DESIGNING CYCLE-ATTRACTIVENESS

PART C. CONCLUDING CYCLE-ATTRACTIVE DESIGNING

A THESIS STUDY BY KIM VAN DOESBURG

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HOW TO READ

In front of you, you can find *'part C - Recommendations for cycle-attractive designing'* of this thesis. This booklet is part of a series of three and was formulated as part of the graduationthesis *'Cycle-attractiveness'* of the Master study Urbanism at the Architecture at Delft University of Technology.

This research consists of seven chapters which are devided into three parts. All questions are introduced at the start and answered the end of each chapter:

C Recommendations for cycle-attractive designing

Part C consists of the final chapter of this research: Summary, conclusions, recommendations & discussions (7). This chapter looks back and reflects on the outcomes and approach of this research. Recommendations are made when it comes to designing for a cycle-attractive city and street and a discussion is started by bringing the outcomes of this research in a broader perspective as well as reflecting on the approach of this research.

A Exploring cycle-attractive design criteria

Part A consists of the first three chapters of this research: introduction (1), relevant criteria for attractive cycling (2) and types of cyclists (3). These chapters focus on the generic parts of this topic and form the basis of part B and C.

Chapter 1 discusses and sets the motivation, problemstatement, objectives, relevances, research questions and the approach of this research.

Chapter 2 explores, through a literature study, what spatial design criteria are already being used and/or should be further looked at when designing for attractive cycling.

Chapter 3 defines different types of cyclists which make use of the city and clarifies the similarities and differences amongst them to show the importance .

B Exploring cycle-attractive designing in Amsterdam

Part B consists of another three chapters of this research: Amsterdam cycling city (4), Variations exploration (5) and Kinkerstraat design (6). This part is a follow up on part A, where the outcomes of part A are being put into practise in the case-study of the city of Amsterdam.

Chapter 4 looks at the city as a whole while elaborating on the current context, existing plans in regards to cycle-attractive designing and proposes a new vision and concept for the city.

Chapter 5 looks for opportunities when designing a street to the (extreme) preferences of one type of cyclist at the locations De Clercqstraat, Kinkerstraat and Koningsparkweg and reflects which changes would be most feasible and which would not.

Chapter 6 continues with the Kinkerstraat alone, and suggests a new design for a specific area of the street while considering all previous outcomes of the research.

CONTENT

PART A - EXPLORING CYCLE-ATTRACTIVE DESIGN CRITERIA

PART B - EXPLORING CYCLE-ATTRACTIVE DESIGNING IN AMSTERDAM

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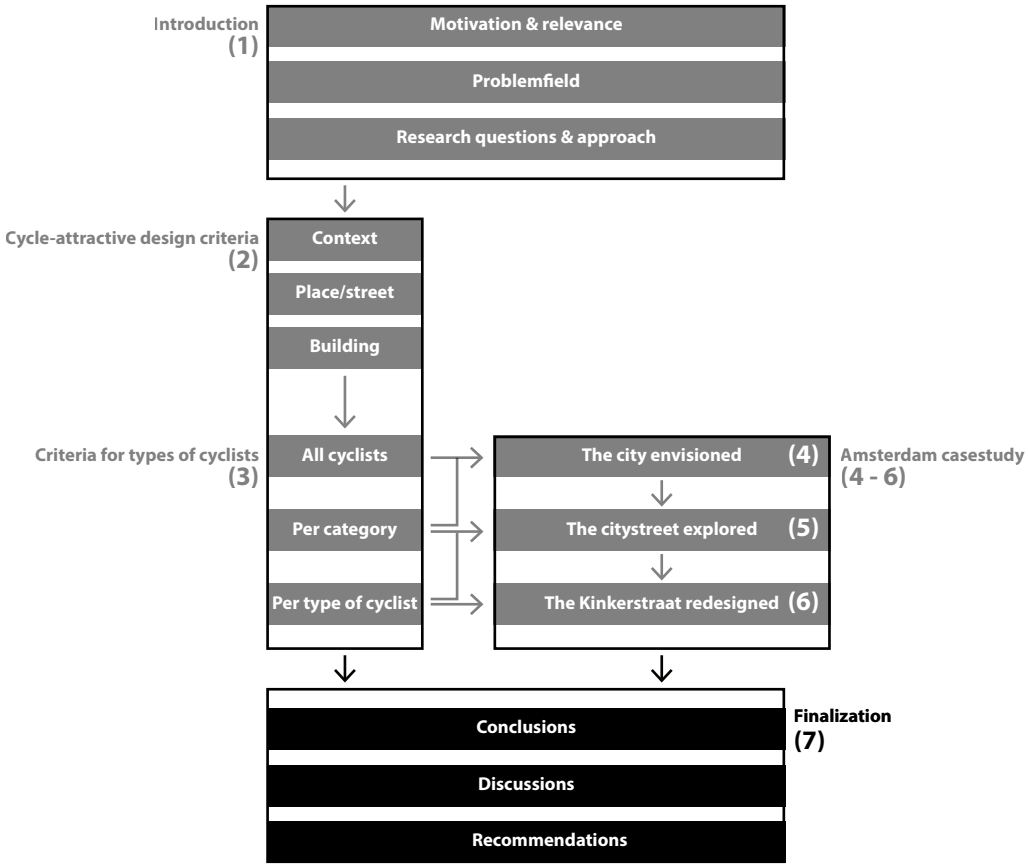
CHAPTER 7

SUMMARY, CONCLUSIONS, DISCUSSIONS & RECOMMENDATIONS

This seventh chapter looks at the results of the whole research and further elaborates on them. The mainquestion of the research is being answered:

Which spatial design criteria are able to enhance the attractiveness of cycling from the viewpoint of different types of cyclists?

The conclusions to this question finalizes this research, formulates recommendations and questions left unanswered.



Research framework

The overview of this research and the links between all parts. Highlighted is the topic being discussed in this chapter.

SUMMARY

MAIN-ISSUE

All over the world countries are focussing more and more on implementing a bicycle infrastructure. Amsterdam, as a representative of the Netherlands, is one of the most bicycle-friendly cities in the world and should be a city where the cyclists get enough room to move around safely in the public streets. However, issues still occur and the space for the cyclist is often compromised to fit other modes of mobility and functions as well.

The Municipality of Amsterdam and urban planners/-designers should aim for public streets to be designed as attractive as possible for cyclists, while considering its context within the city, to make the city as liveable as possible. However, although the Municipality has the goal to choose for and have the public space become attractive to cyclists (and pedestrians) she is unable to define what this attractiveness is and therefore is unable to properly evaluate when this goal has been achieved (Gemeente Amsterdam 2011; 2012; 2013). Although attractiveness is something personal, many types of people do think alike. By defining the different types of cyclists, and the spatial evaluation criteria which influence attractiveness, a stronger goal to attractiveness of the public space can be set and evaluated, while considering the context within the city. Designing for the attractiveness of cycling could move from 'problem solving' into a clear vision to be reached.

In order to take on the issue of defining cycle-attractiveness this study answers the following mainquestion (figure 1):

WHICH SPATIAL DESIGN INTERVENTIONS ARE ABLE TO ENHANCE THE ATTRACTIVENESS OF CYCLING FROM THE VIEWPOINT OF DIFFERENT TYPES OF CYCLISTS?

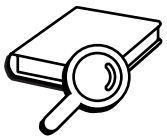
MAIN-RESULTS

Explorations made by Stipo (2016) and Gehl (2010) and (suggested) implementations in the Netherlands (Gemeente Amsterdam, 2010 & CROW, 2005) each use a different way of formulating what they find the most important criteria to design for attractive cycling. Nevertheless they all define their themes similarly to each other, but their criteria differ in their ability for interpretation. Attractiveness is generally defined per individual, and although in all explorations and policies the importance of defining attractiveness is named, it is at the same time left vague and (too) open for interpretation. While comparing all criteria between each other, the design criteria can be defined on their impact on three different scales (*'the context', 'the street/place' & 'the building'*) as well on their spatial impacts (*'direct' & 'indirect'*).

