DEFINING FACTORS FOR ESTABLISHING A BENIFICIAL RAIL MARKET

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SUMMARY

Public clients in the Dutch construction industry have been subject to a major construction fraud in the early 00’s. The low-bid incentive in public procurement procedures is raised by the Parliamentary Committee that researched the matter, as one of the main reasons for this fraud to occur. The implementation of the European guidelines in the Dutch procurement law and the obligation to award contracts based on criteria that meet the principles of the Most Economically Advantageous Tender approach, should prevent a new construction fraud from happening in the future. This approach now seems to have been reversed: instead of contractors colluding in cartels, they seem to be in a state of heavy competition. With contractors going out of business. These extremes of ‘collusion’ and ‘heavy competition’ are typical features of market form called ‘oligopoly’, which is a market with only few sellers of a product. When reflecting this to Dutch public markets, it is seen that especially ‘special sector’ markets contain an oligopolistic sellers side. On the client’s side of these markets, the amount is usually restricted to one, as the government usually appoints one concessionaire of an infrastructure. In economic terms, this is called a ‘monopsony’, a market that contains one (main) buyer. Usually, the side that has the lowest amount of participants is most powerful. But in Dutch special sector markets, both sides of the market have a relative low amount of participants, suggesting that both sides of the market are powerful. As a result of the high interdependence in markets with a small amount of participants on both sides of the market, utilizing market power by either side of the market will cause the other side of the market to be unable to meet their own obligations.

INTRODUCING THE MAIN RESEARCH QUESTION

One of these markets is the Dutch Rail contractors market, in which ProRail is the only client and 6 rail contractors together form the supplier side. News coverage from recent years showed that the Dutch Rail contractors market has been subject to the construction fraud in the early 00’s and is currently facing a suppliers side of the market that is having trouble to keep afloat. As the concessionaire of the Dutch Railway infrastructure, rather than making profit, ProRail’s task is to guarantee a safe, reliable, punctual and sustainable railway infrastructure in the Netherlands. In order to reach this goal, ProRail depends on the contractors. On the other hand the contractors are trying to make a descent profit. It can be stated that both the construction fraud and long-term shortages on the suppliers side is undesirable. The challenge is to establish the desired situation in which both the clients- and suppliers-side of the Dutch Rail contractors market can reach their goals. The objective of this research responds to this challenge by seeking for a list of criteria that must be present in the Dutch Rail contractors market to establish a beneficial market for both the client and the contractor. The central question in this undertaking is:

What factors are crucial in making the Dutch Rail contractors market beneficial for both the client and the contractor?

In order to answer this main research question, 4 questions are set up as a guide to come up with a desired end result. Also, these research questions will act as a guide throughout this summary. Every section will result in answering one of the questions, with the last section answering the main research question.

IDENTIFYING THE DESIRED SITUATION

A ‘factor’ can be described as a condition that influences a market. The presence of certain factors define a market. This thesis aims at establishing a beneficial Dutch Rail contractors market. The present factors in this market should therefore be influencing the market in a beneficial way for both the client and the contractor. However, as the introduction showed, the current Dutch Rail contractors market isn’t beneficial at the moment. Therefore, it can be stated that the currently present factors do not contribute to a beneficial market. Since perfect markets posses the feature of being beneficial for both the client and the supplier. To identify a desired situation, the first step of this research focuses on the characteristics of ‘perfect markets’. The factors that are making the perfect markets beneficial are used as a benchmark for the desired situation in the studied market form. Hence, the observed factors in ‘perfect competition’ are translated into criteria that are required for establishing a beneficial Dutch Rail contractors market.

In economics, the market form of ‘perfect competition’ has been a topic of discussion for multiple decades.
Prominent economists have been discussing perfect markets by pointing out the factors that steer the markets in becoming perfectly competitive. The well-known economist Stigler (1957) presented an overview of the development of ‘perfect competition’ in economic history in his paper: ‘Perfect Competition; Historically contemplated’. In this paper, the different points of view regarding perfect competition from several prominent economists are presented. The separate theoretical descriptions are concluded with an enumeration of what the individual economist sees as the set of minimum requirements for perfect competition. The writer of this thesis opts to deduce a list of criteria from the overview, given by Stigler (1957), as the starting point for answering the central question of this thesis. By translating overlapping criteria into one criterion, the first proposition for a list is made. The proposed list of criteria for establishing a beneficial market is:

**Q1: What requirements are crucial in establishing a beneficial market?**

1. No single player has the power to influence price.
2. There is unrestricted access to all information about the market.
3. The rivals must act independently, not collusively.
4. There are no barriers to enter the market.
5. Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.
6. There is free competition, without influencing third parties.
7. Indefinitely large numbers of participants on both sides of the market.
8. All participants produce an identical or homogeneous product.
9. Capital is increasing.
10. Methods of production are improving.
11. The forms of industrial establishments are changing.

**IMPACT OF LEGISLATIVE BOUNDARIES**

When purchasing goods, services or works, public contracting authorities in the Netherlands are subject to the laws and regulations as laid down in the ‘Aanbestedingswet 2012’. Since these laws and regulation are beyond the influence of either the client or supplier in the researched market form, the factors limiting market participants in their freedom of movement must be taken into account when setting up a list of criteria.

The ‘Aanbestedingswet 2012’ makes a distinction between ‘traditional procurement’ (2004/18/EC) and ‘special sectors’ (2004/17/EC), the latter applies to clients in the water, energy, in transport and postal services sectors (utilities). This thesis is delineated by the special sectors, thereby making the 2004/17/EC of relevance regarding the list of criteria. With regards to the preparation phase, the period between the formal decision to build and the start of construction, public clients can chose from different options for some topics while at the same time there are some obligations. For the procurement procedure a public client in the special sectors can chose from the Open, Restricted and Negotiated procedure. In selecting appropriate suppliers, a public client in the special sectors can apply three selection criteria: 1. Grounds for exclusion 2. Suitability requirements and 3. Detailed criteria. Special sectors have the opportunity to apply a system of qualification for the restricted procedure, in which the selection procedure is avoided by allowing only certified contractors to prepare a bid. When it comes to awarding the contract, there are two major obligations. Firstly, a public client is obligated to award a contract to the Most Economically Advantageous Tender. Low-bid tendering is not allowed, except for situations in which a client can motivate his choice for the low-bid criterion. Secondly, the chosen criteria for deciding which submitted bid is the Most Economically Advantageous Tender must be relevant to the contract. When it comes to forms of organization and its connected Uniform Administrative Conditions for the contract, the public client is free to choose.

The laws and legislation contain two strict obligations for public clients in the special sectors. Since these criteria cannot be influenced by either the buyer or supplier side of the discussed market, the discussed market is required to take these obligations into consideration when dealing with procurement procedures. Thereby, an answer to the second question is provided.
Q2: What are the legislative boundaries for establishing a beneficial Dutch public market?

12. *Contracts must be awarded to the Most Economically Advantageous Tender unless the choice for lowest bid can be backed.*

13. *Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.*

**TECHNICALITIES IN THE DUTCH RAIL CONTRACTORS MARKET**

Rather than analyzing the non-recurring events of a single case, this thesis aims at understanding the influence of standardized processes to the benefits of public markets with one buyer and few sellers. Focussing on the Dutch Rail contractors market, there has to be an understanding of the technicalities and complexity of rail projects. Therefore, a single case study is performed for a standardized project in the Dutch Rail contractors market. The researched track renewal project was subject to an alternative, experimental, approach of the process. The goal of this experiment was similar to the goal of this thesis: creating a situation in which track renewal projects are beneficial for both ProRail and the contractor. In this case, the project team thoroughly researched the standardized process of track renewal projects in order to identify sore points. A solution was sought after for these points of interest in order to establish a track renewal process in favour of both ProRail and the contractor.

Two major difficulties were observed during the case study, both as a result of time constraints. Firstly, the fact that ProRail as a client performs risk assessments, often results in disputes about wrong and right. ProRail performs preliminary research to conditions of the building plot and its surroundings to provide the contractor with the (statutory) information that is of importance for preparing a tender. Due to safety issues and the non-stop usage of the tracks, it is impossible for contractors to perform this research themselves. However, the risk assessments are not tailored to the wishes of a contractor. This often leads to discussions on the rightness of the provided data during the execution phase. The contractor that won tender often debates the risk assessment if they encounter a difference in the reports and the situation outside. Resulting in disputes about who is financially responsible for the additional works that result from these differences. Secondly, the time frames to which a contractor is restricted regarding the execution of works, are established by ProRail, also before the contract is awarded. The reason for doing so is a result of third party influence. The operators of the tracks prepare their time-tables a few years in advance, this is before the contract is awarded. ProRail has to go into a consultation process with the operators about time periods in which works can be executed, at the time the operators prepare their time tables. Hence, the time frames for the execution of works are established in front of the procurement process. Contractors are obligated to comply with these time frames in their tender bid. Making it unable for the contractors to chose their own working methods.

Both the difficulties are an infringement of the contractor’s right to freely chose his working method. The main outcome of this single case study was the assumption that the Dutch rail contractors market would benefit from a situation in which contractors are free to chose their own working methods.

Q3: What requirements are crucial for establishing a beneficial Dutch Rail market, as a result of the technical nature of projects in the Dutch Rail market?

14. *The contractor must be able to choose his own way of producing from the beginning till the end.*

**UNDERSTANDING THE PROPOSED LIST OF CRITERIA**

No list of criteria can be constructed without a thorough understanding of the observed requirements for a beneficial public special sectors market from a broader perspective. Three case studies are conducted to explore the presence and relevance of the proposed list of criteria. The cases are chosen based on their connection with the single case study, in which an experimental approach for a track renewal project was researched. All three the cases are selected based on the fact that they are all standardized renewal processes in a public special sector in a market with one buyer and few sellers, subject to European procurement law. Data was required through interviews with professionals that acted on the client’s side of the market. The three cases that complied with these requirements are a standardized track renewal process in the Dutch Rail contractors market, a standardized high-voltage renewal process in the Dutch high-voltage contractors market and a standardized track renewal process in the Finnish Rail contractors market.
The first step is to explore the presence of the criteria in these markets. Key players are consulted about their experiences regarding the proposed list of criteria. The outcome differs per case, as the standardized processes have a major influence on presence or non presence of a criterion. In this stadium the issue is not whether a criterion is presence, the purpose is to understand whether the proposed criteria are eligible for the different markets. Criteria are considered eligible if they can be influenced by the client or supplier in the market. In these cases, the concessionaire of the infrastructure or the contractors that perform the construction work. Third parties are out of the demarcation of this study, therefore, criteria that are influenced by third parties are considered not eligible for the final list of criteria. The three cases showed an unanimous result on eligibility. The following 5 criteria are proven to be beyond the influence of either the buyer or supplier of the market, and are therefore considered not eligible for the final list of criteria.

- There is unrestricted access to all information about the market.
- Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.
- There is free competition, without influencing third parties.
- Indefinitely large numbers of participants on both sides of the market.
- Capital is increasing.

The remainder of the list is cross-case examined to thoroughly understand the relevance of the remaining criteria in practice. A study of the conducted interviews showed that all criteria that were considered of importance so far, are in fact important for the well being of the studied markets. Especially the criteria regarding the ‘influence of a single player’ and the one regarding the ‘barriers to enter the market’ are remarkable, as they were not observed in any of the cases. However, the cross-case analysis showed that the market success depends on how the client’s side in this markets handles the responsibility of their power. As said, the other criteria were observed to greater or lesser extent in the different cases, as well as their relevance. Which leads us to the answer for the last research question.

Q4: What criteria make public markets with one buyer and few sellers beneficial?

1. No single player has the power to influence price.
2. The rivals must act independently, not collusively.
3. There are no barriers to enter the market.
4. All participants produce an identical or homogeneous product.
5. Methods of production are improving.
6. The forms of industrial establishments are changing.
7. Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.
8. Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.
9. The contractor must be able to choose his own way of producing from the beginning till the end.

ANSWERING THE RESEARCH QUESTION

Returning to the start of this thesis, the current Dutch Rail contractors market is not beneficial for both the client and the supplier. The conclusion is formed on the basis of the final list of criteria, the criteria that are not present are considered the missing in this market. By steering the market in a way that it is going to possesses the missing factors, it is expected that the Dutch Rail contractors market will be beneficial for both the client and the contractor.

What factors are crucial in making the Dutch Rail contractors market beneficial for both the client and the contractor?

- No single player has the power to influence price.
- There are no barriers to enter the market.
• Methods of production are improving.
• The forms of industrial establishments are changing.
• Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.
• Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.
• The contractor must be able to choose his own way of producing from the beginning till the end.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUMMARY</td>
<td></td>
<td>IV</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>GLOSSARY</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>INTRODUCTION</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>THE RESEARCH DESIGN</td>
<td>5</td>
</tr>
<tr>
<td>2.1</td>
<td>THE CONCEPTUAL DESIGN</td>
<td>5</td>
</tr>
<tr>
<td>2.2</td>
<td>THE RESEARCH METHODOLOGY</td>
<td>10</td>
</tr>
<tr>
<td>2.3</td>
<td>THE RESEARCH QUESTIONS</td>
<td>11</td>
</tr>
<tr>
<td>2.4</td>
<td>THE RESEARCH OUTLINE</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>LITERATURE SURVEY</td>
<td>12</td>
</tr>
<tr>
<td>3.1</td>
<td>ECONOMICS</td>
<td>12</td>
</tr>
<tr>
<td>3.2</td>
<td>LAW AND LEGISLATION</td>
<td>18</td>
</tr>
<tr>
<td>3.3</td>
<td>PROCUREMENT POLICY OF PRORAIL</td>
<td>21</td>
</tr>
<tr>
<td>3.4</td>
<td>PROPOSED LIST OF CRITERIA</td>
<td>23</td>
</tr>
<tr>
<td>3.5</td>
<td>INTERPRETATION OF THE CRITERIA</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>PRACTICE</td>
<td>26</td>
</tr>
<tr>
<td>4.1</td>
<td>CASE STUDY DESIGN</td>
<td>26</td>
</tr>
<tr>
<td>4.2</td>
<td>SINGLE CASE STUDY</td>
<td>31</td>
</tr>
<tr>
<td>4.3</td>
<td>REVISING THE PROPOSED LIST OF CRITERIA</td>
<td>36</td>
</tr>
<tr>
<td>5</td>
<td>MULTIPLE CASE STUDY</td>
<td>38</td>
</tr>
<tr>
<td>5.1</td>
<td>CASE I : TRACK RENEWAL AT PRORAIL</td>
<td>39</td>
</tr>
<tr>
<td>5.2</td>
<td>CASE II : HIGH-VOLTAGE RENEWAL AT TENNET</td>
<td>46</td>
</tr>
<tr>
<td>5.3</td>
<td>CASE III : TRACK RENEWAL AT LIKENNEVIRASTO</td>
<td>52</td>
</tr>
<tr>
<td>5.4</td>
<td>CROSS CASE ANALYSIS</td>
<td>59</td>
</tr>
<tr>
<td>5.5</td>
<td>FINAL LIST</td>
<td>65</td>
</tr>
<tr>
<td>6</td>
<td>CONCLUSION</td>
<td>66</td>
</tr>
<tr>
<td>6.1</td>
<td>ANSWERING THE RESEARCH QUESTIONS</td>
<td>66</td>
</tr>
<tr>
<td>6.2</td>
<td>ANSWER TO THE MAIN RESEARCH QUESTION</td>
<td>67</td>
</tr>
<tr>
<td>7.1</td>
<td>FURTHER DISCUSSION</td>
<td>68</td>
</tr>
<tr>
<td>7.2</td>
<td>RECOMMENDATIONS FOR PRORAIL</td>
<td>69</td>
</tr>
<tr>
<td>7.3</td>
<td>PROPOSED VIEW</td>
<td>70</td>
</tr>
<tr>
<td>APPENDICES</td>
<td></td>
<td>74</td>
</tr>
<tr>
<td>A</td>
<td>THE ORGANIZATION PRORAIL</td>
<td>74</td>
</tr>
<tr>
<td>Section</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>B</td>
<td>DUTCH PROCUREMENT LAW</td>
<td>76</td>
</tr>
<tr>
<td>C</td>
<td>INTERVIEW PROTOCOL</td>
<td>79</td>
</tr>
<tr>
<td>D</td>
<td>SINGLE CASE STUDY</td>
<td>82</td>
</tr>
<tr>
<td>E</td>
<td>UAV-GC 2005</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>REFERENCES</td>
<td>99</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

FIGURE 1 REPRESENTATION OF COLLUSION, SOURCE: OWN ILLUSTRATION ................................. 5
FIGURE 2 REPRESENTATION OF HEAVY COMPETITION, SOURCE: OWN ILLUSTRATION .............. 5
FIGURE 3 REPRESENTATION OF THE PURSUED SITUATION, SOURCE: OWN ILLUSTRATION ....... 6
FIGURE 4 RESEARCH FRAMEWORK, SOURCE: OWN ILLUSTRATION ................................. 6
FIGURE 5 CONTINUUM OF MARKET FORMS, SOURCE: OWN ILLUSTRATION ......................... 9
FIGURE 8 UNIFORM ADMINISTRATIVE CONDITIONS, SOURCE: HEIM, (2015) ................. 18
FIGURE 9 VAS-SCALE, SOURCE: OWN ILLUSTRATION .................................................. 28
FIGURE 10 SUBJECT MATTER, SOURCE: OWN ILLUSTRATION, DERIVED FROM DATABASE PRORAIL. 30
FIGURE 11 PROCESS OF PRORAIL’S TRACK RENEWAL, SOURCE: OWN ILLUSTRATION ........ 34
FIGURE 12 PROCESS OF TENNET’S HIGH-VOLTAGE RENEWAL, SOURCE: OWN ILLUSTRATION .... 37
FIGURE 13 PROCESS OF LIIKENEVIRASTO’S TRACK RENEWAL PROCESS SOURCE: OWN ILLUSTRATION

LIST OF TABLES

TABLE 1 TYPES OF MARKETS ........................................................................................................ 12
TABLE 2 REVIEW ON PERFECT COMPETITION ......................................................................... 13
TABLE 3 APPLIED PROCEDURES, SOURCE: PRORAIL PROCUREMENT POLICY (2012) ............ 21
TABLE 4 POSITION OF THE ACTION CASE, SOURCE: OWN ILLUSTRATION ....................... 26
TABLE 5 DESCRIPTION OF THE ACTION CASE, SOURCE: OWN ILLUSTRATION ................. 26
TABLE 7 POSITION OF THE CASES OF THE MULTIPLE CASE STUDY, SOURCE: OWN ILLUSTRATION .. 26
TABLE 8 DESCRIPTION OF THE CASES OF THE MULTIPLE CASE STUDY, SOURCE: OWN ILLUSTRATION 27
TABLE 10 OVERVIEW OF APPLICABLE CRITERIA, SOURCE: OWN ILLUSTRATION .................. 51
TABLE 11 OBSERVED CHALLENGES AND SOLUTIONS, SOURCE: OWN ILLUSTRATION .......... 56
## Glossary

This glossary is a list of all the relevant terms, definitions and abbreviations used throughout the thesis to avoid any ambiguities.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aanbestedingswet 2012</td>
<td>Dutch Procurement law</td>
</tr>
<tr>
<td>Awarding criteria</td>
<td>Criteria that are of importance in awarding a contract</td>
</tr>
<tr>
<td>Buyer</td>
<td>In this thesis the buyer is usually a client in the special sectors</td>
</tr>
<tr>
<td>Client</td>
<td>Public entity that procures according to European procurement law</td>
</tr>
<tr>
<td>Contractor</td>
<td>Certified contractor in the special sectors</td>
</tr>
<tr>
<td>Criterion</td>
<td>A principle or standard by which market forms are judged</td>
</tr>
<tr>
<td>Dutch Rail contractor market</td>
<td>Market existing of ProRail as a client and 6 certified contractors as the suppliers</td>
</tr>
<tr>
<td>European procurement law</td>
<td>European guidelines regarding procurement of goods or services by public clients</td>
</tr>
<tr>
<td>Factor</td>
<td>Circumstance that affects a situation</td>
</tr>
<tr>
<td>Monopsony</td>
<td>Market form with one buyer</td>
</tr>
<tr>
<td>Oligopoly</td>
<td>Market form with few sellers</td>
</tr>
<tr>
<td>Perfect competition/Perfect market</td>
<td>Market form with infinit participants, beneficial for both sides of the market</td>
</tr>
<tr>
<td>Preparation phase</td>
<td>Period between the formal decision to build and start of construction works</td>
</tr>
<tr>
<td>ProRail</td>
<td>Concessionaire of the Dutch Railway infrastructure</td>
</tr>
<tr>
<td>Supplier</td>
<td>In this thesis the supplier is usually a certified contractor in the special sector</td>
</tr>
<tr>
<td>Special sectors client</td>
<td>Concessionaire of a public utility's infrastructure</td>
</tr>
<tr>
<td>Tender procedure</td>
<td>The process of awarding a contract</td>
</tr>
</tbody>
</table>
INTRODUCTION

Over the past decade, the Dutch public construction industry has been recovering from a large-scale construction fraud. A parliamentary inquiry showed that the Dutch government was defrauded for an estimated amount of 1 billion euros over the period 1990-2001 (Meeus, 2002). The report of the inquiry committee showed that choosing contractors based on the lowest-bid gave the contractors an incentive to form a cartel. The lowest-bid principle enabled contractors to distribute contracts among the cartel by fixing prices in advance of the award and divide ‘extra’ benefits afterwards. This conclusion resulted in the recommendation to impose a shift in the preparation phase, instead of awarding contracts on the ‘lowest-bid’, procurement methods should focus on value for money (Staten-Generaal, 2003, pp. 20-22).

One of the main projects subject to the construction fraud, also singled out in the inquiry, was the construction of the “Schiphol tunnel”, a railway tunnel that leads to the main airport of the Netherlands. The Dutch Railways (NS) were duped for an estimated amount of €13 million, by several construction companies involved in the execution of works, among them their own subsidiary company “Strukton”.

At the time of these findings, the Dutch railway sector was in the middle of a reformation. Originally, the Dutch railway sector was a monopolistic market. The NS, managed and exploited the tracks, i.e. contracts were divided among four contractors. After a period of splits and mergers that followed from new European and Dutch legislation, ‘ProRail’ became the manager of the railway infrastructure in 2002. Making ProRail a contracting authority, instead of a monopolist. Inevitably becoming subject to the rules an legislation related to procurement in the Netherlands. As the sole shareholder, the ministry of Infrastructure and the Environment is responsible for the functioning of the Dutch railway infrastructure manager, ProRail. In recent times, on a number of occasions, ProRail has been the subject of adverse news coverage because of their performance. Parliamentary questions that followed from this media-attention gave rise to the public- and political debate. The government subsidizes ProRail with high public funds and expect a level of performance that is in line with these funds in return.

Concessionaires of public owned infrastructures that need highly specialized contractors used to agree on a contract with the contractor on a one-to-one basis. As a result of changed European legislation, state owned companies are obligated to tender contracts and use the principle of Most Economically Advantageous Tendering to do so. This led to quite another viewpoint on what professional commissioning holds. Due to the high level of specialization, infrastructure managers usually face a market in which they are the only client with few contractors. Market mechanisms in a market with one buyer shows a lot of power on the buyer’s side, while in a market with only a few sellers a lot of power is in the hands of the sellers. This negatively influences the performance of both the contractor and the client.

On top of the fact that railway infrastructure capacity is not a constant given, ProRail faces deficits for the years to come and cost-overruns for most of the eye-catching contracts (ANP, 2015). There is budget deficit of €475 million, while at the same time large cost overruns are seen in for the renovation Utrecht Central Station. These events were recently featured negatively in the news. Also, the extension of four maintenance contracts was incorrectly procured. A research to cost overruns in Dutch construction industry, showed an average cost overrun of 10,6%, for 26 projects in the Dutch rail sector (Cantarelli & Flyvbjerg, 2012).

The construction fraud damaged the mutual trust between ProRail and their contractors. Given the public debate, particularly this client-contractor relationship is of high importance in improving the performance. Instead of clear signs of collusion, nowadays contractors are having serious problems surviving. It can be hypothesized that this won’t be beneficial in pursuing ProRail’s goal of satisfying their owner, the government. This research will clarify the current situation as a result of law and legislation, economic mechanisms and market power. Resulting in an list of criteria that are crucial for establishing a market that is beneficial for both client and contractor.
2 THE RESEARCH DESIGN

In order to effectively address the research problem, a research design is set up. The research design constitutes the blueprint for the research approach. The research design is split into a conceptual design and the research methodology. This chapter elaborates on the motive of the research and what actions will be undertaken to find a solution for the research problem. First the conceptual design will be discussed (Verschuren & Doorewaard, 2007, p. 18). The problem analysis will lead to the problem definition. The context of the research will be set in the scope. Next, the objective, research question and outcome are discussed as a guideline for coming up with a solution for the problem definition. In the second part the technical design is described by means of the research methodology.

2.1 THE CONCEPTUAL DESIGN

The conceptual design clarifies the intent of these studies. The goal of the conceptual design is to steer the use of information. Which sources will be used, how these sources should be used and what will be done with the information extracted from the sources (Verschuren & Doorewaard, 2007, p. 30). Next to steering the studies, the conceptual design shows the motive of these studies.

2.1.1 PROBLEM ANALYSIS

Concession holders of public infrastructures are usually the sole buyer in a market with few contractors. As an independent governing body the concessionaires are obligated to invite the market to tender. Due to the implementation of the European guidelines in Dutch procurement law, the concessionaires are required to award contracts based on criteria that meet the principles of the Most Economically Advantageous Tender approach (Hardeman, EMVI, tenzij,..., 2013, p. 10). MEAT tender s tend to result in bids that suit the wishes of the client to a greater extent than low-bid tenders (Hardeman, EMVI, tenzij,..., 2013, p. 9). The amount of contracting authorities applying the MEAT procedure for awarding contracts is growing considerably. Next to the shift in methods for awarding a contract, contract forms are changing as well. Specified contracts with a high level of detail are replaced by integrated contracts, raising the contractors responsibility. From a contracting party’s point of view, integrated contracts lead to less additional work, shared responsibility and innovation, among other things (UAVgc2005, 2015).

However, these shifts did not directly lead to the perceived results. A scientific paper that described the results of a research to cost overruns in Dutch Infrastructure Projects, showed an average cost overrun of 10.6% for rail, 18.6% for roads and 21.7% for fixed links (Cantarelli, van Wee, Molin, & and Flyvbjerg, 2012). This research was based on projects with classic tenders and contracts. A previous analysis of the writer to cost overruns in railway renewal projects over the period 2013-2015 showed a cost overrun percentage of approximately 10%. In finding a cause for the cost overruns in Dutch construction projects, Cantarelli et al. concluded that the pre-construction phase plays a crucial role. The pre-construction phase is considered the period between the formal decision to build and the start of construction. During this phase the selection of the contractor/supplier is crucial (Cantarelli & Flyvbjerg, 2012). By misrepresenting costs and benefits of the contractors project, the contractor tries to win the tender. The awarding criteria are to blame for this opportunistic behavior (Cantarelli, van Wee, Molin, & and Flyvbjerg, 2012, p. 50). Contractors tend to tailor their bid to the awarding criteria and are often not able to meet their promises in the construction phase.

As the concession holder of the Dutch railway infrastructure, ProRail is obligated to apply procurement methods according to the European legislation for special sectors (2004/17/EG). The principles of this legislation are equal treatment, non-discrimination, mutual recognition, proportionality and transparency. These principles are designed to promote competition and enable new parties to enter the market. However, in order to ensure a guaranteed minimum performance of their contractors, European legislation allows clients to apply certain selection criteria. ProRail’s aim for a guaranteed minimum performance is translated into a qualification system. Certificates are given to contractors that meet the minimum requirements set by ProRail. Only certified contractors are allowed to work on and around the tracks. For example, 6 construction companies are certified to perform construction work to the tracks.

To comply with the procurement law, ProRail uses the Most Economically Advantageous Tender strategy. ProRail’s adaption of this procedure is based on four factors: Price, CO2-performance, Safety-performance...
and Past-Performance. There are circumstances under which there can be a deviation from the standards. However, generally the price of the bid is the starting point. This bid will be evaluated by applying fictive discount for the three other factors. Depending on their performance for CO2-performance, Safety-performance and their Past-Performance, contractors receive fictive discounts as a percentage of their bid. This leads to evaluated bids for all tenderers, the lowest evaluated bid will win the tender and sign the contract based on their initial bid. However, CO2- and Safety-performance are almost equal for all certified contractors, while the influence of the past performance criterion is minor, making price still the dominant factor in this tender approach.

ProRail expenditure on construction projects is approximately €2 billion on a yearly basis of which €600 million is spent on track renewal projects. This makes ProRail one of the largest clients in the Dutch construction industry and the biggest in the Dutch railway sector. Inevitably giving ProRail a lot of buying power. On the other hand, there are only six certified contractors in the track renewal market. Therefore, the choice in contractors is small, resulting a lot of power on the sellers side.

Procuring with price as a dominant factor reflects the power of the buyers side. The construction fraud, as discussed in the introduction, can be seen as an example of the consequences that can occur when exploiting the advantages of selling power. It can be concluded that both situations are undesirable, Figure 1 and Figure 2 visualize these situations.
2.1.2 **PROBLEM STATEMENT**

In a market with only six contractors, contractors will either collude or compete with each other. Considering a market with only one buyer, contractors are almost forced to show opportunistic behavior in their tender bids. These type of relationships between client and contractor causes a distressed market. Clients try to ensure a minimum quality for the lowest price, while contractors are covering their opportunistic behavior by claiming additional work in the construction phase, leading to the following problem definition:

*In the Dutch Rail market both sides of the market potentially have large market power, causing a tense market.*

**Objective**

The objective of this research focusses on finding conditions that will have a positive contribution to markets with one buyer and few sellers. This pursued situation is shown in Figure 3.

![Figure 3 Representation of the Pursued Situation, source: own illustration](image)

This objective implies that there is an optimal market form that adds value for both the buyer and the supplier. The characteristics of an optimal market will be explored in section 2.1 to come up with characteristics of the pursued situation, to which the subject matter can be compared. However, an optimum can’t be stated without any debate. Therefore, different viewpoints will be discussed and will lead to a choice in what is considered ‘optimal’. Hence, boundaries and legislation must be discussed as these are the rules that the commissioning party has to take into account. In current situations markets are distressed due to cost overruns that occur in the construction phase. By searching for the causes and backgrounds of these cost overruns, sore points will emerge from a case study that can be found in Ch. 3.

In short, the goal is to trace down the cause of a problem and make statements on how the problem can be solved. Verschuren and entitle this type of research as a ‘Diagnostic research’ (2007, p. 78). It is necessary to choose one direction for finding the cause of the problem, otherwise the research becomes too extensive (Verschuren & Doorewaard, 2007). For this research, the cause of the cost overruns is sought after in the pre-construction phase.
2.1.3 RESEARCH QUESTION

In order to reach the objective a main research question is formulated. The focus of this question is to come up with a list of criteria that will establish a competitive market, for markets with one buyer and few contractors. With the scope in mind, this is formulated as:

What factors are crucial for making the Dutch Rail contractors market beneficial for both the client and the contractor?

Scope

A market situation with only one buyer and a few contractors is exceptional but appears in various fields of expertise. The scope of this research is limited to the renewal of large infrastructures, where the focus lies at the preparation phase as laid down in the following demarcations.

Preparation phase

The period between the formal decision to build and the start of construction. In this period the contract is set-up and the contractor is chosen.

Markets

This research will focus on markets with one buyer and few contractors. More specific, the markets that will be discussed in this research are: the renewal of railway infrastructure in the Netherlands and in Finland, and the renewal of the high-voltage infrastructure in the Netherlands. The markets will be discussed from a client's point of view. The influence of third parties will be excluded from this study.

Economics

For the economic review, the market forms ‘oligopoly’ and ‘monopsony’ are leading. Perfect competition will be discussed as the desired market form.

Legislation

The discussed Dutch markets are ‘special sector’ markets. Therefore, the legislative framework will be narrowed down to the Dutch procurement law for special sectors. The Finnish rail market is subject to the same European procurement legislation as for the Dutch markets, European legislation will also be implemented in this research.

