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UNIVERSITY OF TWENTE.

# Lightrail PPPs in the Netherlands

## Recommendations to increase the attractiveness to lenders

May 2019

University of Twente

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Mott MacDonald
Amsterdamseweg 15
6814 CM Arnhem
PO Box 441
6800 AK Arnhem
The Netherlands

T +31 (0)26 3577 111
mottmac.nl

University of Twente
Drienerlolaan 5
7522 NB Enschede
The Netherlands

Author:

Patrick Hoss
*MSc. student., Civil Engineering and Management*
*University of Twente, Enschede, Netherlands*

Under supervision of the following committee:

Associate Professor Dr. A. Hartmann
*University of Twente, Faculty of Engineering Technology*

Dr. M. van Buiten
*University of Twente, Faculty of Engineering Technology*

Elske Olthof
*Mott MacDonald B.V., Consultant Public Transportation*

Rick Janssen
*Mott MacDonald B.V., Technical Advisor Infrastructure Finance*

Registered in Arnhem, The Netherlands
no. 30199525.

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# Abstract

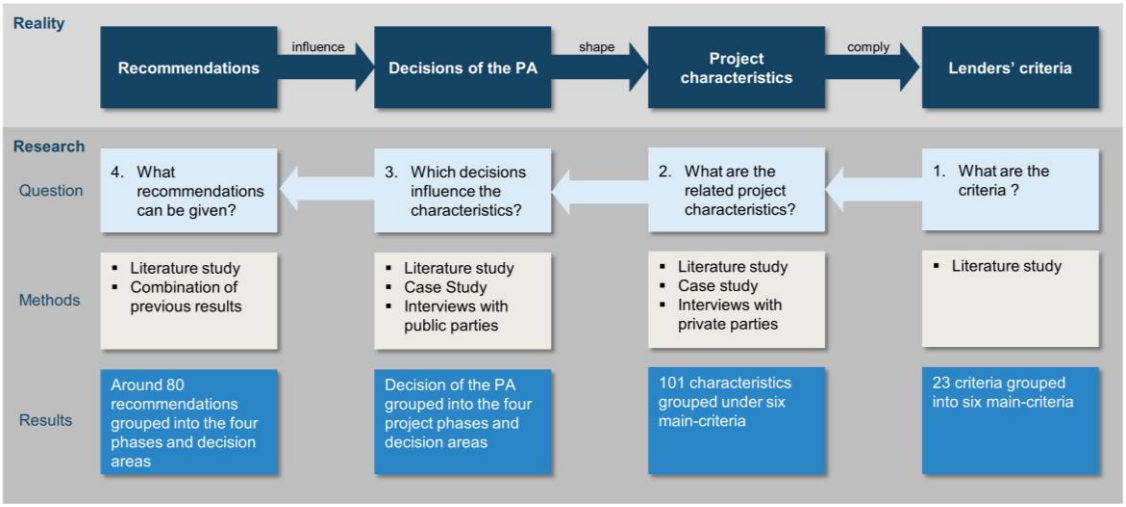
Within the Netherlands, especially in the densely populated West, the mobility needs are increasing, and the capacity of existing transport systems is limited. Congestion of roads, air pollution and travel delays are the consequences. Policy makers and transport planners identify the shift of surface passenger transport to rail bound systems as a possible sustainable solution. Despite the increasing demand, public budgets are limited and most of the money is needed for maintaining existing infrastructure, leaving a gap between the need for new investments and the public money available. One possibility, to finance new infrastructure investments, is the use of private money under a Private Public Partnership (PPP) scheme. To take the route of private project financing, the project must be attractive enough for private investors to provide the necessary financial resources.

This research was conducted to investigate and understand the factors that determine the attractiveness of a light rail PPP project within the Netherlands to lenders, and when those factors need to be considered by the contracting authority throughout early project stages.

When setting up a light-rail PPP project, the public authority takes several decisions, going through different project stages. The project identification phase, the preparation phase, a phase in which the contracts and the tender are drafted, and the actual tender and award phase. The decisions made in those phases, shape the project and determine its unique project characteristics. Lenders searching for new investment opportunities assess prospective projects and decide, whether or not to commit, based on the attractiveness of the project. For assessing the projects attractiveness, they evaluate if the project characteristics comply with their criteria. Consequently, providing recommendations for the public authority in taking these decisions and shaping the projects characteristics in a way that they comply with the criteria used by lenders, is supposed to increase the attractiveness of the project to lenders, as visualized in figure 1.

To develop those recommendations, the process was researched in reverse. 1. The criteria, used by lenders, were identified. 2. The project characteristics related to the criteria were investigated. 3. The decisions leading to the related project characteristics were identified. 4. The recommendations were drafted based on all the previous results.

**Figure 1: Research Overview**




Source: P. Hoss

1. A literature study, reviewing academic sources and other publications like PPP guidelines or conference reports, was used for the identification of the criteria. This resulted in a list of 23 criteria, which could be grouped under the six main-criteria, namely: Economic and political environment, Legal and regulatory environment, Project specificity, Project financial structure, Third party risk allocation and Contract arrangement.
2. For investigating the project characteristics, related to the list of lenders' criteria, a literature study was not sufficient and a case study, including five different light-rail projects, was conducted. The projects are the RegioTram project in Groningen (Netherlands), the Brabo II project in Antwerp (Belgium), the Tram de Liege in Liege (Belgium), the NET Phase 2 in Nottingham (UK) and the ION Rapid Transit Phase 1 in Waterloo (Canada). The cases were chosen considering several aspects and with the main intention of covering a broad variety of project characteristics by assessing different projects. They differ in their location, their size, their contract form, some of them are new system whereby others are extensions to an existing one, some were more successful than others, and some are in a country with a track record of successful PPPs, like the UK with their long PFI history or Canada. Semi-structured interviews with private parties, involved in each of the case study cases, were conducted. The participants were asked to identify project characteristics based on the list of the lenders' criteria. The outcome was a set of 101 project characteristics, which were grouped according to the related lenders' criteria.
3. The set of characteristics was then used to identify the decisions, made by the public authority, which influence the related project characteristics. Again, semi structured interviews with parties involved in the case study projects, were conducted. However, the interviewees were people from the public authority, who were expected to have a better understanding of the decisions made on the public side of the project. The results indicated, that there are four main-decisions. They are related to the four early project phases and determine if the project is ready to proceed to the next project phase. When making those decisions, a variety of subjects, grouped in several decision areas, need to be considered in each of the consequent phases.
4. With the insights and results from the previous phase it was possible to draft a set of recommendations related to the different decisions which the public authority faces in each of the four project phases. The recommendations are presented per phase and decisions making area. In total, 82 recommendations are provided in 18 decision areas to be considered during the four project phases. The findings indicate that most of the lenders' concerns, regarding a project, are negotiable, and subject to discussion in the dialogue phase of the tender procedure. Nevertheless, it appears that some prerequisites need to be met to get them interested. Those include a high level of stable political support, retaining the traffic volume risk, an availability-based payment mechanism, a suitable approach to deal with unexpected utilities, and an appropriate size of the project respectively of their ticket.

Whereby some of the recommendations are a trade-off between retaining risks on the public side and consequently increasing the attractiveness, some are expected to increase the attractiveness without entailing any disadvantages for the public authorities. Even though most of the recommendations comply with general PPP guidance, they are only meant to increase the attractiveness to lenders, and other considerations need to be taken into account when making decisions in early project stage.

Nevertheless, lenders ultimately enter into an agreement with the SPV, and have, with the direct agreements being an exception, no direct contact with the public authorities. Therefore, the public authority can set the right framework conditions, but are limited in their influence. Further, there are other measures to increase the attractive of light-rail PPPs to lenders, not related to a single project, but rather on a high-level national context. These include: the development of a project-pipeline, standardisation of contracts and establishing a centre of expertise, which could be, next to a validation of the recommendations, subject to further research.

# Preface

The report in front of you is the final result of my thesis research project 'Initiating a Light Rail PPP project in the Netherlands attractive to lenders'.

It is the final project of my Master of Science in 'Civil Engineering and Management' with a specialization in 'Design and Management in Construction' at the University of Twente, Netherlands. This research was carried out at Mott MacDonald Netherlands, where I worked as a graduation intern for the time of the project.

First of all, I have been incredible fortunate with my graduation committee, who not only supported me and provided valuable feedback, but also trusted my abilities, and gave me a lot of freedom in conducting this research.

I enjoyed the time working for Mott MacDonald's in the Arnhem office, and I would like to thank Ido Croese and Joost Bolck for this opportunity, my supervisors Elske Olthof and Rick Janssen for their excellent guidance, and all the other colleagues for the warm welcome and the great time during the past six months.

In addition, I want to thank the respondents of the interviews for taking their time, despite having a busy schedule, and contributing with valuable information to the success of this research.

Finally, I want to use this opportunity to thank my family, from whom I received nothing but the greatest support in all the decisions I made.

I hope you enjoy your reading.

Patrick Hoss

Arnhem, May 2019

# Glossary and abbreviations

| | |
|---|---|
| **BAFO** | Best and final offer |
| **CRA** | Credit rating agency |
| **DBFM(O)** | Contract scheme which includes design, finance, construction, maintenance (and operation) work of a project (E. Yescombe, 2013). |
| **DC, D&C, DB, D&B** | Design and Construct (Build) contract form where the design and the construction are novated to a D&C builder. |
| **DSCR** | Debt-Service Cover Ratio |
| **EPC** | Engineering, Procurement and Construction contractor, responsible for all the activities related to design, procurement and construction. |
| **EPEC** | European PPP Expertise Centre (of the EIB) |
| **EPFI** | Equator Principles Financial Institutions |
| **HSL** | High Speed Line |
| **Light rail** | Light Rail is a rail-bound form of public transport, that is used on the scale of the urban region and the city. |
| **LLCR** | Loan-Life Cover Ratio |
| **MEAT** | Most economically advantageous tender |
| **MFIG** | Ministry of Finance of the Indian Government |
| **NL** | Netherlands |
| **NPV** | Net Present Value is value of all future cash flows, discounted with a discount rate to the present value |
| **NS** | Nederlandse Spoorwegen, Dutch state-owned rail operation company. |
| **OECD** | The Organization for Economic-Cooperation and Development. |
| **PA** | Public authority (refers to the client of a PPP concession) |
| **PFI** | Private Finance Initiative, way of creating ‘public–private partnerships’ (PPPs) developed in the UK and Australia |
| **PLCR** | Project-Life Cover Ratio |
| **PPIAF** | Public-Private Partnership Advisory Facility |

| | |
|---|---|
| **PPP** | Public Private Partnership is an umbrella term, that describes several contract forms in which private parties invest in public sector projects. |
| **ProRail** | Asset manager of Dutch railways. Private under Dutch law. |
| **PSC** | Public sector comparator, a qualitative and quantitative instrument, that determines the project outcome using a traditional D&C contract to compare it with the outcome of a PPP, to determine which contracting method delivers the most value for money. |
| **RAMS** | 'RAMS systems assurance is a framework for railway transit authorities and their contractors to ensure that railway systems have been designed, constructed and operated according to all critical factors related to safety, reliability, maintainability, and availability.' (Ardavanis, 2012). |
| **SPV** | Special purpose vehicle (Project company), legal entity and contracting party in a DBFM contract, consistent of a multidisciplinary consortium, taking care of all contractual and financial activities related to the project. |
| **UK** | United Kingdom |
| **Value-for-Money** | The optimum combination of whole life costs and quality to meet the user requirements. |

# List of tables

# Table of figures

# Section I: Introduction

## 1.1 Problem statement

The world's population has been relatively stable for a very long time. With an estimation of 300 million people 2000 years ago, it only doubled to 600 million in 1600 years. However, it has grown tremendously in the 20th century, experiencing the highest growth rate of 2.04 percent per year during the late 60's (*The World at Six Billion*, 2001) and more than tripled from 1.650 million people in 1900 to 6.145 million people in 2000. With a current population of 7.550 million people in 2017 and further growth to be expected (11.184 million until 2100), the need for suitable modes of transportation is also increasing (*World Population Prospects The 2017 Revision*, 2017).

With an average person spending 1.1 hour per day travelling, and an observed increase in travel time of two minutes per person and day each year (Stopher & Zhang, 2014), today's world citizens currently move 23 billion kilometres per year with an expected increase up to 105 billion kilometres in the year 2050 (Schafer & Victor, 2000). This increase can also be observed in Europe, where the passenger transport increased from 5.335 billion person kilometres in 1995 to 6.802 billion person kilometres in 2016. 71% of those kilometres are travelled in passenger cars, followed by 10.5% travelled by plane, 8.2% on rail and 8.1% by bus (*Eu transport in figures: Statistical Pocketbook 2018*, 2018).