In order to make the spatial design criteria more focussed the criteria are divided in different groups where the outcomes are similar for each within that group and different for each outside that group. The groups are formulated as the following:

- 'the same for all cyclists' this group contains the spatial design criteria which count and are the same for anyone using the bicycle.
- 'the same for the category' this group contains the spatial design criteria which count and are the same for the type of cyclists in the same category. The categories are defined by their 'cycle mentality' as easy-going-, steady-going- and fast-going- cyclists.
- 'the same for the type of cyclist' this group contains the spatial design criteria which count and are the same for specific types of cyclists. The types are defined by their 'cycle goal' or 'cycle insecurity' as child-, elderly-, tourist-, trip-,

WHICH SPATIAL DESIGN INTERVENTIONS ARE ABLE TO ENHANCE THE ATTRACTIVENESS OF CYCLING FROM THE VIEWPOINT OF DIFFERENT TYPES OF CYCLISTS?



LITERATURE STUDY

1 *Which relevant spatial design criteria can be used to positively influence the attractiveness of cycling in the city?*

Results: scope of this research

0 *What is the motivation and approach to do a research about cycle attractiveness?*

Results: themes and criteria for attractive cycling

2 *What are the similarities and differences in the experienced (spatial) attractiviness between the different types of cyclists?*

Results: design focus

EXPLORATIVE DESIGN STUDY

3 *How could the cycling network of Amsterdam be planned to function best for all types of cyclists in the city?*

Results: design concept at city level

4 *How could the Kinkerstraat, De Clercqstraat and Koningsparkweg be redesigned from an (extreme) preference while looking at all the different types of cyclists?*

Results: designprinciple exploration and opportunities at streetlevel

Results: a worked out design reflecting on all themes and criteria for attractive cycling, the role for the types of cyclists as well as the functioning of the design within its context in the city

Design study

5 *What (realistic) urban design could fit the Kinkerstraat best while considering the different types of cyclists?*

Figure 1 - Research framework

shopping-, attraction visiting-, daily activity-, weekly activity-, occasional activity-, student-, commuting-, working-, visiting- and racing cyclist.

To test the defined criteria and groups, Amsterdam is used as a case study on both context- and street-/place- & building-level:

On context-level Amsterdam is looked at from the city perspective. The Municipality of Amsterdam has already formulated a vision for the bicycle-network in the form of a 'plusnet' for 2030 and a 'mainnet' for 2040, the base of these envisioned networks can already be used for this new approach of cycle-attractiveness. The bicycle-network of Amsterdam is redefined while taking into account the criteria for cyclists in general and the cyclists per category. The total bicycle-network still forms a whole where cycling clearly has a priority to other traffic, however parts of this network which is specified per category each hold their own qualities fitting for that location. Separately, per category, the networks form a whole as well to ensure all cyclists are able to find their place by their functions within the city.

On street-/place- & building-level the locations of De Clercqstraat, Kinksterstraat and Willemsparkweg are further looked at as representing city-streets where there is currently already too little space for the cyclists. Each of the locations are reviewed at eye-level through a representative section and map, while exploring possible redesigns through the preferences of all specific cyclists as well as the impact on the most important characteristics of the existing location (*building shape, trees,underground pipes and cables, functions and xxx*). The redesigns are also reflected on their impacts on the location (*other traffic, climate, finance and feasibility*) which allows to see which redesigns would fit best onto the locations and what choices should be made to implement them. To further elaborate on the street-/place- & building-level, a part of the Kinkerstraat is looked upon. The characteristics of this location and the criteria for cycle-attractiveness together form a spatial plan of demands, after which inputs from other perspectives give input to a complete spatial urban design. The final urban design is reflected on all scales and is able to redefine the meaning of the location on context-, street-/place- & building-level.

MAIN-CONCLUSIONS

This study shows that the further definition of spatial design criteria for cycle-attractiveness could become a more elaborated tool for design choices when putting the priority or evaluations for the space for cyclists on context-, street-/place- and building-levels. Implications of this study are focussed on that it is limited to the impact on city streets (leaving out parks and residential streets) and it does not elaborate fully on how to cope with the contradictions of other users.

MAIN-RECOMMENDATIONS

In general - In the current ways cities are being envisioned and designed for cycling, designers/planners/policy-makers see the cyclist as one generic and do not take into account the different types of cyclists and their different uses. Designers should become more aware of the similarities and differences a city can plan the best possible network and facilities for its cyclists depending on the spatial opportunities of the city.

Too often space for cyclists is being compromised, when designing for cycle-attractiveness it is required to put the cyclist first. To review what space and elements are needed for the cyclist for a location to become cycle-attractive and

what space is available for flexible interpretation, all spatial criteria should be spatially visualized on the specific location. This should be visualised in a plan of demands which can become the base of a complete urban design.

For Amsterdam - Amsterdam has the strength of already working on a complete as possible bicycle network, they should use this existing vision and further explore the opportunities in a more (visually, with a legend showing what the current state of the network is) elaborated proposal giving clear design and evaluation goals. By defining the envisioned bicycle-network into the categories of easy-going cyclists, steady-going cyclists and fast-going cyclists these goals can be evaluated through the cycle-attractive criteria.

In the small streets of Amsterdam, the cyclist is (too often) given too little space in the street compared to other mobility modes. Even though the Municipality is able to mention this and suggests to separate the different modes of mobility, in the elaborations of their plans it is still unclear how much space the cyclist is getting and why. By defining a plan of demands, firstly, through the perspectives of the cyclist the space for the cyclists should not get compromised with other uses and design choices can be more properly argumented.

CONCLUSIONS & REFLECTIONS

WHICH SPATIAL DESIGN CRITERIA ARE ABLE TO ENHANCE THE ATTRACTIVENESS OF CYCLING FROM THE VIEWPOINT OF DIFFERENT TYPES OF CYCLISTS?

This study has put together various (existing) views on designing for bicycles and designing attractiveness at eye-level. The general design criteria have become an evaluation toolbox which can be used in the approach of making design interventions at the context, street/place & building level while making these design choices for specific types of cyclists.

General conclusions

1 **Which relevant spatial design criteria can be used to positively influence the attractiveness of cycling in the city?**

Explorations made by Stipo (2016) and Gehl (2010) and (suggested) implementations in the Netherlands (Gemeente Amsterdam, 2010 & CROW, 2005) each use a different way of formulating what they find the most important criteria to design for attractive cycling. Nevertheless they all define their themes similarly to each other, but their criteria differ in their ability for interpretation.

The design criteria can be defined on their impact on three different scales (the context, the street/place and the building) as well as their directness of influence through spatial design.

Attractiveness is generally defined per individual, and although in all explorations and policies the importance of defining attractiveness is named, it is at the same time left vague and (too) open for interpretation.

2 **What are the similarities and differences in the experienced (spatial) attractiveness between the different types of cyclists?**

In order to make the spatial design criteria more focussed the criteria are divided in different groups where the outcomes are similar for each within that group and different for each outside that group. The groups are formulated as the following:

- *'the same for all cyclists'* this group contains the spatial design criteria which count and are the same for anyone using the bicycle.
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occassional activity-, student-, commuting-, working-, visiting- and racing cyclist.

