RECYCLE CITY
STRENGTHENING THE BIKEABILITY FROM HOME TO THE DUTCH RAILWAY STATION.

NOOR SCHELTEMA
“Ik droomde op mijn fiets dat ik fietste in mijn droom.”

(Wolfs, 2006)
RECYCLE CITY
DESIGN
JUNE 2012

URBAN REGENERATION GRADUATION LAB MSC 3
DEPARTMENT OF URBANISM
DELFT UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF ASSET DEVELOPMENT
NS STATIONS, UTRECHT

# 1305441
NOOR @ RECYCLECITY.NL
WWW.RECYCLECITY.NL

MENTORTEAM:
DR. IR. REMON ROOIJ [SPATIAL PLANNING & STRATEGIES, URBANISM]
DR. IR. STEFAN VAN DER SPEK [URBAN DESIGN, URBANISM]
DR. IR. DRS. SEBASTIAAN DE WILDE [NS STATIONS]

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NOOR SCHELTEMA
PREFACE

This Design booklet is part of the graduation project ReCYCLE City. The aim of this project is to develop spatial design interventions to strengthen the bikeability from home to the Dutch railway station. The background of this project is explained in thesis plan ReCYCLE City (Scheltema, 2012a).

In the context of the graduation project a validation tool has been developed to objectively measure the quality of the bicycle routes. A literature study formed the base for this validation tool. The outcome of this study contains four criteria for successful public space for cyclists, published in a paper ‘Designing Successful Public Space for Cyclists’ (Scheltema, 2012b).

Noor Scheltema
Delft/Utrecht, June 2012
Reading Guide

In front of you lies the part E of the ReCYCLE City Master’s thesis. This booklet is part of graduation project ‘ReCYCLE City’ of the masters of Urbanism at the faculty of Architecture of Delft University of Technology.

This Master’s Thesis consists of six parts.

Part A contains the introduction of the thesis. The problem field, the objective, research questions and methodology are discussed.

Part B forms the theoretical background of the thesis based on a literature study.

Part C discussed a case study research of 11 bicycle routes. Every case is analysed and compared by the developed validation tool. Literature study forms the basis of this case study research.

Part D contains the guide for the validation tool that is developed as a result of the literature study and the case study research.

Part E shows the design made for the bicycle routes and the station area in Amsterdam Amstel. This part shows how the results of the theoretical framework and the case study research can be used to develop a strategic design for the project area.

Part F draws the conclusions of the work and presents the recommendations for further research.
PART A - THESIS PLAN
THE LOST CYCLIST

PART B - THEORY
STUDYING THE BICYCLE NETWORK

PART C - ATLAS
VALIDATING THE BICYCLE NETWORK

PART D - MANUAL
GUIDE FOR VALIDATING THE BICYCLE NETWORK

PART E - DESIGN
IMPROVING THE BICYCLE NETWORK IN AMSTERDAM AMSTEL

PART F - CONCLUSIONS
IMPROVING THE BICYCLE NETWORK
# PART E - DESIGN

IMPROVING THE BICYCLE NETWORK IN AMSTERDAM AMSTEL

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1. WORKSHOP AMSTERDAM AMSTEL

1.1 The assignment of the workshop

After the theoretical base of the graduation project was finished, a workshop on the bicycle route to Amsterdam Amstel was organized by the author. The validation tool had been developed and case study research turned out Amsterdam Amstel has a lot of potential to improve. Now, it was time to take the theory into practice. Students from the graduation studios of Urbanism and Architecture were invited to join the workshop in Hogeschool van Amsterdam, just next to station Amsterdam Amstel. A team of experts guided the students through their analysis and design process during the day. This team existed of GeertJan Cronenberg (City of Amsterdam), Jan Honning (StedenbaanPlus), Stefan van der Spek (TU Delft), Susan de Vos, Inoek Brouwer en Diana Colijn (NS Stations).

The workshop took place on Wednesday 7 March 2012. The programme started with an introduction lecture by Susan de Vos (NS Stations) on the history of station Amsterdam Amstel. Then, the assignment of the workshop and the ReCYCLE City tool was explained and a manual for the tool was handed out. After the group was divided in five teams we left the workshop room for a short tour around the station area by Willem van Heijningen (NS Stations) and GeertJan Cronenberg (City of Amsterdam). With all this information in mind, the teams got on their OVbikes to explore one of the five selected bicycle routes from the surrounding neighbourhoods to the station of Amsterdam Amstel.

The assignment of the workshop was:

*Make a spatial design for the given cycle route that improves the bikeability from the neighbourhood to station Amsterdam Amstel.*

During the bicycle tour the students where asked to capture the positive and negative aspects of the bicycle network in public space. And to consider the conditions explained in ReCYCLE City tool for the neighbourhood, the speed bicycle route and the railway station area. When the student teams returned from the bicycle tour, they started with defining the problem statement, problem analysis, design proposals (short and long term) and a reflection on the ReCYCLE City tool.
Fig. 1.1 Impression of workshop Amsterdam Amstel (photos by Andrew Reynolds, Laurens de Lange & Nadine Spielmann)
1.2 Results of the workshop

Figure 1.2 shows a compilation of the results the five teams achieved. The first conclusion we can draw is that two teams (2 and 3) have focused their design proposals only on the station area. The other three teams (1, 4 and 5) approached the whole bicycle route from the neighbourhood to the station.

Team one (route Rivierenbuurt) made some general design proposals along the whole route; placing bicycle racks at some car parking lots, reorganizing the street section to split fast and slow traffic, providing priority and more space for bicyclists at crossings and bridges for a more direct connection with to the station.

The second team (route De Pijp) first stressed the nice experience of cycling along the Amstel canal and concluded, like the other teams, that the main design assignment is the station area. They saw lots of opportunities in using the waterside as an attractor and adding extra landmarks to make the bicycle route to the station more legible.

Team three (route Oosterparkbuurt) named the legibility and fluency of the route as key issue. They proposed to use the quality of the city parks and shopping streets along the route as a guide to the station. A shortcut was also part of their design proposal in order to avoid fast traffic crossing and make the route more direct.

The fourth team (Watergraafsmeer) mentioned that lighting and lack of eyes on the street was the main problem along the speed bicycle route. They stated the fast traffic in the station area as a problematic issue. By using the height differences, they tried to split the fast and slow traffic to give bicyclists more space to move.

The fifth team (Betondorp) analysed the whole route and came to a series of problems and design proposals. They stated the first part of the route is currently boring and isolated from the city. By opening up the neighbourhood and the industry area to the bicycle route and adding street furniture, they tried to create a more inviting environment. They concluded that the narrow tunnel in the station area should be redesigned and noted that the sudden turn at the end of the route badly needs a landmark to make it more legible.