Within the Netherlands, the distance travelled by passenger car accounts for up to 60% of the total passenger kilometres but has not increased much since 1990, 2.5% only, whereby travelling by train increased about 6.9% in the same period (*Eu transport in figures: Statistical Pocketbook 2018*, 2018; *Mobility Report 2017*, 2017). This steady increase of traffic volume also leads to problems regarding the capacity of existing transport infrastructure. Problems, such as congestions and delays in travel times, occur for various reasons and are highly complex in nature (Downs & Downs, 2004). The travel delays in the Netherlands 2016 are 9% higher compared to 2005. They particularly increased during the evening peak (15:00-19:00), in urban and suburban areas as well as on main roads. (*Mobility Report 2017*, 2017). To meet current and future needs, capacities need to be extended to match the increasing traffic volume. Also the Ministry of Infrastructure and Water management states the 'Strengthening [of] large-scale collective transport in order to guarantee accessibility and liveability in and around crowded cities and urban regions' in its 2040 transport vision (Ministry of Infrastructure and Water Management, 2018). Furthermore, the European Commission supposes an expansion in rail infrastructure to shift surface transport towards a more sustainable path and to reduce greenhouse gas emission, particularly in densely populated areas with high traffic volume such as the Netherlands (European Commission, 2011).

Despite this development, increasing public debt and public-sector expenditures constrains lead to a substantial reduction in public sector investment in the OECD countries since the 1970s (Debande, 2002). The global gap between available funding and need for new infrastructure was estimated to US$ 1 trillion per year in 2015 and expected to grow further (Maier, 2015). Thus, additional financial sources are needed to cope with the need for new investments in infrastructure and the use of private investment appears to be one possible solution (Doll, Rothengatter, & Schade, n.d.; Pulido, Darido, Munoz-Raskin, & Moody, 2018; van Herpen, 2002). Whereby private investment is commonly used for road and water infrastructure and social infrastructure, where it has proved to significantly increase the 'Value-for-Money' for certain projects, it is still relatively rare among rail projects in Europe (World Bank Insitute, 2013). The infrequent examples are mostly premium parts of rail infrastructure with large budgets, reaching from 0.5 to 8.0 billion Euros and contracted mostly under a Design Build Finance Maintenance (DBFM) contract, usually

financed through an availability payment model, in which payments are made based on the capacity available measured by a set of criteria. However, most of those projects are co-funded by the government by 40-60 % of the total project expenditure (Working Party on Rail Transport (SC.2), 2012). Consequently, private financing should not be regarded as a full withdrawal of state funding, but rather as one possible solution to accumulating new financial resources, achieving more value-for-money, stimulating innovation and competition and improving cost calculations through comparing the project against a public sector comparator (van Herpen, 2002). However, ProRail, responsible for maintenance and extension of the main rail network within the Netherlands, follows a procurement strategy which contradicts private investment. Therefore, the main potential of using private financing can be expected to be in light rail systems for cities and urban regions since they are not within the scope of ProRail's responsibilities.

In January 2018, transport companies and officials from Amsterdam, Utrecht, Rotterdam The Hague met to discuss new forms of financing for an extensive light rail network for the urban belt ("Investeer nu in lightrail om verkeersinfarct te voorkomen - NRC," 2018; "Investment needed now in light rail network, local officials say," 2018). They concluded to call for co funding from third parties since the cabinet does not seriously want to explore new infrastructure until there is 75% of the funding available. 'Construction of light rail takes ten years. We have to start now, otherwise we will have a very big problem in ten years' time.'[1] said councillor of Rotterdam Pex Langenberg ("'Lightrail is noodzaak in Randstad' - NRC," 2018). In early 2019, the Dutch prime minister Rutte discussed the issue and possible ways of innovative financing with government representatives of four large cities (Amsterdam, The Hague, Utrecht and Rotterdam) in a private backroom meeting. A new light rail connection for The Hague through the new developed area 'The Binckhorst', an additional bridge over the Maas in Rotterdam for the 'Oostflank', an underground metro line for Utrecht and a new metro line in the west of Amsterdam are the projects of top priority to the cities. McKinsey, hired to advise the G4 majors, estimated a potential saving of 10-15% if the Netherlands would adopt a PPP model (Niemantsverdriet & Verlaan, 2019).

To take the route of private project financing through a PPP, the project has to be bankable, meaning, it has to be attractive enough for private investors to get involved and provide the necessary financial resources (Rothballer & Gerbert, 2015). To get insights on how to initiate a light rail project which is attractive for lenders is therefore useful in two ways. First, if the decisions in favour for private involvement is made and the contracting authorities can make the right decisions throughout the project process to ensure the attractiveness and consequently the bankability of the project, the chances of a successful project finance increase. Second, and even more important, the improvement of privately financed projects also increases the likelihood of choosing private financing for a light rail project in the first place, and, as a result, contributes to closing the gap between the need for new investments and the limited resources.

## 1.2 Research objective

**Research objective**

The objective of this research is to investigate and understand the factors that determine the attractiveness of a light rail PPP project within the Netherlands to private financing by lenders and when they need to be considered by the contracting authority throughout early project stages.

[1] Original in Dutch: 'Aanleg van lightrail duurt tien jaar. We moeten nu beginnen, anders hebben we over tien jaar een heel groot probleem.' – translated by the author.

Some of the terms used in the research objective are specified more detailed in table 1 below.

**Table 1: Further specifications of terms used in the research objective**

| Term | Specification |
|---|---|
| 'light rail project' | Light Rail is a rail-bound form of public transport that is used on the scale of the urban region and the city. |
| 'PPP' | Public Private Partnership cooperative agreement between a public authority and one or more private parties. |
| 'private financing' | Private financing refers to private investment by investors and lenders under a PPP (DBFM(O)) scheme. |
| 'lenders' | Lenders provide most of the private capital for the project and are usually banks. Therefor the attractiveness to them is of higher importance than the attractiveness to investors who also contribute to the project financing. |
| 'early project stages' | Refers to the exploration, planning and tender phase of a light rail project. |

Source: P. Hoss

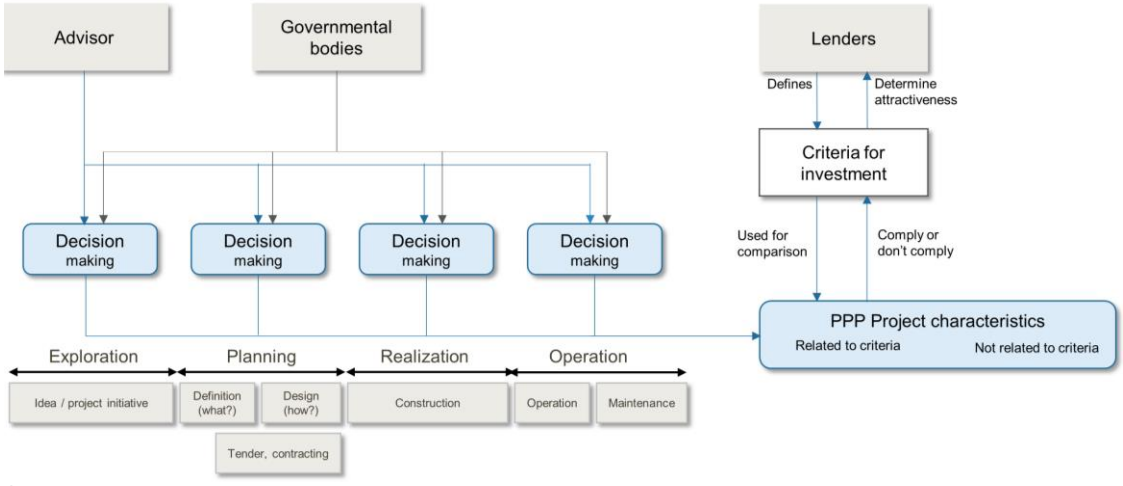
## 1.3 Research framework

The research framework, displayed in figure 2, represents the internal logic of the research and establishes the theoretical background by identifying key concepts and the conceptual model. It is described briefly to get an overview of the context in which the research questions are placed. A more detailed description of the key concepts is provided in *Section III: Background*.

As visualized in figure 2, there are governmental bodies, making decisions in different project stages of a light rail PPP project. Those decisions shape the project and lead to a variety of specific project characteristics. Lenders, interested in investing into a certain project, usually a have a set of defined criteria, which they use to measure the project characteristics against. Depending on the compliance of those criteria with the project characteristics, investment decisions are influenced.

Subsequently, to initiate a light rail PPP project in a way to make it more attractive for lenders, the decisions of the governmental bodies should lead to project characteristics that comply with the set of criteria used by the lenders.

**Figure 2: Research framework**



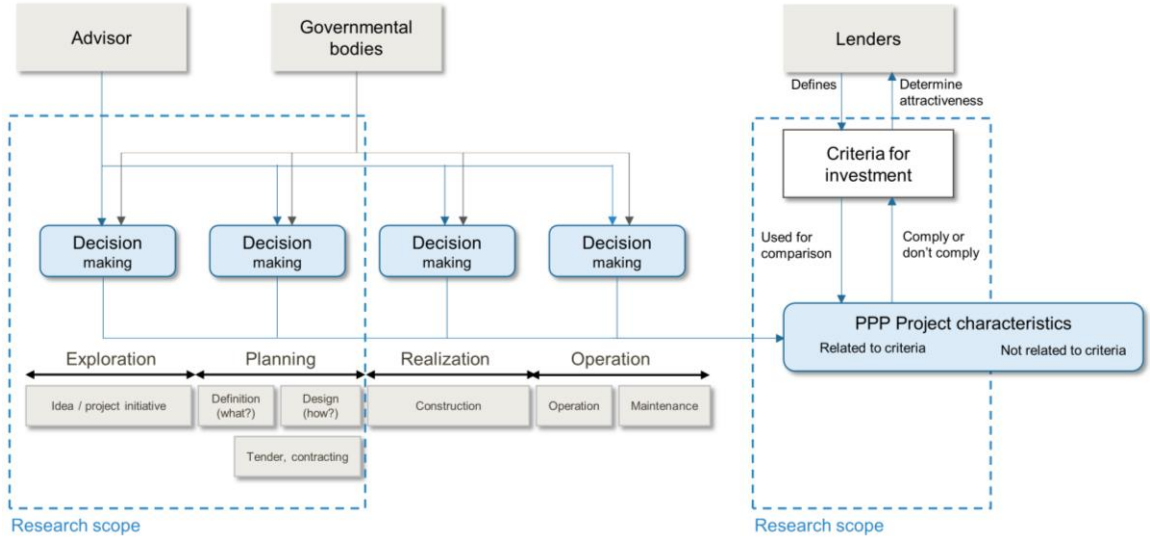

Source: P. Hoss

## 1.4 Research scope

The scope of the research is set to private investments in light rail infrastructure using a DBFM or DBFMO PPP scheme. Projects include the light rail infrastructure and can or cannot include the rolling stock and the operation of the system. The research focuses on the attractiveness of projects to lenders, since they provide most (usually 70-80%) of the private financing (E. Yescombe, 2013). Furthermore, not all project characteristics necessarily relate to criteria set by investors and are thereupon not within the scope of the research. Since the lenders commit to the project during the tender phase, later decisions and their influence on the project characteristics are not important to the attractiveness. A visualization of the research framework, including the research scope, is presented in figure 3.

It is also important to notice that even if the resulting insights can be helpful in the decision whether to privately finance a project or not, the research looks at early project phases, where this decision has already been made. The results should be used for the initiation of light rail projects in the Netherlands, however, due to successful projects in other countries within and without the EU, those projects are considered in the case study as well. More in depth explanation and reasoning about the research scope is provided in *Section III: Background*.

**Figure 3: Research framework including research scope**




Source: P. Hoss

## 1.5 Research questions

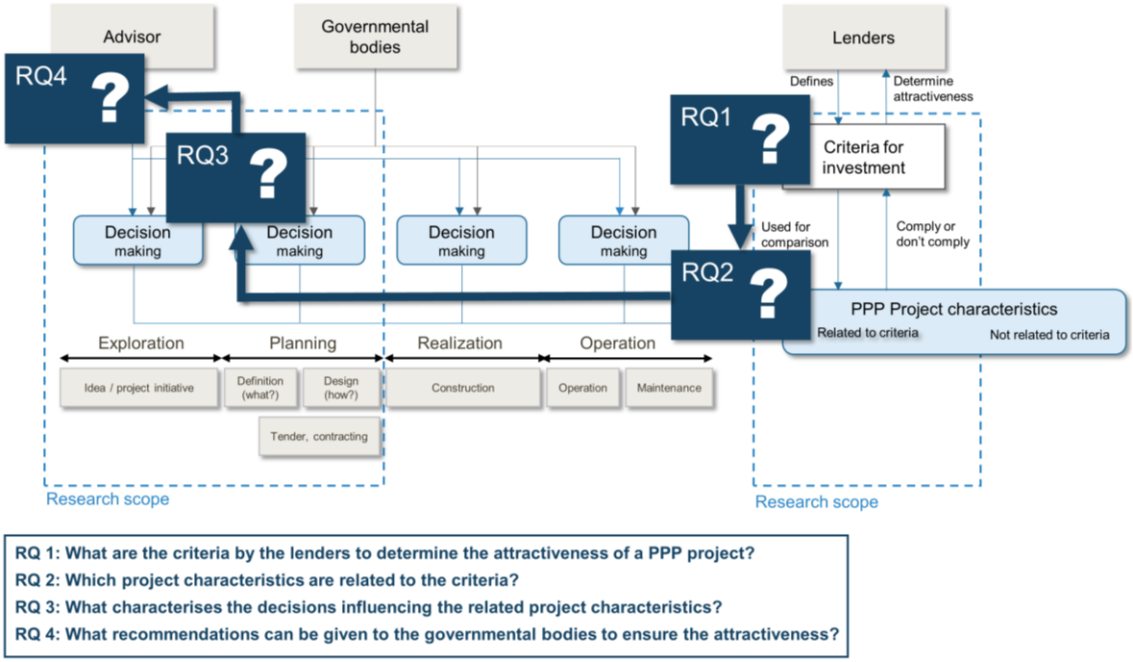
To achieve the research objective '' *[…]to investigate and understand the factors that determine the attractiveness of a light rail PPP project within the Netherlands to private financing by lenders […]*'', a set of key questions, also referred to as research questions, has to be defined. Those questions are as specific as possible and address the 'what' of the research.