Amsterdam conclusions

Context

3 **How could the cycling network of Amsterdam be planned to function best for all types of cyclists in the city?**

Amsterdam is a city where cycling is already the main way of transport for its residents and strongly upcoming for its visitors as well. The Municipality of Amsterdam has already formulated a vision for the bicyclenetwork in the form of a 'plusnet' for 2030 and a 'mainnet' for 2040 which each have to comply to criteria. However, many of these criteria are left too open for interpretation making it unclear when the criteria are achieved.

By defining the bicycle-network for all cyclists in general and per cyclist category (easy-going, steady-going and fast-going cyclists) a more elaborated vision in criteria can facilitate to clearer design and reflection choices. With this, it is important that the bicycle network is complete as a whole and can work seperately per category as well to avoid as many conflicts as possible. Visually (the legend of the vision), the plans made for bicycle networks should be able to show what the design goals are and which locations are crucial to adjust to provide for an as complete and quick as possible. This should be done to provide for clear design choices and this vision map should change over time as development and implementation is taking place.

Place/street and building(s)

4 **How can the spatial design criteria for attractive cycling be implemented on different locations at eye-level from the (extreme) preferences of all the different types of cyclists?**

The spatial design criteria can be implemented similarly on different locations, however each get a different place and focus in the street which causes variaties in the design of the locations. Nevertheless, the outcomes for types of cyclists within the same category generally still look similar and could possibly work well together. The different preferences are able to show how each cyclist uses the street and what implications could be taken place for them if the specific street does not provide for them. It is up to the designer what design would fit best and provides for a realistic opportunity (impact to other users, impact on climate, impact on finance, impact on feasibility) at the location, while also considering the needed changes at the current location and which changes are restricted due the situation.

5 **What urban design could fit the Kinkerstraat best while considering the different kinds of cyclists?**

To get to an urban design which considers the attractiveness of cycling as a priority all criteria for attractive-cycling are implemented in a 'plan of demands', while considering the characteristics of the location. All 'leftover' space can be 'filled in' in a complete urban design which also takes into account the other (desired) stakeholders of the specific location. The indirect criteria can also be taken into account here. A reflection should be made on the larger scale to review what role the Kinkerstraat can

play on the larger scale.

The Kinkerstraat shows especially limiting its space because of the lack of visibility by the pedestrian passage and the existing tramline. Nevertheless, the vibrance of the street asks for activities in within the vision of the easy-going cyclist which allows the limits of the space to be used in a multifunctional way. The Kinkerstraat invites for an urban design which interacts with the existing functions and the real design assignment lays in the defining of how this interaction should be taking place. In this case, the Kinkerstraat is proposed to function as the entrance to functions like the Ten Katemarkt and De Hallen, while making the locations stand-out in an alternative and robust look. These 'side-streets' of the Kinkerstraat, with consideration of the position of the sun, space and (new) functions are also a great opportunity for slow pedestrian-focused streets where 'staying' stands above 'moving'. On the larger scale the Kinkerstraat is still a continuous way from Amsterdam-West to the center, however the main focus is the easy-going cyclist who is there to take their time and really experience the city. Other types of cyclists are directed towards a parallel street to continue their way.

Evaluationtool as a final result

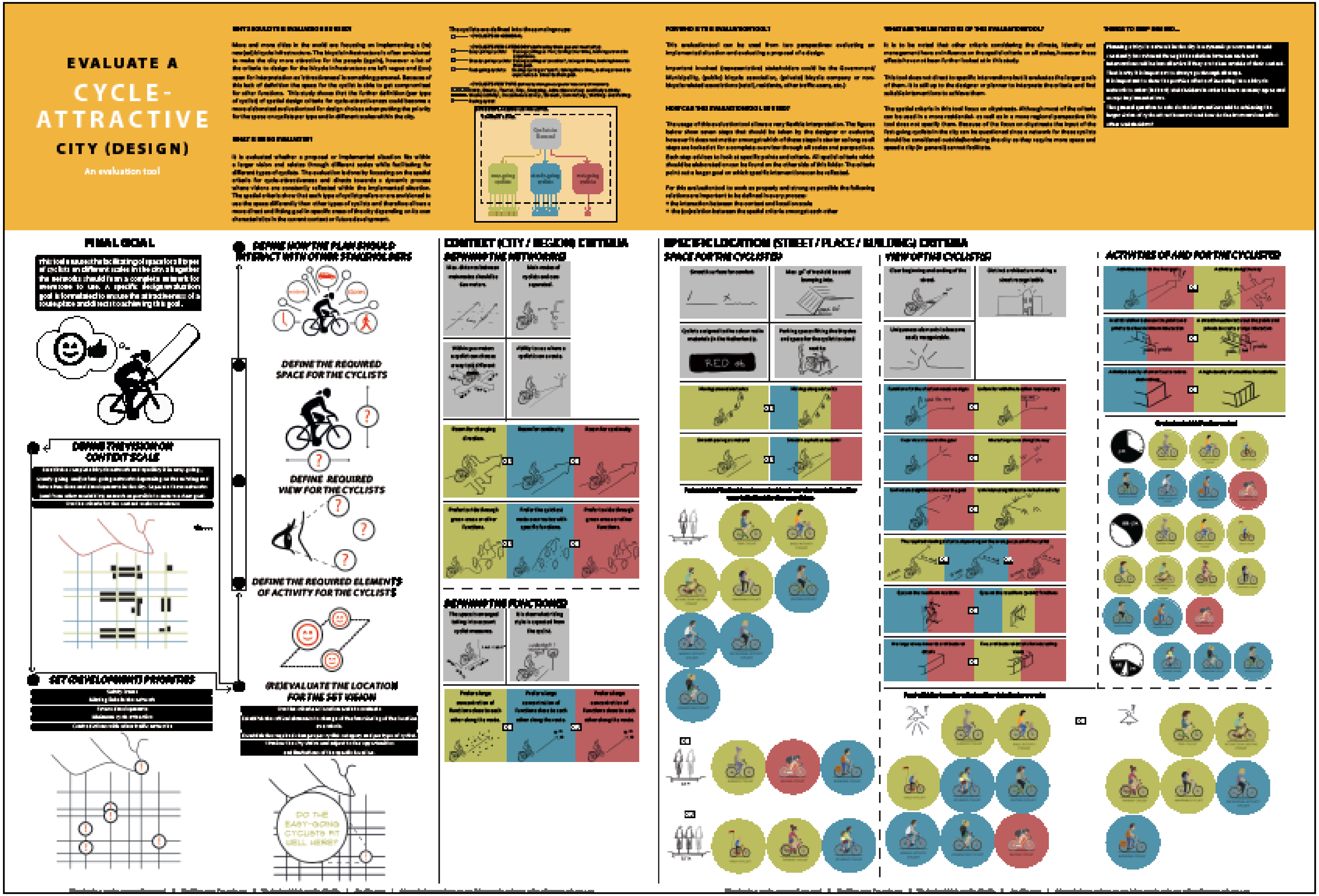
This study broadens the perspective of the designer and evaluator towards more goal-oriented designchoices to enhance the attractiveness for cyclists. What this study can show is that there (most certainly) should be different designgoals depending on the targetgroup of cyclists and that these choices cannot only be generically formulated for cyclists as a whole. As a result, an overview of designcriteria on context- and specific location level are formulated. The designer and/or evaluator is adviced to undertake (at least) seven crusial steps to get to an as founded and complete image and story as possible of both the implemented and designed situation.

The evaluationtool is developed to look through two different perspectives within the designprocess: to evaluate an implemented situation and to evaluate a designed situation. In both situations important stakeholders throughout the process are the Government/Municipality, (public) cycle associations, (private) cycle companies and other non-cyclist relaters (think about shop-owners, residents and other traffic-users).

By pointing out and questioning the following, the evaluationtool makes clear what can be achieved by using it.

