhattan is not an urban escape, however a good example of allocating a route for only pedestrians and other slow-traffic. Although this reference is not visited, research on the route shows many inspirational design features for an escape route. It is an elevated route on a former train railway, separating the park from the car-dominated street level. The High Line is a popular reference due to the pleasant environment created within a dense urban landscape. The implementation of lighting, grass lawns and comfortable seating created the human-scaled environment that an urban area needs.

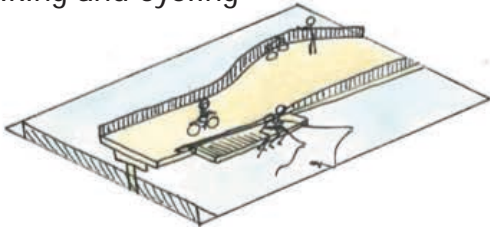




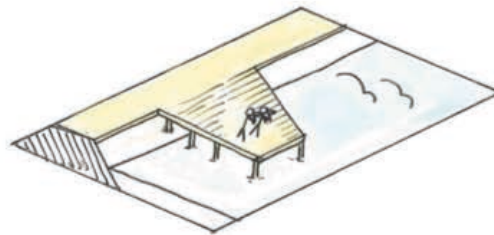
# Results on design

## Design Guidelines from References

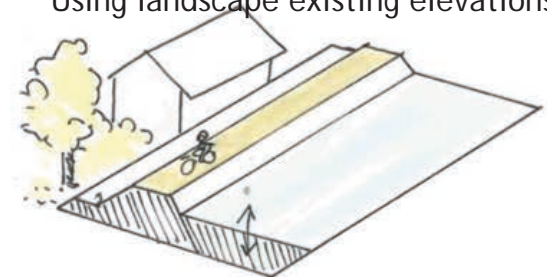
Allocating decks and bridges to walking and cycling



