Creating a strong, vital and attractive link between the Dutch central railway station and city centre
FIXING the LINK

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Colophon

Master’s Thesis *Fixing the Link*

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Cover Image by author (edited photo of Station Haarlem)
Creating a strong, vital and attractive link between the Dutch central railway station and city centre
Preface

A year has passed since the start of my graduation project. I remember it well: Exactly one year ago I had just decided that I would study the link between railway station and city centre in the Netherlands. Until then I had spent my weeks at NS Poort reading every book and article I could find on railway stations. By speaking with several people from the company and also doing some small projects, I finally came to the conclusion that this link - that had not been subject of research often before - had my preference for my graduation project.

How did I become an intern at NS Poort? During the summer of 2008 I had decided that I wanted to do my graduation project for a company. After visiting a couple of municipalities, urban design offices and other companies, I took the decision to graduate at NS Poort, the real estate division of the Dutch Railways (NS). The complex multi-actor, multi-modal and often multi-functional railway station environment had always been a fascination of mine. So I was glad to find myself at the core of the biggest actor in the field.

At first it was hard to imagine that one project could keep you interested, and most of all enthusiastic, for an entire year. During my education at the Faculty of Architecture of the Delft University of Technology (DUT) I had always done projects lasting only a couple of weeks or months. However this did not turn out to be a problem at all. During the year I became more and more enthusiastic about the subject. I remember finding myself having an interesting conversation about it with (of all people) my dentist. And this was no exception. Because the subject is something so concrete and tangible - almost everybody has walked from railway station to city centre at least once in his life - a lot of people enjoyed discussing it with me.

Furthermore I had gathered a group of enthusiastic and ambitious people around me that encouraged me throughout the whole year and always motivated me to bring my thesis to a higher level.

Therefore I would like to thank Sebastiaan de Wilde. First of all for making me an intern at NS Poort and for introducing the subject of this thesis. But mostly for his never ending enthusiasm and dedication to the project. I am looking forward to working with you in the future in my new job at NS Poort.

Furthermore special thanks to my mentors of the DUT. Remon Rooij for his ability to always see the structure in the most difficult set of problems and for his drive to get the best out of every student. Stefan van der Spek for his impressive amount of knowledge and the ability to look at problems from several angles. And, last but not least, Lidy Meijers for her eye for detail that the rest of us was sometimes lacking and her enthusiasm. It was always a pleasure exchanging thoughts and discussing my thesis with you all.

Then there are some people I would like to thank for the inspiring conversations we had on the subject of this thesis: Conrad Kickert, Evelien de Munck Mortier, Mark van Hagen, Barend Kuenen, Harry van Noord, Max van Aerschot, Caroline Weill and Willem van Heijningen.

Last but not least I want to thank Mark for always being there for me and helping me out during the hard times. The same goes for my parents who have always supported me. Thank you very much!

Inoek Brouwer
January 2010, Delft/Utrecht
Abstract

The link between railway station and city centre in the Netherlands is becoming increasingly important in our cities; On the one hand the railway station is gaining importance as entrance to the city (Rooij, 2005; Bertolini & Dijst, 2003; NS, 2006; NS Poort, 2009) and on the other hand cities are promoting their city centres to attract visitors and stimulate the local economy (Van der Hoeven et al., 2008). The link between station and centre therefore has to serve more and more people per day. This link is responsible for the arrival experience of visitors traveling by train to the city and therefore the place to make a good first impression (Van der Spek, 2006).

However, the link between railway station and city centre is often unattractive and lacks vitality (Kusumo, 2007; Rooij & Read, 2008). Visitors of the city have to cross several barriers while walking to the city centre. Furthermore the route is often disorienting and the public space has a low quality. In other words, it is not an inviting entrance to the city: The link between railway station and city centre in the Netherlands is broken and needs to be fixed.

This thesis aims at developing spatial design interventions to fix the link. The focus is on the unfamiliair visitor of a Dutch middle sized city traveling on foot from the central railway station to the city centre. The station is positioned outside of the historic city centre. The objective is to fix the link:

The main research question of the thesis is: What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre?

The spatial design interventions that can fix the link are found by:

1. A literature study on the work of leading authors in the field of (design of) successful public space in the 20th en 21st century. The study results in a list of criteria to fix the link;
2. A case study research on 16 comparable Dutch cases. For this research a validation tool is developed (based on the literature study) to objectively measure the quality of the links.
3. A design to fix the link in Haarlem. Haarlem is one of the 16 cases that has both a low score and a high potential.

1. Literature Study: Part B
The aim of the literature study was to find a list of criteria for a successful and attractive link between railway station and city centre. The list was based on a literature research on the (design of) successful public space. The general findings of this literature study were applied to the link between railway station and city centre in the Netherlands. The main conclusion was that a link is successful when:

1. It is lively;
2. human scaled;
3. legible;
4. and safe & comfortable (Brouwer, 2009a)

All four principles are sub divided into three measurable criteria (see table on the right).

2. Case Study Research: Part C
For the case study research this list was transformed into a validation tool that made it possbile to
objectively validate the quality of 16 comparable Dutch links. The end results of this case study research gave an insight on the general quality of the link in the Netherlands showing good and bad practices and also made it possible to roughly distinguish two types of links: The gradient links and the transition links. Furthermore the tool pointed out exactly what needed to be done to improve the situation. Therefore it not only functioned as an analysis tool to get a grip on the problems, but also as a design tool (Brouwer, 2009b).

3. Design: Part D
Of all 16 cases Haarlem was chosen as a test case to make a design for because of its low score and high potential. The validation tool provided a good start for designing the link in Haarlem. After that however the level of scale of the city centre was considered.

This analysis showed that the railway station and link are weakly integrated in the system of activity nodes of the city centre. This goes for Haarlem but also for other Dutch cities. To fix the link both the railway station and the link needed to become a better integrated part of the network. This was done by adding attractors and by turning the railway station environment itself also into an attractor and place of stay.

Fixing the Link: Part E
Getting back to the main research question of the graduation project (What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre?) this can now be answered in four steps:

1. When dealing with a certain broken link between central railway station and city centre in the Netherlands, first of all the quality of this link should be validated with the help of the validation tool. In this way its strong and weak spots can be found. Furthermore the first recommendations for fixing the link can be made;
2. Then the railway station environment and link should be analysed on the scale of the city centre as a part of a network of activity nodes;
3. To fix the link both the railway station and link need to be integrated into the system of activity nodes of the city centre by adding nodes in the form of attractors and by changing the railway station environment itself into a place of stay and therefore an attractor as well.
4. Then the links themselves should be designed with the help of the criteria from the literature study. In other words, all links should be lively, have human scale, be legible and be safe & comfortable.

1. Liveliness
   a. Mixed Use;
   b. Use along the Day;
   c. Creating an Atmosphere of Watching and Being Watched;
2. Human Scale
   a. Permeability;
   b. Fine Grained Building Blocks;
   c. Walkability;
3. Legibility
   a. Orientation;
   b. Linearity of the Path;
   c. Clarity of the Maps and Signage;
4. Safety & Comfort
   a. Pedestrian Priority;
   b. Eyes on the Street;
   c. Maintenance.
Reading Guide

This Master’s Thesis consists of five parts:

Part A - Introduction;
Part B - Theory;
Part C - Research;
Part D - Design;
Part E - Conclusions.

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

Part B discusses the theoretical background of the thesis in the form of a literature study.

Part C discusses a case study research on 16 Dutch cases. The cases are systematically compared and validated. The literature study formed the basis of this research.

Part D shows the design made for the city of Haarlem. Out of the 16 cases Haarlem was selected as one of the lowest scoring cases with a large potential. This part of the thesis shows how the theoretical background and the case study research forms the input for a strategic design to fix the link between railway station and city centre.

Part E represents the conclusions of the work. It forms the answer to the main research question and conclusions and recommendations are presented.
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Part A - Introduction

The Broken Link

Part A forms the introduction to the thesis. This part explains why there is a broken link between railway station and city centre in the Netherlands.

In the following chapters the problem field is discussed that led to the formulation of the main research question of the graduation project.

This main research question is divided into three sub research questions all represented by a different part of the thesis: Sub research question 01 is discussed in Part B, 02 in Part C and 03 in Part D.

This part of the thesis also speaks about the methodology that is being used to tackle these questions. Furthermore it discusses the relevance and disciplines of the project.
1. Problem Field

1.1 Setting the Scene
Imagine yourself taking the train to Haarlem, a city you have never visited before. In your head you already picture the small and cosy streets around the St. Bavo Church, the Teylers museum, the beautiful view on the Spaarne, the hofjes.. The images you found on the internet have made you form a clear image of the city. Your head filled with these pictures, you step into the train to get there as comfortable as possible. By internet and by speaking with some friends you were already informed that it is only a 10 minutes walk from railway station to city centre and that parking your car in the city is difficult.

When your train arrives at the railway station you are amazed by this beautiful building. It suits the picture you formed of Haarlem perfectly. You are led to the beautiful main hall of the station and glare impressed at the leaded-lights above the entrance. And then you exit the station.
All of a sudden you find yourself surrounded by buses, cars, bicycles, people, buses, bicycles, buses, bicycles. And did you mention the bicycles and buses? There is a bus stop right in front of the entrance of the railway station which obstructs your view completely. Then you find a sign post telling you to go in the opposite direction you expected. After a while, after you have almost got run over by a bus, you get the hang of it and start to follow the instructions on the sign posts.

Finally you arrive at a street that brings you directly to the city centre. It still takes a while to get there because the side walks are too narrow for all the people using it and you have to wait quite a long time at a traffic light. When you arrive at the big market square Haarlem turns out to be everything you expected.

The example of Haarlem is unfortunately not a unique example of how Dutch cities welcome their train travelers: In several cities in the Netherlands there is a broken link between railway station and city centre. This thesis discusses this broken link in the Netherlands and is a search for spatial design interventions that can help to fix the link. Also academics have understood the problem of integrating mobility environments such as railway stations in the urban social spatial fabric (Rooij & Read, 2008).

The following sections discuss why there is a broken link between railway station and city centre and results in a problem statement. After that the research questions of the graduation project are discussed including the methodology that was used to answer them.
INTRODUCTION

The Broken Link

Figure 1.3: Station Square Haarlem

Figure 1.4: Right after exiting the Railway Station
1.2 The Railway Station
The last decades the mobility of people has increased enormously and is ever increasing. This is mainly due to the economical development of the Western world. Technological innovations have made the distances we travel larger and thus the world seem smaller (Rooij, 2005; figure 1.5). As a consequence, traffic streams in between cities are increasing.

This increased mobility causes a lot of pressure on the infrastructure and the environment, as a result of which there is a mounting concern about sustainability. More and more the importance of public transport is emphasized as the solution to the negative effects of mobility. Investments in public transport are high on the agenda of policy makers (ibid.).

The train is the only transport modality that can compete with the car when it comes to transportation on a regional level of scale, because of its speed and comfort. Furthermore the railway station offers a good entrance to the city, being both an accessible node (accessible by different modes of transport on different levels of scale) and an accessible place in the city, often situated nearby the city centre (Bertolini & Dijst, 2003; figure 1.6).

Because of this important function of the railway station it has become a place where a lot of different transport modalities, different functions and different people are brought together, which also means that a lot of different actors are involved. This usually makes it a chaotic place that is mainly focused on traffic: People walking from train to bus, buses driving to their stops, bicycles running over people to get in time to the train etc. In all this hustle and bustle of people moving and getting at certain places in time,
network considerably accelerates the process of time-space compression in Europe. The significant reduction in travel times between cities and regions over recent decades has been interpreted most expressively in the map of 'shrinking Europe' by Spiekermann and Wegener (Figure 1.2). The map shows how distances are deformed in relation to travel time between regions by high-speed train (not including, therefore, the effects of increasing air transport). Planned improvements will, for a constant timescale, effectively bring regions closer together. In 1991, shrinkage is mainly limited to France, which at that time had by far the most extensive high-speed network. By 2010, the European network will have been expanded and other countries will be affected too, notably Spain, Italy and Germany.

However, time-space compression involves more than merely shorter travel times (Janelle and Gillespie, 2004:667). There is also a strong cultural element in it. According to Harvey (1990:240), it entails:

... processes that so revolutionize the objective qualities of space and time that we are forced to alter, sometimes in quite radical ways, how we represent the world to ourselves.

This aspect is crucial to understanding the impact of the high-speed train on urban development. Besides being an efficient means of transport for many, the HST has an international image: the mere possibility of lunching in Paris and being back in Amsterdam, London or Marseille before dinner – even if few people actually do – and the possibility of commuting over long distances. Moreover, it provides an elegant way of travelling. The high-speed train is considered clean, chic and stylish, making a large part of many railway companies' rolling stock look like old junk in comparison. Altogether, at present it enjoys more or less the same fashionable image that was the preserve of the...
the quality of the public space is usually forgotten. It mainly serves all the traffic taking place in it. The weakest user in traffic, the pedestrian, is left to its fate (figure 1.8).

The Dutch Railways (NS) have come to realise the importance of focusing on the experience of the journey of their customers. They have studied their customers extensively (figure 1.9) and are designing their new railway stations in such a way that all customer types have both a pleasant transport and a pleasant transfer time. An important part of this new strategy is to design the railway stations as multifunctional nodes (figure 1.10): The train station is not only a place where you go to take the train, but you can also do some shopping, have a meal, go workout, have a business meeting or simply sit down with a cup of coffee and watch all the people passing by (NS, 2008; NS, 2006; Van Hagen & De Munck Mortier, 2003; NS Poort, 2009).

This positive development currently stops at the station building, this being owned by the Dutch Railways. The station square is part of the public space of the city and therefore it is the responsibility of the municipality. But there are several other actors involved in the arrangement of these squares, like bus companies, taxi companies, actors owning the real estate surrounding the square etc. This requires integral planning which is usually a difficult process.

1.3 The City Centre
Another consequence of the growing econcomy and mobility is the increased competition between cities. The increased velocity of transport modalities has brought places closer to each other (figure 1.12) as a result of which there is more competition between
Figure 1.8: In front of railway station Amsterdam Centraal: The pedestrian is left to its fate (Photo by Rienk Mebius, 2008)
cities. The last years several cities have invested in attracting visitors and extending their stay in the city to stimulate the local economy. Hereby the focus is often on the city centre as it offers many activities and opportunities for sight seeing and shopping (Van der Hoeven et al., 2008). City marketing has become a new trend in policy (figure 1.11).

1.4 The Link between Railway Station & City Centre
As the railway station becomes an important entrance to the city and cities are promoting their city centres, the link between these two places becomes an important part of the city that has to serve more and more people per day. It is also the part responsible for the arrival experience in the city of visitors traveling by train and therefore the place to make a good first impression.

Research shows how the attractiveness of the entrance of the city influences the potential for tourists income for the city. The amount of hours that the visitor will stay and the amount of money he will spend is dependent on the attractiveness of the entrance (Van der Spek, 2006). It is therefore important that the link between railway station and city centre - being responsible for the arrival experience of the visitor - is a strong and attractive link. Both the city and the Dutch Railways could benefit of this.

1.5 The Broken Link
Historically most of the Dutch railway stations were placed outside the city’s walls (figure 1.13). The advantage of doing this, was that there was no direct confrontation between the railway and the historical city centre, which made a big difference in the costs. In the last twenty years of the 19th century the urban area of many Dutch cities expanded considerably.
Figure 1.11: Examples of city marketing (Source: tourpress.nl, takepart.com, tndmedia.nl, fdcw.org)
As a result, the areas that used to be on the outside of the city, were now completely surrounded by new districts; what used to be on the outside, was now right in the inside (Cavallo, 2008; figure 1.15).

This typical Dutch case with the railway station positioned at the border of the historical city centre is subject of this thesis.

Nowadays, walking from the railway station to the city centre means crossing several barriers (figure 1.18): Usually there is a ring road around the historical city centre that has to be crossed, including a canal. Ironically, as has been shown in the first section of this thesis, in most cases the square in front of the station is a barrier for pedestrians as well.

The route walking from railway station to city centre is often disorienting (figure 1.19): Several turns have to be made which makes it difficult for the visitors to orientate themselves. Clear landmarks, that can help to guide the visitors, are sometimes missing.

Furthermore the public space along the link usually has a low quality and activity in the plinth is lacking (figure 1.20) which makes the mental distance quite long. This is due to the fact that in between historical city centre and railway station more modern buildings were built in a completely different style with much less attention for detail. In comparison with the refined buildings in the historical city centre, these buildings come across quite plump and boring.

In most cases in the Netherlands the link between railway station and city centre is thus unattractive and lacks vitality (Kusumo, 2007); the link is broken and...
Figure 1.13: Historical placement of railway stations in the Netherlands (Cavallo 2008, p.36)

Figure 1.14: The Randstad in the year 1850 and in 2000; the enormous expansion of cities is visible (Cavallo 2008, p.25)
1.6 Problem Statement

Summarizing we come to the following problem statement:

As the Dutch railway station is becoming an increasingly attractive entrance to the city and cities promoting their city centres, the link between railway station and city centre is becoming increasingly important for the arrival experience of visitors of the city.

However, this link is often broken: the pedestrian has to cross several barriers to get to the city centre, the route is disorienting and the public space is unattractive and lacks vitality.
**A - INTRODUCTION - The Broken Link**

Figure 1.18: Several barriers have to be crossed

Figure 1.19: The route is disorienting

Figure 1.20: The public space has a low quality
2. Field of Objectives

2.1 Main Objective
The main objective of the thesis is to develop spatial design interventions to create a strong, vital and attractive link between the Dutch central railway station and city centre. To put it simple: the link between railway station and city centre needs to be fixed (figure 2.1).

2.2 Further Objectives
In terms of city marketing we already discussed how the city has the opportunity to make a good first impression on visitors during their way from station to city centre. Therefore the focus of the project is on the unfamiliar visitor (and pedestrian) of the city. The idea behind this is that if even a person that is unfamiliar with a certain city can find his way to the centre, the link will be appropriate for regular visitors and inhabitants as well. In other words: the focus lies on the unfamiliar visitor traveling on foot to the city centre, but eventually the spatial design interventions will serve all pedestrians using the link.

Another objective is to add to the body of knowledge on the subject. As has been described in the previous chapter studying the link between railway station and city centre is relatively new. In her dissertation Camelia Kusumo (2007) points out how a lot of authors have written about railway station environments and others have studied city centres extensively, however the link between these two places is a relatively new study object. Also Rooij & Read (2008) have pointed out the importance of integrating mobility environments into the city’s network. This thesis can be an addition to the work done so far and hopefully will initiate new research on the link between railway station and city centre.

2.3 Products Graduation Project
The graduation project officially has three intended end products: a literature study described in a paper, a research and a design. The literature study helps to form a theoretical framework for the thesis, the research gains input from practice for the project and the design forms a test case to test our findings from theory and practice. The three intended end products help structure the thesis: Part B is the theory part, C is the research part and D is the design part. Furthermore the end products form the basis of the three sub research questions that are extracted from the main research question. These questions including the methodology used to tackle them are discussed in the following chapters.
Figure 2.1: The main Objective: Fixing the Link
3. Research Questions

In this chapter the research questions of the graduation project are discussed. First the main research question is explained, after which the three sub research questions are introduced.

3.1 Main Research Question
The main research question of the graduation project is:

What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre?

There are two notions in this question that need further clarification: the Dutch central railway station and the city centre.

3.2 The Dutch Central Railway Station
As has been described in chapter 1 the lack of vitality between railway station and city centre is mostly caused by its historical placement outside of the historical city. Therefore the project will only discuss Dutch railway stations that have a similar history and therefore comparable problems.

Furthermore only the central railway station will be discussed. In the case of Delft for example, Delft Zuid is not of importance for this project.

3.3 The City Centre
When considering the link between central station and city centre, the former is a clear starting (or ending) point; it is one building. The latter however is quite a broad notion; what exactly is the ending (or starting) point of our link?

Figure 3.2 shows a map of Maastricht. In yellow the streets with retail in the plinth are mapped. We see that some streets that are used by a lot of people per day form an expansion of the retail area. We call these streets Aanloopstraten, roughly translated as ‘Access Streets’. These are the streets where the visitor of the city gets the impression of entering the city centre. We define the start of the city centre (i.e. point B in figure 3.1) at the start of the access streets of the city.

To define this point a definition was made by the author. If 90% of the plinths along a profile was active it was defined as access street. Figure 3.3 shows an example of defining activity in one side of a profile: The profile contains 8 buildings and also 8 of them have activity in the plinths in the form of retail. Therefore it has a score of 100%. The other side of the street has to be checked as well.

3.4 Sub Research Questions
To be able to answer the main research question of the graduation project, it is divided into three sub research questions. The answers to the sub research question have lead to the answer to the main research question. In the following the sub research questions are discussed.

3.5 Sub Research Question 01
First of all we need to define what we mean by a strong and vital link. In literature we need to search
Figure 3.2: Example access street in Maastricht (Brouwer 2009b, p.176)

Figure 3.3: Example access street in Delft (*Binnenwatersloot*), Brouwer 2009b, p.15
for definitions for public space quality and criteria that have to be met to create this quality. Then we need to find out which of these criteria are applicable to the link between railway station and city centre.

**We could ask ourselves the question:**

What are criteria for successful public space applicable to the link between the Dutch railway station and city centre helpful for design and planning?

### 3.6 Sub Research Question 02

Furthermore the quality of the current links in the Netherlands have to be studied. We need to find comparable cases and check if they meet the list of criteria for a strong and vital link between railway station and city centre. Furthermore we need to find out if we can draw general conclusions on the quality of the link in the Netherlands.

**We could ask ourselves the question:**

What is the current quality of the link between railway station and city centre in comparable cases in the Netherlands?

### 3.7 Sub Research Question 03

Finally we need to find a way to translate the list of criteria and our findings from practice into a spatial design for a certain city. We need to pick one of the case studies with a low score to make a design for and fix the link between station and city centre.

**We could ask ourselves the question:**

How are the criteria for successful public space and the conclusions derived from the case studies applicable in a spatial design for the city ... ?