All teams concluded that the problems in the neighbourhood contain lack of priority to bicyclists and stress between slow and fast traffic. Parked cars close to the bicycle route are common. One major conclusion of the teams was that the main problems of the bicycle route start when entering the station area. The station area is seen as the main design assignment.
Fig. 1.3 Compilation of the workshop results per team
1.3 Preliminary conclusions of the workshop

The results of the workshops were very useful in the understanding of the key issues of the bicycle routes. The main conclusions gave a new insight in the design assignment for the area and the main focus on the station area. It was interesting to see that all teams saw the barriers of the fast traffic roads as main problem. They all suggested to split up fast and slow traffic to improve the directness. Other suggestions showed how the legibility of the route could be improved by adding landmarks. Figure 1.2 shows some general conclusions on improving the bicycle route to Amsterdam Amstel.

The reflections on the validation tool were very helpful to make improvements on the conditions and the hierarchy of the tool. It was interesting that they concluded the tool should be applied on the route as a whole instead of three different urban areas. Furthermore, they stated directness is of major importance in the tool. They named the tool as handy indicator for quality of the bicycle route.
Fig. 1.2 General conclusions on improving the bicycle route to Amsterdam Amstel

1. Fast traffic forms barrier for slow traffic

2. Split up fast and slow traffic to create more room for bicyclists and pedestrians.

3. Add landmarks to stress the routing

Legend:
- Purple: Station
- Light Purple: Slow traffic
- Dark Purple: Fast traffic
- Blue: Water side (Amstel canal)
- Green: Attractor

Fig. 1.2 General conclusions on improving the bicycle route to Amsterdam Amstel
2. ANALYSIS OF AMSTERDAM AMSTEL

2.1 Design location Amsterdam Amstel

The results of the case study research were decisive in choosing the design location. Amsterdam Amstel is chosen as design location because of the following reasons:

- All bicycle connections to the railway station have a underaverage dissatisfier score (figure 2.1);
- The bicycle routes and the railway station have a lot of potential;
- The City of Amsterdam, NS Stations and ProRail are currently planning to develop Amsterdam Amstel;
- Amsterdam Amstel raised my personal enthusiasm;
- The results of the workshop provide a good starting point for the design.

2.2 The weak bicycle network of Amsterdam Amstel

The bicycle routes to Amsterdam Amstel all show underaverage scores on safety and directness, the dissatisfiers. Figure 2.2 shows the five bicycle routes and the results derived from the ReCYCLE City tool. In order to improve the bicycle routes to the railway station we first have to know what the opportunities are.
Fig. 2.2 The five bicycle route to station Amsterdam Amstel and the results from the ReCYCLE City tool
01.a Unlegible where the station is (-).

01.b Small bicycle path over bridge (-), obstacles along busy road (-)

01.c Beautiful Amstel canal along the bicycle path (++)

01.d Small bicycle path over bridge (-), obstacles along busy road (-)
02.a Sarphatipark along the bicycle route, nice sightlines (experience, +)

02.b No bicycle track at fast traffic road (-)

02.c Lively street (+), bumpy pavement (-) with obstacles along the track (-)

02.d Station and bicycle parking are hidden (-)
03.a Bumpy pavement (-) with obstacles just next to the road (-)

03.b Direct bicycle route to the station (+)

03.c Where is the station? Unlegible place

03.d Only one extra crossing to go at the chaotic station square (-)
04.a No eyes close to the street (-), straight path (+)

04.b Direct bicycle path towards the station...

04.c Four crossings to survive: no priority for cyclists (-)

04.d Entrance of the parking/station still unclear (-), first a curvy road to cross (-)
05.a  No eyes on the street (-), obstacles along the path (-), slope (-)

05.b  Nice skyline of Amsterdam Amstel (+), no eyes on the street (-),

05.c  Obstacles next to the path (-), insufficient lighting (-)

05.d  Straight bicycle route (+) leads to the station with a sudden sharp turn (-)
2.3 Conclusions on improving the bicycle routes

As part of the case study research, the bicycle routes to station Amsterdam Amstel were analysed. Summarizing the results from the case study research, we can formulate some main recommendations to improve the bicycle route.

First of all the fast and slow traffic flows should be split up to create room for bicyclists to move around fast and safe. Secondly, bicyclists should be provided priority. The bicycle route should also be directly connected to the bicycle parking and the entrance of the station. The bicycle parking capacity should be increased to meet the current and future needs. The entrance of the bicycle parking and the station legible and inviting. Last but not least, the position of the station area in the city should be reconsidered. Figure 2.3 shows the recommendations.

If all these recommendations were accomplished the Amsterdam Amstel can improve its score on dissatisfiers from 49-57% to 76-95% and on satisfiers from 59-81% to 75-94% (see figure 2.4).

The main conditions to strengthen the bicycle network from home to the railway station in Amsterdam Amstel are as follows:

1. Split fast and slow traffic.
2. Give priority to bicyclists traffic.
3. Increase capacity of bicycle parking to meet the future demands and connect it directly to the bicycle parking and from the bicycle parking to the entrance of the station.
4. Make the entrance of the bicycle parking(s) and the station legible and inviting.
5. Reconsider the position of the station area in the city.
3. Increase capacity of bicycle parking

4. Make the entrance legible and inviting

5. Reconsider the position of the station area in the city.

Fig. 2.4 Current scores (left) en future scores (right)
2.4 The development of station Amsterdam Amstel

The building of station Amsterdam Amstel dates back from 1939 when it was opened as train station. The station was built on a dike body just outside the city centre to avoid bottlenecks with city life on ground floor level. When the station was built the station square was still situated next to a green Dutch polder. This changed rapidly when Watergraafsmeer was developed and later on the offices at the canal side of the station were built (see figure 2.6).

Since the area of Amsterdam Amstel grew and grew, the station developed itself fast as multimodal hub in which train, metro, bus, tram, bicycle and pedestrian all came together. Since 1977 the station also became a metro station. Each platform provided from that time access to the train and the metro. That was very modern for a station at that time.

When the car use increased the fast traffic roads and roundabout in front of the station quickly expanded and started to form a barrier for slow traffic between the station and the neighbourhood. The current traffic flows around the station show the result of the fast traffic becoming dominant in the station area (see figure 2.6).

Fig. 2.6 Photos of Amsterdam Amstel in 1930’s (Archive City of Utrecht)
Fig. 2.6 Photos of Amsterdam Amstel in 2012 (by the author)
2.5 Amsterdam Amstel and the city

Station Amstel Amsterdam currently functions as an important node for the city. This position will become even more important in the future since the capacity of station Amsterdam Central is up to its limits. Station Amsterdam Amstel has an ideal location for people who are traveling to the south of the Netherlands. Figure 2.7 shows the spatial reach of Amsterdam Amstel, which covers a large part of the city of Amsterdam within a distance of 2.5 kilometers from the station. Amsterdam Amstel is only one stop removed from Amsterdam Central station. And the train system connects the station with for example Rotterdam, Utrecht and Maastricht.