- Planning a bicycle-network in the city is a dynamic process and should constantly be reviewed through the relation between each scale.
- Interventions will be less effective if they are taken outside of their context. That is why it is important to always go through all steps.
- It is important to show the positive effects of investing into a bicycle network to other (indirect) stakeholders in order to have as many agree and accept implementations.
- The general question to ask: do the interventions add to achieving the larger vision of cycle-attractiveness? And how do the interventions affect other stakeholders?

Figure 2: overview of the evaluationtool >



EVALUATE A
CYCLE-ATTRACTIVE
CITY (DESIGN)
An evaluation tool
FINAL GOAL
DEFINE THE VISION ON CONTEXT SCALE
SET (DEVELOPMENT) PRIORITIES
DEFINE HOW THE PLAN SHOULD INTERACT WITH OTHER STAKEHOLDERS
DEFINE THE REQUIRED SPACE FOR THE CYCLISTS
DEFINE REQUIRED VIEW FOR THE CYCLISTS
DEFINE THE REQUIRED ELEMENTS OF ACTIVITY FOR THE CYCLISTS
(RE)EVALUATE THE LOCATION FOR THE SET VISION
DO THE EASY-GOING CYCLISTS FIT WELL HERE?
CONTEXT (CITY / REGION) CRITERIA
DEFINING THE NETWORKING
DEFINING THE FUNCTIONING
SPECIFIC LOCATION (STREET / PLACE / BUILDING) CRITERIA
SPACE FOR THE CYCLIST(S)
VIEW OF THE CYCLIST(S)
ACTIVITIES OF AND FOR THE CYCLISTS
RED

Fast-going cyclists

AS FAST AS POSSIBLE

CYCLING IS SPORT

LOOK AHEAD AND AROUND

CYCLING IS PRACTICAL

WANT TO BE ON TIME

LOOK AHEAD

Steady-going cyclists

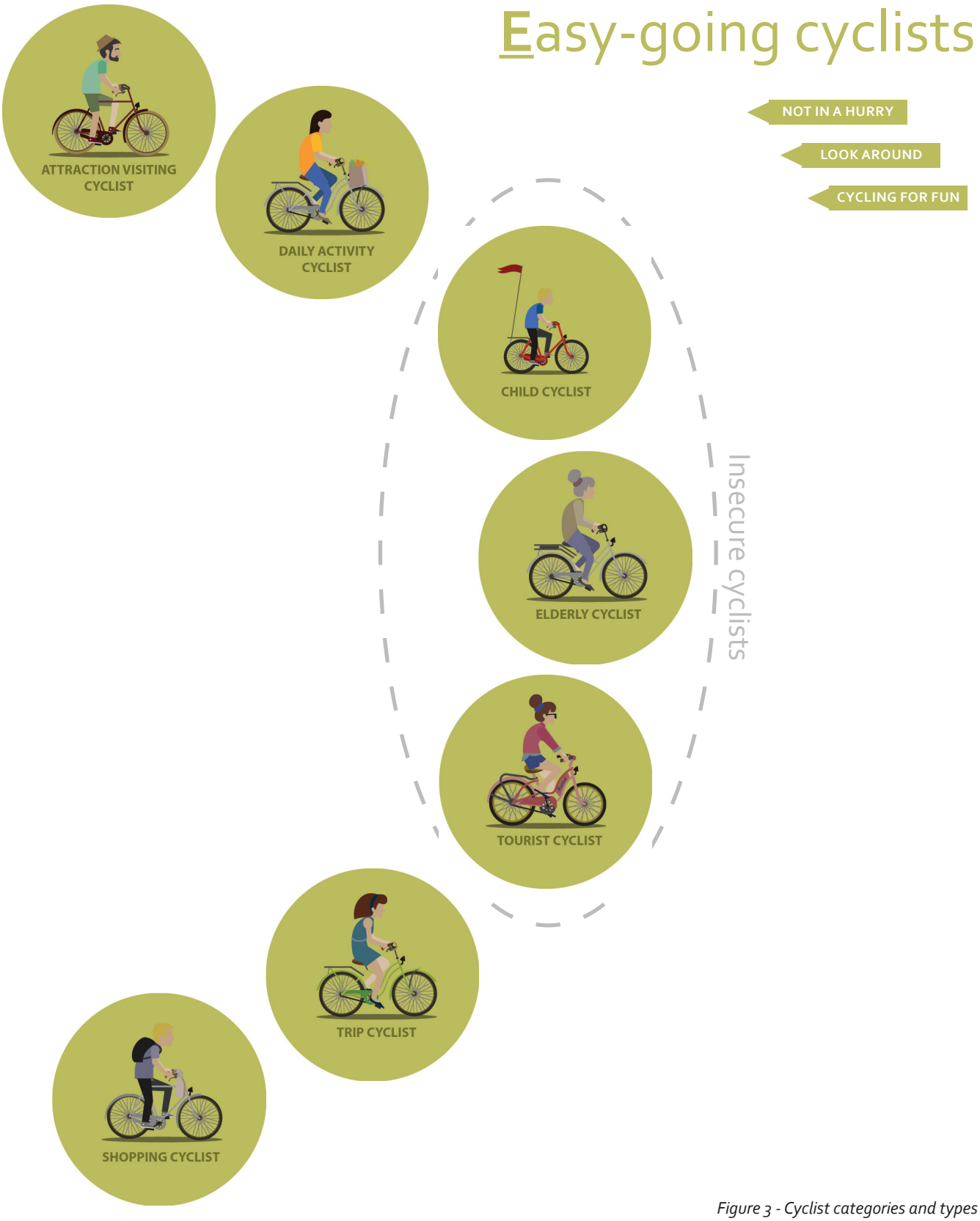


Figure 3 - Cyclist categories and types

Research objectives

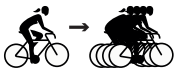
This thesis-study had various goals to achieve to come to the answer if the main-question.

It is the objective to provide a further elaboration on how to design for cycle-attractiviness at eye-level

This study is able to elaborate further on the similarities and differences of types of cyclists by reflecting on existing literature and defining the outcomes specifically for types of cyclists rather than cyclists in general. All five subquestions give an input to this objective: the first two (general) give the base input on which design criteria should be used and the last three (Amsterdam) are able to show how they should be implemented.

It is the objective to provide elaborated motivations for the individual to get on the bicycle with a city focussing on cycle-attractiveness

This study focusses on the attractiveness of cycling while defining this for a more specific and individual type, although not specifically explaining why these individuals should use the bicycle it does provide motives how cycling could be more attractive for them while designing for the city as a whole.



It is the objective to provide a stronger drive to design for cycle-attractiveness by elaborating on the impacts for individuals and the collective users on both eye- and city-level

This study is able to show that not all criteria are generic for all cyclists and, with that, provides the reason on why the designer should look into the prefered category (collective users) and the specific type of cyclist (individual users). This study is able to show what kind of design impacts designing for this cycle-attractiveness has on eye- and city-level. On the other hand this study is not able to elaborate in depth about what impacts this could have after implementation, besides that the space becomes more cycle-attractive to the user.

It is the objective to provide for opportunities for the functioning of the city without compromising the space of the cyclists

This study is able to show on both the city as well as the street-level what opportunities could be created for the functioning of the city while putting the cyclist on priority. On city level it is able to show how a complete bicycle-network is still able to be defined into different design goals while considering the current context of the city. The spatial differences of three different locations while implementing the cycle-attractive design criteria to the extreme preferences of specific types of cyclists and is with that able to show the many different opportunities within an existing situation. The elaboration towards an urban design on the Kinkerstraat is able to show some relations to the existing functioning of the city on other themes than infrastructure, however this could still be further elaborated on to get a full overview.