As described and visualized in the previous chapter, the decisions, made by contracting authorities throughout the project process, shape the project characteristics which do or do not comply with the criteria set by the lenders.

Thus, determining how to increase the attractiveness, means researching this process vice versa. More specific, it is necessary to identify the lenders criteria for attractiveness first (RQ1). Second, the PPP project characteristics interrelated to those criteria are identified (RQ2.). Third, the

research determines the decisions influencing the interrelated project characteristics (RQ3) before the gained insights are used to provide recommendations for the contracting authorities in line with generic PPP recommendations (RQ4). Figure 4 provides an overview of those considerations and visualizes the research questions in the context of the research framework.

**Figure 4: Research framework including research questions**




**RQ 1: What are the criteria by the lenders to determine the attractiveness of a PPP project?**
**RQ 2: Which project characteristics are related to the criteria?**
**RQ 3: What characterises the decisions influencing the related project characteristics?**
**RQ 4: What recommendations can be given to the governmental bodies to ensure the attractiveness?**

Source: P. Hoss

Based on those considerations, the research questions and sub questions are defined in the grey box below.

**Research questions**

1. What are the criteria used by lenders to determine the attractiveness of a light rail PPP project?
    a. Which criteria can be identified?
    b. Which of those criteria can be influenced by the contracting authority throughout the decision-making process?

2. Which project characteristics of a light rail infrastructure project are related to the lenders criteria?
    a. What are the project characteristics of a light rail project interrelated to the lenders criteria?
    b. How do they differ from road infrastructure PPP's?
    c. Which of them and to what extend can they be influenced by the contracting authority in the decision-making process?

3. What characterises the decisions influencing the related project characteristics?
    a. What are the main decisions which influence the project characteristics?
    b. What subjects are taken into account when making those decisions and to what project characteristics are they related?
    c. When and by whom are those subjects taken into account?

4. What constitutes a set of recommendations that can be used to advice governmental bodies in early project stages?
    a. What recommendations, that influence the decisions leading to favourable project criteria, can be given to public authorities?
    b. To what extend are those findings in line with general PPP recommendations?

The research questions are relevant because they proof to be meaningful form a managerial and academic perspective. They are feasible because they can be answered within the constraints of the project (time, money, knowledge) and they are interesting to keep the researcher motivated throughout the time-consuming research process.

## 1.6 Managerial relevance

The research initiator Mott MacDonald is an international consultancy company with its headquarter in London, United Kingdom. They currently employ 16.000 people in over 150 different countries focusing on six global 'sectors' – advisory, built environment, energy, international development, transport and water. The first office in the Netherlands was founded in 2005 and situated in Utrecht. In 2007, they acquired Euroconsult and moved to their current location – Arnhem, the capital of the province of Gelderland in the eastern part of the Netherlands. While being relatively small in the beginning, the company focused on offering services in niche areas rather than offering a broad variety of services like the big headquarters in other countries. After monitoring the settlement of the metro in Amsterdam as their first project, they got involved in signalling design and procurement of the metro in Rotterdam, worked in reliability assessments of rolling stock and are currently involved in many national and international projects. Over the past thirteen years, they developed an internal structure consisting of mainly two departments – The '*Rail Team*' and the '*Infra Finance Team*'.

The '*Rail Team*' offers consultancy/advisory services with specialties in: Signalling and safety, track systems, wheel/rail interface, testing & commissioning, RAMS (Reliability Availability Maintainability Safety), asset management, contract management, secondment into client project organizations, audits, reviews, due diligences and second opinions.

The '*Infra Finance Team*' (former 'Lenders technical advisors') is focused on advising lenders in a variety of projects, whereby most of them are Public Private Partnerships (PPP's). The provided services reach from risk assessment in an early project stage to monitoring the service during the operation phase.

Mott MacDonald's future ambitions include growing and expanding their business by hiring new advisory staff, expanding their expertise, connecting with local companies and acquiring new knowledge and insights in fields within their specialization.

Since private investment is one possible alternative to achieve more value-for-money in building, water- and road infrastructure projects, and it is a possible solution to close the gap between the need for new light rail infrastructure and limited funding, it is of strong interest to the company to deepen their understanding of private investment opportunities in light rail projects within the Netherlands. Especially getting a better understanding of factors that determine the attractiveness of a light rail project for private financing enables the company to advice governmental clients in initial project stages to consider the attractiveness early on, leading to an increased bankability of the project. Finally, the improvement of the privately financed projects also increases the likelihood of a decisions for private funding of a project in the first place.

## 1.7 Structure of the report

This is the end of the first chapter (*Section I: Introduction*), which provided the problem statement, the research objective, placed the research questions in the context of the research framework and defined the scope of the project.

The next chapter (*Section II: Research Design*) describes the research design, the research material, the planned schedule and a risk assessment.

The key concepts of the research framework and the theoretical background of the research is provided in the next section (*Section III: Background)*.

Afterwards, the results of the research are illustrated and used to answer the research questions in two separate sections. The first one (*Section IV: Lenders criteria & related project characteristics*) focuses on the private side of a PPP and outlines the result of the criteria used by lenders to evaluate a light rail PPP project and the related project characteristics. The second results section (*Section V: Lenders criteria & related project characteristics*) looks at the projects from a public perspective. It elaborates what decisions, made by the public authority, lead to the project characteristics, identified in section IV. Further, recommendations for the public authority, to take those decisions in a way which makes the project more attractive to the lenders, are provided.

Afterwards, the results are discussed in (*Section VI: Discussion*) and the limitations, as well as recommendations for further research are presented (*Section VII: Limitations and Recommendations*).

The final section (*Section VIII: Conclusion),* summarizes the main points of the research and relates the findings back to the initial problem.

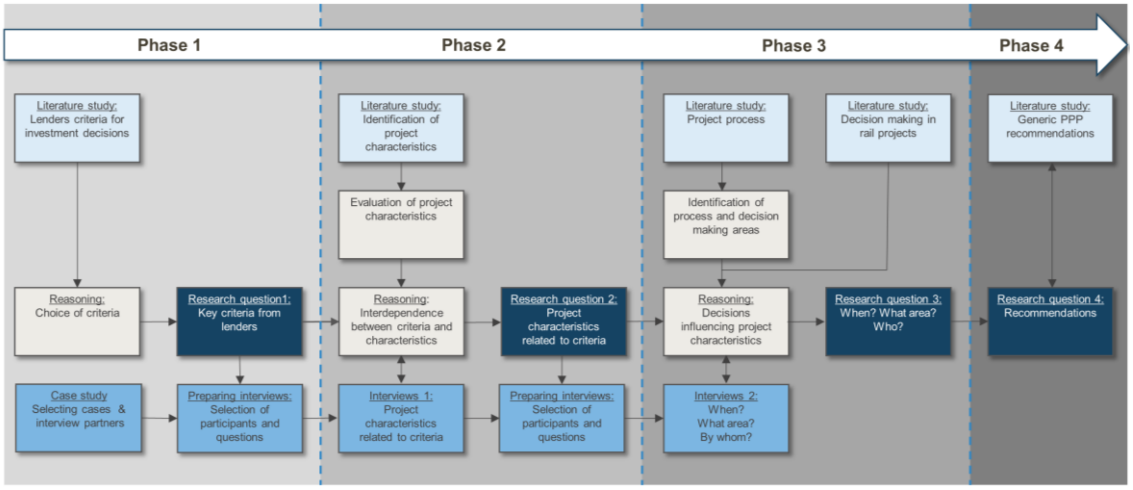
# Section II: Research design

After the 'what' and 'why' of the research is described in the first section, this section provides the technical design of the research. It outlines the research strategy (2.1), including the different research phases, the use of literature studies, case studies and interviews. Further, an overview of the research material (2.2), the schedule of the research project (2.3) and a risk assessment (2.4) is provided.

## 2.1 Research strategy

To achieve the research objective by answering all the research questions and sub questions, a research strategy is needed. This strategy outlines the different steps conducted throughout the research process. The whole research can be divided into four distinct phases, each of which is dealing with one of the research questions and sub questions defined above. To answer those questions, literature and case studies are conducted. An overview of the research strategy is displayed in figure 5, whereby the following chapter explains each phase in detail (2.1.1). Further, an overview of the literature studies (2.1.2) and the case study (2.1.3), conducted during the research process, is provided. The last part explains the use of interviews form of data collection for the case study (2.1.4). It is important to note, that the phases describe the logical and timely sequencing of the research, however, in the execution of the research activities, those phases can overlap and be executed at the same time. A detailed schedule, where this overlap becomes evident, is displayed in the research schedule chapter (2.3).

**Figure 5: Research strategy**




Source: P. Hoss

### 2.1.1 Phases

**Phase 1**

The very first phase of the research strategy aims at identifying the criteria used by the lenders to determine the attractiveness of a light rail project (RQ1 a). Therefore, a literature study is conducted, identifying the existing criteria. In a second step 'Choice of criteria' a selection is made based on which of the criteria can be influenced by decisions and which are defined exclusively by external factors and consequently cannot be influenced (RQ1 b). Those considerations should

lead to a set of key criteria, which will be validated by experts and used in phase 2. Simultaneously, the cases for the case study, conducted in the following phases, are selected. The answer of RQ1 allows to select the participants and questions for the interview in phase 2.

**Phase 2**

The second phase of the research tries to identify the project characteristics that are related to the set of criteria outlined in phase 1. First, a literature study is carried out to identify project characteristics of a light rail project, whereby a first evaluation shows whether they are related to the project criteria. Simultaneously, experts from selected cases are interviewed to get their perception of interrelated project characteristics. Both results are considered in the 'reasoning' which finally leads to the interdependent project characteristics (RQ2 a). Those project characteristics are compared to those from road infrastructure PPPs to identify differences and similarities (RQ2 b). Additionally, the interviews are used to ask the experts about the possibility to influence the project characteristics during the decision-making process, to exclude those which cannot be changed, from further research (RQ2 c). At the end of phase 2, a set of interrelated project characteristics, which can be influenced in the decision-making process, is identified and can be used to prepare the interviews, including the selection of participants, for phase 3.

**Phase 3**

In the third phase of the research, decisions related to the interdepended project characteristics are investigated. Literature studies about decision making and project process steps in light rail projects are used to accumulate the necessary background information, like the identification of project process steps and the areas of decision making, which are needed to conduct the interviews. The interviews, again with experts from the selected cases, aims at exploring what the main decisions are (RQ 3a). Further they are used to identify what subjects, related to the project characteristics, need to be considered when taking those decisions (RQ3 b). In addition, they should answer the question when and by whom those subjects should be considered (RQ3 c).

**Phase 4**

The last phase of the research concludes with a set of recommendations for the public authority, to keep in mind while making decisions in certain decision-making areas throughout the project phases (RQ4 a). Further, the recommendations are linked back to the lenders criteria, identified in phase one. In a final step, those recommendations are compared to generic PPP recommendations, identified through another literature study, to ensure their compliance (RQ4 b).

### 2.1.2 Literature study

Literature study is an essential part in every phase of this research project. Therefore, table 2 gives a brief overview of the literature studies conducted. The term literature study, usually referring to academic sources, is hereby used as an umbrella term that includes non-academic documents (e.g. reports, guidelines, conference protocols etc.) as well. An overview of the exact research material related to the research sub questions can be found in chapter *2.2 Research material*.