When we take a closer look at the location of station Amsterdam Amstel we can still see the orientation of the station is focussed on the city centre (see figure 2.8). The axis of the Weimarstraat starts at the main west entrance of the station and ends in the city centre of Amsterdam. The east entrance was provided decades after the station was built. This entrance gives access to the canal side of the station where currently some social housing, a school and offices are located. This axis is now quite boring since all activities are turned inwards and the ground floor facades are closed.

The west entrance is orientated to a new lower neighbourhood, which did not exist yet when the station was built. This seems somehow illogical since this neighbourhood is 4 metres lower and turned off the station square. The axis from the lower west entrance into the neighbourhood has been retained.

Figure 2.9 shows the activity nodes in the Amsterdam Amstel area. What we can see is that the north axis, the orientation axis towards the city centre, is surrounded by a series of activities. However, the orientations to the west and east have a lack of activity nodes. The directions of the entrances remain unclear and the public space in front of the station is badly connected to its surroundings. Even though the station is not positioned far out of the city, it feels like the east and west side of the station area are placed outside the attractive activities. Both axes have a lack of open activities in the plinth. These activity nodes can function as stepping stones to connect the city with Amsterdam Amstel (see figure 2.10 and 2.11).
Fig. 2.8 The orientation of station Amsterdam Amstel towards the city centre, Amstel canal and Watergraafsmeer.

Fig. 2.9 The nodes around Amsterdam Amstel

Fig. 2.10 The station has three orientations, but some are unclear

Fig. 2.11 Adding activity nodes will clarify the orientation and connect the system of
3. STRATEGY FOR AMSTERDAM AMSTEL

After the case study research and the analysis from the past chapters we can conclude that the station area of Amsterdam Amstel is currently unbalanced. Fast traffic is dominating public space around the station. Bicycle and pedestrian traffic are pushed off the station square. The bicycle parking is lacking capacity. The bicycle route to the bicycle parking and the station is unlegible. The entrances are also badly marked. The figures at the right show how the strategy on the scale of the bicycle routes and the general strategy on the scale of the city are combined into one conceptual proposal for station area Amsterdam Amstel.

The main conditions to strengthen the bicycle network from home to the railway station in Amsterdam Amstel, derived from the case study research and the workshop, form the base for the strategy. Three variants were developed to show the opportunities of the station area with different levels of interventions.

These variants are formulated as follows:
1. **Variant 2015**: focusses on improving the current situation with a minimum of spatial interventions.
2. **Variant 2020**: aims to optimise the existing situation to the maximum with only small interventions.
3. **Variant 2030**: creates the ideal situation with all interventions that are needed.

Fig. 3.1 Strategy for the bicycle routes in Amsterdam Amstel (above) and the city combined (right)
PART E - DESIGN - IMPROVING THE BICYCLE NETWORK IN AMSTERDAM AMSTEL

Fig. 3.1 Strategy for the bicycle routes in Amsterdam Amstel (above) and the city combined (right)
Based on the spatial strategy to improve the bicycle routes from home to the station of Amsterdam Amstel three design variants for Amsterdam Amstel are discussed. Next to every design proposal, recommendations for the designer are given. For every variant five conceptual design proposals for the bicycle routes and one spatial design proposal for the station area are shown in this chapter. Every design proposal will be explained by sections and 3D impressions. Furtheron, design suggestions for bus, tram, car and bicycle parking will be given.

4.1 Station area
The station is the entrance and exit of the city at the same time. Bicycle commuters arrive and depart from the station every single weekday. Therefore it is important that the bicycle routes to the station area are well designed. As result of the case study research we saw that the station area of Amsterdam Amstel has a lot of opportunities to improve its public domain. The question is: how are we going to do that?

With the spatial strategy in mind, three variants are developed. Each variant has a different intention. The first variant focusses on short term, easy-to-fulfill improvements to the existing urban fabric. The second variant aims to optimise the current situation with a extended set of small interventions. The last variant seeks for the ultimate with an extensive set of small and big interventions.
VARIANT 2015: BICYCLE ROUTE RIVIERENBUURT

Crossing: bicycle priority
Shared bicycle lane with SLOW motorized traffic
Alternative options to cycle to the railway station
Separated bicycle lane
Shared bicycle lane with FAST motorized traffic
Crossing: equivalent
Crossing: bicycle no priority
Inside bicycle parking, free
Outside bicycle parking, unguarded, free
Inside bicycle parking, paid
Nice green surrounding
Weakest link

Section PP'

Too big flow of fast traffic to provide priority to cyclists
Softening turn and prioritize cyclists
Make bicycle path straight and smooth

LEGEND
Railway Station
Angle Rotation at Decision Point
Separate bicycle lane
Shared bicycle lane with SLO MO motorized traffic
Shared bicycle lane with FAST motorized traffic
Crossing bicycle priority
Crossing equivalent
Crossing bicycle no priority
Alternative options to cycle to the railway station
Inside bicycle parking, free
Outside bicycle parking, unguarded, free
Inside bicycle parking, paid
Nice green surrounding
Weakest link

Attractiveness
Comfort
Directness
Safety

76% Satisfiers
70% Dissatisfiers
66% Dissatisfiers
53% Dissatisfiers
VARIANT 2015: BICYCLE ROUTE DE PIJP

- Bicycle street (cars are guests)
- Create smooth asphalt bicycle track
- Too big flow of fast traffic to provide priority to cyclists
- Smoothen sudden turn
- Create asphalt bicycle street (cars are guests) and make the sudden turn smooth and legible
- Increase bicycle parking capacity

LEGEND

- Railway Station
- Angle Rotation at Decision Point
- Separated bicycle lane
- Shared bicycle lane with SLOW motorized traffic
- Shared bicycle lane with FAST motorized traffic
- Crossing bicycle priority
- Crossing equivalent
- Crossing bicycle via priority
- Alternative options for cycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, unguarded, free
- Inside bicycle parking, payed
- Nice green surrounding
- Waterline
VARIANT 2015: BICYCLE ROUTE DAPPERBUURT

Crossing: bicycle priority
Shared bicycle lane with SLOW motorized traffic
Alternative options to cycle to the railway station
Separate bicycle lane
Shared bicycle lane with FAST motorized traffic
Crossing bicycle priority
Crossing equivalent
Crossing bicycle no priority
Inside bicycle parking, free
Inside bicycle parking, guarded, free
Nice green surrounding
Weak link

LEGEND
Railway Station
Angle Rotation at Decision Point
92% Satisfiers
55%
58%
67%
60%
65%
65%
60%
55%
92% Dissatisfiers