2.1.4 RELEVANCE

This research will be of help for sole buyers in their search giving the right interpretation to professional commissioning. It is an exploration of the current market approach and how legislation limits the opportunities for the client in their approach. The research seeks for possibilities that will enable a market situation in which the client will receive good value for money whilst he can still realize a profit. The next chapters will discuss the elements that can contribute to this goal and the limitations that come with them. This leads to a list of criteria that are of importance for establishing market mechanisms that add value for both the buyer and the seller.

When reflecting on the scope, this research studies a market situation that is extraordinary on both the buying and selling side. Scientific research usually discusses markets with a scarcity in either buyers or sellers, but always an abundance of buyers or sellers on the other side. On the one hand this research will give theoretical insights in this typical market form, on the other hand it will help sole buyers in practicing their job as a professional client. In the end, at the outcome of this research is:

A list of criteria that contributes to establishing a Dutch Rail market that is beneficial for both the client and the contractor
2.2 THE RESEARCH METHODOLOGY

In order to come up with criteria that are crucial for establishing a competitive market, a research methodology has to be designed. This chapter will discuss the steps that will be taken in order to reach the goal of defining these criteria.

2.2.1 RESEARCH FRAMEWORK

The research framework is a schematic representation of the most important research phases. It shows which steps the researcher will go through in order to achieve the goal of the research project. The framework for this research is based on the research principles of Verschuren and Doorewaard in their book ‘Designing a research’ (Verschuren & Doorewaard, 2007).

The framework in Figure 4 shows the lay-out of this report and is organized as follows: (Ch. 3) A confrontation of the theory of market mechanism and procurement legislation with the situation in the Dutch rail sector. Resulting in a proposed list of criteria for establishing a beneficial public market. (Ch. 4) A single case study provides insights in the technicalities that come along with railway projects. (Ch. 5) A multiple case study provides the input for the presence and relevance of the criteria from the proposed list, resulting in a finalized list of criteria. (Ch. 6) This research is concluded with answer to the main research question of this undertaking, resulting in a list of factors crucial to establishing a beneficial Dutch Rail market.

This research will start with defining the pursued situation and its constraints. A literature survey will provide insights in what is a desirable situations, and the factors that come along with it. By means of an elaboration of the market mechanisms that occur in oligopolies, monopsonies and markets with perfect competition insight is gained in the current situation on the one hand, and will act as a starting point for the pursued situation on the other. Then the constraints for procurement are consulted, since the pre-construction phase is focused on as the solution space. This first step will result in a long-list of criteria from which a Dutch public market will benefit, given the constraints that come with the laws and regulation that influence Dutch procurement. The second step is an observation of the impact of technical nature of railway projects in the Netherlands. This will be done by performing a single case study that exposes the short comings of these type of projects.

Next, the followed procedure for three independent cases of infrastructure renewal is reviewed. The experiences with markets with one buyer and few sellers will be discussed from a client’s point of view. Resulting in a verdict on the presence and relevance of the proposed criteria. This will result in a finalized list of criteria that is necessary for establishing a beneficial special sectors market with one buyer and few suppliers.

This thesis will be concluded with answering the main research question. The shortcomings of the Dutch Rail contractors market with regards to the finalized list will be the input for this answer. Thereby, the objec-
2.3 THE RESEARCH QUESTIONS

The research question as introduced in the research design is to comprehensive to answer at once. The list below shows how the main research question is broken down in several questions. These questions will act as a guide to answering the main research questions. These question will be answered in the following chapters. The answers for these sub-questions will be discussed and combined in the conclusion, as they will be give input for the definitive list of factors crucial to establishing a beneficial Dutch Rail contractors market.

What factors are crucial for making the Dutch Rail contractors market beneficial for both the client and the contractor?

1. What requirements are crucial in establishing a beneficial market?
2. What are the legislative boundaries for establishing a beneficial Dutch public market?
3. What requirements are crucial for establishing a beneficial Dutch Rail market, as a result of the technical nature of projects in the Dutch Rail market?
4. What criteria make public markets with one buyer and few sellers beneficial?

2.4 THE RESEARCH OUTLINE

This thesis aims at establishing a market that is beneficial for both the client and the contractor. The introduction showed how these markets are facing an imbalance in power. Stating the problem in a more abstract manner led to the objective of establishing a list of crucial factors. Chapter 3 will explore the literature. This will be concluded with a long-list of criteria for establishing a market beneficial for both the client and the contractor. This list will be examined in chapter four, as it is tested to an experimental real life case and three other cases that are subject to similar market forms and legislation. A cross case analysis of these cases will result in a validated list of criteria. This list will then be analyzed and possibilities for implementing parts of the list will be discussed. This results in a final list of criteria with an advice on how to apply them to the current processes of ProRail.
This chapter starts with establishing a definition of the desired beneficial situation. Economic literature is consulted to define what is ‘beneficial’ and to address the requirements needed to reach this situation. These requirements are translated into criteria, resulting in a proposed list of criteria for a well-functioning market. In order to place the Dutch Rail market in perspective, the economic features of the Dutch Rail market are traced. Next, the law and legislation applicable to infrastructure managers in the special sectors is discussed. The requirements that lead from the laws and legislation will be added to the list of criteria for the desired situation. Since this study is being performed at ProRail, ProRail’s procurement policy will be discussed last. This chapter will be concluded with answering research question one and two. Thereby, proposing a list of criteria that are crucial in establishing a beneficial market and presenting the hurdles that were observed during this literature survey.

3.1 ECONOMICS

In general, economics is defined as a social science that studies the behavior of individuals, businesses, governments and entire societies when dealing with scarcity and the incentives influencing this behavior (Bade & Parkin, 2009, p. 3). The scientific world defines two views on economics; the macro-economic view and the micro-economic view. Macro-economists perform studies to the relationship of indicators, such as GDP and unemployment rates with the economic development for national, regional and global economies. The latter focuses on the behavior of individuals and participants regarding scarcity and the allocation of limited resources (Weintraub, 1979).

This chapter aims at finding requirements for a well-functioning. The economic view that analyzes market-mechanisms is that of micro-economics, therefore the focus will be on the micro-economic approach of markets.

3.1.1 MARKET FORMS

A market is considered an economic system that facilitates the making of exchanges between buyers and sellers. The set of suppliers and demanders whose trading establishes the price of a good are the ones forming the market (Stigler & Sherwin, 1985).

The behavior of a participant is heavily influenced by the type of market in which it is active. Several types of markets exist, where the types are described by: 1. The number of participants, 2. Whether products of different participants are equal or non-equal (Mankiw, 2012, p. 331), and 3. How easy it is to enter or leave the market (Stigler G. J., 1983). At the end of the 19th century, economists discussed two market forms; Perfect competition and Monopolies (Silva, 2007, p. 40). However, besides these two market forms there are a few others. Where market forms other than perfect competition are usually referred to as imperfect competition. Besides perfect competition the market forms, monopolies, monopolistic competition and oligopoly are the four major types of markets (Bade & Parkin, 2009, p. 348). The well-known economist Joan Robinson introduced an additional term called ‘Monopsony’ in her book ‘The Economics of Imperfect Competition’ (1933). The table below shows the proposed market forms by The number of participants (both buying and selling), Whether products of different participants are equal or non-equal, and The barriers to entry.
In practice, perfect competition is a rarely seen market form (Chakravarty, 2002). On the contrary, perfect competition is a common used reference to identify the imperfection of other markets (Clifton, 1977). When considering perfect competition as an extremely well-functioning market, the following continuum can be formed in which monopolies are considered the toughest form of imperfection (Mankiw, 2012, p. 330).

The following paragraphs will discuss the characteristics of the market forms from the continuum, with the exception of monopolistic competition, since this market form falls out of the scope of this research.

**Perfect competition**

Assuming perfect competition is the pursued situation makes it necessary to firstly define the characteristics of perfect competition. The markets that this study focuses on is defined by one buyer and few sellers. When taking Table 1 into consideration, it can be stated that the associated market forms are: Oligopoly and Monopsony. These market forms will be elaborated on as well, in order to come up with a comparison. Resulting in a clear view on discrepancies between the pursued situation of perfect competition and the market forms relevant for this study.

As said, perfect competition is a market form that is rarely observed in real life. Joan Robinson defines a market of perfect competition as: ‘a state of affairs in which the demand for the output of an individual seller is perfectly elastic’ (Robinson, 1933). Where other economists propose a wide range of factors to define a market of perfect competition, Robinson sticks to two crucial notions of perfect competition; firstly, a situation in which a single seller can’t influence price (that is perfect competition in my terminology) and second, a situation in which a single seller can’t make more than normal profits.’ (Robinson, 1933). This abstract statement is in line with the long-list of factors that other economists mention. For example, in his book Risk, Uncertainty and Profit (1964) prof. Frank H. Knight describes perfect competition as follows; ‘perfect competition entails rational conduct on the part of buyers and sellers, full knowledge, absence of frictions, perfect mobility and perfect divisibility of factors of production, and completely static conditions.’ (Robinson, 1934). In later years, Nobel prize winner George Stigler rephrased Knight’s conditions to: ‘Perfect market competition will prevail when there are indefinitely many traders (no one of which controls an appreciable share of demand or supply) acting independently in a perfect market. A perfect market is one in which the traders have full knowledge of all offer and bid prices.’ (Stigler G. J., 1957). As can be seen, there is a wide range of definitions for perfect competition. In his review of articles on perfect competition, Stigler (1957) the development of the term ‘perfect competition’ is shown by summing up several definitions of different well known economists. Smith and Jevons used the term ‘competition’ after which it evolved in ‘perfect competition’, first used by Edgeworth. Table 2 shows a selection of the definitions from this article.
Thesis Twan Briels

and concludes with a modern view on perfect competition.

<table>
<thead>
<tr>
<th>Economist</th>
<th>Crucial factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adam Smith (1776)</td>
<td>The rivals must act independently, not collusively. The number of rivals, potential as well as present, must be sufficient to eliminate extraordinary gains. The economic units must possess tolerable knowledge of the market opportunities. There must be freedom (from social restraints) to act on this knowledge. Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.</td>
</tr>
<tr>
<td>William Jevons (1871)</td>
<td>A market, then, is theoretically perfect only when all traders have perfect knowledge of the conditions of supply and demand, and the consequent ratio of exchange. There must be perfectly free competition, so that anyone will exchange with anyone else upon the slightest advantage appearing. There must be no conspiracies for absorbing and holding supplies to produce unnatural ratios of exchange.</td>
</tr>
<tr>
<td>Francis Edgeworth (1881)</td>
<td>Indefinitely large numbers of participants on both sides of the market; Complete absence of limitations upon individual self-seeking behaviour Complete divisibility of the commodities traded.</td>
</tr>
<tr>
<td>John Bates Clark (1899)</td>
<td>Population is increasing. Capital is increasing. Methods of production are improving. The forms of industrial establishments are changing. The wants of consumers are multiplying.</td>
</tr>
<tr>
<td>Bade &amp; Parkin, (2009)</td>
<td>Sellers and buyers are well informed about prices. All participants are price takers. No entry barriers to enter the market. All participants produce an identical or homogeneous product.</td>
</tr>
</tbody>
</table>

*Table 2 Review on perfect competition*

However, using the same side note as Stigler (1957) does in his article, these lists of requirements, has not to be dealt with as a list of minimum requirements. All of the requirements can be argued, since for all of the requirements an example of perfect competition can be found under which circumstances can be seen that are the opposite of what is stated before as a requirement for perfect competition (Stigler 1957).

**Oligopoly**

Oligopoly occurs when only a few participants dominate the market or industry (Sloman & Garrat, 1998, p. 135). Besides, there are legal or natural barriers for new participants to enter the market (Bade & Parkin, 2009, p. 432). Since there are only a few participants under oligopoly, the action of one participant influences the others. When a participant cuts the prices of a product, the profits might increase since there will be more buyers choosing the cheaper product. However, the other participants will react by lowering their prices as well. In other words, participants under oligopoly are interdependent (Gollop & Roberts, 1979, p. 331).

Oligopoly exists in two states, with some sub-states. Participants that act under oligopoly will either collude or compete with each other (Day, Hobbs, & Pang, 2002, pp. 598-599). Even though several forms of Competition and Collusion can be observed, this thesis will elaborate on the basic forms.

**Collusion**

In his article ‘A theory on Oligopoly’, Stigler (1964) states that it is likely for participants collude due to the fact that participants will always search for maximization of their profits. Where maximization will be found
when participants act together as a monopoly. When collusion is formalized, it is called a cartel (Sloman & Garrat, 1998, p. 137). The advantage of collusion is that uncertainty can be reduced. By setting prices, dividing market shares, advertising expenditure etc. the participant is assured of income. Factors that favor collusion include; the presence of only a few participants, openness about costs and production methods between participants, similar average production costs and methods and significant barriers to enter the market.

**Competition**

Competition under oligopoly is a situation in which all participants are trying to obtain an as large as possible piece of the market (Durham, McCabe, Olson, Rassenti, & Smith, 2004).

**Monopsony**

The term Monopsony was (re)introduced by Robinson to describe a market with a single buyer and multiple sellers (Robinson, 1948, p. 215). This situation is also referred to as a ‘buyers monopoly’. The characteristics of a monopsony resembles those of a monopoly. The term monopsony is usually referred to when labour markets are discussed. Where the employer enjoys a lot of market power, since the employer is the only ‘buyer’ (Hirsch & Schumacher, 1995).

**3.1.2 NATURE OF COMPETITION**

Competition can be measured by either the ability of an individual participant to influence price or by the excess of price over marginal costs in a market (Stigler G. J., 1972, p. 92). The individual market power of a participant depends on the ability of this participant to influence the price, e.g. to increase profits by setting a price above marginal costs (Hahn, 1984, p. 754). A participants nature of seeking for optimizing profits influences participants in their market behaviour. Using these statements as a reference, the nature of competition for the introduced market forms will be discussed next.

**Market behaviour under perfect competition**

As of for market behaviour; theory on perfect competition makes a distinction between a short-term and a long-term view. Where in the short term, participants are entering the market when profits are high, and leave the market when profits decrease, resulting in an equilibrium. Robinson describes this phenomenon as ‘the process of reaching equilibrium’ (Robinson, 1934, p. 110). As mentioned earlier, perfect competition exists when there is no single participant that can influence price and profits are normal (Robinson, 1934, p. 104). With many buyers and many sellers, the influence of one seller or buyer is negligible. Hence, the power of an indivisual participant is low, the market has full power.

**Market behaviour under oligopoly**

When collusion occurs, the sellers in the market will form a cartel. The cartel will attempt to maximize industry profits (Schmalensee, 1987, p. 351). However, this can only be reached when there is a possibility for side-payments and participants must make agreements that are capable of withstanding cheating. Also, the barriers to enter must be high, otherwise entrants can uncover the collusive behaviour (Schmalensee, 1987, p. 352). It can be stated that markets that are organized into cartels with the aim of influencing the level at which prices are set, have large market power since they can influence price and make high profits.

The role of new entrants shows the interdependence of the participants in an oligopolistic market. Making that participants must consider their position relative to its current and potential rivals and their customers when deciding their price. The interdependence makes that if one participant drops the price, its rivals are forced to do so as well, due to the fact that a customer will choose the lowest price when the products are close substitutes. This makes that oligopolists want to stabilize their position in the market to keep their market share and expand when there is a possibility (Rothschild, 1947, p. 310). Besides, Rothschild (1947, p. 311) states that the price of a participant therefore is not the result of market forces but the expression of a strategic policy, for choosing the right price at the right time. So, cartelization gives the opportunity to influence the price, giving the cartel high seller market power. While participants that act individual in an oligopolistic environment are constantly securing their position and therefore can't influence price, giving them low seller market power.

**Market behaviour under monopsony**

A monopsonist can maximize his profits when the marginal utility is equal to marginal cost (Robinson, 1933, p. 218). In Layman’s terms this means that the buyer seeks for its optimal position, that’s when one additional amount of a good or service is equal to its costs. However, this equilibrium deviates from what
is described as the socially efficient amount of labour (Kuhn, 2004, p. 371). Meaning that a buyer buys his good or service at a lower price than the efficient market price as in perfect competition (Kuhn, 2004, p. 371). A monopsonist can influence price and therefore has high buyer market power.

**Market Power in combined markets**

Even though not much have been written on combined markets, the retail industry is discussed in some papers. The discussed situations focus on a small amount of buyers (the retail chains) and few sellers (the major producers). The major difference between the infrastructure renewal industry and the supermarket industry is the presence of an extra stakeholder; the end-user. Whereas in these studies the links are made between producers price and the end-user’s price, this thesis focuses on the effects for the infrastructure manager, the buyer. Despite the fact that these markets differ from the construction industry, the outcomes of these studies are interesting and might be applicable for the construction industry.

The above introduced studies focuses on the role of buyer- and seller-power in the market. The study adopts the principle that market power plays an important role in the price that eventually is paid by the client. The term ‘countervailing power’ is introduced in order to describe the market power developed on one side of a market as a result of the market power on the other side (Chen, 2015).

Firstly, the situation with monopsony power and a competitive sellers market is discussed. It is concluded that when monopsony power exists and no power in the seller’s market, monopsony power will always cause a loss in efficiency. However, when the sellers have countervailing power, there is a better chance on benefits for the client (Chen, 2015).

Countervailing power is enhanced when the seller’s competition is stable. Stability can be accomplished by setting high barriers to entry, by doing so there is no fear for high competition due to new entrants. On the contrary it is stated by Sternberg that a decrease of sellers automatically results in an increase in consumer price. While in perfect competition the opposite happens (Chen, 2015).

When a comparison is made with the markets this thesis deals with, it can be stated that when the infrastructure manager uses his monopsony-power, this will negatively influence the market on the long run. The solution that is brought up would result in accepting ‘countervailing power’ from the contractors but make strict contract arrangements. Barriers to entry are not necessarily negative, but a reduction of the amount of contractors should be avoided.

### 3.1.3 INSIGHTS IN ECONOMICS

#### perfect competition

This section on economics concludes with a list of criteria that came up from the literature survey for establishing ‘perfect competition’. The criteria are enumerated and overlapping criteria are grouped under one number, e.g. 1a, 1b etc. Hereby answering research question one:

**Q1: What requirements are crucial in establishing a beneficial market?**

1.a *The number of rivals, potential as well as present, must be sufficient to eliminate extraordinary gains.*

1.b *All participants are price takers.*

2.a *The economic units must possess tolerable knowledge of the market opportunities.*

2.b *A market, then, is theoretically perfect only when all traders have perfect knowledge of the conditions of supply and demand, and the consequent ratio of exchange.*

2.c *Sellers and buyers are well informed about prices.*

2.d *There must be freedom (from social restraints) to act on this knowledge.*

3. *The rivals must act independently, not collusively.*

4. *No entry barriers to enter the market.*

5. *Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.*
6.a There must be perfectly free competition, so that anyone will exchange with anyone else upon the slightest advantage appearing. There must be no conspiracies for absorbing and holding supplies to produce unnatural ratios of exchange.

6.b Complete absence of limitations upon individual self-seeking behaviour.

7.a Indefinitely large numbers of participants on both sides of the market.

7.b Population is increasing.

8.a Complete divisibility of the commodities traded.

8.b All participants produce an identical or homogeneous product.

9.a Capital is increasing.

9.b The wants of consumers are multiplying.

10 Methods of production are improving.

11 The forms of industrial establishments are changing.

Imperfect markets

This section proved that the discussed market of this thesis features characteristics of an oligopoly and a monopsony. Given the fact that the rail market is one with a single buyer and few sellers, it must be noted that some remarks must be taken into account. A list of remarks will follow up the list of criteria for establishing a market with perfect competition. It can be stated that infrastructure managers are dealing with markets in which they are the (one of the) only buyers in a market with few sellers. Insights gained from the research to monopsonies, oligopolies and combined markets results in the following:

1. Oligopoly causes either collusion or competition. Where collusion causes selling market power and competition the opposite.

2. A monopsony gives large power to the buyer.

3. Utilizing monopsony power usually results in a less efficient market.

4. Countervailing power in monopsony markets can be useful when contracts are strictly maintained.
When purchasing goods, services or works, public contracting authorities in the Netherlands are subject to certain laws and regulations. Public clients are required to respect these standard agreements and conditions when setting up a procurement strategy (Rijksoverheid, n.d.). This paragraph deals with the limitations and opportunities that comes along with this legislation in relation to factors that influence the benefits of client and contractor.

### Law and Legislation

Current procurement laws in the Netherlands are the result of the implementation of European directives and national political discussions on public contracts. The current legislation for procurement is laid down in the ‘Aanbestedingswet 2012’ (= Dutch procurement law 2012) (Rijksoverheid, n.d.). This law came into effect on the 1st of April 2013 and is applied for all tenders, above and below the European thresholds. The European threshold is an annual revised value that is considered a worth-while tender value for a business to submit a tender abroad. Only contracting authorities are required to hold tendering processes. Private parties can choose to use the Aanbestedingswet 2012 but are not obligated to do so. ‘Contracting authorities’ in the Public Contracts Procurement Decree are defined as:

> ‘The State, a provincial authority, a municipal authority, a water board, a body governed by public law or an association of these government bodies or bodies governed by public law.’ (Chao-Duivis, 2013, p. 137)

Dutch procurement law is designed on the basis of the procurement directives that are set by the European Union. These directives are implemented in national (Dutch) legislation, i.e. the Dutch procurement law 2012 (Rijksoverheid, n.d.). The Aanbestedingswet 2012 makes a distinction between ‘traditional procurement’ (2004/18/EC) and ‘special sectors’ (2004/17/EC), the latter applies to clients in the water, energy, transport and postal services sectors (utilities) (Kennisportal Europese Aanbestedingen, n.d.). The purpose and underlying idea of the current procurement law and regulations is to meet the principles of equality, objectivity, transparency, proportionality, state reason and legitimate expectations (Kennisportal Europese Aanbestedingen, n.d.). The procedures as shown in Figure 7 should be in line with the thought behind the principles.

The separate directive for special sectors was introduced in order to prevent favouritism. Favouritism was feared due to the closed nature of the special sector markets. The closed nature of markets in the special sectors is a result of the operator’s exclusive rights to manage (a part of) the network infrastructure (Europa decentraal, n.d.). Therefore, a lot of power is in the hands of the network administrator.

### Procedures

This thesis’s scope lies within the special sectors, to which 2004/17/EC is applied. The procurement process in 2014/17/EC deviates from 2004/18/EC in the sense that for procurement procedures, special sectors are restricted to the 1. Open procedure 2. Restricted procedure and 3. Negotiated procedures (Europa decentraal, n.d.).

### Selection criteria

If a procurement procedure is chosen, selection criteria can be applied for all procedures. Selection criteria are created to monitor the bidder, not the bid. There are three types of selection criteria: 1. Grounds for exclusion 2. Suitability requirements and 3. Detailed criteria. Special sectors have the opportunity to apply a system of qualification for the restricted procedure, in which the selection procedure is avoided by allowing only certified contractors to prepare a bid (Kennisportal Europese Aanbestedingen, n.d.). Further explanation on this matter can be found in Appendix D.

### Awarding criteria

The tender bid itself is evaluated on the basis of either ‘Lowest bid’ or by using criteria to decide which tender is the Most Economically Advantageous Tender. The criteria for choosing the Most Economically Advantageous Tender can vary in their nature, but must be of relevance for the contract (Europa decentraal, n.d.). The evaluated tender with the lowest bid or appointed as the Most Economically Advantageous Tender is awarded the contract. A tender is reviewed based on criteria that are announced prior to the tender procedure. The contract is awarded to the tenderer submitting the most compliant tender. With the introduction of the Aanbestedingswet 2012, contracting bodies are obligated to award contracts not to the tender with the lowest price but to the Most Economically Advantageous Tender. Exceptions can be made
when a client can motivate his choice for the low-bid criteria (Hardeman, 2013). When the Most Economically Advantageous Tender procedure is used, the criterion price can’t play a dominant role in the evaluation of the tender (Door uitwerking subcriteria in werkelijkheid gekozen voor het criterium van de laagste prijs?, 2014). The process as discussed so far is shown in figure 6.

Figure 6 Procurement process, source: Views to deal with the challenges of implementing Best Value (Heim, 2015)

Forms of organization

Contracts are prepared based on the organizational form that is chosen for the project. In recent years, a shift from traditional contracts to integrated types is visible in Dutch construction industry (Lenferink, Tillemans, & Arts, 2013). Integrated contracts are types of contracts where contractors are involved in an earlier stage of the project. Depending on the phase the project is in at the time of contracting, as shown in Figure 8.

Figure 7 Forms of organization, source: Risico management in de bouw, een verkenning (Vermande & Spalburg, 1998)

When a contract is signed, it is common practice that the contractual relationship between contractor and client is regulated through uniform administrative conditions (Chao-Duivis, 2013). The uniform administrative conditions is the result of a collaborative effort of the construction industry and the government. Using the standardized conditions simplifies the administrative procedures and thereby reduces the amount of paperwork. Thereby contributing to the uniformization of contracts, allowing the preparation of contracts to be less labour intensive. Contracts are prepared ex-ante and can be modified to the needs of the specific project. By doing so, contracts become more clear for both the client and contractor, resulting in less discussion on the content of the contract. Several uniform administrative conditions exist, which one is applied for the contract depends on the type of organization and the sector in which the contract is set up.
An overview of all the different uniform administrative conditions can be found below.

<table>
<thead>
<tr>
<th>Uniforme Administratieve Voorwaarden voor de uitvoering van werken en van technische installatiewerken 2012 (UAV 2012);</th>
<th>Similar to UAV 1989, including the Uniform Administrative Conditions for installation work, the former UAV TI.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniforme Administratieve Voorwaarden voor de uitvoering van werken 1989 (UAV 1989);</td>
<td>Traditional organization structures, general conditions for highly specified contracts.</td>
</tr>
<tr>
<td>Algemene voorwaarden voor aannemingen in het bouwbedrijf 2013 (AVA 2013);</td>
<td>These terms and conditions are for building or renovation of an immovable property by a contractor on behalf of a corporate party or a consumer.</td>
</tr>
<tr>
<td>VGBouw Model Bouwteamovereenkomst 1992;</td>
<td>General conditions for a ‘bouwteam’. In a ‘bouwteam’ situation, the general contractor takes over the design and execution of a project, acting a bit like an orchestra conductor.</td>
</tr>
<tr>
<td>Rechtsverhouding opdrachtgever–architect, ingenieur en adviseur DNR 2011;</td>
<td>For the contract agreements between architects, engineers, consultants and the client.</td>
</tr>
<tr>
<td>Het model Koop-/aanemingsovereenkomst (KA/AV).</td>
<td>Deals with projects where a buyer of land seeks a contractor.</td>
</tr>
</tbody>
</table>

Figure 8 Uniform Administrative Conditions, source: Views to deal with the challenges of implementing Best Value (Heim, 2015)

**UAV-GC 2005**

The uniform administrative conditions relevant for this thesis, is the UAV-gc 2005. The UAV-gc 2005 is set up to deal with integrated contracts. When using an integrated organizational structure such as design and construct, governmental organizations usually use the conditions of the UAV-gc 2005. In this conditions, there are more responsibilities for the contractor, as he is seen as the expert party.

The division of responsibilities is rather extensive. Two important responsibilities from a client’s point of view are that the client is responsible for the tuning of the activities that are necessary to define the soil conditions, and also for providing a safe working environment (UAVgc2005, 2015). An extensive memo that divides the responsibilities between client and contractor can be found in Appendix F

**Insights in Law and Legislation**

This section focused on the law and legislation that applies to special sectors. From this research, it can be concluded that special sector clients have both options and obligations. The obligations are considered the answer to research question two.

**Q2: What are the legislative boundaries for establishing a beneficial Dutch public market?**

1. **Contracts must be awarded to the Most Economically Advantageous Tender unless the choice for lowest bid can be backed.**

2. **Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.**

The following conclusions should be taken into account when setting up a list of criteria:

- **Special sectors generally use selection criteria to reduce the amount of contractors that are tendering.**

- **For the award of a contract, a procuring entity should keep in mind the European principles of equality, objectivity, transparency, proportionality, state reason and legitimate expectations.**

- **In UAV-gc 2005 contracts, the client is responsible for safety and the provision of information on soil conditions.**
3.3 PROCUREMENT POLICY OF PRORAIL

This thesis focuses on the Dutch Railway sector from a client’s point of view. Therefore, the procurement policy of ProRail (=the client) will be discussed.

Since prorail acts in many different fields of expertise, the contract policy with regards to contracting is a document with high level of abstraction that gives guidance for choosing forms of organization, procurement methods and contract forms. However, the contracting policy has not been updated since its date of publication on the 14th of November 2012. Some parts of the policy are outdated as a result of the implementation of the Aanbestedingswet 2012 on the 1st of February 2013. On several points, the policy follows the precursor of the Aanbestedingswet 2012, the ‘Besluit aanbestedingen speciale sectoren’ (Bass). Nowadays, the Bass, together with the ‘Besluit aanbestedingsregels voor overheidsopdrachten’ (Boa) and ‘Wet implementatie rechtsbeschermingsrichtlijnen aanbesteden’ (Wira), has merged in the Aanbestedingswet 2012. The following paragraphs give an overview of the content of the procurement policy of ProRail

Contracting process

The process of contracting occurs in the following chronological manner. A project team takes several aspects into consideration when choosing an organizational form, a contract form and a procurement method.

Goal

As a concession holder ProRail acts under the commission of the government. As the manager of the railway infrastructure ProRail has four strategic goals: a Safe railway infrastructure, a Reliable railway infrastructure, a Punctual railway infrastructure and a Sustainable railway infrastructure. In order to reach these goals, a large amount of maintenance and renewal projects are carried out by multiple contractors, under the commission of ProRail. The complexity of managing these projects was the basis of the decision to write a contracting policy for ProRail. This contracting policy aims at:

- The contracting policy provides a framework and clarifies the behaviour of ProRail with regards to contracting for both Stakeholders and Interested parties
- The contracting policy defines the norms and values on the basis of which the board of ProRail the functioning of their own assigned Tenderboard measures.

Forms of organization

The form of organization is chosen based on how integrated a contract is. In the contracting plan (contracteringsplan), the project team sets out the objective criteria on which the choice for the organizational form is based. Generally, ProRail applies the Traditional, Design and Construct and derivatives from D&C as their organizational form, for example Engineer and Construct.

Contracts

Determining the type of contracts occurs on the basis of three objectives. 1. The pricing method 2. Structure of the contract 3. Usability of general terms and condition.

Applied procedures

The contracting policy states that there are four possible procurement procedures in accordance to the ARW-2006; 1. Open procedure, 2. Restricted procedure, 3. Negotiated procedures and 4. Private procedures.

1. **Open procedure**
   The procedure is only applied when two criteria are met; the market is wide and the costs for a contractor to participate in the tender are low. Generally said, this procedure concerns only ‘off-the-shelve products’.

2. **Restricted procedure**
   The procedure is applied when there is a wide market but the costs for preparing a tender are high.

3. **Negotiated procedure**
The procedure is applied when there is a small market, when costs for preparing a tender are high or when ProRail is of the opinion that early-contractor involvement is of added value.

4. **Private procedure**
ProRail chooses their contractors directly when the value of a contract is under a specific threshold. There are two possibilities, when one contractor is invited it is called a single private procedure and in case of an invitation for multiple contractor it is called a multiple private procedure.

The thresholds that ProRail applies are not in compliance with the ARN-2013 and the current European thresholds. They are even lower, and are given in the table below.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Works</th>
<th>Deliveries</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single private</td>
<td>&lt; € 100,000</td>
<td>&lt; € 50,000</td>
<td>&lt; € 50,000</td>
</tr>
<tr>
<td>Multiple private</td>
<td>&gt; € 100,000</td>
<td>&gt; € 50,000</td>
<td>&gt; € 50,000</td>
</tr>
<tr>
<td>Public (Open &amp; Restricted)</td>
<td>&gt; € 250,000</td>
<td>&gt; € 100,000</td>
<td>&gt; € 100,000</td>
</tr>
<tr>
<td>Public (European)</td>
<td>&gt; € 5,000,000</td>
<td>&gt; € 400,000</td>
<td>&gt; € 400,000</td>
</tr>
</tbody>
</table>

*Table 3 Applied procedures, source: ProRail procurement policy (2012)*

**(Pre-) Selection Criteria**
For the different types of work that ProRail brings to the market, there are differences in the selection criteria. For works that are not restricted by standards and certificates are brought to the market by using the open procedure. Works that are performed within the region of the tracks are subject to a qualification system. Contractors that want to compete in a tender for these works need to meet specific standards and possess certain certificates. ProRail has an extensive list of contractors that are qualified to perform the different works. These contracts are brought to the market through the restricted procedure. Further explanation of the applied selection criteria can be found in Appendix D.