**Table 2: Literature studies in the research projects**

| Research phase | Name in strategy | Main objective |
|---|---|---|
| 1 | 'Lenders criteria for investment decisions' | By analysing literature and documents, the main goal is to identify the criteria used by the lenders to assess the attractiveness of a light rail project. |
| 2 | 'Identification of project characteristics' | The main goal is to identify project characteristics of light rail projects, using academic literature and documents. |
| 3 | 'Project process' | The main goal is to determine distinct process steps of a light rail project to use them in the interviews, examining the when certain decisions are made and what subjects need to be considered throughout the project process. |
| | 'Decision making in rail projects' | The main goal is to get a broader understanding of the decision-making process to identify which decisions lead to the project characteristics, in which decision area, by whom and when they are taken. |
| | 'Generic PPP recommendations' | The main goal is to find generic PPP recommendations to compare them to the recommendations resulting from this research |

Source: P. Hoss

### 2.1.3 Case study

To answer the research questions 2 and 3, a literature study is not sufficient. Therefore, a comparative case is conducted. The choice of using a case study approach leads, compared to other methods e.g. a survey, to a deeper understanding rather than generating broad knowledge (Lapan, Quartaroli, & Riemer, 2012). The comparative case study in this research follows the hierarchic method, which means carrying out the case study in two stages. First, the cases are examined individually and independent from each other. The results of the first stage are used to compare them in the second stage, looking for similarities and differences. Since a case study approach aims at intensive data generation, a small domain, consisting of a small number of cases, is sufficient. Those cases can be a strategic sample, meaning the cases can be selected by the researcher. There are four main reasons for the choice of a comparative case study. First, the research is practice oriented, aiming at developing a set of recommendations. Since light rail projects are highly complex systems embedded in a project context, it is helpful to obtain a general picture of the case, which is easier by using case studies rather than surveys. This general picture of the project context allows to anticipate consequences of the proposed recommendations. Second, compared to a survey or an experiment, not much pre-structuring is required using a case study approach, which makes it more flexible to change during the research process. This flexibility is needed because the results of the previous research stage shape the interviews conducted in the following stage. Third, the data gathered in the field, from experts involved in real light rail projects, can result in higher acceptance, compared to the results of a complex survey or artificial experiment (Verschuren, Doorewaard, & Mellion, 2010). Fourth, the small number of cases needed, matches the similar small amount of PPP light rail projects in reality

and the selective sampling fits perfectly with the idea of selecting only cases within a similar project context (political, legal background) and a similar contracting method (DBFM, DBFMO).

For the case study, relevant cases were selected in phase 1 of the research. Criteria for the choice of cases are the type of project (light rail project), the location (national as well as international cases), the use of a PPP, the use of a specific contract form (DBFM, DBFMO), the availability of information (reports available in English, connection to parties involved in the project, Mott MacDonald involved in the project) and the current status of the project (planned, tendered, under construction, operating, failed). Table 3 gives an overview of the light rail projects selected for the case study whereby the following chapters describe the projects further.

**Table 3: Selected light rail projects for the case study**

| Project | Country | City | Status | Lines | Project type | Contract | MM involved |
|---|---|---|---|---|---|---|---|
| Regio Tram Groningen | Netherlands | Groningen | Cancelled in December 2012 | 2 | new | DBFMO | yes |
| Brabo 2 | Belgium | Antwerp | Operation mid. 2019 | 1 | extension | DBFM x2 +DBF | no |
| Tram de Liege | Belgium | Liege | Financial close in Jan. 2019 | 1 | new | DBFM | yes (not in winning consortium) |
| Nottingham express transit (Phase 2) | UK | Nottingham | Operation Phase 1 (Phase 2) since 3004 (2015) | 2 | extension | DBFMO | yes |
| ION Rapid Transit (Stage 1) | Canada | Waterloo | Test phase planned to open in 2019 | 1 | new | DBFMO | yes (not in winning consortium) |

Source: P. Hoss

#### 2.1.3.1 Regio Tram Groningen

The Regio Tram Groningen project was supposed to service two new inner-city lines as a solution to the increasing traffic demands within the city of Groningen. A joint project organization was formed by the Municipality and the Province to prepare the tender in 2007 with an intended start of the new service in 2016. After three years of preparation, a Design Build Maintenance and Operate (DBFMO) contract was set out for tender in 2010, whereby the operation of the service was included to shift traffic volume risk to the private sector. After two parties entered into a competitive dialog with the authorities, the municipality of Groningen suddenly cancelled its cooperation due to the lack of political support two days before the tender closure and the winner of the tender has never been awarded. In December 2012 the project was finally abandoned. The tenders spend a lot of time, money (8 million euros per consortium) and effort in their proposals but were only compensated by 2 million euros. This example shows the high importance of broad political support from all parties and local stakeholder. Further, it displays the high complexity of DBFMO contracts and light rail projects in contrast to the limited capabilities of regional authorities, who's civil servants, boards and councils seem to lack the necessary expertise to fully comprehend the implications of using a DBFMO contracts (van Wassenaer, 2012; Working Party on Rail Transport (SC.2), 2012).

#### 2.1.3.1 Brabo II

Brabo II is the name of a multi-faceted project, extending the public transport network in Antwerp, the capital of the Belgian province Flanders. The project is part of the ''Masterplan 2020'', which aims at upgrading the mobility in the city. After the first projects of the masterplan, Brabo I and Livian I, were successfully completed under a DBFM scheme, Brabo II was set out for tender in 2013 and the preferred bidder was chosen in December 2014. The goal of Brabo II is to simulate intermodal mobility by allowing people, coming to the city by car or train, to access the city centre with the tram. Since other upgrades in the inner city of Antwerp were overdue, the Flemish public transport company 'de Lijn', the Flemish region's traffic roads agency (AWV) and the municipality

of Antwerp worked together and combined the 20km greenfield tram extension, brownfield road and urban development in the 200€ million project, including a short tunnel, two moving bridges, public spaces and underground parking. Financial close was reached one year after announcing the TramContractors as the preferred bidder and the SPV entered into three different contracts with the clients. A DBFM contract concerning the tram development, one DBFM contract for the roadwork and a DBF contract for the tunnel, the bridges and the public spaces. Work is expected to continue until mid-2019 (BAM, 2015; Beheersmaatschappij Antwerpen Mobiel, 2016; PFI, 2016).

#### 2.1.3.2 Tram de Liege

The Tram de Liege is an inner-city light rail project in the major Walloon city and the capital of Belgian's province Liege close to the Dutch and German boarder in the east of the country. In 2008, 41 years after the last tram was running through the streets of Liege ("Luik vervoer," 2017), regional politicians brought forward the idea of a new tram to address traffic issues in congested the inner-city parts (urbAgora, 2008). After several months of considering numerous options and taking into account the public opinion, the route was chosen and published in October 2011. The line will connect the suburb Herstal in the northeast with the multimodal interchange Sclessin in the southwest, running through the city centre with a length of 11.7km and 21 stops ("Liège: le tracé du futur tram a été adopté," 2011). In December 2011, the Walloon government approved the plans and gave the go ahead for the project with construction scheduled from 2015-2018 (TramLiege.be, 2011). In December 2014, the transport agency Société Régionale Wallonne du Transport selected the MobiLiège consortium of Alstom, BAM PPP PGGM and DG Infra for the DBFM contract. However, Eurostat, the European supervisory body for public accounting standards, refused to approve the project since they wanted to be 380€ million expenditure to be recorded at one time in the regional budged. The Walloon government adjusted the project but issue remained the same and approval was denied two more times in July 2015 and January 2016 ("Eurostat's stoppage | The Liège tram," 2016). Consequently, the DBFM contract with MobiLiège was abandoned and a compensation of 1.6€ million was payed to the consortium. Nevertheless, the city of Liege had already spent 33€ million in preparatory works and after considering several scenarios, the regional government stayed committed to the project, stating it will be only delayed not buried with a new date of completion scheduled for 2022. (Ltd DVV Media International, 2016). A new tender was announced in march 2016 and, after Eurostat gave green light for the new proposal ("Eurostat positive opinion," 2017), two consortia, Tram'Ardent and MobiLiège 2.0 submitted their best and final offers in September 2017. On the 19 of September 2018, the Société Régionale Wallonne du Transport announced Tram'Ardent as preferred bidder (DVV Media International, 2018) and contracts were signed at the end of January 2019.

#### 2.1.3.1 Nottingham Express Transit Phase 2

The Nottingham Express Transit (NET) is a tram system in the city of Nottingham, located in the east midlands of England. The system was planned and executed in two phases. The construction of a tram system was identified as one possibility to stimulate urban renewal and dealing with the increasing road conjunction by the City and County Council in the 1980s. 167£ million funding for the project was confirmed by the Minister of Transport in 1998 and the Councils awarded a PFI to the Arrow Light Rail LTD consortium in early 2000 (Nottingham Post, 2015). This first phase, with £200 million total construction costs, connects the main station in the south of Nottingham with Hucknall and Phoenix Park in the north. The 14km line runs through the city centre, serves 23 tram stops and was supposed to be operated by the subcontracted Nottingham Tram Consortium for 30 years. Operation began in March 2004 (Railway Technology, 2016). However, economic benefits of only one line are limited and the council consequently promoted an extension, Phase 2, to serve the urbans areas south and west of the city centre. After a slight hiccup, caused by the change of leadership as a result of local elections in Nottinghamshire 2009,

the government re-ensured its support in 2010. In March 2011, the preferred bidder was chosen, and the contract awarded to Tramlink in December the same year. The new contract included the concession and the construction for Phase 2 as well as the operation and maintenance of the whole network. Therefore, the existing concession with Arrow Light Rail was terminated at the same time. Construction of the project began in July 2012 and Phase 2 stated operating with a delay of eight month in late August 2015 (Nottingham City Council, 2012; The Economic Strategy Research Bureau (ESRB), Nottingham Business School, 2016). Main reasons for the delay was the unexpected amount of buried services which had to be moved, problems with noise and vibrations along the route and delays in tracked replacement works (RTM, 2018).

#### 2.1.3.2 ION Rapid Transit (Stage 1)

The Ion Rapid Transit, is a regional transportation system in the region of Waterloo, located in the province of Ontario in central-east Canada. The first stage of the system connects Cambridge, Kitchener and Waterloo with a rapid bus transit service, regular bus service and a light rail transit line between Conestoga Mall in the City of Waterloo and Fairview Park Mall in the City of Kitchener. The fist idea of a rapid transit corridor dates back to 1976, when it was mentioned in the Regional Official Policies Plan. First planning began in 2000 and the project was included in the Growth Management Strategy in 2003. The council decided to implement the project in two stages and approved a funding scheme in 2011 and decided to opt for a DBFMO scheme in 2012. The tender was published in 2013 and GrandLinq (Conestoga Mall in the City of Waterloo and Fairview Park Mall in the City of Kitchener) was awarded with the contract for designing, building, financing, maintaining and operating the 19km long LRT line in 2014. Meanwhile, the planning for phase two, the extension of the LRT system from Fairview Park in Kitchener to Ainslie Street in Cambridge began. However, the operation of the second phase is not to be expected until 2026. Construction for stage one began in 2014, and the system was supposed to start operating in fall 2017. With unexpected findings of underground services and the discovery of a 200-year-old road, which puts construction on hold due to archaeological work for more than one month, the work on the LRT line was delayed several months. Bombardier, the provider of the rolling stock, had difficulties in delivering and testing the 14 vehicles for the LRT system and the planned operation was postponed to spring 2018, later to fall 2018 and finally to spring 2019 (CTV News Kitchener, 2017; Region of Waterloo, 2016, 2018).

### 2.1.4 Interviews

The main data collection method, used in the case study, are interviews conducted with parties involved in the light rail project of the corresponding case. By definition, an interview is a purposeful conversation between two or more people (Sekaran & Bougie, 2016). Since it is known what information is needed, a semi-structured interview approach is used, allowing to ask the individuals about their opinion of the relating research question but also leaves space for additional comments not covered by the questions asked. Whereby face-to-face interviews are preferred because they can establish rapport and motivate respondents, they are time consuming and can be cost intensive as well. Therefore, based on the geographic location of the cases, some interviews might be conducted via Skype or phone calls. Because the interviews, conducted in phase 2 and 3 of the research, are always based on the results of the previous phase, they are prepared, and respondents chosen, after those results are available. Meaning, the results from phase 1 were used to choose the participants and prepare the questions for the first interviews conducted in phase 2 and the results of phase 2 are used for the preparation of the second round of interviews, conducted in phase 3.

All interviews are following a similar structure. They start with a general introduction about the research and the purpose of the research to the interviewee. Next, the interviewee is asked for permission to record the interview. Audio recordings of the interviews help to validate the data and ensure accuracy and completeness (Sekaran & Bougie, 2016). After the introduction, the

interviewee is asked about their educational background and work experience they gained so far. This is done for two reasons, first to get an overview of their expertise which might influence their perception of the topic and second to get them in a talkative mood by asking a question which is easy to answer and non-threatening. Further, they are questioned about their role and their companies role in the project (one of the five case study cases) for the same reason (Barriball & While, 1994; Sekaran & Bougie, 2016). Afterwards, the questions related to the main goal of the interviews are asked. Those differ for the interviews conducted in phase 2 and phase 3 and are described in more detail below. However, they follow the same principles.