100m

Nice green surrounding

Bicycle path beside the highway foot side, starting station area from the back side

Too big flow of fast traffic to provide priority to bicyclists
Softening turn

Too big flow of fast traffic to provide priority to bicyclists
Softening turn

Softening turn

Softening turn
PART E - DESIGN - IMPROVING THE BICYCLE NETWORK IN AMSTERDAM AMSTEL

VARIANT 2015: BICYCLE ROUTE WATERGRAAFSMEER

- Crossing: bicycle priority
- Shared bicycle lane with SLOW motorized traffic
- Alternative options to cycle to the railway station
- Separated bicycle lane
- Shared bicycle lane with FAST motorized traffic
- Crossing bicycle priority
- Crossing equivalent
- Crossing bicycle no priority
- Alternative options to cycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, unguarded, free
- Inside bicycle parking, paid
- Nice green surrounding
- Weakest link
- Attractiveness
- Comfort
- Directness
- Safety

Legend:
- Railway Station
- Angle Rotation at Decision Point
- Separated bicycle lane
- Shared bicycle lane with SLOW motorized traffic
- Shared bicycle lane with FAST motorized traffic
- Crossing bicycle priority
- Crossing equivalent
- Crossing bicycle no priority
- Alternative options to cycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, unguarded, free
- Inside bicycle parking, paid
- Nice green surrounding
- Weakest link

Scale: 1:100m

43
VARIANT 2015: BICYCLE ROUTE BETONDORP

Create a smoother turn that makes the entrance to the railway station legible.

Priority to cyclists!

Add lighting. Nice views from the dike, but totally desolated. More open facades along the track preferred.

Adding lighting does not solve the problem of this desolated area

Steep slope

Add lighting in the dark and narrow tunnel.

76% Satisfiers
75% Disatisfiers
64% Directness
62% Safety
50% Attractiveness
40% Comfort

LEGEND
Railway Station
Angle Rotation at Decision Point
Crossing: equivalent
Crossing: bicycle priority
Crossing: bicycle no priority
Alternative options to cycle to the railway station
Inside bicycle parking, free
Outside bicycle parking, unguarded, free
Inside bicycle parking, paid
Nice green surrounding
Weakest link
VARIANT 2015: DESIGN IMPRESSIONS

Fig. 4.2 Bicycle parking now (section AA')
- Not clear how to reach the station hall
- Bicycle track suddenly ends.

Fig. 4.4 Impression of the maintained pavement
- No signs of the entrance of the bicycle parking, bicyclists have to cross sidewalk

Fig. 4.6 Impression of the Meester Treublaan now (section BB')

Fig. 4.3 Impression of the bicycle parking proposal (section AA')
- In the same color as the arc, the entrance of the station hall is made clear

Fig. 4.5 Impression of priority for bicyclists (‘zeerapad’ for bicyclists)
- Arc above the path marks the

Fig. 4.7 Impression of the Meester Treublaan, design proposal (section BB')
The first variant mainly focuses on using the existing infrastructure and public space to improve the bicycle route to station Amsterdam Amstel. The most important change this design proposal makes is that all bumpy asphalt is replaced with new asphalt and priority to bicyclists is given where possible. Furthermore, the bicycle parking capacity is increased to provide enough bicycle racks for the current and future demand. The location of the current bicycle parking is big enough to provide double level bicycle racks that meet the needs of the current bicycle parking capacity. The results of the interventions are shown in the pyramids next to the conceptual schemes of the routes. Now we will discuss the consequences of the design recommendations on the safety, directness, comfort and attractiveness of the bicycle routes to the station. The effects are:

1. Safety:
   - Road division: Separate bicycle paths have been maintained and enlarged where possible.
   - Visibility & lighting: On the route from Betondorp and Watergraafsmeer extra lighting is added.
   - Pavement: The asphalt bicycle routes are extended towards the bicycle parking outside and inside.

2. Directness:
   - Linearity: Nothing changed since it would need bigger interventions.
   - Continuity: More priority has been provided to bicyclists.
   - Right of way to cyclists: By removing a crossing and giving more priority to cyclists the directness is improved. Priority is given when bicyclists turn right without crossing the street.
   - Orientation: By removing some crossings there are less decision points along the bicycle route.
   - Fluency: By making smoother bicycle tracks and arranging continuous pavement the route is easier to follow.
   - Flatness: Nothing changed, since flattening bridges and hills would require too big interventions.
   - Legibility: By improving the points above, the route is easier to follow, but the entrances of the station remain somewhat illegible.
   - Transfer distance: This is not changed since the bicycle parking is located at the same place where it is now.
   - Bicycle parking capacity: The bicycle racks have been changed for double level bicycle parking.

3. Comfort:
   - Human scale: Nothing changed.
   - Bicycle amenities: Along the Treublaan a bicycle street has been developed by adding asphalt and changing the car from dominant user to guest in the street.
   - Bicycle parking types, racks & levels: Only the tracks and the layout of the bicycle parking have been changed for double level racks.

4. Attractiveness:
   - Maintenance: Investments are made in public space at the west side of the station.
   - Liveliness: No extra functions are added in the plinth so the activity rate of the station area stays the same with this variant.
   - Experience: By investing in the base conditions the experience will automatically improve. Though, there are still a lot of options to make a better impression.
VARIANT 2015: SPATIAL DESIGN PROPOSAL FOR THE STATION AREA

- Bicycle street (cars are guests)

- Priority to cyclists and continuing bicycle pavement makes route more faster and legible

- Bicycle route fluently continues to bicycle parking

- Increased bicycle parking capacity accessible by bicycle track through the parking

- Priority to cyclists and continuing bicycle pavement

- Main bicycle routes to the station
VARIANT 2015: DESIGN IMPRESSIONS

Fig. 4.8 Impression of Van Der Kunststraat (now) - section CC'

Fig. 4.9 Impression of Van Der Kunststraat (design proposal) - section CC'

Fig. 4.10 Impression of bicycle parking in Goudriaanstraat (now) - section DD'

Fig. 4.11 Impression of new situation in Goudriaanstraat (design proposal) - section DD'
Fig. 4.12 Impression of Julianaplein, east side of the station currently (above) and in the future (below)
VARIANT 2020: BICYCLE ROUTE RIVIERENBUURT

- Bicycle parking located on the slope, next to the entrance of the station
- Too big flow of fast traffic to provide priority to cyclists
- Make the turn legible by creating a clear connection point (path - entrance station)
- Connecting the bicycle track with slope to the entrance of the railway station

**Legend**
- Railway Station
- Angle Rotation at Decision Point
- Separated bicycle lane
- Shared bicycle lane with SLOW motorized traffic
- Shared bicycle lane with FAST motorized traffic
- Crossing bicycle priority
- Crossing equivalent
- Crossing bicycle no priority
- Alternative options to cycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, unguarded, free
- Inside bicycle parking, paid
- Nice green surrounding
- Weakest link
- 100m

**Crossing:**
- Bicycle priority
- Shared bicycle lane with SLOW motorized traffic
- Shared bicycle lane with FAST motorized traffic

**Alternative options to cycle to the railway station:**
- Separated bicycle lane
- Shared bicycle lane with SLOW motorized traffic
- Crossing bicycle priority
- Crossing equivalent
- Crossing bicycle no priority

**Legend**
- Attractiveness
- Comfort
- Directness
- Safety

- 92% Satisfiers
- 80% Disatisfiers
- 48% Dissatisfiers
- 69% Satisfiers
- 92% Satisfiers
Shortcut to Centraalstaan provides more space for cyclists in slow traffic street and less chaotic crossings.