The answers to these three sub research questions lead to the answer to the main research question of the thesis (*figure 3.4*).

The next chapter discusses the methodology that is used to tackle these questions.
A - INTRODUCTION - The Broken Link

Main RQ: What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre?

Sub RQ 01: What are criteria for successful public space applicable to the link between the Dutch railway station and city centre helpful for design and planning?

Sub RQ 02: What is the current quality of the link between railway station and city centre in comparable cases in the Netherlands?

Sub RQ 03: How are the criteria for successful public space and the conclusions derived from the case studies applicable in a spatial design for the city ... ?

Spatial Design Interventions that can fix the link

Figure 3.4: Research Questions schematically presented
4. Methodology

This chapter discusses the methodology of every sub research question. The sub research questions have a direct link with the intended end products of the graduation year (the Literature Study and the Research and Design) as described in chapter 2. Per question is explained to which required end product it is related. Figure 4.1 shows the research questions in a schedule.

4.1 Methodology Sub Research Question 01
Sub research question 01 (What are criteria for successful public space applicable to the link between the Dutch railway station and city centre helpful for design and planning?) is answered by studying literature on the quality of public space. This literature study is one of the required end products of the graduation project.

The objective of the study is to make a list of criteria for successful public space. Therefore the work of leading authors in the field of (design of) successful public space are studied from the 20th and 21st century. First a summary of the work is made, after which a list of criteria is composed. Then it is discussed if and how the criteria are applicable to the link between railway station and city centre.

To make the criteria usable for practice they must be formulated as follows:
1. What: the criterion is explained;
2. Why: the criterion is grounded on literature;
3. How: it is explained how the criterion can be measured (this is a direct basis for sub research question 02).

The findings of this study are discussed in a paper for the course AR3U021 Theory of Urbanism (Brouwer, 2009a).

4.2 Methodology Sub Research Question 02
Sub research question 02 (What is the current quality of the link between railway station and city centre in comparable cases in the Netherlands?) is answered by doing a case study research. Research is also one of the required end products of the graduation year.

The criteria for successful public space derived from literature are used to make a validation tool for the quality of the link between station and city centre (therefore the ‘how’ is used from the what/why/how formulation of the criteria). The tool is used to validate 16 comparable cases in the Netherlands. Two main criteria for selecting these case have been mentioned in the previous chapter. The results of the case studies analysis are published in an Atlas (Brouwer, 2009b). A grade is given for every separate criterion and in the end all the cases are compared to find good and bad practices.

For this the locations are visited and notes, sketches and photos are made. Finally the results of all the case studies are compared and (general) conclusions are derived. Chapter 8 of this report discusses the case study research.

4.3 Methodology Sub Research Question 03
Sub research question 03 (How are the criteria for successful public space and the conclusions derived from the case studies applicable in a spatial design for the city ... ?) is answered by making a design. A design is the last required end product of the graduation year.

Out of the 16 case studies one city is selected with
Main RQ: What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre?

Sub RQ 01: What are criteria for successful public space applicable to the link between the Dutch railway station and city centre helpful for design and planning?
Result: PAPER > CRITERIA
Method: Literature

Sub RQ 02: What is the current quality of the link between railway station and city centre in comparable cases in the Netherlands?
Result: ATLAS > VALIDATION TOOL
Method: Case Studies

Sub RQ 03: How are the criteria for successful public space and the conclusions derived from the case studies applicable in a spatial design for the city ... ?
Result: DESIGN > TEST CASE
Method: Paper + Atlas

Sub RQ 04: Spatial design interventions to fix the link

Figure 4.1: Project Schedule
a low score. Furthermore it is checked with NS Poort what city they would like to see a design for. Finally the city of Haarlem was selected.

As starting point for the design the criteria from the literature study and the results from the case studies are used. Furthermore the chosen location is further analysed. Techniques for designing are among others sketching, location visits, photographing, mapping and 3D modeling.

To make a head start designing a workshop on the city of Haarlem was organised in April (the workshop took place before the city was selected as subject of design).

**4.4 Interrelationship Research Questions**

When answering sub research question 01 input was derived from the case study research. Parallel to the literature study the validation tool for the case study research was made. Furthermore the workshop on the city of Haarlem also formed a direct input for the literature study.

Sub research question 02, the case study research, got its input directly from literature in the form of the list of criteria. Furthermore the workshop on the city of Haarlem also formed input because it was the first time in the project that a case from practice was systematically analysed and designed for.

Sub research question 03, the design, got its input directly from the case study research. The validation tool pointed out the weaknesses of the link and gave it also clear design tasks. But also the input from literature was used. Some important findings on public space quality were not directly translated into the validation tool. For instance because they were difficult to measure. In the design these findings were translated.

*Figure 4.2* shows the interrelationship of the three sub research questions in relation to the main research question. The answers to the three sub research questions and the correlation between the three finally results in spatial design interventions to fix the link between railway station and city centre in the Netherlands.

**4.5 Research by Design or Design by Research?**

When we study the relationship between the sub research questions, we see how research on both literature and practice forms the basis of the graduation project. However, by simply starting designing (for instance by organising a workshop early in the graduation year) important conclusions can be found that can be used as input for the research. So even though this project seems to be a ‘Design by Research’ it is not that black and white and it will always be a combination of both ‘Design by Research’ and ‘Research by Design’.
Figure 4.2: Interrelationship between research questions
5. Relevance & Disciplines

5.1 Academic Relevance
The project contributes to the existing Body of Knowledge by doing research on the link between railway station and city centre. Except for the work of Camelia Kusumo (2007) no research has been done yet on this important part of our cities. Kusumo bases her findings mainly on space syntax analysed and two dimensional mapping. This research will focus on the experience of the pedestrian and the elements adding to this experience while walking from railway station to city centre.

Another addition to the Body of Knowledge is the validation tool that is developed as a tool to answer sub research question 02. This tool arms the researcher with operational definitions to measure the quality of the link between railway station and city centre to find what part of the built environment is responsible for this vitality. Furthermore it can be used in practice by urban planners. The systematic comparison of 16 Dutch cases also forms an addition to the Body of Knowledge.

5.2 Societal Relevance
By making a strong link between railway station and city centre, the competitiveness of the city will improve. Because of the attractive connection to the city, visitors coming by train will get a positive image of the city. They will stay longer, spend more money and will probably return (Van der Hoeven et al., 2008; Van der Spek, 2006). They might even talk about their positive experiences and seduce other to visit the city as well.

Furthermore traveling by train becomes more attractive as an alternative for the car. This has a positive effect on the environment.

The pedestrian friendliness of the public space will be improved as well. This will have positive effects on the liveability and walkability of the city and will therefore be a great improvement for its inhabitants and visitors. Improving the walkability also means making the city more sustainable (Gehl & Gemzøe, 2006). Kopenhagen is a good and successful example of this (figure 5.1).

5.3 Disciplines
Disciplines involved in this project are Spatial Planning and Strategy (mentor Remon Rooij), Urban Design and Design of Public Space (mentor Stefan van der Spek) and Renovation, Modification, Intervention and Transformation of the built environment (mentor Lidy Meijers).

Furthermore an important actor in the project is NS Poort, the real estate division of the Dutch Railways (mentor Sebastiaan de Wilde).

5.4 What follows
The following three parts of the thesis all represent a sub research question of the graduation project. Part B represents sub research question 01, C question 02 and D question 03. Part E summarises all the work done and draws general conclusions.
Figure 5.1: Street in Kopenhagen. On the left before and on the right after the renovation in 1992. The street is no exception in Kopenhagen. Pedestrianising a major part of the city centre has proven to be a large succes (Gehl et al.2006, p.15)
Part B - Theory
Studying the Link

This part of the thesis corresponds with sub research question 01 (What are criteria for successful public space applicable to the link between the Dutch railway station and city centre helpful for design and planning?). The question is answered with the help of a literature study on the work of leading authors in the field of (design of) public space quality in the 20th en 21st century. The objective was to make a list of criteria for a strong and successful link between railway station and city centre. This list of criteria is used as a direct input for answering sub research question 02 (Part C).

Over the years many researchers, designers and planners have tried to find the answer to the question: what makes public space successful? It is relatively easy to point out specific places that are commonly considered to be successful. To show however what it is exactly that makes a certain place more attractive than another place is something different.

The following chapters discuss a conceptual framework for successful public space based on literature from the second half of the 20th century. Then it is argumented how this conceptual framework is still valid for work published after this period. Subsequently it is proposed to adjust the conceptual framework. After this the work of all the authors that have been discussed is summarized in a list of criteria applicable to the link between railway station and city centre.

1 The results of the literature study are published in a paper (Brouwer, 2009a)
6. Successful Public Space

6.1 A Conceptual Framework for Successful Public Space

The debate about successful public space in the 20th century roughly distinguishes three points of view; there are the authors that stress the importance of the physical setting, the authors that consider activity on the streets to be the key to successful public realm and the ones emphasizing the sensory experience of people when moving through public space.

Architect and urban designer Gordon Cullen belongs to the group stressing the importance of the physical setting. In his book *The Concise Townscape* (Cullen, 1961) Cullen shows in a series of photographs and sketches how amongst others design styles, ornamentation, gateways, vistas, landmarks and the way buildings open out into spaces contribute to the quality of public space. *Figure 6.1* is an example of Cullens way of analysing public space quality.

An author of the second group that considers activity as an important element of public space is Jane Jacobs. In *The Death and Life of Great American Cities* (Jacobs, 1961) she attempts to explain how cities work in real life. Hereby she emphasizes the importance of streets and sidewalks as places where all the different people from the city get out of their houses and actually meet each other; streets and sidewalks of a city are its most vital organs. Jacobs says that a sidewalk is lively because of its functional and physical diversity among uses and therefore diversity among users and their time schedules. She names four conditions for generating this diversity (see *figure 6.3*).

The third and last group is represented by Kevin Lynch and his book *The Image of the City* (Lynch, 1961). In his work he stresses the need for people (and for other organisms as well) to recognise and pattern their surroundings. To him a ‘good’ city is a city that is easily legible and has a clear image. According to Lynch an environmental image is formed by identity (distinction), structure and meaning (practical and emotional). He divides the city into five elements: paths, edges, districts, nodes and landmarks and describes how careful design of these elements can contribute to a better image of the city. *Figure 6.2* shows an analysis of the city of Boston with the help of the five elements.

In 1998 John Montgomery summarizes these three points of view in a conceptual framework. Based on a scheme developed by Punter in 1991 (Punter, 1991; *figure 6.4*) Montgomery argues that three elements - activity, form and image - together form an urban sense of place (*figure 6.5*). Furthermore he develops a list of 25 principles for achieving this urban sense of place (*figure 6.6*) grounded on literature study. Based on later work of Lynch (1981) Montgomery also argues that the form is the ‘fit’ (or precondition) for the other two elements; a city form can be so designed as to stimulate activity, a positive image and therefore a
Figure 6.1: Serial Vision of Walking through a town (Cullen 1961, p.17)

Figure 6.2: Analysis of Boston with the help of paths, edges, nodes, districts and landmarks (Lynch 1961, p.145-146)
strong sense of place.

6.2 Successful Public Space in literature in the 21st century: Form, Activity or Image
Montgomery’s conclusion that researchers consider the quality of a place in terms of Form, Activity or Image, has proven to be applicable also for later work. In the following, literature on quality of public space from the 21st century is discussed. Per author is shown which of the three elements – Form, Activity or Image – is emphasised (see diagrams).

Considering the element of Form, Raymond Isaacs investigated the relationship between aesthetics of the built environment and pedestrian behaviour. With the help of a literature study in combination with field studies in Dresden, Isaacs concludes that there is a relationship between urban form and aesthetic experience. The relationship between aesthetic experience and pedestrian behaviour however is not supportive (Isaacs, 2000). In other words; built environment does contribute to quality of public space. However, this quality does not guarantee pedestrian activity.

Whereas, according to Jan Gehl and Lars Gemzøe, pedestrian activity in particular is crucial for the quality of public space (Gehl & Gemzøe, 2006). They consider the city as a meeting place where the public space is the facilitator. High quality public space that facilitates human interaction well, will contribute to the sustainability of a city. Gehl and Gemzøe argue that investments in public space should be done to stimulate pedestrian and urban activities. To them the element of activity is therefore the key to succes.

Van der Hoeven, Smit and Van der Spek stress the importance of the legibility of cities and thus focus on the element of image. For the sustainability of a city its competitiveness with other cities has become increasingly important and therefore its ability to attract visitors and lengthen their stay in the city. Signage, city maps, GPS and lighting are used as tools to improve the legibility and the quality of the public realm (Van der Hoeven et al., 2008).

Orum & Chen are more philosophical in defining quality of place. They see the city as ‘more than simply material facts of existence: they represent the social forms that serve to make us who we are’ (Orum & Chen 2003, p.x). According to Orum & Chen a place has four meanings (figure 6.7). Reflecting on Lynch’s theory on the image of the city, it is concluded that Orum & Chen discuss the identity and meaning of a place, whereas Van der Hoeven et al. discuss its structure.

Figure 6.7: Meanings of Place (Orum & Chen 2003, p.11)

Four meanings of place according to Orum and Chen:
1. A sense of individual identity: of who we are;
2. A sense of community: being part of a larger group (family neighbourhood etc.);
3. A sense of past/future: a place behind us and ahead of us;
4. A sense of being at home: being comfortable, in place.
Figure 6.4: Components of a sense of place according to Punter (1991)

Figure 6.5: Components of a sense of place according to Montgomery (1998, p.98)

Figure 6.6: Principles for achieving an urban sense of place (Montgomery 1998, p. 114)

<table>
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<tr>
<th>(A) Activity</th>
<th>Principle 1: Generating pedestrian flows and vitality</th>
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<td></td>
<td>Principle 2: Seeding people attractors</td>
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<td></td>
<td>Principle 3: Achieving a diversity of primary and secondary uses</td>
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<td>Principle 4: Developing a density of population</td>
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<td>Principle 5: Varying opening hours and stimulating the evening economy</td>
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<td>Principle 6: Promoting street life and people-watching</td>
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<td>Principle 7: Growing a fine-grained economy</td>
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<th>(B) Image</th>
<th>Principle 8: Legibility</th>
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<td></td>
<td>Principle 9: Imageability</td>
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<td></td>
<td>Principle 10: Symbolism and memory</td>
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<td>Principle 11: Psychological access</td>
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<td>Principle 12: Receptivity</td>
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<td>Principle 13: Knowledgeability</td>
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<th>(C) Form</th>
<th>Principle 14: Achieving development intensity</th>
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<td></td>
<td>Principle 15: Zoning for mixed use</td>
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<td></td>
<td>Principle 16: Building for a fine grain</td>
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<td>Principle 17: Adaptability of the built stock</td>
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<td>Principle 18: Scale</td>
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<td>Principle 19: City blocks and permeability</td>
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<td></td>
<td>Principle 20: Streets: contact, visibility and horizontal grain</td>
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<td>Principle 21: The public realm</td>
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<td>Principle 22: Movement</td>
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<td>Principle 23: Green space and water space</td>
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<td>Principle 24: Landmarks, visual stimulation and attention to detail</td>
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<td></td>
<td>Principle 25: Architectural style as image</td>
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</table>
6.3 Successful Public Space in practice in the 21st century: Form, Activity and/or Image, Safety & Comfort

We can conclude that quality of public space is a topic that has been thoroughly discussed in literature. The ideas about public space quality however are also put in practice by a couple of British and American organisations: Living Streets, Projects for Public Space (PPS), Walk 21 and Active Living Research. Whereas in literature the authors seem to be focusing on one of the three elements, the organisations see quality of public space as a result of two or all three of the elements of Form, Activity and Image.

The British organisation Living Streets for example, developed a scheme with criteria for walkable streets (figure 6.8). According to the organisation traffic priorities have overwhelmed the streets. It is their task to stand up for the pedestrians and create safe, attractive and enjoyable streets where people want to walk. The criteria displayed in the scheme deal with both Form and Image. However, the organisation introduces a new perspective for looking at public space quality; the perspective of the pedestrian. Even though all the authors have mentioned the importance of focus on the individual human being, no author has made criteria like reduced street crime, high maintenance and appropriate volume and speed of traffic explicit. In other words; the safety and comfort of the pedestrian.

The American organisation PPS also developed a diagram (figure 6.9) to show ‘what makes a great place’ (PPS, 2009). Accept for the elements of Activity and Image, their focus is also on the safety and comfort of pedestrians.

A third organisation is Walk 21. The previously mentioned author Lars Gemzøe is in the board of this British organisation that ‘exists to champion the development of healthy sustainable and efficient communities where people choose to walk’ (Walk 21, 2009). For these communities the organisation developed a diagram (figure 6.10). Whereas Living Streets and PPS focus on a more local scale of streets and specific places, Walk 21 takes a higher level of scale of a community into account. Once again we see a focus on two elements – Activity and Image – and also a clear focus on the safety and comfort of the pedestrian.

In the scope of the Active Living Research Program a research has been done that was recently published in the article Measuring the Unmeasurable by Reid Ewing and Susan Handy (2009) about the relationship between built environment and walkability. This relationship is suggested in the conceptual framework in figure 6.11. According to Ewing et al., urban design qualities, being dependant on physical features and evoking individual reactions, are responsible for the overall walkability of a place. In their research Ewing et al. developed an observational validation tool to objectively measure these urban design qualities. The field manual that was made to do this measurement (Purciel & Marrone, 2006) not only measures the
Living Streets are Walkable Streets

What Makes a Great Place?

Figure 6.8: Living Streets are Walkable Streets (Living Streets, 2009)

Figure 6.9: What makes a Great Place? (PPS, 2009)

Figure 6.10: Diagram Walk 21 (2009)

Figure 6.11: Conceptual Framework Built Environment in relationship with Walkability (Ewing & Handy 2009, p.67)
height of buildings, the proportion of windows in the facades – in other words; the physical features or form – but also how many people are on the street, what kind of functions are located in the street – in other words; the activities. Furthermore the image is measured by counting the amount of parks, plazas, recognisable buildings etc. This study is thus an attempt to measure all three elements that define a place according to Montgomery. Safety and Comfort of the pedestrian is however not mentioned. Just like Montgomery, Ewing et al. see the physical setting as a ‘fit’ or precondition for Activity and Image.

6.4 Adjusting the Conceptual Framework
Summarizing, we have seen how quality of public space has been studied from three angles: Form, Activity and Image. Studying organisations that deal with improving public space, we observed a fourth angle: The focus on the safety and comfort of the pedestrian. Furthermore we noticed how some authors considered the Form to be the ‘fit’ or precondition for Activity and Image (Lynch, 1981; Montgomery, 1998; Ewing & Handy, 2009).

With this in mind we reconsider the table of criteria formulated by Montgomery as seen in figure 6.5. As we have already seen, Montgomery formulated a list of principles per element. However, Form being the ‘fit’ for Activity and Image, we notice several cross relationships. For instance principle 15 (zoning for mixed use) has a diversity of primary and secondary uses (principle 3) as a result. In this way several cross relationships can be made (figure 6.12).

That being said, it is now suggested to adjust the conceptual model for the quality of public space. The new model makes clear how Form is the basis or precondition of Activity and Image and how these two result in the quality of the public space (figure 6.13). The model can also be turned around; when the quality of a place is low, it will have a bad image and there will be less activity. Eventually this may lead to an alteration of the form.

The objective of this paper is to make a list of criteria that represent this Form as the basis of Activity, Image and eventually the quality of public space. This list will be discussed in the next paragraph.

6.5 Criteria for Successful Public Space
Summarizing the work studied so far, it can be stated that public space has to meet four main criteria to be successful.

Public space will be successful when:
1. the streets are lively,
2. the built environment has a human scale,
3. it is easily legible,
4. and the pedestrians feel safe & comfortable.

Ad 1: Liveliness refers to the amount of people on the street. When there is a lot to do in a place, there are a lot of people moving around in the street, which creates a lively, vital city scene. It is therefore important to create people attractors and to make sure that they attract people along the entire day. Furthermore there should be enough places to sit down to create an atmosphere of watching and being watched. These eyes on the street also evoke a sense
Figure 6.12: Principles for achieving an urban sense of place (Montgomery 1998, p. 114 & 98)

(A) Activity
- Principle 1: Generating pedestrian flows and vitality
- Principle 2: Seeding people attractors
- Principle 3: Achieving a diversity of primary and secondary uses
- Principle 4: Developing a density of population
- Principle 5: Varying opening hours and stimulating the evening economy
- Principle 6: Promoting street life and people-watching
- Principle 7: Growing a fine-grained economy

(B) Image
- Principle 8: Legibility
- Principle 9: Imageability
- Principle 10: Symbolism and memory
- Principle 11: Psychological access
- Principle 12: Receptivity
- Principle 13: Knowledgeability

(C) Form
- Principle 14: Achieving development intensity
- Principle 15: Zoning for mixed use
- Principle 16: Building for a fine grain
- Principle 17: Adaptability of the built stock
- Principle 18: Scale
- Principle 19: City blocks and permeability
- Principle 20: Streets: contact, visibility and horizontal grain
- Principle 21: The public realm
- Principle 22: Movement
- Principle 23: Green space and water space
- Principle 24: Landmarks, visual stimulation and attention to detail
- Principle 25: Architectural style as image

Figure 6.13: Conceptual Framework for Successful Public Space
of safety (Jacobs, 1961; Montgomery 1998; Purciel & Marrone, 2006; PPS, 2009; Ewing & Handy, 2009).

Ad 2: Human scale of the built environment refers to the physical setting of a place that matches the size of human beings and corresponds to the speed at which humans walk (Purciel & Marrone 2006). Therefore it is important that building blocks are short and fine grained. Furthermore distances should be walkable (Jacobs, 1961; PPS, 2009, Ewing & Handy, 2009).

Ad 3: Legibility of public space refers to the ease in which people can recognise and pattern their surroundings (Lynch, 1961). Orientation and clarity of paths, with the help of signage, is therefore an important point of focus (Lynch, 1961; Montgomery, 1998; Living Streets, 2009; Walk 21, 2009).