In contrast to a structured interview, the wording of the questions of a semi structured interview does not have to be exactly the same. Rather, the meaning of the question remains the same which standardizes the interviews and facilitates comparability (Denzin, 1989). Further, the freedom of a semi-structured interview allows the use of probes, which can be used to ensure the quality of the gathered information in various way (Barriball & While, 1994; Hutchinson & Wilson, 1992). Relevant issues raised during the interview can be clarified, sensitive issues can be explored in more detail, inconsistency between different answers can be clarified and it can help to assist the respondents to better recall information (Austin, 1981; Bailey, 1987; Gorden, 1975; Nay-Brock, 1984; L. Smith, 1992; Treece & Treece, 1973).

To get the desired answers, funnelling is used to narrow down the topic of interest from broad questions to more detailed ones. All the questions are meant to be unbiased to avoid influence the answer of the interviewee in a certain way (Sekaran & Bougie, 2016). After covering the main questions related to the purpose of the interview, some other, rather general questions are asked. The first question aims at identifying other possible interview partners with a different perspective or a more detailed insights on the subject of matter (snowball sampling), by asking the interviewee if they can think of anyone else who might be able to contribute valuable information (Palinkas et al., 2015). The second one asks the responded if there is anything else, they want to add which might not has been touched upon during the interview but still is important in their opinion. This enables them to bring up issues related to the subject which has not been covered with the interview, to emphasize the importance of issues already discussed, or to provide more general information which they assume to be helpful for the research goal (Zorn, 2005).

All the interviews are summarized by the researcher and validated by the respondent to ensure that it is in line with what they meant to say. The summaries, as well as the interview questions for round one and round two can be found in the appendix.

Those summaries are used to analyse the data, following the thematic analysis approach. This approach analysis the data in six phases: 1. The researcher reads and rereads the data to get familiar with the content. 2. Relevant information is coded. 3. The coded information is combined into broader themes. 4. The themes are reviewed and compared to the context of the subject. 5. Themes are redefined and named. 6. The themes are used to produce a written report (Braun & Clarke, 2006; C. P. Smith, Atkinson, McClelland, & Veroff, 1992).

Further, two more interviews are conducted with staff working in the spatial and transport planning department for the cities of Rotterdam and The Hague, to get more insights about the ongoing, but still confidential, discussion between the G4 majors and the prime minister. Even though those interviews are not directly related to the research questions, and the transcripts cannot be attached, the insights are still incorporated in the recommendations of this report. An overview of the interviews, conducted in different phases of the research, is presented in table 4.

**Table 4: Overview of conducted interviews, goals and respondents**

| | | Interviews phase 2 | Interviews phase 3 | Additional interviews |
|---|---|---|---|---|
| **Type** | | Semi-structured | Semi-structured | Not structured |
| **Objective** | | Identifying project characteristics that are related to the lenders criteria. | Identifying what decisions are taken, which subjects are considered making those decisions, when and by whom they are considered. | Insights in the ongoing G4 discussions and the bigger picture about the situation in the Netherlands |
| **Related to RQ** | | RQ2 a,b,c | RQ3 a,b,c | (indirectly RQ 4) |
| **Respondents** | Regio Tram Groningen | - John Laing, Head of Europe investment team<br>- Stibbe, Lawyer | - Municipal Council Groningen, Project Director<br>- Allen & Overy, Legal advisor on behalf of the public project team | - Transport and special planner's city of Rotterdam<br>- -Transport and special planner's city of The Hague |
| | Brabo 2 | - BAM PPP, Tender manger | - Flemish Region, Director of Finance | |
| | Tram de Liege | - DIF, Equity investor | - Walloon Region, Director of Finance | |
| | NET Phase 2 | - Nottingham City Councils, Tender manager | - Nottingham City Councils, Tender manager | |
| | ION Rapid Transit (Stage 1) | - GrandLinq, General manager | - Region of Waterloo, Transit and Transport Planner | |

Source: P. Hoss

#### 2.1.4.1 Interviews conducted in phase 2

The interviews in phase 2 are conducted to answer the second research question. Namely, the identifications of light rail project characteristics which determine the attractiveness of the project to lenders. Those project characteristics interrelate to the criteria used by the lenders to asses a project. Further, is it examined if, and to what extent, the contracting authorities can influence those project characteristics by decisions taken in early process stages. Interviewees are people, involved in, or working together with the SPV of the corresponding case, since they faced the issue of achieving bankability themselves, when setting up the project company and preparing the tender. After conduction the first five interviews with five people involved in the projects, a sixth interview is added since several interviewees supposed to talk to a lawyer, familiar with details of the regulatory and legal context. Since the goal of the research is aiming at a light rail PPP in the Netherlands, a lawyer involved in the Dutch case study project and familiar with the national legal and regulatory context was chosen.

#### 2.1.4.2 Interviews conducted in phase 3

The decisions, connected to the project characteristics related to the lenders criteria identified in the previous step, are taken in different phases of the project process. The second round of interviews is conducted to determine what the main decision are and what subjects, considered when taking those decisions, can be identified. Therefore, the distinction into four different phases, introduced in chapter 3.5, is used. Further, it is assessed when and by whom those subjects are considered. Respondents are people involved on the public/contracting side of the case study projects.

## 2.2 Research Material

The research material, used in this research project, derives from three different research objects – documents, literature and people. Each research object has one or several sources of information, which are accessed in different ways. For documents and literature, the content of the different sources is accessed through analysis, whereby for the information from people is gathered trough individual semi structured face-to-face interviews. An overview of the used research material, including the source and the access strategy, for each sub questions is displayed in table 5 below.

**Table 5: Research objects, source and mode of accessing of the research sub questions**

| Research sub question | Research object | Source | Accessing |
|---|---|---|---|
| **RQ1 a** Which criteria can be identified? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | | - Conference reports/guidelines | Content analysis |
| | Literature | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| **RQ1 b** Which of those criteria can be influenced by the contracting authority throughout the decision-making process? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | | - Conference reports/guidelines | Content analysis |
| | Literature | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| **RQ2 a** What are the project characteristics of a rail infrastructure project interrelated to the lenders criteria and how do they interrelate? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | | - Conference reports/guidelines | Content analysis |
| | Literature | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| | People | - Involved project parties | Face-to-face interview |
| **RQ2 b** How do they differ from road infrastructure PPP's? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | Literature | - Conference reports/guidelines | Content analysis |
| | | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| | People | - Involved project parties | Face-to-face interview |
| **RQ2 c** Which of them and to what extend can they be influenced by the contracting authority in the decision-making process? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | Literature | - Conference reports/guidelines | Content analysis |
| | | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| | People | - Involved project parties | Face-to-face interview |
| **RQ3 a** What are the main decisions which influence | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |

| Research sub question | Research object | Source | Accessing |
|---|---|---|---|
| the project characteristics? | | - Conference reports/guidelines | Content analysis |
| | Literature | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| | People | - Involved project parties | Face-to-face interview |
| **RQ3 b** What subjects are taken into account when making those decisions and to what project characteristics are they related? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | | - Conference reports/guidelines | Content analysis |
| | Literature | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| | People | - Involved project parties | Face-to-face interview |
| **RQ3 c** When and by whom are those subjects taken into account? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | | - Conference reports/guidelines | Content analysis |
| | Literature | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| | People | - Involved project parties | Face-to-face interview |
| **RQ4 a** What recommendations, that influence the decisions leading to favourable project criteria, can be given to public authorities? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | | - Conference reports/guidelines | Content analysis |
| | Literature | - Journal articles | Content analysis |
| | | - Books | Content analysis |
| | | - Papers | Content analysis |
| | Results | - Results from previous RQs | Content analysis |
| | People | - G4 city officials | Face-to-face interview |
| **RQ4 b** To what extend are those findings in line with general PPP recommendations? | Documents | - Company reports/guidelines | Content analysis |
| | | - Governmental reports/guidelines | Content analysis |
| | | - Association reports/guidelines | Content analysis |
| | | - Conference reports/guidelines | Content analysis |
| | | - Journal articles | Content analysis |
| | Literature | - Books | Content analysis |
| | | - Papers | Content analysis |
| | | | Content analysis |

Source: P. Hoss

## 2.3 Research schedule

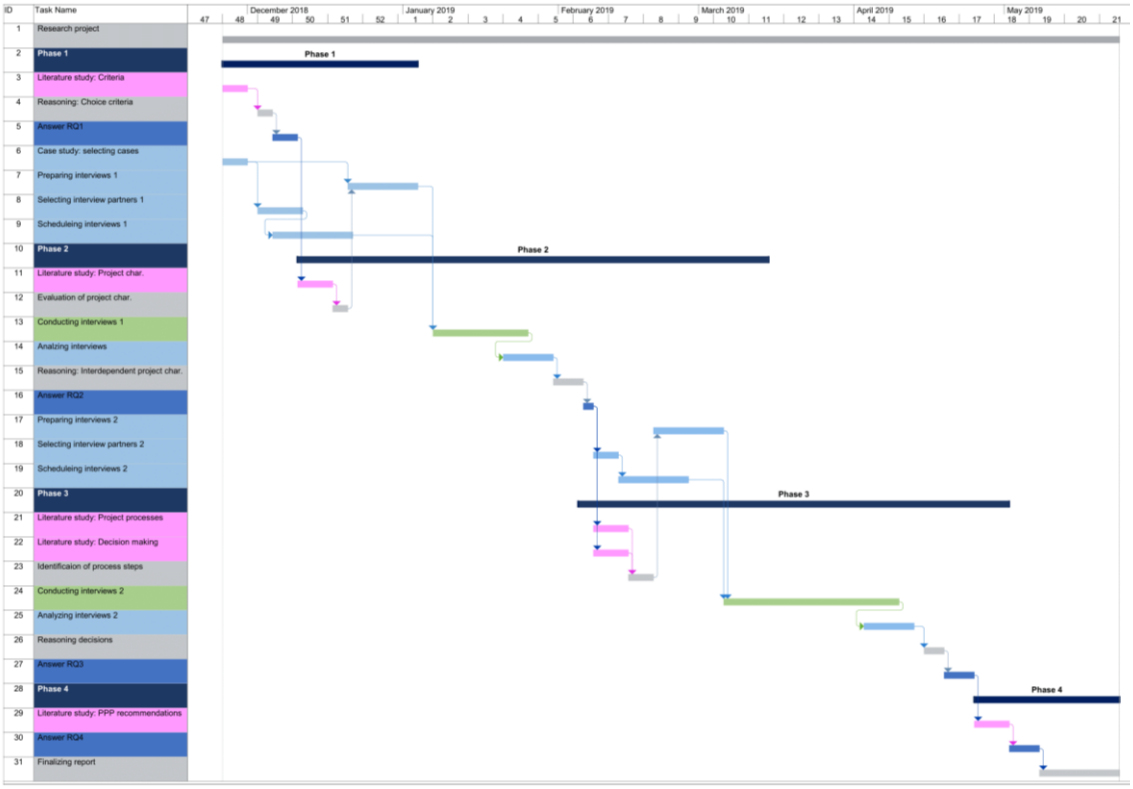
The research schedule is based on the research strategy outlined in chapter 2.2.1. The different research activities are conducted in four different phases, each of which related to one of the four research questions. All the durations given below are rough estimations that can be adjusted accordingly. Also, some activities might be spread out over a longer period but allow to perform other tasks in between. For example, the two weeks, which are scheduled for conducting the interviews, might turn out to be five interviews on five days within a three-week period. Thus, activities, which are planned in sequence, might be carried out simultaneously to fill the resulting gaps. However, for a better overview of the logical sequence, main tasks are scheduled one after another. In addition, the research activities do not only have to be carried out, but also documented in the research report. This 'writing report' activity is not separately mentioned in the research schedule since it is assumed to take place throughout the whole research process.

The research project is supposed to start on Monday the 26. November 2018 and runs for 112 working days, finishing at the 30. of April 2019. In between there is a two weeks break, considering the holidays around Christmas and New year (22.12.18 – 04.01.19), in which only the preparation of interviews is scheduled.

No specific buffer is added since the activities themselves include some buffer and weekends can be included in busy times. Further, no consequences are to be expected from a project delay.

The research schedule is displayed in figure 6 below and a larger version can be found in Appendix 1.

**Figure 6: Research schedule**




Source: P. Hoss

## 2.4 Risk assessment

Since the research conducted can be seen as a project itself, it is, like all projects, exposed to certain risks (Barkley, 2004). To ensure a smooth project process, it is helpful to be aware of the main risks and ways to deal with them. Therefore, table 6 below displays important potential risks, describes them briefly, estimates their likelihood of occurrence, evaluates their potential impact on the project and shows measures to mitigate them (Bissonette, 2016).