Legible and easy routing: slope + bicycle parking in one reaches to the entrance of the station.

Too big flow of fast traffic to provide priority to cyclists.
VARIANT 2020: BICYCLE ROUTE OOSTERPARKBUURT

Attractiveness
Comfort
Directness
Safety

Legend:
- Railway Station
- Angle Rotation at Decision Point
- Separated bicycle lane
- Shared bicycle lane with slow motorized traffic
- Shared bicycle lane with fast motorized traffic
- Crossing bicycle priority
- Crossing equivalent
- Crossing bicycle no priority
- Alternative option to cycle to the railway station

Inside bicycle parking, free
Outside bicycle parking, unguarded, free
Inside bicycle parking, paid
Nice green surrounding
Resident lane

Place obstacles (lighting, bicycle racks, etc.) at least 1.5m separated from the bicycle track
Create more space for cyclists at the crossing to get a better overview
Shortcut along the other side of the road for direct access to the station
Downgraded fast traffic roads in front of the station give priority to cyclists
Bicycle path directly connected to the indoor free bicycle parking

Crossing: bicycle priority
Shared bicycle lane with SLOW motorized traffic
Alternative options to cycle to the railway station
Shared bicycle lane with FAST motorized traffic
Crossing: bicycle no priority
Nice green surrounding
Resident lane
VARIANT 2020: BICYCLE ROUTE WATERGRAAFSMEER

- Crossing: bicycle priority
- Shared bicycle lane with SLOW motorized traffic
- Alternative options to cycle to the railway station
- Separated bicycle lane
- Shared bicycle lane with FAST motorized traffic
- Crossings: bicycle priority
- Crossings: equivalent
- Alternative options by bicycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, unguarded, free
- Inside bicycle parking, payed
- Nice green surrounding
- Weakest link
- Safety
- Directness
- Comfort
- Attractiveness

Legend:

- Railway Station
- Angle Solution at Decision Point
- Separated bicycle lane
- Shared bicycle lane with SLOW motorized traffic
- Shared bicycle lane with FAST motorized traffic
- Crossings: bicycle priority
- Crossings: equivalent
- Alternative options by bicycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, unguarded, free
- Inside bicycle parking, payed
- Nice green surrounding
- Weakest link

Note: slope gives existing indoor bicycle a direct and inviting entrance.

Shortcut provides more legible and fluent connection to the station.

Indoor bicycle parking combines free and payed parking. Payed has better access to station hall.
VARIANT 2020: BICYCLE ROUTE BETONDORP

- Smooth turn ends in wide slope down to the indoor bicycle parking.
- Use existing bicycle track for a shortcut to the East entrance.
- Soften sharp turns and open up the corners to have more eyes on the street.
- Create a less steep slope along the dune.

Legend:
- Railway Station
- Angle Rotation at Decision Point
- Separated bicycle lane
- Shared bicycle lane with SLOW motorized traffic
- Shared bicycle lane with FAST motorized traffic
- Crossing bicycle priority
- Crossing bicycle no priority
- Alternative options to cycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, unguarded, free
- Inside bicycle parking, payed
- Nice green surrounding
- Weakest link

Map showing the bicycle route with various options and features.
VARIANT 2020: DESIGN IMPRESSIONS

Fig. 4.13 Impression of the bicycle parking at the east side (now) - section AA’

Fig. 4.14 Impression of the bicycle parking at the east side (design proposal) - sect.AA’

Fig. 4.15 Impression of the Meester Treublaan (now) - section BB’

Fig. 4.16 Impression of the Meester Treublaan (design proposal) - section BB’
The second variant takes bigger interventions in consideration to improve the bicycle route from the surrounding neighbourhood to station Amsterdam Amstel. One major change is that the bicycle parking at the west side is placed on a slope that goes from the bicycle route of the Rivierenbuurt directly up to the entrance of the station. The bicycle route from de Pijp enters this outdoor bicycle parking from the canal side. At the east side all bicycle parking has been placed inside since the indoor parking provides enough room. A intervention that has to be made was to extend the entrance of this bicycle parking to make it better accessible and legible from the square side. Below, the effect of these interventions will be discussed by means of the conditions for successful public space for cyclists. The effects are:

1. Safety:
   - Road division: Investments has been made to enlarge the current bicycle routes.
   - Visibility & lighting: Parked cars have been removed or replaced so the view on the street would improve.
   - Pavement: All routes are made of asphalt.

2. Directness:
   - Linearity: The bicycle routes from Dapperbuurt and Betondorp are slightly changed to improve the directness.
   - Continuity: Investments has been made to decrease the amount of crossings.
   - Right of way to cyclists: By increasing the amount of crossing more priority to cyclists is provided.
   - Orientation: By investing in alternative (already existing) bicycle routes, less decision points have to be taken.
   - Fluency: The alternative route provides a more fluent routing.
   - Flatness: The flatness of the bicycle routes have not been changed.
   - Legibility: Due to the investments on the alternative bicycle routes, the way finding is easier.
   - Bicycle parking capacity: Investments have been made to increase the bicycle parking to the current and future standards.

3. Comfort:
   - Human scale: Nothing has been changed to the current buildings.
   - Bicycle amenities: Indoor bicycle parking is provided.
   - Bicycle parking types, racks & levels: The bicycle parking is placed on a slope and the indoor parking at the other side is one floor down.