Ad 4: Safety and comfort refers to the way pedestrians feel in public space. Because they are the weakest users of the street, they need the most protection. As we have learned, the presence of people on the streets is crucial for the vitality of a place. Therefore we need to make sure that these people feel safe and protected to assure their presence in public space. It is important to protect the pedestrians from other traffic, evoke a sense of social safety by making sure there are ‘eyes on the street’ and assure a high level of street maintenance (Living Streets, 2009; PPS, 2009; Walk 21, 2009).

6.6 Criteria for Successful Public Space applicable to the link between railway station and city centre

Having developed four main criteria for public space vitality, their relevance for the link between railway station and city centre should be checked. As we have already mentioned in the introduction, several railway stations were historically placed outside the city’s walls (figure 6.15). With the urban area of many Dutch cities expanding in the last twenty years of the 19th century (figure 6.16), the areas that used to be on the outside of the city, were now completely surrounded by new districts (figure 6.17); what used to be on the outside, was now right in the inside (Cavallo, 2008).

Nowadays, walking from the railway station to the city centre means crossing several barriers. Usually there is a ring road around the historical city centre that has to be crossed, including a canal. Ironically, in most cases even the square in front of the station forms a barrier for pedestrians. Because the route to the centre is often not very lively, the mental distance is also quite long (figure 6.18 & 6.19). It still feels like the railway station is outside of the city whereas it has become the inside.

The first criterion for public space quality, liveliness, does not seem to be relevant for the link between railway station and city centre; with the large amount of passengers using the train and walking to the station, liveliness seems to be guaranteed. However, the link between station and centre is often only used as traffic zone, to get from A to B as quickly as possible. The presence of people attractors is important to turn this place of flow around into a place of stay. Therefore there should be a mix of functions, that are used along the entire day and there should be places for people to sit down; for watching and being watched.

The second criterion, human scale, is also applicable to the link. As has been mentioned, the railway station was historically placed outside the – fine grained – historical city centre. This usually means that in terms of built environment there is a contrast between
THE EXPANSION OF THE BUILT-UP AREA NEXT TO THE DEVELOPMENT OF THE RAILROADS IN FIVE MIDDLE SIZED DUTCH TOWNS (HAARLEM, LEIDEN, DELFT, GOUDA, DORDRECHT).

The approach of the first railway lines to the Dutch cities. Hand sketches made by the author.

Figure 6.15: Historical placement of railway stations in the Netherlands (Cavallo 2008, p.36)

Figure 6.16: The Randstad in the year 1850 and in 2000; the enormous expansion of cities is visible (Cavallo 2008, p.25)

Figure 6.17: Development of Delft; absorption railway zone in urban fabric (Van Duin & Claessens 2008, p.106)
human scale buildings and large scale buildings. These large scale buildings give the impression to the pedestrian that he is still outside of the city centre and also still in the place of flow.

The third criterion, legibility, is very important for the link between station and city centre. People that come to visit a city and are not familiar with the place need clear directions. This can be done with the help of signage, but if the built environment itself gives a clear direction, this is even better.

The fourth and last criterion, safety and comfort, is also applicable. By creating mixed use along the link, the social safety will be improved because of the ‘eyes on the street’. Furthermore the street maintenance is important for the experience of the pedestrian. In terms of safety and comfort of the pedestrian along the link between station and centre there is still something missing; the barriers that the pedestrian has to cross between the two have been mentioned. Therefore it will be also important to watch the pedestrian priority in street design. The pedestrian should always have priority on the crossing. This could even mean that the crossing road must be put underground.

The final list of criteria can be found in figure 6.20.

A longer discussion on how the criteria are derived from literature and in what way they are applicable to the link between railway station and city centre is provided in Appendix A.
Preliminary main research question:
What spatial design intervention(s) can improve the vitality of the route between the Dutch central station and city centre?

The Missing Link
Creating urban buzz along the link between the Dutch central station and inner city

Preliminary main research question:
What spatial design intervention(s) can improve the vitality of the route between the Dutch central station and city centre?

The Missing Link
Creating urban buzz along the link between the Dutch central station and inner city

1. Liveliness
   a. Mixed Use;
   b. Use along the Day;
   c. Creating an Atmosphere of Watching and Being Watched;

2. Human Scale
   a. Permeability;
   b. Fine Grained Building Blocks;
   c. Walkability;

3. Legibility
   a. Orientation;
   b. Linearity of the Path;
   c. Clarity of the Maps and Signage;

4. Safety & Comfort
   a. Pedestrian Priority;
   b. Eyes on the Street;
   c. Maintenance.

Problem statement
As the mobility of people increases the physical places where mobility flows interconnect, such as train stations, are becoming increasingly important in our cities (Bertolini & Dijst, 2003).
The Dutch railway company, the NS, recognises this trend and aims to develop the Dutch central station into a multifunctional node (NS Poort, 2008).
The station becomes a new centre in our cities (Kusumo, 2008): complementary to the existing inner city centre.
However, the public space between these two centres remains unattractive and lacks urban buzz.

Objective
The objective of the project is to find spatial design solutions for creating a strong, vital and attractive link between the Dutch central station and the inner city.

Societal Relevance
Traveling by train becomes more attractive, which will have a positive impact on the environment. Furthermore an important part of the city becomes more liveable.

Academic Relevance
The existing ‘BoK’ will be developed with the help of case studies into practical design tools, that will be tested on a specific location.

Haarlem: How to get from the station to the city centre?

Haarlem: How to get from the station to the city centre?

Figure 6.18: Barriers along the link

Figure 6.20: Criteria for Successful Public Space

Figure 6.19: Station Square as barrier in Haarlem
7. Conclusion

As we have seen, this part of the thesis corresponds with sub research question 01 (What are criteria for successful public space applicable to the link between the Dutch railway station and city centre helpful for design and planning?).

7.1 Summary
To answer this question literature from the 20th en 21st century on public space quality was studied. The literature study resulted in a conceptual framework for successful public space (figure 7.1).

The model makes clear how Form or physical setting of a place is the precondition for Activity in that place and the Image of that place. This Activity and Image result in the perception of a certain quality of the public space. The model can also be turned around; when the quality of a place is low, it will have a bad image and there will be less activity. Eventually this may lead to an alteration of the form to turn the process once again around.

Also based on the literature study we stated that public space is successful if:

Public space will be successful when:
1. the streets are lively,
2. the built environment has a human scale,
3. it is easily legible,
4. and the pedestrians feel safe & comfortable.

From these four conditions is checked if and how they are applicable to the link between station and centre. This resulted in a list of criteria (figure 7.3).

When we go back to the conceptual framework in figure 7.1, we see how the currently broken link between railway station and city centre will be fixed by meeting all four criteria.

7.2 Conclusion
Sub research question 01 asked for criteria to fix the link between the Dutch railway station and city centre. The answer to the question is the list presented in figure 7.3. When the link meets this set of criteria it will be a successful and attractive link (see next two pages) and therefore a nice inviting entrance to the city for the unfamiliar visitor traveling by train.

7.3 What follows
The list of criteria forms a direct input for answering sub research question 02: The criteria are translated into a validation tool that was used to validate 16 Dutch links. The case study research is explained in the next part, part C, of this thesis.
When the Form is altered of the built environment (for instance 2 former dwellings are turned into 1 restaurant).

.. this results in Activity (the restaurant attracts visitors in the evening and has a terrace in front of the building).
.. and also a certain Image (the people dining outside on the terrace, give the street a lively and attractive image).
.. the Quality of the Public Space increases.

The other way around, when the Quality of the Public Space is low.

.. this results in a bad Image (for instance a place is not well maintained and commonly considered to be unattractive).
.. the Activity decreases (people do not visit a certain place anymore, so there are less people walking on the street).
.. the Form must be altered to turn the situation around.

Figure 7.1: Conceptual Framework for Successful Public Space and explanation of the model
In the following images the conclusions of this part of the thesis are summarised.

The images give the answer to sub research question 01 in five steps:

*What are criteria for successful public space applicable to the link between the Dutch railway station and city centre helpful for design and planning?*

Legend

- Railway Station
- City Centre
- Landmark
- Facades buildings along link

01. Liveliness needs to be created by extending the functions of the city centre;

02. But the railway station also has to open up to the outside to create more liveliness;

03. Furthermore a human scale has to be realised in the built environment;
04. And a clear and legible axis towards the city centre needs to be created, accompanied by landmarks;

05. Finally, the route has to be safe and comfortable for the pedestrians using it.
This part of the thesis corresponds with sub research question 02 (What is the current quality of the link between railway station and city centre in comparable cases in the Netherlands?). The question is answered with the help of a case study research on 16 Dutch links between railway station and city centre. The objective was to get an impression of the current situation in the Netherlands concerning the link between railway station and city centre and to find good and bad practices.

To judge what is ‘good’ and what is ‘bad’ a validation tool was developed that helped systematically validate and compare the cases. The tool directly uses the list of criteria from literature that has been discussed in the previous part of the thesis.

The following chapters discuss which cases were selected and on what grounds they were selected. Then the validation tool is discussed more in detail. After that the method of testing the cases is explained. Then the city of Haarlem is shown as an example of the testing, followed by an overview of the other cases. Finally general conclusions are discussed.

Of all 16 cases Haarlem, being one of the ‘bad’ examples from practice, was chosen as subject to make a design for. The design is explained in part D.

1 The results of the case study research are published in an atlas (Brouwer, 2009b)
8. Validating the Cases

8.1 Selecting the cases
The first step in doing the case studies was to select the cases. The cases were selected on two grounds: the problems had to be comparable and only central stations of a city could be selected. Figure 8.3 shows the 30 biggest stations of the Netherlands. In collaboration with NS Poort 16 cases were selected (figure 8.2 & 8.3). The top 4 has been left out because these four big stations deal with a complete different set of problems than the others. Den Haag HS forms an exception. Even though it is not the central station of the city, it deals with the same kind of problems as the other selected cases.

8.2 The Validation Tool
As we have seen in the previous chapter four main criteria for a successful link between railway station and city centre are developed by a literature review (figure 8.1). These four criteria are all subdivided into three measurable criteria. Per criterion a scoring sheet is defined by the author. This scoring sheet is composed in collaboration with NS Poort and the mentors of the Delft University of Technology. The scoring sheet is as objective as possible. To explain the method we will give an example.

The first criterion for a successfull link between railway station and city centre is *liveliness*. One of the preconditions for liveliness is *mixed use* (criterion 1a in figure 8.1). In our literature study we formulated every criterion as follows:
1. What: the criterion is explained;
2. Why: the criterion is grounded on literature;
3. How: it is explained how the criterion can be measured.

---

**Top 30 Passengers boarding and deboarding per day (Rough interpretation of confidential list of NS (NS, 2008):**

<table>
<thead>
<tr>
<th>Station</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amsterdam Centraal:</td>
<td>160,000</td>
</tr>
<tr>
<td>Utrecht Centraal:</td>
<td>150,000</td>
</tr>
<tr>
<td>Rotterdam Centraal:</td>
<td>90,000</td>
</tr>
<tr>
<td>Den Haag Centraal:</td>
<td>80,000</td>
</tr>
<tr>
<td>Leiden Centraal:</td>
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<td>’s Hertogenbosch:</td>
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<tr>
<td>Arnhem:</td>
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<tr>
<td>Nijmegen:</td>
<td>30,000</td>
</tr>
<tr>
<td>Den Haag HS:</td>
<td>30,000</td>
</tr>
<tr>
<td>Haarlem:</td>
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<tr>
<td>Amersfoort:</td>
<td>30,000</td>
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<td>30,000</td>
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<tr>
<td>Tilburg:</td>
<td>20,000</td>
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<tr>
<td>Delft:</td>
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<tr>
<td>Breda:</td>
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<td>Alkmaar:</td>
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<tr>
<td>Hilversum:</td>
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<td>10,000</td>
</tr>
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<td>10,000</td>
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<tr>
<td>Deventer:</td>
<td>10,000</td>
</tr>
<tr>
<td>Apeldoorn:</td>
<td>10,000</td>
</tr>
</tbody>
</table>

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Figure 8.3: Selection Case Studies (black = selected)
1. Liveliness
   a. Mixed Use;
   b. Use along the Day;
   c. Creating an Atmosphere of Watching and Being Watched;
2. Human Scale
   a. Permeability;
   b. Fine Grained Building Blocks;
   c. Walkability;
3. Legibility
   a. Orientation;
   b. Linearity of the Path;
   c. Clarity of the Maps and Signage;
4. Safety & Comfort
   a. Pedestrian Priority;
   b. Eyes on the Street;
   c. Maintenance.

Figure 8.1: Criteria for Successful Public Space

Figure 8.2: Selected Case Studies in the Netherlands
For criterion 1a. Mixed Use this looks like this:

What? The link between railway station and city centre must have more than one people attractor. People attractors are offices, residences, shops, places of education, recreation and entertainment.

Why? A specific use ensures the presence of people on the street (Jacobs, 1961; Montgomery 1998; Purciel & Marrone, 2006; PPS, 2009) during a specific time of the day. Mixing functions will also mean stimulating street activity along the entire day and creating a lively and vital scene.

How? Count the amount of functions per characteristic profile (CP), consider both sides. Divide the functions into groups: residences (R), offices (O), shops (S), leisure (L) and places of education (E). Per function one point can be scored. The function only counts when the entrance is situated at the street. On the left an example.

On the left we see the example of a street in Maastricht. For both sides of the street the amount of different functions has been defined. The right side (upper image, figure 8.4) has 3 different kinds of functions: Residences, Offices and Leisure. The left side (lower image, figure 8.4) has 4 different functions. All and all the street has 4 different kinds of functions: Residences, Offices, Shops and Leisure: For this street the score is 4.

In a comparable way all 12 sub criteria are translated into scoring sheets. In Appendix A the scoring sheets can be found.

We have seen in figure 8.1 that every criterion for a successfull link contains 3 measurable sub criteria. For every sub criterion a maximum of 5 points can be scored. Adding these scores up, this means that for Liveliness, Human Scale, Legibility and Safety & Comfort all a maximum of 15 points can be scored. The scores are finally translated into a graph containing 4 axes for every main criterion (figure 8.5). The surface of this amoeba tells us something about how well the link scores (as a percentage of the maximum possible score) and it makes it comparable with other cases. Furthermore it acts as a guideline and visualises clearly how certain improvements can lead to better results.

8.3 Working method
Every case study research began with a field trip. Carefully the route from railway station to city centre was documented by making photographs and notes. During the visits it was important to act as if the location was visited for the first time. To be able to measure the links in a structured way, all links were
Figure 8.4: Count the amount of functions on both sides of the street. Above is the right side of the street with 3 functions (ROL), below is left with 4 functions (ROSL). All and all there are 4 different functions present (ROSL) so CP A of Maastricht scores 4 points on Mixed Use (Brouwer, 2009b).
divided into characteristic profiles (CP A, B, C etc.) and decision points (DP 1, 2, 3 etc.).

In figure 8.6 the example of Maastricht is given. These CP’s and DP’s formed the basis of the testing.

To process the test results easily an excel sheet was made by the author (lower left image in figure 8.6). After an excursion the results were inserted in excel and immediately translated into an amoebe.

After all testing was done, the case study research was documented in an Atlas (Brouwer, 2009a). In this atlas for all 16 cases first an impression is given of the city and the railway station. Then two maps are shown of the link, one on the scale of the city and the other on the scale of the link itself, showing how it is divided into characteristic profiles (CP’s) and decision points (DP’s). After that an impression of the link is given with the help of photographs, after which the scoring sheet is displayed. Finally conclusions and recommendations are given to fix the link.

The next pages show the part of the atlas on the city of Haarlem as an example of how the testing and validating was done.
1. Liveliness

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</tr>
<tr>
<td>1b. 24h+DE 24h+DE</td>
<td>4 4</td>
<td>10,00</td>
</tr>
<tr>
<td>1c. SO SO</td>
<td>2 2</td>
<td>2,00</td>
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Open group using the (+) on the left

2. Human Scale

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<td>3,00</td>
</tr>
<tr>
<td>2b. 9,52 12,50</td>
<td>5 4</td>
<td>11,50</td>
</tr>
<tr>
<td>2c. 240</td>
<td>4</td>
<td>14,33</td>
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</table>

3. Legibility

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<td>5,00</td>
</tr>
<tr>
<td>3b. 0</td>
<td>5</td>
<td>5,00</td>
</tr>
<tr>
<td>3c. DP 1 DP 2 DP 3 DP 4 DP 5 DP 6</td>
<td>5 5 3</td>
<td>14,33</td>
</tr>
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</table>

4. Safety & Comfort

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<th>GRADE</th>
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<tr>
<td>4b. N</td>
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</tr>
<tr>
<td>4c. CWI</td>
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<td>5,00</td>
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2. Human Scale

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<th>INPUT</th>
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<th>#b</th>
<th>AVbw</th>
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<tbody>
<tr>
<td>CP A (L)</td>
<td>75</td>
<td>9</td>
<td>8,33</td>
</tr>
<tr>
<td>CP A (R)</td>
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<td>CP B (L)</td>
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</tr>
<tr>
<td>CP B (R)</td>
<td>75</td>
<td>5</td>
<td>15,00</td>
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</table>
9. Validating Haarlem

This chapter consists of all the pages from the Atlas concerning Haarlem (Brouwer 2009b, pp.144-153).

Haarlem City
Haarlem is the capital of the province of Noord Holland. Its textile industry made the city flourish in the 17th century. Later the trade moved to Amsterdam and Haarlem lost its important position in the Netherlands. Haarlem has a rich history and beautiful inner city. In 1994, 2004 and 2005 the city was voted best shopping city of the Netherlands. The city is famous for its hofjes, almshouses built around courtyards. The city contains 19 of these hofjes that are often open for public (wikipedia, 2009).

Haarlem Station
The first railway station in Haarlem was opened in 1839 connecting Haarlem to the oldest railway line of the Netherlands. Station Haarlem was one of the three first railway stations in the country. The station was located at the current working area of the company NedTrain (see map on next page). In 1842 it moved to the north of the city centre where it still is now. In 1906 the old building was replaced by a new one designed in Art Nouveau or Jugendstil style. The railway station is an important monument of the city (station-sweb, 2009, wikipedia, 2009).
Source (upper left clockwise to lower left): by author, wikipedia (2009) (5x)
Haarlem/impression*

DP 1: Buses block the view completely, behind there is also a large building.

DP 1 (looking to CP A): Station Square is chaotic, not clear where to go to.

DP 1 (behind buses): Public Space has no quality, chaotic situation.

CP A (L): Boring & uninviting building, location has much potential.

*Visited: 19 Aug 2009, 9am
CP B (L): There seem to be bicycles everywhere, plinth is active.

CP B (R): Low quality shops.

DP 3: Large barrier with no priority, profile of the barrier is rather green.

DP 4: ‘Blue’ barrier creates atmosphere and big potential.
### 1. Liveliness

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<thead>
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<td>CP C</td>
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<td>ROSL</td>
<td>ROSL</td>
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<tr>
<td>D</td>
<td>24h+DEN</td>
<td>24h+DE</td>
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### 2. Human Scale

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<tbody>
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<td>CP C</td>
</tr>
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<td>47,50</td>
<td>60,00</td>
</tr>
<tr>
<td>88,33</td>
<td>12,16</td>
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<td>470</td>
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### 3. Legibility

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<td>CP B</td>
<td>CP C</td>
</tr>
<tr>
<td>N</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>DP 1</td>
<td>DP 2</td>
<td>DP 3</td>
</tr>
<tr>
<td>CS+NM</td>
<td>CS+NM</td>
<td>NS+NM</td>
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</tbody>
</table>

### 4. Safety & Comfort

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<td>CP B</td>
<td>CP C</td>
</tr>
<tr>
<td>RR</td>
<td>SS</td>
<td>R1</td>
</tr>
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<td>N</td>
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<td>Y</td>
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<tr>
<td>1</td>
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<td>3</td>
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</tbody>
</table>
Liveliness
Except for CP A the liveliness of the link is good. There is a high mix of functions and they are opened throughout the whole day. Benches and terraces are lacking. The station square (CP A) has a large potential which is not being used.

Human Scale
In terms of human scale it is the same: CP A has a low score and the other CP’s score relatively high. CP A and the left side of CP B are the only ones with ‘modern’ buildings. The walkability is not good. However CP B and C are almost access streets. A little intervention should do the trick.

Legibility
The legibility of the link is not good. It is not clear where to go and too many rotation angles have to be made. This is strange because the route to the station is actually only one axis. Furthermore the signage is bad. Reorganising the station square and investing in maps and signage would be the first thing for Haarlem to do.

Safety & Comfort
The safety and comfort could be much better if pedestrian priority was granted at all crossings, by adding more terraces and benches and by investing in the public space and the buildings surrounding it.
**Haarlem//strategy**

**Subjective Experience walking along the Link**

Haarlem does not know how to sell itself. The uninviting railway station environment is a big contrast with the beautiful city centre, even despite the monumental station building. Especially the station square is a mess. There is a lot of potential over here.

**Spatial Strategy to fix the Link**

The most important intervention in Haarlem is to split up the fast and slow traffic and to create a clear axis towards the centre by moving the entrance of the railway station. The Station square is smaller and better arranged and turned into a place of stay.
Haarlem//proposal

- Create green leisure square
- Use potential of water for corner development
- Make link car-free, move fast traffic to the east
- Invest in terraces + benches!
10. Overview Case Study Research

This chapter gives a quick overview of all 16 case studies. The cases are presented alphabetically. For a complete overview, please study the Atlas Case Studies (Brouwer, 2009b).
Fixing the Link - Atlas Case Studies

Validating the quality of the link between central railway station and city centre in the Netherlands

– Inoek Brouwer –

Figure 10.1: Cover Atlas Case Studies (Brouwer, 2009b)
Liveliness
In terms of liveliness Amersfoort has an average score. There is a certain mix of functions although the city should focus on adding more program like shops and education. Especially the shops will create more eyes on the street and let Amersfoort score better on criterion 1c. The opening hours are relatively good.