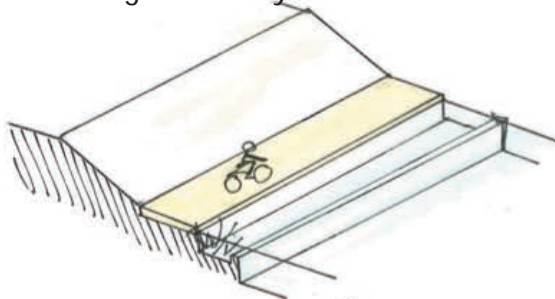
Creating resting and viewpoints



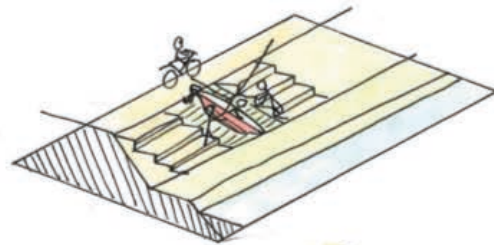
Using landscape existing elevations



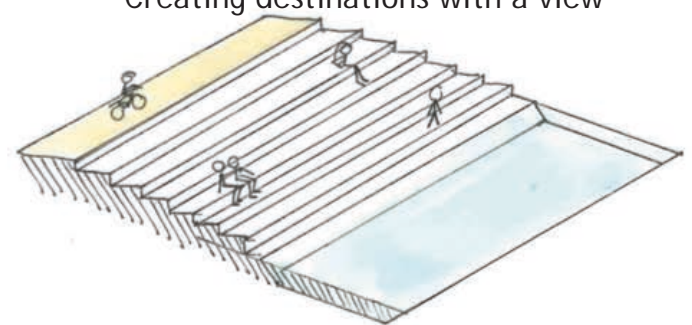
Following waterways



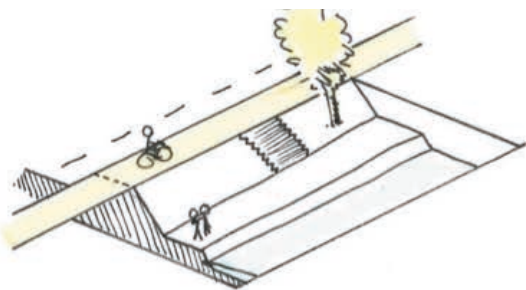
Recreational facilities



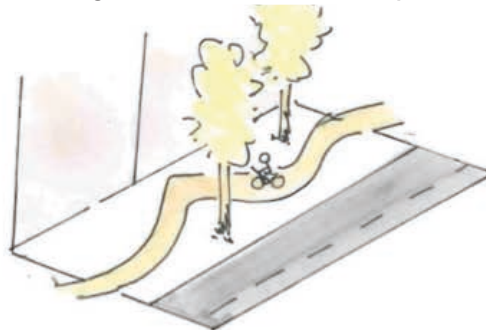
Creating destinations with a view



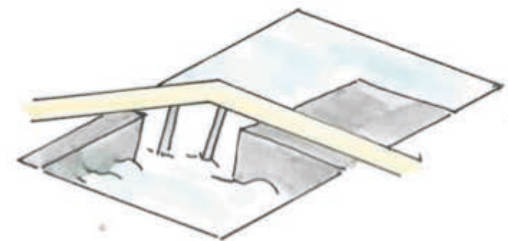
Creating layered paths



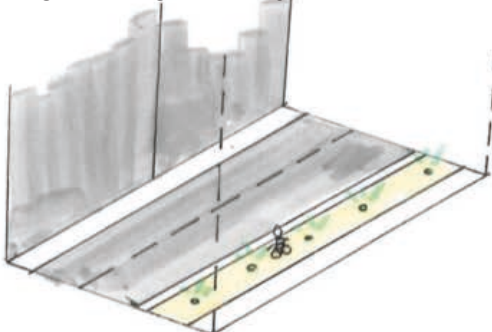
Making room for slow transport



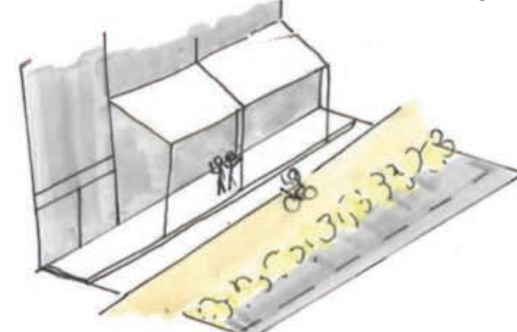
New bridges



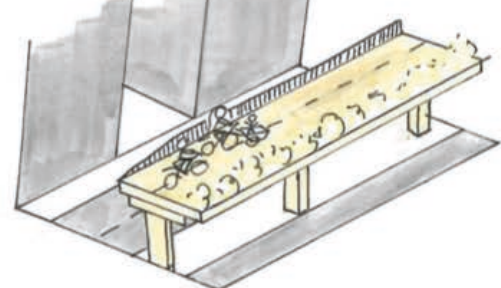
Lighting leading the way



Enhanced facades and connecting cafe's



Elevated paths when avoiding car dominated roads





# Results by design

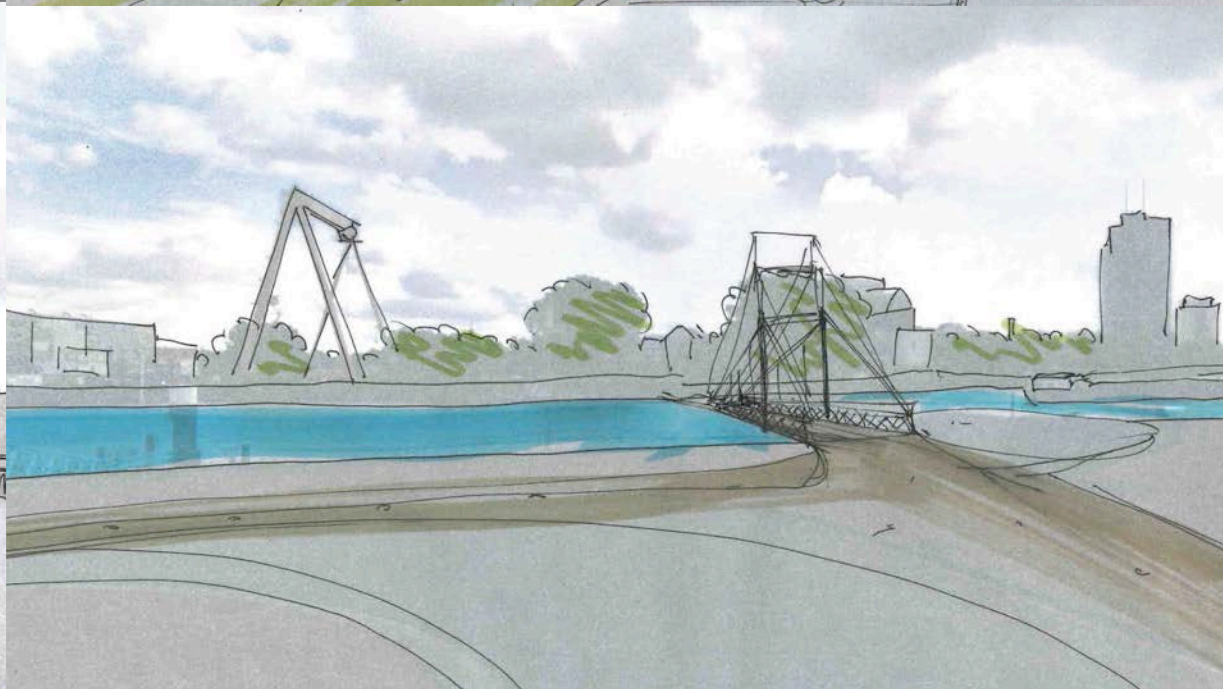
Design Trails

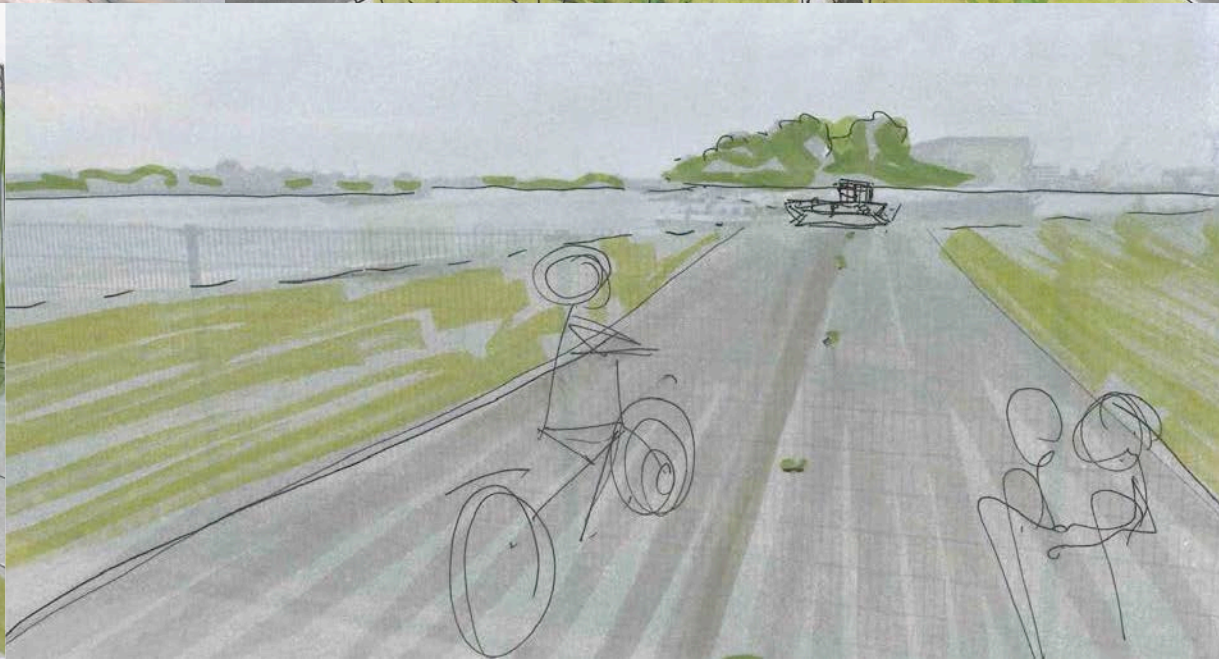
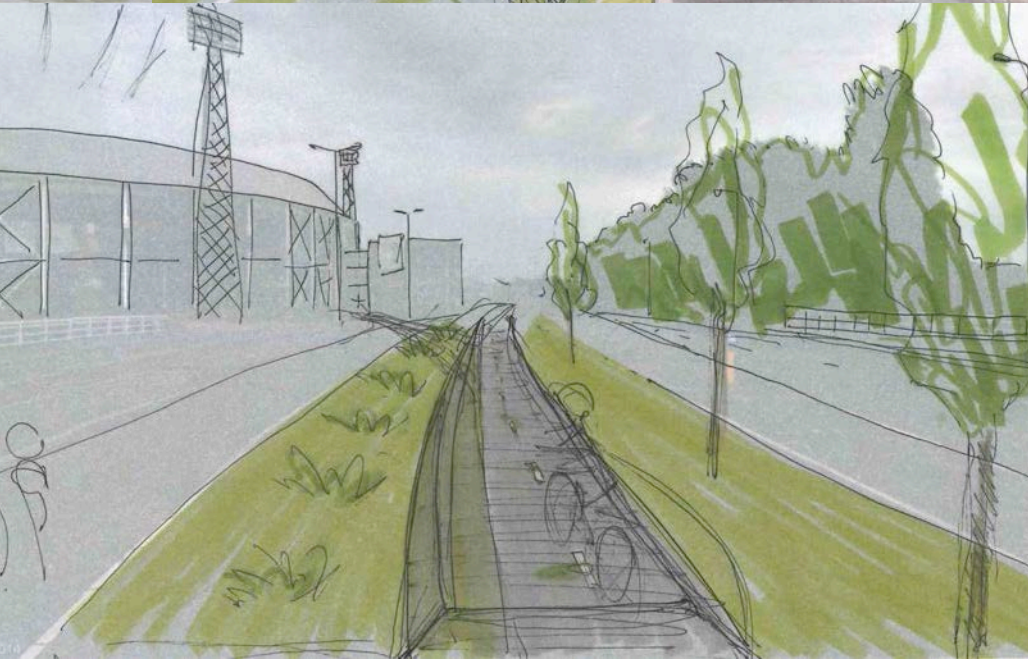




# Results by design

## Sketches





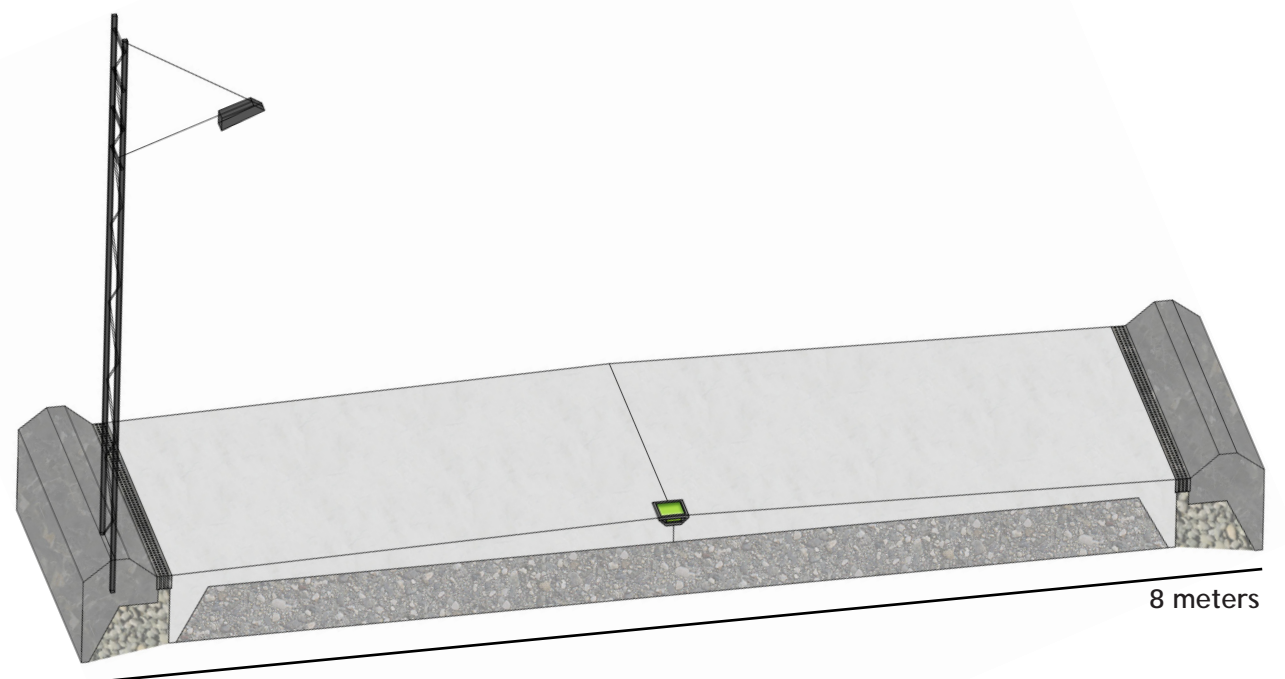
## Detail Design “De Mazzel!”