4. Attractiveness:
   - Maintenance: Investments have been made to make the public space look well.
   - Liveliness: No extra investments have been made to add extra activities.
   - Experience: The safety, directness and comfort have been a lot improved. This will influence the experience.
VARIANT 2020: SPATIAL DESIGN PROPOSAL FOR THE STATION AREA

- Bicycle parking is placed on a slope that ends in front of the station entrance.
- Direct access to station entrance, without any stairs.
- New wide bicycle friendly slope to the indoor bicycle parking.
- Bicycle parking is indoor with direct connection up to the station hall.
- Priority to bicyclists.
- Main bicycle routes to the station.
VARIANT 2020: DESIGN IMPRESSIONS

Fig. 4.17 Impression of the Van Der Kunststraat (now) - section CC'

Fig. 4.18 Impression of the Van Der Kunststraat (design proposal) - section CC'

Fig. 4.19 Impression of the bicycle parking and entrance Goudriaanstraat (now) - sect-DD'

Fig. 4.20 Impression Goudriaanstraat (design proposal) -section DD'
Fig. 4.21 Impression of Julianaplein, east side of the station now (above) and in the future (below)
VARIANT 2030: BICYCLE ROUTE RIVIERENBUURT

Inside free bicycle parking under entrance of the station

Split entrance for bicyclists (ground floor + stairs to entrance) and pedestrians (slope from water side to entrance)

Use water side to visibly connect station with the city

Section PP'

Crossing: bicycle priority

Shared bicycle lane with SLOW motorized traffic

Alternative options to cycle to the railway station

Separate bicycle lane

Shared bicycle lane with FAST motorized traffic

Crossing bicycle priority

Crossing equivalent

Alternative options to cycle to the railway station

Inside bicycle parking, free

Outside bicycle parking, unguarded, free

Inside bicycle parking, paid

Nice green surrounding

Roadnet line

100m

LEGEND

Railway Station

Angle Rotation at Decision Point

Crossing: equivalent

Crossing: bicycle no priority

Inside bicycle parking, free

Outside bicycle parking, unguarded, free

Inside bicycle parking, paid

Nice green surrounding

Roadnet line

Attractiveness

Comfort

Directness

Safety
VARIANT 2030: BICYCLE ROUTE DE PIJP

LEGEND
- Railway Station
- Angle Rotation at Decision Point
- Separated bicycle lane
- Shared bicycle lane with SLOW motorized traffic
- Shared bicycle lane with FAST motorized traffic
- Crossing bicycle priority
- Crossing equivalent
- Calming bicycle no priority
- Alternative options to cycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, un guarded, free
- Inside bicycle parking, payed
- Nice green surrounding
- Weakest link
- 100m

Bicycle street (‘cars are guests’) →

Downgraded street makes priority for pedestrians possible and safe

Bicyclists enter the free inside bicycle parking from ground floor

Bicycle street with totally split fast and slow traffic. No parked cars next to bicycle track

Legible and inviting entrance of the bicycle parking of the station visible
VARIANT 2030: BICYCLE ROUTE OOSTERPARKBUURT

[Map and legend showing bicycle routes and priorities, with various labels and symbols indicating different types of routes and amenities, such as bicycle parking, green surroundings, and prioritized routes.]

- **Crossing: bicycle priority**
- **Shared bicycle lane with SLOW motorized traffic**
- **Alternative options to cycle to the railway station**
- **Separated bicycle lane**
- **Shared bicycle lane with FAST motorized traffic**

**LEGEND**

- Railway Station
- Angle Rotation at Decision Point
- Separated bicycle lane
- Shared bicycle lane with SLOW motorized traffic
- Shared bicycle lane with FAST motorized traffic
- Creating bicycle priority
- Creating equivalent
- Designing bicycle or priority
- Environment optimal to cycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking, unguarded, free
- Inside bicycle parking, paid
- Nice green surrounding
- Breakfast time
- Slope (climbing gradient 0.05) leads to clear and inviting entrance. Priority for slow traffic.
- Downgraded fast traffic road only used for taxi and regular bus lines.
VARIANT 2030: BICYCLE ROUTE WATERGRAAFSMEER

Only the tram crosses the bicycle path. Priority for bicyclists. Fast traffic road should be reconsidered, since an extra exit on the highway would make this road supersfluous.

New bicycle shortcut through the neighborhood provides more room for slow traffic and clear view on the station.

Shortcut to indoor bicycle parking creates an even more direct and inviting entrance with direct access to the station hall.
VARIANT 2030: BICYCLE ROUTE BETONDORP

Slope goes down to free indoor parking under entrance of the station

Shape the square with more trees and street furniture and open up the facades at ground floor to create a representative entrance of the station area.

Enlarge sidewalk to create more room and overview for slow and fast traffic

Add street furniture (beter lighting, benches etc.) to give shape to the empty slice

Create a less steep slope along the slice

76% Satisfiers
77% Dissatisfiers
96% Necessaries

Attractiveness
Comfort
Directness
Safety

Legend
- Railway Station
- Angle buildings at Decision Point
- Separated Bicycle lanes
- Shared bicycle lane with slow motorized traffic
- Shared bicycle lane with fast motorized traffic
- Crossing bicycle priority
- Crossing equivalent
- Crossing bicycle no priority
- Alternative options to cycle to the railway station
- Inside bicycle parking, free
- Outside bicycle parking unsecured, free
- Inside bicycle parking, paid
- Nice green surrounding
- Weakest link
**PART E - DESIGN - IMPROVING THE BICYCLE NETWORK IN AMSTERDAM AMSTEL**

**VARIANT 2030: DESIGN IMPRESSIONS**

**Fig. 4.22** Impression of east bicycle parking now (above) and future (middle and below) - section EE’

**Fig. 4.23** Impression of Meester Treublaan (now) - section BB’

**Fig. 4.24** Impression of Meester Treublaan (design proposal) - section BB’
The third and last variant to strengthen the bicycle route to the station is the most extensive one of the three. Bigger investments are done and therefore this design proposal needs some more time to accomplish. The most important interventions of this variant are the indoor bicycle parkings at both side of the station. The bicycle routes continue in the bicycle parking. And after the bicycle is parked people can walk directly up to the station hall or the entrance of the station. Another important proposal is to split fast and slow traffic to the maximum. At the west side of the station, only cars who need to go to their destination in the area may drive here. At the east side the downgraded roads are only accessible for buses and taxi’s. The results of these proposals on bicycle routes seem to have the most positive influence. Below, the effects are described:

1. Safety:
   - Road division: All bicycle routes are completely separate.
   - Visibility & lighting: Investments have been made to make all crossings clear and visible. Lighting in added along the viaducts and dikes along the route.
   - Pavement: All bicycle routes are paved with asphalt.

2. Directness:
   - Linearity: Investments have been made to make bicycle route shortcuts to increase the directness.
   - Continuity: By changing the route layout the continuity has improved.
   - Right of way to cyclists: Priority to cyclists is provided through the whole station area.
   - Orientation: Investments on the shortcuts have its positive impact on the orientation as it decreases the amount of decision points.
   - Fluency: The fluency has been improved by the shortcuts.
   - Flatness: This has not been changed.
   - Legibility: By the investments on the alternative routes, the legibility has improved largely. The routing and the entrances of the parking and the station are clear.
   - Bicycle parking capacity: This has been extended to current and future demands.