Human Scale
The permeability of the link is quite good. Walking towards the station the scale of the blocks become more human scaled. The building width however is average and could be much better. Along the link there are a lot of tall buildings that make you feel very small. The length of the route towards the centre is bad. It only scores 1 point.

Legibility
The legibility in Amersfoort is not good; coming out of the railway station it is not clear where to go to and one has to make 3 angle rotations towards the centre. Fortunately the municipality has realised this and has made sure that there is high quality signage. At almost every decision point there is both a map and signage.

Safety & Comfort
There are a lot of barriers to be crossed for pedestrians without having priority. The municipality could easily invest in this to improve the link. For instance by extending the pavement of the sidewalk on the street or making a zebra. Furthermore there is a lack of eyes on the street as we stated while discussing the liveliness. The route is clean and well kept. However there could be more investments in the public space, like flowers, benches etc.

Subjective Experience walking along the Link
In Amersfoort you feel at first lost in the public space. The buildings are big and the street is wide. Later on in CP D the scale becomes more human. This CP is however a bit dull. After crossing the ring road you find yourself suddenly right inside the city centre. It is clear that the ring road stops development of retail in the direction of the railway station.
Spatial Strategy to fix the Link
The best thing for Amersfoort to do would be to move the railway station closer to the city centre. This being quite an unrealistic proposal the recommendations for Amersfoort are more on a smaller (and thus cheaper) scale. The sketch on the right summarises the most important interventions.
Livelihood
The livelihood in CP A is dramatic. There is only one function present that is opened during office hours. Furthermore there are no eyes on the street.

Human Scale
The human scale on the other hand scores quite high. The blocks are short and the distance to the centre is not long as well.

Legibility
In terms of legibility Arnhem scores low once again. Two times a rotation angle has to be made (this is a lot considering the length of the route) and signage could be better.

Safety & Comfort
Every decision point is a barrier in Arnhem. Furthermore there are no eyes on the street. Finally the public space is not well kept and certainly not invested in.

Subjective Experience walking along the Link
In Arnhem the city centre is really close to the railway station. It does however not feel this way. You feel like you are outside of the centre. This changes after crossing the ring road.
Spatial Strategy to fix the Link
Because of the new railway station that is being built as we speak in Arnhem, the question is how helpful it is to make a proposal for the current and temporary situation. However the link could be drastically improved by making small adjustments. The sketch on the right shows the most important interventions.
Liveliness
The first and last CP A & D have a relative high score on liveliness. The CP’s in between however score have a low score. There are almost no shops along the link.

Human Scale
The human scale of the link is average. It could be improved but it is not bad right now. The actual distance to the city centre however is bad and could be improved by making sure that the access street moves towards the station.

Legibility
The orientation right outside the railway station is good. Because of the 3 rotation angles that have to be made while walking towards the centre, the score is lower than it could have been. Signing is also average.

Safety & Comfort
Every decision point is a barrier in Breda. Furthermore there are no eyes on the street. Finally the public space is not well kept and certainly not invested in.

Subjective Experience walking along the Link
The route towards the city centre in Breda is actually quite beautiful. It is a nice quiet walk through a park and alongside the KMA building. It is however a bit boring, especially CP A and CP C. It feels like there is a lot of potential in Breda. I wonder what the link will be like at night.
Spatial Strategy to fix the Link

In Breda the link is quite weak because of all the turns there have to be made walking towards the centre. Solving this problem would mean moving the station. An alternative route towards the centre is not that easily found. Furthermore only CP D can be turned into an access street. Therefore a strategy is proposed to create different atmospheres along the route. See sketch on the right.
Livelihood
The link could contain much more functional diversity. Even though CP D scores 4 points which seems to be good, the CP is that long that these couple of functions do not have a big effect. Furthermore more terraces and benches should be present in the public space.

Human Scale
The human scale is good except for the walkability. The access street should be much closer to the railway station. CP D is not suitable as an access street and therefore it will never change if the municipality will not change the route.

Legibility
The legibility is bad. Not only is it not clear where to go to when exiting the station building, there are also too many rotation angles to be made. Finally the signing could be much better.

Safety & Comfort
In terms of safety and comfort there are too many barriers to be crossed. Especially the ring road is a problem including the station square. The amount of eyes on the street is average. There is a lot of housing along the route which makes it safe. However there could be more functions opened outside office hours and terraces and benches. The maintenance of the route is good.

Subjective Experience walking along the Link
In Delft CP A is a very uninviting place that is definitely not a place of stay. CP B is not suitable as entrance to the centre, being very narrow, dark and unactive. CP D is a beautiful street, however it is a bit boring and long. At DP 5 you find yourself all of a sudden in the middle of the centre.
Spatial Strategy to fix the Link

In Delft the best solution would be to change the route. In the sketch two options are given and the second option is chosen as the winner. The municipality of Delft has also implicitly chosen this new situation by moving the railway station to the north.
Liveliness
In terms of liveliness the link has a relatively high score. In several CP’s there is functional diversity and there is a spread in the opening hours. The atmosphere of watching and being watched could improve by creating more terraces and benches.

Human Scale
In terms of fine grain the link has a very high score, in terms of permeability it is average. The walkability is bad. Den Haag should make sure that the barrier effect of the ring road is minimised to make sure that the access street can move towards the station.

Legibility
The legibility is good. The signage in the vicinity of the station could improve, but furthermore the situation is good.

Safety & Comfort
There are too many barriers to be crossed in Den Haag. However if we consider the length of the route, relatively seen this might have been worse. Den Haag should definitely invest in maintenance of the public space.

Subjective Experience walking along the Link
In Den Haag the link felt really shabby and unattractive. I even felt a little bit unsafe. This is mainly due to the low quality functions alongside the link and the badly maintained buildings. The link has all the basis ingredients (there is functional diversity, it has a human scale, the link is legible) and thus a large potential. This does not come out yet.
Spatial Strategy to fix the Link

Den Haag has all the ingredients to become a nice link; there is a functional mix, also along the day, the legibility is good and the human scale. However the public space is really shabby and unattractive. The strategy in Den Haag would be to focus on creating different atmospheres and places to stay along the link (comparable with the strategy in Breda). The idea is that other CP's will become access streets soon.
Liveliness
The liveliness of the route is bad. There is almost no functional diversity and also no activity along the day. Dordrecht should improve the liveliness of the link by adding mixed program and making sure this program is visible on the street.

Human Scale
The length of the building blocks is good, however the width of the buildings is bad. There are several tall buildings along the link with no human scale. Interventions in the facade could help to improve this scale. Furthermore it is quite a long walk towards the city. From the photos we have also learned that the street profile is very broad. This does not come out in the tests but is certainly something Dordrecht should consider working on.

Legibility
The legibility is good: one has to walk one straight line towards the centre. Some signing could improve however.

Safety & Comfort
In terms of safety and comfort there is also some work to be done for the city. There are a lot of barriers. The situation could easily be improved by making zebra crossings or adjusting the pavement. The maintenance of the route is good.

Subjective Experience walking along the Link
In Dordrecht I felt lost in the public space because of the huge width of the profile. Furthermore it is positive that the link is this green, however the big trees make it also a dark and unheimisch place. Together with the lack of active plinths I did not feel very comfortable. Furthermore the link seemed to be very long because of this.
**Spatial Strategy to fix the Link**

Dordrecht has a clear straight axis towards the city centre that is quite green. As a human being however, you feel completely lost in all this space. Therefore it is proposed to make the axis more human by creating a separate slow and fast traffic axis alongside of each other. See sketch on the right for more details.
Safety & Comfort

In terms of safety and comfort are more or less comparable. Whereas link A has 3 average scores, link B has bigger differences between the values. Link B has no barriers so we would recommend (also in terms of legibility) to focus on this link. Together with the addition of more program it would do the trick. Link A should focus on overcoming the barriers.

Liveliness

In terms of liveliness link A has a higher score than B. This is mainly because link A is an average of 2 CP's. There is some functional diversity, however in both cases residences are lacking. Adding program would improve the situation.

Human Scale

The human scale of both links seems to be good: the block and building width is small, just like the length of the route. However these scores do not correspond with the situation. The buildings are too small for the open space and thus one feels lost in all this space.

Legibility

The legibility of link B is relatively good; of link A it is average. However considering the fact that it was not clear which of the 2 links was the one the municipality wants us to use, we would argue that this makes the situation less readable.

Subjective experience walking along the Link

Just like in Dordrecht I felt lost in the public space in Eindhoven, especially in CP B. The city centre is really close to the station, but when you exit the station building you do not get the feeling that it is this close. This is - once again - due to the large ring road that has to be crossed. The road need a lot of space, which makes the retail behind it badly visible and the pedestrian has no priority crossing it. Eindhoven has two routes to the city, which is actually an ideal situation. This means that you are already inside the centre and can go wherever you want to go.
In Eindhoven there are two different ways to walk to the city centre. We call these links Eindhoven A (coming from the station on the right) and Eindhoven B (walking straight forward). Both links are tested on the next pages.

**Spatial Strategy to fix the Link**

Main solutions in Eindhoven can be found in the sketch on the right. The strategy is to redevelop CP B by adding a lot of mass and program and giving pedestrian priority to overcome the ring road barrier. If CP B could be turned into an access street the city centre would start at the railway station and there would not even be a link.
**Livelliness**
The functional diversity of CP B is much better than that of CP A. Gouda should invest in the ‘eyes on the street’ by adding terraces for example. Both CP’s score bad on this criterion.

**Human Scale**
The human scale of the link is average to good. Especially the block length is above average. The length of the link could improve but this is not easily done.

**Legibility**
The legibility is bad, except for the signage. It is not clear where to go to and too many rotation angles have to be made. This is not easy to solve.

**Safety & Comfort**
In terms of safety and comfort there is a lot to improve. There are too many barriers and not enough eyes on the street.

**Subjective Experience walking along the Link**
In Gouda it was good to see that the municipality has already invested in creating a clear route towards the centre. This was done by planting a row of trees that give both direction and protection. However the quality of the buildings and functions along the route unfortunately stay behind. This is especially in CP B (L) and A (R) the case. Furthermore the ring road forms a big barrier that needs a lot of space.
Spatial Strategy to fix the Link

Gouda has already payed some attention to improving the legibility towards the city centre. The link could however be turned around more into a place of stay. Adding activity in the plinths and eyes on the street is therefore the main strategy. Furthermore an alternative link with the centre is proposed.

Gouda has already paid some attention to improving the legibility towards the city centre. The link could however be turned around more into a place of stay. Adding activity in the plinths and eyes on the street is therefore the main strategy. Furthermore an alternative link with the centre is proposed.
Liveliness
The route is relatively lively and almost all CP’s are comparably lively. Especially the amount of terraces is striking which gives a nice atmosphere. Groningen should focus on implementing functions that are also opened in the evening and night.

Human Scale
Except for CP A the human scale of the link is good. However the actual length of the route is too long and should be shorter. CP C, D and E could easily turn into access streets by adding some activity in the plinths which would dramatically change the walkability.

Legibility
The lebility could be better. Especially in terms of signing a lot can improve. Changing the orientation and angle rotations is more radical.

Safety & Comfort
Considering the length of the route the link does not have too many barriers. Only the ring road near the station is one. Solving this problem would create a bigger score. Furthermore some investments in the public space could be done by adding green, benches etc. Adding program , as was mentioned at liveliness, would also improve the situation.

Subjective Experience walking along the Link
Walking towards the centre in Groningen feels nice and comfortable, except for the first part where the ring road needs to be crossed. For the greater part the route is car free, there is a high mix of functions and there are nice, small, special shops and cafe’s along the route. Even though one has to make an angle rotation walking from station towards the museum, this does not really matter because the museum is such a clear landmark.
Spatial Strategy to fix the Link

The focus in the strategy of Groningen is on the so called green square. Together with the Groninger Museum this could become a nice place to stay. By doing this CP, D and C will probably turn into access streets on the long term which drastically shortens the link.
Liveliness
The liveliness of the link is ok. Especially CP B has a lot of potential to have a higher score. Even though 3 out of 5 functions are present it seems to lack vitality in real life. The functions should open up to the street.

Human Scale
The human scale is good. CP B has quite a long building block but the buildings themselves are of a human size. In terms of walkability the score could be higher if the access street would be CP C. This is likely to happen.

Legibility
The legibility is perfect. On all criteria it has the highest score.

Safety & Comfort
Also in terms of safety and comfort the score is really high. Moving the ring road, which is not that easy, and adding more program in CP B will make the score even higher.

Subjective Experience walking along the Link
The situation in Den Bosch is according to the rules; There is a clear axis towards the centre, clear pavement, beautiful well maintained buildings, the station square is well arranged.. Everything is right, except for the liveliness. The route is rather dull. The functions that could create activity are introverted.
Spatial Strategy to fix the Link

The situation in ’s Hertogenbosch is already quite good. Therefore only small interventions are necessary. The focus is on CP B. See furthermore sketch on the right.
**Leiden/*results**

**Liveliness**
CP A almost has the maximum score, whereas CP B has a much lower score. CP B is very small so we could ask ourselves how bad this is. Furthermore it is the question if the access street is in fact CP A.

**Human Scale**
The human scale of the link is also very good. Only CP A has a relatively long building block. The building width however is fine. The walkability is also good.

**Legibility**
The legibility of the route in Leiden is perfect.

**Safety & Comfort**
The safety and comfort of the link is almost perfect. Adding some program in CP B would create the highest score. The question is how necessary this is.

**Subjective Experience walking along the Link**
The link feels good: It is lively and clearly legible. When you arrive at the access street however it feels a little bit different. The functions are of a low quality and the sidewalks are narrow. This feels more like ‘the problem’ than the link that is tested.
Spatial Strategy to fix the Link

In Leiden it is proposed to make the axis towards the centre car free. Furthermore it is important to turn the public space into a place of stay instead of flow. See sketch on the right.
Livelihood
In terms of functional diversity the link has a high score. The atmosphere of watching and being watched could be better when terraces and benches are added.

Human Scale
The width of the buildings gets a higher score than the width of the blocks. The walkability is good. CP A and B however have the potential to become access streets if the barrier of the ring road is overcome.

Legibility
The legibility of the route in Leiden is very good. Only at DP 3 maps were lacking. This is a small investment.

Safety & Comfort
The ring road is the only barrier but it counts heavily. Furthermore the addition of terraces and benches has been named already.

Subjective Experience walking along the Link
Walking towards the city centre in Maastricht feels like there is a nice gradient in the activity of the plinths. Slowly the amount of retail increases in combination with the liveliness. Maastricht proves that the length of the route does not really matter because in time the access street has moved closer to the station.
Spatial Strategy to fix the Link

In Maastricht the focus lies on making the CP’s more active. This is done by removing parking spaces and creating place for terraces. Furthermore the situation is already quite good. See sketch.
Livelihood
The amount of different functions increases while walking towards the centre. In a way this is a nice gradient. However CP A gives you really an unheimisch feeling. This should definitely improve because it is not an inviting entrance to the centre. Furthermore Nijmegen should create more terraces, benches, shops and functions opened outside office hours.

Human Scale
Nijmegen has a low score on human scale, which is not surprising when looking at the photographs. Once again it is adding up towards the centre. The walkability is bad. The access street should be closer to the station.

Legibility
The score on legibility is really bad; the lowest score of all case studies. The urban morphology makes the situation badly readable but also the signs and maps are unclear and sometimes lacking. This could easily be solved.

Safety & Comfort
In terms of safety and comfort the link also has a low score. The ring road is a large barrier in between station and centre, there are not enough eyes on the street and the link is badly maintained.

Subjective Experience walking along the Link
It seems strange that the municipality wants the pedestrians to walk this route alongside the ring road. The public space is not suitable at all as an entrance to the city; The buildings are too big, there is barely any (active) plinth, several angle rotations have to be made. Personally I found this the worst link, even worse than Arnhem that has a lower score. Making the buildings more human scaled and improving the liveliness, legibility and safety & comfort would cost a lot of money, probably too much money. Therefore an alternative has to be found. I felt unsafe walking along the link. I wonder what it would be like at night.
Spatial Strategy to fix the Link

In Nijmegen it is suggested to change the route. The current link is very pedestrian unfriendly, whereas at the same time there is a clear green axis (see photos) towards the station offering a high potential. This makes the situation much better readable.
Liveliness
The results show us that the liveliness of Tilburg is quite good. When we compare this score with the photographs something seems to go wrong. In every profile there is a mix of functions. However if there is only one small introvert restaurant or shop in a profile it already counts for a point. We can conclude that even though Tilburg has a mix of functions the city should focus on making these functions more extraverted and on adding more program.

Human Scale
The building blocks in Tilburg are too long. The building width however is good. The walkability is also bad. If CP C could be turned into an access street - it has the potential - this would help improve the situation.

Legibility
The legibility in Tilburg is average. It would be good for the municipality to invest in signs and maps.

Safety & Comfort
There are too many barriers to be crossed. Furthermore there are not enough eyes on the street and the maintenance could be better.

Subjective Experience walking along the Link
In Tilburg there seems to be barely any space for the railway station. In other cities we can speak of a railway station environment, in this case it is only a building. CP A and B are really dull and uninviting places. Furthermore you feel like you are making a detour towards the centre because of the urban fabric.
Spatial Strategy to fix the Link

Tilburg needs to focus on the station square and on DP 3 and CP C. It is proposed to let CP C become an access street by making it car free and adding a program. Especially green elements and terraces are lacking. See sketch on the right.
Liveliness
The liveliness along the link is relatively good. CP B and D have the highest scores. However, Zwolle should invest in creating shops along CP A, B and C. Furthermore, the amount of terraces is good. More benches would be better.

Human Scale
The human scale of the built environment is good and getting better while getting closer to the centre. The walkability, however, is not that good. The access street should be closer. CP D could easily become access street, CP C however not.

Legibility
In terms of legibility there are too many angle rotations; 4, which is quite a lot. Moving the station would be a drastic and costly solution to this problem. Furthermore some attention should be paid to improve signage.

Safety & Comfort
The safety and comfort is relatively good. There should be more eyes on the street and the barriers have to be eliminated.

Subjective Experience walking along the Link
In Zwolle, the station is located too far away from the city centre. The walk towards the centre however is a scenic and comfortable one, showing Zwolle's true identity. The signs at the railway station already tell the pedestrian that it takes you 12 minutes to get there (see photo below), so you are prepared for the walk. The streets in between station and centre do not feel suitable to become access streets, because of the buildings. Walking here made me wonder how necessary it is for the activity to start at the railway station. If the pedestrian is well informed about the length of the link, why should this be a problem?
Spatial Strategy to fix the Link
Zwolle has to make its station area more lively by adding program and opening up towards the public space. Right now the public space seems empty. Therefore the municipality has to invest in the station square (CP A) and CP B. In CP B there is already some development in CP B (see photo below). CP C does not have the potential to become very urban. It is a very nice stroll along the water in a beautiful green, typically Zwolle environment. This has to stay like this. See sketch on the right.
11. Conclusion

This part of the thesis corresponds with sub research question 02 (What is the current quality of the link between railway station and city centre in comparable cases in the Netherlands?).

11.1 Summary

To answer this question the quality of 16 comparable Dutch links was measured by a validation tool. The tool was developed by using the list of criteria for a successful link as a result of the literature study (presented in Part B). The four criteria Liveliness, Human Scale, Legibility and Safety & Comfort, all sub divided into three sub criteria, were made objectively measurable and gradable (see Appendix A for the complete set). The final score of every link is presented in the amoebes in figure 11.1. The complete research is presented in an Atlas (Brouwer, 2009b).

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### Results Case Studies

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Average Score</th>
<th>Standard Deviation</th>
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<tbody>
<tr>
<td>Liveliness</td>
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<tr>
<td>Human Scale</td>
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<td>Legibility</td>
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<tr>
<td>S &amp; C</td>
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<td>2,67</td>
</tr>
</tbody>
</table>

Table 11.2: General average scores and standard deviations

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### Figure 11.1: End results of the 16 case studies
11.2 Discussion Results
What can be said in general about the link between railway station and city centre in the Netherlands? First of all table 11.3 makes clear that the criterion Human Scale has the highest average score. After that Safety & Comfort and Legibility have comparable average scores and Liveliness has the lowest score. In other words, in general the human scale of the link in the Netherlands is relatively good, whereas the liveliness could be better. All average scores are relatively high (higher than 7,5 points which is half of 15). If we study the standard deviation we see how legibility has a very high deviation. This means that there are big differences in the scores. This is also visible in figure 11.1 when we compare all the graphs. The validation tool for legibility consists of 2 out of 3 tests that generate 1 point, 3 points or 5 points score. Therefore it is logical that the standard deviation is bigger. The other tests have a more gradient like progression. It could be argued that the high standard deviation exaggerates the situation. On the other hand it makes the weak points better visible.

Table 11.2 shows us that in general the link scores 34% with a standard deviation of 16%. The latter is quite high. When we study table 11.4 we see that this high standard deviation is mainly caused by the high scores. There are only 6 cases (Den Haag HS, Eindhoven A and B, ‘s Hertogenbosch, Leiden Centraal and Maastricht) that score higher than the average 34%. The last three cases have an exceptional high score. Among the 11 cases that score less than 34% the differences are not that big. Once again we can ask ourselves if the method exaggerates the good examples. On the other hand we have seen during the field trips that the situation in ‘s Hertogenbosch, Leiden and Maastricht is in fact really good.

11.3 Transition Links & Gradient Links
After having studied all 16 cases we can state that we can roughly distinguish two types of links: There is the link where there is a gradient perceptible towards the centre. Slowly more and more activity in the plinths can be found. Examples are Haarlem, Den Haag HS and Maastricht. This last example shows how the actual distance to the city centre is not of importance. In Maastricht the heart of the city centre is quite far away from the railway station. In time however the city centre has expanded in the direction of the railway station, turning street after street into access streets. Even though the pedestrian has to walk quite a lot, it does not feel like a long way because there is a lot to do and to see. In other cities there was a clear transition between being outside the city centre and all of a sudden being inside. Examples are Amersfoort, Arnhem and Zwolle. In almost every case the expansion of the city centre was hindered by a barrier, mostly a large ring road. In some cases the buildings along the link were just not suitable for creating activity in the plinths and there was no clear axis towards the city centre (e.g. Nijmegen).