This is the final design for the urban escape route path. The urban escape route will have the name: “De Mazzel!” which is term used for saying ‘see ya!’ With a name and standard recognizable design, it will be marketed in the city as the urban escape.

These sections show four variations of the same concept. The design is inspired by the Rotterdam harbor with smooth concrete paving and crane-like lighting. Construction lights inspire the lamps inside the path, although they are not as bright. These lights will guide the way for the entire 19 km of the route.

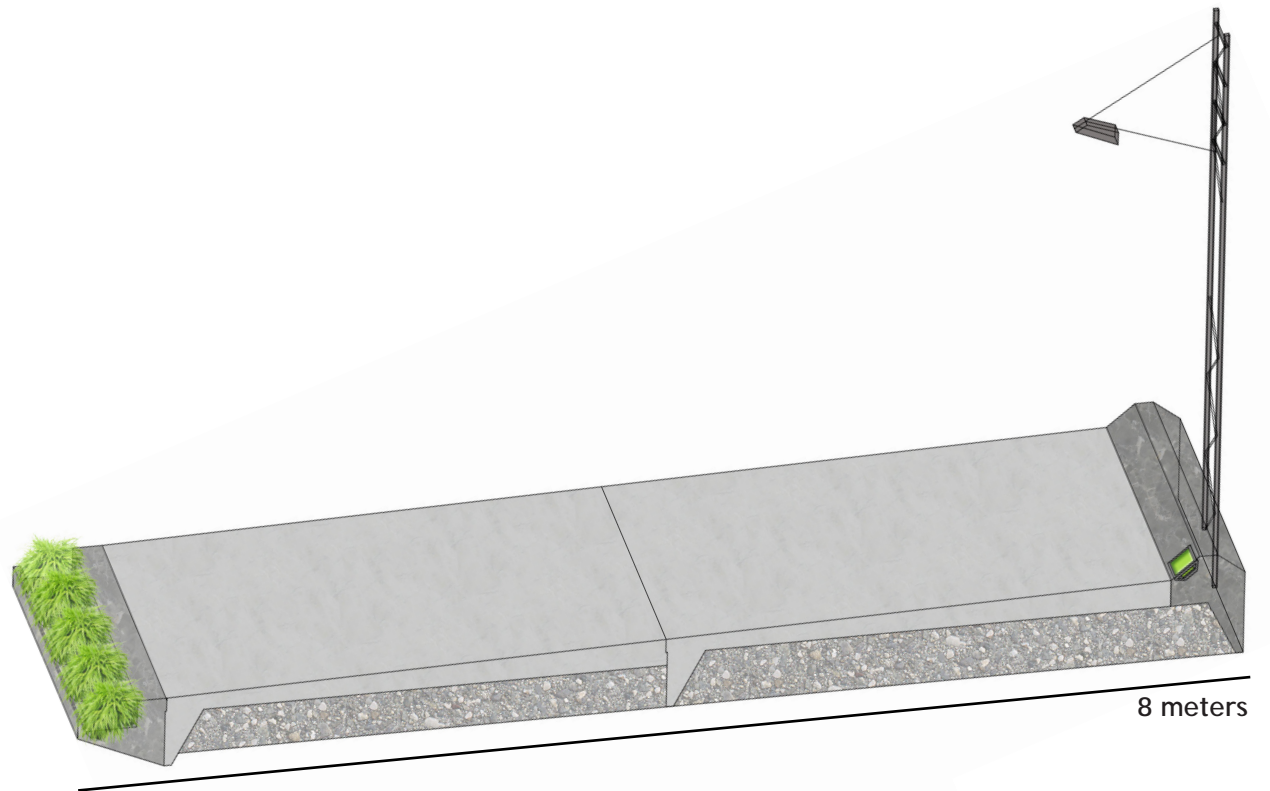
The construction is very simple, as all variations use the same size and shape of the materials. The variations exist for different the locations. There first section is the standard design of the route. The lighting is placed inside the curbs of the path as the water runs to the center and gets lightly purified though a filter and then passed though large pebbles to allocate it into the ground water. At locations where this is not possible, such as a dike; the second design is made. The second design is similar, however has the water running to the sides instead of the center. This allows the lighting to be place in the center of the path.

The third and fourth design variation is for waterside paths. When the path is situated along a waterway, these variations can be used to separate pedestrians and slow movers from the relatively faster bicycles. The wooden deck in the fourth design can be widened where



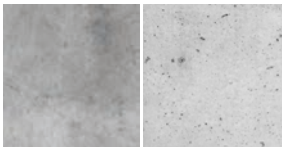
possible. It is supported by an extension of the metal lighting frame. The third design allows the water to flow towards the planting, which filters the water and then lets it flow into the waterway next to it.

The curbs form an enclosed feel to the route, are easy for construction and also act as a speed bump at intersections, so that cars will give way to the pedestrians and cyclists on the route, enhancing safety.