3. Comfort:
   - Human scale: Closed buildings are opened up to have more open and human scaled buildings along the route to the station.
   - Bicycle parking types, racks & levels: All bicycle parking is located inside. At the west side at ground floor and at the east side too.

4. Attractiveness:
   - Maintenance: Investments have been made to perfectly maintain the station area.
   - Liveliness: By adding functions and opening up the plinths the liveliness has increased.
   - Experience: The experience has been improved by the many investments on extra activities, more priority to bicyclists and extra street furniture.
VARIANT 2030: SPATIAL DESIGN PROPOSAL FOR THE STATION AREA

Bicycle street (cars are guests)

Direct bicycle path on ground floor next to boulevard to the station

New indoor bicycle parking at ground floor with direct access to station

New legible entrance to free indoor bicycle parking

Indoor bicycle parking with direct connection up to the station hall

Priority to cyclists and continuing bicycle pavement

Main bicycle routes to the station
VARIANT 2030: DESIGN IMPRESSIONS

Fig. 4.25 Impression of the Van Der Kunststraat (now) - section CC'

Fig. 4.26 Impression of the Van Der Kunststraat (design proposal) - section CC'

Fig. 4.27 Impression of the bicycle parking and entrance Goudriaanstraat (now) - sect. DD'

Fig. 4.28 Impression of Goudriaanstraat (design proposal) - section DD'
Fig. 4.29 Impression of Julianaplein, east side of the station now (above) and in the future (below)
VARIANT 2030: DESIGN IMPRESSION
4.2 Design suggestions to define the station square

The design proposals to improve the bicycle routes to the station all improved on safety, directness and comfort. But on attractiveness there is still something to improve, namely the human scale, the liveliness and experience of the station area. The public space around the station currently feels undefined. The fast traffic roads have a dominant position in the area and make the place feel chaotic and unwelcome for bicyclists and pedestrians.

Figure 4.31 shows that the public space around the station flows away through the many gaps between the buildings. The station square may be a square but does not feel like one. The buildings stand too far away to feel the human scale of the place. Although some of the plinths provide activities it is not well experienced. The liveliness in the plinth is not convincing (see figure 4.32).

Figure 4.30 shows the three steps that are developed to repair the station square. The first step is that the buildings from the sides where the square lacks definition should turn inwards to embrace the square. At the moment the facades of these buildings are too far away from each other to enclose the square. In the second step, buildings are added to define the station square. In the proposal the buildings are placed in front of the station, in line with the orientation of the station and sight lines. In order to provide enough space and sunlight for the people in the neighbourhood behind the station, the buildings have a limited height. The proposed building in the south of the proposal can be made higher. This will not influence the sunlight on the neighbourhood or the station square. Only the bus platform will catch some shadow.

The last step is to add functional green zones to completely define the station squares. This green area has a double function since it serves for recreation and also gives the feeling of a surrounded square.

Fig. 4.30 Undefined station squares at both sides of station Amsterdam Amstel
Fig. 4.31 Undefined station squares at both sides of station Amsterdam Amstel
Fig. 4.32 Panorama photos of station area Amsterdam Amstel (by the author). 01, 02, 03 and 06 are taken from the east station square. 04 and 05 are taken from the Amstel canal (west side).
Figure 4.33 shows the design proposal made for the station area of Amsterdam Amstel. The impression shows that the added buildings at the west and east side of the station now give room for a square. Adding green as forming object around the station square has the advantage that it serves the people at the neighbourhood side at one hand. And at the other hand gives the station square a greener image. Nowadays, since big investments are not obvious, the green also reduces the need of adding costful building.

The building block at the south of the east side of the station is proposed in different levels to meet the difference between the station and the neighbourhood. The top of this building serves as landmark. The functions in this building vary from shops and services in the plinth, to offices and housing in the floors above. The same counts for the buildings placed in front of the station at the east side. The plinth is transparent and offers room for shops that serve the neighbourhood and the station square. The floors above can be developed as flexible housing, social rental and owner-occupied.

Now, there is only social housing and a school at the station square of the west side of the station. Both functions are currently turned inwards. In the design proposal a floating lunchroom and cocktailbar is created to attract more people to this square and connect the station with the water side, characteristic for this area.

The currently dominating fast traffic roads have to be reconsidered. The fast traffic roads in front of the station (Julianaplein) can be downgraded to slow traffic roads for taxi’s and ‘park and ride’. Only the buslines cross the upper Julianaplein. This results in a slow traffic station square where bicyclists and pedestrians can move and stay safely and comfortable.
Fig. 4.33 Impression of the public space around the station
JULIANAPLEIN - CURRENT SITUATION
JULIANAPLEIN - FUTURE IMPRESSION
WEESPERZIJDE - CURRENT SITUATION
WEESPERZIJDE - FUTURE IMPRESSION
REFERENCE PHOTOS
4.3 Design suggestions for the Bus

This chapter shows some conceptual proposals for the bus platforms in the station area. The design proposals from the past chapter have shown the opportunities for the bicycle routes. The station area is of course used by many more users. To start with, we first discuss the variants for the bus.

When the station was designed the buses where all located at the south east entrance of the station. Currently, the bus platforms are spread through the area (see figure 1.1). This causes a chaotic effect. People see the buses everywhere and it remains unclear where the main bus platform is. The many buses that pass the fast traffic road also become a barrier since slow traffic did not get priority at the moment. New alternatives can give some insight in the opportunities of the area.

The most important condition for a new bus platform is that pedestrians have priority. The platform has to be designed for pedestrians instead of for buses. The best option would be if pedestrians do not have to cross the bus road to reach their bus. A second aspect that is taken into account is that the buses should have place to wait and of course enough space to turn and stop. The current amount of platform have to be maintained.

In the first variant a round platform is built at the place where now Eurolines has placed a fence around. The platform is accessible by a wide cross-over. Pedestrians have enough place to wait at the side and on the platform itself. An advantage of this option is that the stops are flexible since the bus can stop all over the roundabout. Coloring the stops and an electronic travel time board at the circle can give the people information where to go. A disadvantage is that people have to cross the road to reach the main bus platform. Therefore, the second variant seems to fit the requirements better. The roundabout that was placed in the middle in variant one, is now placed at the end of the existing platform. Pedestrians do not have to cross any road to reach the buses and they can wait at the same platform as where they depart.

Fig. 4.30 Bus platforms at Amsterdam Amstel (current situation)
The last variant has the same concept as the second one, but this time the buses drive straight into the platform so the people on the platform will automatically see that the bus has arrived. This option offers the most space for pedestrians, but is less bus friendly. Therefore the second options seemed the most optimal one.

Fig. 4.31 Three design suggestions for the bus platforms at Amsterdam Amstel
4.4 Design suggestions for the Tram

After discussing some design alternatives for the bus, we now see some variants for the tram. The current situation of the tram takes a lot of space (see figure 1.1). In the times the station and the tram is design it did not matter that the tram line took over the whole east side of the station but nowadays the space offers a lot of opportunities for other public functions. One of the main requirements to improve the tram design is that it should offer space for other activities.