Figure 11.5 shows the so called ‘gradient links’ and ‘transition links’. The gradient links score high: Among them are the 3 biggest scores and 4 out of 7 score higher than the average. From the other 3 there are 2 close to the average. Only Haarlem scores bad. The gradient links feel most natural when walking towards the centre; you feel as if you are walking in the right direction.

The next two pages explain what exactly is the difference between a gradient link and a transition link.
Figure 11.5: The cases with a red label have ‘gradient links’, the others have ‘transition links’
What is the difference between a transition link....
Walking from station to city centre is boring, there is nothing to see and to do. Then, all of a sudden, after crossing a large road for instance you are right in the middle of the city centre: There is a large transition.

How can we explain this?
Usually there is a barrier, for instance in the form of a large road, blocking the expansion of the city centre;
Sometimes the buildings along the link are unfit for creating activity in the plinth;
The route is disorienting; Too many turns have to be made. There is not one clear axis leading to the city centre.

In other words: A transition link is mainly a **Place of Flow**
When you walk from railway station to city centre the activity in the plinths slowly builds up. Without noticing it you are entering the city centre: There is a gradient in activity.

How can we explain this?

There is no barrier. For instance in Leiden the road has been put underground or the pedestrian gets priority crossing; there is an increasing activity in the plinths of the buildings along the link; there is one clear axis going to the city centre that a lot of people will use; it is therefore an interesting place for shops.

In other words: A gradient link is transforming into a **Place of Stay**

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Right: Plan of the link in Leiden: One clear axis towards the city centre

Left (large diagram): Diagram explaining the principle of the gradient link

Left (small diagram): Nowadays the direct railway station environment is usually active as well

Leiden, a typical gradient link: The activity in the plinth builds up towards the city centre
11.4 Recommendations
Reflecting on working with the validation tool we can conclude that we could not only get a better understanding of the current state of the link in 16 cases in the Netherlands, but that it also functions as a guideline tool to improve the situation. Let us take the case of Maastricht as an example: Figure 11.6 shows the current score of the link. In the Atlas we have proposed a spatial strategy for Maastricht. Realising this strategy would create a score of 82% for Maastricht. Concerning criterion 1b for CP A and B 24h+DEN is the new score and concerning criterion 1c the new score is TBSO. Furthermore criterion 3b scores CS+CM on DP 3 and criterion 4a looses one barrier (R1 = N). In this way all the cases can be recalculated.

This brings us to the next conclusion: The new score of Maastricht is 82%. Creating a score of 100% would mean that Maastricht has to implement ‘Education’ in both CP A and B, that the building blocks should be shorter and that there should be more fine grain and the distance to the access street should be shortened. Some of these measures are costly and not that relevant. Therefore we must conclude that every city should prioritise the spatial interventions and that the link could never be fixed entirely (i.e. get a score of 100%) because it is simply not that interesting. In other words, we must conclude that the link does not have to be fixed, but ‘only’ improved.

In terms of possible design strategies we can state that a solution like developing a so called ‘red carpet’ in between station and centre is a good (first) solution to the problems. Several municipalities are developing a carpet like that already (e.g. the municipality of Haarlem). The carpet gives the pedestrian a clear direction. However more should be done. It is especially important to turn the public space from ‘place of flow’ into a ‘place of stay’. Currently in several cases (the ‘transition links’) you have the feeling that you are still outside the centre. This makes the route often boring. By creating places of stay something is happening which makes the route feel less long. Creating places of stay can be done by creating new access streets closer to the station by adding program (e.g. Maastricht) or by creating a ‘scenic walk’ walking from atmosphere to atmosphere as was proposed in the cases of Breda and Groningen.

The validation tool thus has proved to be a useful method for judging 16 different cases. It is however not perfect (yet). In the following paragraphs recommendations are made for improving the tool.

First of all we have seen in the case of Dordrecht that the tool for measuring human scale did not measure the width of the street profile being also an important indicator for human scale. It is thus advised to consider this in a new tool.

Furthermore in terms of testing the liveliness some things could be improved. In the case of Tilburg we have seen that one small cafe or shop could already add a point to the score, even if this cafe or shop is introverted and does not contribute to the liveliness in the street. It is advised to process this into a new tool. For instance it can be thought of to only give a point when there are at least two functions in the CP or a relation must be found with the length of the CP.

One of the five possible functions creating liveliness is Education. The question is how important this is for the liveliness of the link. Perhaps in a future tool Education can be left out and a distinction can be made
Figure 11.6: Current score of Maastricht and new score after interventions
between Cafe’s & Restaurants and other Leisure.

When discussing the cases of Zwolle and Delft, we have seen that the pedestrian had to cross a ‘typical Zwolle’ or ‘typical Delft’ CP (figure 11.7 & 11.8). In these cases the pedestrian got to see something of the image of the cities. Even though we have learned from literature that this image (Lynch, 1961) is important, it is not processed in the validation tool. The problem is that it is a highly subjective and difficult to measure criterion. Even though this is the case it is proposed to test it in some way in a future tool.

Finally we have also learned from Lynch (1961) how landmarks form an important tool in guiding pedestrians. This is also something that is lacking in the current validation tool.

11.5 Conclusion
Now let us get back to the research question it all started with: What is the current quality of the link between railway station and city centre in comparable cases in the Netherlands? We can conclude that there is a big difference in quality between these 16 cases. Some cases have high quality links, others could use some help improving. The most important conclusion is that the validation tool has given us clear guidelines as to what we could do to improve the situation. By making quick design proposals for every case the first step is made in fixing the link between railway station and city centre.

Furthermore the division of all the cases into two typologies gives a better understanding of the situation and hopefully a direction into a good and sustainable solution.

11.6 What follows
The case study research has not only shown the current quality of the links in the Netherlands, but it has also given a first clue of possible interventions to improve the quality of the link. The next part of this thesis discusses how these first clues for design interventions can be elaborated into a design for the city of Haarlem.
Figure 11.7: Typical Delft atmosphere (canals, bridges, buildings)

Figure 11.8: Typical Zwolle atmosphere (green, maintainence, buildings)
This part of the thesis corresponds with sub research question 03 (*How are the criteria for successful public space and the conclusions derived from the case studies applicable in a spatial design for the city ... ?*). To answer this question a design proposal is made for 1 of the 16 cases from the case study research. Haarlem was selected for this. The design forms a test case for the theory that was developed by the literature study and the case study research.

Furthermore, as we will see in the following chapters, designing also gave us new insights in the problem and also new possible solutions.

A clear example of this is a workshop that was organised by the author at the beginning of the graduation project. At that time the phase of designing had not started yet. Taking a look in practice however, gave a new perspective on the problem and therefore it formed an input for both the literature study and the case study research.

The following chapters first discuss this workshop. Then it is discusses why the city of Haarlem was selected. After that an analysis of the link in Haarlem is shown, followed by a spatial strategy to fix the link. Finally general conclusions are discussed.
12. Workshop Haarlem

12.1 Workshop Haarlem
At the start of the graduation project a workshop on the link between railway station and city centre in Haarlem was organised by the author. At that time only literature had been studied and it was time to take a look in practice. The students from the graduation lab including studio leaders and a group of European Postgraduate Masters in Urbanism students was invited to come to NS Poort for this workshop. At that time Haarlem was randomly picked as an example and the case study research had not even started yet. It is a coincidence that Haarlem was also chosen as design location.

On April 9 the workshop took place. First Haarlem was visited after which we headed to Utrecht to the office of NS Poort. After a presentation of Asset Developer and mentor Sebastiaan de Wilde the group divided into four groups, accompanied by four NS Poort professionals, to find an answer to the question: How can the route from railway station to city centre in Haarlem be improved for the unfamiliar visitor of the city? In the following paragraph the most important results are discussed.

12.2 Conclusions Workshop
Figure 12.2 shows a compilation of the workshop results. First of all we can conclude that there are two groups (01 & 04) that have made a couple of strategies whereas the other two (group 02 & 03) have developed only one. These last two groups both state that the two axes that connect station and city centre should remain, whereas group 01 and 04 also draw alternatives where one axis is made the main route and the other is skipped. The entrance of the station building is moved. Group 04 names the two axes as a part of the problem, whereas group 03 sees them as opportunities. There was thus no consensus about this point.

Furthermore every group except for group 01 speaks about the so called blue and green axes that intersect the route towards the station. Group 02 and 03 even make this a part of the strategy.

Every group proposes to demolish the building standing right in front of the station building, opposite to the main entrance. The building is standing much too close and is blocking the view, which makes the situation disorientating.

Next to demolishing this building, group 02, 03 and 04 propose to build landmarks. Coming from the station, the church is an important landmark for the visitor to find the city centre. The other way around there is no clear landmark to find your way back to the station. Group 02 and 03 therefore place two landmarks on the station square and group 04 places two landmarks in the middle of the route.

Another point that was mentioned by every group was to lay out a red carpet from railway station to city centre in terms of pavement, street furniture et cetera. This is something the municipality of Haarlem already has planned to do.

All and all the workshop showed different ways in improving the route. There was no consensus about the amount of axes that is needed as a route, however every group made clear that the readability of the route should be improved. Therefore the workshop can be seen as a collection of ideas of improving this readability.
Figure 12.1: Impression of the workshop (photos by Roberto Rocco)
12.3 Preliminary Conclusions
The workshop on Haarlem helped to get a better grip on the problem. It was interesting to see how some groups cut the route up in smaller parts with different atmospheres to shorten the mental distance of the route. The barriers that had to be crossed were considered as chances for creating these different atmospheres. In this way the problems were turned around into opportunities.

Furthermore the results offered ideas of improving the readability, which was named several times as a problem just as reorganising the traffic.

The sketches in figure 12.3 show some general first design ideas by the author to fix the link between railway station and city centre in Haarlem. The two sketches above explain how fast ans slow traffic could be disentangled to create one clear slow axis towards the city centre. This axis is accompanied by landmarks.

The lower two sketches show how the route could be cut up in different atmospheres. This makes the mental distance of the route shorter. On the right is shown how corner development can create stepping stones to make these different atmospheres.

Figure 12.3: Some general conclusions on how to fix the link in Haarlem
Main Old Structure

3 Sequences
1. Open Plaza + Bus Station + Visible
2. Green + Terraces + Bars/Cafés
3. Water + Boat houses

3 Sequences + 2 Main Roads

- Shopping
- Cultural

Alt. 01
One axis

Alt. 02
Icon

Alt. 03
Walk-Way
13. Analysis Haarlem

13.1 Why Haarlem?
After finishing the case study research and comparing all the results a top 5 of lowest scores was derived. Out of these 5 cases Haarlem was selected as design location because of the following reasons:

- The link has a low score despite being a gradient link;
- The link has a lot of potential;
- Haarlem recently won the prize of most hospitable city of the Netherlands (Van Spronsen & Partners, 2009). Investigation shows however that the accessibility of the city centre by public transport is something the city needs to work on (figure 13.2);
- NS Poort adopted Haarlem as a new project;
- Haarlem raised my personal enthusiasm;
- The work done for the workshop on Haarlem provided a good starting point for the design.

13.2 The broken link in Haarlem
After this selection we got back to the results from the case study research to see exactly what goes wrong in Haarlem along the link between railway station and city centre. Figure 13.3 shows the scoring sheet of Haarlem (see also chapter 9). In red the low scores are displayed. Furthermore the link itself divided into Characteristic Profiles (CP’s) and Decision Points (DP’s) is displayed as well.

On the next pages the red boxes are discussed separately. In eight steps is shown where Haarlem should work on, illustrated by photographs. After this conclusions are discussed.
Figure 13.3: Scoring sheet Haarlem with final graph. The red boxes show the lowest scores that are explained on the next pages. On the top left the link in Haarlem sub divided into Characteristic Profiles and Decision Points.
01. The building opposite to the station is an unlively building: Only 2 functions have their entrances at the station square (Offices (O) & Shops (S)), that are only opened during the day (D). Furthermore there are only shops (S) present to create an atmosphere of watching & being watched.

02. The part of the same building directly facing the entrance of the railway station is even worse: This part has a closed facade and no direct entrances towards the functions inside. This is the first thing visitors of Haarlem see after exiting the railway station...
03. Along CP B & C there is a high mix of functions opened during different times of the day. However there are no terraces (T) or benches (B) to create an atmosphere of watching & being watched.

04. The contrast between the building on the left and the buildings on the right is big. Block size and building width do not correspond with each other. Furthermore the link itself is relatively long (470m) in comparison with other Dutch links.
05. The legibility of the link is bad. First of all it is extremely hard to orientate when exiting the station building (see DP 1 in the map). Secondly two turns have to be made while walking to the centre which makes the legibility bad. Thirdly there are barely any clear maps along the route. Signs are OK.

06. Haarlem is a typical example where the station square itself forms a barrier for the pedestrian. The photo shows how the pedestrian has no priority whatsoever on the station square.
1. Liveliness

<table>
<thead>
<tr>
<th>CP A</th>
<th>CP B</th>
<th>CP C</th>
<th>CP D</th>
<th>CP E</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>ROSL</td>
<td>ROSL</td>
<td></td>
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<tr>
<td>0</td>
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</tbody>
</table>

Open group using the (+) on the left

2. Human Scale

<table>
<thead>
<tr>
<th>CP A</th>
<th>CP B</th>
<th>CP C</th>
<th>CP D</th>
<th>CP E</th>
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</thead>
<tbody>
<tr>
<td>88,33</td>
<td>47,50</td>
<td>60,00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>88,33</td>
<td>12,16</td>
<td>11,00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>470</td>
<td></td>
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</tbody>
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3. Legibility

<table>
<thead>
<tr>
<th>N</th>
<th>2</th>
<th>DP 1</th>
<th>DP 2</th>
<th>DP 3</th>
<th>DP 4</th>
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</table>

4. Safety & Comfort

<table>
<thead>
<tr>
<th>R</th>
<th>S</th>
<th>R1</th>
<th>R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>C</td>
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</tbody>
</table>

07. A little further along the link there is once again no pedestrian priority. The photo shows a large crossing where pedestrians have to wait several minutes for a traffic light for all the cars and buses to pass. Along the link there is another road that has to be crossed with no pedestrian priority.

08. Last but not least the public space along the link is only clean (C). It is however not very well-kept (W) or invested in (I), for instance by adding green elements.
13.3 Conclusions on fixing the link in Haarlem

In the atlas (see also chapter 9) a design proposal was made to fix the link. The most important intervention was to split up the fast and slow traffic and to create a clear pedestrian-only axis towards the centre by moving the entrance of the railway station. The station square thus becomes smaller and better arranged and is turned into a place of stay. Furthermore stepping stones are created along the axis towards the city centre by corner development.

If all these ideas were realised the final grade in Haarlem would improve from 20% to 79% (*figure 13.5*). As we have seen in the conclusions from the case studies the link is thus not entirely fixed (score = 100%) but enormously improved. Completely fixing it would cost a large amount of money and would not create a much better situation.

All and all the main recommendations after having done the case study research on Haarlem are (see also *figure 13.4*):

01. Disentangle fast and slow traffic;
02. Prioritise pedestrian traffic;
03. Make the functions along slow axis open up to public space;
04. Redesign station square to make it legible
   • Bundle pedestrian traffic coming from railway station;
   • Redesign building opposite to railway station;
05. Define position of the railway station in relation to city centre.

This last criterion is new. After having studied the link on a local scale thoroughly, the link and its position inside the city centre should be studied.
Figure 13.5: New scoring sheet with new graph. The red boxes show the improved scores. By realising the design proposals from the sketch the new score becomes 79%.
13.4 The Link and the City

Figure 13.6 shows how Haarlem can be considered as a system. In blue are all the places in the city centre that attract people and in purple are all the places that generate people. The arrows in between these places are in fact the streets with the most activity in the plinths: A lot of people walk there, so it is interesting to open a shop along one of these links for instance.

When we look at the position of the railway station in this system, we see that it is a place that only generates people and does not attract people. People only go there to get out of the city. Furthermore the system is unbalanced: Only the ‘left’ and shorter link is being used intensively. The ‘right’ link is relatively long and barely any retail is established along this link.

The smaller image on the right in figure 13.6 shows how people walk when coming from the railway station. The first part of their walk is only a place of flow; They are moving towards the city centre. When the activity in the plinths has increased it becomes a place of stay (this is where the access street to the city centre starts) and people will start to disperse in the city centre. On their way back they will go through the same place of flow again.

So even though the railway station is not positioned too far away from the other activity nodes in the city centre, it feels like it is on the outside because people only go there to get out of the city as quickly as possible. It is not a place of stay, but a place of flow and that is exactly what the public space looks like.

13.5 The link and the City in Den Haag and Groningen

To get a better grip on this situation two reference
Figure 13.6: The city as system of activity nodes: Haarlem. In blue are the attractors, in purple the generators.
cases are discussed: The case of Den Haag and Groningen. These two cases used to have a comparable unbalanced systems. New developments around the railway station however have changed this system. We will first discuss the case of Den Haag.

The upper sketch in *Figure 13.7* shows the system of activity nodes in Den Haag as it was in the beginning of the 90s of the last century. Just like in Haarlem the system of the city was unbalanced and the railway station (Den Haag Centraal) was only a people generator lying outside of the system. Just like in Haarlem the first part of the route towards the city centre was only a place of flow, slowly turning into a place of stay (in a gradient like way).

Then the municipality started to develop a new axis in the city: The central library was built, together with two big ministries next to the railway station and a large offices and housing project. Later on a shopping building was built including a large cinema. These developments created several new attractors and brought the system of the city in balance. In stead of walking one way to the city and then dispersing into the centre, all of a sudden it became possible to walk in circuits and new places of stay were introduced.

When the new railway station building of Den Haag Centraal was designed by architects Benthem & Crouwel a new main entrance was made on the long side of the building in the west, whereas it used to be on the short side in the north. By doing this the new axis towards the city centre was officially acknowledged and even been made more important than the old one.
Figure 13.7: The system of activity nodes in Den Haag before and after the development of the second axis
Now let us study the situation in Groningen. Figure 13.9 shows us the situation at the beginning of the 90s and the situation as it is now. The walk from railway station to city centre used to be quite a long one. Furthermore the main shopping axis in the city was not in line with the railway station. The route was also quite boring and only a place of flow. Walking back the same route had to be taken.

But then the municipality of Groningen decided to build the Groninger Museum right in front of the railway station. Together with this new museum, that was built in the water, a bridge was built to make a new connection with the city centre.

Nowadays this forms the main (and much more logical) entrance to the city centre. The museum has proved to be an important attractor in the city, stimulating visitors to travel by train.

13.6 Conclusions concerning the Link and the City
Both cases show us how the position of the railway station in the city used to be weak: It was positioned on the outside of the ‘system’ and formed a place only generating people and not attracting people. To solve this problem in both cities new attractors were developed to create new links with the city centre and to stabilize the system. All of a sudden the railway station became a part of the city centre in stead of lying on the outside. In both cities the situation is not perfect (yet). The new developments are however a step in the right direction and a good lesson learned from practice to help designing. The task for Den Haag and Groningen would be to transform the direct railway station environment into a place of stay (and an attractor) as well.
Figure 13.9: The link between railway station and city centre in Groningen before and after the establishment of the Groninger museum
13.7 A better understanding of the city Haarlem
Now back to Haarlem. In the previous paragraphs we have seen how unbalanced the system of the city centre is in Haarlem. Now we are going to take a closer look at the city centre itself.

As we have learned from the atlas (chapter 9) Haarlem has flourished because of its textile industry. In the 17th century it was one of the richest cities in Holland. Nowadays this is still visible in all the beautiful buildings: Haarlem has almost 1200 monuments (wikipedia, 2009).

Even though the city lost its important position in the Netherlands, the city is still loved for its beautiful inner city. Nowadays Haarlem is mainly known for its shopping. In 1994, 2004 and 2005 it won the award of best shopping city in the Netherlands. Furthermore Haarlem recently won the prize of most hospitable city of the Netherlands. Being close to Amsterdam and Schiphol Haarlem attracts many people for a day or weekend out. The city is also known as a cultural city: It has several museums (among which the oldest museum of the Netherlands, the Teylersmuseum), theatres and galleries. The new logo of the city made by city marketing (figure 13.12) expresses this class and quality.

Figure 13.11 show the most important places tourists of Haarlem visit in the city centre. The image shows how the main shopping axis of Haarlem forms the back bone of the city centre. This shopping axis is a historic line in the city (figure 13.13). The link between railway station and city centre attaches to this line. It is strange to see that people have to walk all the way from the main entrance of the railway station to this axis whereas the secondary entrance is much
Figure 13.11: The most important places visited by tourists of Haarlem.
Walking from the railway station people walk in one line and disperse into the city when they get to the Big Market Square.
closer. People familiar with the city will know to take the secondary entrance. New and unfamiliar visitors (and also the target group of this graduation project) are directed to the main entrance by signs on the platforms in the railway station.

When walking from station to centre most people will walk along the link until they reach the main shopping axis and the Big Market Square. After this they disperse into the city centre. The small sketch in figure 13.13 shows how the market square thus can be considered as a hinge.

The funny thing is that almost all touristic high lights can be reached more directly by walking down the east axis. This east axis is also closer to the main entrance of the city centre. By letting people use the current link between railway station and city centre they are thus making a detour.