## Table 6: Assessment of project risks

| Risk | Risk description | Likelihood | Impact | Mitigation |
|---|---|---|---|---|
| **Interview partners not available** | Decisions makers of public authorities are not available for interviews, are not approachable or cannot be identified at all. | **Medium**<br>Since the decisions makers often employ important roles within their work environment, it is quite likely that they are busy and hard to approach. | **High**<br>The interviews are a crucial part of the case study and next to literature study the main data gathering method. | - Cases where Mott MacDonald was involved in the project are preferred since the existing connection might be helpful to approach the Interviewees<br>- Interview partners are selected and approached in a very early stage<br>- More potential projects for the case study are identified to have the opportunity to exchange a certain project if there is no one approachable |
| **Scheduling of interviews doesn't comply with planning** | The interview partners have a schedule themselves and might not be available for interviews within the designated period. | **High**<br>The decision makers are quite likely to be busy and it cannot be expected that they all have time for interviews within the planned period. | **Medium**<br>The research follows a logical order, with each research questions relying on the answers of the previous one. Delays in answering one questions subsequently delays the whole research process. However, this does not lead to a major problem since a delay of the project has no negative consequences. | - A flexible planning allows interviews within a broad timeframe<br>- Interview partners are approached early to increase the likelihood of scheduling an appointment within the designated period<br>- The second interview is scheduled in the beginning or when conducting the first interview |
| **Limited support by supervisors** | The company, as well as the University supervisors, are busy with their own work. Further, they might be out of office for extended periods. Therefore, support cannot always be guaranteed. | **Low – Medium**<br>There are two supervisors on both sides, so it is very unlikely that all of them are not approachable at the same time. | **Low – Medium**<br>The research project is designed as an independent work of the student; the availability of the supervisors is usually not of high importance. However, if problems arise or when reaching certain milestones (for example the green light meeting), their availability can affect the process. | - Good and frequent communication with supervisors<br>- Early scheduling of meetings<br>- Possibilities of a delay are investigated: No consequences from the University and there is the possibility to extend the contract with the research owner, Mott MacDonald |
| **Wrong estimation of activity durations** | It might be possible that some activities might take longer than expected and scheduled in the initial planning. | **High**<br>The planning of the research process is scheduled in advance and all the durations are estimated based on vague assumptions the likelihood of occurrence is quite high. | **Low**<br>It is also possible that durations are overestimated, and there are no severe consequences for a delay, the impact on the research project is rather low. | - Monitoring of the research progress<br>- Additional capacities on weekends<br>- Adjusting the plan throughout the process |
| **Scope creep** | Continuous and uncontrolled growth in the project scope. | **Medium**<br>Possible to some extend since the research builds up in each phase and the results cannot be foreseen completely until the previous phase is completed. | **Medium**<br>An increased scope can lead to insufficient resources and delays. | - Clearly defined scope in the RQs<br>- Continuous comparing the original scope with the activities conducted at any moment<br>- Interviews prepared after results of the previous phase which makes them more flexible to adopt changes |

Source: P. Hoss

# Section III: Background

This section provides the theoretical background of the research and the main components of the research framework in which the research questions are placed. First, the current situation regarding private investments in rail infrastructure is outlined (3.1). Second, the scope of private financing in rail projects and light rail is defined (3.2) and the different types of private investments respectively related contract forms are presented (3.3). In addition, the parties, involved in a DBFM(O) PPP project, are introduced (3.4) and the project phases used in the research framework are explained (3.5)

## 3.1 Situation in Europe and the Netherlands

**Private investment in infrastructure in Europe**

Private investment in infrastructure projects has a long tradition in many countries, but gained more significance in the 1980s, when private sector thinking was introduced and marked-based criteria were applied to public sector projects and services (Pierre, 1997). Early examples of private investment can be found in Spain, where the first toll roads have been privately funded in 1968. Around a decade later, the UK conservative government used private capital to decrease public involvement in the economy. Public-private-partnerships (PPPs) became a preferred method for economic regeneration (Bult-Spiering & Dewulf, 2006).

**PPP history in the Netherlands**

In the Netherlands, public private partnership was first introduced in 1986, by the government stating the new policy: ‘New structures of public and private co-operation are founded, including local government, local business and, if necessary, central government, aimed at raising investments in urban renewal.’ (Lubbers, 1986)

Since then, private investment in infrastructure was emerging in the Netherlands, mainly driven by the reconsidered role of the government and the need for more efficient approaches to apply on large scale infrastructure projects (Kouwenhoven, 1991; Lemstra, 1996). In 1998, the administration under Wim Kok was confronted with insufficient public funds and the pressure to meet certain desires for new infrastructure. Thus, the government identified a variety of infrastructure projects suitable for private investment and put the use of PPPs on the political agenda. Projects which seemed to be suitable for private investment were various motorways (A4 Delft-Schiedam, A59 Geffen-Oss, N31 Leeuwarden-Drachten,N301 Hilversum-Haarlem), the development of the Rotterdam dockland area (second Maasvlakte) and two major rail projects (HSL-South, Betuwe Line) (Hörchner, 1999; *Meer Waarde door Samen Werken - Eindrapport*, 1998). In 2005, the Dutch government started to develop standard DBFM contracts and standard tender guidelines, resulting in an impressive pipeline of projects, including mainly roads and locks. One year later, in 2006, the Ministry of Transport, Public Works, and Water Management established a PPP unit, beginning a rigorous campaign for PPP development.

**PPP examples in the Dutch rail sector**

Three projects, worth mentioning in the PPP history in the Netherlands, are the HSL-South, the Regio Tram Groningen and the Betuweroute. Since the Regio Tram Groningen is the only light rail PPP project in the Netherlands so far, and therefor included in the case study, it was described already in chapter 2.1.3. The two other ones are outlined briefly below.

The HSL-South a 125km high speed line between Amsterdam Central and the Belgian border with a total investment of 4.55 billion euros, was opened in 2009 after a long delay mainly caused

by political discussions about signalling systems. The project was split into three parts, the substructure, contracted under six Design and Construct (D&C) contracts, including the whole substructure, tunnels, bridges and connections to existing rail lines. The second part, the superstructure with an NPV of 500 million euros, was awarded to the consortium Infraspeed (Fluor, Siemens, Royal BAM Group, Ballast Nedam, Innisfree) and consisted the concrete slab, rails, signals, safety systems and the electrification. The DBFM contract used in the project was based on the UK SoP1 model and lead to a completion within time and budged in 2007. The third and last part, the rail concession, was awarded to a joint venture of Dutch Railways and KLM. This division of the project in three parts was necessary, since the Dutch government had not the experience to contract such a large and complex project. Since all the interface risks were borne by the government and the system could not start operating due to missing specifications required by the government, they had to pay the infra provider the full availability payment for two years without receiving the concession. In 2011, the Dutch ministry of Transport had to intervene to save the concessionaire from bankruptcy (van Wassenaer, 2012).

The Betuweroute is a 160 km long transport railway track running from the port of Rotterdam to Zevenaar in the east of the Netherlands close to the German border. The idea was born in the 1980s, when a lobby of companies in Rotterdam and public officials demanded a train connection to the German border. In 1993, the decision was made to construct the track with an estimated value of 2.5 billion euro whereby 830 million should be contributed by private parties who could recover their costs during the operation phase by user payments. Private investment was of high political importance and the Mister of Transport declared that no shovel would touch the ground if the private financing is not secured. One important factor of the economic success of the project was the implementation of a new transport policy, aiming at a shift of transport from road to rail. However, this policy wasn't implemented, and experts started doubting the viability of the project. Further, the line crosses several nature reserves and residential areas, around 100 houses had to been demolished, leading to increasing resistance of the public and expensive changes in the planning. Project opponents tried to stop the project several times, but the government explained that the point of no return was reached and there is no going back. The final costs of the projects, finished in 2008, reached 4.7 billion euro, exceeding the initial budged about 40-50%. The whole project was a failure, private parties were not willing to invest, and the government had to contribute to the cost of operation. The initial idea to include private funding was ignored when pursuing the execution of the project even if the viability wasn't ensured anymore("Betuweroute Double-Track Freight Line," n.d.; Koppenjan & Leijten, 2007).

In 2010 a report was published, including all tendered PPP projects, showing the achieved increase in value-for-money of PPP projects which is the driving force behind PPP projects in the Netherlands (Working Party on Rail Transport (SC.2), 2012).

**Current railway market in the Netherlands**

The Nederlandse Spoorwegen (NS) is a Dutch stated owned company and, amongst other smaller ones, the principal passenger railway operator in the Netherlands, providing rail services on the Dutch main rail network. The maintenance and extension of the network is currently executed by ProRail, a private company under Dutch law and the state of the Netherlands as sole stakeholder trough Railinfratrust BV. ProRail is charged with the management concession as described under the Dutch Railway Act (section 16). The concession is granted by the Minister of Infrastructure and management, currently from 2015 to 2025, making ProRail responsible for:

- 'the maintenance of the main railway network,
- the preparation and performance of the expansion of the main railway network,
- the fair, non-discriminatory and transparent allocation of capacity of the main railway network, control of the traffic on the main railway network' (ProRail, 2018).

This vertical separation, enforced in 2002, between NS and ProRail has, after difficulties in the beginning, improved punctuality, reliability, capacity and safety of the network and stimulated competition in the regional transport and freight transport sector (*The impact of separation between infrastructure management and transport operations on the EU railway sector*, 2011). ProRail is outsourcing the maintenance work and mainly using DB contracts and a fixed price reward system. Other forms, such as DBFM(O) contracts, involving private financing, are a rare exception and contrary to ProRail's procurement strategy (Eriksson & Lingegård, 2016). Therefore, this research focuses its attention on urban and regional light rail projects, which are not influenced by the policy of ProRail but managed by regional asset managers such as GVB in Amsterdam, RET in Rotterdam, HTM in The Hague and RTU in Utrecht who act as asset manager, network controller and operator in one.

## 3.2 Scope of rail projects – Light Rail

Private investment, especially in the form of PPP using DBFM(O) contracts, can contribute to a variety of areas in rail infrastructure as displayed in figure 7 below.

**Figure 7: Range of investment in rail under PPP schemes**


Source: Adopted from Working Party on Rail Transport (SC.2) ad Hoc Workshop PPP Schemes and Railways Financing. (2012). (Conference report No. SC.2)

Generally speaking, the range of investment is large, and the cases are few. However, due to the limitation in time, the main focus of the research initiator and the procurement policy by ProRail explained above, the scope of this research project is limited to private investments in new infrastructure for light rail projects which can or cannot include the rolling stock.

**Light rail in the Netherlands**

Even if light rail seems to be a relatively new concept of public transport, the first definition was given by the Transportation Research Board in 1987:

'Light rail transit is a metropolitan electric railway system characterized by its ability to operate single cars or short trains along exclusive rights-of-way at ground level, on aerial structures, in subways or, occasionally, in streets, and to board and discharge passengers at track or car-floor level.' (*Glossary of Urban Public Transportation Terms*, 1978)

This definition, which is still valid, was replaced by a new one in 2010 to make a clear distinction between light rail and other rail bound forms of transport:

'Light rail is a rail-bound mode of public transport for cities and urban regions. Contrary to train (heavy rail) and metro (subway, underground) light rail principally is able to be integrated within public realm, sharing public space with other traffic to some extent.' (RVDB/Lightrail.nl, 2010).

Light rail usually covers a medium sized area, is integrated in the environment, has several crossings with other traffic modes, is often prioritized at junctions, common stopping distances reach from 0.4 – 2 km, train signalling is often applied and the vehicle capacity is medium (van Oort, van der Bijl, & Roeske, 2014). Those light rail characteristics are summarized in table 7 below and compared to other modes of rail bound infrastructure.

**Table 7: Characteristics of light rail compared to other modes.**

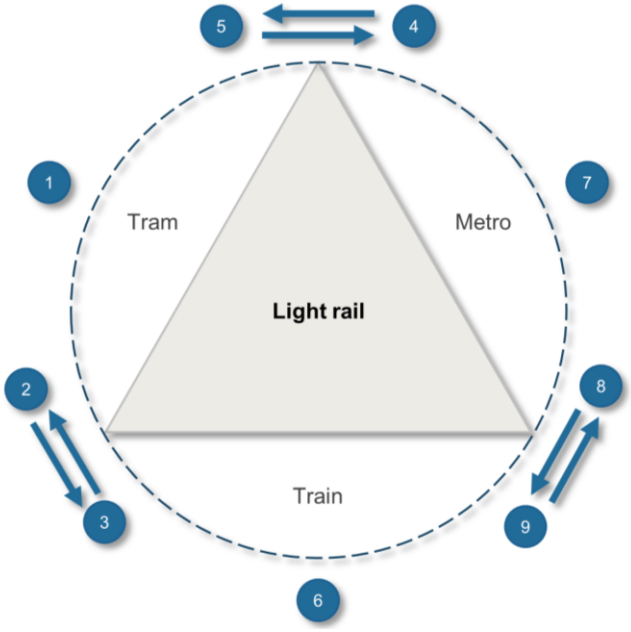
| | Light rail | Train | Tram | Metro |
|---|---|---|---|---|
| Covering area of the system | Medium | Large | Small/Medium | Small/Medium |
| Connection to environment | Integrated | Exclusive | Integrated | Exclusive/closed |
| Crossings with traffic | Several | Few | Many | None |
| Priority at junctions | Often | Always | Sometimes | NA |
| Stopping distance | 0.4 – 2 km | 2 – 100 km | 0.2 – 0.8 km | 0.4 – 2 km |
| Train signalling applied | Often | Always | Sometimes | Always |
| Vehicle capacity | Medium | High | Low | Medium/high |

Source: adapted from Uitweg uit de spraakverwarring. Definitie en begrippenkader Light Rail, (Baartman, Van der Bijl, & Van Witsen, 2010)

The table presented above suggest light rail being a separate form of transport compared to tram, train and metro. However, hybrid forms are common in reality and therefore a more comprehensive distinction, is displayed figure 8 below.