**Tender Procedures**
The tender procedure, used in ProRail's procurement policy, is a comprehensive procedure. Further elaboration on this procedure can be found in Appendix D. From this appendix, it can be concluded that in this procedure Price plays a dominant role in awarding a contract.

**Insights in ProRail’s Procurement Policy**
This section focused on the ProRail's procurement policy. Their policy must be taken into consideration when setting up a list of criteria. However, this thesis will result in a list of criteria for the client's (ProRail) side of the rail market. This list will not focus on influencing Dutch procurement law but recommendations that follow from the list might contain adjustments to ProRail's procurement policy. Therefore, the following list is contains observations and no opinions.

1. *The goal of ProRail's contracting policy is to ensure a Safe railway infrastructure, a Reliable railway infrastructure, a Punctual railway infrastructure and a Sustainable railway infrastructure.*
2. *ProRail mainly uses 'Traditional' contracts or 'Design and Construct' and their derivatives.*
3. *Depending on the value of the contract, one of the following 4 procurement procedures are applied: 1. Open procedure, 2. Restricted procedure, 3. Negotiated procedures and 4. Private procedures.*
4. *Selection criteria are applied, depending on the market in which is procured.*
5. *Tenders are awarded by using standardized awarding criteria.*
The last three paragraphs gave insights in what factors are of importance when establishing a beneficial market. The literature survey on economics focused on the establishment of ‘perfect markets’, while the legislative section on laws and legislation resulted in boundaries to which special sector markets are subject. The list of criteria for establishing ‘perfect competition’ is considered the starting point for establishing a Dutch Rail market that’s beneficial for both the client and the contractor, supplemented by criteria that are to be followed as a result of legislation. The list of criteria for establishing ‘perfect competition’ is rather extensive and can be reduced, primarily by removing duplication (1a. and 1b. becomes 1, etc.). By doing so, the list is reduced to 11 criteria. The procurement law is considered a given fact, since ProRail is not in the position to change these regulations. This results in an additional 2 criteria that are tailored to the procurement procedure. Hence, the proposed list of criteria is a result of the enumeration of the criteria that were found for question 1 and question 2. A further explanation of the criteria follows in section 3.5.

Firstly, the proposed list of criteria for establishing the pursued situation will be presented. Next, the 13 criteria will be discussed by comparing them to the conclusions regarding the current situation. Here, the influence of the partial conclusions throughout this chapter will be taken into account.

Proposed list of criteria:

1. No single player has the power to influence price.
2. There is unrestricted access to all information about the market.
3. The rivals must act independently, not collusively.
4. There are no barriers to enter the market.
5. Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.
6. There is free competition, without influencing third parties.
7. Indefinitely large numbers of participants on both sides of the market.
8. All participants produce an identical or homogeneous product.
9. Capital is increasing.
10. Methods of production are improving.
11. The forms of industrial establishments are changing.
12. Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.
13. Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.
With answering sub-question 2, a proposed list of criteria is established. These criteria are derived from
the literature survey that focused on the desired situation and the influence from laws and legislation. In
order to provide a clear view on the content of these criteria, the criteria will separately be described.

1. **No single player has the power to influence price.**
   A feature of perfect competition is that the market is the price setter. Implying that the actions of a single
   player in the market doesn't affect the others, as a result of the large number of participants in the market.
   This results in a market equilibrium that is perfectly elastic, meaning that there will be no extraordinary
   gains or losses. Therefore, this criterion merges the criteria 'The number of rivals, potential as well as pre-
   sent, must be sufficient to eliminate extraordinary gains' and 'All participants are price takers'.

2. **There is unrestricted access to all information about the market.**
   In perfect competition, the participants are not obstructed in any way regarding the consultation of infor-
   mation about the market. Four out of five researched economic viewpoints showed a similar statement.
   The economists state that participants in the market must possess 'tolerable knowledge of the market op-
   portunities', 'perfect knowledge of supply and demand', 'informed about prices' and 'freedom to act on the
   knowledge'. This criterion is an aggregation of these statements.

3. **The rivals must act independently, not collusively.**
   As shown in the first criterion, perfect competition works when there is no party in the ability to influence
   price. Collusion is a form of cooperation that aims at disadvantaging the competition. Therefore, the first
   criterion would be brought into jeopardy.

4. **There are no barriers to enter the market.**
   When there are barriers to enter a market, there is no free competition. Since barriers are placing parties
   that have overcome the barriers in better position than those that didn't overcome the barrier (yet).

5. **Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.**
   Stigler (1957) states that 'The invisible hand is of limited effectiveness in time periods so short that rivalry
   cannot make itself felt.' Where the 'invisible hand' describes unintended social benefits resulting from indi-
   vidual actions. Which on its turn is not in compliance with the principles of the first criterion.

6. **There is free competition, without influencing third parties.**
   This criterion comes from the assumption that “in the same market, at any moment, there cannot be two
   prices for the same kind of article.” Similar to the third criterion, it is of importance that the partier in the
   market act independent, without the (positive or negative) influence of third parties.

7. **Indefinitely large numbers of participants on both sides of the market.**
   This criterion includes the statement of Clark (1899), that population is increasing. Both Clark’s population
   requirement and the ‘indefinite number of participants’ statement serve a common aim. In perfect competi-
   tion, when the equilibrium is not established yet, participants will enter and leave the market. In order to
   keep this movement going, ‘population’ must increase. On the long run, when the equilibrium is reached,
   there are no participants that are able to set the price (criterion 1). This is only possible when the market is
   indefinite large, so that market can be the price setter.

8. **All participants produce an identical or homogeneous product.**
   The goods traded in a perfect competitive market should be the same, in order to make it impossible for
   participants to distinguish themselves in any area. This would potentially be beneficial for the participant,
   while the principles of perfect competition state that all parties are equal. The criterion ‘Complete divisibil-
   ity of the commodities traded.’ is considered an old-fashioned way of saying the same.

9. **Capital is increasing.**
   This criterion also contains the need for multiplying wants of customers. As for reaching the long term
   equilibrium, it is of importance that capital increases. For a market to be beneficial for both sides of the
   market, the capital for both sides has to be growing. Clients seek for value for money, while suppliers aim at
   financial capital.
10. Methods of production are improving. Clark (1899) formulated his requirements by reflecting the principles of perfect competition to stationary markets. Perfect competition will stagnate when there is no improvement. Therefore, the methods of production should constantly be improved.

11. The forms of industrial establishments are changing. Similar to the 7th criterion, perfect competition benefits from participants entering and leaving the market. Therefore, the forms of industrial establishments must constantly change.

12. Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed. The Dutch procurement law prescribes public clients to use a Most Economically Advantageous Tender procedure for awarding contracts. In this procedure, quality must prevail over price. Unless a public client finds grounds to motivate his choice for a tender procedure in which price is dominant.

13. Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract. Besides the dominance of quality in awarding contracts, Dutch procurement law states that the criteria for determining quality should be relevant to the contract.

Concluding remarks
The discussion of the criteria above lacks in covering all partial conclusions of this chapter. These conclusions are related to the list, but are assumptions based on theory that must be validated through the case studies. As proven, the Dutch Rail market features a monopsony on the buyer’s side and an oligopoly on the seller’s side. The conclusions that were drawn up with regards to these market forms that are not mentioned in the discussion above are: Utilizing monopsony power usually results in a less efficient market, and Countervailing power in monopsony markets can be useful when contracts are strictly maintained.

Besides, certain conclusions regarding ProRail’s goals and policy are not directly apply to the criteria, but can be of relevance in later stages of this thesis. The goal of ProRail’s contracting policy is to ensure a Safe railway infrastructure, a Reliable railway infrastructure, a Punctual railway infrastructure and a Sustainable railway infrastructure. In procurement 4 procurement procedures are applied: 1. Open procedure, 2. Restricted procedure, 3. Negotiated procedures and 4. Private procedures. Contracts are ‘Traditional’ contracts or ‘Design and Construct’ and their derivatives.

The proposed list of criteria, combined with the concluding remarks will be the foundation for the single and multiple case study that will be discussed in the following chapters.
The previous chapter concluded with a list of 13 criteria that are assumed to be substantially influencing the market’s behavior. This chapter will test the existence of these criteria in practice. The subject matter of this thesis is the Dutch Rail market. Firstly, it is necessary to understand the processes and nature of the projects in this market. Project specific conditions must be taken into consideration. The best way for understanding the characteristics of specific projects is to perform an in-depth single case study (Yin, 2009). If the characteristics of the market are known, the contextual conditions for the phenomena of one buyer—few sellers markets can be tested. The aim of the second case study is to trace the importance of the observed requirements in practice. This is done to predict how future projects can be prevented from flaws that come with certain criteria, and at the same time to come up with an advice on how to adjust procedures to improve the current situation. Yin (2009) states that for these goals an embedded multiple-case design is applicable.

This chapter exists of a single case-study and a multiple case study. The following paragraphs will discuss the case study design in terms of research sources, case protocol and the case selection. Independently for the single case-study and the multiple case study.

4.1 CASE STUDY DESIGN

The previous chapter elaborated on scientific literature on economy and laws and legislation. However, the economical behavior of a market and its laws and legislation does not deal with practicalities. The first aim of the case study is to gain insight into the technical nature of Railway projects. As discussed in chapter 2, the scope for this research is narrowed to infrastructure renewal projects, from a buyer’s point of view. Firstly, it is necessary to understand these types of projects. Therefore, a single case study is a useful method to find out what opportunities and challenges come along with the nature of the projects (Yin, 2009). This might add criteria to the list and/or some criteria can be remarked.

Next, a multiple case study is performed to see “which” and “how” these criteria from both the literature survey and the single case study are influencing the market. By performing a multiple case study, the observed criteria are tested and weighed. The multiple case study consists of 3 ‘standard projects’ within the sector of infrastructure management. Further information on the design of the cases follow in the next sections.

The results of a multiple case study are generally seen as more robust, while on the other hand the level of detail of a single case study can’t be met (Yin, 2009). However, the single case study covers these shortcomings.

Case selection

For both the single case study and the multiple case study, certain criteria must be met in order to keep the continuity. First of all, the cases are analyzed from a client’s point of view, then there is the importance to have access to information about the case and the cases must fall within the demarcation as stated in The Research Design. However, the approach for the cases differ and will therefore be discussed separately.

The single case study

This thesis aims at establishing a beneficial market for both the client and the contractor in a market with one/few client and few contractors. Instead of analyzing a single project that faces non-recurring events, a standardized process is chosen to understand the difficulties of the overall market. The single case study’s purpose is to get insights in the complexity of projects in the railway sector. To summarize: the case must feature the following characteristics:

- A project in the Dutch railway sector
- A standardized project
- The market consists of one/few clients and few contractors

The multiple case study

In the multiple case study a comparison is made between cases that feature circumstances that match the single case study, in order to see similarities and differences. Therefore, the criteria are the same. Except
for the characteristic: A project in the Dutch Railway sector. Since ProRail is the single concessionaire, it would mean that multiple cases within the same company would be compared. While the purpose of this multiple case study is to compare different approaches of a standard process. Hence, when performing a multiple case study in a single participant, the processes are the same.

4.1.1 POSITION OF THE CASES

Single case study

As said, the single case study must be a standardized project, facing a market situation with one buyer and few contractors, in the Dutch Railway infrastructure. Since the market tries to improve the market situation as well, ProRail experiments with their various project approaches. With this thesis aiming at establishing a beneficial market for both sides of the market, a case that tries to improve standardized processes for the same purpose best suits the goal of this thesis. Therefore the single case study is an experimental approach of a standard process. The way the project is positioned within ProRail is shown below.

<table>
<thead>
<tr>
<th>Case</th>
<th>Segment</th>
<th>Company</th>
<th>Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBV-NO-2017</td>
<td>Railway infrastructure</td>
<td>ProRail bv</td>
<td>Projects</td>
</tr>
</tbody>
</table>

Table 4 Position of the Action case, source: own illustration

In Table 5, a short description is given for the single case study. This description entails furthermore the concerned market and the goal of the experiment.

<table>
<thead>
<tr>
<th>Case</th>
<th>Market</th>
<th>Global case description</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track renewal in North-East district of the Netherlands in 2017</td>
<td>Track renewal</td>
<td>Track renewal of approximately 25 km. tracks, in the North East district of the Netherlands in 2017</td>
<td>Reduce the amount of requests for amendments</td>
</tr>
</tbody>
</table>

Table 5 Description of the Action case, source: own illustration

The multiple case study

With ProRail being the only (big) client in the railway sector, there is a certain difficulty to find cases that have the same characteristics. Besides the precondition that the cases are situated in a market with one buyer and few sellers, the chosen cases must possess similar features as the single case study. As discussed before, the multiple case study doesn't entail one particular case, the cases are standardized processes that are repeated for every (similar) case. The table below shows how the chosen cases are situated in their organization.

<table>
<thead>
<tr>
<th>Case</th>
<th>Segment</th>
<th>Company</th>
<th>Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Track renewal</td>
<td>Railway infrastructure</td>
<td>ProRail bv</td>
<td>Projects</td>
</tr>
<tr>
<td>2. High-voltage renewal</td>
<td>High-voltage infrastructure</td>
<td>TenneT bv</td>
<td>Service grid</td>
</tr>
<tr>
<td>3. Track renewal</td>
<td>Railway infrastructure</td>
<td>Liikennevirasto</td>
<td>Projects</td>
</tr>
</tbody>
</table>

Table 7 Position of the cases of the multiple case study, source: own illustration

The following next table shortly introduces the cases and shows their relation with the single case study by comparing the market situation and the legislation.

<table>
<thead>
<tr>
<th>Case</th>
<th>Global case description</th>
<th>Economics (client/contractor)</th>
<th>Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Track renewal</td>
<td>Renewal of the parts of the tracks lying on the subgrade; Railroad ties, Track ballast, Rails and the Railroad switches</td>
<td>Monopsony/Oligopoly</td>
<td>Aanbestedingswet 2012 Special Sectors 2004/17/EC</td>
</tr>
</tbody>
</table>
4.1.2 ANALYSIS

This paragraph will discuss the methodology for analyzing the cases. The approach for the single- and multiple case study will be discussed separately, since these differ.

The single case study

The goal for the simple case study is to find practicalities in a single standardized project, that are either contrary to the list that concluded chapter 3 or overlooked in the literature survey. The single case study will result in a reviewed list of criteria that will serve as input for the interview protocol of the multiple case study.

The multiple case study

The multiple case study's purpose is to identify the criteria of the list that are seen in daily life. A multiple case study must consist of cases that are either expected to give similar or contradicting outcomes (Yin, 2009). As proven earlier, the cases that are analyzed both contradict and correspond in their nature. However, the expected outcome is that the cases contradict. The cases will be discussed on the basis of the reviewed list of criteria that came out as a result of the single case study. After which the cases will be compared in a cross case analysis.

Gathering information

The following paragraphs will discuss the gathering of information by means of the research sources and the applied interview techniques, followed by a short explanation on the cross-case analysis. This chapter will be concluded with an overview of the single and multiple case study design.

Research Sources

The way data is collected is different for the single case study and the multiple case study. The single case study's goal is to understand and refine the technical difficulties of a renewal project. Thereby adding criteria to the list. While the multiple case-study aims at exploring the proposed list of criteria for each case.

The single case study

For the single case study, the writer will be member of the project team that performs the case's project in real life. This gives the opportunity to have direct access to information about the project. By attending meetings, have discussions with experts from different departments of ProRail and interview project team members, an outline of the project's procedures is given. Resulting in observed difficulties for the case, that are translated in criteria.

The multiple case study

While the multiple case study is designed to explore the existence of the list of criteria in practice. Thereby searching for resemblances and differences for the chosen cases. For the multiple case study it is necessary to apply the same procedure for gathering information. This so-called protocol is a generally accepted manner for collecting data and can be very helpful (Yin, 2009). The chosen protocol for the multiple case study follows the next steps; firstly, documents are consulted to understand the case and next interviews will be held with key-figures from the client's side to understand their view on the market.

4.1.3 INTERVIEWS

The single case study

As said, the writer will be part of the actual team that performs the experimental project. Data will be acquired through discussions with team members, attend meetings and study project related documents.
The multiple case study

Face-to-face interviews will be conducted for each separate case with several key players from the client’s side. The key players are asked the same questions. The interviews are recorded enabling the interviewer to focus on interviewing and play back the interviews to write down the findings. Key players in this sense are professionals that are member of project teams that carry out the renewal of infrastructures. In the analysis references will be made to interviewees. The table below shows the interviewees, their employer and their function. Fictive names are given to the interviewees, as their names are kept secret. The different amounts of interviewees is the result of the possibilities that were given to the writer to interview professionals.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Company</th>
<th>Location</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PR#1</td>
<td>ProRail bv</td>
<td>1. Utrecht</td>
<td>1. Project Manager</td>
</tr>
<tr>
<td>2. PR#2</td>
<td></td>
<td>2. Utrecht</td>
<td>2. Rail Systems Engineer</td>
</tr>
<tr>
<td>3. PR#3</td>
<td></td>
<td>3. Utrecht</td>
<td>3. Rail Systems Engineer</td>
</tr>
<tr>
<td>5. PR#5</td>
<td></td>
<td>5. Utrecht</td>
<td>5. Senior Associate Professional Commissioning</td>
</tr>
<tr>
<td>1. TT#1</td>
<td>TenneT bv</td>
<td>1. Arnhem</td>
<td>1. Strategic Buyer</td>
</tr>
<tr>
<td>2. TT#2</td>
<td></td>
<td>2. Hoogeveen</td>
<td>2. Contract Manager</td>
</tr>
<tr>
<td>1. Li#1</td>
<td>Liikennevirasto</td>
<td>1. Helsinki, Fi.</td>
<td>1. Project Manager</td>
</tr>
<tr>
<td>2. Li#2</td>
<td></td>
<td>2. Helsinki, Fi.</td>
<td>2. Head of track renewal department</td>
</tr>
<tr>
<td>3. Li#3</td>
<td></td>
<td>3. Helsinki, Fi.</td>
<td>3. Project Manager</td>
</tr>
</tbody>
</table>

Table 9 Introduction of the interviewees, source: own illustration

The key players are asked for their opinion on the market relations in their sector. The interview focuses on the criteria that were found in chapter 3, therefore the interview questions are related to these topics, as can be seen in appendix D.

VAS (Visual Analog scale)

Besides open ended questions, a Visual Analogue Scale (VAS) is introduced in the interview protocol. The Visual Analogue Scale is “a measurement instrument that tries to measure a characteristic or attitude that is believed to range across a continuum of values and can’t easily be directly measured” (Gould, Kelly, Goldstone, & Gammon, 2001, p. 706). Since this thesis searches for an opportunity to influence behavior, the Visual Analogue Scale suits well.

The Visual Analogue Scale is a line, that is anchored at each end by the extremes of the variable that’s being measured. An example is given below.

Very low ---------------------------------------------------------- | Very high

Figure 9 VAS-scale, source: own illustration

The advantage of the Visual Analogue Scale in comparison to discrete scales, is that the scale is more direct and prevents the respondents from choosing a safe moderate option. On the contrary, Visual Analogue Scales are time consuming in gathering the data, since each marking has to be determined by hand (Couper, Tourangeau, Conrad, & Singer, 2006).

The scale that is used in this thesis has a length of 10 cm. Making it easy to measure the scores. Scores that are discussed in the multiple case study are the result of these measures.

Cross case analysis

In order to compare the cases of the multiple case study, the cases will be discusses by elaborating on the differences and similarities for each criterion. This cross case analysis will be displayed in chapter 5. Chapter 6 will then discuss the list for the last time in which it is finalized.

4.1.4 OVERVIEW

To summarize this paragraph, the case study will proceed as follows. Firstly, a single case study is performed to define the difficulties that are encountered in a track renewal project. The experimental approach of the project is designed to prevent the project from requests for amendment, thereby trying to
establish a situation in which both ProRail (the client) and the contractor can make normal benefits. This results in a revised version of the list of criteria as stated at the end of chapter 3. Next, this list is used to design the interview protocol for the multiple case study design. The multiple case study exists of three cases that show resemblances with the track renewal project of the single case study. The difference lies in the approach of the cases. The single case study focuses on one single project and the occurrences during this project, while the multiple case study focuses on the standardized processes for these types of projects. A cross case analysis will provide an overview of the observed information of the cross case analysis, directly leading to the finalization of the list of criteria.
4.2 SINGLE CASE STUDY

This action case study discusses an experimental approach for a standard track renewal project. ProRail procures an amount of €120 million of track renewal projects on a yearly basis. The experiment aims at establishing a smoother process, i.e. a well-performing market. By applying alternative methods for the topics where difficulties arise in the standard process of these projects, an experimental approach is developed. By doing so, the difficulties are directly exposed during the process of developing the approach. This section will start with an introduction of the project, followed by an elaboration on the difficulties that were observed during the process. Resulting in an addition to the existing list of chapter 3. A complete explanation of the procedure for a standard project, as well as the experimental approach can be found in appendix D.

Context

BBV is short for ‘Boven Bouw Vernieuwing’ (Track renewal). ‘Bovenbouw’ are the parts of the tracks lying on the subgrade; Railroad ties, Track ballast, Rails and the Railroad switches. The works are characterized by their relative low level of difficulty and iterative character. The red box in the figure below represents the area of activity during a track renewal project.

![Figure 10 Subject matter, source: own illustration, derived from database ProRail](image)

Procedure

In short, the procedure of a BBV-project follows the following steps. The Asset Management department of ProRail is notified that (a part of) a track needs to be renewed, due to an ending life-cycle or damage to the tracks. Asset Management tests the notification by sending out a contractor to examine the notification. The conclusions of the contractor are summarized and result in a loosely defined scope. This scope is handed over to the projects department. Here, the project will be prepared for a tender procedure. The projects department has three tasks, 1. Finalizing the scope 2. Define time-slots 3. Prepare the contract. The job to finalize the scope is outsourced to an engineering agency, as well as the time-slots in which the project must be completed. The contract is set up by the legal department of ProRail. These documents are then published on ‘Tendernet’, making it possible for contractors to hand in a tender. The contract is awarded based on the criteria as discussed in section 3.3.

Experimental approach
For the procedure of the experimental approach, major differences can be seen. In short, the experimental procedure is laid down as follows. The project was handed over by AM to the project team in an earlier stage in comparison to standard track renewal projects. The project team decided to bring the contract to the market earlier, with the major difference that the contract wasn’t accompanied by usual risk assessments, but with fictive numbers instead. The contractors had to prepare a bid based on these fictive numbers and also design a time frame in which they were going to perform the works. By giving the contractors the opportunity to design their own time frame, the contractor can optimize his working method. The contract was awarded in the same way as for normal track renewal projects. This was all done in earlier stages of the process to save time in order to shift the job of performing risk assessment to the contractor that was awarded with the contract. This extra time gave the opportunity for the winning contractor to perform risk assessments in a way that suits him best, he was only restricted by minimum requirements that are set in ProRail’s guidelines for risk assessments. The contractor must present his findings three quarters of a year in advance of the start of construction work. At that time, differences in fictive numbers and the risk assessments are compensated out of an alliance fund. This alliance fund was set up and filled by ProRail and contained certain incentives. The contractor can receive money from the fund if the risk assessments show differences with the fictionalized numbers. However, the fund is restricted to an amount of € X, the money that remains after the differences are compensated are split two-ways and divided among ProRail and the contractor. Besides, if the contractor needs more funds than € X, the contractor has to cover an amount of half times € X out of his own resources. After that, ProRail pays only the cost price for additional work. During the execution, the process should lead to less discussion about compensation, since these discussions were solved with the alliance fund.

The general idea of the experimental approach is to shift the risks to the party that is best in managing the risks. For example, ProRail decides what time is necessary for a contractor to perform his job, meaning that the contractor has to adjust his working methods to the given time frame. To sum up the differences with the standard procedures:

- Risk Assessments are performed by the contractor
- The contractor designs his own time frame

An extensive description of the standardized process and the experimental approach can be found in Appendix D.

**Difficulties**

As a member of the project team assigned with the experiment, the writer of this thesis has been involved directly. The following difficulties are a result of observations, discussions with other team members, meetings with contractors and meetings with managers of the team members. A distinction is made between technical difficulties and legislative difficulties. The hurdles as a result of management-culture will be discussed last.

### 4.2.1 Technical Difficulties

**Risk Assessments**

In standard BBV projects, the contractor is provided with risk assessments performed by an engineering agency. These documents are consulted by the contractor when he prepares his bid. Since these risk assessments have been subject to discussion in a major part of the BBV-projects, the idea was to shift the assignment for risk assessments from the engineering agency to the contractor.

Difficulties of projects with working on infrastructures is the large influence of the environment on the project’s scope. A painter can go to a project location, measure the surface that has to be painted and calculate the man-hours and amount of paint needed to complete the job. For BBV-projects, among other things, the conditions of sub-grade and flora and fauna in the environment of the building plot are heavily influencing working methods, calculations and necessary man-hours for a contractor. Thereby directly influencing the tender bid.

Besides the fact that risk assessments are very costly, the fact that the infrastructure is used for the major part of the day makes that it is not possible for each contractor independently to perform risk assessments on sight. In standard projects, risk assessments are performed once, by an engineering agency commissioned by ProRail, according to the guidelines that where set up by ProRail. The results are presented to the contractors, as a reference to prepare their bid. Bids will be prepared based on the risk assessments, the
The contract will be awarded according to the awarding process as laid down in ProRail's procurement policy.

**Experimental solution**

The goal of the experiment is to let the contractors perform risk assessments themselves. However, as discussed before, it is not possible for all contractors separately to go on site and perform risk assessments. Risk assessments must be performed with daylight, which would result in major gaps in the operators’ timetables. Therefore, for the experiment, the references were made up, based on averages from the extensive databases that ProRail possesses. The bidders had to come up with an offer based on these fictive numbers. The solution that was made up for this problem is as follows. All offers were based on the fictive numbers and the contract was awarded similar to the standard procedure. The contractor to which the contract is awarded will be given the opportunity to perform risk assessments. With the side note, that these risk assessments must meet the prescribed rules as laid down in ProRail's guidelines.

Even though the made up references are based on averages from the past, they will most likely differ from the actual situation on site. This problem is solved with a so-called 'Alliance agreement'. In short this means; ProRail sets up a fund of a certain value to cover the contractor’s (financial) expenses that result from the difference between the imaginary situation and the situation that comes out of the contractor’s risk assessments. Contractors are given incentives to be inventive about their solutions for the differences, in two ways. Firstly, the contractor will be given half of what is left of the fund at the end of the project. Second, when (extra) costs exceed the funds, the contractor is obligated to cover the costs out of his own pockets, up until half the initial value of the fund. After that, ProRail will pay the actual costs (without profit-ratios etc.).

**Establishing a time frame**

ProRail decides for a contractor the time that will be made available for the job. The reason is two-folded, first reason results from the fact that the infrastructure manager, ProRail, is not the exploiting party. The exploiting party financially pays the infrastructure manager in exchange for the rights to make use of the tracks. The operators wish to make a profit. Since it is more profitable make use of the tracks instead of taking the tracks out of service, operators are not keen on construction work being performed during their timetables.

The planning for the usage of the railway infrastructure concerns several parties. As said, the operators have a major voice in the establishment of the time tables. However, freight carriers by rail, maintenance contractors and international operators also have a say in how and when the tracks are used. The timetables are established through a process of consultation between representatives of all parties, approximately two years in advance. This means that the consultations take place around the time the tender is brought to the market. This leads to the second reason for ProRail to make a decision for the time frame: the project is not yet awarded at the moment that time frames must be established.

In practical sense, time frames heavily influence working methods of contractors. With heavy machinery and equipment it is possible to perform with a higher speed in comparison to manual labour. By pre-establishing the length and moment of the time frame, ProRail directly influences the working methods of the contractors. Thereby forcing contractors to choose working methods that are compatible with the time scheme.

**Experimental solution**

The goal of the experiment was to give the contractors the opportunity to establish a time frame that suits their working method. Due to time restraints, it was not possible to include the (winning) contractor in the process of consultation, neither was it possible to commit to all wishes of the contractors. Therefore, the solution that was chosen is as follows: the contractors are given principles that must be met in order to get their time frame accepted. These principles consisted constraints regarding available time, maximum and minimum, the maximum consecutive time frames and constraints regarding the building plot. Contractors were given the opportunity to design their own time frame and state their preferences regarding the period of time they wanted to execute the works. However, ProRail promised that they adhere to the amount and length of the time frames that were designed by the contractor, but retained the possibility to shift the time frames within the year of construction. If ProRail unexpectedly adjusts the time frames, contractors will be compensated with funds from the Alliance fund.

4.2.2 **LEGISLATIVE DIFFICULTIES**
Providing information

The list of risk assessments as can be seen in table 10 of Appendix D are a result of the distribution of the responsibility for information provisioning according to the UAV-gc 2005. The exact distribution can be found in Appendix D. These risk assessments are often called into question by contractors during the execution phase and cause discussions and subsequently cost overruns. However, the legal obligation to provide the information, combined with the high level of user-density of the tracks forces the experiment to come up with an alternative method to provide the contractors with information. As said before, fictional data on the situation outside is given and the contractor that wins the contract will get the opportunity to perform risk assessments after the contract is awarded. However, in an ideal situation, the contractors are able to perform risk assessments themselves and then be responsible for their own information provision.

Tender procedure

The technical nature of track renewal projects decided ProRail to apply the ‘restricted procedure’ for the tender procedure. As a selection criterion, a system of certification is applied. Bidders must possess certain certificates to participate in the process.

In standard track renewal projects, ProRail awards a contract as discussed in paragraph 3.3. The general thought is that ProRail’s awarding criteria are outdated and that in fact the lowest bid will win the tender. In this experiment a way of redefining awarding criteria was sought after. However, the fear that the level of the risk assessments and safety are adversely affected, as a result of choosing criteria that are related to the risk assessments or the time frames, made that these plans were not carried through. Eventually, the contract was awarded according to ProRail’s standard awarding process.

4.2.3 MANAGEMENT DIFFICULTIES

The experimental approach as laid down at the beginning of this single-case study is initiated by the two rail system engineers that were part of the project team. They participate in a Lean Management trajectory at ProRail. The thought of ‘let the expert be the expert’, eg. shifting the responsibility for the risk assessments and designing the time frame, are a result of this program. The chosen project was especially suitable since Asset Management handed over the proposed project to the ‘projecten’ department in an earlier stage of the project than usual. This savings in time gave the opportunity to perform the experiment, since the contractor has to do risk assessments after the contract has been awarded. However, before the tender procedure can start, the contract must be approved by the managers of the team members. If the managers give their approval, the contract can be presented to the ‘tender board’. The tender board is an intern ProRail board, consisting of the department’s president (in this case the Projects department), a manager of the procurement department and a secretary. On fixed times, they have the board is entitled to make binding decisions regarding the intention of procuring.

After the contract was presented to the managers of the team members, the project team faced some problems. One of the managers was of the opinion that the proposed experimental approach was conflicting with the plans of another experimental project that fell under his responsibility. After some discussions between the managers, the proposed contract was approved and could be presented to the tender board. This caused a delay in time and could have led to a situation in which the experiment could not have been proceeded. Eventually, the contract was approved by all managers and it was presented to the tender board. The tender board on its turn was in favor of the plans, and approved the proposed contract without major difficulty. However, it can be stated that not all managers were completely aware of the experiment and their power could have led to a situation in which the experiment couldn’t proceed.
4.2.4 CONCLUSIONS

The single case study has given insights in the technical difficulties of a track renewal project and how this relates to the legislative boundaries. The combined incentives of giving contractors the opportunity to perform their own risk assessments and design their own time frame can be considered as criterion for establishing a beneficial market for both ProRail and the contractors. The following conclusion results from combining the incentives, and is an answer to the third research question:

Q3: What requirements are crucial for establishing a beneficial Dutch Rail market, as a result of the technical nature of projects in the Dutch Rail market?