#### Materials:

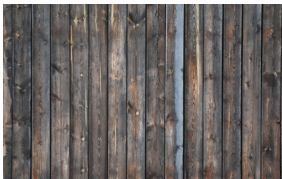
Concrete paving



Limestone curbs



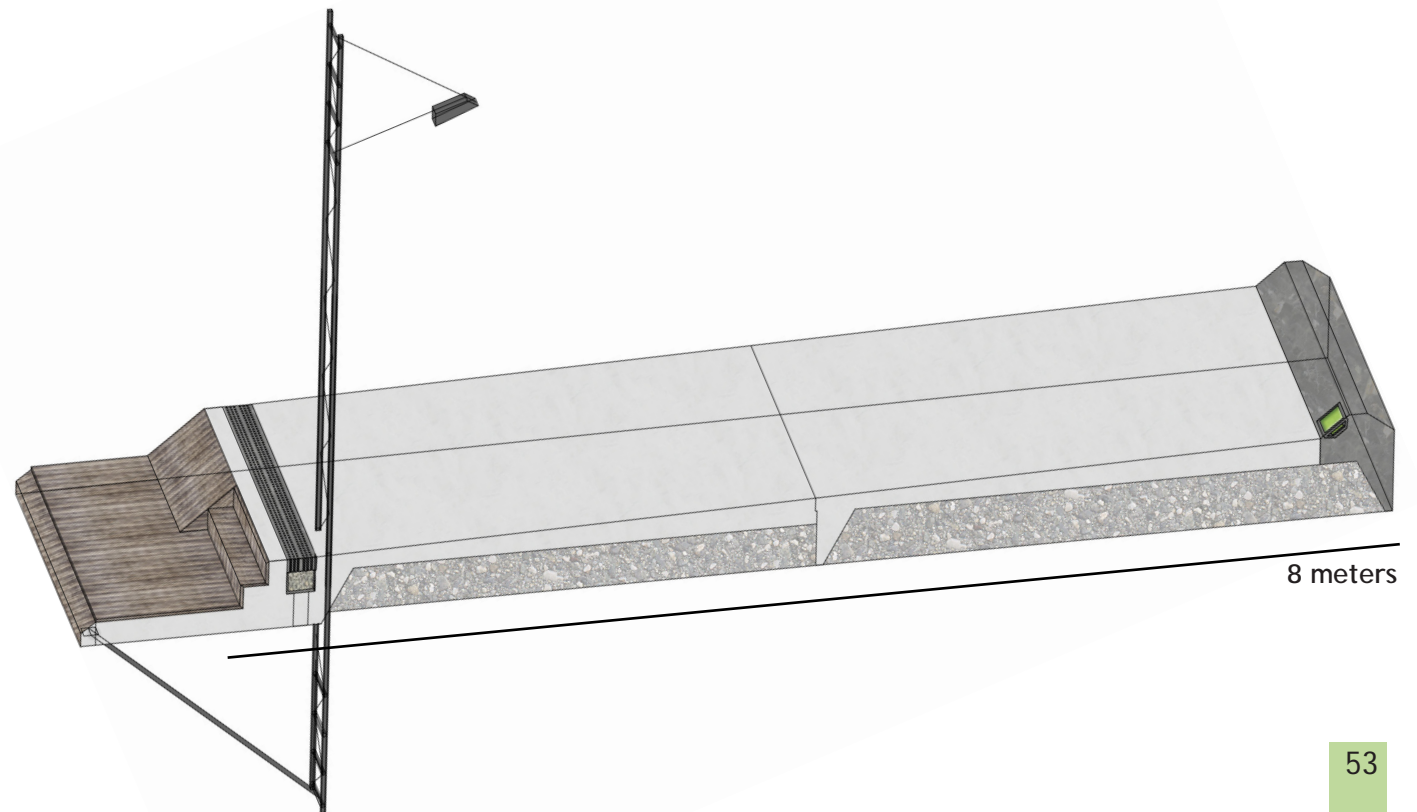
Wooden deck



Pebble filtering

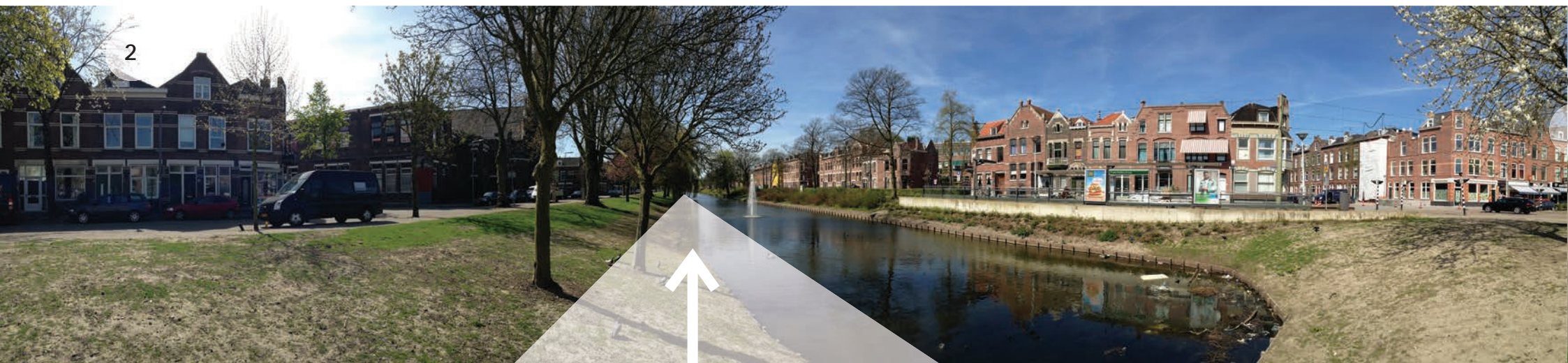


Harbor crane lighting



# Results by design

## Locations for detailed route design

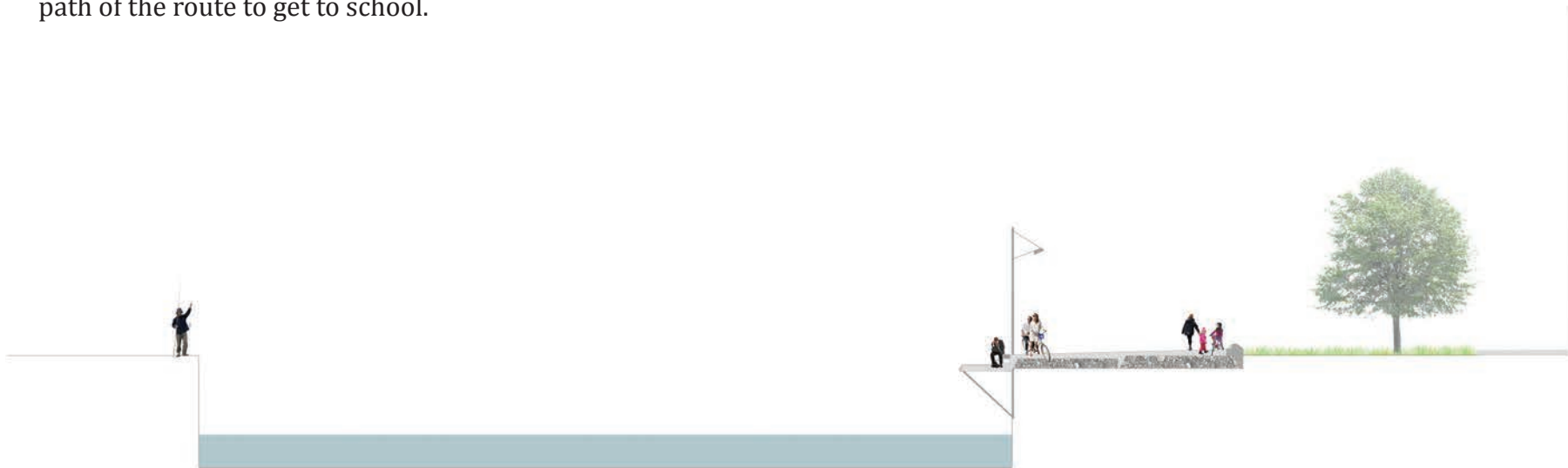


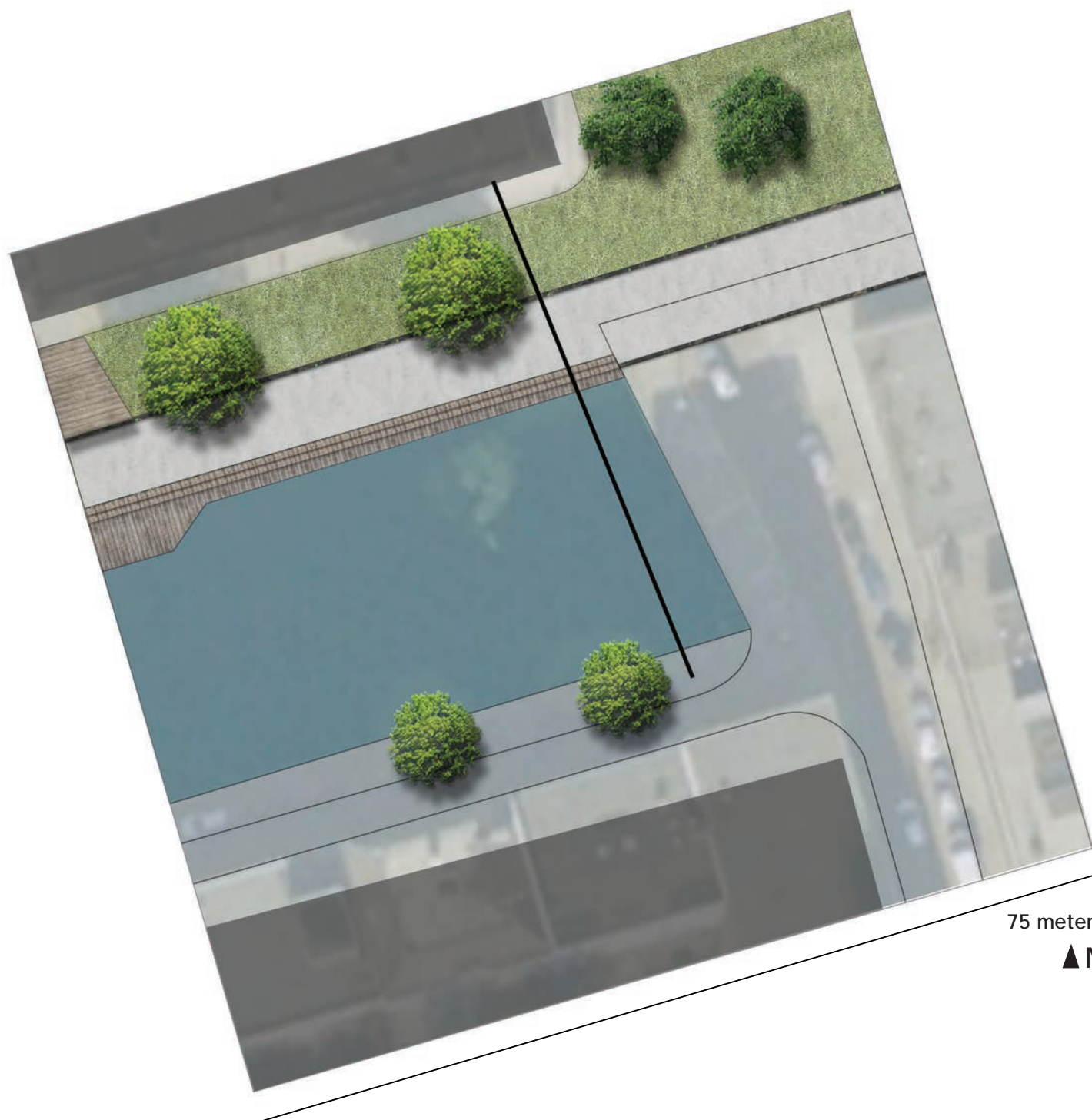


# Results by design

## Plan and Section 1

This first design is at the start of the route along the Steigersgracht. It uses the fourth design detail variation. The path is located on the right side of the canal because this location has the most sun. (See Appendix for shadow study). Other earlier designs experimented with a path running over the water, however this would lose the connection with the canal design. The plan shows that the wooden deck extends on the east side, which is where a cafe terrace could potentially be placed. The