**Figure 8: Scope of light rail systems**

| Light rail | Non- light rail |
|---|---|
| 1 (Regional) tram | 6 Train |
| 2 TramTrain | 7 Metro |
| 3 TrainTram | 8 MetroTrain |
| 4 TramMetro | 9 TrainMetro |
| 5 MetroTram | |




Source: Adopted from van Ort et al. (van Oort, van der Bijl, & Roeske, 2014b)

In 1997, the Dutch government noted nearly 30 light rail initiatives, whereby fifteen of them gained support (De Bruijn & Veeneman, 2009). However, most of the plans have been cancelled at different project stages and only two projects, the RandstandRail and the Uithoflijn, have actually being constructed. Factors for failure of projects include changing the scope of the project during the implementation, interface risks of project components, too few project variants or alternatives, uncertainty between the relation of different governmental layers, change in political climate, insufficient integration of the project in the spatial development and urban planning policies (van Oort et al., 2014).

## 3.3 Contract forms and private financing

Transport infrastructure projects can involve private financing in a variety of ways. A concession scheme, initiated by public authorities, sets the private sector in charge for providing the capital asset as well as the service, whereby they are reimbursed by public sector payments. privatization transfers the ownership rights to the private sector, leaving the government only a regulating role in some cases. A contracting out scheme makes the private sector only responsible for providing services but not any of the capital assets (Debande, 2002). On a project scale, reaching from a completely public to a completely private project, different contract schemes can be distinguished, which influence the financing of the project (E. R. Yescombe, 2007). An overview is presented in table 8.

**Table 8: Range of infrastructure provision from public to private with contract forms**

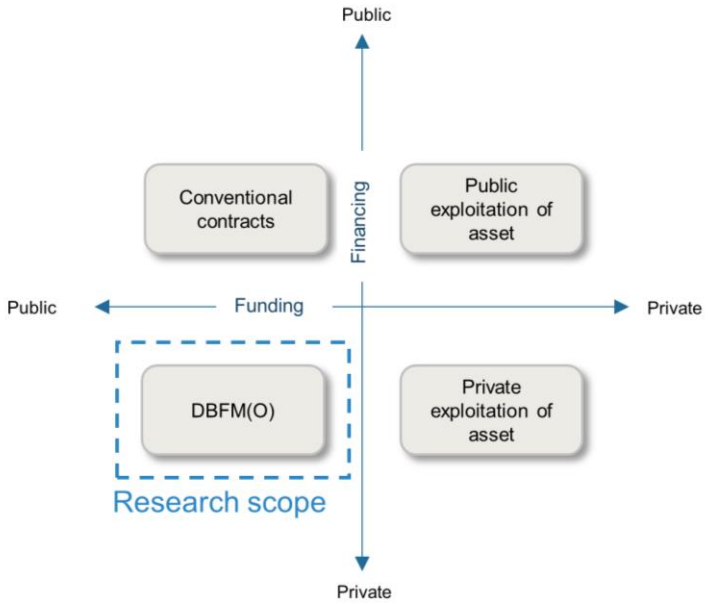
| | Public project ◄ | | | | | ► Private project |
|---|---|---|---|---|---|---|
| | | ◄ Public-Private-Partnerships ► | | | | |
| **Contract Type** | **Public-sector procurement** | **Franchise (Affermange)** | **Design-Build-Finance-Operate (DBFM) *** | **Build-Transfer-Operate (BTO)**** | **Build-Operate-Transfer (BOT)***** | **Build-Own-Operate (BOO)** |
| **Construction** | Public sector | Public sector | Private sector | Private sector | Private sector | Private sector |
| **Operation** | Public sector | Private sector | Private sector | Private sector | Private sector | Private sector |
| **Ownership** | Public sector | Public sector | Public sector | Private sector during construction, then public sector | Private sector during Contract, then public sector | Private sector |
| **Who pays?** | Public sector | Users | Public sector or users | Public sector or users | Public sector or users | Private sector offtaker public sector, or users |
| **Who is paid?** | n/a | Private sector | Private sector | Private sector | Private sector | Private sector |

* Also known as Design-Construct-Manage-Finance (DCMF) or Design-Build-Finance-Maintain (DBFM)
** Also known as Build-Transfer-Lease (BTL), Build-Lease-Operate-Transfer (BLOT) or Build-Lease-Transfer (BLT)
*** Also known as Build-Own-Operate-Transfer (BOOT)

Source: adapted from Yescombe (E. R. Yescombe, 2007)

Within Europe, most privately financed rail projects are contracted under the DBFM(O) scheme, which means transferring the construction and the operation to private the sector, while the public sector keeps the rights of ownership. This also implies, that the private investors are responsible for raising the money for the project and the costs are borne by the public sector or the users of the infrastructure. In contrast, conventional contracts are public funded and financed as shown in the figure 9 below (Ministerie van Financiën, 2012). Financing hereby relates to the initial capital, which is raised by the private sector to cover the project expenses, whereas funding relates to the costs of the project, usually born by the public sector or covered by charging user fees (Roosjen, 2013).

**Figure 9: Financing and funding of construction projects**




Source: adopted from Huijsman (Huijsman, 2010)

The DBFM(O) contract type, developed within the context of the Private Financial Initiative in the UK in the 1990s, combines innovative tendering with private investment and increases the ability of the private sector to realize design efficiencies. The main goal of using a DBFM contract is

adding Value-for-Money, so achieving a high quality output with the same financial resources available (*Op de goede weg en het juiste spoor – Advies van de Commissie Private Financiering van Infrastructuur*, 2008). This increased efficiency can be achieved for large projects, in which the benefits outweigh the increase in transaction costs. Hence, a minimum project value of 60 million euro is set by the Ministry of Finance (Ministerie van Financiën, 2012). To ensure that Value-for-Money is added, core principals are established. The first principal is the allocation of risks to the party most capable of handling it. By transferring the long term risk to the private party, they have an incentive for constructing and maintaining the asset in the most economic and efficient way possible (Eversdijk & Korsten, 2009). A second principal is the life-cycle approach, taking into account the whole contract's term, usually set to 15 to 30 years in the Netherlands. This time reflects the period over which the government wishes the service to be provided (National Audit Office, 2010). Third, by payments made on the basis of availability of the asset specified by certain output criteria, the government buys a service rather than a product which enables private parties to be more innovative since they are not bound to specific technical specification anymore (Ministerie van Financiën, 2012). In addition to those principals, which are believed to add Value-for-Money, a DBFM contract is also a way for governments for off-balance-investments, since the payments have to be made only when the project is realized already. Adding the operation of the project into the contract, so changing a DBFM to a DBFMO contract, usually transfers the volume risk to the private sector (*Op de goede weg en het juiste spoor – Advies van de Commissie Private Financiering van Infrastructuur*, 2008).

The comissionee of a DBFM contract is usually a special purpose company (SPV), which arranges the financing, usually a mix between equity (10-20%) and debt (80-90%). Equity can be provided from different sources. Typically, equity is provided by capital shares of contractors or industrial developers, who are involved in the project themselves. Further, financial investors, who are not involved in the project, can contribute as co-investors. Through Initial Public Offerings (IPOs), retail investors providing equity are becoming more common in very sophisticated markets. Mezzanine, junior and subordinated debt are usually provided by industrial contractor/ shareholder investors for tax for tax and accounting benefits (APMG, 2018; EPEC, 2011). Debt financing usually consist of loans from commercial or investment banks, institutional investors or shadow lenders. Bonds are used get money directly from capital markets (for example pensions funds, insurance companies etc.) Other debt sources include structures like leasing, supplier credits, supplier financing or Islamic financing (APMG, 2018). Private Commercial loans are arranged with banks or other investors and usually managed by a lead arranger (Ministerie van Financiën, 2012). To decide whether or not a project is suitable for financing by international financial institutions, they usually apply a set of specific criteria which they compare against the project characteristics. Those criteria include: The quality of the cost estimation, the degree of competition within the sector, the degree of public and political support, environmental issues, SPV shareholder structure, risk allocation within the project and many more (Working Party on Rail Transport (SC.2), 2012).

## 3.4 Involved project parties

Different parties are directly and indirectly involved in an infrastructure project contracted using a DBFM(O) scheme. This chapter provides brief description about the most important ones, about their relations to each other and the organization scheme of the DBFM(O) contract.

Public Authority:

The Netherlands has three levels of government, the state government on a national level, the provinces and the municipalities on a regional level. They themselves, or a public-sector organization, e.g. ProRail, can act as client of the infrastructure project and grants a concession, using a DBFM(O) contract to the Special Purpose Vehicle (SPV). Since the project hast to fulfil

societal need, the infrastructural client is mostly concerned about the timely completion of the work and the usability according to the output specification rather than the aesthetical design. To accumulate the expertise necessary to carry out a project under a DBFM contract, the client usually hires management, legal, technical, insurance and finance advisors. The decisions the public authority makes throughout the project process, shapes the projects and has a major influence on the project characteristics (Boot & Bruggeman, 2010; Bult-Spiering & Dewulf, 2006).

Special Purpose Vehicle (SPV):

The Special Purpose Vehicle (SPV), also referred to as Project Company, is the contracting party responsible for the design, finance, building and maintenance of the project according to the output specifications set in the DBFM contract. It is a multidisciplinary consortium, taking care of all contractual and financial activities related to the project. It 'manages the asset during the contractual period and bears the risk of failing' (National Audit Office, 2008). Since the high complexity of most projects, the consortium consists of several parties, such as contractors, project managers, maintenance companies etc. They contract the lenders and investors, as well as an insurance company with the help of external management, legal, technical, insurance, market risk and finance advisors.

Investors:

The investors contribute with private equity to 10-30% of the financing. In most cases, they are industrial parties and also stakeholders in the project. The high return rate of equity investments reflects the relatively high risk of loss in case of project failure. The SPV repays the amount with an additional dividend (E. Yescombe, 2013).

Lenders:

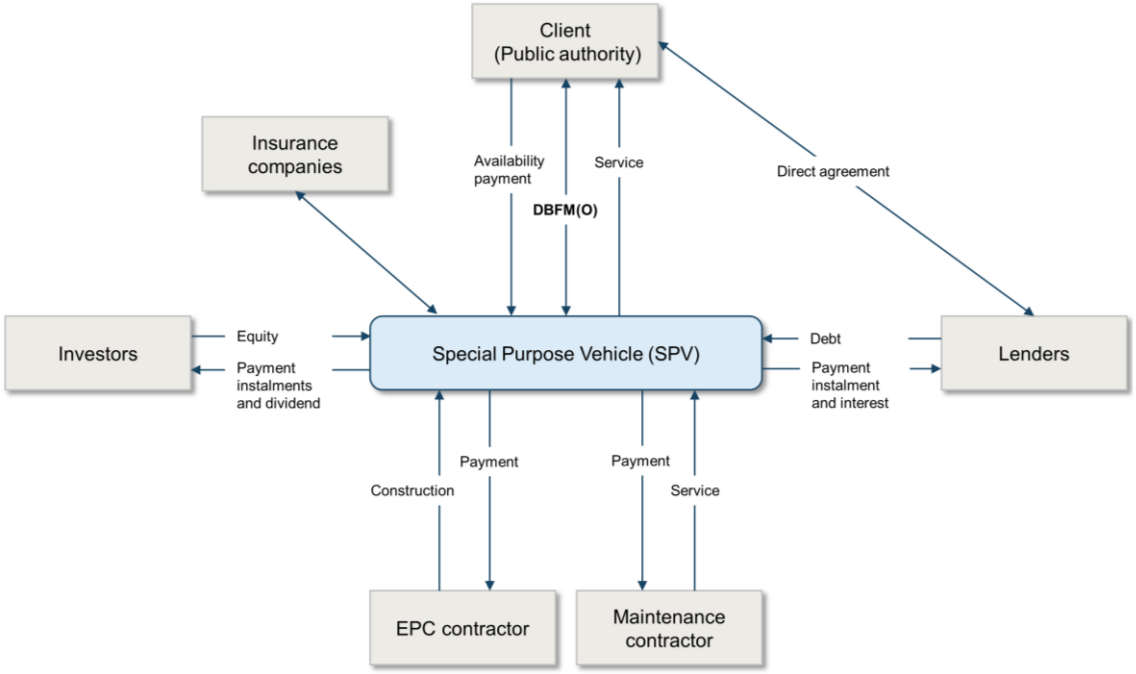
The main source (70-90%) of private finance is debt financing, mainly provided by banks or bonds – the lenders. Because of their relatively high share in the project financing, the attractiveness of the project is of high importance and in the main focus of this research. Since their knowledge is mostly limited, they also hire external advisors. This due diligence results in an early-stage via the SPV (Akintoye, Beck, & Hardcastle, 2003). The receive their money back in payment instalments with an additional interest. Further, they also have a direct agreement with the client, enabling them to step in directly when the SPV cannot finish the project (Koster & Hoge, 2008).