But what is wrong with the east axis? Why is this axis not the link between railway station and city centre? Figure 13.13 is an impression of this axis. The axis clearly does not give us an ‘inner city feeling’. This is mainly due to the lack of activity in the plinth. Compared with the west axis this axis is quite long. All along this entire axis there is not much to do and see: It is only place of flow. What is missing are stepping stones or attractors along the link that can generate more people walking along the link and that can shorten the mental distance to the city centre.
Figure 13.14: The east axis

Summarising we the link between railway station and city centre in Haarlem was studied and some interventions to improve this link were proposed. Furthermore the city centre of Haarlem was considered as an (unbalanced) system. Therefore two reference cases, Den Haag and Groningen, were studied to get a better understanding on how to fix such an unbalanced system. With this in mind a conceptual proposal is made (figure 14.1). By adding stepping stones to the east axis this axis becomes a part of the system of activity nodes and stabilises it. Figure 14.3 shows how the railway station thus becomes a part of the city centre in stead of lying outside of it.

This strategy on the scale of the city centre is combined with the strategy on the scale of the link itself from the previous chapter (figure 14.2). This finally results in the final strategy from figure 14.3.

The strategy focuses on three things:
1. The station square is transformed into a place of stay and guides the pedestrians to their destinations by leading them to one of the two axes to the city centre;
2. The west axis becomes car free and connects the Dolhuys in the north to the main shopping axis more to the south. By adding a green stepping stone and opening the (already present) functions up to the public space, it becomes a vital and attractive entrance to the city centre;
3. Along the east axis a couple of stepping stones are created and more space is given to the pedestrians. This axis will be the touristic entrance to the city guiding people directly to several museums, theatres, the Big Market Square with the St. Bavo Church and the river Spaarne.
Figure 14.1: By adding stepping stones or attractors to the system of activity nodes in Haarlem and by making the railway station environment itself an attractor and place of stay as well, the railway station will become a part of the city centre.
All and all this comes down to the addition of a couple of attractors and the redesign of public space and one building. The idea is to maintain as much as possible and to redesign or add if needed. By limiting demolition and investing in redesign of buildings public space a sustainable proposal is retrieved.

The next chapter discusses the design to fix the link between railway station and city centre in Haarlem (figure 14.4) as a result of the spatial strategy proposed in figure 14.3.
Figure 14.3: Spatial Strategy to fix the link in Haarlem
Figure 14.4: Left: Plan current situation in Haarlem, Right: Spatial Design Proposal for Haarlem to fix the link between railway station and city centre.
15. A Design for Haarlem

In this chapter the design for Haarlem is discussed. Based on the spatial strategy to fix the link from the previous chapter the design consists of three key projects: The station square, the shoppings axis and the touristic axis. The following paragraphs discuss these projects separately. Every project can be considered as a visualised program of demands. Therefore every paragraph discusses design recommendations for the designer in stead of presenting a finished design.

15.1 The Station Square

The station square is the first thing visitors of Haarlem get to see when traveling by train to the city. Therefore it is a very important place to make a good first impression of the city: You never get a second chance to make a first impression.

One of the biggest problems concerning the station square is the amount of traffic on it in combination with the lack of pedestrian priority. Therefore this is the first thing to be solved. Figure 15.1 show the current situation and a proposal. The bus station is moved inside the building opposite to the main entrance of the station and the station square is given back to the pedestrians. Currently this part of the building is in use as parking garage. By putting the bus station inside of this building the parking garage looses half of its square meters. In another part of the building these meters are added once again (figure 15.11). In the new situation the bus station appears to be much smaller than the current bus station. For the new bus station however a program of demands is used from the municipality concerning a new bus station. This only shows how much space the current bus station is consuming. In the plan the railway station has two exits: One to the city centre and one to the bus station and the touristic high lights of Haarlem.
Figure 15.1: Station square Haarlem: Buses, Cars and Pedestrians. The top image shows the current situation with a lot of traffic on the square, the lower image is the new situation
Another problem is the undefined public space of the station square. This is mainly due to the building opposite to the railway station, owned by ING (from now on: ING building). Whereas other squares are defined by the buildings surrounding it - the buildings forming the walls of the room the square is - the ING building does none of the sort. It makes the public space undefined and hard to read. Furthermore all the open corners give an uncomfortable feeling. By adding a building block to the ING building a clear square is created (figure 15.3).

In the analysis of the link the big contrast between the ING building and its surroundings was stated (figure 15.6). To fit the building better in its surroundings a mass study was made (figure 15.5). The building was modified in such a way that a human scale was retrieved and two clear landmarks were created to find the railway station when coming out of the city centre. Furthermore two connections are made with the surroundings of the block to integrate the street ‘behind’ the ING building and the nearby residential areas with the railway station environment. When an architect is to design the ING building he is not committed to create the exact same building volume. Figure 15.5 only shows an example of how it could be done. The designer should take into account:

- that the volume is modified in such a way that it does not look that massive anymore and that it gets more human scale;
- that two landmarks should be created visible from the city centre;
- that a lively, continuous plinth of approximately 6 meters should be created;
- and that a connection with the surroundings should be made on ground floor.
Figure 15.3: Station square Haarlem: Defining Public Space. The top image shows the current situation with undefined public space, the lower image shows how a new building volume defines the space.
Figure 15.7 is an image of Plein 1992, a square in Maastricht. The building standing at this square can be used as a reference image for the architect.

So far only the building mass has been discussed. This part discusses the functional arrangement of the ING building. The ING building contains several different functions (residences, offices, shops, a parking garage, and a sports hall) that can contribute to the liveliness of the square. The entrances of these functions are however situated rather badly (figure 15.10). Even though there are several functions inside the building only offices and a very small amount of shops dominate the station square. This means that the ING building is only active during office hours. The dwellings are all oriented away from the square and therefore there is no social control in the public space which gives the pedestrian an unsafe feeling. Other functions like the parking garage and the sports hall have closed facades and the entrances are hidden. The sports hall even has its entrance on the second floor, creating scary dark corners and unattractive public space.

In terms of the functional arrangement of the building a new proposal is made (figure 15.11). The large amount of offices is now mixed with residences all having their entrances at the square and orientated in this direction. Furthermore an active plinth is created all along the building. Along this plinth there is retail and the entrances to the functions situated on the upper floors. The sports hall is enlarged. A fitness centre is added above the entrance to the bus station, creating activity on the upper floors when exiting the railway station. And more square meters are added creating a possibility to organise events like fairs. Furthermore the entrance to the sports hall is replaced to the groundfloor adding another entrance...
Figure 15.5: Example of how the ING building could be modified to create human scale, a better connection with the surrounding building blocks and clear landmarks.

Figure 15.6: Contrast between ING building and other buildings.

Figure 15.7: Plein 1992, Maastricht (Cor Smits, 2008).
Figure 15.10: Functional arrangement of ING building. The building is introverted and barely oriented at the station square. There are also barely any entrances at the square.
Figure 15.11: New functional arrangement of ING building. A high mix of functions is created and entrances are situated at the square.
and creating more liveliness at the station square. Once again the architect is not restricted to this exact functional arrangement. It is however important that he takes into account:

- that there is a high mix of functions active during different times of the day;
- that the entrances are situated at the station square on ground floor;
- that there are dwellings overlooking the station square to create social control;
- that the facades open up to the public space;
- and that there is an active plinth.

Concerning the ‘ugliness’ of the building this can be solved by adding new facades. A successful example of this is the Ministry of Finance in Den Haag (figure 15.14) that can be used as reference project for the architect. It is not the idea to prescribe a certain design style for the architect. The case of the Ministry of Finance however shows how an outdated building can be turned into a modern building relatively easy. The architect of course has to make sure that the new facade of the ING building suits the surrounding buildings well.

*Figure 15.15* is a proposal for a plan of the station square. The plan shows an interpretation of the functional arrangement of *figure 15.11* on ground floor. The square meters are not fixed. Furthermore the bus station and the passages in the building to the surroundings are visible. The plan also shows that there are a lot of entrances situated at the station square, but also on the other sides of the building.

So far the focus was on building mass and functional arrangement around the square. But what should
Mixed Functions in Plinth
- Mainly Dwellings, a couple of Shops and Offices

Exit: City Centre
- Lunchroom
- Cafe + Chinese Restaurant + Hotel

Mixed Functions in Plinth: Mainly Dwellings, a couple of Shops and Offices

Exit: Bus Station + Touristic Axis
- Offices
- Hotel + Employment Agencies + Cafe
- Audio Shop + Restaurant + Office + Barber + Cafe
- Chiropractic Office
- Hofje van Staats

Entrance Parking
- Bus Station
- Bus Car
- Kiosk
- Sport Hall
- Restaurant Connexxion Canteen + Info Booth

Mixed Functions in Plinth: Mainly Dwellings, a couple of Shops and Offices

Figure 15.15: Proposal of how the station square could work on ground floor
the square itself look like to turn it into a nice and inviting place of stay? For this three reference squares were studied: The big market square in Haarlem, The Plein in Den Haag and the Vrijthof in Maastricht. All three squares are typical places of stay that play an important role in the public space network of their cities. Figure 15.16 shows the squares from above, the dimensions and an impression. It is surprising to see that even though the station square seems to be extremely large it has a comparable size as the other squares. It is even much smaller than the Vrijthof. In figure 15.17 the four squares are systematically analysed to find out what elements exactly make them that attractive.

The three squares (Grote Markt, Plein & Vrijthof) show a lot of similarities summarised in the images on the next pages. The main conclusions are:

- The main pedestrian routing and car routing are separated, they do not interfere with each other. At the station square the opposite is the case;
- In the case of the Grote Markt and the Vrijthof the fast traffic is slowed down at the square;
- Only one active plinth is needed at the square as we can see at the Vrijthof. As long as it is interacting with the pedestrian route. The more activity is of course the better;
- Every square has an icon on it in the form of a large monumental building with a clear function (a church, a theatre, a city hall etc.). Usually this building has a beautiful facade and it situated opposite to a line of terraces. The icon thus gives the square an image, but also a beautiful view;
- The middle of the square is empty, whereas the surface of the station square is completely in use as traffic zone;
Figure 15.16: The station square and 3 comparable squares in the Netherlands
There is a line of trees surrounding this emptiness and giving a second line of facades to the square. Furthermore they create a human scale and shelter the people. They also give direction; 

Finally there is usually one (or more) element(s) on the square like a fountain or a statue. This also gives the square identity and creates places for people to sit on. Furthermore it can be a place for children to play on.

These conclusions are summarised in an image:

These principles can be used to make a design for the station square in Haarlem (figure 15.18). Fast and slow traffic are seperated, active plinths are created, the iconic railway station building is used to create an image for the square (this can be enhanced by lighting: figure 15.19), terraces are created that have the railway station as a view, the middle of the square is left empty, two lines of trees shape the square, and an element is introduced to add to the image and to create an attractor.

Figure 15.20 - 15.22 show three proposals of how an architect or landscape designer could translate the scheme of figure 15.18 into a spatial design. Figure 15.23 offers the designer some impressions of what these proposals could look like.
Figure 15.17: Analysis of the four squares
Figure 15.20: Station Square Spatial Proposal 01

- Benches are designed by local designers or artists.
- Buildings and trees define public space. Elements in public space give the place character and create places to sit, play, and interact.
- Elements in public space create places to sit, give the place character, and give reason to play and stay.
- Trees create a green 'room' on the square. This makes the public space more human scaled.
- Open corners for routing.
Stairs create places to sit and interact, also a stage for the monumental railway station building.

Buildings and trees define public space, human-scaled, pleasant, safe, and comfortable places.

Places to sit preferably designed benches by local designers.

Trees could be replaced by small pieces of art from local artists.

Element visible from axis giving identity to the place, like:
- large tree
- statue
- water element
- play object
Elements are loosely positioned in public space. The elements guide the people in the direction of the city centre (and the other way around).

The elements do not necessarily contain water. They can also contain flowers or bushes.

Trees are placed in elements that can be used to sit on as well.
Figure 15.23: Impression Station Square
Summarising this paragraph on the design of the station square in Haarlem has discussed design recommendations for the building mass and the functional arrangement of the buildings surrounding it and a list of principles for furnishing the station square in order to make it an inviting place of stay. These design recommendations and principles have a direct effect on the liveliness, human scale, legibility and safety & comfort of the square. The effects are:

1. Liveliness
   - Mixed use: More functions are mixed and entrances are placed on ground floor;
   - Use along the day: Functions are added that are also open outside office hours;
   - Creating an atmosphere of watching & being watched: Space for terraces is created, just like benches, more shops and functions opened outside office hours;

2. Human scale
   - Permeability: The massive ING building is made shorter by making passages to the surroundings;
   - Fine grained building blocks: By playing with the building mass of the massive ING building a more fine grain has been created;
   - Walkability: A direct route to the axes towards the city centre has been created;

3. Legibility
   - Orientation: In stead of walking around the square people can walk straight ahead now. Furthermore the new high dwelling tower including the elements on the square give the visitor a clear direction;
   - Linearity of the path: People can walk straight ahead in the new situation, because they take the right exit that is in line with the axis they have to take to the city centre. The amount of angle rotations thus has been diminished.

4. Safety & Comfort
   - Pedestrian priority: The pedestrian has priority by making the square car and bus free;
   - Eyes on the street: Dwellings overlooking the station square have been created;
   - Maintenance: Investments are made in the public space and the buildings surrounding it. By keeping the public space clean on the short term as well the place will look well maintained.

All and all the station square has been transformed from an undefined and unattractive place of flow into an inviting and attractive place of stay (**figure 15.24**).

15.2 The Shopping Axis
The next key project is the shopping axis leading the visitor from the railway station directly to the main shopping axis of Haarlem. Currently this is the main route to the city centre. In the old situation visitors of Haarlem were directed to the main hall of the railway station after which they had to make a detour to arrive at the axis. In the new situation train travelers are directed from the platforms to the right (former secondary) exit of the railway station, where they arrive at the new and improved station square. This exit is much better in line with the axis to the city centre.

**Figure 15.25** shows the new shopping axis.
Figure 15.24: Station Square Old vs. New
Figure 15.25: Impression + Plan Shopping Axis

1. Dolhuys
2. Station Square
3. Kruisweg
4. 'Green Square'
5. Canal (Oude Gracht)
6. Kruisstraat
7. Hofje van Oorschot
8. Grote Markt
D - DESIGN - Fixing the Link in Haarlem

- Hofje van Oorschot
- Landmark: Corner Building + Former start pedestrian only zone
- Grote Markt + Landmark St. Bavo Church
- 'Green Square': Place of Stay with new Kiosk
- Former start Access Street Centre
- Landmark: Dwellings
- Landmark: Monument (Offices)
- Old Dairy Factory; and Insurance Company.
- New Bridge for Slow Traffic only
- Station Haarlem
- Station Square: Place of Stay
- Landmark: Entrance
- Dolhuys Museum
  - Create Entrance at Axis
- Pedestrian Only
- New Profile
- Redesigned Building
- Stepping Stone
- Active Plinth
- Landmark
- Entrance

150m

N

Continuous Activity in Plinth

To Touristic Axis

To Shopping Axis

N 150m

Pedestrian Only

New Profile

Redesigned Building

Stepping Stone

Active Plinth

Landmark

Entrance
The analysis has shown that the streets already have a high mix of functions, several shops and some small cafés or lunch rooms. The only problem was the lack of space for these functions to open up towards the public space. *Figure 15.27* is a photo of section A (see map) showing the small sidewalks and the large amount of activity in the plinths. The picture below also shows how there is a high mix of functions and dwellings overlooking the street. In other words: It is all there but it does not come out.

Therefore the proposal is simple. By making the entire link car free the public space is handed back to the pedestrians. The main intervention is thus to get the car out of the street profile and to redesign the pavement and street furniture. To show the connections with the city centre of Haarlem the pavement of the city centre can be extended. *Figure 15.28* shows a proposal for the new profile. The idea is that the same pavement and street furniture is to be used all the way from the *Dolhuys* museum to the big market square of Haarlem to make explicit that it is one axis. The rearrangement of the traffic is visible in *figure 14.4*. Just like for the station square a couple of design sketches are made to show some possibilities on how to design the axis (*figure 15.29 - 15.31*). The designer is free to use his own creativity in the design. However he has to take a few things into account:

- A continuous line of vertical elements needs to be created to guide the pedestrian. This can be done with trees, lamp posts, art work etc.;
- A bicycle path needs to be created with a slight difference in pavement;
- Elements must be designed for people to sit on. They can be integrated with planting or art work for instance;
Figure 15.27: Current profile Shopping Axis or Section A looking towards the city centre
There has to be space for terraces;
Furthermore it would be nice if a reference can be made to the station square, for example by using the same elements.

Besides designing a new profile for the street a new stepping stone is added. For this a proposal is made to create a ‘green square’ along the intersecting green boulevard. This green square is mainly for cafés, restaurants or lunch rooms. There are already one café, one lunch room and one restaurant at this square. Because of lack of space they only have small terraces. By expanding the new pavement on this spot creating a square (figure 15.33) this space is available for terraces. Furthermore a kiosk could be added or small lunch room or café to add more program to the square. It also gives the square an extra facade. The designer is free to design the green square. He only has to remember to create (a lot of) space for terraces.

Implementing the proposal would mean an effect on the liveliness, human scale, legibility and safety & comfort of the route. The effects are:

1. Liveliness
   - Mixed use: Just a couple of functions are added;
   - Use along the day: No changes;
   - Creating an atmosphere of watching & being watched: Space for terraces is created, just like benches or other places to sit;

2. Human scale
   - Permeability: No changes;
   - Fine grained building blocks: No changes;
   - Walkability: The axis is characterised by a
Figure 15.28: New profile Shopping Axis or Section A looking towards the city centre
Continuity in vertical elements leads the way to the city centre.

Lighting

Trees are also benches

bicycles

Make a very subtle difference in pavement between bicycle paths & pedestrian zone.
Continuity in vertical elements leads the way to the city centre.

1 bench could also be 3 chairs (designed by local designers).

Use same elements as elements on the station square to guide the pedestrians.

Bicycles

Make a very subtle difference in pavement between bicycle path & pedestrian zone.
Figure 15.31: Shopping Axis Spatial Proposal 03

Continuity in vertical elements leads the way to the city centre.

Lighting

Benches

Gutter with water as continuous line

↓

bicycles

Make a very subtle difference in pavement between bicycle paths and pedestrian zone.
Figure 15.32: Impression Shopping Axis
continuous active plinth. By adding just a couple of functions the axis meets the > 90% active plinth demand for it to be an access street. This would mean that the link is drastically shortened;

3. Legibility
   - Orientation: In stead of walking around the square people can walk straight ahead now. Furthermore the new high dwelling tower including the elements on the square give the visitor a clear direction;
   - Linearity of the path: People can walk straight ahead in the new situation, because they take the right exit that is in line with the axis they have to take to the city centre. The amount of angle rotations thus has been diminished.
   - Clarity of Maps & Signage: More signs and especially maps should be added.

4. Safety & Comfort
   - Pedestrian priority: By making a sort of red carpet for the pedestrian between station and city centre absolute pedestrian priority has been created;
   - Eyes on the street: No changes;
   - Maintenance: Investments are made in the public space and the buildings surrounding it. By keeping the public space clean on the short term as well the place will look well maintained.

15.3 The Touristic Axis
The last key project is the touristic axis leading visitors from main exit of the station to touristic high lights in Haarlem. Figure 15.35 shows the new touristic axis.
Figure 15.33: ‘Green Square’: Old situation (top) and proposal. A slow traffic square is created for terraces
Figure 15.35: Impression + Plan Touristic Axis
Fixing the Link in Haarlem

- Pedestrian Only
- New Profile
- Redesigned Building
- Stepping Stone
- Active Plinth
- Landmark
- Entrance

Station Haarlem
Bus Station + Parking Garage
Landmark: Dwellings
Hofje van Staats
New Museum (former Police Station):
  - Main entrance at axis;
  - Secondary entrance at Spaarne.
New Bridge: Entrance to Museum
New Plinth Janskliniek:
  - Move entrance to Jansweg;
  - Create activity in plinth.
St. Joseph Church
Jans Church + Noord Hollands Archief
Begijnhof + Waalse Church
Landmark: St. Bavo Church
Department of Court Haarlem
New Stop Excursion Vessel
To Touristic Axis
To Shopping Axis
New Stop Excursion Vessel
Along the touristic axis some more changes are made. Just like for the shopping axis a new profile is proposed and the traffic is slightly rearranged. But the focus along the touristic axis is more on creating stepping stones or attractors. The axis already has some of these attractors but they are very introverted as we have seen on photos on the previous pages. Therefore the street looks rather dull and uninviting.

Figure 15.37 is a photo of section B (see map) showing the dull street where nothing seems to be happening. Once again the sidewalks are narrow and there is a lot of traffic. But also along this axis there is in fact already some activity in the plinths that does not come out.

The new pavement is presented in figure 15.38. Right now the street is a one way street. Partially this will be transformed into a two way street. Furthermore the side walks become much broader. This is done by narrowing the lanes and by skipping the bus lane and the row of parked cars. The enlarged parking garage at the station square offers new parking places. The sunny side of the streets gets the broadest sidewalk. Furthermore asphalt is banned from the profile. By paving the street with bricks an ‘inner city atmosphere’ is created and motorised traffic is psychologically slowed down.

In terms of designing the same rules are applicable as for the touristic axis. Therefore figure 15.29 - 15.31 is applicable to this axis as well. There is however less space to design large objects.

But changing the pavement is not enough along this axis to get people to walk there. Therefore to the already existing stepping stones a new one is added: The former police station could be transformed into
a museum. This perfectly suits the cultural image of the city. Furthermore it is a great location. On the one hand it is on the axis close to the railway station, stimulating visitors to take the train and on the other hand it is close to the river spaarne and thus offers a good opportunity to link these two places to each other. To connect to the axis as good as possible a new bridge is to be built leading to the main entrance of the museum (figure 15.39).

Another idea is to make a new stop for the excursion vessel in Haarlem. Close to this proposed new stop is a building that is perfectly suitable for a lunch room or café/restaurant. The building is now empty (figure 15.40).