cafe is shown as a wooden hut in front of the building. This is possible as the back of the building is facing the path. The former parking lot is turned into a green lawn where more trees could be planted. The cars in the former parking lot are allocated to the Markthal parking area. Across from the canal is an elementary school that could use path of the route to get to school.





75 meters

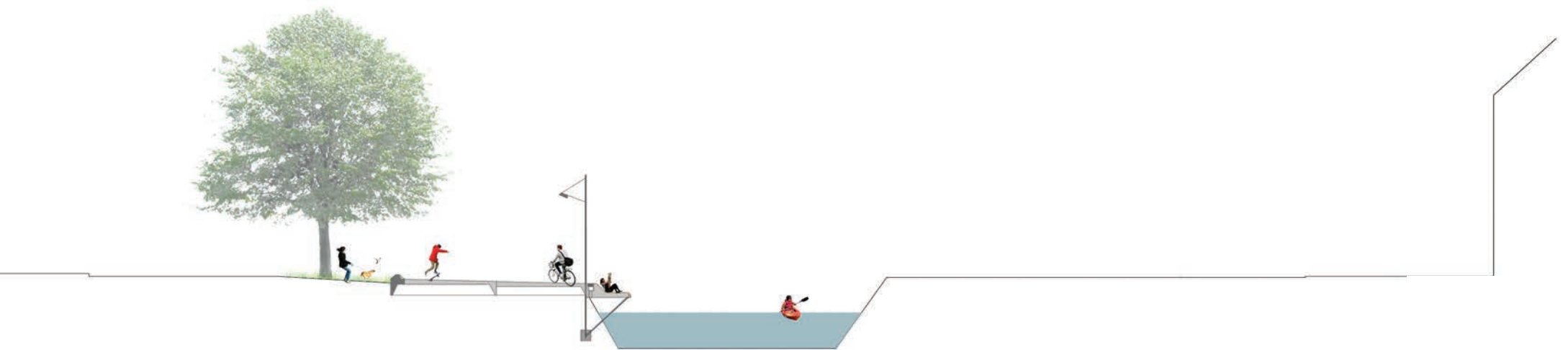


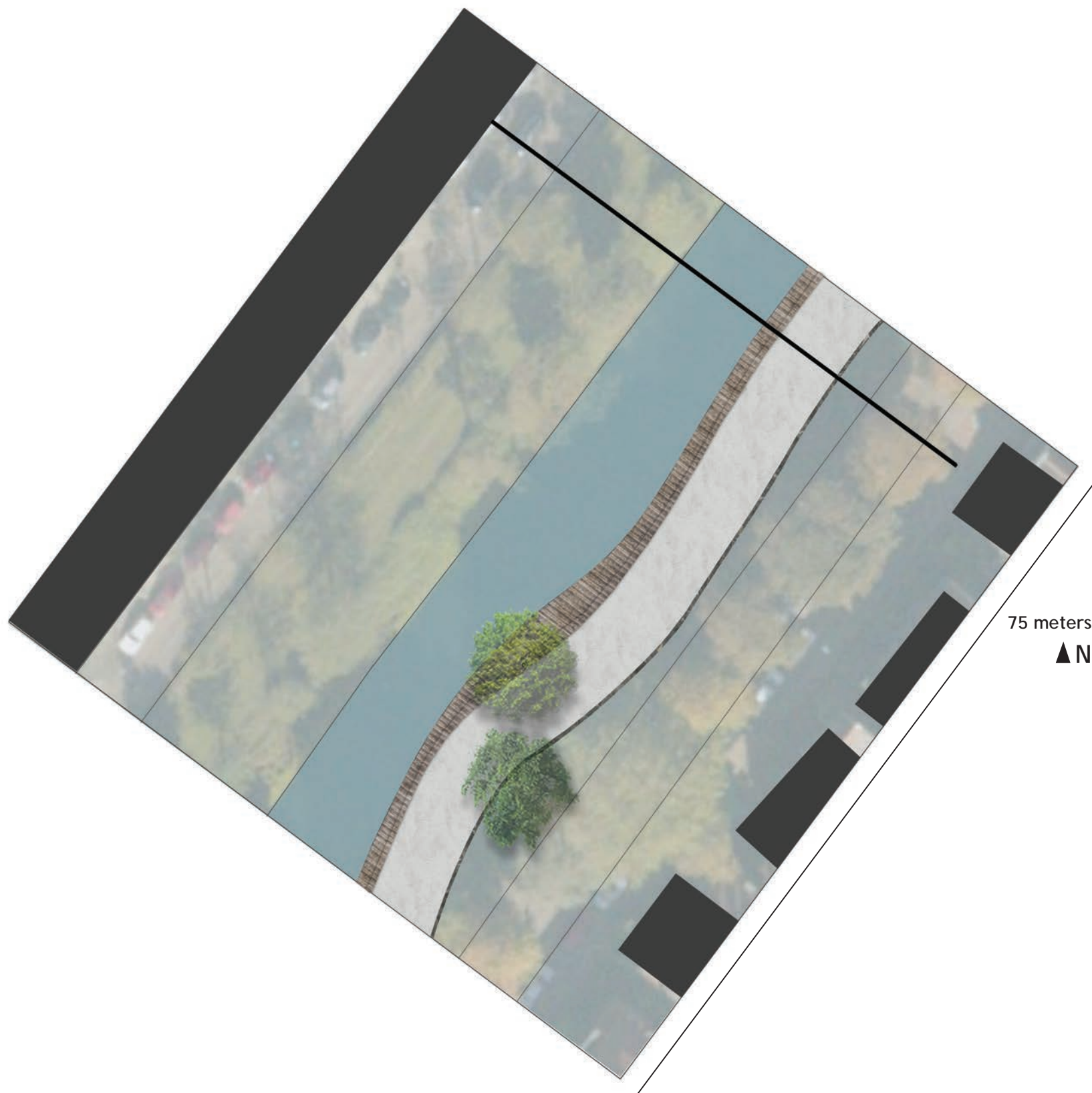
N

# Results by design

## Plan and Section 2

The second design is located in a 19th century neighborhood. The roads on both sides of the waterway are too narrow for the route design. In the green space on the east side of the plan a tramway is located, which is why the route runs on the southwest side. Again, the fourth detail design is chosen for this part of the route to experience the waterside and provide seating and resting places.