1. The contractor must be able to choose his own way of producing from the beginning till the end.

Also, the single case study gave insight in technicalities that come with track renewal projects. These must be considered when taking conclusions.

1. The infrastructure is built with materials that are laid down in ProRail’s guidelines, and the renewal is restricted to parts of the infrastructure. Therefore, it is not possible for contractors to distinguish themselves by applying different/alternative materials.

2. The UAV gc 2005 forces ProRail to perform risk assessments for the contractor, while contractors is the expert in defining how the risk assessments must be carried out.

3. The goal of establishing time frames that are in line with the contractor’s working method can only be reached if the contract is awarded in an earlier stage, making it possible to lay down the contractor’s time framework during the consultation process, which involves all users of the tracks.

4. The awarding criteria applied by ProRail are considered outdated, but it is difficult to come up with new award criteria.

5. Management culture can obstruct innovation in procurement methods, it is therefore important to inform everybody that is related to the project in an early stage of the project.
4.3 REVISI NG THE PROPOSED LIST OF CRITERIA

As stated in the case study design, the single case study’s purpose was to find criteria for track renewal projects that are crucial in pursuing the desired situation. The conclusion of the single case study resulted in one additional criterion that must be taken into account when conclusions and recommendations are set up. The new proposed list of criteria is displayed, after which the side notes are shortly discussed as they are the answer to sub-question 3.

Revised proposed list of criteria:

1. No single player has the power to influence price.
2. There is unrestricted access to all information about the market.
3. The rivals must act independently, not collusively.
4. There are no barriers to enter the market.
5. Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.
6. There is free competition, without influencing third parties.
7. Indefinitely large numbers of participants on both sides of the market.
8. All participants produce an identical or homogeneous product.
9. Capital is increasing.
10. Methods of production are improving.
11. The forms of industrial establishments are changing.
12. Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.
13. Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.
14. The contractor must be able to choose his own way of producing from the beginning till the end.

Concluding remarks
The above list of criteria is set up as a guideline for pursuing the desired situation of a beneficial Dutch Rail market. However, some hurdles regarding various criteria were seen during the elaboration on the single case study. The observations that were laid down in the conclusion of the single case study, can be translated to used in forming a conclusion for this thesis. The following observations should be considered when doing so.

• The awarding criteria applied by ProRail are considered outdated, but it is difficult to come up with new criteria.

• The layout of the infrastructure makes it impossible for contractors to distinguish themselves by using different materials.
• The UAV gc 2005 forces ProRail to take some expertise out of the contractor’s hands.

• The high-density Dutch rail infrastructure, with many different users, makes that time frames must be established before contracts are awarded.
MULTIPLE CASE STUDY

The observations of the single case resulted in a revised list of criteria. Thereby, sub-question 2 was answered. As discussed in the case study design, this list will act as the starting point for a multiple-case study. The objective for the multiple case study is to observe ‘what’ criteria are present in a public market with one buyer and few sellers, and also defining ‘how’ these criteria influence the market. Eventually, this will lead to a list of criteria that are supposed to be of importance for a beneficial Dutch Rail contractors market.

Firstly, a short recap on ‘why’ the chosen cases are of relevance is in place. As introduced in the case study design, the cases subject to this study are: ProRail’s track renewal process, TenneT’s high-voltage renewal process and Liikennevirasto track renewal process. The choice for these cases is made based on the influences from law & legislation, the viewpoint, project type and the market forms. To ensure a fair comparison, these factors must be similar to those for the single case. The figure below shows these influences.

Secondly, an answer to ‘what’ criteria are present must be found. To do so, the three cases will be discussed separately. Each case is introduced by laying down the context and process of the standard process. The presence of each criterion is derived from the interview results. Keywords are used as a reference to determine the (non) presence of the criteria. Criteria that are out of this thesis’s demarcation, in example criteria that are influenced by third parties, are considered not applicable for the list of criteria. Each criterion will start with a summarization of the keywords, followed by a discussion of the observations from the interviews. A criterion is concluded with a figure that enables the reader to understand the presence of a criterion at a glance.

Now that the presence of the criteria is demonstrated. After removing the criteria that are considered not applicable, the next step is to identify the influence of the criteria. As stated in very early stages of this thesis, ‘perfect competition’ was used as a starting point for the proposed list of criteria. Since the discussed markets are imperfect markets, it is likely that not all the criteria are eligible for imperfect markets. By cross-case discussing the influence on the markets for each criterion separately, an answer is formulated for ‘if’ and, if so, ‘how’ the criteria are of relevance for imperfect markets. The criteria will be split in criteria that are eligible for the Dutch Rail contractors market, and those that aren’t.

Finalizing the list will be done by cutting out the criteria that are not eligible for public markets with one buyer and few sellers. The criteria that are, together, form the finalized list of criteria for establishing a beneficial public market with one buyer and few sellers, i.e. the Dutch Railway contractors market. Thereby answering the fourth research question: ‘What criteria are of importance in public markets with one buyer and few sellers?’.
5.1 CASE I: TRACK RENEWAL AT PRORAIL

ProRail is the concessionaire of the Dutch railway infrastructure. Except for the experimental approach as discussed in the action case study, track renewal projects are carried out according to a standardized process. Firstly the context of the project is described after which the different processes are discussed. When the process is introduced, the observed influence of the separate criteria of the revised list is discussed.

To judge the success of the market from a client’s point of view, the interviewees were asked to draw lines on the VAS-scale for a couple of questions (q. 5 and q.7 of the interview protocol) in which the subjects ‘performance’ and ‘cooperation’ are central. The average of these questions shows the success of the market. Since the VAS-scale uses a scale of 0-10, the success of the market is based on this 10-point scale. Getting back to the VAS-scale, for example the performance question, 10 points on the VAS-scale means that contractors show their ‘best possible performance’ through the eyes of the interviewee. Undeniable, zero points implies ‘no performance’. On average, the market success of the Dutch Railway construction market, from a client’s point of view, is 6,73 points.

Context
The context of track renewal projects in the Netherlands exists of the renewal of the parts that lie on top of the subgrade; Railroad ties, Track ballast, Rails and the Railroad switches. The scope is visualized in figure , of the action case study.

Procedure
The process as shown in figure 11 follows these steps:

**i. The Notification**
The Asset management department is notified by their Life Cycle Management program that either the tracks are at the end of their life-cycle or damage to the tracks is detected. A contractor is commissioned to check the notification and to determine a rough scope for the project. When this process is completed, the project is handed over to the projects department.

**ii. Proposed Project**
The rough scope that is handed over by Asset Management to the Project Department is the starting point for the project. A project team assigns an engineering agency to define a detailed scope by performing risk assessments. Members of the project team go into a consultation process with the operators to come up with a time frame in which the project must be carried out. Next, the contract is drawn up and the contract is tendered by using the restricted procedure. A contractor uses the risk assessments and time frame as a reference for their bid. The tender procedure is standardized and contains of the awarding criteria: Price, CO2 awareness, Safety awareness and Past Performance. When this process is completed, the contract is awarded and the project is handed over to another project team that supervises the execution of works.

**iii. The Project**
During the execution of works, a team of three professionals from ProRail, assisted by a construction manager from an Engineering agency supervise the project. After completion, the works are examined and if the project is approved, the tracks are handed over to Asset Management.

An extensive elaboration of the process can be found in appendix D.
### PRESENCE OF THE CRITERIA

Next, the criteria will be discussed separately. The questions from the interview protocol were tailored to the criteria and are used as the data input to discuss the criteria's position in real life. Each separate criterion will be concluded with a figure that summarizes the presence of the criterion. As stated before, the presence of a criterion is determined by using keywords, enumerated at the beginning of each criterion. The keywords are derived from the formulation of the criterion and the literature survey as discussed in chapter 3. A criterion is considered present if at least two keywords or their derivatives are present in the observations, derived from the results of the interviews. A criterion is considered not present if at least two antonyms of the keywords are observed. A ‘+’ represents a present criteria, a ‘−’ means it is not. When a criterion is listed as ‘+/−’, both a keyword and an antonym is observed. However, there is a special case in which terms like: Third party influence, beyond control of the contractor and client and bound by law and legislation are observed. As discussed in the demarcation, third parties are excluded from this study. Therefore, these criteria are considered not applicable and will be indicated as n/a, instead of ‘+’, ‘−’ or ‘+/−’.

#### 1. No single player has the power to influence price.

*Keywords: No/low interdependence - No influence - No power - Indefinit/multiple clients /suppliers*

All of the interviewees state that the interdependence of the between the contractors is very high, an average of 8,2 on the VAS-scale. PR#5 states that “a contractor can’t make a move without influencing the competition”. Every contractor wants an as big as possible piece of the pie, and therefore the contractors go low on their price, forcing the competition to do so as well (PR#4). Three reasons for the heavy competition are given. Firstly, the fact that price plays a dominant role in the tender procedure. Contractors that are in need of a contract go very low on price in order to win the contract (PR#2). An often seen situation in tenders is that a few contractors that not yet have a contract are heavily competing, while the contractors that already have a contract submit a tender with a high price and it’s a bonus if they win it (PR#4). The second reason that is put forward is that the market is oversaturated, which causes an imbalance in supply and demand (PR#5). The third reason, that is given by all the interviewees, is that the contractors are highly reliant on ProRail as a client. ProRail is the main Dutch client, apart from some metro and tram operators. However, most of the Dutch rail contractors are operating companies of large companies that act in other sectors. If the Dutch company goes out of business, this doesn’t cause the mother company to go out of business as well (PR#2; PR#4).

In short, the keywords interdependence, influencing and main client are observed. These words are the opposite of those that would certify the presence of the criterion. It can therefore be stated that this criterion is not present from a ProRail’s point of view.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No single player has the power to influence price.</td>
</tr>
</tbody>
</table>

#### 2. There is unrestricted access to all information about the market.

*Keywords: Unrestricted - Open access - Information*

The contractors are restricted to the information that is provided by ProRail. The risk assessments and the information that can be derived from a rail infrastructure database are the only sources of information a contractor can use (PR#5). Contractors are prohibited from performing any form of research on site, as a result of safety issues (PR#3). Before the Dutch construction fraud, the contractors were allowed to share information with the idea that this would strengthen each other’s ability to prepare a good tender (PR#4). Nowadays, it is prohibited by law for contractors to have mutual consultations about the project. This is seen as a way of collusion, which is not allowed. “This can be seen in the Tender bids, the average tender is shown to be 20% less expensive in comparison to the tenders submitted before the construction fraud.” (PR#4) The lack of information often results in disputes about the accuracy of the information (PR#5).

As a result of safety issues, there is restricted access to information. The construction fraud resulted in a legislative prohibition in sharing information. It can be stated that third parties (the law) decides on this matter. Therefore, this criterion is considered not applicable.
3. **The rivals must act independently, not collusively.**

Keywords: Independence - Market has the power - Price setting - No collusion

None of the interviewees observed collusive behaviour. Instead, heavy competition is seen in the procurement of projects. Collusion is prohibited by law since the construction fraud was revealed in the early 00’s (PR#1). It is often seen that contractors compete in a tender as a consortium, to cover the risks of high-value contracts (PR#4). These partnerships do not automatically imply that contractors act collusive, the consortia act as independent parties. The heavy competition is thought to be the reason for discussions in the execution phase, where additional work is claimed, which results in cost overruns (PR#2; PR#5).

So, no collusion is observed by the interviewees. Instead, heavy competition is observed which is considered as independent rivalry.

4. **There are no barriers to enter the market.**

Keywords: No/low barriers - Free access - Low investments - No requirements

All interviewees agree that there are barriers to enter the market. However, the view on what can be seen as a barrier differs. The first barrier that is mentioned is the certification system ProRail applies. A contractor that wants to submit a bid for a track renewal project is obligated to be certified. In order to obtain a certificate, ProRail’s procurement department investigates the contractor’s operational management and two test-project must be carried. If a contractor’s performance fulfils the standards, set by ProRail, the certificate will be granted (PR#1; PR#2; PR3; PR#5). To meet these requirements, high investments in machines and knowledge are necessary. “The technical complexity of the Dutch system requires tremendous knowledge investments, rather than financial investments”(PR#5). Besides, it is stated by two of the interviewees that the market is oversaturated, making it less attractive for contractors to enter the market since they don’t know if they will make a profit (PR#4; PR#5).

High barriers to enter the market are observed, through the need for high initial investments and a certification system applied by ProRail.

5. **Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.**

Keywords: No time constraints - Free to choose - Non-interference - Broad demand

Time constraints are seen in the time frames that are laid down by ProRail in advance of the tender procedure. Contractors are obligated to stick to these time frames. Besides, all five interviewees mentioned that the execution of works is concentrated in the third and fourth quarter of the year. “Besides the fact that construction work is concentrated at the end of the year. During the weeks, contractors are not allowed to perform works at daytime, making that contractors are becoming seasonal workers” (PR#4). This situation is not conducive for the contractors, as they are depending on these contracts, a more even distribution of the works over the year would be beneficial for the contractors (PR#3; PR#5). The reason for this situation can be found as a result of the power the operators possess during the consultations about time-tables. Opera-
tors are pushing ProRail to force their contractors to work during nights and weekends, since their losses are minor in these time periods. However, this situation is detrimental for the employees of the contractors that need to work at odd times (PR#2).

Contractors are obligated to work within pre-established time frames. However, ProRail nor the contractors have the power to influence the time frames in a positive way for track renewal projects. They both depend on the willingness of the operators to provide time frames. It can therefore be said that time is restricted by third parties. As these third parties fall out of the demarcation of this thesis, this criterion is not eligible.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.</td>
</tr>
</tbody>
</table>

6. **There is free competition, without influencing third parties.**

*Keywords: Free competition - No third party influence - Unregulated*

Influence of third parties is seen in various ways. ProRail is influenced by the government as the subsidy provider and controlled in their actions by the ‘Autoriteit Consumenten & Markt’, an independent public body that supervises, among other things, competition in the rail market (PR#5). Also there is the influence from the operators (PR#1). Operators pay a user fee for operating the tracks and generally try to block execution activities during their timetables (PR#1; PR#2).

Third parties are seen in governmental organizations that supervise the general affairs in the market. Operators steer the market by influencing the possibility to choose time frames for the execution of works. Making it impossible to change this criterion within the demarcation of this study, thus not applicable.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>There is free competition, without influencing third parties</td>
</tr>
</tbody>
</table>

7. **Indefinitely large numbers of participants on both sides of the market.**

*Keywords: Unrestricted amount - Indefinite - Multiple markets - Broad demand*

The Dutch Rail market is restricted to one client, ProRail. ProRail is appointed by the Dutch government as the concessionaire of the Dutch Railway infrastructure. However, contractors are working outside of the Netherlands as well. For example in Sweden, Australia and Switzerland (PR#3; PR#4). Also, comparable markets such as Tram and Metro rail infrastructure are the sectors in which the contractors act (PR#1; PR#2). The amount of contractors that are certified to perform work on the tracks is 6 at the moment. In recent years some entrants and leavers can be seen, but that are only a few (PR#2; PR#4).

As the concessionaire of the whole Dutch Rail infrastructure, ProRail is the only buyer. There is no possibility to change this situation, since the government as a third party chooses only one railway administrator. Making this criterion not applicable.

<table>
<thead>
<tr>
<th>Criterion</th>
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<tbody>
<tr>
<td>7</td>
<td>Indefinitely large numbers of participants on both sides of the market.</td>
</tr>
</tbody>
</table>

8. **All participants produce an identical or homogeneous product.**

*Keywords: Single product - Identical - Equal quality - Defined quality*

ProRail’s guidelines define the required quality for the products that must be used. Since the majority of the products come from the same supplier, the used products are identical. The only way for contractors to distinguish themselves is to apply different working methods that can be chosen within the given time-
constraints (PR#2; PR#5). A quote of one of the interviewees clearly illustrates the current situation: “The technical features and minimum quality of the product are fenced in by ProRail’s guidelines, there is no possibility for contractors to distinguish themselves in this area, except for the chosen working method” (PR#5).

It can be said that a homogeneous product is produced of which the minimum quality is defined in the guidelines set by ProRail.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
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<tbody>
<tr>
<td>All participants produce an identical or homogeneous product.</td>
<td>+</td>
</tr>
</tbody>
</table>

9. **Capital is increasing.**

Keywords: Market determined - Increase - Free market - Investments

The increase of capital is heavily dependent on the governmental policy (PR#5). If the government in power focuses on durability, large investments in the rail infrastructure is made. But in recent years the government preferred to invest in the road system (PR#4). The investments fluctuate year by year, depending on the governmental support. When low investments are made by the government, the contractors will compete harder to win a tender. Which can jeopardise the financial situation of the contractors (PR#5).

So the increase of capital depends on the government rather than the market. Therefore, the increase or decrease of capital can be different each year. Since ‘capital’ is not a result of market mechanisms, this criterion is considered not applicable.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
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<tbody>
<tr>
<td>Capital is increasing.</td>
<td>n/a</td>
</tr>
</tbody>
</table>

10. **Methods of production are improving.**

Keywords: Change - Innovation - New - Better/faster/accurate

Changes are seen in the working method. Over the past years, investments were made in new machinery by the contractors, which resulted in a faster execution of works and a more accurate end result (PR#2). However, on the contrary “ProRail designs binding time frames that suit all the working methods. So, there is no real incentive for contractors to improve unless costs can be reduced” (PR#2). But when the interviewees is asked whether ProRail is encouraging innovation, opinions are split in extremes. Three interviewees gave a mark below 4 and said that the rules and guidelines that are set by ProRail make it impossible for contractors to be innovative, while the other two stated the ProRail is encouraging innovation. This encouragement is seen in the growing importance of durability as awarding criteria, however “real incentives are not yet present, as price continues to be dominant as awarding criterion” (PR#3).

Innovation is observed, resulting in better results for both the client and the contractor. On the contrary, the extensive guidelines combined with the binding time frames are discouraging innovation as there is no real incentive for improvement. So both sides of the criterion are observed.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
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<tbody>
<tr>
<td>Methods of production are improving.</td>
<td>+/-</td>
</tr>
</tbody>
</table>

11. **The forms of industrial establishments are changing.**

Keywords: New entrants - Constant change - Alternative markets - Appealing market

As for industrial establishment, the changes are minor. The six contractors that are currently certified have been in the market for a long time. Approximately 5 years ago, a few contractors from Germany tried to enter the market as a result of an underperforming German market. However, only two contractors won
a tender and remained active in the Dutch Rail contractors industry (PR#4). These two contractors are contractors Spitzke and Swietelsky, the latest entrants in the market for over 5 years. Also, 5 years ago a Dutch-French combination competed in a few tenders but never won a tender and are currently not competing (PR#2). On the contrary, Dutch contractors are exploring alternative markets by performing more work abroad in recent years, “the boarders are blurring and Dutch contractors won big contracts in Sweden, Australia and Germany” (PR#5).

The Dutch market is seen as very constant, with the latest contractors entering approximately 5 years ago. However, Dutch contractors are exploring other opportunities by performing works abroad more often in the latest years. So, it can be said that the Dutch market is constant, while at the same time the contractors in the market are exploring alternative markets. Making that both sides of the criterion are present.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
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<tbody>
<tr>
<td>11. The forms of industrial establishments are changing</td>
<td>+/-</td>
</tr>
</tbody>
</table>

12. Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.

Keywords: Price is not dominant - Awarding on quality - Low-bid argument

Except for PR#4, all interviewees state that price plays a dominant role in the tender procedure. Also, all interviewees are of the opinion that quality should play a more dominant role in the tender procedure. The awarding criteria CO2-awareness and Safety-awareness consist of so-called quality ladders with 5 levels. The performance of the contractors for these criteria are measured and their performance is translated into a level of performance. The level of performance is linked to a fictive discount as a percentage of the price of the contractor’s tender. However, currently all contractors are on the same level for both ladders, therefore, their fictive discounts are the same. The third criteria of past performance shows a difference in fictive discount between the contractors, but these differences are minor and insignificant when it comes to awarding the contract (PR#2; PR#3; PR#5).

Price is seen as a dominant factor in the tender procedure. The influence of the quality criteria in the awarding process is considered minor and insignificant. It can be said that this criterion is not present.

<table>
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<tr>
<th>Criterion</th>
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<tbody>
<tr>
<td>12. Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.</td>
<td>-</td>
</tr>
</tbody>
</table>

13. Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.

Keywords: Quality criteria - Project related - Project specific - Different bids

The awarding criteria are pre-set and the same criteria are used for all track renewal projects, regardless the content of the project. “The criteria are relevant to the goals of ProRail as an organization, not project specific” (PR#5). The current awarding criteria are in use for 5 years, over these 5 years “the criteria lost their distinctive character” (PR#2). This resulted in the current situation with all contractors are on the same level of fictive discount, as mentioned in criterion 12.

The criteria are not relevant to the specific project but for ProRail’s policy. Neither do they result in distinctive bids from the different contractors. So this criterion is not met.

<table>
<thead>
<tr>
<th>Criterion</th>
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<tbody>
<tr>
<td>13. Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.</td>
<td>-</td>
</tr>
</tbody>
</table>
The contractor must be able to choose his own way of producing from the beginning till the end.

Keywords: Free choice - Own working method - Enough time - No boundaries

ProRail decides the time frames for the execution of works. Besides, the materials a contractor wants to use must meet the requirements as laid down in ProRail’s guidelines. However, contractors are free in choosing own working method (PR#1; PR#5). Contractors are using extensive machines nowadays. These machines result in faster completion and higher quality of the works. However, these machines are not developed in the Netherlands, but come from abroad. Most machines that are of added value for the Dutch Rail market were in first instance introduced in Germany and Austria. The Europoule (a poule of machines that can be hired by contractors all over Europe) makes it possible that these machines come to the Netherlands as well (PR#3; PR#2). Contractors need to, since the given time frames not always provide enough time to use traditional working methods (PR#2; PR#4).

So, within the given boundaries of the time frames, a contractor can choose his own working method. So, both the criterion and its opposite are observed.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
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<tbody>
<tr>
<td>14 The contractor must be able to choose his own way of producing from the beginning till the end.</td>
<td>+/-</td>
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</table>
5.2 CASE II: HIGH-VOLTAGE RENEWAL AT TENNET

TenneT is the Distribution network operator of the Dutch High-voltage infrastructure above 150 kV. Similar to ProRail’s Track Renewal projects, the renewal of the High-voltage infrastructure is performed by standardized processes. As a Dutch special sector company, the same European and Dutch law and legislation is applicable to TenneT’s procurement process. Firstly the context of the project is described after which the different processes are discussed. When the process is introduced, the observed influence of the separate criteria of the revised list is discussed.

Similar to the previous case, to judge the success of the market from a client’s point of view, the interviewees were asked to draw lines on the VAS-scale for a couple of questions (q. 5 and q. 7 of the interview protocol) in which the subjects ‘performance’ and ‘cooperation’ are central. The average of these questions shows the success of the market. On average, the market success of the High Voltage market, from a client’s point of view is 4.76 points.

**Context**

The context of high-voltage renewal projects in the Netherlands exists of the renewal of the foundations, power pylons and the high-voltage lines.

**Procedure**

The process as shown in figure 12 follows these steps:

1. **The Notification**
   When the Life Cycle Management program notifies that parts of the infrastructure must be renewed, the Asset Management department of TenneT starts up the process by checking the notification. When this check shows that the notification was right, the next step in this first phase of the process is to define the scope of the project. An engineering agency is assigned to perform risk assessments to define the detailed scope. When the scope is defined and all necessary environmental research is done, the project and its related documents are handed over to the projects department.

2. **Proposed Project**
   The project and its related documents are used by a project team of the projects department to set up a contract. Besides, the project team goes into a consultation process with the operators to come up with a time frame in which the project must be carried out. Next, the contract is tendered by using the restricted procedure. A contractor uses the risk assessments and time frame as a reference for their bid. The rough scope that is handed over by Asset Management to the Project Department is the starting point for the project. A project team assigns an engineering agency to define a detailed scope by performing risk assessments. Members of the project team go into a consultation process with the operators to come up with a time frame in which the project must be carried out. Next, the contract is drawn up and the contract is tendered by using the restricted procedure. A contractor uses the risk assessments and time frame as a reference for their bid. The awarding criteria for the tender procedure are chosen out of a long list of awarding criteria. The amount of awarding criteria and their relative weight in the calculation model depends on the specific features of the project. Depending on the alleged hurdles, awarding criteria are chosen that suit these hurdles the best. When this process is completed, the contract is awarded and the project is handed over to another project team that supervises the execution of works.

3. **The Project**
   In the execution phase, the project is supervised by a construction manager of TenneT. When the project is finished and approved by the construction manager, the project is handed over to Asset Management.
5.2.1 PRESENCE OF THE CRITERIA

Similar to the previous case, the criteria will be discussed separately. Each criterion will be concluded with a figure that shows the presence of the criterion. As stated before, the presence of a criterion is determined by using keywords, stated at the beginning of each criterion. A criterion is considered present if at least two keywords or their derivatives can be found in the observations, derived from the results of the interviews. A criterion is considered not present if at least two antonyms of the keywords are observed. A ‘+’ represents a present criteria, a ‘-’ means it is not. When a criterion is listed as ‘+/−’, both a keyword and an antonym is observed. However, there is a special case in which terms like: Third party influence, beyond control of the contractor and client and bound by law and legislation are observed. As discussed in the demarcation, third parties are excluded from this study. Therefore, these criteria are considered not applicable and will be indicated as n/a, instead of a ‘+’, a ‘-’ or a ‘+/−’.

1. **No single player has the power to influence price.**
   
   **Keywords:** No/low interdependence - No influence - No power - Indefinite/multiple clients/suppliers

   Due to heavy competition, TenneT is in the position to influence price by awarding contracts based on the lowest-bid. However, the interviewees both state that TenneT tries to avoid this situation by awarding contracts based on quality. At the same time, the contractors are heavily depending on TenneT as a client, TT#1 gives a 9.1 out of 10 on the VAS-scale for interdependence. In his explanation, he says that TenneT must be careful that TenneT isn’t over-stretching the market with the low amount of contracts that are put on the market. Also, both interviewees agree that the contractors earn a decent amount of money. Interdependence is shown to be very high between both sided of the market. Also, the low amount of contractors are forcing the TenneT to rethink on every tender they put out. Therefore, influencing power is seen.

<table>
<thead>
<tr>
<th>Criterion</th>
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<tbody>
<tr>
<td>1. No single player has the power to influence price.</td>
<td>-</td>
</tr>
</tbody>
</table>

2. **There is unrestricted access to all information about the market.**
   
   **Keywords:** Unrestricted - Open access - Information

   The contractors are restricted to the information that is provided by TenneT. Contractors are not allowed to perform any form of research on site, as a combined result of the influence of the operators and safety issues (TT#1; TT#2). When research is performed on site, the power must be shut down. In order to do so, third parties must stop bringing electricity to the high-voltage net. Which makes that TenneT depends on the willingness of the operators to shut down the network. Most of the contracts are actually part of a framework agreement. Contractors will tender for the framework agreement, with the knowledge that there will be a certain amount of contracts and its combined worth. However, there is no actual knowledge about the contracts content upfront (TT#2).

   Contractors are restricted in their gathering of knowledge as a result of third party influence. The operators have to allow TenneT to shut down the power in order to let contractors perform research on site. This makes that this criterion is not applicable.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
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<tbody>
<tr>
<td>2. There is unrestricted access to all information about the market.</td>
<td>n/a</td>
</tr>
</tbody>
</table>

3. **The rivals must act independently, not collusively.**
   
   **Keywords:** Independence - Market has the power - Price setting - No collusion

   None of the interviewees notice signs of collusion within the market. TenneT narrows down the market of high voltage contractors by using framework agreements. In these agreements, contracts are awarded through a mini-competition in which 6 contractors compete. Within this mini-competition heavy competi-
tion between the individual contractors is observed (TT#1; TT#2).

By applying a mini-competition, TenneT created a situation in which contractors heavily compete as individual rivals. Collusion is not observed.

4. **There are no barriers to enter the market.**

<table>
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<tr>
<th>Criterion</th>
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<tbody>
<tr>
<td>3. The rivals must act independently, not collusively.</td>
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</table>

Both interviewees state that there are high barriers to enter the market, “but that it is an inherent feature of the special sector markets” (TT#2). By applying the restricted procedure, TenneT enables themselves to use a certification system. TT#2 states that these certificates are necessary because of the hazardous jobs that need to be performed. But at the same time, no foreign entries are seen due to the high costs for obtaining a certificate. The specialized contractors from abroad don’t enter the market because they doubt of they will win enough tenders to get a reasonable return on investments (TT#2). Before a contractor can get certified, he must prove to be able to possess high liquid assets. Not by showing to possess the right machinery, those are rather inexpensive, but in terms of financial liquidity (TT#1). The financial guarantees TenneT demands from their contractors are relative high (TT#2).

Barriers are seen as a result of the restricted procedure that is applied in the tender phase. The uncertainty of winning contracts and high required financial guarantees make that contractors are hesitant in entering the market.

5. **Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.**

<table>
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<th>Criterion</th>
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<tbody>
<tr>
<td>4. There are no barriers to enter the market.</td>
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</tbody>
</table>

Time constraints are seen in the time frames that are laid down by TenneT in advance of the tender procedure. Contractors are obligated to stick to these time frames. However, there are possibilities to change the timeframes after the contract is awarded. Since the procedures of applying for time frames is not so time consuming, “it is possible to change until 2 months before the works are executed” (TT#1). Works are carried out throughout the whole year, with the exception for freezing days (TT#2). However, TenneT depends on the willingness of the operators regarding the time frames (TT#1; TT#2).

The operators are decisive in the establishment of time frames, making the market depended on third parties. Therefore, this criterion is not applicable.

6. **There is free competition, without influencing third parties.**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Influence of third parties is seen in two ways. Firstly, TenneT is influenced by the government as the subsidy provider and controlled in their actions by the ‘Autoriteit Consumenten & Markt’, an independent public body that supervises, among other things, competition in the high-voltage market (TT#2). Second, the high-voltage network transports the electricity from the generator to the client. When construction work is performed, the electricity generators such as the ‘NAM’ and offshore wind farms, must (partially) stop their process of adding bringing electricity to the network. In order to prevent the clients from running
out of power, power is redirected through other lines. TenneT and the generators agree on a time frame in which the lines are disconnected. But the deadline is strict, the lines must be in production after the deadline (TT#1; TT#2).

There is third party influence in various ways, making this criterion not applicable for this market.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 There is free competition, without influencing third parties</td>
<td>n/a</td>
</tr>
</tbody>
</table>

7. **Indefinitely large numbers of participants on both sides of the market.**

Keywords: Unrestricted amount - Indefinite - Multiple markets - Broad demand

The Dutch high-voltage network is split in different voltages. TenneT is the administrator of the infrastructure that transports the electricity above 150 kV. The infrastructure that transmits voltages below 150 kV are managed by 8 regional administrators, making a total of 9 clients (TT#1; TT#2). The concessionaires for the high-voltage networks are appointed by the government. For the contractors, there used to be separate certificates for the different parts of the high-voltage infrastructure. Contracts were awarded separately. At that time, there were 20 contractors in total. Nowadays, the contracts are awarded by means of a framework agreement. The contractors that want to compete in these tenders must either have all certificates or form partnerships to have all certificates within the partnership. The contracts are awarded based on a mini-competition, in which 6 suppliers compete for the contracts (TT#2).

The client's side of the market is determined by the Dutch government, making that the market depends on a third party in the amount of participants in the market. Therefore, this criterion is considered not applicable.

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<th>Criterion</th>
<th>Presence</th>
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<tbody>
<tr>
<td>7 Indefinitely large numbers of participants on both sides of the market</td>
<td>n/a</td>
</tr>
</tbody>
</table>

8. **All participants produce an identical or homogeneous product.**

Keywords: Single product - Identical - Equal quality - Defined quality

Contractors are obligated to buy materials from the suppliers designated by TenneT. These suppliers produce the same materials, making the product identical. The only way for contractors to distinguish themselves is to 'apply different working methods and be innovative with their risk management' (TT#1).