It is the objective to provide an approach to an elaborated and properly argumented design and evaluation, in consideration of a larger goal and vision

In the suggested approach (figures 2 to 8) the cycle-attractive design criteria form a tool to come to a final urban design which reflects on both the smaller and larger goal and vision of the city and location.

It is the objective to provide a view on what kind of cycle-city Amsterdam could be when designing for cycle-attractiveness

This study provides a proposal on how Amsterdam could implement and use the cycle-attractiveness criteria and make this part of its (already existing) vision of the bicycle-network. The study does not directly tell what kind of a (innovative) cycle-city Amsterdam could be, but mainly points towards a further elaboration of a complete bicycle-network as that is the biggest opportunity of the city.

Implications

• The study is limited to city streets: parks, residentatial streets and the region are not elaborated on which could mean that some of the criteria or the approach does not work properly in these areas.

• The study does imply impacts for other users, however it does not elaborate fully on how to cope with the contradictions which may mean that some criteria contradict too much with other users to be put into practise as it is suggested.

• The study focusses on spatial criteria for cycle-attractiveness, however also showed there are indirect criteria which can be influenced spatially. The study does not elaborate further on these indirect criteria.

Methods of design thinking & approach

In this study I have used several methods to get to my final results. I am reflecting on my ways of design with the theory 'Design expertise' (Dorst, K. & Lawson, B. 2009). This theory explores different kind of perspectives of design thinking. The following perspectives are named:

- Design as... a mixture of creativity and analysis (p.28-30)
- Design as... problem solving (p.30-32)
- Design as... learning (p.32-34)
- Design as... evolution (p.34-39)
- Design as... the creating of solutions to problems (p.40-42)
- Design as... integrating into a cogerent whole (p.42-44)
- Design as... a fundamental human activity (p.44-48)

The motivation to start this study came around from a problem-solving design thinking: contradictions of attractiveness between different cyclists was the 'problem' and looking for ways to design for the different types of cyclists was the 'solution'. For this study this was a good way to start, however the opposed 'problem' was too large (a part of the whole of Amsterdam) causing difficulty in focus. It would have been better for me to pick a smaller and more specific location at the start of the process as it would have helped me to scope down quicker.

For the explorations at the locations of De Clercqstraat, Kinkerstraat and Willemsparkweg I have used design as a way of 'learning'. This part of the study came out to be largest, as many possibilities were tested at the three locations. Although the designs became very abstract this way of designing became an important part as it is able to show the spatial impacts of the different cyclists and locations the best. While I was doing these explorations I have asked myself if I should make the interventions more specific, however I feel I made the right choice by keeping it abstract as the possibilities of specific interventions are endless and I would not have been able to argument them well enough.

The study relates the context-scale to the specific location-scale and themes which touch each other spatially. Through this perspective an 'integrated and coherent whole' is pushed for. Throughout the process I have been able to relate the different elements more and more with each other, however due a constant change of focus this was more difficult at the start and this could have been further elaborated into the final result.

As the problemfield of this study is in relation to cycling as well

as to other issues of the city (think about safety, livability, identity, etc.), the study as a whole follows the ways of design as the creation of 'solutions to problems'. The cyclist perspective became the leading way to look at the problems, but all spatial criteria have been formulated and implemented into solving them.

The theory of design expertise (Dorst, K. & Lawon, D., 2009) also touches upon describing 'evaluating'. "Not only do designers generate alternatives between which choices must be made but also they must know [...] when to stop. Clearly then, designers must have evaluative abilities. [...] design involves making judgements between alternatives along many dimensions that cannot be reduced to a common metric. Designers must then have a very particular evaluative skill enabling them to feel comfortable about arriving at [...] tricky judgements. Designers must be able to perform both objective and subjective evaluations and to be able to make judgements about the relative benefits of alternatives even though they may rely on incompatible methods of measurement. [...]" (p. 56)

"But evaluation in design is much more than just a straight choice between alternatives, on the basis of a more or less clear list of criteria. It is much more of a process of deliberation; because the design discipline implicitly contains many incommensurable viewpoints about what is 'good' and 'bad'. (p.56)

What is said here really falls into place with my final product of the evaluationtool. The tool has set criteria and an approach to check upon designer goals, however they are still left open for interpretation when it comes to the specific interventions as this is something the designer should be able to judge about themselves considering the location and vision. The evaluationtool directs the designer further into what would be 'good' or 'bad' per type of cyclist, however they still have to reflect which intervention can achieve that larger goal.

When it comes to myself, the evaluating of my work is still in development. It is a long process debating whether what is good or bad and that has affected my choices. Evaluating a process after it has happened is of course way easier than while still in the middle of it, and that is something that I should continuously work on in order to scope down and focus when the process asks for it.

The personal process

For this study I have gone through a large process of ups and downs to get to my final result. For me, the process was one of the most important and evident things to go through. The reflection on this process allows me to close off the process of this study and look at what I have learned from it and what I would like to take along and further develop in the future.

Process

The start of this whole study (figure 14, part A) went with many ups and downs where I was still searching for a direction to go to and what I wanted to focus on. I knew my study topic would be about bicycles, however I was still wondering at which scale (street or city) I would prefer this as well as the type of study (social, spatial focus). Especially during this time I found a lot of inspiration of many presentations and discussions that were given at Pakhuis de Zwijger about mobility and cycling specific, although interesting this may have fed the many possibilities I could go with. Through these doubts I had decided I was not ready for the midterm yet and had to review my thoughts on the topic.

After this period of doubt I started to find my way better, I worked my way towards the midterm (P2) which ended with quite positive feedback giving me a boost to continue. Up till the first moment I had to hand in my concept (p4) I was doing well into working towards my final product, unfortunately reaching this moment I found out all products and information I had gathered had become a huge pile I was unable to figure out anymore in the time that was left. As I was unable to visualize a complete story and was yet unable to fully explain myself I was not able to pass this moment and had to redo this again. This extra time, however, gave me the time to work out the core of my study. After the P4 I have focussed my work on the reflection and enhancing the design of the Kinkerstraat.

Positive points of my process

• The presentation moments were great reflection moments and moments to organize all found information and products made where I could become more secure of the whole story.

• Often during the process I came to moments where I had to observe and criticize, also if this was about my approach. Doing this allowed me to rething my ambitions and reflect on them constantly, making me aware this is something that is always under development.

• As presentation has been my 'weakpoint' for a very long time, I am able to acknowledge my personal growth in this and I am convinced this is now actually one of my stronger points.

Development points of my process

• It is important for me to be aware and scope my assignment down as soon as possible so that I can focus instead of finding more and more inspiration leading me away from the final goals.

• It is important for me to constantly keep track of my progress and finishing parts up visually on paper constantly, rather than leaving this till the last moment.

• I am able to see 'taking a step back' as something which can be a positive thing and allow new ideas to grow from already existing information and products.

• Translating spatial criteria into interventions for a specific (small scale) location is something I should still develop, for this I should really try to understand the location so that I feel more confident making statements and implementations.