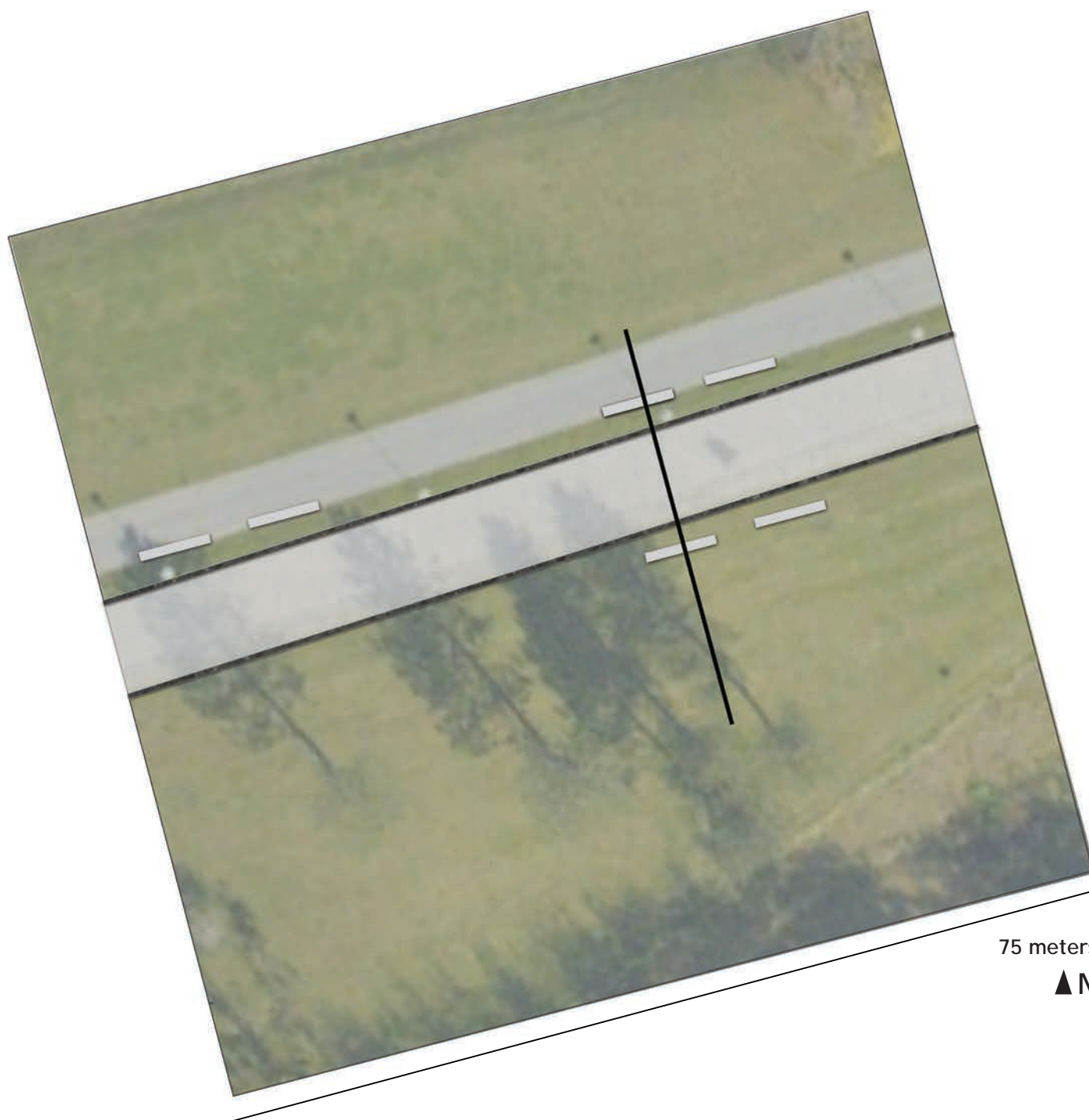
75 meters  
▲ N

# Results by design

## Plan and Section 3

The third design is located in the Zuiderpark. This was a relatively simple design as only the path was placed. The former bike route will be replaced with this design to ensure recognition of the urban escape route, “De Mazzel!”