Since the products are coming from one single designated supplier, the contractor produce an identical product.

<table>
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<th>Criterion</th>
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<tbody>
<tr>
<td>8 All participants produce an identical or homogeneous product.</td>
<td>+</td>
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</tbody>
</table>

9. **Capital is increasing.**

Keywords: Market determined - Increase - Free market - Investments

Capital is increasing as a result of the focus on green energy. The growth in the amount of wind farms is causing TenneT to invest in their infrastructure. The compensation that is asked from the generators is supervised by the 'Autoriteit Consumenten & Markt', but the usage is growing and so is the income from user-fees (TT#1; TT#2). There is a growth of projects in progress commissioned by energy suppliers who are the operators of the high voltage network (TT#2).

As a result of the growing usage of the high voltage infrastructure, the capital/infrastructure is growing.
The methods of production are similar to what it was years ago (TT#1). The VAS-scale showed an average of 3.6 when it was asked whether TenneT motivates contractors to be innovative in their working methods. TT#1 states that TenneT is very reluctant when it comes to new working methods, while TT#2 states that contractors are free to choose their own working methods if the working methods are in compliance with TenneT’s guidelines.

It can be stated that methods of production are not improving. The lack of innovation is partly due to TenneT’s policy, while contractors are not using the space to innovate as well.

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<th>Criterion</th>
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<tr>
<td>10 Methods of production are improving.</td>
<td>+/-</td>
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</tbody>
</table>

Both the interviewees state that over the past few years, no new companies entered or left the market. This is due to high barriers to enter the market (TT#1; TT#2). Foreign companies are hesitant to enter the market, “the high initial investments to enter the market, combined with the uncertainty to win a tender, makes the Dutch energy market repellent for new entrants” (TT#2).

Not a lot of change in the industrial establishment is seen. The market lacks appeal as a result of high barriers to enter and a high level of uncertainty. Therefore, it can be said that the forms of industrial establishment is not changing.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 The forms of industrial establishments are changing</td>
<td>-</td>
</tr>
</tbody>
</table>

Price plays a rather important role as an awarding criterion (TT#1). TT#1 stated that he had worked for ‘Rijkswaterstaat’ before, and that price played a more dominant role at TenneT in comparison to ‘Rijkswaterstaat’. However, TenneT is improving their procurement methods. The quality criteria are becoming more important in recent years (TT#1; TT#2). On the VAS-scale, the interviewees give an average of 8.7 regarding TenneT’s innovative behaviour regarding procurement procedures. For now, TenneT’s hesitance to applying full quality based contracting is substantiated with the idea that the certified contractors are struggling with this method, as they are used to low bid procurement for a long time (TT#1).

It can be stated that TenneT is in a transition towards quality-based procurement. Therefore, both presence and non-presence of this criterion are observed.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.</td>
<td>+/-</td>
</tr>
</tbody>
</table>

Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for
Nowadays the awarding criteria are **project specific**. In the sense that the criteria chosen from a long-list of established **quality criteria**. The amount of criteria and their relative importance **depends** on the technical difficulty of the project. The criteria are assessed by analyzing the contractor’s action plans (TT#1). However, TenneT is very innovative with regards to procurement procedures. In example, TenneT obliges the contractors to make more extensive action plans, that are used for assessing the criteria. However, “the difficulty with innovative awarding mechanisms is the problem of checking if a contractor delivers what was written down in the action plan” (TT#1). However, contractors are used to traditional low-bid procurement and are having problems with the transition towards the quality-based procurement methods. This leads to high cost-overruns in the short term, but it is thought that it will be beneficial on the long run (TT#2).

So, the **quality criteria** for awarding contracts are chosen **separate** for each **project**. Making this criterion present for this market.

<table>
<thead>
<tr>
<th>Criterion</th>
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<tbody>
<tr>
<td>13</td>
<td>Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.</td>
</tr>
</tbody>
</table>

14. **The contractor must be able to choose his own way of producing from the beginning till the end.**

Contractors are obligated to buy their materials from a fixed supplier, who is chosen by TenneT through a procurement process (TT#1). Besides, the time frames are binding but the contractors are **free to choose** their **own working methods** within the framework (TT#2). Keeping in mind that the contractors must meet the standards as laid down in the guidelines, regarding quality and safety.

The contractor is able to choose his **own working methods**. However, the time frames **limit** the contractors in their opportunities. Therefore, this market shows both the presence and absence of this criterion.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>The contractor must be able to choose his own way of producing from the beginning till the end.</td>
</tr>
</tbody>
</table>
5.3 CASE III: TRACK RENEWAL AT LIIKENNEVIRASTO

Liikennevirasto is the Finnish concessionaire for the management of the Finnish Railway infrastructure. Track renewal projects are conducted according to Liikennevirasto in different ways, depending on the difficulty and size of the project. Firstly, the context of the project is described after which the different processes are discussed. When the process is introduced, the observed influence of the separate criteria of the revised list is discussed.

To judge the success of the market from a client's point of view, the interviewees were asked to draw lines on the VAS-scale for a couple of questions (q. 5 and q.7 of the interview protocol) in which the subjects ‘performance’ and ‘cooperation’ are central. The average of these questions shows the success of the market. Since the VAS-scale uses a scale of 0-10, the success of the market is based on this 10-point scale. Getting back to the VAS-scale, for example the performance question, 10 points on the VAS-scale means that contractors show their 'best possible performance' through the eyes of the interviewee. Undeniable, zero points implies 'no performance'. On average, the market success of the Finnish Railway construction market, from a client's point of view is 7.63 points.

Context

The context for Finnish track renewal projects is exactly the same as for Dutch track renewal projects as discussed in the ProRail case. So, track renewal contains renewal of the parts that lie on the subgrade, Railroad ties, Track ballast, Rails and the Railroad switches.

Procedure

The visualized process as shown in figure 13 is designed among the following steps.

i. The Notification

The Asset management department is notified by their Life Cycle Management program that tracks are at the end of their lifespan. This notification is checked by Asset Management and at the same time a rough scope for a project is determined. When this process is completed, the project is handed over to the projects department.

ii. Proposed Project

The rough scope that is handed over by Asset Management to the Project Team is the starting point for the project. The project team assigns an engineering agency to define a detailed scope by performing risk assessments similar to those in the ProRail case, and make the design for the scope. Members of the project team go into a consultation process with the operators to come up with a time frame in which the project must be carried out. Also, the Project Team is responsible for purchasing the materials that are needed for the project. Next, the contract is drawn up and the contract is tendered. A contractor uses the risk assessments, design and time frame as a reference for their bid. The approach for the tender procedure is based on the following principles:

- The project value
- The difficulty level

The project value

If the project value is above the European threshold, the contract is procured by using a Most Economically Advantageous Tender approach in a restricted procedure. Below the European threshold, the contract is awarded based on the lowest bid in a restricted procedure. Except for projects with a high difficulty level, they are procured by using a Most Economically Advantageous Tender approach, similar to contracts that are above the European threshold.

The difficulty level

Contracts with a high level of difficulty are procured according to a Most Economically Advantageous Tender approach. The awarding criteria for these contracts focus on these difficulties. The previously indicated
contract award criteria must be incorporated in the contractor’s action plan for the project that is submitted along with the price. The action plans are assessed by the project team, before the price of the tender is revealed. The contract is awarded by using a calculation model that considers both the quality of the action plans and the price. The division of quality-price in the calculation method depends on the importance of the designated difficulties. The minimum quality-price ratio is 20:80 and the highest ratio is 60:40.

iii. The project
During the execution phase, the project is supervised by a project supervisor from Liikennevirasto. After completion of the project, an inspection train measures the quality of the works. If the quality is within a range of 10% of a pre-set benchmark, the project is finished and handed over to the Asset Management department again. If the quality is more than 10% off, the contractor is obligated to perform improvement works.

5.3.1 PRESENCE OF THE CRITERIA
Similar to the previous case, the criteria will be discussed separately. Each criterion will be concluded with a figure that shows the presence of the criterion. As stated before, the presence of a criterion is determined by using keywords, stated at the beginning of each criterion. A criterion is considered present if at least two keywords or their derivatives can be found in the observations, derived from the results of the interviews. A criterion is considered not present if at least two antonyms of the keywords are observed. A ‘+’ represents a present criterion, a ‘-’ means it is not. When a criterion is listed as ‘+/−’, both a keyword and an antonym is observed. However, there is a special case in which terms like: Third party influence, beyond control of the contractor and client and bound by law and legislation are observed. As discussed in the demarcation, third parties are excluded from this study. Therefore, these criteria are considered not applicable and will be indicated as n/a, instead of a ‘+’, a ‘-’ or a ‘+/−’.

1. No single player has the power to influence price.
   Keywords: No/low interdependence - No influence - No power - Indefinit/multiple clients /suppliers

   By using different types of tender procedures, Liikennevirasto influences the choice for a contractor. When track renewal projects are performed under the European threshold, Liikennevirasto applies the low-bid procedure. By doing so, Liikennevirasto uses their power to steer the choice for a contractor. Low-bid procurement is in favour of small contractors. For contracts above the threshold and those that are considered difficult, contracts are awarded on quality. Which on its turn is in favour of the large contractors (Li#1; Li#2; Li#3). It could be stated that Liikennevirasto influences price with their procurement procedures. However, the market is fairly divided due to the difference in size of the competing contractors and all contractors make a decent profit (Li#1; Li#2).

   The interviews showed that Liikennevirasto uses their power to influence the market. Therefore, the criterion is not present.

<table>
<thead>
<tr>
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<td>No single player has the power to influence price.</td>
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</table>

2. There is unrestricted access to all information about the market.
   Keywords: Unrestricted - Open access - Information

   The traditional contract forms make that the market is not so complex. All contractors know each other’s capacities in terms of machines and knowledge. This is reflected in the tender procedures. For large projects, small contractors must hire external workers in order to be able to complete the works within the pre-established time frame. Making them far more expensive compared to the two large companies. While on the other hand small contractors benefit from their small organization when it comes to small projects. Combined with the fact that materials are purchased by Liikennevirasto, there are no secrets in the market (Li#1; Li#2). However, even though there are no secrets as a result of the small market, the contractors are not allowed to have contact about the tenders. Legally, information cannot be shared, since the contractors could potentially collude (Li#2; Li#3).

   There is no open access about the market as a result of legislative boundaries. These legislative bounda-
ries cannot be modified by the contractor nor Liikennevirasto, as they are formed by the Finnish government. Making this criterion not applicable.

3. **The rivals must act independently, not collusively.**

*Keywords: Independence - Market has the power - Price setting - No collusion*

Instead of collusion, **heavy competition** is observed. The recent entrance of four small contractors are forcing the established players to compete for their market share (Li#1). On the other hand, the small contractors were able to gain a substantial market share over a short amount of time. The 2nd, 3rd and 4th biggest contractors invested a lot in new machinery and grew as a company. Now, these contractors are heavily competing for contracts as a means of generating return on investment (Li#2). Contractors act independently, but the smaller contractors do hire machinery from the larger contractors. However, contractors do this for their own benefit (Li#3).

It can be stated that **collusion is not observed**, contractors do work together but the purpose of these collaborations is not to collude. Therefore, this criterion is considered present in this market.

4. **There are no barriers to enter the market.**

*Keywords: No/low barriers - Free access - Low investments - No requirements*

Barriers are mainly seen in the financial resources that are necessary to enter the market. The machines that are needed are **very expensive** (Li#1; Li#3). Besides, people with knowledge about railway infrastructures are **scarce**. Also, contractors need to be **certified** to be allowed to compete in a tender. These certificates are handed out by an external auditing bureau. New entrants must first show their capabilities as a subcontractor for track works. The next step is to perform a small test project in a remote area. If all this goes well, the certificate is granted (Li#1; Li#3).

**Barriers** are seen in the form of a **certification system**. This system requires contractors to invest in machinery and knowledge, which are respectively expensive and scarce.

5. **Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.**

*Keywords: No time constraints - Free to choose - Non-interference - Broad demand*

As a result of the weather conditions in Finland, track renewal projects are **restricted** to working in times when there is no frost. This usually means that works are executed in the period from April-October (Li#2). The time frames for the execution of works are pre set by Liikennevirasto and also depend on the geographical position. In the north, construction work is done during the day, while nights are used in the more dense southern regions (Li#1). This is a result of the different usages of the tracks. In the north, mainly freight carriers are active, while in the dense areas the focus lies on commuter transportation. The choice for time frames is **interfered by the operators**, as they want works to be completed outside their timetables (Li#1; Li#2; Li#3). Materials are purchased by Liikennevirasto and, therefore, this matter doesn't come into play (Li#1; Li#2; Li#3).

Due to weather conditions and time frames, the contractors are **bound** to certain time limits. A contractor **depends** on Liikennevirasto for the time frames. On its turn, Liikennevirasto heavily depends on the opera-
tors for the time frames. These third parties are considered out of this thesis's demarcation and therefore this criterion in not applicable.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>5  Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.</td>
<td>n/a</td>
</tr>
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</table>

6. **There is free competition, without influencing third parties.**

*Keywords: Free competition - No third party influence - Unregulated*

In northern parts of Finland, freight traffic is more important than passenger traffic. For these areas, the works are executed during the days, since most of the freight transport takes place at night. While in the areas with a high population density, in the southern parts of Finland, works are executed during the nights. Both the day and night works are chosen to disrupt the timetables of freight carriers and rail passenger transporters as little as possible (Li#1; Li#3). Hence, Liikennevirasto is obligated to consult the operators of the tracks before it can be decided if, and when works can be executed.

Since Liikennevirasto is not the operator of the infrastructure, they depend on third parties regarding the time frames for the execution of works. Therefore, this criterion is considered not applicable.

<table>
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<tbody>
<tr>
<td>6  There is free competition, without influencing third parties</td>
<td>n/a</td>
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</table>

7. **Indefinitely large numbers of participants on both sides of the market.**

*Keywords: Unrestricted amount - Indefinite - Multiple markets - Broad demand*

Liikennevirasto is the only client in Finland for the train rail contractors. Liikennevirasto is appointed by the Finnish government as the concessionaire of the Finnish Railway infrastructure. For alternative markets, only the largest contractor, VR, is currently working abroad, in Estonia and Sweden. The other contractors do perform works in the Metro and Tram sector, but are mainly dependent on Liikennevirasto. Also, due to a difference in track gauge, it is very difficult for contractors to enter the European market (Li#1). At the same time, foreign contractors face difficulties when they want to enter the Finnish market. Currently, no foreign contractor is participating in the Finnish rail contractor market. At the moment, there are 6 contractors, 2 large contractors and 4 small contractors (Li#1; Li#2; Li#3).

The Finnish Railway infrastructure is bound by one client, appointed by the government. It is not possible to expand the market, as there is only one railway infrastructure in Finland. Making this criterion not applicable.

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<tr>
<td>7  Indefinitely large numbers of participants on both sides of the market.</td>
<td>n/a</td>
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</tbody>
</table>

8. **All participants produce an identical or homogeneous product.**

*Keywords: Single product - Identical - Equal quality - Defined quality*

The materials that are used for the construction works are bought by Liikennevirasto, from two suppliers, thus using a traditional format in which the contractor only executes the works. The suppliers produce materials according to the guidelines, in which minimum quality requirements are laid down. Therefore, the final product is the same, homogenous (Li#1; Li#2; Li#3).

The used materials are uniform, since they are produced according to the guidelines of Liikennevirasto,
9. **Capital is increasing.**  
*Keywords: Market determined - Increase - Free market - Investments*

As a public organization, Liikennevirasto depends on funds from the government. In the last few years, the government is investing in the railway infrastructure. This has attracted the 4 contractors that entered the market. For 2017 and 2018 it is known that capital will increase, since the government increased the budget for Liikennevirasto, but 2019 is unknown (Li#2).

The development of capital depends on the governmental policy. Therefore, capital can increase or decrease. This cannot be influenced by the client nor the contractor, making this criterion not applicable for this study.

<table>
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<tr>
<th>Criterion</th>
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<tbody>
<tr>
<td>Capital is increasing.</td>
<td>n/a</td>
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</table>

10. **Methods of production are improving.**  
*Keywords: Change - Innovation - New - Better/faster/accurate*

**Improvement** is seen amongst all contractors. The reason for these improvements is a combination of the low-bid incentive for the small contracts that are awarded based on price, and the entrance of small contractors to the market. The two large contractors used to perform all construction work and had no incentive to change their working methods since they were assured of a sufficient amount of contracts to generate profit. The competition grew with the entrance of four small contractors. These small contractors have shown to be very innovative in their working method; they had to, in order to be able compete with the two large contractors. They have managed to outrun the heavy machinery with their cleaver working methods, which led to a wake-up call for the large contractors. This stimulated the large contractors to improve their working pace and overall working methods, in the hope to regain their market share (Li#2). The contracts that are awarded based on the lowest bid were in favour of the new entrants, since small projects gave the opportunity to outrun the heavy machinery, whilst this wouldn't be possible for large contracts (Li#1; Li#3).

The entrance of new contractors acted as a catalyst for the innovation of the working methods. Small contractors managed to outrun large machinery by using cleaver working methods that stimulated large contractors to come up with new and faster ways of working. Methods are in fact improving.

<table>
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<tbody>
<tr>
<td>Methods of production are improving.</td>
<td>+</td>
</tr>
</tbody>
</table>

11. **The forms of industrial establishments are changing.**  
*Keywords: New entrants - Constant change - Alternative markets*

After a long period with only two contractors, in the last five years, 4 contractors entered the market (Li#2). The reason for this sudden entrance is two-folded. Firstly, the Finnish government is increasing Liikennevirasto’s budget, this attracts new contractors to the market. Second, Liikennevirasto changed their procurement policy, hoping to attract new contractors (Li#2). Before, it was common that Liikennevirasto procured large track renewals contracts that contained the renewal of 40 km, up to 160 km of tracks. This was in favour of the large contractors and their heavy machinery. However, to attract new contractors Liikennevirasto downsized the scale of the projects. In the first place, this makes it possible for new contractors to submit a tender without the contract’s risks being too high. Also, these contracts (that are of...
Contracts that are above the European threshold of € 5,225,000,00, and projects with a high level of difficulty are awarded based on awarding criteria without price being dominant. Projects below the European threshold are awarded based on the lowest bid for multiple reasons. There is a shortage of time and capacity at Liikennevirasto to award all tenders by applying a Most Economically Advantageous Tender approach (Li#3). Lowest bid tenders give small contractors the opportunity to enter the market (See criterion 11). Also, the projects that are awarded based on the lowest bid contain simple works for which no special qualities other than those that are covered by the certification system (Li#2).

Liikennevirasto applies both Most Economically Advantageous Tender procedures and low-bid procedures. The arguments for using the low-bid procurement strategy are justifiable, therefore this criterion is present.
Liikennevirasto purchases the materials for a contract, and the time frames are set up front. The contractor is able to choose his own working method, but is restricted to the materials and time frames that are handed to them by Liikennevirasto (Li#1; Li#2; Li#3). However, Liikennevirasto tries to motivate the contractors to optimize their working methods by entering incentives into the contract. Liikennevirasto finds it very important that contractors don’t exceed the time frames, since operators are using the tracks directly after completion of the works (Li#2). This goal is strengthened by the fact that there is only a single track in most parts of Finland, so there are no fallback positions (Li#1). An example of a system of incentives is as follows. If a contractor doesn’t overrun the given time frames, a financial bonus is granted. This bonus decreases each time a deadline is not met. If time overruns occur more than a pre-set amount of times during the project, the contractor is fined by Liikennevirasto (Li#2).

Contractors do have a free choice in deciding which working methods will be applied. However, the contractors are limited in their choice by the time frames, given by Liikennevirasto. So, both features of the criterion are present.

<table>
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<tbody>
<tr>
<td>The contractor must be able to choose his own way of producing from the beginning till the end</td>
<td>+/-</td>
</tr>
</tbody>
</table>
5.4 CROSS CASE ANALYSIS

The multiple case study gives insights in how the proposed list of criteria is experienced in practice. However, no list of criteria can be established without thorough understandings of the observations regarding the list criteria from a broader perspective. The next step is to search for resemblances and differences in the observations. The reasons for recurring observations and differences will serve as input for establishing the final list of criteria.

This chapter explores the differences and replication by means of a cross-case analysis. The observations for each separate criterion will be compared and their possible existence is discussed. The cross case analysis will be concluded with an overview of the criteria and their observed existence in practice. Criteria that can’t exist in practice are erased from the list, resulting in the final list of criteria. What the challenges lie ahead for implementing these criteria in a market is discussed in the next chapter, followed by an advice on how to overcome these hurdles in the Dutch rail market.

5.4.1 ELIGIBILITY

The purpose of this cross case analysis is to define whether the proposed criteria are eligible for a market in the public sector with one buyer and few sellers. In the previous sections the presence of the independent criteria is discussed for the separate cases. The next step is to discuss why the criteria are either present or absent. This study focuses on a market referred to as a public imperfect market, implying that third parties are present and that the market is not perfect. As stated before, the starting point for the establishment of the list of criteria, thereby those that are discussed so far, are derived from a market with perfect competition. This contradiction will undeniably result in the absence of one or more criteria (eligibility issues aside). However, the reason behind the presence or absence of a criterion decides whether the criterion is eligible for public markets with one client and few sellers. The first step in this process is to cut out the criteria that are considered ineligible as a result of third party influence. As stated in the introduction of the multiple case study, third party influence is out of this study’s scope. Therefore, these criteria will be cut out up front. After the first division is made, the remaining criteria will be discussed in terms of relevance. First, the list will be shortened by removing the criteria subject to third party influence. Third party influence is considered unavoidable if in 2 or more cases a criterion is assessed n/a. Below, an overview is presented from the results of the multiple case study. The highlighted criteria are those, that are removed from the list since they are out of this thesis’s demarcation and will not further be discussed.

<table>
<thead>
<tr>
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<tbody>
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<td>1</td>
<td>No single player has the power to influence price.</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>There is unrestricted access to all information about the market.</td>
<td>n/a</td>
</tr>
<tr>
<td>3</td>
<td>The rivals must act independently, not collusively.</td>
<td>+</td>
</tr>
<tr>
<td>4</td>
<td>There are no entry barriers to enter the market.</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.</td>
<td>n/a</td>
</tr>
<tr>
<td>6</td>
<td>There is free competition, without influencing third parties.</td>
<td>n/a</td>
</tr>
<tr>
<td>7</td>
<td>Indefinitely large numbers of participants on both sides of the market.</td>
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</tr>
<tr>
<td>8</td>
<td>All participants produce an identical or homogeneous product.</td>
<td>+</td>
</tr>
<tr>
<td>9</td>
<td>Capital is increasing.</td>
<td>n/a</td>
</tr>
<tr>
<td>10</td>
<td>Methods of production are improving.</td>
<td>+/-</td>
</tr>
<tr>
<td>11</td>
<td>The forms of industrial establishments are changing</td>
<td>+/-</td>
</tr>
<tr>
<td>12</td>
<td>Contracts must be awarded by using a method where price is not dominant.</td>
<td>+/-</td>
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<td>13</td>
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<td>+/-</td>
</tr>
</tbody>
</table>
The contractor must be able to choose his own way of producing from the beginning till the end.

Successfulness of the market

5.4.2 PRESENT CRITERIA

As a result of interference of either governmental institutions or operating parties, four criteria have been cut off from the list. These criteria are considered not eligible for public markets with one buyer and few sellers. The next step is to observe similarities. The goal is to create a list of criteria that must be present in public markets with one buyer and few sellers to establish a beneficial market. The criteria that are already present in all three cases, must remain in existence in the future. These criteria will not be deleted from the list. However, there is no further reason to discuss these criteria, as they are already present. In the next section, a cross case analysis will be conducted for the criteria that are eligible but not present for all cases. In this cross case analysis, the relevance of the different will be discussed. This is explained in the introduction of that section. Firstly, the overview below shows the criteria that are already observed as present, and should be retained present.

<table>
<thead>
<tr>
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<tbody>
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<td>3</td>
<td>The rivals must act independently, not collusively.</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>4</td>
<td>There are no entry barriers to enter the market.</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>8</td>
<td>All participants produce an identical or homogeneous product.</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>10</td>
<td>Methods of production are improving.</td>
<td>+/-</td>
<td>+/-</td>
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</tr>
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<td>14</td>
<td>The contractor must be able to choose his own way of producing from the beginning till the end.</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
</tr>
</tbody>
</table>

Successfulness of the market

6.73 4.76 7.63
5.4.3 COMPARING RESULTS

The comparison of results will discuss ‘how’ the criteria are of relevance for the studied markets. This is done by discussing the influence of the separate criteria to the studied market form. The presence of the criteria in the separate cases is visualized on the right side of criterion. The author in this case observed the impact of the criteria by studying the interviews. A comparison of these findings will result in a statement about the influence of the criteria. The statement will result in either a positive (+) or negative (−) verdict for the criterion. Criteria with a positive influence (+) are considered of relevance for the studied market form. On the other hand, criteria with a − are considered irrelevant. The criteria that are considered irrelevant are removed from the list. The criteria that remain, combined with the criteria that are already present form the final list of criteria.

As said, the cross case analysis will be concluded with an overview of the findings. By cutting out the irrelevant criteria, the final list is established. Thereby answering the main research question: ‘What factors are crucial for making the Dutch Rail contractors market beneficial for both the client and the contractor?’

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<th>1. No single player has the power to influence price.</th>
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Since a monopsony situation is part of the researched markets, it can be derived from the literature study that a single player with influencing power is to be expected. This is reflected in the results of the multiple case study. In all cases, the contractors are heavily depending on the client as the main or single buyer. The very existence of the contractors would be jeopardized if they don’t win tenders. This puts the client in a dominant position. The ProRail case showed that the client is able to influence price by awarding contracts based on the lowest bid, or by causing scarcity. Naturally, the lowest bid gives the contractors an incentive to go low on price in order to win a tender. Scarcity increases this behaviour if price plays a (dominant) role as an awarding criteria. On the other hand, when a contractor is saturated with enough contracts, it is seen that the contractors submit high bids. Since they don’t need the contracts, they want them only if profits are high. It can be stated that this situation shows similarities with the negative results of ‘utilizing monopsony power’. In the literature survey, Chen (2005) already said that utilizing monopsony power would result in a less efficient market.

The TenneT case showed that the client must constantly monitor the market finding a balance in the amount of contracts that are put on the market, and how they are awarded. With the goal to prevent the market from oversaturation. The case that proved to be the best functioning market, the Liikennevirasto case, showed that that using client-power in a well-considered manner results in an equally divided market., contracts can be divided more equal over the market. This situation corresponds with economic literature on monopsonies, in which the term ‘countervailing power’ is introduced. Where countervailing power is “the market power developed on one side of a market as a result of the market power on the other side” (Chen, 2015). When reflecting this to the Liikennevirasto case, it is observed that the monopsony situation forces contractors to compete in tenders of Liikennevirasto. Liikennevirasto on its turn gives (countervailing) power to both the small and large contractors by applying different tender procedures that can be in favour of either small or large contractors. On the other hand Liikennevirasto policy of incentives, strict supervision and inspection of the works is in line with Chen’s (2005) advice to strictly supervise contracts when providing countervailing power.

Summarizing, this criterion cannot be reached but is of relevance for the discussed market form. Both the literature survey and Liikennevirasto case showed that in a market with both a monopsony and an oligopoly, the monopsonist should be careful in using his market power. To create a situation that is beneficial for both sides of the market, he should make use of his ability to create countervailing power.

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<th>4. There are no entry barriers to enter the market.</th>
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All cases show that as a result of the technical nature of the projects, there must be barriers to enter
It is not safe for contractors to start working on the tracks or high voltage networks without proving to possess certain competencies. Certification systems are used in all three cases, to ensure the contractors are working to the standards that the client expects. However, there is a dispute on the height of the certification barrier. TenneT and ProRail professionals state that obtaining the certificate is a high barrier, since contractors have to meet a lot of requirements before a certificate can be obtained. In the Liikennevirasto case, the certification system doesn’t appear to be a high barrier in the opinion of the interviewees. Contractors are in fact encouraged to obtain a certificate.

However in all three cases it is mentioned that high initial investments, in terms of money and knowledge, are necessary to enter the market. The possibilities for obtaining return on investment, combined with the barriers of the certification system are directly related to this barrier. Without any prospect of return on investment, no new contractors will enter the market. The TenneT case showed that high barriers to enter the market, combined with high investments doesn’t result in a lot of new entrants. While the ProRail case showed that high barriers to enter, combined with lower investments also doesn’t lead to new entrants. The Liikennevirasto showed that low(er) barriers to enter in terms of certification, regardless the high investments, attract new contractors to enter the market. Employees of Liikennevirasto also indicated that contractors are willing to enter the market since they are aware of the growing investments of the government in the Rail infrastructure in the coming years.

Legally speaking, the clients in the Dutch special sectors have the opportunity to apply certification systems. They do so for a reason, as discussed before safety issues are very important. However, the difficulty to obtain a certificate, combined with the possibility to generate turnover, are vital to attracting new entrants. Therefore, this criterion is considered relevant for public markets with one buyer and few sellers.

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<td>4. There are no entry barriers to enter the market.</td>
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10. Methods of production are improving.

The view on improvement of production methods differs, case by case. At TenneT, almost no improvement is seen as a result of TenneT’s cautious policy with regards to approving new methods. ProRail showed different opinions, on the one hand the rigid guidelines are said to be a constraint for innovation, while on the other hand ProRail’s growing focus on durability is catalyzing new working methods. However, no real incentives for a contractor to improve are visible.

At the best performing market, Liikennevirasto, improvement in working methods is seen as a result of the changing industrial establishments. New entrants to the market are in the need to be very innovative in order to gain market share. By developing clever working methods, they outrun the established order in financial terms. The working methods are cheaper, making it possible for the entrants to gain market share through winning low-bid tenders. This caused a reaction from the large contractors, who are now trying to regain their lost market share by establishing new working methods.

As a result of the Liikennevirasto case, it can be concluded that a single client has the ability to force clients to improve their working methods. But, the contractor needs an incentive to do so. So, this criterion is of relevance for a public market with one single player and few sellers.

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<td>10. Methods of production are improving.</td>
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11. The forms of industrial establishments are changing. 

Due to uncertainty and high barriers to enter the market, the ProRail and TenneT cases showed a relative stable market, with not many entrants or leavers in the market. For the ProRail case, it was seen that contractors tried to enter the market in recent years. However, only 2 remained active in the industry over time. The contractors that left didn’t win a single tender and eventually chose to stop competing in tender procedures. The TenneT case showed no new entrants over the past few years, it was stated that the high initial investments that have to be made, are making contractors hesitant to enter the market.
The Liikenevirasto case showed a different view. As a result of a growth of investments in the Finnish Rail sector, contractors are attracted to the market. Liikenevirasto is responding by lowering the barriers to enter the market, by shrinking the contract volumes. By doing so, new entrants have the opportunity to enter the market without taking too big of a risk. The results have been positive, the cleverness of the new entrants is indirectly stimulating the large contractors to innovate their working methods.

The Liikenevirasto case showed that industrial establishments can change and that it is beneficial for the market, when the client influences the market in the right way. So, this criterion is of relevance for a public market with one single player and few sellers.

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<td><strong>11</strong> The forms of industrial establishments are changing.</td>
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12. **Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed**

Dutch procurement law states that contracts must be awarded based on quality instead of price. Both ProRail and TenneT apply quality-criteria for awarding contracts, however the effect differs. The interviewees in the ProRail case state that price is a dominant factor in their tender procedures. The awarding criteria lost their distinctive features over the years. In the TenneT case, all contracts are awarded without price being dominant. The preferred situation is reflected in the interviews. The interviewees at ProRail support a more quality-based procurement method, while at TenneT it is stated that the approach for awarding contracts satisfies the needs.