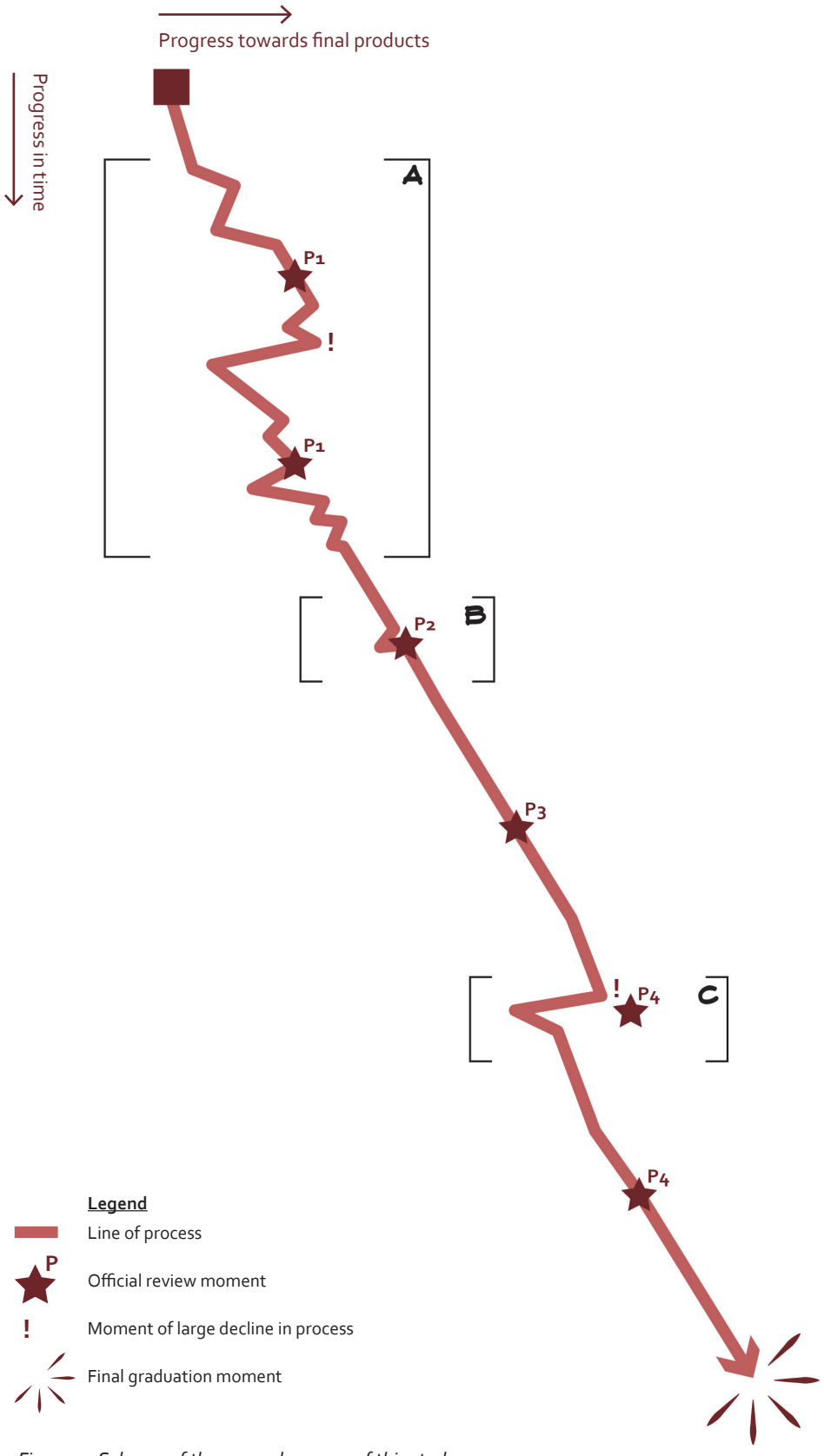


Figure 4 - Scheme of the general process of this study

Looking back

Looking back on my process and my final products, I remember how I first was so sure I wanted to do a project starting from a general theme (cycling) and then develop that into a tool which could be implemented on the 'most suitable' location I could find while researching. I wanted to do this because this was something I had not done before and therefore was out of my comfortzone. Now I know that such kind of approach on my thesis project did not work out as well as I had hoped for. Designing small-scale has always been a point of development for me, so I believe it would have been better for me to start with a specific location and really trying to understand that location rather than a general theme. I can clearly see that the design at the Kinkerstraat could have been elaborated further way more than I have done now. On the other hand, a design was never meant to be my final product as I planned to make a toolbox from the start. So in the context of the study I have conducted in the end, I don't feel like it is a major issue.

Looking back, this study is not the greatest design assignment out there however it was also never meant be one. Instead this study became the greatest learning project and I feel that such an experience stands way above a good design.

DISCUSSIONS

How could this study be used in another city?

This study has used Amsterdam as an inspiration as well as a case-study to test the evaluationtool. Amsterdam, however, is not the only city in the world which is designing for cyclists and that is why the evaluationtool could be used in these other cities as well. This question would be most interesting for (public) cyclist associations and (private) cyclist companies around the world so that they can learn from all the different ways the criteria are or can be implemented as specific interventions.

Important for the type of cities are three points:

- They should put effort into bicycle-friendliness/cycle-attractiveness.
- They should put effort into changing a life-style (from the car to the bike) and are able to make bold choices.
- They should be looking at a vision for the city as a whole rather than only small parts of the city as cycling is part of a larger network.

These points are important because they ensure that the qualities of cycling (on other themes of the city) are broadly stimulated since the impact on a cycling network cannot be of a large impact if it is only partly implemented. It is important that the advantages of designing for cyclists can also be an advantage to other actors and this has to be shown to them in order to make larger scale interventions happen. Cities which could be interesting are for example Copenhagen, London and Groningen.

Since cycling touches so many (other) city themes, what other themes would be (most) interesting to further look at in case this study is continued?

This study has looked upon the build environment in relation to accessibility and networks of cycling. Of course, the build environment is only one aspect of stimulating cycling and that is why this question could be most interesting to the Government/ Municipality as well as other non-cyclist relaters (like stores, other traffic and residents).

Out of this study mainly two aspects show an interesting follow-up study:

- Cycling and economic development: small scale businesses, knowledge clusters and culture clusters within the city could greatly take advantage of investing in cycling as they are easily accessible (short rides of max. 7 kms). They could all be part of an integrative strategy to develop the bicycle network and direct the cyclists into taking specific routes, as well as a development strategy of the functions themselves in relation to the current or future bicycle network.
- Cycling and nature & landscape: The bicycle network, especially that of the fast-going cyclists, can also be extended outside the city and into the region. Improving the bicycle network into the nature and landscape surrounding the city a boost can be given to the trip and racing cyclists. An extra impuls to stimulate recreational cycling next to practical cycling which happens in large amounts within the city already.

RECOMMENDATIONS

Designing for cycle-attractiveness in general

1 Many cities are envisioned with attractive public space. Attractiveness is, however, something that is currently still viewed as something that can only be defined per individual and therefore often left vague and open for interpretation. That attractiveness is not further defined leaves goals to become attractive too open for interpretation and unclear when it has been achieved. If one envisions attractive public spaces they should be able to define what this is.

2 In the current ways cities are being envisioned and designed for cycling, designers/planners/policy-makers see the cyclist as one generic and do not take into account the different types of cyclists and their different uses. Designers should become more aware of the similarities and differences a city can plan the best possible network and facilities for its cyclists depending on the spatial opportunities of the city.

3 An overal vision on the meaning of cycle-attractiveness should provide for a proper and specific design goal of a city on small (street/place/building) and larger scales (context) and in short- and longterm.

4 Designing for cycle-attractiveness through the three categories (easy-going cyclists, steady-going cyclists and fast-going cyclists) facilitates a practical design and evaluation goal while keeping flexibility in the interpretation of the aestethic design.

5 By exploring the redesigns from the viewpoints of all different cyclists, as well as the impacts on the existing situation, the opportunities of a street can be fully explored.

6 Too often space for cyclists is being compromised, when designing for cycle-attractiveness it is required to put the cyclist first. To review what space and elements are needed for the cyclist for a location to become cycle-attractive and what space is available for flexible interpretation, all spatial criteria should be spatially visualized on the specific location. This should be visualised in a plan of demands which can become the base of a complete urban design.