75 meters

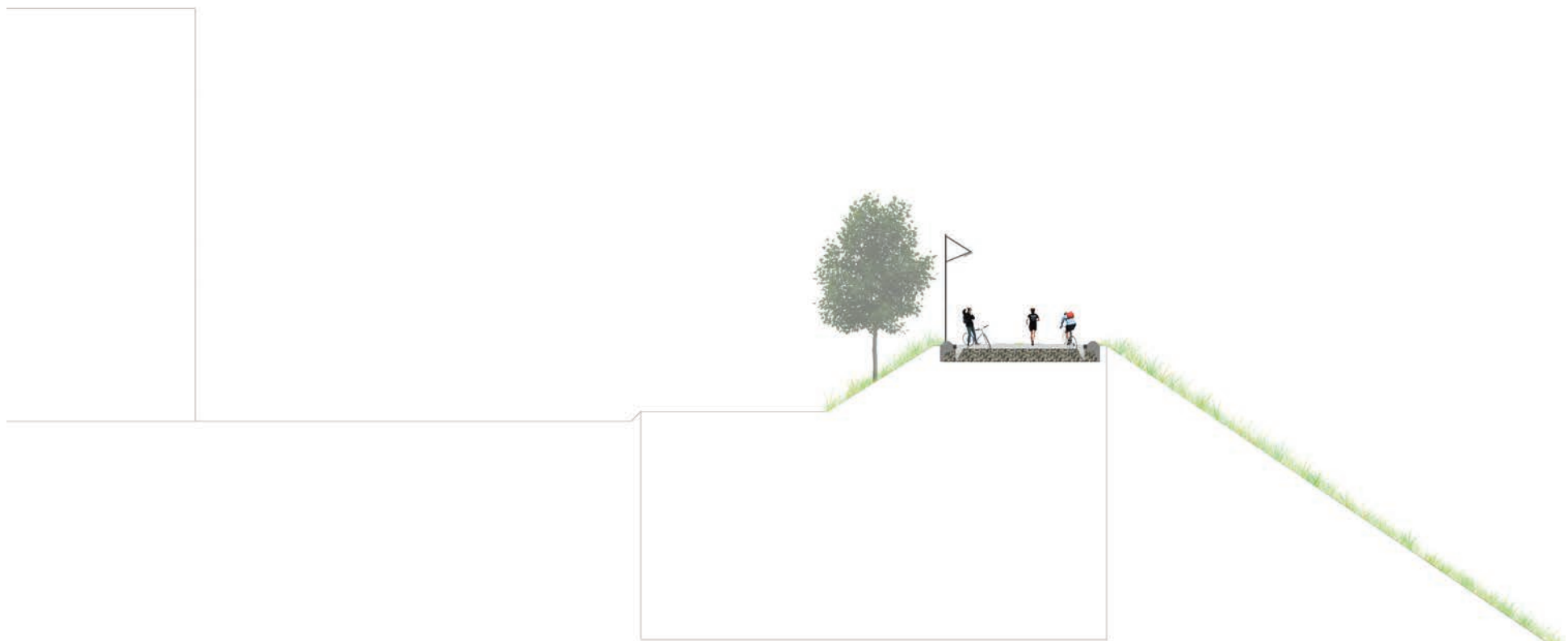


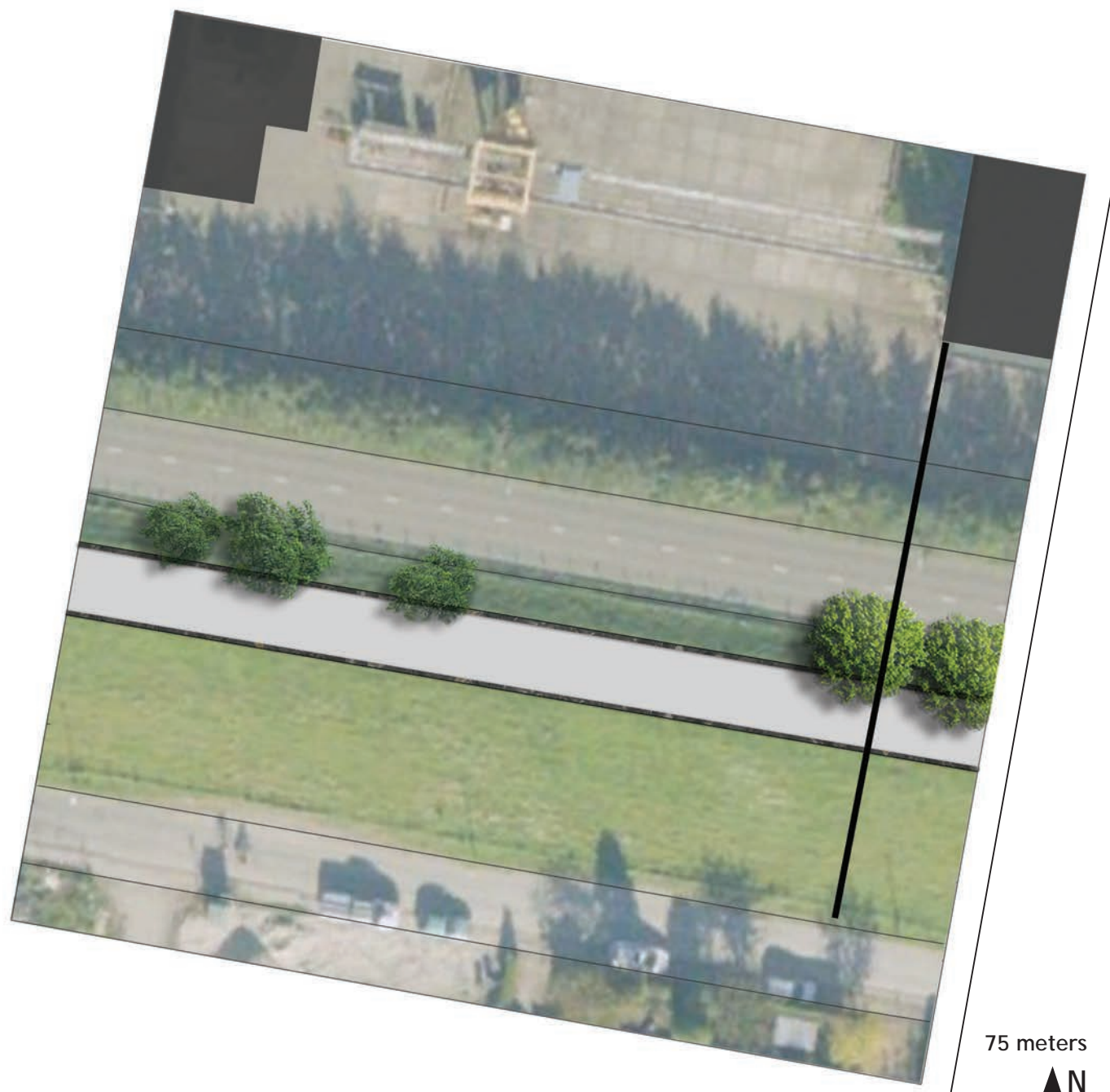
N

# Results by design

## Plan and Section 4

The fourth location is at the end of the route, which runs over a dyke. This is a very important dyke, so the cross-section of the dyke cannot be altered. This is why the path is reduced in size at this location to a width of six meters instead of eight meters. The dyke had no path originally, and cyclist currently use the road. This is however very dangerous as there is no bike path and the road is very busy with car traffic. The urban escape route is therefore segregated by trees to absorb the road noise and CO<sub>2</sub>.





# Conclusion

In conclusion, an urban escape route allocated to independent transportation such as bicycles, can lead to the improvement of liveability inside the city when it embraces certain features.

First of all, the location of the route itself should take account various factors. This includes where elementary schools are to stimulate children to cycle to school. It should take account in what areas cycling needs to be stimulated by looking at the current use. Routes that are already used often have less urgency to be improved and designed. The route should take account existing landmarks, to connect sights and attractions in one bike trip. The location should also make use of the existing landscape, such as dykes, rivers, canals, bridges, parks and varied neighborhoods. This will provide a variation of experiences and make it easier to implement. Lastly, The natural or rural landscape that the route is leading to should be suitable for recreational activity. People cycle with families during free time to recreate outside the city. Not having to take the car or train to visit these areas will improve the accessibility, reduce emissions and make people feel free. Even if residents do not leave the city, one knows the possibility is there at any time, and may thus feel less trapped inside the city.

It is not only the accessibility to the green space outside the city that will improve the liveability. Implementing the route also creates more accessibility and green space inside the city. The eight meter wide route is exclusively allocated the running, cycling, skating, roller blading and any other form of transport that does not rely on fuel or electricity. Having no motorized vehicles will improve the air quality. At intersections, the bumpers designed on the edges of the route will communicate to cars to give way. Also by marketing the route when implemented, giving the route a name and a recognizable theme, residents of

Rotterdam will be familiar with the route, recognize it from their cars and know to give way to the people using the route. Including human-scaled design features such as small café's, seating around the path, green space, waterside views and attracting people also helps create more liveable space inside the city. The route also includes as much vegetated space around the path as possible. This does not only increase the ratio of green space per capita in Rotterdam; but also maximizes the space for water absorption and filtration. Lastly, it also creates a connected ecological network to enhance biodiversity throughout the city.

The designed route running from the central church on the market square in Rotterdam towards the rural Windmills of Kinderdijk, is called 'the Mazzel!' It has taken on the theme of the harbor of Rotterdam for recognition throughout the city. The green lights inside the path and curbs light the way to green space. Every single turn that the route takes has been thought-out and planned carefully in the field to make sure that an eight-meter wide path can fit and to compensate alternative traffic solutions for cars. At points where this was not possible, such as on the dyke, the path has been reduced to six meters, still providing enough space for people traveling both ways and similar directions at different speeds. The route is suitable for social use, recreational use, active and competitive use. The route connects the urban landscape with the rural landscape by bringing green from the rural area inside the city and providing comfort for bicycles. People absorbed in the pressure of urban life are reconnected with nature through this connection. This route design is a sustainable solution for improving the liveability in large urban areas. Worldwide, this could be a successful landscape solution for enhancing quality of life in cities.

A summary is listed below of what an urban escape route should include to maximize urban liveability.