However, at the best performing market, the approach can almost be seen as a combination of both. As Liikenevirasto is based in Finland, different law and legislation applies to the procurement procedure. Under the European threshold, in Finland, public clients are free to choose their procurement method. This implies that low-bid procurement is allowed. For multiple reasons, Liikenevirasto applies both low-bid procurement and quality based procurement. Low-bid procurement is applied when contracts are under the European threshold and are considered low-risk projects. Contracts with specific difficulties, or above the European threshold, are awarded based on quality. The reason for low-bid procurement is two folded. Firstly, working capacity issues force Liikenevirasto to apply low-bid procurement, as it is less time consuming than quality-based procurement. Secondly, the low-bid contracts are in favour of new entrants, thus by doing so contractors are stimulated to enter the market. New (small) contractors will be defeated by large contractors when it comes to quality-based procurement, while at the same time they will outbid large contractors in low bid procurement as a result of less overhead in the company. As said, the low-bid contracts need less attention, thus the opportunity is created to give more attention to the procurement of difficult contracts. These contracts are awarded based on criteria that are tailored to the contract.

Both TenneT and Liikenevirasto have shown that it is possible to award contracts without price being dominant. Whereas Liikenevirasto showed that combining both low-bid and quality based procurement stimulates contractors to enter the market. Therefore, this criterion is of relevance for a public market with one single player and few sellers.

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<td><strong>12</strong> Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed</td>
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13. **Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.**

In all cases quality criteria are used for awarding contracts, be it in different ways. ProRail’s quality criteria are said to be in compliance with ProRail’s policy, rather than that they are relevant to the project. The answers of the interviewees indicate that enhancing the distinctive features of the tender procedure would
be beneficial for the market. TenneT applies quality criteria that are chosen from a long list of pre-established criteria, the procedure fulfils the goal of obtaining tenders of high quality. However, the traditional contractors in the market find it difficult to deal with this new tender approach, as they are used to traditional low bid procurement.

If we ignore the contracts that are procured based on the lowest bid, Liikenevirasto uses criteria that are made up for each contract separately. The action plans of the contractors are assessed for these criteria. By doing so, the action plan that best suits the qualities that are sought after will be awarded with the contract. The advantage of this approach is said to be the successful completion of the majority of projects that are procured in this manner. A disadvantage is seen in the lawsuits that often result from this approach. Contractors that don’t win the tender often go to court, to dispute the outcome of the awarding criteria. A great deal of working capacity is reserved for these procurement processes, making it impossible to approach each tender in a similar way.

However, the Liikenevirasto showed that the need for working capacity on this matter could exceed the available capacity. Similar end results are observed in the TenneT case, with less capacity needed, through the use pre set list of criteria. The ProRail case showed that there are less opportunities for contractors to be distinctive as a result of the use of the same criteria for each project. Therefore, this criterion is of relevance for a public market with one single player and few sellers.

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<td>13 Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.</td>
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14. The contractor must be able to choose his own way of producing from the beginning till the end. | PR | TT | Li |
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In all three the cases, the contractor is able to choose his own working method within the given time frame and guidelines, set up by the client. These time frames can obstruct the freedom of choosing working methods. Especially due to the fact that in all cases, the time frames are established before the contract is awarded. With other words, the contractor can’t influence the time frames in order to match the time frame with their working method. In the single case study, contractors were able to choose their own time frames. This resulted in two large time frames and two small time frames. These results fairly differed from what would have been the time frame for this project if it was set up by ProRail. Therefore, it can be stated that pre-established time frames affect the choices of a contractor regarding production methods.

The pre-set time frames are a result of the standardized processes. With working methods heavily depending on the availability of time, these time frames limit contractors to choose their own working methods. The experimental approach of the single case study showed that the submitted deviate from the ‘normal’ bids. Therefore, this criterion is of relevance for a public market with one single player and few sellers.

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<td>14 The contractor must be able to choose his own way of producing from the beginning till the end.</td>
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Special sector contractor markets are influenced by third parties in various ways. Concessionaires are accountable to the government, as they were appointed by the government to be the client in this market. Besides, the government uses supervising bodies to see if the market complies with the laws and legislation that apply to the market. Also, the concessionaires are the administrator of the tracks, not the operators. The operators are for-profit organizations that tend to use their power to minimize the amount of time a infrastructure is taken out of use. Third party influence is out of this thesis’s demarcation, making it impossible to meet all criteria from the proposed list. The cross case analysis showed the relevance of the criteria. Not all criteria are observed as ‘present’ in the cases, some are even not present in all cases. However, the boundaries for letting those criteria be present lie within the market itself. As theory and the single case study have proven that these criteria are of benefit for establishing beneficial markets, they will remain on the list. They can be seen as a recommendation for similar markets to give a thought to.

With the final list below, an adapted list of criteria is proposed that entails the criteria that are considered of importance for public special sector markets. The numbers in brackets are the old numbers for the criteria, the bold numbers are the ‘new’ numbers. With this, an answer is formulated to the fourth research question; ‘What criteria make public markets with one buyer and few sellers beneficial?’. From the insights obtained in the multiple case study it can be concluded that the following criteria are beneficial in establishing a beneficial public market:

**Final list of criteria:**

1. (1.) No single player has the power to influence price.
2. (3.) The rivals must act independently, not collusively.
3. (4.) There are no barriers to enter the market.
4. (8.) All participants produce an identical or homogeneous product.
5. (10.) Methods of production are improving.
6. (11.) The forms of industrial establishments are changing.
7. (12.) Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.
8. (13.) Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.
9. (14.) The contractor must be able to choose his own way of producing from the beginning till the end.
CONCLUSION

The previous chapter provided an answer to the last research question. The multiple case study elaborated on the last part of the research by examining the existence of the proposed list of criteria in practice. Now the time has come to discuss the progress that has been made in this undertaking. This study started with the introduction of a problem and the intended approach to come to an answer for the problem statement.

This chapter connects the achieved insights with the impact on the Dutch Rail contractors market. The main purpose of this conclusion is to provide an answer to the main research question. By combining the results from the research questions, an answer to the main research question is formulated. Firstly, the answers provided to the research questions are elaborated upon. Thereafter the recommendations for the Dutch Rail contractors market are given. Followed by recommendations for further scientific research. This chapter is concluded with a personal view of the writer regarding the implementation of the final list of criteria in practice.

6.1 ANSWERING THE RESEARCH QUESTIONS

Four research questions were introduced in the research design as a guide for this research to come up with a valid answer to the main question of this study. The first research question focused on the desired situation, which is derived from the theory on ‘perfect competition’. The Dutch Rail contractors market is bound by law and legislation that is applicable to the Dutch ‘special sectors’. A study towards these regulations provides an answer to the second research question. Next, the nature of a project in the Dutch Rail sector and its standardized process is researched to find an answer to the third research question. Lastly, the multiple case study validated the (non)presence of the criteria in practice, thereby answering the fourth research question.

RESEARCH QUESTION 1: What requirements are crucial in establishing a beneficial market?

The field of economics is divided into micro- and macro-economics. Micro-economics focusing on the behavior of individuals and participants rather than on the development of regions, countries and the world economy. Therefore, the micro-economic view is used as a starting point for the presentation of a beneficial market. A market that is considered beneficial for both the client and the supplier in this perspective is called a ‘perfect market’, or a market that features ‘perfect competition’. Over multiple decades, the exact meaning of perfect markets is debated by many. In 1957, Nobel prize winning economist George Stigler published a paper that gave an overview of perfect competition as discussed by well known economists from 1776 onwards. All economists are of the opinion that perfect markets possess certain factors that steer the market in a sense that the market becomes ‘perfect’. When it comes to transforming an imperfect market in a perfect market, it can be stated the imperfect market must transit in a market where the steering factors of perfect markets are present. Therefore, the factors that make a market perfect, can be seen as the criteria that must be met for establishing a beneficial market.

When listing the influencing factors from the different economist, supplemented by a more recent view on perfect competition, a long list of criteria is established that give insight in what features must be present in perfect markets. This long list contains some overlapping features, that can be compressed into one. From the study, a list of 11 criteria is concluded to be required for a beneficial market:

1. No single player has the power to influence price.
2. There is unrestricted access to all information about the market.
3. The rivals must act independently, not collusively.
4. There are no barriers to enter the market.
5. Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.
6. There is free competition, without influencing third parties.
7. Indefinitely large numbers of participants on both sides of the market.
8. All participants produce an identical or homogeneous product.
9. Capital is increasing.
10. Methods of production are improving.
11. The forms of industrial establishments are changing.

**RESEARCH QUESTION 2: What requirements are crucial in establishing a beneficial market?**

Dutch Public parties are obligated to comply with the Aanbestedingswet 2012, for the procurement of contracts. The 'Aanbestedingswet 2012' makes a distinction between 'traditional procurement' (2004/18/EC) and 'special sectors' (2004/17/EC), the latter applies to clients in the water, energy, in transport and postal services sectors (utilities). This thesis is delineated by the special sectors, thereby making the 2004/17/EC of relevance for this study. Within the laws, public clients are free to chose from several options on some points, while they are required to follow standard procedures on others. The boundaries are considered those points that are obligatory. The laws and legislation contain two strict obligations for public clients in the special sectors. Since these criteria cannot be influenced by either the buyer or supplier side of the discussed market, the discussed market is required to take these obligations into consideration when dealing with procurement procedures. These are:

12. **Contracts must be awarded to the Most Economically Advantageous Tender unless the choice for lowest bid can be backed.**
13. **Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.**

**RESEARCH QUESTION 3: What requirements are crucial for establishing a beneficial Dutch Rail market, as a result of the technical nature of projects in the Dutch Rail market?**

In order to find an answer to the third research question, a single case study was conducted in the Dutch Railway sector. Rather than analyzing the non-recurring events of a single case, this thesis aims at understanding the influence of standardized processes to the benefits of public markets with one buyer and few sellers. Focussing on the Dutch Rail contractors market, there has to be an understanding of the technicalities and complexity of rail projects. Therefore, the chosen was a standardized project in the Dutch Rail contractors market. The researched track renewal project was subject to an alternative, experimental, approach of the process. The goal of this experiment was similar to the goal of this thesis: creating a situation in which track renewal projects are beneficial for both ProRail and the contractor. In this case, the project team thoroughly researched the standardized process of track renewal projects in order to identify sore points. A solution was sought after for these points of interest in order to establish a track renewal process in favour of both ProRail and the contractor. The main outcome of this single case study was the assumption that the Dutch rail contractors market would benefit from a situation in which contractors are free to chose their own working methods. Which became an addition to the list of requirements for establishing a beneficial public sector market:

14. **The contractor must be able to choose his own way of producing from the beginning till the end.**

**RESEARCH QUESTION 4: What criteria make public markets with one buyer and few sellers beneficial?**

In order to find an answer to this question, a multiple case study is conducted. Three cases studied to explore the presence and relevance of the proposed list of criteria. The cases are chosen based on their connection with the single case study. All three the cases are selected based on the fact that they are all standardized renewal processes in a public special sector in a market with one buyer and few sellers, subject to European procurement law. Data was required through interviews with professionals that acted on the client's side of the market. The three cases that complied with these requirements are:

- Track renewal process in the Dutch Rail contractors market
- High-voltage renewal process in the Dutch high-voltage contractors market
- Track renewal process in the Finnish Rail contractors market
From studying the interviews, it was concluded that several criteria from the proposed list were not eligible for the discussed market. Due to third party influence, the following 5 criteria are proven to be beyond the influence of either the buyer or supplier of the market, and are therefore considered not eligible for the final list of criteria.

- *There is unrestricted access to all information about the market.*
- *Sufficient time must elapse for resources to flow in the directions and quantities desired by their owners.*
- *There is free competition, without influencing third parties.*
- *Indefinitely large numbers of participants on both sides of the market.*
- *Capital is increasing.*

With these criteria deleted, the remainder of the list is cross-case examined to thoroughly understand the relevance of the remaining criteria in practice. A study of the conducted interviews showed that all criteria that were considered of importance so far, are in fact important for the well being of the studied markets. Thereby, the list can be finalized by enumerating all relevant criteria. By doing so, the last research question can be answered:

1. *No single player has the power to influence price.*
2. *The rivals must act independently, not collusively.*
3. *There are no barriers to enter the market.*
4. *All participants produce an identical or homogeneous product.*
5. *Methods of production are improving.*
6. *The forms of industrial establishments are changing.*
7. *Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.*
8. *Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.*
9. *The contractor must be able to choose his own way of producing from the beginning till the end.*

### 6.2 ANSWER TO THE MAIN RESEARCH QUESTION

This thesis starts with the formulation of a problem definition: In the Dutch Rail market both sides of the market potentially have large market power, causing a tense market. The research is designed to result in a list of criteria that embodies a perfect market, within the boundaries the Dutch Rail contractors market have to deal with. The first phase of this study focused on formulating a desired situation while considering limitations every step of the way. A long list of criteria resulted from this first phase, that consisted of both criteria that would contribute to reaching the desired situation and criteria that are obligatory for the Dutch Rail contractors market.

The objective of this study is to create a beneficial Dutch Rail contractors market for both the client’s and supplier’s side. The second part of this study resulted in a list of criteria that must be present in public markets with one buyer and few sellers in order to establish the desired situation. Criteria that are not present in those markets are considered the factors restraining the market from being beneficial. As the Dutch Rail contractors market is central in this study, the following question is central to this graduation thesis:

**MAIN RESEARCH QUESTION:** What factors are crucial for making the Dutch Rail contractors market beneficial for both the client and the contractor?

The Dutch Rail contractors market is hindered by 7 out of 9 criteria from the final list. These criteria are partially or not present in the current practices of the market. The absence of these criteria are seen as the
factors that lead to an imbalance in the market and are the result of either the nature of the combined monopsony-oligopoly market or policy from the main client in this market. As an answer to the main research question, the 7 criteria that are not present in the current Dutch Rail contractors market are presented as the factors that are crucial in making this market beneficial. The reason for their absence will shortly be discussed. Due to third party influence, the final list deviates from the initial list that embodied the desired situation without any restrictions. As shown in previous sections, these criteria cannot be present without the help of third parties and are therefore considered not eligible.

1. **No single player has the power to influence price.**

Considering the nature of the researched market form, the absence of this criterion might be somewhat predictable. However, it doesn't make it less important. With only one main client and few contractors, both sides of the market heavily depend on each other. It could be opted that in this type of situation it would be better to just divide the contracts amongst the contractors. But that is in conflict with the European guidelines and Dutch procurement laws that both stimulate competition in public markets. In current practice, the contractors are heavily competing for an as big as possible share of only one pie.

An option could for ProRail to explore the opportunities of working together with alternative markets in order to broaden the market for the rail contractors. In that way, both sides of the market become larger. Contractors from outside the Netherland could work here and Dutch contractors could work abroad. If this seems impossible, theory has shown that giving the contractors countervailing power while strictly supervising the contracts will be beneficial.

2. **There are no barriers to enter the market.**

From a seller's point of view, barriers are mainly set by the client in this market. In comparison to other researched markets, amongst high initial investments, obtaining a certificate for working on the tracks is very difficult. Another barrier that was observed during this study was ‘oversaturation of the market’. This however, is a result of the fact that there is only one main client, appointed by the government. Contractors are competing in tenders abroad, but not (yet) on a level that makes them independent from ProRail as their main source of income.

ProRail could consider lowering their requirements with regards to the certification system. In Finland this has proven to result in the entrance of new contractors.

3. **Methods of production are improving.**

This factor is partially present in the current Dutch Rail contractors market. However, the Dutch track renewal case study showed that no incentives are given for improving working methods. The improvements that are made are the result of the implementation of improvements made abroad.

ProRail could think of creating incentives for contractors. The Finnish case showed that the entrance of new contractors acted as a wakeup call for the contractors that were market leaders for a long time. The new competition acted as a challenge for the contractors to become more efficient.

4. **The forms of industrial establishments are changing.**

Over the last 5 years no new contractor entered the market. The reason for this is similar to the given explanation for the absence of criterion two. New contractors are hesitant to enter the market as a result of high barriers and the uncertainty regarding return on investment.

Also, for this factor, ProRail should explore ways to stimulate new contractors to enter the market. The first step would be to lower the barriers to enter the market.

5. **Contracts must be awarded by using a method where price is not dominant. Unless the choice for lowest bid can be backed.**

The criteria that are used by ProRail to award contracts consist of 4 elements. Price, Safety, CO2-awareness and Past Performance. Interviewees stated that both the Safety and CO2-awareness criterion is not distinctive, as a result of the related certification system. All contractors are on the same ‘level’ for these criteria, making that the contractors obtain the same fictive discount in the tender phase. Besides, the differences in the Past Performance criterion are considered minor. This leaves us with Price as a dominant factor.

The current quality criteria are outdated. As a public client, ProRail is obligated to award contracts based on qual-
A possible solution would be to set up a long list of awarding criteria, as shown in the TenneT case.

6. **Criteria for deciding which tender is the Most Economically Advantageous Tender must be relevant for the contract.**

The introduced awarding criteria are similar for all contracts. There is no differentiation in awarding criteria as a result of the nature of a project. The criteria are in line with ProRail’s policy rather than of importance for the single projects. The multiple case study showed that it is in fact possible to tailor the awarding criteria to the needs of a contract.

*This factor can be resolved together with the previous one. With the establishment of a long list of awarding criteria, the criteria can be tailored to the needs of a contract.*

7. **The contractor must be able to choose his own way of producing from the beginning till the end.**

All cases showed that the contractors are allowed to choose their own working methods, but they are committed to the pre-established time frames. In the Dutch Rail contractors market, these time frames are pre-established as a result of the power of the operators of the tracks. They demand from ProRail to schedule construction work outside their time tables. Thereby indirectly forcing the contractors to adapt their working methods to these time frames.

*By obtaining more power in relation to operators, ProRail should be able to establish time frames that are tailored to the working methods of the contractor that wins the tender. However, the standardized process should be adapted in a sense that the contract is awarded before the consultations about the time frames take place. Otherwise, the winning contractor cannot indicate his preferences.*

### 6.3 Further Discussion

The literature survey showed that utilizing monopsony power results in a less efficient market. Instead, the use of countervailing power is advised. When reflecting these statements to the multiple case study, it can be concluded that Liikenevirasto optimizes the countervailing power by applying different procurement strategies. Both the lowest-bid approach and the Most Economically Advantageous Tender approach contribute to the improvement of production methods and a change in industrial establishment. However, if countervailing power is given to the contractors, it is of importance to strictly supervise the contractor’s behaviour. Liikenevirasto does this by performing quality tests after completion of the works.

This mechanism is disrupted when countervailing power evolves in collusion on the oligopolistic side of the market, the contractors. Currently, no collusion is observed, neither is it allowed by law. Strict supervision of the contractor’s side of the market is advised, to prevent collusion from occurring.

However, a second observation needs attention. The change of industrial establishment is closely related to the available budget on the client’s side, and the barriers to enter the market. Budgets can’t be influenced by ProRail, but the way they handle the budget can. Two conclusions can be drawn from the multiple case study with regards to managing the financial resources. Firstly, the Liikenevirasto case showed that dividing the track renewal projects in contracts with different sizes results in a better distribution of the works amongst the contractors. Second, both in the TenneT and the ProRail case it is said that an equal distribution of the contracts over the year prevents the market from being oversaturated. When execution of works is concentrated in a short period of time, contractors that already won enough contracts submit tenders with a high price. At the same time, contractors that feel the urge to win the tender submit lower than normal bids. Early stages of this study showed that sub-normal profits of losses are not to be seen in perfect competition.

With regards to barriers for contractors to enter the market, the following conclusions can be made. The certification system is necessary to ensure a safe working environment. So, the certification system can’t be abolished. But it is possible to reach out a helping hand to contractors that are intending to obtain the needed certificates. By reducing the requirements for obtaining the certificates or by supporting contractors to get in partnerships with established contractors, contractors can gain important knowledge that is necessary to enter the market. Also, the financial risks for new entrants can be reduced by procuring contracts with a low value. This enables new contractors to enter the market.
A direct effect of new entrants to the market, as seen in the Liikenevirasto case is that new entrants cause improvement of working methods. New contractors must be innovative in their working methods to be cheaper than the large established contractors. If a new entrant achieves to gain a market share, the direct reaction from established contractors is to improve their working methods in order to regain their lost market share.

Innovation has shown to be closely related to establishing incentives. Both the TenneT and Liikenevirasto case showed that awarding contracts based on quality motivates contractors to suit their tender to the awarding criteria. When price is the most dominant awarding criterion, contractors don’t feel the urge to improve their working methods. Besides the fact that Dutch procurement law obliges ProRail to award contracts by using awarding criteria that are of relevance for the contract, the awarding criteria are a tool in obtaining the qualities the client is after. One of the observations from the single case study was that in the organization of ProRail it is considered very difficult to come up with new awarding criteria. Ensuring that safety is not compromised is a major concern. Especially when awarding criteria that focus on the total time span of the project are used. Besides, the challenge to meet the procurement law’s principles of equality, objectivity, transparency, proportionality, state reason and legitimate expectations, is seen as a major difficulty. The TenneT case showed that a pre-established list of criteria to create a concrete policy on this. The applied awarding criteria as observed at Liikenevirasto is on the fringes of what is accepted to be reasonable behaviour according to the European principles. The idea of designing awarding criteria for the specific features of contract is a good idea, but might be too time consuming in ProRail’s perspective.

Lastly, the single case study showed that ProRail is obligated to provide contractors with certain information as a result of the distribution of responsibilities in the UAV-gc 2005. In the experimental approach ProRail bends over backwards to accommodate the contractors with sufficient information. The Alliance agreement followed from these responsibilities. The Liikenevirasto case showed another approach, they use a traditional organization form. When translated to the Netherlands, this would mean that the contractual relationship between contractor and client is managed by the UAV-2012.

6.4 RECOMMENDATIONS FOR PRORAIL

The results from the conclusions and the further discussion are used to come up with recommendations for ProRail’s track renewal procedures.

- **Support new contractors in entering the market.**

  This can be reached by reducing the barriers to enter the market. The (financial) requirements that must be met for obtaining a certificate must be lowered. Also, contractors that successfully have acted as a sub-contractor must be able to obtain certification through a simplified procedure. Also, bringing contracts with low financial risks to the market makes the process of entering the market less difficult. This recommendation might lead to difficulties for the current contractors to keep afloat. Also, as laid down in chapter three, a reduction of contractors is not desirable. However, the Liikenevirasto case showed that it is beneficial to have a high number of small contractors instead of few large contractors. Large contractors may have to resign some of their employees, but new entrants need to find (these) professionals with extensive knowledge about the tracks to enter the market.

- **Equally divide the contracts throughout the year.**

  Concentrating the contracts in a rather short period have showed to be undesirable. Contractors that are not ensured of a contract tensely try to win a tender, while contractors that are ensured submit high bids. When contracts are divided amongst the year, it is more likely for all contractors to submit a competitive bid. In line with the thoughts of interviewee PR#5, it is recommended to establish an annual ‘procurement-agenda’. The information that can be found in this agenda must cover the projects that will be procured, and the estimated amount of work in terms of what activities must be carried out.

- **Establish a list of awarding criteria, focused on quality.**

  Different contracts face different risks. Since the track renewal projects are recurring projects, ProRail professionals that deal with these projects on a daily basis are aware of the main risks of these projects. It must be possible to establish a long-list of awarding criteria that cover these risks. From this list, the project team can choose awarding criteria that suit the characteristics of the project best.
The current awarding criteria, except for the past performance criterion, have lost their distinctive features over the years. It is thus important to review the long-list of criteria on a recurring basis, in order to prevent this from happening.

- **Involve contractors in an earlier stage of the process.**

  Contractors benefit from choosing their own working methods. Currently, contractors are bound by time frames and (incomplete) information provided by ProRail. The single case study showed that barriers as a result of law and legislation can be overcome by setting up an Alliance. By awarding the contract before the risk assessment are performed and before time frames are established, a contractor can influence the factors that are considered boundaries for his working methods.

- **Create incentives for the contractors**

  For third parties, it is very important to be able to use the tracks at the end of a time frame in which construction work is performed. ProRail aims at a Safe, Reliable, Punctual and Sustainable railway infrastructure. Incentives must therefore be related to the quality of the works and the completion of works in time, rather than awarding a faster completion of the works.

- **Involve all management layers in the process of implementing new processes.**

  Consistency is key in a fast and thorough implementation of the recommendations. Contractors will be hesitant in their cooperation if they see all different experimental approaches. Therefore, it is important that the complete organization of ProRail propagates the same new approach to the contractors.

### 6.5 PROPOSED VIEW

So far, this chapter dealt with the observed challenges and possible solutions for the implementation of the final list of criteria with regards to the cross case analysis. The ‘further discussion’ elaborated on the findings of the literature, single- and multiple case study that are of relevance for the Dutch Rail market. Combined, this led to recommendations for ProRail, as the main client in the Dutch Rail market. In order to incorporate these recommendations and the criteria of the final list in the standardized process of track renewal, a new standardized process is proposed. The proposed view is a result of combining the positive features of both the case studies of TenneT and Liikenevirasto and the single case study.

However, this proposed process doesn't deal with the recommendations related to ProRail’s policy. Therefore, the recommendations as laid down under Support new contractors in entering the market and Equally divide the contracts throughout the year must be taken into account when using the proposed process.

**Proposed procedure**

i. **The Notification**

   When the Life Cycle Management program notifies that parts of the infrastructure must be renewed, the Asset Management department of ProRail starts up the process by checking the notification. When this check shows that the notification was right, the next step in this first phase of the process is to define the definitive scope of the project. By using the extend databases that ProRail possesses, fictive numbers are established for the project’s scope and its surroundings. When the scope is defined and all necessary environmental research is done, the project and its related documents are handed over to the projects department.

   *Difference: ProRail’s Asset management department is responsible for defining the detailed scope.*

ii. **Proposed Project**

   The project and its related documents are used by a project team of the projects department to set up a contract. The project team examines the risk assessments in order to define potential risks in the project. When these risks are identified, a long-list of awarding criteria is consulted to choose the most suitable criteria for the contract. Next, the contract is drawn up and the contract is tendered by using the restricted procedure. An alliance agreement between ProRail and the contractor will be formed to deal with differences in the fictive numbers and the results of the risk assessments in a later stage of the project.

   For the tender procedure, the contractors are asked to prepare a tender bid based on fictive numbers. But more important, the contractor is obligated to hand in an action plan for the contract that shows how risks, the awarding criteria, are dealt with. The amount of awarding criteria and their relative weight in the calcu-
lation model depends on the specific features of the project. The action plans and the bids are evaluated by the project team, this results in the awarding of the contract to the Most Economically Advantageous Tender.

When the contract is awarded, the contractor is included in the consultation process with the operators to come up with a time frame in which the project must be carried out. Thereby, the contractor is enabled to influence the time frames, in order to establish a time frame that suits his working method best. Parallel to the consultation process, the contractor starts with performing risk assessments. Differences in the fictive numbers and the risk assessments are compensated by an alliance fund. It is crucial that ProRail examines the Risk Assessments very precisely, and that the agreements of the Alliance are respected.

When this process is completed, the project is handed over to another project team that supervises the execution of works.

Differences: Contracts are awarded earlier in the process; Contracts are awarded based on project specific qualities; Contractors can choose their own working methods as a result of their influence in both the risk assessments and the time frames.

iii. The Project
In the execution phase, the project is supervised by a construction manager of ProRail, or by an engineering agency that is assigned by ProRail. During the execution of works there will be no interference from ProRail's side. Except when situation occur in which the guidelines regarding safety are disregarded. After completion of the project, the quality of the works is examined by an inspection train. If the (self-established) time frames are met and the quality of the project is in compliance with the requirements of ProRail, the contractor must be awarded with a financial bonus. In case of time overruns, both for the total project and intermediate deliveries of the works, contractors must be fined.

Differences: Contractors are given incentives to deliver high quality and complete projects in time.

6.6 RECOMMENDATIONS FOR FURTHER RESEARCH

This research has led to new questions that cannot be answered in this thesis. The following recommendations are articulated for further research as a result of this thesis:

• This research studied only three case studies in the multiple case study. To get a broader view on this matter, more cases should be discussed.

• Research to the implementation of the missing factors in the Dutch Rail contractors market. How can these factors be translated in guidelines for the track renewal projects, or renewal projects as a whole.

• The influence of countervailing power in markets with one buyer and few sellers. The first criterion of the final list doesn't match the characteristics of the researched market. Further research can be done by exploring whether Countervailing power can be useful for these types of markets.

• The influence of third party power to public sector markets with one buyer and few sellers. Third parties were left out of this thesis’s demarcation. However, their presence resulted in the removal of several criteria from the list. Their presence can be seen as an obstruction to the market.
APPENDICES

A THE ORGANIZATION PRORAIL

The beginning

Dutch railway history starts with the opening of the railway track between Haarlem and Amsterdam on the 20th of September, 1839. From that moment on several routes were constructed by different private companies. This changed when in 1860 the parliament decided to construct ten new routes and used their force to take over the power in the world of the Dutch railways. Even though the exploitation and maintenance was done by several companies, state-owned as well as private companies, the deciding power rested with the government. World War I weakened the economic power of the Netherlands. The railway companies were losing money and feared bankruptcy. The government felt that the railway system was of great importance for the Dutch society and bankruptcy of the railway companies could not occur. Between 1917 and 1937 the state subsidized the private railway participants to compensate losses and remain active. When in 1938 the last two remaining private rail companies merged, the government bought all shares of this new company. This transaction made the Dutch railway industry a state owned business with the new formed company ‘Nederlandse Spoorwegen’ (NS) in a monopolistic position. The NS can be considered as a semi-public company, the company acted as a public company but all shares were in the hands of the government. This drastically changed during the 1990’s, when maintenance and exploitation were split into two separate branches. The split meant the start of a lot of difficulties regarding the railroads and its users. Focus will lie at maintenance, since exploitation is not included in this studies.

The split

At the end of the 1980’s the board of the NS felt the urge to split. Three aspects encouraged the board the restructure the organization;

1. The growth in the amount of train passengers which resulted in a necessary extension of the rail track network.
2. The search for more efficiency and effectivity.
3. The European Council implemented a new directive (91/440/EC) for the railway industry in which ‘direct state operation’ of railroads is prohibited. This directive came into effect in 1992.

The first two aspects were signs of a shortfall in capacity. This led to a reaction from the government in their capacity as owner of the Dutch Railways. They pledged to inject large sums of money to expand and improve the Dutch Railway Infrastructure. The government assigned the ‘commission Wijffels’ to explore the opportunities for approaching the challenge of the first two mentioned aspects. The commission was advised by consultants of McKinsey & Company. In their report ‘Onderhoud & Vernieuwing Samen’ McKinsey recommends independent business units, responsible for their own financial results. This advice was adapted by the commission and the government and lead to the split of the NS into organizations based on particular tasks.

The commission concluded that the NS’s core business consisted of four tasks; 1. Exploitation of passenger traffic 2. Exploitation of freight transport 3. Managing the capacity, and 4 Expand and maintain the railway infrastructure. The advice was to bring the freight transport to the market to create competition. The same advice was given for the exploitation of passenger traffic, be it after a transition period in which the government loosened the ties. The latter two tasks should continue to be supported by the government, since there is no profitable perspective for either one. However, the advice for managing the expansion and maintenance of the infrastructure was a bit more complicated. The construction activities should be outsourced by setting out contracts, funding will be provided by the government, complemented by a charge on exploitation after exploitation becomes profitable. Hence, exploitation of both passengers and freight should eventually become subject to market mechanisms (1&2), capacity management will continue to be funded by the government (3) and managing the infrastructure will be funded by the government as well given that executive duties are outsourced(4).

Splitting the NS and dividing tasks among several companies did not go in once. Firstly, a chronologically description of events will be given. Followed by an image that shows these occurrences.
1990
The first split came in 1990, when the engineering activities of the NS were decentralized to ‘NS ingenieurs bureau’ (NS engineering agency). Major effect of the decentralization was the opportunity for the NS to hire external engineering agencies, this was necessary in order to handle the extra work load that came with the planned extensions of the railways. Before 1990, all engineering activities were performed by departments of the NS. At the time, NS had separate departments for the expansion of the tracks and the maintenance of the tracks. These departments were merged and became NS infraservice, responsible for the expansion and maintenance of the rail infrastructure.

1994
1994 was the second big year in restructuring. The engineering agency that already was decentralized, became a privatized company called ‘Holland railconsult’ (now; Movares). From that moment on, all engineering tasks are contracted to private engineering companies. Also in 1994, NS infraservice was restructured. After the discharge of 600 employees, the division NS infraservice was split into a management division (NS RailinfraBeheer) and a construction division (NS infraservice).