The first alternative is the less extreme one. In line with the proposals for the bicyclists the tram stop could be replaced a little bit. This provides enough space to accomplish variant three of the bicycle proposals. An advantage of this variant is that the tram lines do not need to be changed. Only the platforms have to be redesigned, but in the current situation the platforms mainly exist of concrete blocks. So changing this would not need many extra investments. A disadvantage is that the tram still takes a lot of space.

The second alternative places the tram stop at the north east side of the station. In order to achieve these changes some big investments are needed. The advantage of this variant is that the stops are clearly at one stop in front of the main entrance. A disadvantage is that it costs a lot of money and it causes some friction with the busy roundabout.

The third alternative suggests to extend the tram line into Watergraafsmeer. It is a variant on the first alternative. This could be done to create extra stops or to create extra buffer for the many waiting tram vehicles at the end of the line. An advantage of this intervention is that the tram turn is now removed out of the station area so you have space left to use for other activities. When this intervention would be done in combination with the extension of the tram line the investments could be combined. A possible disadvantage is that the tram line still crosses the station area, but this option offers still extra space to use for adding buildings or other facilities.
Fig. 4.33 Three design suggestions for the tram lines at Amsterdam Amstel
5. CONCLUSIONS

This part of the thesis corresponds with last research question: *How are the conditions for successful public space for cyclists and the conclusions resulting from the case studies usable in a spatial design for the city?*

5.1 Summary

This question was answered by a design proposal to strengthen the bicycle routes from five surrounding neighbourhoods to station Amsterdam Amstel.

A workshop on the subject was organized in the beginning of the design process. Five teams worked for one day, each on a different bicycle route. They analysed the routes and made design proposals to improve the bicycle route to the station on the short and long term. Furthermore, the participants tested the ReCYCLE City tool and wrote an individual reflection on how to improve it. The results of the workshops are together with the case study research used to make a strategy. The main conditions to strengthen the bicycle network from home to the railway station in Amsterdam Amstel are formulated as as follows:

1. Split fast and slow traffic.
2. Give priority to cyclists traffic.
3. Increase capacity of bicycle parking to meet the future demands and connect it directly to the bicycle parking and from the bicycle parking to the entrance of the station.
4. Make the entrance of the bicycle parking(s) and the station legible and inviting.

5. Reconsider the position of the station area in the city.

Figure 5.1 shows the recommendation in a scheme. This strategy is used to develop three spatial design proposals for the station area. To make a distinction in the dimension of interventions the variants stand for different time spans:

1. **Variant 2015**: focusses on improving the current situation with a minimum of spatial interventions (see figure 5.2).
2. **Variant 2020**: aims to optimise the existing situation to the maximum with only small interventions (see figure 5.3).
3. **Variant 2030**: creates the ideal situation with all interventions that are needed (see figure 5.4).

Per variant the consequences of the design proposals and details on the safety, directness, comfort and attractiveness were discussed.
Fig. 5.1 Recommendation to improve the bicycle routes to station Amsterdam Amstel

Fig. 5.2 Variant 2015.

Fig. 5.3 Variant 2020.

Fig. 5.4 Variant 2030.
5.2 Discussion

The ReCYCLE City tool that was developed by the literature study and case study research has been used to test the design consequences of the proposed variants. Figure 5.5 shows the score of the current situation and the future situation, based on the consequences of the third variant.

The validation tool was very useful in pointing out the strong and weak points in the bicycle routes and improving them. Although the design proposals for the bicycle routes meet the needs of the bicyclist, the station area is not only used by the bicyclists. Therefore, the needs of the other users should also be taken into account. The city should be analysed in a bigger perspective to understand the opportunities. We can conclude that the ReCYCLE City tool is a reliable method to easily validate the bicycle routes from home to the railway station and pinpointing the opportunities to improve it. The theoretical base clearly underpins on solid grounds the trigger and motives of the validation tool. After a design was made for Amsterdam Amstel, we can conclude that for making a design for an urban area, the city should be brought into a bigger perspective.

The satisfiers and dissatisfiers in the pyramid show that the bicycle routes are very much improved compared to the current situation, but they are not perfectly fixed. If all the recommendations are accomplished the Amsterdam Amstel can improve its score on dissatisfiers from 49-57% to 76-95% and on satisfiers from 59-81% to 75-94%. The road division is often changable. The eyes on the street can be difficult if there are no houses but only industry along the route. Also the linearity of the route is often hard to improve if there are no shortcuts possible. The flatness of the route is also a tough one to improve. The comfort and attractiveness of the bicycle routes can be improved by accomplishing the recommendations for a more defined station area. Theoretically, a score of 100% would be possible for these conditions But in practice, this is often impossible due to the limitations of land ownership borders and the existing built environment and its infrastructure network.

The design proposals for the station area can be a first impuls to a new developments in the area. The bicycle interventions of the three variants show that with relatively small interventions enormous improvements can be made. To improve the liveliness and the experience of the area, more open and attractive functions in the plinth should be developed. This improves not only the bicyclists experience and legibility of the entrance of the station, but also of all other users. Important to notice is that the interventions of the third variant are no continuation of the second variant. Therefore, it should be considered, for each side of the station, to develop (i) Variant 2020 after Variant 2015 or (ii) Variant 2030 after Variant 2015, as shown in figure 5.5.

5.3 Conclusion

Coming back to sub research question 04 (How are the conditions for successful public space for cyclists and the conclusions resulting from the case studies usable in a spatial design for the city?) we can conclude that the ReCYCLE City
tool has proven to be a usable method in pinpointing the strong points and design opportunities. To make a design, it requires a closer look on the context-specific infrastructure and activity network of the city. Both methods provide an excellent base for a design to improve the safety, directness, comfort and attractiveness. And to develop the station area into an inviting and lively place to move and stay integrated in the urban fabric of the city.

6.4 What follows

The next part of the thesis, ReCYCLE City booklet part F, answers the main research question of the graduation project. This is done by bringing all sub research questions together and drawing significant conclusions on the work that is done.
In Dutch culture, cycling and walking are the most common ways of active transportation within the city. Nowadays, more than forty percent of all train passengers arrive at the railway station by bicycle. And it is estimated that the combination of bicycle and train will become even more important in the future. But the spatial quality of the bicycle network from the Dutch residential neighbourhoods to the railway station is often poor: uncomfortable and incoherent. Urban design might and should bring solutions. Unfortunately, the cyclist’s perspective is worldwide under-represented in even the most comprehensive work of urban design.

This Master’s thesis is a search for spatial design interventions to improve the bikeability from home to the Dutch railway station.