There are two other functions along the link, more to the south, that need some alteration. The first one is the Janskliniek. This is a health centre. The photo in figure 15.41 shows how the facade is completely closed. The same goes for the department of the court. These functions need to open up towards the public space. This means that active plinths need to be created. This could be done for instance by moving the cafetaria to the ground floor and by making large windows where the tables are places. This could also be done by moving the entrance. Furthermore a part of the building at the street could be let to small shops etc. The second of the two functions is a department of the court in Haarlem that also has a closed facade. For this functions the same alterations are proposed as for the Janskliniek. The worst case scenario would be to move out both the functions and to find new functions more suitable for the city centre.

Implementing the proposed design interventions would have an effect on the liveliness, human scale,
Figure 15.38: New profile Touristic Axis or Section B looking towards the city centre
legibility and safety & comfort of the route. The effects are:

1. Liveliness
   - Mixed use: A new function in the form of a museum is added. Furthermore the entrances of other - already existing - functions are moved to the axis to create activity. When people will start using this axis more often, new functions will arrive;
   - Use along the day: No changes. This will however change as well when the axis starts to be used more often;
   - Creating an atmosphere of watching & being watched: Space for terraces is created, just like benches or other places to sit;

2. Human scale
   - Permeability: By altering the ING building a higher permeability has been created;
   - Fine grained building blocks: This is also changed because of the alteration of the ING building;
   - Walkability: On the long term the functions of the city centre will start to expand towards the railway station along this axis, bringing the access street closer to the station. The walkability will thus improve;

3. Legibility
   - Orientation: The axis is in line with the main entrance of the railway station. The orientation is thus enormously improved;
   - Linearity of the path: People can walk straight ahead in the new situation, because they take the right exit that is in line with the axis they have to take to the city centre. The amount of angle rotations thus has been diminished.

4. Safety & Comfort
   - Clarity of Maps & Signage: More signs and especially maps should be added.

4. Safety & Comfort
   - Pedestrian priority: Pedestrian priority is given at all crossings;
   - Eyes on the street: No changes;
   - Maintenance: Investments are made in the public space and the buildings surrounding it. By keeping the public space clean on the short term as well the place will look well maintained.

15.4 Boston Freedom Trail

In terms of improving the readability of the routing and at the same time creating something unique for Haarlem another thing can be added to the design. In Boston the main touristic highlights are connected by the so called Boston Freedom Trail. This is a red brick or painted line in the pavement of the streets providing the visitors of Boston with a nice tour through the city (freedomtrail.org).

This idea can easily be implemented in Haarlem as well. The tourist information of Haarlem already has made several folders offering certain routes through the city (figure 15.42). These routes can be translated to the actual streets. The example of Boston of course does not has to be copied exactly: The red brick line can be made of a different material or in stead of a line of pavement it can be small pieces of artwork or lighting etc. The designers are free to choose. It would be recommended to use this idea throughout the entire city centre making explicit how the railway station and the link are a part of it.
Coster was the inventor of the printing press.

The route goes further straight in the direction of the VVV tourist office on the Klokhuisplein.

You have now reached the end of this walking tour.
16. Plans Municipality Haarlem

Currently the municipality of Haarlem is making plans for the public space between city centre and railway station as well. In this chapter the plans of the municipality are discussed in comparison with the presented plans in the previous chapter.

The following projects are being realised right now:
1. A ‘red carpet’ is rolled out from city centre into the direction of the railway station;
2. A new underground bicycle storage is built under the station square;

And these projects are being planned:
3. The design of a new station square;
4. New pavement for the streets in between the station square and the new red carpet.

In the next paragraphs Project 2 and 3 are compared with Key Project Station Square of this thesis and Project 1 and 4 are compared with Key Project Shopping Axis and Touristic Axis.

16.1 Station Square
Project 2, a new underground bicycle storage, is a very good idea to improve the maintenance of the station square. Currently there are bicycles everywhere. By putting them underground in a guarded storage that is also free for the people to use, the situation is drastically improved.

Project 3 concerns the design for a complete new square and is a first design proposal: So nothing is fixed (yet). Figure 16.2 is an image of the proposed new station square. wUrck (the architects of this design) propose to turn the station square into a street with a lobby, bus square and building attached to it. The idea to cut the square up into a street and a square is nice. One could even say that in the design proposal for the square in chapter 15 this was done too. However the quality of the rest piece of public space that remains is questionable. Will it function as an uninviting place of stay? True, the bus station is made smaller and shoved into a corner of the square out of the way of the pedestrian. It is however still taking up a large part of the square and influences the attractiveness: Who wants to spend time next to a bus station?

Furthermore the so called lobby is cut off from the rest of the square on three sides by bus lanes. Once again not a nice place of stay. The previous chapters pointed out that a ‘good’ square functions as a room with facades as walls (chapter 15.1). All facades of this lobby are behind the barriers of the bus lanes and bus station. It will therefore remain only place of flow, even though it is designed nicely. The municipality should keep in mind that it is the pedestrian that the design has to be made for, not the buses.

The design by wUrck also shows two new buildings on the location of the ING building. It is a shame that such an easy solution is chosen: The building can relatively easy be turned into an inviting building that suits Haarlems station square well. The municipality should definitely consider this sustainable solution.

16.2 The two Axes towards the City Centre
The municipality of Haarlem also sees the importance of redesigning the two axes leading towards the city centre. In this thesis two new profiles are proposed, that have similarities but also both have their own characteristics. The municipality of Haarlem proposes two projects as well. In stead of defining two projects in the form of two axes, they make a different division.
Figure 16.1: Impression Bicycle Storage (wUrck, 2008)

Figure 16.2: Impression Proposal Station Square (wUrck, 2009)
Project 1 is a loop (figure 16.4). This loop is partially made car free and partially allows cars with a maximum speed of 30 km/h. The project is being built as we speak and is not yet car free. The plan is finished in 2014.

Project 4 is being planned right now and concerns the missing piece of the axes in between railway station and Project 1. A couple of proposals are made for new pavement along the axis (figure 16.6 & 16.7). Along the west axis only buses are aloud. Car traffic is moved to the east axis.

Basically the plan of the municipality comes down to moving the borders of the city centre. In the west the border is chosen at the start of the current access street. The part of the plan that is being made car free definitely forms an improvement, it is a shame however that this positive development is stopped too soon, still leaving the railway station lying on the outside. The profiles of Project 4 will of course be an improvement to the existing situation, but the pedestrian still has to deal with bus traffic on its way to the city centre. It will therefore remain a place of flow. Especially the use of asphalt of Project 4 will emphasise this. Therefore the use of bricks is recommended.

By designing the east axis like this and by not adding any stepping stones the municipality more or less has decided that the east entrance to the city (lying closest to the main entrance of the railway station) will never work as an equal entrance to the city.

Summarising the municipality is doing a good job redesigning the public space, but at some points the plans could be taken a little bit further.
Vanaf begin volgend jaar worden de straten opnieuw ingericht. Hieronder de planning:


Door hydraulische palen is het parkeren mogelijk. Fase 3 (ca. 2014) De Nieuwegrachtgarage kan worden uitgebreid. Een nieuw fietsersontwerp en een nieuw systeem voor de parkeerplaats.
17. Conclusion

This part of the thesis corresponded with sub research question 03 (How are the criteria for successful public space and the conclusions derived from the case studies applicable in a spatial design for the city ... ?).

17.1 Summary
To answer this question a design proposal was made to fix the link between railway station and city centre in Haarlem.

First a design workshop was organised to make a head start designing. This workshop generated several ideas on how to fix the link. Then the results from the case study research concerning Haarlem were analysed carefully. This directly lead to a couple of design interventions. After that the link was studied on a larger scale, leading to new insights. The proposed design interventions as a result of the case study research in combination with the findings about the link on the scale of the city formed the input for a spatial strategy for Haarlem (figure 17.1).

This spatial strategy consists of 3 main interventions:

1. The redesign of the station square including the ING building transforming it into a place of stay;
2. The redesign of the west or shopping axis expanding from Dolhuys to city centre including a reorganisation of traffic, new pavement and the addition of a stepping stone;
3. The redesign of the east or touristic axis including new pavement and the redesign of a couple of stepping stones along the axis.

Per key project the effects of the interventions on the liveliness, human Scale, legibility and safety & Comfort were discussed.
Finally the proposal for Haarlem was compared with the design proposal of the municipality of Haarlem for the link between railway station and city centre.

17.2 Discussion Results
With the help of the validation tool that was developed for doing the case study research the quality of the new link in the design could be tested. Figure 17.2 shows the new results. Because of the fact that CP B and C have become access streets only CP A remains, being the link. Because the people come from a different entrance in the new situation the characteristic profile is turned 90 degrees (see figure 17.2). The new score is 84%. The link is not fixed but enormously improved. It could be argued however that CP A has also become an access street. Then there would not even be a link and theoretically speaking the score would then be 100%.

In time the city centre could expand as figure 17.4 shows. Most likely the expansion will also take place in the east-western direction. This is however outside of the scope of this project.

The results presented in this part of the thesis also show that validating Haarlem with the validation tool formed a solid basis to make a design with. The tool clearly pointed out the places that needed improvement in Haarlem. However for making a design to fix the link the city centre of Haarlem also needed to be studied (besides the level of scale of the link). Using the validation tool for designing would implement that every link in every city should be the same. This is however not the case: Every city is different and every link should be designed in a way that suits the situation. We can thus conclude that the validation tool is an excellent and objective method.
Figure 17.2: New scoring sheet with new graph. The red boxes show the improved scores. By realising the design proposals from the sketch (top left; Brouwer 2009b, p. 153) the new score is 84%.
for analysing the link and giving first clues to fix it. When it comes to designing however also the city centre should be studied.

By looking at the city centre as a system of activity nodes the position of the railway station environment and its link with the city became clear. Especially by comparing the case of Haarlem with Den Haag and Groningen a proposal could be made to integrate the railway station and link better in the city.

Chapter 13 showed us that the position of the railway station in Haarlem (but also in other Dutch cities) is weak. It is positioned on the outside of the city centre only generating people and not attracting people. Therefore the railway station environment and the link between station and centre is a place of flow. And it also looks like this. Integrating the railway station better into the system can be done by adding attractors and by turning the railway station environment itself also into an attractor and place of stay (figure 17.5).

17.3 Conclusion
Now let us get back to sub research question 03 (How are the criteria for successful public space and the conclusions derived from the case studies applicable in a spatial design for the city ... ?).

It can be concluded that the validation tool has proven to be a reliable method for finding the weak spots of the link and to give first design clues.

After that the system of activity nodes from the city centre has to be studied to find the position of the railway station and link in the network.

Using these two methods as input a design can be made that both provides for a lively, human scaled, legible and safe & comfortable link and transforms the railway station environment into an attractive and inviting place of stay forming an integrated part of the city’s network.

17.4 What follows
The next part of the thesis discusses the main conclusions of the thesis and gives an answer to the main research question of the graduation project. This is done by bringing the answers to the three sub research questions together.
Figure 17.5: By adding stepping stones or attractors to the system of activity nodes in Haarlem and by making the railway station environment itself an attractor and place of stay as well, the railway station will become a part of the city centre.
This part of the thesis gives an answer to the main research question of the graduation project (*What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre?*).

To answer this question three sub research questions were formulated. The sub research questions are answered in part B, C and D of this thesis. The findings of the literature study, the case study research and the design form the input for the answer to the main research question. After this recommendations are given for future work and a reflection on the graduation project.
18. Summary & Conclusions

At the beginning of this thesis it was stated that there is a broken link between railway station and city centre in the Netherlands and that this link needs to be fixed. The current way train travelers are welcomed and guided to the city centre leaves much room for improvement. NS Poort recognises the importance of this link and by inviting the author to study the subject the first step is made towards a solution to the problem.

The main research question of the graduation project was: What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre? To answer this question three sub research questions were formulated, all related to a clear end product and all discussed in a separate part of this thesis (figure 18.1).

The answer to sub research question 01 was a list of criteria for a successful and attractive link between railway station and city centre (figure 18.2). The list was based on a literature research on the (design of) successful public space. The general findings of this literature study were applied to the link between railway station and city centre in the Netherlands. The main conclusion was that a link is successful when:

1. Liveliness
   a. Mixed Use;
   b. Use along the Day;
   c. Creating an Atmosphere of Watching and Being Watched;
2. Human Scale
   a. Permeability;
   b. Fine Grained Building Blocks;
   c. Walkability;
3. Legibility
   a. Orientation;
   b. Linearity of the Path;
   c. Clarity of the Maps and Signage;
4. Safety & Comfort
   a. Pedestrian Priority;
   b. Eyes on the Street;
   c. Maintenance.

Figure 18.2: Criteria for Successful Public Space

Answering sub research question 03 however made clear that there is more to designing the link. Of all 16 cases Haarlem was chosen as a test case to make a design for because of its low score and high potential (figure 18.3 & 18.4). Furthermore the tool pointed out exactly what needed to be done to improve the situation. Therefore it not only functioned as an analysis tool to get a grip on the problems, but also as a design tool.

This analysis showed that the railway station and
Main RQ: What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre?

Sub RQ 01: What are criteria for successful public space applicable to the link between the Dutch railway station and city centre helpful for design and planning?
Result: PAPER > CRITERIA
Method: Literature

Sub RQ 02: What is the current quality of the link between railway station and city centre in comparable cases in the Netherlands?
Result: ATLAS > VALIDATION TOOL
Method: Case Studies

Sub RQ 03: How are the criteria for successful public space and the conclusions derived from the case studies applicable in a spatial design for the city ...?
Result: DESIGN > TEST CASE
Method: Paper + Atlas

Spatial design interventions to fix the link

Figure 18.1: Schedule Graduation Project
link are weakly integrated in the system of activity nodes of the city centre. This goes for Haarlem but also for other Dutch cities. To fix the link both the railway station and the link needed to become a better integrated part of the network. This was done by adding attractors and by turning the railway station environment itself also into an attractor and place of stay.

Getting back to the main research question of the graduation project (What spatial design interventions can create a strong, vital and attractive link between the Dutch central railway station and city centre?) this can now be answered as in four steps:

**Step 01:** When dealing with a certain broken link between central railway station and city centre in the Netherlands, first of all the quality of this link should be validated with the help of the validation tool. In this way its strong and weak spots can be found. Furthermore the first recommendations for fixing the link can be made.

**Step 02:** Then the railway station environment and link should be considered on the scale of the city centre as a part of a network of activity nodes:

The way it is positioned makes it a gradient link (above)
In the images the railway station is in blue, whereas the other nodes are in red. This is done to show the different character of the railway station. The red nodes are places that attract people (an example is the big market square of a city). They are also places of stay: Usually attractive public space with functions attached to it where people want to spend time.

The railway station is a place where people want to get away from as quickly as possible: For instance to take the train and travel to another city. Or, when they arrive by train, to go to a certain destination in the city. The railway station itself and the public space surrounding it is only in use as place of flow. Therefore the link in between railway station and city centre is also a place of flow. When walking to the city centre this can transform in a gradient way into place of stay (the gradient link) but it will always be public space that is mainly used for getting from A to B.

**Step 03:** To fix the link both the railway station and link need to be integrated into the system of activity nodes of the city centre.

This can be done by adding attractors and by changing the railway station environment itself into a place of stay and therefore an attractor as well. Practically this means creating more links:

Step 04: Then the links themselves should be designed with the help of the criteria from the literature study. In other words, all links should:

1. be lively;
2. have human scale;
3. be legible;
4. and be safe & comfortable.
19. Recommendations

This thesis has armed the researcher and designer with four important products:

1. an objective and easily usable validation tool;
2. a definition for distinguishing two different types of links;
3. a theoretical approach to study and integrate the link in its urban social spatial context;
4. and an example of how these theories can be used in a spatial design to fix the link.

The introduction of this thesis discussed that studying the link between railway station and city centre is relatively new. This thesis can thus be considered as a first step towards more research in the field. This chapter is therefore important as it is giving direction to future research. The recommendations will be mainly based on the four important end products of the thesis.

Ad 1: Concerning the validation tool chapter 11 has already mentioned some recommendations. These recommendations concern:

- validating the width of the street profile for the human scale of the link;
- finding a relationship with the length of the characteristic profile and the functions along the profile;
- to withdraw the function ‘Education’ from the list for creating liveliness and replacing it by ‘Cafes & Restaurants’;
- finding a way to validate the highly subjective image of a place;
- and to introduce the validation of present landmarks.

Ad 1: The validation tool was based on a list of criteria from a literature study. For this thesis general literature on the design of successful public space was studied. It would be recommended to continue to search for more specialised literature that can be used to refine the tool. An example of this is the Transit Oriented Development movement (among others: Calthorpe, 1993). This movement generated principles for designing around public transport stops so as to stimulate public transport ridership and to create walkable, pedestrian friendly and thus sustainable cities. The ideas of the TOD movement cannot be applied directly to the Dutch link between station and centre, however several principles can be translated to the situation discussed in this thesis.

Ad 1: Furthermore it would be recommended to try and find an order and hierarchy in the list of criteria. Some criteria namely function as dissatisfiers (for instance safety is a basic need: If the link is not safe, it will never be successful) whereas others function as satisfiers (the experience of the route for example: If all basic needs or dissatisfiers are met, this gives it that extra memorable feeling). NS already has made such a diagram for the train journey itself. The next step would be to make such a diagram for the link between railway station and city centre.

Figure 19.1: Pyramid of Customers Demands (Van Hagen, 2003)
Ad 1: Another recommendation would be to improve the user friendliness. It might be considered to make an interactive scoring sheet online on a website. The scoring sheet can then be easily used by everybody and can be programmed as such that it automatically generates the results in a standardized report. It will be important to develop techniques for visualizing the results better, for instance on a map. This will make the results better understandable and usable.

Ad 1, 2, 3 and 4: This graduation project had a clear focus on a specific type of railway station: The central railway station of a middle sized city, positioned at the border of its historic city centre. Of the 6 types of stations that NS has defined (NS Commercie 2001, p.66) the subject of this project corresponds with station type 2:

<table>
<thead>
<tr>
<th>NS has defined 6 typologies of (270) railway stations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very large station in the centre of a large city; (6)</td>
</tr>
<tr>
<td>2. Large station in the centre of a middle sized city; (30)</td>
</tr>
<tr>
<td>3. Suburban Station; (11)</td>
</tr>
<tr>
<td>4. Station in a small town or village; (101)</td>
</tr>
<tr>
<td>5. Suburban station with departure function; (78)</td>
</tr>
<tr>
<td>6. Station outside a small town or village. (44)</td>
</tr>
</tbody>
</table>

Figure 19.2 shows the 55 largest stations of the Netherlands. In pink are all 30 type 2 stations and the underlined ones are the cases selected for the case study research of this project. All selected cases are type 2 stations except for Eindhoven, being a type 1 station. This means that the NS now has a validation tool and theoretical design solutions for 30 railway stations out of its 55 largest stations in the country. The next recommendation would be to develop adjustments to the tool and theoretical design solutions for the other types of stations positioned in

Figure 19.2: Top 55 Dutch Stations (pink = type 2, underlined = case study selected for research)

- **Top 55 Passengers boarding and deboarding per day (Rough interpretation of confidential list of NS (NS, 2008):**

<table>
<thead>
<tr>
<th>Station</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amsterdam Centraal:</td>
<td>160,000</td>
</tr>
<tr>
<td>Utrecht Centraal:</td>
<td>150,000</td>
</tr>
<tr>
<td>Rotterdam Centraal:</td>
<td>90,000</td>
</tr>
<tr>
<td>Den Haag Centraal:</td>
<td>80,000</td>
</tr>
<tr>
<td>Leiden Centraal:</td>
<td>60,000</td>
</tr>
<tr>
<td>Schiphol:</td>
<td>50,000</td>
</tr>
<tr>
<td>Eindhoven:</td>
<td>50,000</td>
</tr>
<tr>
<td>’s Hertogenbosch:</td>
<td>40,000</td>
</tr>
<tr>
<td>Amsterdam Sloterdijk:</td>
<td>40,000</td>
</tr>
<tr>
<td>Arnhem:</td>
<td>30,000</td>
</tr>
<tr>
<td>Nijmegen:</td>
<td>30,000</td>
</tr>
<tr>
<td>Den Haag HS:</td>
<td>30,000</td>
</tr>
<tr>
<td>Haarlem:</td>
<td>30,000</td>
</tr>
<tr>
<td>Amersfoort:</td>
<td>30,000</td>
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<tr>
<td>Groningen:</td>
<td>30,000</td>
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<tr>
<td>Zwolle:</td>
<td>30,000</td>
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<tr>
<td>Amsterdam Zuid:</td>
<td>30,000</td>
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<tr>
<td>Tilburg:</td>
<td>20,000</td>
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<tr>
<td>Delft:</td>
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<td>Breda:</td>
<td>20,000</td>
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<td>Alkmaar:</td>
<td>20,000</td>
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<tr>
<td>Amsterdam Amstel:</td>
<td>20,000</td>
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<td>Dordrecht:</td>
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<td>Maastricht:</td>
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<td>Hilversum:</td>
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<td>Gouda:</td>
<td>10,000</td>
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<tr>
<td>Almere Centrum:</td>
<td>10,000</td>
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<tr>
<td>Leeuwarden:</td>
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<tr>
<td>Deventer:</td>
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<tr>
<td>Apeldoorn:</td>
<td>10,000</td>
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<tr>
<td>Enschede:</td>
<td>10,000</td>
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<tr>
<td>Ede-Wageningen:</td>
<td>10,000</td>
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<tr>
<td>Zaandam:</td>
<td>10,000</td>
</tr>
<tr>
<td>Duivendrecht:</td>
<td>10,000</td>
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<tr>
<td>Rotterdam Alexander:</td>
<td>10,000</td>
</tr>
<tr>
<td>Roermond:</td>
<td>10,000</td>
</tr>
<tr>
<td>Schiedam Centrum:</td>
<td>10,000</td>
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<tr>
<td>Roosendaal:</td>
<td>10,000</td>
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<tr>
<td>Rotterdam Blaak:</td>
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<tr>
<td>Hoofddorp:</td>
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<tr>
<td>Naarden-Bussum:</td>
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<tr>
<td>Hoorn:</td>
<td>10,000</td>
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<tr>
<td>Hengelo:</td>
<td>10,000</td>
</tr>
<tr>
<td>Lelystad Centrum:</td>
<td>10,000</td>
</tr>
<tr>
<td>Woerden:</td>
<td>10,000</td>
</tr>
<tr>
<td>Amsterdam Bijlmer ArenA:</td>
<td>10,000</td>
</tr>
<tr>
<td>Zutphen:</td>
<td>10,000</td>
</tr>
<tr>
<td>Heerlen:</td>
<td>10,000</td>
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<tr>
<td>Sittard:</td>
<td>10,000</td>
</tr>
<tr>
<td>Amsterdam Lelylaan:</td>
<td>10,000</td>
</tr>
<tr>
<td>Weesp:</td>
<td>9,000</td>
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<tr>
<td>Houten:</td>
<td>9,000</td>
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<tr>
<td>Assen:</td>
<td>9,000</td>
</tr>
<tr>
<td>Almelo:</td>
<td>9,000</td>
</tr>
<tr>
<td>Venlo:</td>
<td>9,000</td>
</tr>
</tbody>
</table>
the vicinity of the city centre as well. Station type 1 and 4 can be considered for this.