1995
In 1995 the remained ‘NS’ is split into 4 companies, 3 separate companies became responsible for managing the tracks and 1 company for exploiting the tracks. Infrastructure management tasks were divided over three state-owned companies that used to be a division of the NS organization. The companies NS Railinfrabeheer, Railned and NS Verkeersleiding became responsible for respectively maintenance of the tracks, division of the exploitation rights and the train service (treinenloop). NS passengers became responsible for the exploitation. By doing so, the NS fulfilled its task of making a division between Infra-management and Exploitation of the tracks according to the previously discussed guideline 91/440/EC. Hence, maintenance and exploitation were separated.

1998
Next, in 1998 the construction company ‘NS infraservice’ that used to perform construction jobs dissolved. From that moment on, the construction jobs were distributed over three construction companies; Strukton (50% of total maintenance jobs) BAM NBM (20%) and Volker Stevin (30%). The split resulted in a competitive market for the execution of works for railway construction projects.

2003
Eventually in 2003 the three companies; NS Railinfrabeheer, Railned and NS Verkeersleiding merged, forming ‘ProRail’. ProRail became the responsible party for construction, maintenance, management and security. Where actual construction- and engineering work is outsourced.

2005
The Dutch government started with granting a 10-year concession to one party that will manage the Dutch railway infrastructure in 2005. ProRail became the concession holder for the period 2005-2015, the concession is renewed and granted to ProRail for another 10 years in February of 2015.

As of 2015, the relation between government, exploitation and maintenance is in accordance to the figure below.
As the asset owner, the government grants concession for both exploitation and managing the railway infrastructure. The exploitation market became accessible for other operators, with the incentive to create competition. The government separated the railway infrastructure into several sections and gives out a concessions for each separate section. Hence, multiple operators act as an ‘asset user’. The railway operator ‘Nederlandse Spoorwegen’ (NS/Dutch Railways), of which the state owns all the shares, became the main operator in the Netherlands. Over the years smaller and bigger operators entered the market and began to exploit small tracks in the hinterland, tracks that are considered unprofitable by the NS. As of 2014 there are 9 Dutch-based and 4 foreign-based operators using the Dutch tracks. Besides passenger transportation, there is a large amount of operators that exploit the tracks for transporting freight. ProRail is the licensed authority for the maintenance and expansion of the railway infrastructure, and will act as the asset manager. The actual execution of works and engineering tasks are outsourced. Since this research focuses on the Asset management side of the Railway industry, this chapter will continue with the relationship between ProRail and the Service Providers, as showed on the figure.

**The organization**

**Asset manager**

Nowadays ProRail describes their responsibilities as follows:

*ProRail is responsible for the Dutch rail network: construction, maintenance, management and security. As an independent party, we divide the space on the track, control all trains, build and manage stations and laying new tracks. Finally, we maintain existing tracks, switches, signals and crossings.*

Biggest side note for this description is the fact that ProRail acts as a manager and does not perform executional work. Executional work is performed by contractors, this is in line with the recommendations of the commission Wijffels. The organization structure will be discussed in the following paragraph.

**Organizational structure**

The organization ‘ProRail’ has a divisional structure as can be seen in figure. Professor Mintzberg, considered an authority in the field of organizational structures and organizational design, states that organizations that act in several different markets have the incentive to apply a divisional organization structure, with divisions for each different market (Mintzberg, 2006, p. 216). The top line shows the heads of departments, the five departments together carry out the tasks that come with the responsibilities of the Asset Owner as stated in previous paragraph. These responsibilities force ProRail to act in different markets.
PRINCIPLES

Current procurement laws in the Netherlands are the result of a implementation of European directives and national political discussions on public contracts. The current legislation for procurement is laid down in the ‘Aanbestedingswet 2012’ (=procurement law 2012). This law came into effect on the 1st of April 2013 and is applied for all tenders, above and below the European thresholds. Only contracting authorities are required to hold tendering processes. By ‘contracting authorities’ the Public Contracts Procurement Decree means:

‘The State, a provincial authority, a municipal authority, a water board, a body governed by public law or an association of these government bodies or bodies governed by public law.’ (Chao-Duivis, 2013, p. 137)

The general principle for contract law is equal treatment. This is reflected in the four principles that form the basis for the European procurement directives that should ensure a free and fair European market. These are: Equality, Objectivity, Transparency and Proportionality.

Equality The Equality or non-discrimination principle states that there can be no differentiation based on nationality.

Objectivity Everyone must be treated equally and everyone should get the same information. Besides, discriminating factors in a contract that gives more opportunities for one of the tendering parties are not allowed.

Transparency Criteria for the tender must be clearly displayed in advance and decision must be justified.

Proportionality Technical specifications, grounds for exclusion, suitability requirements, selection and award criteria must be relevant and proportionate to the nature and scope of the contract.

Commissioning parties are obligated to live up to these principles for every tender that is subject to European procurement laws (Europese Commissie, 2014). These principles must be lived up to regardless the procurement procedure.

PROCUREMENT LAW (ARW-2012)

For this thesis, the focus lies at special sector companies, where a work means:
The outcome of building or civil engineering works taken as a whole which is sufficient of itself to fulfil an economic or technical function (Chao-Duivis, 2013, p. 138).

The regulation especially for works is laid down in the ARW 2012 (= procurement law works 2012). As said, the ARW 2012 came into effect on the 1st of April 2013 and had some important changes in comparison to the previous ARW 2005. First important difference is the ‘EMVI-tenzij’ regulation, which states that for tender procedures the ‘Economically Most Advantageous Tender’ method is obligatory, exceptions can only be made when the contracting authority can clearly motivate their choice for lowest bid tendering. Second important condition is that the ARW-2012 must also be used for tenders under the European threshold (PIANOo, 2013).

Originally, works with an estimated value above the threshold must be put out for European tender. The threshold is revised annually, the current limit for works is € 5.186.000.

PROCEDURES

The law and regulations deal with how governmental bodies can access the market. There are 2 standard procedures that can be used at any time, the Open procedure and the Restricted procedure (PIANOo, 2013).

1. Open procedure
The procedure begins with an announcement via TenderNed of the work in the EU Official Journal. The procedure has one round in which all bidders (suppliers who register with an offer) directly may submit a
tender. Tenderers and tenders (bids) are evaluated at the same time. A bidder must meet the minimum requirements. There can be no grounds for exclusion criteria in the tender. The contract is awarded on the basis of lowest price or the most economically advantageous tender (MEAT). Negotiation is not allowed (PIANOo, 2013).

2. **Restricted procedure**
The procedure is similar to the open procedure with one difference. Awarding the contract occurs in two rounds. The procedure begins with an announcement on TenderNed of the work in the EU Official Journal. In the first round the most suitable (usually 5) contractors will be selected. In the second round, the selected contractors will get the opportunity to hand in a bid. There can be no grounds for exclusion criteria in the tender. The contract is awarded on the basis of lowest price or the most economically advantageous tender (MEAT). Negotiation is not allowed (PIANOo, 2013).

There are several exceptional procedures that can only be applied when a governmental body can underpin their argument to depart from the standard procedures. These exceptional procedures are: Competitive dialogue, Negotiated procedure with prior publication of a contract notice, Negotiated procedure without prior publication of a contract notice and Direct agreement procedure (Chao-Duivis, 2013, p. 139). From these exceptions, ProRail only applies the Negotiated procedures. Therefore the description of exceptional procedures will focus on the negotiated procedures.

3. **Negotiated procedures**
All interested parties (suppliers who request participation in the proceedings) must meet the minimum requirements. There may be no exclusion criteria applied to the procedure. Usually (but not necessarily), there will first be a selection process, in which at least the three most suitable candidates are selected (PIANOo, 2013).

The selected candidates are asked to submit a tender. Then there will be a negotiation round with tenderers about the submitted tenders. The works are fixed in advance, there can only be negotiations on the price and performance conditions. Those negotiations may be conducted in phases, during which tenderers can be dropped based on awarding criteria. It is not allowed to reduce the number of bidders to a level in which there is no effective competition anymore.

During the negotiations all tenderers are treated equally. It is not allowed to disclose information which may give some tenderers an advantage over other bidders.

**Selection Criteria**

Procedures with a pre-selection have the opportunity to choose the most suitable contractors in advance by applying selection criteria. Clients have to publish in advance and clearly communicate the criteria upon which is decided which contractors meet the minimum requirements for the client and are eligible to participate in the tender procedure. These types of criteria contain:

- Grounds for exclusion
- Minimal suitability requirements
- Selection criteria to allow only particular types of contractors

Then there is a second type of criteria for choosing a contractor which is related to awarding the contract, in relation to the MEAT method. Sub-criteria for the MEAT method can be chosen by the client, examples of these criteria are: Price, Execution of works, Project management, Delivery date or planning, Quality, Competencies, skills, Environmental Characteristics, Usage, Life Cycle, Total cost of ownership etc. (PIANOo, 2013).

So, there are three types of Selection criteria. The first criteria focusses on grounds for exclusion, secondly there are suitability criteria and eventually the contract is awarded to the most suitable contractor by means of applying criteria for the Most Economically Advantageous Tender procedure.
Het doel van dit interview is een vergelijking te trekken tussen ProRail, de Finse spoorinfrabeheerder en de Nederlandse beheerder van het hoogspanningsnetwerk (TenneT). De Finse spoorinfrabeheerder is vergelijkbaar met ProRail omdat er één beheerder is en meerdere onderhoudsaannemers. TenneT is vergelijkbaar met ProRail omdat zij evenals ProRail een besloten vennootschap is met als enige aandeelhouder de staat. Daarnaast vallen beide bedrijven onder de speciale sectoren van de Europese richtlijnen 2004/17/EG. De onderlinge verhoudingen tussen marktpartijen, de relatie opdrachtgever-opdrachtnemer en de verhouding price-output staan centraal in dit interview.

Kengetallen.
1. Hoeveel tendermanagers zijn er werkzaam binnen uw organisatie?
   ………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………….
2. Hoeveel contracten worden er jaarlijks via procurement afgesloten?
   ………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………….
3. Wat is de jaarlijkse inkoopomzet voor de onderhouds- en vernieuwingsmarkt?
   ………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………….
4. Kan een aannemer volgens eigen planning onderhouds- en vernieuwingswerkzaamheden uitvoeren?
o Ja
o Nee
   Toelichting:
   ………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………….

Prestaties
5. Hoe presteren aannemers in de onderhouds- en vernieuwingsmarkt?
   Geen prestatie ………………………………………………………………………………………………….
   Best mogelijke prestatie ………………………………………………………………………………………
   Toelichting:
   ………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………….
6. Wat wordt er gedaan om de prestaties van aannemers te verhogen?
   ………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………….
7. Hoe ervaart u de samenwerking opdrachtgever – opdrachtnemer?
   Vijandig ……………………………………………………………………………………………………………
   Samenwerkend …………………………………………………………………………………………………
   Toelichting:
   ………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………….

Marktwerking
8. Wat is de governance van uw organisatie? (bijv. bv./concessie via overheid/waar ligt de verantwoordingsplicht?)
   ………………………………………………………………………………………………………………………….
   ………………………………………………………………………………………………………………………….
9. Is de infrabeheerder enig opdrachtgever in de sector?
o Ja
o Nee
   Toelichting:
10. Hoeveel aannemers zijn er werkzaam in de onderhouds- en vernieuwingsmarkt?

11. Dienen aannemers te voldoen aan minimumeisen om de specifieke werkzaamheden uit te mogen voeren?

12. Zijn de aannemers ook werkzaam in andere sectoren/landen?

13. Zijn er veel toetreders tot de onderhouds- en vernieuwingsmarkt?

14. Wat zijn volgens u mogelijke barrières voor het toetreden van de markt?

15. Hoe is de wederzijdse afhankelijkheid tussen de infrabeheerder en de aannemers?
   Onafhankelijk -------------------------------- Zeer afhankelijk

16. Is in het inkoopproces prijs of kwaliteit dominant wat betreft de gunning?

17. Werken uw aanbestedingen welzijn verlagend of welzijn verhogend? Licht toe.
   o Welzijn verlagend
   o Welzijn verhogend

Toelichting:

18. Is uw organisatie innovatief in toegepaste methoden op het inkoopproces? Op welke wijze?
   Niet innovatief -------------------------------- Zeer innovatief

19. Wat is het effect van uw inkoopproces?
   o Aannemers concurren hevig voor een opdracht
   o De markt is redelijk verdeeld


21. Zijn de onderhouds- en vernieuwingscontracten geïntegreerd of staan deze los van elkaar?

22. Welke organisatievormen in contracten worden er toegepast?
   o Gefinancierde geïntegreerde contracten
   o Geïntegreerde aannemerscontracten
   o Traditionele contracten
   o Geïntegreerde engineerscontracten
   o Management contracten

23. Wat is de tijdsduur van de onderhoudscontracten?
### Innovaties

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<thead>
<tr>
<th>Vraag</th>
<th>Opties</th>
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<tr>
<td>24. Welke contractvormen worden toegepast?</td>
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<tr>
<td>25. Wordt de markt aangemoedigd om te komen met innovatieve ideeën?</td>
<td>Geen aanmoediging  Actieve aanmoediging</td>
</tr>
<tr>
<td></td>
<td>Toelichting:</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Wat is de kwaliteit van de ingediende innovatieve ideeën?</td>
<td>Zeer laag  Zeer hoog</td>
</tr>
<tr>
<td></td>
<td>Toelichting:</td>
</tr>
<tr>
<td>27. Hoeveel innovatieve ideeën zijn ingediend en hoeveel zijn ervan</td>
<td></td>
</tr>
<tr>
<td>toegepast in de onderhouds- en vernieuwingsmarkt?</td>
<td></td>
</tr>
<tr>
<td>28. Hoe kan de markt werken</td>
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</tbody>
</table>
SINGLE CASE STUDY

CONTEXT

BBV is short for ‘Boven Bouw Vernieuwing’ (Track renewal). ‘Bovenbouw’ are the parts of the tracks lying on the subgrade; Railroad ties, Track ballast, Rails and the Railroad switches. The works are characterized by their relative low level of difficulty and iterative character. The red box in the figure below represents the area of activity during a track renewal project. The figure below shows the subject matter.

PROCEDURE

ProRail uses financial support from the government to maintain, renew and expand the Dutch railway infrastructure. In order to get access to the requisite funds, ProRail is obligated to show the government (as supplier of the funds) the importance of the project for which the subsidies will be used. Normally ProRail applies for funds on a yearly basis, money is transferred from the government to ProRail on a yearly basis as well. For example; the application procedure for subsidies for a project that will be executed in 2015 starts in 2014, aiming at an authorization for these subsidies at the end of 2014. However, preliminary work starts 2 years in advance of the project, regardless of this subsidies procedure. So for works that will be executed in 2015, preparations start in 2013.

To get a better insight in this complex project procedure, a division into 4 phases is made as a basis for a clear explanation of the procedure of a typical BBV project; 1. The notification 2. The initiative 3. The preparation 4. The execution of works. This section will be written around these four phases. In order to keep grip on the duration of the process, every phase will be labeled with duration in terms of months. The interests and positions of each stakeholder that is discussed during the explanation can be found in section ...

In order to relate these phases to the standard procurement process, as described by Mr. van der Horst, in his book ‘Aanbesteden doe je zo’ (2010). This method distinguishes 8 steps that lead to the procurement of a good. This process is shown in figure .. and will be used to paint a picture of which step in the process is described, for the description of the standard procurement method for track renewal projects.

1. The notification (year N)
The start of a typical BBV-project is a notification from SAP PLM (life-cycle management software). This software contains all data about the railway network in the Netherlands. It sends a signal to the user (Pro-Rails division Asset-Management) when the track needs to be renewed, mostly due to the expiring date of the economical or technical life spans of the (parts of the) track. This information is complemented with the data from measuring and inspection trains that are pre-emptive controlling the infrastructure.

2. Establishing the project (year N+1)

After the notification made by SAP PLM, AM sends out a contractor to examine the state of the tracks that are eligible for renewal. Based on the outcomes of these tests, a loosely defined scope is formed by Asset Management. Resulting in a ‘proposed project’. This proposed project is then transmitted to the department ‘Projecten’ (Projects). When this project is transmitted to projecten depends on the region of the scope. For North-East, the region that will later be discussed, the proposed project is transmitted in month 5 or 6 of year N+1. Projecten on its turn is responsible for the preparation phase, which starts in year N+1 month 9.

3. Preparation phase (year N+2)

When the general outline of the scope is defined, the assignment is handed over to Projecten. Projecten starts in month 9 of year N+1 with assigning an engineering agency. The contract will be brought to the market in the 6th month of year N+2, resulting in awarding the contract in month 10 of year N+2. Hence, there are 13 months reserved for the preparation of the tender and the tender itself. During the period of time as discussed above, the department of projecten has the task to prepare a contract that eventually will lead to assigning a contractor for the job. A core team of ProRail employees is assigned to guide the process of “getting the contract on the market”. The core team is built around 4 different fields of expertise; Technical (the Rail Systems Engineer, RSE), Juridical (the Tender Managers), Financial (Cost Engineer) and Managerial (Project Manager). To get a clear view of this complex job, its stakeholders and different stakes, a distinction is made between technical, juridical and scheduling tasks, as listed below. Which then will be discussed separately:

i. Finalizing the scope
ii. Define time-slots
iii. Prepare a contract

i. Finalizing the scope

The scope given by AM is not at the detailed level that is required to set out the contract for a tender. The contractors that will tender need a more detailed scope as a basis for their subscription. To reach this level of detail, the rough scope is zoomed into by professionals from different fields of expertise. To get a clear view of the project, three types of information are of importance; 1. What is the actual Scope 2. What are the factors and risks potentially influencing the scope and 3. What are the juridical restrictions for the project.

The RSE is responsible for gathering all the required information for these three aspects. For defining the actual scope (1), the RSE contracts an Engineering Agency (EA). The EA is provided with the information from AM. The EA’s task is to compare the architectural plans with the actual situation on the site. These measurements are the basis for the definitive scope.

In order to come up with all the factors that can influence the scope and juridical restrictions concerning the area in which construction work takes place(2 & 3), ProRails department ‘Leefomgeving, Juridische zaken en Vastgoed’ (LJV; Environment, Legal Affairs and Real Estate) performs a desk study in Railmaps. This results in a report containing the available knowledge about the history and known obstacles of the construction area, Flora and Fauna, possible explosives and the Legal restrictions regarding the area of the scope. Parallel to this research an external Engineering company is hired to perform field research. Their task is to write a report on the current situation of scope and its environment. The procedure is to examine the information that was extracted from SAP PLM (step 1), perform further research to aspects that came up as critical during LJV’s research and execute certain standard procedures which are performed to define the conditions of the environment (step 2). Below, all research that has to be done and the actor performing the research is listed.
Table 3 Risk Assessments

<table>
<thead>
<tr>
<th>Research</th>
<th>Environment, Legal Affairs and Real Estate</th>
<th>Engineering Agency</th>
<th>Type of information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitive scope</td>
<td>X</td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>Preliminary Design</td>
<td>X</td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>Soil pollution</td>
<td>X</td>
<td></td>
<td>Influencing Scope</td>
</tr>
<tr>
<td>Explosives in grounds</td>
<td>X Cables and pipes(ProRail+Others)</td>
<td>X</td>
<td>Influencing Scope</td>
</tr>
<tr>
<td>Cables and pipes</td>
<td>X(Wion)</td>
<td>(X)</td>
<td>Influencing Scope/Scope</td>
</tr>
<tr>
<td>Land appropriation</td>
<td>X</td>
<td></td>
<td>Juridical</td>
</tr>
<tr>
<td>Flora and Fauna</td>
<td>X</td>
<td>X</td>
<td>Scope/Juridical</td>
</tr>
<tr>
<td>Obstacles</td>
<td>X</td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>Ballast gradation</td>
<td>X</td>
<td></td>
<td>Influencing Scope</td>
</tr>
<tr>
<td>Road blocks</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated cost of the tasks</td>
<td>X</td>
<td></td>
<td>Suitability estimated budget</td>
</tr>
<tr>
<td>Permits</td>
<td>X</td>
<td></td>
<td>Scope/Juridical</td>
</tr>
<tr>
<td>Asbestose research</td>
<td>X</td>
<td></td>
<td>Influencing Scope</td>
</tr>
</tbody>
</table>

As said, a Rail Systems Engineer (RSE) from ProRail manages the contract by setting out the job, gathering all necessary information and check the (liability) of the results. The list of tasks that has to be done to complete the construction comes from an external engineering company. They are assigned to define the tasks that comes with the scope, and bring the scope to a higher level of detail.

ii. Define time-slots

Time management plays an important role in BBV. Asset users (the exploiting parties) have the right to make use of the railway infrastructure in exchange for a user fee. However, during executional works, there can be no rail traffic on the tracks that are subject to the construction works. In order to secure the safety of the workers, one or more sections of the infrastructure are taken out of order in this period. The framework for this train free period consist of two aspects; time-slots (‘when’ are no trains passing over the tracks) and a design that shows which tracks are taken out of order during these time-slots.

The discussion of which section can be taken out of order at what time is held by an RSE, a long-term analyst (ProRail) and the exploiting parties. Firstly, the RSE estimates the necessary time for the construction activities of the scope and roughly defines the section of tracks that has to be taken out of order during executional work. This information is the input for a discussion between the long term analyst and the exploiting parties, to find a or several timeslot(s) in which executional work can take place. This discussion results in a FOT-drawing (a detailed design of the sections that are taken out of order) and time-slots available for executional work. The RSE checks the FOT-drawing and the time-constraints that the long-term analyst delivers. When it satisfies the requirements, the RSE gives his/her approval for using this design as the input for the so-called ‘TVP-framework’ (framework for the Train Free Period). This framework is given along with the contract, so a contractor knows at what time he can execute works and the amount of available time he gets to complete the project. The necessity of this information lies in the fact that a contractor needs this information for choosing working methods and setting a price.

iii. Preparing the contract

With the scope finalized, the contract can be set up. ProRail’s Tender manager has a coordinating job in this phase. The tender manager combines four documents; a. Standard (ProRail) contract documents b. The scope c. The ‘TVP-framework’ (Train Free Period) d. Annexes

- The standard contract documents are written by a contract specialist from ProRail, the project specific information is filled in by the Tender manager.
- The scope is managed by the RSE (see finalizing the scope)
c. The RSE estimates the required time and space that is necessary to complete the job. After negotiations with other ProRail departments and exploiting parties are concluded, there will be a document that contains the time-slots (the TVP-framework) in which the contractor can carry out construction work and it shows the building-plot.

d. Annexes contain the research reports as discussed in finalizing the scope.

Parallel to these activities, the cost engineer commissions an engineering agency to estimate the costs involved in the project. Based on an extensive costs database, the cost engineer evaluates the estimation. This is done in order to have an idea on what to expect from the tenders.

Next, the contract is published on TenderNed in month 6 of year N+2. Over a period of about 2 months, contractors can prepare a bid. When the bids are placed, the cost engineer evaluates the bids. When a bid is unlikely to be reliable, the cost engineer requests the contractor to give a clarification of the bid. After this procedure, the bids are compared by the tender manager. According to the MEAT criteria, one bid will be declared as the winning bid in month 10 of year N+2. The chosen contractor gets the right to execute the contract in year N+3. Further elaboration on the tender procedure can be found in paragraph ..

4. The execution of works (year N+3)

ProRail’s involvement during the execution of works is less extensive in comparison to the preparation phase. Especially for track renewal projects, where the timeslots are usually in the range of a weekend, a night or a mid-week, and where there is no construction shed. A construction manager and a construction administrator from ProRail are the primary contacts for the project’s leader of the contractor. When there are no flaws in the process there is a monthly meeting, but the construction manager and administrator are not on the building site. The supervision on site comes from a construction supervisor, usually an employee of the same engineering agency responsible for the risk assessments from the preparation phase. In case of emergencies, the construction manager holds the mandate to decide how to handle with problems up to pre-set financial limits. Problems solutions above the limit need to be discussed with ProRail’s project manager. Also, the RSE needs to available for technical discussions as a backup.

Tender Phase

Accreditation

To be eligible for performing track maintenance on the Dutch railway infrastructure, a contractor must possess certain certificates and needs to be licensed by ProRail. This also counts for the subject matter: track renewal. These obligatory certificates are:

<table>
<thead>
<tr>
<th>Flaan &amp; bedrijf</th>
<th>Verificatieplaats: lokier, locatie</th>
<th>Internaals</th>
<th>TenderNed</th>
<th>Internatnl</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAL Rail BV</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Brede, briefly: R. Witte, NL 8909.16.3392.60</td>
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<tr>
<td>Dura Vermeer Railinfra BV</td>
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<td>X</td>
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<td>Intocht Traffic &amp; Infra BV</td>
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<td>Rail Partner Holland BV</td>
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<td>Wilhelpy, briefly: R. Witte, NL 8409.30.3167.05</td>
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<td>Splitke Spoordouw BV</td>
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<td>Utrecht, briefly: R. Witte, NL 8509.63.6252.00.01</td>
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<td>SPL Poortorinos Benelux BV</td>
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<td>Herentals, briefly: R. Witte, NL 8511.77.9800.00.05</td>
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<tr>
<td>Strickland Rail BV</td>
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<td>X</td>
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<td>Stiwelstey Bragelishaft m.b.H.</td>
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<tr>
<td>Zweigniederlassung München</td>
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<td>X</td>
</tr>
<tr>
<td>Münchne, briefly: R. Witte, DK 1094.79.6644</td>
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<td>Steekey Railway Benelux BV</td>
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<td>Oostmalle, briefly: R. Witte, NL 8225.31.3891.01</td>
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<tr>
<td>Volleirail Nederland BV</td>
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<td>De Wilde NL BV</td>
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<td>X</td>
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<tr>
<td>Maastricht, briefly: R. Witte, NL 8809.73.3822.01</td>
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<tr>
<td>Van Gelder Rail BV</td>
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<tr>
<td>Houten, briefly: R. Witte, NL 8827.47.84.13.00</td>
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</tbody>
</table>
1. **VCA: general safety**

VCA (SCC in English) stands for Safety Checklist Contractors and is a common certification program for contractors who do dangerous work, or work in risk full areas. Companies receive this certificate when their employees can prove that they possess sufficient knowledge of safety, health and environment.

2. **BTR: special for rail**

Track work comes along with very specific risks, especially collision- and electrocution risks. In addition to the VCA, ProRail and NS Stations developed a certificate to cover these risks, called BTR (Sector-Oriented Specifications for the Rail Infrastructure).

Companies that are working by the order of ProRail, within risk area (on or near the risk areas/tracks), need to be both VCA and BTR are certified. The most recent list of contractors that possess both certificates is shown below. The highlighted area shows the contractors that are eligible for track renewal projects. With the exception of Rail Partner Holland and De Wilde NL bv. (they are licensed to perform parts of track renewal projects, not a complete project) there are six companies holding the necessary certificates for subscribing in track renewal projects.

**Awarding the contract**

Awarding a contract is done on the basis of the so-called MEAT method (Most Economically Advantageous Tender). From the six possible options of applying MEAT, ProRail has chosen to use the option of awarding contracts based on value. Basically the way this works is that the ProRail gives ‘fictive discounts’ for predetermined criteria. These discounts are deducted from the tender price, resulting in a ‘fictive tender price’. Eventually the contract is awarded to the lowest fictive tender price. By doing so, the value of quality is used in terms of money.

ProRail applies three criteria in the MEAT method, being: 1. (Past) Performance 2. Safety and 3. CO2-emmision. Where (past) performance can influence the bid-price either in a positive or negative way, the latter two can only have a positive influence. To predetermined the amount of discount- and inflation of the tender price, a tool is set up for the individual criteria. The tools show how these criteria influence the tender price in terms of percentages of the tender bid. These tools are: 1. Performance rating (Prestatiemeting), 2. The Safety ladder (Veiligheidsbewust korting) and 3. The CO2-ladder (CO2 bewust korting). In order to understand the credit method, the calculation method will be discussed followed by the individual tools.

**Calculation method**

As said, the tender bid is modified by applying fictive discount rates. The discounts is calculated as a percentage of the tender bid. The tender bid minus the discounts leads to an evaluated price, the lowest evaluated bid wins the tender and is awarded with the contract. The standard ProRail format for the evaluation price is shown below.

| Tender bid (Inschrijfsom) | €................. |
| CO2 –awareness discount (CO2-bewustkorting) | €.................- |
| Safety awareness discount (Veiligheidsbewustkorting) | €.................- |
| Correction Past Performance (Correctie prestatiemeting) | €.................+/-. |

Evaluated Price (Evaluatieprijs) : €.................

The exact discount rates and content of the different criteria are discussed in the following paragraphs.

**Performance rating**

The performance rating is based on the past 5 quarters. Based on interviews with project/construction managers from ProRail, involved in projects with a particular contractor, an audit commission rates a contractor based on a score card. For each of the five quarters a contractor gets an overall score from 1 to 10. These scores are then combined, the youngest quarter counts for 100% and the oldest for 20%. Now, for every tenth of a point that a contractor is above a 7, he earns 1% fictive discount on the price. This can also be the other way around, when a contractor earns an average of less than 7 points, there will be no discount but an addition for the fictive price.

**CO2 ladder**

This ladder is developed by ProRail with the ambition to reduce CO2-emmissions that come from executional works related to ProRail. Patrick Buck, department-director of projects at ProRail said:

“ProRail has developed the CO2 Performance Ladder because we want to motivate contractors in their
ambition. The ladder does not dictate, but challenges and rewards. Thus, the ladder stimulates innovation. We note that this approach is appreciated by the business community.’ The ladder exist of 5 steps, the higher on the ladder, the higher the discount. The table below shows the steps and the fictive discount, related to the step.

<table>
<thead>
<tr>
<th>Step</th>
<th>CO2-level</th>
<th>Discount rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The company is aware which types of energy they use.</td>
<td>1%</td>
</tr>
<tr>
<td>2.</td>
<td>The company knows how much each type of energy is used. Differentiated over the various activities of the company.</td>
<td>2%</td>
</tr>
<tr>
<td>3.</td>
<td>The company has a CO2 administration, with no possible discussion about the quantities and the calculation method. The company understands where the main targets for the reduction lie.</td>
<td>4%</td>
</tr>
<tr>
<td>4.</td>
<td>The company has in addition to scope 1 and 2, determined what the relative size of scope 31 emissions are. The Management is aware of the impact of the company's various chains, for the up and downstream in which it is acting. Based on this knowledge, the company identifies promising potential energy- and CO2 reduction measures in the chains, and potential supply chain partners to address them.</td>
<td>7%</td>
</tr>
<tr>
<td>5.</td>
<td>The company broadens and deepens his understanding of scope 3, and in the way the company can reduce emissions in scope 31</td>
<td>10%</td>
</tr>
</tbody>
</table>

The companies are reviewed and classified in a category by an external control body that is called ‘SKAO’. Safety ladder

On the 1st of February, 2013, the safety ladder came into effect. ProRail’s incentive for introducing a safety ladder came from the idea that safety has high priority in ProRail's policies regarding their own employees. On the other hand, external workforces are hired to perform work by orders of ProRail. The safety of the contractors employees is the responsibility of the managing-director of the contractor. Hence, ProRail is not in the position to directly influence the safety of their contractors. In order to get a grip on the safety-level on site, the safety ladder has been introduced as a procurement tool. The safety ladder is applied similar to the CO2 ladder. There are five steps/categories on which the fictive discount is based. These five steps are based on Parker’s framework in his paper “A framework for understanding the development of organizational safety culture” (Parker, 2006). In this paper five levels are defined to describe the safety culture of a company. The higher in rank, the higher the discount rate. These levels are copied for the safety ladder and are as can been seen in the table below.