Amsterdam as a cycle-attractive city

7 Amsterdam has the strength of already working on a complete as possible bicycle network, they should use this existing vision and further explore the opportunities in a more elaborated proposal giving clear design and evaluation goals. By defining the envisioned bicycle-network into the categories of easy-going cyclists, steady-going cyclists and fast-going cyclists these goals can be evaluated through the cycle-attractive criteria.

8 In the small streets of Amsterdam, the cyclist is (too often) given too little space in the street compared to other mobility modes. Even though the Municipality is able to mention this and suggests to separate the different modes of mobility, in the elaborations of their plans it is still unclear how much space the cyclist is getting and why. By defining a plan of demands, firstly, through the perspectives of the cyclist the space for the cyclists should not get compromised with other uses and design choices can be more properly argumented.

9 The Kinkerstraat is one of the smaller city streets in Amsterdam which facilitates for all users causing a large chaos. It is therefore required to make a decision on the focus of the street. Due to its small width flexibility of usage through the day may provide for more facilities without doing too much in the street.

10 The Kinkerstraat suffers from large bicycle parking problems during the day, this issue is very difficult to solve by designing extra parking spaces as the street is already overfull. Maintaining the street and being strict on parking regulations is a must for the Kinkerstraat to stay safe and accessible.

11 The Kinkerstraat has a very characteristic pedestrian passage underneath its buildings on one side of the street, the columns cause for a lack of vision from the cyclist as well as the pedestrian point of view. It is required that distance is created (minimum of 2.2 meters) between the columns and the bicycle lane (or other main movement with a larger speed) to reduce the chance of accidents due to blocked vision as possible.

12 The Tollenstraat, as a side street of the Kinkerstraat, is currently being renewed. The Tollenstraat could be a clear entrance to De Hallen and facilitate to become a culture street where cafes, restaurants and alternative shops get space to brand the street.

Further research

13 As this study is focused on city streets a further exploration on specific spatial design criteria within residential areas and in parks could provide a more complete perspective to give a full overview of their impacts on cycle-attractiveness in the city.

14 As this study is focused on the impacts within a city, attempting to involve the 'fast-going cyclists' did not succeed. The fast-going cyclist-network is more interesting to develop in the region, outside the city. A further research on a cyclist-network going outside the city, into the region, could bring perspectives for an even larger scale.

15 In this study the indirect design criteria are not yet fully explored and are only elaborated on in a limited way, that is why a further research could provide a clearer influence and impact of these on the spatial design criteria.

16 This study focusses on the bicycle related to infrastructure and the build environment as part of the city, a further research could be done to see how the bicycle benefit can relate to the other themes of the city like economic development and nature & landscape.

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With the results of this study I am finishing my period as a student. I will certainly always continue to learn and develop myself, studying was only a small part of this.

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REFERENCES

Akar, G. & Clifton, K.J. (2009).

Influence of individual perceptions and bicycle infrastructue on decision to bike. Transportation Research Record (No. 2140), Washington, p.165-172.

Bicycle Dutch (2012).

Trouble in paradise?. https://bicycledutch.wordpress.com/2012/11/22/trouble-in-paradise (accessed on 24-01-2016).

Bicycle Dutch (2014).

Can there be too many people cycling?. https://bicycledutch.wordpress.com/2014/11/20/can-there-ever-be-too-many-people-cycling (accessed on 24-01-2016).

Blue, E. (2012).

Everyday bicycling: how to ride a bike for transportation (whatever your lifestyle). Microcosm publishing, Portland.

Blue, E. (2013).

Bikenomics: How bicycling can save the economy. Microcosm publishing, Portland.

Brommelstroet, M. te., Hulster, G. & Crouse, E. (2010).

Munchenierung of Amsterdamize: De fietsrevolutie vanuit een marketing perspectief bezien. Collequium Vervoersplanologisch Speurwerk, Roermond.

Bruheze, A.A. de la. & Veraart, F.C.A. (1999).

Fietsverkeer in praktijk en beleid in de twinstigste eeuw. Ministerie van Verkeer en Waterstaat, Hofstad Druktechniek, Zoetermeer.

Citylab; O'Sullivan, F. (2015).

Amsterdam has officially run out of spaces to park its bicycles. http://www.citylab.com/commute/2015/02/amsterdam-has-officially-run-out-of-spaces-to-park-its-bicycles/385867/.

Copenhagenize.eu (2011; 2013; 2015).

Copenhagenize index. http://copenhagenize.eu/index/index.html (accessed on 05-01-2016).

Crouse, E. (2010).

Bikealicious. Master thesis. University of Amsterdam, Amsterdam.

CROW (2006).

Ontwerpwijzer fietsverkeer. CROW-publicaties, Ede.

Dill, J. & McNeil, N. (2013).

Four types of cyclists?. Transportation Research Record (No. 2387), Washington, p. 129-138.

Dorst, K. & Lawson, B. (2009).

Design expertise. Elsevier, Oxford, p. 24-57.

Fietsforum Tilburg, (reffered to on September 2016).

Ontwerpsnelheid. http://www.fietsforumtilburg.nl/ontwerpsnelheid/.

Gehl, J. (2010).

Cities for people. Island Press, Washington.

Gemeente Amsterdam (2005).

Beleidskader hoofdnetten. Gemeente Amsterdam,

Amsterdam.

Gemeente Amsterdam (2011).

Structuurvisie 2040. Gemeente Amsterdam, Amsterdam.

Gemeente Amsterdam (2012).

Meerjarenplan Fiets 2016. Gemeente Amsterdam, Amsterdam.

Gemeente Amsterdam (2012b).

Visie openbare ruimte Bellamy- en Borgerbuurt. https://www.amsterdam.nl/publish/pages/431985/boekje_visie_kinkerbuurt_versie_4_okt_2012.pdf (accessed on 10-02-2016).

Gemeente Amsterdam (2013).

M*obiliteit Aanpak Agenda 203*0. Gemeente Amsterdam, Amsterdam.

Gemeente Amsterdam (2015a).

Meerjarenplan Verkeersveiligheid. 2021. Gemeente Amsterdam, Amsterdam.

Gemeente Amsterdam (2015b).

Muntplein en omgeving: verkeersmaatregelen. https://www.amsterdam.nl/parkeren-verkeer/verkeersprojecten-0/muntplein-omgeving/ (accessed on 11-02-2016).

Gemeente Amsterdam (2015c).

Plusnetten. http://maps.amsterdam.nl/plusnetten_inspraak/?LANG=en (accessed on 12-04-2016).

Gemeente Amsterdam (2016).

Kwintijn nieuwbouw. https://www.amsterdam.nl/projecten/kwintijn-nieuwbouw/ (accessed on 22-11-2016).

Goudappel Coffeng (2011).

Het hoofdnet fiets. Via: https://fietsersbond.amsterdam/infrastructuur (accessed on 11-02-2016).

iAmsterdam (2015).

Facts and figures. http://www.iamsterdam.com/en/media-centre/city-hall/dossier-cycling/cycling-facts-and-figures (accessed on 10-02-2016).

Kadaster (2016).

Klic melding. (consulted on 09-11-2016).

københavn kommune (2011).

Good, better, best. http://kk.sites.itera.dk/apps/kk_pub2/pdf/823_Bg65v7UH2t.pdf.

LVBLCTY; Steinberg, L. (2015).

T*he pitfalls of Copenhagenize's new bicycle-friendly ranking.* http://www.lvblcity.com/blog/2015/7/the-pitfalls-of-copenhagenizes-new-bicycle-friendly-ranking.

Marshall, W.E. & Garrick, N.W. (2011).