The case study research has shown that for Eindhoven, the only type 1 station in the list, it was impossible to find only one link between station and centre. The 6 type 1 stations all concern large cities that probably have several links as well. The validation tool can be used easily for the larger stations too, however several links need to be tested all having a different character.

The theory that was developed as a result of this project might also be applicable to a type 3 station. An example of such a station is Rotterdam Alexander, lying directly next to shopping mall Alexandrium. Even though the station is not positioned at the border of a city centre the link between railway station and shopping centre could be designed with the same principles. Therefore it is recommended to also try to use the theory for other types of stations as well.

Ad 3 and 4: The railway station and link to the city centre are considered to be a part of a network of activity nodes in the city:

This means that there are several links between railway station and other important places in the city centre on a walkable distance. It is recommended to validate and design all links between railway station and other attractors within a distance of 1 kilometre (i.e. a walkable distance) with the help of the theory. For instance the link between station and university campus could be a next study object. In this way there are several cases that can be thought of that are recommended to study in the future. The results of this project can be used as a solid basis.

Figure 19.3 on the right is an edited photograph of the railway station of Haarlem. After stepping out of the train the visitor of Haarlem directly sees the big church of the city. This is of course not a realistic image: The church would have to be moved. However the image represents a vision of how the Dutch city will welcome its visitors at the central railway station in the future.
Figure 19.3: Station Haarlem: An inviting entrance to the city centre
20. Reflection

This chapter gives a reflection on the methodology of the graduation project and also a reflection with respect to the content of the project.

20.1 Reflecting the Methodology

Starting this project was not that easy: The link between railway station and city centre had not often been subject of research before. Especially during the literature study this was sometimes hard. Therefore mainly literature has been studied on general quality of public space. The transformation from general criteria to criteria applicable to the link had to be made by the author in collaboration with NS Poort and the DUT mentor team. Especially the workshop helped to get a better grip on the problem and to sharpen the list of criteria. During the whole process slight alterations were made in the list of criteria and still there are things that need to be altered.

Translating a complex multi layered problem into one simple and easily usable tool was a difficult assignment. The tool has found a way to (as well as possible) measure quality objectively. There are however some improvements to be made (see previous chapter). In general we can say that working with a standardised tool has proven to be successful. With the tool 16 different cases could be compared in a systematic way.

The step that had to be made from systematically comparing cases to designing for Haarlem was a big one. At the start of the graduation project the idea was to make a tool that could both validate the quality of the link objectively and generate clear design principles. Even though the latter was partially true, the input was not sufficient for a design. Part D of this thesis has shown how the link also needs to be considered on the level of scale of the city centre. Studying reference cases brought the solution.

The method for designing was much less structured than the method used for the other end products of the graduation project. Therefore it was hard to start up. The most important input came from making several visits to the design location (and even spending a weekend in Haarlem), speaking with Caroline Weill from City Marketing Haarlem, Max van Aerschot, Stadsbouwmeester of Haarlem and Willem van Heijningen, Asset Developer at NS Poort for the region in combination with consults of the mentor team of the graduation project.

20.2 Research by Design or Design by Research?

Chapter 4.4 of this thesis showed how this project both used ‘Research by Design’ and ‘Design by Research’. Of the 4 important products of this thesis (see chapter 19) the first 2 were derived by research, whereas the second 2 were derived by designing:

Product 1, the validation tool, was based on a literature research and product 2, the definition for the two types of links, was based on the case study research.

Product 3, the theoretical approach to the problem, and product 4, the spatial design solution to fix the link were derived by making a design for Haarlem.

Therefore it can be concluded that designing has just as much added to answering the main research question as researching. Whereas the design first seemed to be ‘only’ a test case to test the findings from research, it turned out to be an important building block for the theory on the link between railway station and city
centre. Therefore it can said that research by design and design by research both have been important and complementary methodologies in tackling the problem.

20.3 Reflecting the Content
Half way the 19th Century the first railway lines in the Netherlands were constructed outside the city’s walls, mainly to save costs but also because a lot of people did not really believe in this new transport modality. As we know now the train has definitely proven to be a succes. More and more large developments in the city are centred around railway stations, proving its important role in our contemporary society. This project has shown how the railway station has become an important place in our cities and how it can be integrated even better into its social spatial network.

For sustainable reasons (development around) public transport will remain an important topic in urbanism and politics, but also in several other fields. The railway system will become a complementary system to the car system. Public transport ridership will increase in the future and creating walkable, readable and attractive public space will therefore be subject of research more often in the future.

Furthermore a large amount of people will have more free time on their hands due to the current aging of the population. The so called ‘baby boomers’, born after World War II, have almost finished their careers and are to retire in the coming years. These are the people interested in a day or weekend out in another city. If NS finds a way to reach this target group the company will see a large increase in its train travelers. The walkable link between railway station and city centre will motivate this group to take the train.

Other developments in the railway sector like the High Speed Lines and ‘Program Highly frequent Railway’ (Programma Hoog Frequent Spoor) all contribute to the increasing important role of the train. In the future the Dutch railway system in the Randstad might even function as a set of metro lines that connects different car free and walkable centralities with each other. The main challenge for the future would be to balance this system with the other public transport and car system.
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Images lacking referencing are made by the author
Appendix A
Explanation Criteria Validation Tool
1. Liveliness

Liveliness refers to the amount of people on the street. When there is a lot to do in a place, there are a lot of people moving around in the street, which creates a lively, vital city scene. It is therefore important to create people attractors and to make sure that they attract people along the entire day. Furthermore there should be enough places to sit down to create an atmosphere of watching and being watched. These eyes on the street also evoke a sense of safety (Jacobs, 1961; Montgomery 1998; Purciel & Marrone, 2006; PPS, 2009; Ewing & Handy, 2009).
CP A, Maastricht: Count the amount of functions on both sides of the street. Above is right side with 3 functions (ROL), below is left with 4 functions (ROSL). All and all there are 4 different functions present (ROSL) so CP A of Maastricht scores 4 points on Mixed Use.
1a. Mixed Use

What? The link between railway station and city centre must have more than one people attractor. People attractors are offices, residences, shops, places of education, recreation and entertainment.

Why? A specific use ensures the presence of people on the street (Jacobs, 1961; Montgomery 1998; Purciel & Marrone, 2006; PPS, 2009) during a specific time of the day. Mixing functions will also mean stimulating street activity along the entire day and creating a lively and vital scene.

How? Count the amount of functions per characteristic profile (CP), consider both sides. Divide the functions into groups: residences (R), offices (O), shops (S), leisure (L) and places of education (E). Per function one point can be scored. The function only counts when the entrance is situated at the street. On the left an example.

>> Now type the first letters of the functions in excel and excel calculates the score per CP.
CP A, Maastricht: CP A (right, R) has a score of 24h + DE, CP A (L) also has a score of 24h + DE. The total score is 24h + DE = 4 points.
1b. Use along the Day

What? The link has to be active along the entire day, i.e. attract people along the entire day.

Why? Mixed use does not always guarantee use along the entire day. This is why this has been made a separate criterion. A city centre with its shops, restaurants and bars, usually meets this requirement. The train station however, being positioned outside this city centre and only serving one or two trains after a certain hour or being closed off completely, becomes an unattractive, usually even unsafe environment. It is therefore important to create active use along the entire day for this link.

How? Decide per CP when the functions are active. Residences (R) are active during the entire day (24h), offices and shops for example only during office hours (Day or D), restaurants usually in the evening (E), approximately from 6 - 10/11 pm, and bars also after midnight (N).

Possible scores:
- 5: 24h + DEN
- 4: 24h + DE/DN/EN or DEN
- 3: 24h + D/E/N or DE/DN/EN
- 2: 24h
- 1: D/E/N

>> Now choose one of the given options in excel and excel calculates the score per CP.
CP A, Maastricht: CP A (R) has three functions opened outside office hours, CP A (L) has shops (S) and one functions opened outside office hours. On the photograph of CP A (right, below) it is visible that there are no terraces or benches along the CP. The score of CP A is 2 points.
1c. Watching & Being Watched

What? The link has to have enough places for people to watch and being watched.

Why? By creating places where people can stop and sit down, we create new activities on the street (people-watching, eating ice-cream, reading a paper, sun bathing etc.) and people will stay longer in the public realm. This will not only create more liveliness but it is also good for the social safety (Jacobs, 1961; Montgomery, 1998; Gehl & Gemzøe, 2006; Purciel & Marrone, 2006; Living Streets, 2009; PPS, 2009; Walk21, 2009). The presence of shops is also important for social control, just like functions that are opened outside office hours (Jacobs, 1961). This criterion also has to do with the transformation of the link from traffic zone into a place of stay.

How? Check per street block if there are terraces (T), benches (B), shops (S) and/or functions opened outside office hours (O). For a T 2 points are given, the other three score 1 point each.

>> Now fill in the right letter combination in excel and excel calculates the score per CP.
Picture by author (Athens, Olympic Village)
Human scale of the built environment refers to the physical setting of a place that matches the size of human beings and corresponds to the speed at which humans walk (Purciel & Marrone 2006). Therefore it is important that building blocks are short and fine grained. Furthermore distances should be walkable (Jacobs, 1961; PPS, 2009, Ewing & Handy, 2009).
CP A, Breda: On CP A (L) there are three blocks that are respectively 30, 30 and 100 meters long. On CP A (R) there is one block of 135m. The average block width Bw is calculated by excel as 73,75m. This means a score of 3 points.
2a. Permeability

What? The city blocks along the link should be short to create a human scale and high level of permeability.

Why? When city blocks are short there are more streets to walk down and more opportunities to turn corners; there is a high permeability (Jacobs, 1961). The psychological distance thus seems shorter because the scale is more human (Cullen, 1961; Montgomery, 1998; Isaacs, 2000).

How? Measure the width of the building blocks (Bw) using the measure tool in Google Earth. There can be several building blocks per CP. The values must be rounded up to a multiple of 5.

Possible scores:

- 5: Bw  40m
- 4: 40  Bw  70m
- 3: 70  Bw  100m
- 2: 100 Bw  130m
- 1: Bw > 130m

>> Now fill in the different building block lengths in excel. Therefore you have to open a group in excel using the (+) in the left column. Excel calculates the score per CP.
CP A, Breda: On CP A (L) the average building width is respectively $30/1 = 30m$, $30/1 = 30m$ and $100/9 = 11,11m$. On CP A (R) bw is $135/10 = 13,5m$. The average building width for the entire CP is $(30+30+11,11+13,5)/4 = 21,15m$. Therefore the score is 3.
2b. Fine Grain

What? The link between station and centre should contain fine grained building blocks.

Why? When a building block is fine grained – i.e. it consists of several small buildings instead of one – the scale of the public space will be more human. Apart from that, fine grained blocks have other advantages. First of all, fine grained blocks create a fine grained economy and therefore mixed use and activity. Secondly, this fine grain makes a place well adaptable and thirdly, fine grained building blocks usually show a difference in condition and age and therefore in price level. This means once again a variety of businesses and thus a more human scale of the place (Jacobs, 1961; Montgomery, 1998; Ewing & Handy, 2009).

How? Count the amount of buildings (#b) per building block and calculate the average building width (bw) per CP.

Possible scores:

- 5: bw 10m
- 4: 10 bw 20m
- 3: 20 bw 30m
- 2: 30 bw 40m
- 1: bw > 40m

>> Now fill in the amount of buildings (#b) per building block in excel. Excel calculates the building width (bw) per block and also the average bw per CP. Finally Excel calculates the score.
Upper left: Amersfoort, route is 815m > score is 1 point. Upper right: Gouda, route is 305m > score is 3 points.
Lower right: Arnhem, route is 115m > score is 5 points. Lower left: Maastricht, route is 240m > score is 4 points.
2c. Walkability

What? The city centre should be on a walkable distance from the railway station.

Why? If you want people to walk, it is necessary to create walkable distances. Otherwise they will use other modes of transport. Therefore it is important that the route to the city centre is as short as possible.

How? Measure the length (L) of the route with the help of the measure tool in Google Earth. Values must be rounded up to a multiple of 5.

Possible scores:

<table>
<thead>
<tr>
<th>Score</th>
<th>Length (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>150m</td>
</tr>
<tr>
<td>4</td>
<td>150m</td>
</tr>
<tr>
<td>3</td>
<td>300m</td>
</tr>
<tr>
<td>2</td>
<td>400m</td>
</tr>
<tr>
<td>1</td>
<td>&gt; 500m</td>
</tr>
</tbody>
</table>

>> Now fill in the length (L) of the route in excel and excel calculates the score.
Picture by author (Vienna, Schloss Shönbrunn).
3. Legibility

Legibility of public space refers to the ease in which people can recognise and pattern their surroundings (Lynch, 1961). Orientation (where am I and where do I have to go to?) and linearity of paths (too many turns make you lose your orientation) and clarity of mapping and signage, are therefore important points of focus (Lynch, 1961; Montgomery, 1998; Living Streets, 2009; Walk 21, 2009).
There are 2 options: (1) you should walk straight forward towards the city centre (2) you have to turn left or right. The upper 4 drawings are typologies for the first situation, the lower 3 images are for the second situation.

1A. Crossing with equal street width (Y)
1B. Street straight ahead is more narrow (Y/N)
1C. Street is narrow and far away (N)
1D. Same situation but now with clear landmark (Y/N)

2A. Crossing with equal street width (N)
2B. Street straight ahead is more narrow (Y/N)
2C. There is no street straight ahead (N).
3a. Orientation

What? Right after coming out of the railway station it should be easy for pedestrians to orientate themselves and to find out in what direction they should go.

Why? According to Lynch (1961) it is important for human beings to structure and identify our surroundings. If we can do this, we feel comfortable and we will have a positive image of a place. The railway station environment is a place where a lot of things happen and a lot of people are hurrying to get somewhere in time.

How? Check if the situation corresponds with one of the typologies on the left.

Possible scores:
5: Y
3: Y/N
1: N

>> Now choose from the top down menu in excel between the three possible answers and let excel calculate the score.
DP 1, Haarlem: After exiting the railway station you have to turn right.

DP 1: Looking at the station square, you have to get to the opposite corner.
3b. Linearity of the Path

What? Walking from railway station to city centre there should not be too many turns in the route. In other words, the path has to be linear.

Why? Making several turns makes a person loose its orientation. As we have learned from Lynch (1961) we know that people need to orient themselves. Especially in a city that a person has never visited before it is important to have a clear route from railway station to centre because this person needs to find his way back a couple of hours later.

How? Count the amount of turns there are in the route. A turn is made when you are on a crossing and you are going into another direction than straightforward.

Possible scores:
5: 0 turns
3: 1 turn
1: 2 turns
0: >2 turns

>> Now fill in the amount of turns that have to be made and let excel calculate the score.
DP 1, Leiden: CS+CM > the score is 5 points

DP 2, Eindhoven: Centre is in two directions? Maps are clear > US+CM > 4 points.

DP 2, Delft: Signs directing to the left are for bicycles > US+NM > 2 points.

DP 4, Den Haag: No signs, but it is clear not to go right but straight forward > C=5.

DP 2, Amersfoort: Signs are behind this building > US+NM > 2 points.

DP 4, Haarlem: Clear signs, no maps > CS+NM > 3 points.
3c. Clarity of Maps and Signage

What? Pedestrians should be able to easily find their way from railway station to city centre and the other way around.

Why? According to Lynch (1961) it is important for human beings to structure and identify our surroundings. Maps and signage are important tools that help us understand our surroundings and it is therefore an important factor that gives quality to a place and let the people feel at ease (Van der Hoeven et al., 2008).

How? Decide per Decision Point (DP) if it is clear where to go to; are there clear signs or maps?

Possible scores:

<table>
<thead>
<tr>
<th></th>
<th>clear signs (CS)</th>
<th>unclear signs (US)</th>
<th>no signs (NS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear maps (CM)</td>
<td>CS+CM=5</td>
<td>US+CM=4</td>
<td>NS+CM=3*</td>
</tr>
<tr>
<td>unclear maps (UM)</td>
<td>CS+UM=4</td>
<td>US+UM=3</td>
<td>NS+UM=2*</td>
</tr>
<tr>
<td>no maps (NM)</td>
<td>CS+NM=3*</td>
<td>US+NM=2*</td>
<td>NS+NM=1*</td>
</tr>
</tbody>
</table>

* When there is no map or sign but it is unmistakingly clear (C) where to go to, 5 points can be given.

>> Now choose from the top down menu in excel between the ten possible answers and let excel calculate the score.
Picture by author (Feyenoord, Rotterdam)
Safety and comfort refers to the way pedestrians feel in public space. Because they are the weakest users of the street, they need the most protection. As we have learned, the presence of people on the streets is crucial for the vitality of a place. Therefore we need to make sure that these people feel safe and protected to assure their presence in public space. It is important to protect the pedestrians from other traffic, evoke a sense of social safety by making sure there are ‘eyes on the street’ and assure a high level of street maintenance (Living Streets, 2009; PPS, 2009; Walk 21, 2009).
4. Safety & Comfort

<table>
<thead>
<tr>
<th></th>
<th>RR</th>
<th>SS</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
</tr>
</thead>
<tbody>
<tr>
<td>4a.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4b.</td>
<td>N</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4c.</td>
<td>CW</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Scoring Sheet Amersfoort: RR, SS and 4 roads with no priority (R1-R4), see also map.

Per barrier 1 point is subtracted, for the ring road 2 > all and all 7 points means a score of 0 points.
4a. Pedestrian Priority

What? The pedestrian must have priority in the street design along the link between railway station and city centre.

Why? Walking from railway station to city centre means crossing several barriers. Therefore it is important that pedestrians, as weakest users of the street, always get priority and to make sure that these barriers are easily crossed.

How? Decide which barriers the pedestrian has to cross along the link. If the pedestrian has to cross a chaotic and unclear station square (SS) one point is subtracted. Furthermore if the ring road (RR) has to be crossed (see map of the city) two points are subtracted. Finally, every road that needs to be crossed with no priority (there is only pedestrian priority when there is a zebra without traffic lights and when there is a clear difference in pavement to give priority to the pedestrian) another point is subtracted. Crossing the ring road (RR) with no priority (R1) means subtracting 3 points.

>> Now fill in yes (Y) or no (N) for every possible barrier in excel and let excel calculate the score.
CP C, Breda: No residences, terraces, benches etc, no safe feeling > 0 points.

CP B, Breda: Looks empty but there is a restaurant on the left with terrace: TB = 3.

CP A, Haarlem: Only offices and shops, no safe feeling > S = 1 point.

CP D, Breda: 1c = TBO (4 points) + R (+1) = 5 points.
4b. Eyes on the Street

What? Along the link there should be ‘eyes on the street’ in order for people to feel safe and comfortable.

Why? When people have the idea that they are not alone, that there are people living and working around, they will feel socially safe (Jacobs, 1961; Montgomery, 1998; Gehl & Gemzøe, 2006; Purciel & Marrone, 2006; Living Streets, 2009; PPS, 2009; Walk21, 2009). This criterion is almost the same as criterion 1c. Watching and Being Watched. However for creating a sense of safety it is also important that there are residences overlooking the street. People tend to watch over their ‘own’ street well (Jacobs, 1961).

How? The score of criterion 1c is used as a basis. If the CP also contains residences a point is added to the score, with a maximum of 5 points.

>> For this criterion you do not have to fill something in, excel calculates the score automatically.
CP A (R), Den Haag: empty, badly maintained buildings > C = 2 points.

CP A (R), Gouda: Trees to protect and guide pedestrian, also clean > CI = 3 points.

CP B (L), Gouda: The buildings are not well maintained > no W.

CP B (L): Tilburg has invested in placing green elements in the street > CI = 3 points.

CP B (R), ’s Hertogenbosch: C (no litter), W (beautiful buildings) I (flower pots) > 5.

CP B (R), ’s Hertogenbosch: C (no litter), W (beautiful buildings) I (flower pots) > 5.

DP 1, ’s Hertogenbosch: Here the public space looks well maintained as well.
4c. Maintenance

What? The link between station and centre should look well maintained.

Why? High maintenance of public space will give people a feeling of safety; it means that there are people looking after the place and feeling responsible. Furthermore the place will look more attractive (Living Streets, 2009; PPs, 2009; Walk 21, 2009).

How? Judge how well the link is maintained. Look at (1) how the place is kept clean on the short term (is there litter lying around etc.), (2) if it is well-kept (is there graffiti on the walls, does the pavement look good etc.) and (3) if there are investments made in public space (are there extra green elements, art etc.). (1) = C = 2 points, (2) = W = 2 points, (3) = I = 1 point. The score is an overall impression of the entire link.

>> Now fill in the letters C, CW or CWI and let excel calculate the score.
In several Dutch cities walking from railway station to city centre is not a pleasure. It is hard to find your way and the public space has a low quality: The link between railway station and city centre is broken. What makes this link broken? And how can we fix it?

This Master’s Thesis is a search for spatial design interventions that can fix this link.