<table>
<thead>
<tr>
<th>Level</th>
<th>Safety level</th>
<th>Statement</th>
<th>Discount rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pathological</td>
<td>‘We don’t care as long as we don’t get caught.’</td>
<td>0%</td>
</tr>
<tr>
<td>2.</td>
<td>Reactive</td>
<td>‘Safety is important, and we undertake a lot of action when safety-related issues occur’.</td>
<td>2%</td>
</tr>
<tr>
<td>3.</td>
<td>Calculative</td>
<td>‘We have the system in place’.</td>
<td>5%</td>
</tr>
<tr>
<td>4.</td>
<td>Proactive</td>
<td>‘We are working on the problems that still arise’.</td>
<td>8%</td>
</tr>
<tr>
<td>5.</td>
<td>Generative</td>
<td>‘The issue of safety is at the center of our operational management and is fully integrated in our organization’.</td>
<td>10%</td>
</tr>
</tbody>
</table>

There are six audit-companies appointed to perform the reviews and classify the contractors in one of the five levels. These are:
Incentive

BBV projects, executed over the past years, have been a main source of cost-overruns at ProRail. These cost-overruns usually come from a change in scope or time or a combination of these factors. ‘Change’ in this perspective means that the contractor is asked to execute work contrary to what was written down in the original contract. When there is a recognizable change in scope that possibly leads to a cost- or time-overrun, the contractor can make use of a procedure that is called ‘Verzoek Tot Wijziging/VTW’ (Request for Modification of the contract). In this VTW the contractor indicates how he thinks there is a difference in the current situation in comparison to the initial contract. ProRail and the contractors discuss the contractors view in a VTW-meeting. This meeting aims at coming to an agreement for the VTW, resulting in an adoption in the contract for the budget- and/or time constraints.

Even though cost- and time overruns in general are unwanted, requests for modification can also be cost- and time effective. But, VTW’s are also undesirable because of their time-consuming nature. VTW-meetings are meeting where conflicting interests are discussed, the contractor usually asks for more while ProRail’s delegation is trying to avoid overruns. A thorough preparation from the concerned departments (RSE, Cost Engineer, AKI, Project management etc.) is required to convince the contractor of ProRail’s viewpoint. This asks a lot of the capacity from the individual departments, resulting in a shortage of manpower for other projects.

Origin for the Experiment

Generally, the thought is that one of the main reasons for the large number of VTW’s lies in the fact that;

‘ProRail performs risks assessments for a project and decides how to manage these risks, while in the preparation phase of a project, but the contractor is responsible for managing them during the execution phase’

This means that ProRail takes the responsibility to map the geotechnical and juridical situation of the building plot (see page ..). Besides, ProRail designs a TVP-framework, thereby setting time-constraints for the execution of works. This information is leading in the tender. Hence, contractors use these reports for setting a price for their bid. Here lies the origin of the problem, ProRail decides what information is necessary to prepare a bid and to prepare for the execution of works, while a contractor is eventually executing the works and has to deal with the external factors influencing the execution of works. A discrepancy in the provided information and the actual situation during the executional phase (N+3) is one of the main factors influencing the amount of VTW’s.

When it turns out that the information provided by ProRail prior to the execution of works is not compliant with the actual situation on the building plot, contractors will argue that they want a compensation for the difference. The reasoning behind the claim for compensation is the fact that calculations based on the risk assessments are no longer valid. The difference in the situation then and now is makes that their promises in terms of time and money are no longer viable. In order to obtain the difference in the calculations for the tender phase and the current situation, the contractor hands in a VTW. As said, VTW’s have negative consequences in terms of shortage in working capacity and cost and/or time-overruns, or positive when the VTW is cost- and/or time effective.

Aim of the Experiment

The discussed problems are causing a shortage in working capacity at the different departments at ProRail. Which leads to the goal for this experiment;

‘Reducing the amount of VTW’s arising from the uneven distribution of duties, powers and responsibilities.’

Besides the goal of this experiment, other favorable circumstances can be achieved. These are;

• Reducing the Tender managers effort
• Reducing the RSE's effort
• The number of tenders is reduced from 2 to 1
• The contractor will get more grip on the safety
• Instead of executing works in Q3 and Q4, construction can take place in all 4 quarters
• The contractors can make use of his creativity in choosing working methods

Understanding VTW's

As said, VTW's are a source of discussion between ProRail and their contractors. Besides influencing the time- and cost management of a project, the relationship between ProRail and their contractors is put to the test over and over again. ProRail faces 11,000 VTW’s a year of which the processing time differs from minutes to sometimes even up to a year. Calculations based on surveys conducted from Rail System Engineers, showed that the equivalent of the complete department's capacity was necessary to handle all VTW's per year. This, of course is not actually the case, but it shows the employees aversion to VTW's. An analysis should give a better understanding of the origin of the VTW's and if the general idea of the redundancy of VTW's is justified. This analysis focused on around the 100 VTW's that arose during 3 track renewal projects. A categorization of the VTW's is shown in the figure below.

In order to get an understanding of what these VTW's include, a short explanation of the categories will follow.

**Extra AM**
Asset Management demands extra construction in addition to the contract. A contractor can't foresee this in the tender phase and therefore are entitled to demand compensation.

**Design mistake in contract**
The requirement specification has problems that were discovered after the tender.

**Adjustment of legislation**
During the period between the signing of the contract and the completion of the project, legislation changes and force contractors to adjust their working method.

**Indexing**
Due to inflation or an unexpected change in price for used materials, in between the Tender Phase and the Execution phase, a indexation is applied. (Factors eligible for indexing are named on forehand in the process documents that come along with the contract)

**Free riding costs**
ProRail aims at performing the maximum amount of work in a TVP. When there is the possibility to perform works within the scope of the TVP after the contract is awarded, without entering the building plot of the track renewal project. This is considered a change, influencing the working method of a contractor etc. The additional costs that come with a free-rider are compensated.

**Scope mutation**
During the period between the signing of the contract and the completion of the project, the scope of the
project changes. A contractor can’t foresee this in the tender phase and therefore are entitled to demand compensation.

*Mistake contractor*
A contractor’s mistake during execution has to be discussed.

*Cables and pipes*
When the risk assessment that should uncover all unknown Cables and Pipes is not complete, and a contractor comes across unknown Cables and/or Pipes. These cables and pipes need to be transferred into a tube or to a lower level in the ground, causing extra work.

*TVP-Framework*
The TVP-framework is not in line with the actual necessary time.

*Difference in documents and real life situation*
This is the same as for Cables and Pipes, the risk assessments are not sufficient and therefore influencing the executional works.

*Difference track ballast*
This is the same as for Cables and Pipes, the risk assessments are not sufficient and therefore influencing the executional works.

*Recycling*
Materials that should be renewed are still in good shape and can be re-used.

*Solution space*
The VTW analysis is the starting point of finding a possible solution for reducing VTW’s. Since this experiment starts in the preparation phase (N+1/2), the decision making power with regards to VTW’s that can possibly be reduced should lie in this phase. Besides, the decision making power for these categories should be of the core project team. These VTW’s are eligible for change, in order to contribute to the experiment’s goal. Prerequisite for these VTW’s is that they can be influenced in the preparation phase (N+2) by the core team. Hence, these employees are all part of the department ‘Projecten’(pppp) This led to dividing the analysis into a part that can be influenced and a part that can’t be influenced by the project team, as shown below. The categories that are eligible for change are: Difference track ballast, Difference in documents and real life situation, FOT(Functionele Ontrekkings Tijd) and Cables and pipes.

The figure shows the VTW’s that can possibly be diminished by changing protocols in the preparation phase in dark red. This could lead to a decrease of 49% of the VTW’s, shown in the dark red. The possible VTW’s that can be diminished all have one thing in common: the subjects are controlled by ProRail in the preparation phase, but are influencing the contracting party during the executional phase. In a less abstract manner: ProRail provides the contractors with information in the preparation phase (N+1/2), to paint a picture of the situation that the contractor will find when performing the executional works. This information is then used by contractors to prepare a bid. When this information is not accurate, the contractor will request for an amendment.

Here lies the crux of the problem, the influence of the surroundings and available period of time are crucial
factors for the execution of works. Differences in the actual situation in comparison to the situation that was presented in the preparation phase lead to changes in working method, necessary time, scope etc. As said, these difference are the reason behind VTW's. In order to solve this problem, the experiment puts forward a new risk allocation. Where risks are situated at the stakeholder that is able to manage them, instead of managing each other’s risks. In short, the underlying thought of this experiment is to ‘shift the risks that are the responsibility of the client, but are manageable by the contractor, to the contractor. And the other way around’

EXPERIMENTAL APPROACH

As part of a ‘lean management’ program that aimed at finding a solution to reduce the amount of VTW’s (Requests for Modification of the contract), two Rail Systems Engineers got the opportunity to apply an experimental method to a Track Renewal project. The starting point of the experiment, is the preparation phase. With the side note that the initial scope, given by AM in phase N+1 was given early, in month 3 of N+1 instead of month 5/6 of N+1 , thus having an advantage of 2/3 months. The scope of the project is a combined set of 5 smaller project with a total length of around 25 km. that will be subject to track renewal, shown in the figure below.

In the following paragraphs, a further elaboration on how risks in this project will be shared between the contractor and the client (ProRail)

Experimental working method

For the discussed goal of shifting risks to stakeholders that are best in managing the particular risks, an alternative manner of managing the following risks is necessary; Difference track ballast, Difference in documents and real life situation, FOT(Functionele Ontrekkings Tijd) and Cables and pipes. The following sections will discuss the general idea of the experiment and the applied method for the mentioned risks.

General idea

The fact that the proposed project was handed over to projecten early gave the opportunity to prepare an alternative approach for this particular track renewal project. Contractors hand in VTW’s based on the
fact that risk assessments with regards to the conditions of the surroundings do either not match the actual situation outside or are not complete. Reasons for these problems can be found in the fact that the risk assessments are performed in year N+1, 2 years before the execution of works. In the meantime, a lot can change. For example, changes that can influence the completeness of the risk assessments are; the soil is polluted over the years, nature forces changed the surroundings, AM added scope to the project which makes that the assessments are not complete any more etc. Contractors complain about the completeness of the risk assessments and the lack of connection between their working method and the risk assessments. This results in contractors redoing these risk assessments by themselves. In the end, this means that the same job is done twice. Therefore, the solution is found in shifting the risk assessments that are performed by Engineering Agencies to the contractors. As can be seen in the figure below, the tasks of the engineering agency in the preparation phase by the order of ProRail, will be done by either the contractor, or an engineering agency, hired by the contractor.

As can be seen in the figure, the shift also involves a difference in the moment of engineering. Normally these studies are performed during the preparation phase, now the engineering is done after the tender is awarded.

Instead of using the research reports from the engineering agency as a starting point for budgeting the project. Contractors will get, the same, starting points for each number that is usually obtained from the reports. These starting points on their turn, are based on the averages numbers from an extensive database, held by ProRail. Complemented by results from a desk research performed by LJV, normally the input that is given to engineering agencies for further research, as described in paragraph ...

**The tender**

The tender procedure is similar to the standard tender procedure as described in paragraph ... Awarding-criteria will be the same.

However, the starting points that usually are obtained from the research reports from the EA are not available. Contractors will receive starting points, numbers, for all the information that usually is obtained from these reports to use for their calculations.

Another difference between the standard procedure and the experimental is the fact that the contractor needs to hand in two additional documents. The first is a TVP-plan (plan for the train free period) and the second is a sheet in which the price for ballast renewal is shown. This sheet must contain a price for the renewal of 70% (starting point) of the track ballast for 1 running meter of track.

**The risk assessments/environmental research**

Researches that will be shifted to the contractor can be made suitable to the wishes of the contractor, with
regards to working method etc. The colorized researches, as discussed in chapter .., will be shifted to the contractor.

<table>
<thead>
<tr>
<th>Research</th>
<th>Environment, Legal Affairs and Real Estate</th>
<th>Engineering Agency</th>
<th>Type of information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitive scope</td>
<td>X</td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>Preliminary Design</td>
<td>X</td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>Soil pollution</td>
<td>X</td>
<td>X</td>
<td>Influencing Scope</td>
</tr>
<tr>
<td>Explosives in grounds</td>
<td>X</td>
<td>X</td>
<td>Influencing Scope</td>
</tr>
<tr>
<td>Cables and Pipes(ProRail+Others)</td>
<td>X(Wion)</td>
<td>(X)</td>
<td>Influencing Scope/Scope</td>
</tr>
<tr>
<td>Land appropriation</td>
<td>X</td>
<td></td>
<td>Juridical</td>
</tr>
<tr>
<td>Flora and Fauna</td>
<td>X</td>
<td>X</td>
<td>Influencing Scope/Juridical</td>
</tr>
<tr>
<td>Obstacles</td>
<td>X</td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>Ballast gradation</td>
<td>X</td>
<td></td>
<td>Scope</td>
</tr>
<tr>
<td>Road blocks</td>
<td>X</td>
<td></td>
<td>Influencing Scope</td>
</tr>
<tr>
<td>Estimated cost of the tasks</td>
<td>X</td>
<td></td>
<td>Suitability estimated budget</td>
</tr>
<tr>
<td>Permits</td>
<td>X</td>
<td></td>
<td>Influencing Scope</td>
</tr>
<tr>
<td>Asbestos research</td>
<td>X</td>
<td></td>
<td>Influencing Scope</td>
</tr>
</tbody>
</table>

**TVP-framework**

An aspect that was one of the major causes for VTW's was the length and design of the FOT. This FOT includes a design of the tracks that are taken out of order during the execution of works (this means there will be no trains on this part of the tracks and if necessary electricity is shut off on this part of the tracks as well) and the period of time that these tracks are taken out of order. In a normal situation the RSE designs the FOT, and the contractor has to deal with this period and design. Since there are many VTW's coming from these FOTs, the contractor will be involved in designing the FOTs and can hereby relate the FOTs to their working methods.

To give guidance in designing the FOT, ProRail provides a TVP-framework (train free period – framework). This framework gives information such as the maximum amount of uninterrupted time a contractor can apply for, the maximum amount of space a contractor can use and from which of the sides the building plot is accessible. This framework is also a ground for exclusion. When a contractor hands in a design that is not within the cadres of the framework, he will be excluded from the tender.

**Contractual solution**

Shifting the risks from the client to the contractor is not without any consequences. As stated before, the risk allocation in track renewal contracts are in conformity with the provisions of the UAV-GC 2005. The paragraphs concerning risk allocation are distilled from the UAV-GC 2005 and can be found in appendix E ProRail used to keep the responsibility of performing studies/risk assessments to their selves, they were carried out by an engineering agency. In the new situation the responsibility for the research/risk assessments is shifted to the contractor, but the responsibility for the risks linked to the research still lies at the client. So when a risk occurs, the client is still ultimately responsible.

Alliance

In order to take into account the responsibility that lies at the client, in this case ProRail opted for applying the 'risicodelings regeling' (=Risk sharing regulation). The ‘Risk Sharing Regulation’ is an optional contract article of the main agreement of the standard BBV-contract, but is usually not inserted in the contract. The purpose and idea behind the article is: Art. 25 Risicodeling
1. De Opdrachtgever en de Opdrachtnemer onderkennen met betrekking tot de Werkzaamheden een aantal risico’s waarbij de een de kans dat het risico zich voordoet en de ander de gevolgen van het risico (nadat het zich heeft voorgedaan) effectiever kan beheersen. Het tweede lid van dit artikel behelst een opsomming van deze risico’s. Partijen spreken af dat deze risico’s niet tussen hen verdeeld maar door hen gedeeld zullen worden en dat deze risico’s dus behoren tot hun gezamenlijke verantwoordelijkheid. In samenwerking zullen partijen alles in het werk stellen om te voorkomen dat deze risico’s zich verwezenlijken en om de voor het Werk nadelige gevolgen van optredende risico’s ongedaan te maken.

Risk fund

In this experiment the interpretation of the alliance article is given by means of a ‘risk fund’. The risk fund contains risks that are related to the shift in responsibility. As stated, the risk assessments will be performed by, or under commission of, the contractor, but the client is still ultimately responsible for the risks when they occur. The risks that are subject to this shift will be covered by the risk fund. For this particular case, it is decided that the risk fund will be filled by the client. The client is responsible for the risks and therefore responsible for the financial consequences of a risk when it occurs. The amount of money that is reserved for the fund is based on calculations made by the cost engineer. A calculation that combined the chance of a risk to occur, and the average costs connected to a risk led to X €.

Incentives

In order to motivate the contractor to perform studies to the conditions influencing the scope, several provisions are made for unreasonable profit-taking to be avoided. These are both beneficial for the contractor but can also lead to more expenses for the contractor.

1. **Half-Half**
   *The amount of money that is left from the fund after completion of the project is divided into two parts. Both the client and the contractor will receive half. Giving the contractor the opportunity to gain extra profit, as a result of good risk control.*

2. **Adding money from ballast graduation**
   *Starting point for the ballast graduation is a rate of return for ballast of 30% (Par. ...). When the contractor manages to raise the rate of return, the profit that comes with the raise will be brought into the fund. This increases the fund (normally, the profit would be for the client)*

3. **Contractors responsibility**
   *When the fund is fully exhausted, the cost-overruns up to 50% of the initial fund must be covered by the contractor. Costs above these 50% will be split amongst the client and the contractor.*

4. **Compensation based on research**
   *Contractors can only claim financial compensation based on their studies. Research must prove the deviation from the starting points for each risk. The size of the compensation for each deviation is based on the detailed record of the contractors budget, that was handed in for the tender.*
E UAV-GC 2005

ProRail

Aan: Mike Gattas
Van: Twan Briels
CC: Tjeerd Biessels
Datum: 3/4/2015
Betreft: UAV-GC 2005

§ 3 Verplichtingen van de opdrachtgever
3-1 De Opdrachtgever zorgt er voor dat de Opdrachtnemer tijdig beschikt over:
(a) Alle informatie waarover de opdrachtgever beschikt, voorzover het ter beschikking stellen
daarvan noodzakelijk is om de Opdrachtnemer in staat te stellen het Werk en het Meerjarig Onder
houd conform de Overeenkomst te realiseren.
(b) 
3-2 De Opdrachtgever is verantwoordelijk voor de inhoud van alle informatie die door hem aan de Op-
drachtnemer ter beschikking is gesteld, alsmede....

§ 4 Verplichtingen van de opdrachtnemer
4-7 De Opdrachtnemer is verplicht de Opdrachtgever onverwijld schriftelijk te waarschuwen indien:
(a) de Vraagspecificatie, of
(b) de bij de Vraagspecificatie gevoegdeannexen, of
(c) de Basisovereenkomst, of
(d) informatie die de Opdrachtgever aan de Opdrachtnemer ter beschikking stelt, of
(e) klaarblijkelijk zodanige fouten bevatten of gebreken vertonen, dat hij in strijd met de eisen van redelijkheid
en billijkheid zou handelen als hij zonder waarschuwing bij het verrichten van Werkzaamheden daarop zou
voortbouwen

§ 9 Vergunningen, ontheffingen, beschikkingen en toestemmingen: verplichtingen van de Opdracht-
gever
9-1 De Opdrachtgever zorgt er voor dat op de in een bij de Vraagspecificatie gevoegdeannex genoem
tijdstippen de vergunningen, ontheffingen, beschikkingen of toestemmingen die vermeld staan
in die annex, beschikbaar zijn. De Opdrachtnemer is verplicht, voorzover dat in zijn vermogen ligt,
de Opdrachtgever de medewerking te verlenen die noodzakelijk is voor het verkrijgen van die
vergunningen, ontheffingen, beschikkingen of toestemmingen.
9-2 De Opdrachtnemer zorgt voor de tijdige verkrijging van de vergunningen, ontheffingen, beschikking
en en toestemmingen die hij nodig heeft of wenst en die niet behoren tot die welke
zijn bedoeld in lid 1 en die niet vermeld staan in de in § 9 lid 1 bedoelde annex.
10-2 De Opdrachtnemer zorgt voor de tijdige verkrijging van de vergunningen, ontheffingen, beschikkingen en toestemmingen die hij nodig heeft of wenst en die niet behoren tot die welke zijn bedoeld in lid 1 en die niet vermeld staan in de in § 9 lid 1 bedoelde annex.

10-3 Voor het antwoord op de vraag welke vergunningen, ontheffingen, beschikkingen en toestemmingen nodig zijn voor het gebruik van het Werk, zijn de in § 4 lid 3 bedoelde eisen maatgebend.

§ 12 Veiligheid en gezondheid
12-1 De Opdrachtnemer is verantwoordelijk voor orde, veiligheid en gezondheid op alle plaatsen waar door of namens hem Werkzaamheden worden verricht, in het bijzonder op de in § 3 lid 1 sub b en § 17 bedoelde terreinen. Die verantwoordelijkheid omvat de veiligheid en gezondheid van alle gemachtigden en hulppersonen die hij voor de nakoming van de Overeenkomst aanwijst of inschakelt, de veiligheid en gezondheid van derden, alsmede de veiligheid van alle goederen die hij voor de nakoming van de Overeenkomst gebruikt.

12-2 De Opdrachtnemer moet ten tijde van de ondertekening van de Overeenkomst beschikken over een veiligheidssysteem dat van toepassing is op de Werkzaamheden. Het veiligheidssysteem moet zodanig functioneren dat de Werkzaamheden veilig en beheerst worden uitgevoerd. Het veiligheidssysteem dient te worden vastgelegd in een veiligheidshandboek.

12-3 Indien en voorzover dat in het acceptatieplan is vastgelegd, legt de Opdrachtnemer een veiligheid en gezondheidsplan (V&G-plan), eventuele V&G-deelplannen alsmede een V&G dossier ter Acceptatie aan de Opdrachtgever voor. Het bepaalde in § 23 is van toepassing.

12-4 Indien de Opdrachtnemer krachtens het bepaalde in lid 3 het V&G-plan, de V&G-deelplannen en het V&G-dossier ter Acceptatie aan de Opdrachtgever voorlegt, voegt hij daarbij desgevraagd tevens alle relevante Documenten waarnaar in het V&G-plan, de V&G deelplannen en in het V&G-dossier wordt verwezen, voorzover dat noodzakelijk is om de Opdrachtgever in staat te stellen te beoordelen of de genoemde Documenten kunnen worden geaccepteerd.

§ 13 Bodemaspecten
13-1 De Opdrachtnemer is verantwoordelijk voor de afstemming van de Werkzaamheden op de bodemgesteldheid. Indien als gevolg van de wijze waarop de Werkzaamheden op de bodemgesteldheid zijn afgestemd, vertraging in de uitvoering van de Overeenkomst, schade aan of gebreken in het Werk dan wel schade aan andere goederen van de Opdrachtgever of van derden ontstaat, is de Opdrachtnemer daarvoor aansprakelijk, behoudens het bepaalde in lid 2.

13-4 Indien de Opdrachtnemer is niet aansprakelijk voor verontreiniging die tijdens de uitvoering van de Werkzaamheden wordt aangetroffen op, in of onder het in § 3 lid 1 sub b bedoelde terrein of water. De Opdrachtgever kan de Opdrachtnemer opdragen de aangetroffen verontreiniging te verwijderen, hetzij in de Vraagspecificatie, hetzij door middel van een Wijziging als bedoeld in § 14 lid 1.

UAV-GC 2005:

§ 3 Verplichtingen van de opdrachtgever
3-1(a) Het is niet in alle gevallen zo dat wanneer de Opdrachtgever zelf beslist om informatie die de Opdrachtnemer nodig heeft om zijn prestatie te kunnen uitvoeren, die informatie vervolgens ook door de Opdrachtgever ter beschikking moet worden gesteld aan de Opdrachtnemer. Een zodanige verplichting bestaat alleen indien de Opdrachtnemer zelf niet over de mogelijkheid beschikt die informatie zelfstandig via andere kanalen te verkrijgen. Het noodzakelijkheidsriterum heeft niet zozeer betrekking op de informatie als wel op het ter beschikking stellen daarvan.

3-2 .... De opdrachtgever is in beginsel verantwoordelijk voor al hetgeen van hem afkomstig is en als basis dient voor de prestatie van de Opdrachtnemer. Het betreft hier de inhoud van de ter beschikking gestelde informatie en van de Vraagspecificatie, alsmede van de door de Opdrachtgever opgedragen wijzigingen. ....

§ 4 Verplichtingen van de opdrachtnemer
4-7 Contracten waarop de UAV-GC 2005 van toepassing zijn, daarbij mag van de Opdrachtnemer een actiever onderzoek verwacht worden.

§ 5 Contractoverneming

§ 9 Vergunningen, ontheffingen, beschikkingen en toestemmingen: verplichtingen van de Opdrachtgever
9-(1,2) Opdrachtgever
Opdrachtgever is verplicht zorg te dragen voor de verkrijging van de in de annex vastgelegde vergunningen en dergelijke. Indien de bedoelde annex ontbreekt, wordt die situatie gelijkgesteld met de situatie waarin een die annex er wel is maar geen melding maakt van vergunningen die Opdrachtgever zal verstrekken.

9-2 Opdrachtnemer
Alleen wanneer de medewerking van de Opdrachtnemer noodzakelijk is voor de Opdrachtgever om zijn verplichting na te komen, is de Opdrachtnemer te medewerking verplicht. Opdrachtnemer is niet verplicht tot medewerking als Opdrachtgever de verkrijging van de vergunningen zelfstandig kan realiseren.

Daarnaast: Opdrachtnemer dient medewerking te verlenen ‘voorzooveer het in zijn vermogen ligt’.

§ 10 Vergunningen, ontheffingen, beschikkingen en toestemmingen: verplichtingen van de Opdrachtnemer
10-1 3 categorieën vergunningen;
  a. Ontheffingen
  b. Beschikkingen
  c. Toestemmingen
10-3 Zij kunnen betrekking hebben op (a) opzet van het Werk en de realisatie van Meerjarig Onderhoud of (b) het gebruik van het Werk. Mogelijk behoren zij tot de categorie (c) van vergunningen die nodig zijn voor de realisatie van het Werk en het Meerjarig Onderhoud of die de Opdrachtnemer wenselijk acht en die kunnen worden ondergebracht bij de categorieën (a) of (b)

De Opdrachtnemer moet zorgen voor het verkrijgen van de vergunningen die to bovengenoemde categorieën behoren. Mits, niet vermeld in de Annex, dan rust op de Opdrachtnemer een inspanningsverplichting om die vergunning te verkrijgen.

§ 13 Veiligheid en gezondheid
13-(1,2) Bodemaspecten
De opdrachtnemer kan in beginsel alleen verantwoordelijk zijn voor de invloed die de bodemgesteldheid op de Werkzaamheden (per definitie zijn Werkzaamheden) uitoefent. Die verantwoordelijkheid omvat in beginsel derhalve niet de invloed die op de Vraagspecificatie of op een Wijziging van de Opdrachtgever door de bodemgesteldheid wordt uitoefend. Die verantwoordelijkheid kan de Opdrachtnemer echter toch nog naar zich toe trekken wanneer hem het tekortschieten in de nakoming van een op hem rustende waarschuwingsplicht kan worden toegerekend.

Het gele boekje (Aanvullingen)
§ 3 Indien de Opdrachtnemer ten behoeve van het Werk meer of andere buitendienststellingen wenst dan hem in de Vraagspecificatie zijn toegezegd, spant de Opdrachtgever, indien hij niet zelf over de verlangde infracapaciteit kan beschikken, zich op verzoek van de Opdrachtnemer in om de daartoe benodigde infracapaciteit te verwerven van de vervoerders die krachtens een Toegangsovereenkomst van de betreffende infrastructuur gebruik maken. De daarvoor door de vervoerders in rekening te brengen kosten kunnen onder meer bestaan uit een gedeeltelijke terugbetaling van de heffing voor het gebruik van de betreffende infrastructuur, kosten voor vervangend vervoer en een handlingsfee. Indien de vervoerders bereid blijken de gevraagde infracapaciteit aan de Opdrachtgever ter beschikking te stellen, zal de Opdrachtgever in samenspraak met de respectieve vervoerders een opstelling maken van de daaraan verbonden kosten. Die kostenopstelling wordt door de Opdrachtgever aan de Opdrachtnemer voorgelegd. Indien de Opdrachtnemer vervolgens binnen bekavme tijd, doch uiterlijk binnen 14 dagen, schriftelijk aangeeft met de kosten in te stemmen, zal de Opdrachtgever de verwerving van de infracapaciteit effectue ren en zullen de kosten in mindering worden gebracht op de in de Basisovereenkomst vastgelegde prijs van het Werk, waarna de Opdrachtnemer overeenkomstig de daarop betrekking hebbende procedure voor de aanvraag van de buitendienst- en/of spanningloostelling zorgt. Indien de Opdrachtnemer echter aangeeft niet met de kosten in te kunnen stemmen of indien een schriftelijke reactie van de Opdrachtnemer binnen de termijn van 14 dagen uitblijft, zullen de kosten die de Opdrachtgever in verband met het overleg met de vervoerders heeft moeten maken in mindering worden gebracht op de in de Basisovereenkomst vastgelegde prijs.

§ 10 (a) Indien aan het verlenen van een vergunning of ontheffing naar het oordeel van de Opdrachtnemer onredelijke of onredelijk bezwarende voorwaarden zijn verbonden of naar verwachting verbonden zullen gaan worden, informeert de Opdrachtnemer de Opdrachtgever daaromtrent direct, opdat de Opdracht-
gever nog de gelegenheid heeft om al dan niet als belanghebbende tegen het betreffende besluit op te komen.

(b) De Opdrachtnemer verplicht zich om medewerking te verlenen aan het op zijn naam stellen van de tijdelijke vergunningen, die door de Opdrachtgever voorafgaand aan de gunning door hem zijn aangevraagd of verkregen. De Opdrachtnemer verplicht zich medewerking te verlenen aan de wijziging van de tenaamstelling van door hem aangevraagde en verkregen vergunningen die na afloop van het contract voor de Opdrachtgever moeten blijven gelden. Bij oplevering zal de Opdrachtgever aangeven welke vergunningen dit betreft.

**De UAV-GC 2005 – Enkele handvaten**

1 Ten aanzien van de door Opdrachtgever aan Opdrachtnemer verstrekte informatie geldt als hoofdregel dat het moet gaan om informatie waarover Opdrachtgever beschikt en waarbij de Opdrachtnemer niet over de mogelijkheid beschikt de informatie zelfstandig via andere kanalen te verkrijgen, zo volgt uit de toelichting op paragraaf 3 UAV-GC 2005.

2 Een andere bron van discussie is het antwoord op de vraag welke door de Opdrachtgever verstrekte informatie de Opdrachtnemer eigenlijk tot uitgangspunt dient te nemen. Zo wordt bijvoorbeeld het onderscheid tussen ‘bindende’ en ‘niet-bindende’ informatie gemaakt. Zolang partijen een dergelijk onderscheid tussen soorten informatie en een verschillende waardering daarvan niet zijn overeengekomen (en de aanbestedingsdocumentatie hierover niets vermeldt), geldt de hoofdregel van paragraaf 3 lid 2 UAV GC 2005, dit bepaalt dat de Opdrachtgever verantwoordelijk is voor al hetgeen van hem afkomstig is en dat dit als basis voor de prestatie van de Opdrachtnemer. Hieruit volgt dat de Opdrachtgever verantwoordelijk is voor alle door hem in het kader van de opdracht aan de Opdrachtnemer ter beschikking gestelde informatie.

3 Overigens merken wij op dat ook op basis van artikel 7:754 BW een aannemer bij het aangaan van een overeenkomst (tot aanneming van werk) verplicht is zich pro-actief op te stellen en zijn (toekomstige) Opdrachtgever (onder meer) te waarschuwen voor onjuistheden in de overeenkomst.

4 bestaat de mogelijkheid voor Opdrachtnemer om de ontbrekende informatie zelf te vergaren, dan geldt als uitgangspunt dat zij van deze mogelijkheid gebruik dient te maken. In dat kader is het ons inziens ook niet meer dan logisch dat een Opdrachtgever geen informatie mag achterhouden die voor de Opdrachtnemer van belang is voor het doen van een passende aanbieding respectievelijk voor een correcte uitvoering van de Overeenkomst.

5 De Opdrachtgever dient zich bewust te zijn van de mogelijkheid van verschuiving van aansprakelijkheid wanneer zij gebruik maakt van haar toetsingsbevoegdheid. Par.14 lid 7 UAV-GC bepaalt immers dat, als de Opdrachtgever bij het toetsing daadwerkelijk een fout constateert in de OntwerpdOCUMENTEN, zij deze dient te melden. Verzuimt zij dit, dan kan zij de gevolgen van de fout niet op de Opdrachtnemer verhalen.
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