- No motorized vehicles to improve safety and air quality.
- Resting points in green space for psychological well-being.
- Enough space for fast and slow bicycles to stimulate cycling for all social groups.
- Connection between neighborhoods and elementary schools to stimulate bike use for children.
- Connection between schools and natural or rural area for education.
- Sufficient lighting for safety.
- Room for walking and cycling.
- Sufficient route surfaces allocated to the user.
- Provide accessibility.
- Interesting facades.
- Facilities for standing, waiting, sitting and resting.
- Consideration of the view experience of sun and people.
- Include comfort throughout different seasons.
- Human-scaled; applicable scale to user.
- When passing large traffic situations, create a walking and cycling highway .
- Connection between the city's landmarks.
- Connection between segregated neighborhoods.
- Urban escape towards the natural or rural landscape.
- Implementation of more trees to absorb CO<sub>2</sub>.
- Vegetation to store and purify water.
- Connected green space for enhancing biodiversity, create an ecological corridor.
- Elevation to distinguish users of the route and provide easy access.
- The use and design of bridges.
- Include a series of recognisable path lights, leading the way throughout the route.
- Make the path wide enough for both slow and fast bikers. (>six meters wide)
- Follow and experience waterways.
- Include resting places.
- Include a layered approach of path design. In some cases walking and cycling seperated.
- Well-designed for adequate maintenance.
- Materials suitable for implementation, use and maintenance.
- Interesting facades.
- Facilities for standing, waiting, sitting and resting.
- Consideration of the view experience of sun and people.
- Include comfort throughout different seasons.
- Applicable scale to user.
- Have positive sensory experiences such as well-detailed design and long-lasting efficient materials.
- Name / slogan for recognition; in this case 'the Mazzel'
- Smooth concrete or asphalt paving for comfortable riding.
- Clear curbs as edges to separate cars at intersections.
- Water absorption and filtration methods in route construction.
- City themed for recognizable design; in this case for Rotterdam, harbor themed.

# Discussion

## Reflection

Reflecting on this research design, there are limitations to the methodology. In the literature review, most of the research was done in the fall of 2014, not taking into account later articles that may have written on the topic. For the map analysis, only infrastructure, waterways, elevation, landmarks, education, natural rural destinations and current bike use was taken into account for the positioning of the routes. Other map layers and indicators could be included to choose the location of the route. For the current use map layer, the density of bikers is based on the Strava database. Active bikers gather this data and record their cycling routes through an application during bike rides. This indicates that not nearly all bikers are recorded and especially not casual rides. Drawing the conclusion that there is less biking in the south of Rotterdam than in the North is also based on the Strava data, and thus not credible for all bikers.

In the interview section, no legible conclusions are drawn for the research or design, merely a small view and rough feeling. The interview did however raise many questions during the research design process. There were namely, a small number of uncommon cases of people who did not seem interested to leave the city of Rotterdam at all. They felt fine as an urban dweller week in, week out. There were also several cases of people who enjoyed taking trips out of the city, however would exclusively visit other cities. These cities included for example, Delft, The Hague and Amsterdam. This category would seem insignificant in this research, or worse, make the research insignificant. These cases were rare, and there are no mayor conclusions taken from the interview intermezzo, merely an impression for analysis. Perhaps not only residents should be interviewed, but also the people who do not live in Rotterdam.

Perhaps the future generation of urban dwellers will prefer staying in the city and if they do escape

the city then do so to other cities instead of the natural or rural landscape. Perhaps people are becoming permanent urban dwellers. Even the music of this century sounds like someone is tearing down a building along with an urban construction site drilling foundations in the ground along with a busy street with cars and trams. This music of today sounds like noise. Of course, this music issue is a subjective personal observation and opinion. During this paper however, one may counter argue that over many generations, we are all slowly becoming permanent urban dwellers that do not need the rural or natural landscape. McHarg certainly would not agree.

Like mentioned in the introduction, in 2050, 80% of the global population will live in cities. (Ween 2014) People are becoming used to its convenience, its variety in entertainment its fast moving tempo and evidently, even the noise. Cities are compact and the next building or piece of information on the iPhone is so close that looking further has become unnecessary. Will people still want to leave the city in the future is an interesting counter question. Perhaps it is better for the natural environment and maintenance of biodiversity if humans keep to themselves within the boundaries of large cities.

For now however, for the purpose of this research design, it is assumed that people still find it comforting to have an escape from the city towards the natural and rural area by a form of transportation that is independent. The transportation is independent in the sense that it does not rely on fuel or electricity to use. Even if residents do not escape the city often or even never at all, the possibility and the potential are present, with a clear route without boundaries. The thought and fact that it is possible to escape; is freedom, which definitely contributes to quality of life.

## Further research

Reflecting on the research on design, this section could be enhanced with more examples of escape routes and design innovations. Comparing five very different cities, design guidelines were extracted, however, countless guidelines could potentially be extracted from many more cities and examples for more design guidelines.

In the research by design process, the method of applying the knowledge gained in the research for design and research on design section was used trial and error was applied. Applying the design guidelines and knowledge of liveable urban design proved very difficult to apply to the case of Rotterdam. It was mostly done by trial and error, which is very time-consuming; most time consuming part of the thesis. Many concepts were evaluated and thrown away to achieve the final design. This is however part of the landscape research through design process. Before a design is perfect and complete, a large amount of paper and time is needed. It proved to be incredibly difficult to find space for a walking and cycling route, especially finding space for an eight meter wide one. And this in a city where bike lanes are already provided and supported. Whether such space can thus be found in other large cities where biking is less supported is certainly questionable. Limitations to the results are that other locations on the route, such as the larger traffic situations that the route encounters were, although studied in the design trials; not designed in detail. In the best case, the whole 19 km of the route would be designed in detail.

In terms of the research as a whole, a more distinct focus on specifically cycling could have been done to further specify the research and design. This may have made the topic more focused. This research is not about only cycling, however on urban escape routes for all independent transportation. A research design for specifically cyclists could also be a further research item.

The first step that could be taken from this thesis to further research is the design of the other three routes leading out of the city. In this thesis the southeastern route towards Kinderdijk was chosen to design in detail, as the problems that were encountered were most representative for the other routes. The other routes will however certainly encounter other issues to solve in design.

On this thesis topic there are possibilities for more research. Not only on urban escape routes, but also generally on the connection between local and regional urban layout and the liveability of the city. On the local level the human scaled design theories by Jan Gehl has started the trend. Regionally, however there is more to be researched from a landscape architects point of view.

From this research, one can also look at other alternatives besides cycling. Depending on the city, there may also be opportunities for sailing, kayaking, swimming, ice-skating or simply a more detailed study on running.

Additionally, further research could include another way to attract the middleclass to Rotterdam. In this thesis, it is established that the liveability of the city needs to be improved to attract higher educated residents to live in Rotterdam. Other ways of attracting this focus group as well as other ways of improving the liveability of the city can also be researched.

Lastly, if this research design would be implemented in other urban areas worldwide, it would be very interesting to see what other design guidelines, struggles and difficulties arise.

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(All images not taken personally were retrieved from Google Images. <https://images.google.com>)

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Before this thesis, I had only visited the city of Rotterdam several times. Having completed this research design however, it feels as though I have lived in the city for these eight months. Having stared at all possible map layers, walking, biking, running through the city repetitively though the seasons and interviewing fifty-two residents has made the city very familiar. It may still have many liveability problems, but if the urban escape route would be implemented I would move there tomorrow!

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# Appendix

## *Interview Sheet Rotterdam Residents.*

Wageningen University | Landscape Architecture



Interview Rotterdamse middelklasse | Stad uitvaartroutes

1. Woont u in Rotterdam?

Ja

2. Heeft u wel eens behoefte om (in uw vrije tijd) de stad uit te gaan?

Ja / Nee

Ja: 3. Waar gaat u dan heen? (Welk recreatie gebied / landschap type)

4. Met welk vervoersmiddel komt u daar?

5. Hoe lang doet u er over?

6. Bent u hier tevreden over deze afstand?

Ja / Nee

Nee: 7. Waarom wel / niet?

---

8. Fietst, schaatst, of vaart u wel eens in Rotterdam?

Nee / Fietst / Schaatst / Vaart /

9. Fietst, schaats, of vaart u wel eens buiten Rotterdam?

Nee / Fietst / Schaatst / Vaart /

Ja: 10. Vind u het fijn om via de fietst / wandelend / bootje van huis uit de stad uit te kunnen?

Ja / Nee

11. Woont u graag op een locatie met een goeie verbinding de stad uit (naar buitenruimtes)?

Ja / Nee

## Shadow study Steigersgracht