Evidence on why bike-frendly cities are safer for all road users. Environmental Practice 13 (No. 1), Washington, p. 16-26.

Ministerie van infrastructuur en milieu (2017).

De opgaven voor de Nationale Omgevingsvisie.

Rijksoverheid, Den Haag, p. 10.

Miranda-Moreno, L.F. & Nosal, T. (2011).

Weather or not to cycle. Transportation Research Record (No. 2247), Washington, p. 42-52.

Noordhoff Atlasproducties (2015).

De bosatlas van Amsterdam. Noordhoff Atlasproducties, Groningen.

Pelzer, P. (2012).

Nieuwe perspectieven op fietscultuur. Tijdschrift Vervoerwetenschap 48 (No. 4), Washington, p.7-23.

Pelzer, P. & Brommelstroet, M. te (2010).

Fietsen: Revolutie en Reprise. Agora (No. 4).

Stipo (2016).

The city at eyelevel - Lessons for street plinths. Eburon, Delft.

Stone, Z. (2013).

Is Amsterdam too biker-friendly?. http://www.fastcoexist.com/1682399/is-amsterdam-too-biker-friendly.

Streetfilms (2013).

No, Amsterdam is not 'swamped' by bikes. http://www.streetfilms.org/are-there-really-too-many-bikes-amsterdam/.

Tagliabue, J. (2013).

The Dutch prize their pedal power, but a sea of bikes swaps their capital. New York Times. Published: June 21, 2013.

The Guardian; Hill, Z. (2011).

Copenhagen's novel problem: too many cyclists. http://www.theguardian.com/environment/bike-blog/2011/sep/09/copenhagen-cycling-congestion.

The Guardian; Zee, R. van der. (2015).

How Amsterdam became the cycle capital of the world. http://www.theguardian.com/cities/2015/may/05/amsterdam-bicycle-capital-world-transport-cycling-kindermoord.

TU Delft – Urban Metabolism, (reffered to on October 2016).

What is Urban Metabolism? https://urbanmetabolism.weblog.tudelft.nl/what-is-urban-metabolism/.

Vivanco, L.A. (2012).

Reconsidering the bicycle: An anthropological perspective on a new (old) thing. Routledge, New York.

BASE IMAGES

Freepik (2016a).

Set de personas montando en bicicleta. http://www.freepik.es/vector-gratis/set-de-personas-montando-en-bicicleta_944983.htm.

Freepik (2016b).

Cycling infographic. http://www.freepik.com/free-vector/cycling-infographic-template_940929.htm.

Openstreetmap (2016).

Openstreetmap (Amsterdam). https://www.openstreetmap.org/.

Vecteezy (2016a).

Woman walking cycle vectors. https://www.vecteezy.com/vector-art/126887-woman-walking-cycle-vectors.

Vecteezy (2016b).

Walk cycle vector. https://www.vecteezy.com/vector-art/105571-free-walk-cycle-vector.

Vectoropenstock (2016).

Walking people silhouettes set. https://www.vectoropenstock.com/vectors/preview/70491/walking-people-silhouettes-set.

Nounproject (2016; 2017).

Nounproject. https://thenounproject.com/.

APPENDIX C

Research academic reflection

The relationship between research and design

The research of this thesis is divided in two topics: 1. The definition of cycle-attractiveness and 2. The implementation in Amsterdam. For this study, it was very important to define what cycle-attractiveness is to make the step towards the design.

As a conclusion on the literature-study on what cycle-attractiveness is, it could be said that attractiveness is something for the individual to determine. However, on a large part individuals think alike and therefore the definition of types of cyclists had to be elaborated. Three different categories and fourteen different types of cyclists have been defined in which some themes of cycle-attractiveness have shown to be more important to further elaborate than others. The overview of elaborated spatial design criteria for cycle-attractiveness form the basis of the design in the case-studies in Amsterdam. On the context level a proposal for a redefined and complete bicycle-network was formulated through the spatial design criteria which are important on this scale. On street/place and building level three locations (De Clercqstraat, Kinkerstraat and Willemsparkweg) have been explored on for all types of cyclists. The spatial design criteria important for this scale have been implemented here. As redesigning a street not only influences the cyclists, a comparison and reflection with other themes of the city (climate, underground, other users, finance and feasibility) has been made as well. By evaluating the similarities and differences amongst other cyclists and other themes of the city this study shows which fit best together and which combinations should be avoided. By doing so more direct and argumented design choices can be made to make a street as attractive as possible for the users fitting well together, and by providing different routes which are attractive for the other users.

Reflecting on both street/place & building-level as well as the context/city-level is of huge importance to this study and approach as the city should provide routes for all types of cyclists, however which route fits best depends on the (current or envisioned) functions of the streets. Also, when it has been decided one street will be designed for a type of cyclist this should reflect on other streets by providing for the other types of cyclists.

To showcase that these spatial design criteria can be further elaborated into a complete urban design, a specific location within the Kinkerstraat was used and the street was redefined while taking along the functioning of the context of the Kinkerstraat. The implementation of the spatial design criteria onto the situation of the Kinkerstraat displays how the original theoretical research can (possibly) be put into practise.

The relationship between the theme of the studio and the subject study chosen by the student within this framework (location)

The graduation studio 'Urban Metabolism' focuses on the different flows within the city. Cycling can be seen as one of the (hard) infrastructural flows and is therefore part of the 'ecosystem' of the city. In the Netherlands, cycling is one of the most closely related to moving people around and, with that, has a huge impact on the relationship between human activities and the (natural-/urban-) environment it is in (TU Delft – Urban Metabolism, 2016).

Cycling is moving all kinds of people to many different places, and while on their way people are able to experience and sense the city on many levels. By looking at the city through the viewpoint of cycle-attractiveness relations can be made with all other themes within a city. The focus in this study is to show the complicity of all that influences within the goal of attractive cycling.

The Netherlands is known as a bicycle-country. While this study focuses on Amsterdam, this city is very relevant as it functions as a representative and example towards the world. Nevertheless, Amsterdam still has locations where the streets and the network can be more attractive to cyclists. With that idea the De Clercqstraat, Kinekrstraat and Willemsparkweg display, in this study, how a street can look and function when a design is made for a specific target-group (type of cyclist(s)). Currently, these streets are a combination of many uses and give too little room for the cyclists. The approach for these streets can be an example for other streets with similar issues in the city.

The relationship between the methodical line of approach of the studio and the method chosen by the student in this framework

Although this thesis-study is focusing on the bicycle network and the functioning of it, it also (and has to) reflects on other flows which are related to it. Think about other infrastructure like cars, public transport and pedestrians. And, as this study is about redesigning the street, it also refers to the underground flows like sewage pipes, electricity, water, gas etc. This studyis an experimental research with extremes, however it reflects back on how realistic certain changes would be if they were to be actually implemented.

The urban design of the Kinkerstraat displays the link between many other themes of the city while prioritizing the cycle-attractiveness of the location and the relation with the existing context.

The relationship between the project and the wider social context

Cycling is something everyone can do, resident or visitor, and it is an easy way of getting around. Even though the Netherlands (and with that, Amsterdam as well) is already known as a bicycle-country, its popularity is still rapidly increasing. More and more often the car is traded by the bicycle in the city. Think about what an impact this can have on the health of the people, not only by becoming more active but also (for example) by improving the air quality that is still strongly being polluted by emissions of cars today.

By finding more motives to cycle, by making cycling more attractive, more people can get out on the streets and experience the city in an interactive way. While this thesis-study looks at the many different types of cyclists it provides an insight in for whom the street is meant and how to make it more attractive for the (specific types of) cyclists. By taking into account all types and all influences, cycling and living in the city can be made as attractive as possible for everyone. No compromises for the cyclists are required.