Contractors:

The SPV contracts different contractors to execute the construction work and provide other services. In most cases, two main contractors can be distinguished, the engineering, procurement and construction (EPC) contractor and the maintenance contractor. In cases where the operation is included in the contract (DBFMO) arrangements, there is also a contractor responsible for the operation of the infrastructure or system. All contractors are paid by the SPV based on their Design & Build or service contracts and bear a part of the project risk, passed on by the SPV.

An overview of the different parties and their organization in a DBFM project is displayed in figure 10 below.

**Figure 10: Organizational scheme of an infrastructure project under a DBFM contract.**

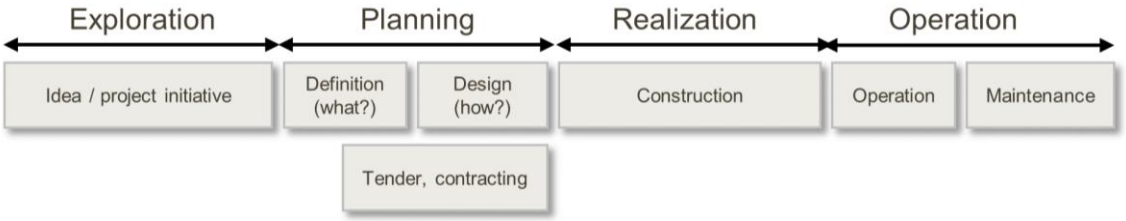



Source: P. Hoss

## 3.5 PPP Project process stages

From the initial idea of a new infrastructure project to the actual completion and the availability of the desired service, the project undergoes a complex process. Within this process, certain stages can be identified. First, a project idea, followed by the project initiative is set up. This is called the exploration phase. Second, the planning phase defines the 'what' and 'how' of the project, meaning to come up with an exacted project definition. The tender procedure is planned, created, published and executed. After the evaluation of the offers, the winner is awarded with the project and contracts are finalized. The realization phase is the execution of the project planning according to the terms set in the contracts. Afterwards, the project enters the operation phase which includes the operation and maintenance of the infrastructure asset. There is not always a clear distinction between those stage, but rather a smooth transition from one to another. Overlaps between those stages are also possible in practice (Department of Public Enterprises, 2002; EPEC, 2018; Lepel, 2015; Van Valkenburg & Nagelkerke, 2017). However, it can still be helpful to identify those stages for practical reasons. One of them is to advise the client of the project at the right time during the process, to maximize the influence of decisions shaping the project characteristics. Generally, early decisions are expected to have an higher level on influence and lower expenditures since changes are adopted more easily (Paulson & Asce, 1976). The main process stages are displayed in figure 11 below.

**Figure 11: Project process stages**

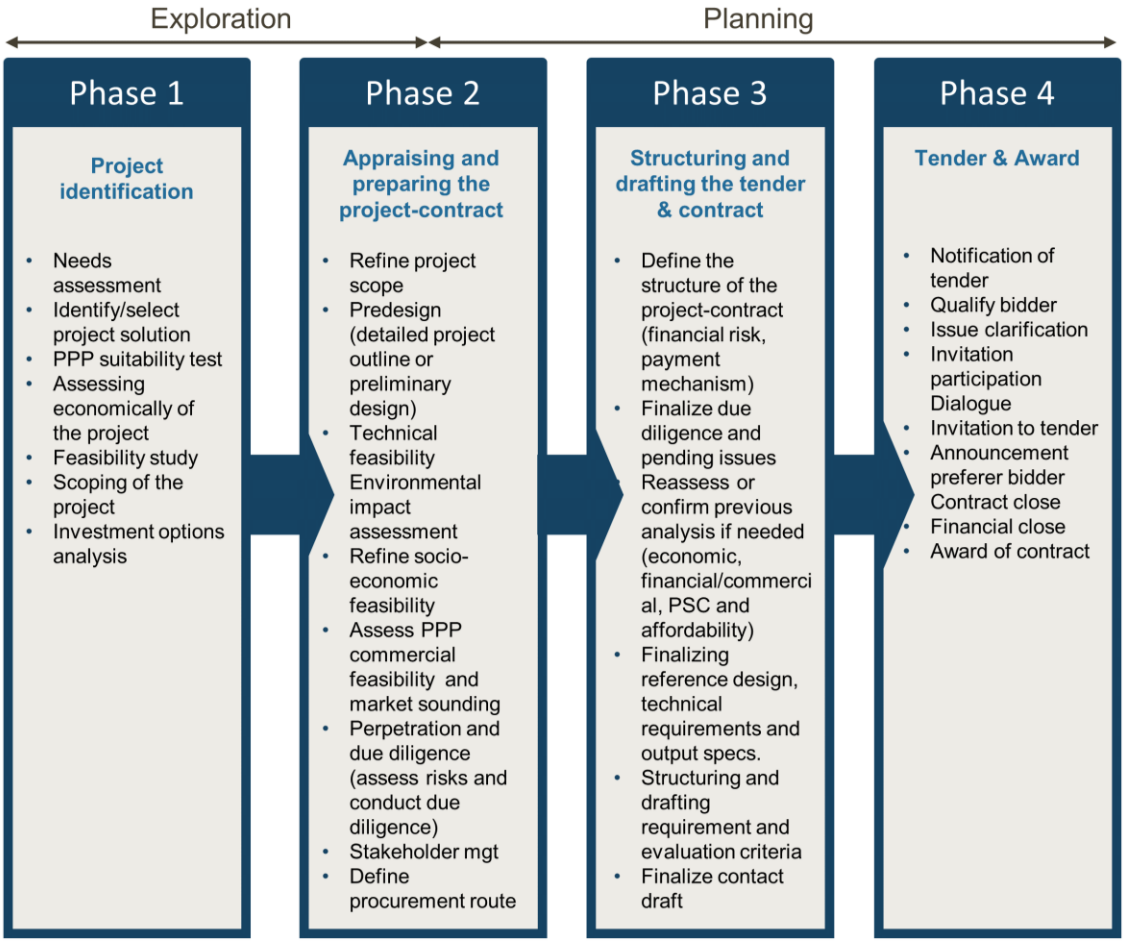



Source: Adopted and changed from (Op de goede weg en het juiste spoor – Advies van de Commissie Private Financiering van Infrastructuur, 2008),

Regarding the different phases of a PPP project, different approaches are taken to sequence the project process. Looking at supportive PPP documents from institution like the EPEC, the PPIAF or the MFIG, they all distinguish four to five different phases (EIB, 2015; Government of India, 2010; PPIAF/World Bank, 2009). Further, academic literature, dealing with different issues in relation to PPP projects, introduces additional ways of dividing the lifecycle into several phases, (Carbonara et al., 2015; Demirag, Dubnick, & Khadaroo, 2004; Yuan, Zeng, Skibniewski, & Li, 2009). All of those approaches are quite similar in nature, however, especially the academic ones tend to use a finer division for the phases of interest compared to phases in the rest of the lifecycle.

Since this research is focusing on the early process stages, an approach from the 'APMG Public-Private Partnerships Certification Program: PPP-Guide 'is adopted, in which, the 'Exploration' and 'Planning' phase, displayed in the graph above, are divided further into four project phases. Phase 1 is the 'Project Identification', phase 2 deals with 'Appraising and preparing the project-contract', followed by phase 3 'Structuring and drafting the tender & contact' and phase 4 the 'Tender & Award' (APMG, 2018). This distinction is used as a framework for answering the question, when the decisions, determining the project characteristics related to the lenders criteria, of the public authorities are made (RQ3 c). Figure 12 shows this framework and provides an overview of the main issues concerning the various phases.

**Figure 12: PPP project phases in the exploration and planning stage**




Source: Adopted and changed from the APMG Certification Guide (APMG, 2018)

Those general phases apply, despite minor variation, in most of the European countries and therefore in the Netherlands as well. However, there are several ways in tendering a PPP project, whereby the most common one in the Netherlands is the competitive dialogue. Meaning, phase 4, the 'Tender & Award', starts with the notification of tender, followed by a selection stage, in which candidates can request to participate. Based on suitability requirements, including issues such as the economic and financial standing, the project management expertise and the project financing expertise, the candidates are admitted to the dialogue stage. This stage is usually structured in two successive phases, whereby only three remaining parties are invited to the second dialogue stage. After this stage, the parties are invited to submit their best and final offers, which are usually assessed based on the criterion of the most economically advantageous tender (MEAT), whereby the exact criteria can differ for every project but usually involve issues such as risk allocation, sustainability, stakeholder management, restraining construction and traffic nuisance. Based on this assessment, a preferred bidder is announced, and after the contract close and financial close, the contract is awarded (Van Valkenburg & Nagelkerke, 2017).

## 3.6 Decision making in PPP projects

Implementing a PPP project and steering it through the phases of its lifecycle requires taking a lot of decisions, which finally influence the value-for-money of the project and consequently its success (Yuan et al., 2009). Consequently, a decision making framework, improving the efficiency

of the decision making process, is needed (Zhang X. Q., Kumaraswamy M. M., Zheng W., & Palaneeswaran E., 2002).

Carbonara et. Al. suggest a decision making framework they created by combining business process modelling with the empirical and practical knowledge in the field of PPP decision making (Carbonara et al., 2015). This framework leads to a decision-making tree, describing when certain decisions are made in the PPP lifecycle, in what area those decisions can be grouped in, which exact issues have to be dealt with, how those decisions can be made and by whom those decisions are made. This framework is used to structure the results of RQ3 and RQ4.

# Section IV: Lenders criteria & related project characteristics

## 4.1 Lenders' criteria

### 4.1.1 Two types of lenders

To identify the criteria used by lenders, the lenders themselves have to be identified first. Next to the equity provided by investors, there are two main sources of private money, contributing to the financing of the project (Brealey, Myers, & Allen, 2013).

The more important ones are commercial banks, which provide loans and get involved in the project negotiations with the public authorities. There are 20-30 big international banks, specialized in PPP investments, and certain local ones, which are usually involved in major PPP infrastructure projects (E. R. Yescombe, 2007). When arranging a project-finance, a lead arranger is appointed, who is ultimately responsible for underwriting the debt, and place them in the market and channels the communications by the bank syndicate and the SPV. The lead arranger of the credit can be an external financial advisor, who evaluates bids on the project by banks, or one (or several) of the banks themselves (Ministerie van Financiën, 2012). Using an external financial advisor as lead arranger increases the consultancy costs, which can make up to 1% of project capex, but also stimulates competition between the bidding banks. On the other hand, a bank as lead arranger, limits competition but also decreases the financial consultancy costs (E. R. Yescombe, 2007). The banks, typically experienced in PPP projects, evaluate the project and the long term viability themselves (Grimsey & Lewis, 2002; Pulido et al., 2018).

The second source of private financing are bond holders. The SPV offers bonds, whereby the issuer gets payed the money, and a fixed interested rate back at agreed date in the future. Most of the bonds are held by bond-investment funds, and attractive to insurance companies and pension funds, who favour a good long-term return with a low risk profile (E. R. Yescombe, 2007). In contrary to the commercial banks, the bond holders are seldom involved in due diligence processes and have significant less contact with the SPV. Bond investments are often arranged by investment banks, responsible for arranging and underwriting the financing, but not providing the financing themselves. They present the project to a credit rating agency, which rates the projects based on an independent project risk review. The investment bank conducts are market test, knowing the interested rate and other key conditions, and only commits to the financing after ensuring the availability of buyers. If the investment bank commits to the financing, they place the bonds with several investors, and can trade some of them to ensure liquidity (Noël & Brzeski, 2005; E. R. Yescombe, 2007).

Comparing the two sources, some differences can be recognized. First, the market for bonds is relatively small compared to the market of loans. Further, a project has to be large enough, to be suitable for bond financing. Bonds are usually issued for the long term, whereby banks are not naturally lenders for 20 years since their main business focuses on short term deposits (Noël & Brzeski, 2005). Also, bonds are tradable instruments and loans are not. In practice however, the loans are traded between banks, whereas the bond holders often hold on to their bonds. The repayment schemes of bank loans offer more flexibility compared to the repayment of bonds. Another difference is the interest-rate pricing, which is usually based on open-market quotations for bank loans but remains a 'black box' for bonds (Farquharson, Torres de Mästle, & Yescombe, 2011). The most important distinction related to the topic of this research, is the evaluation of the project by the lenders. As mentioned above, the banks use their own expertise and in-house

capabilities to assess the attractiveness of a project, whereby investment banks and bondholders rely on the rating of external credit rating agencies (Farquharson et al., 2011; E. R. Yescombe, 2007).

### 4.1.2 Private sector and project risks

No matter who the lenders are, they focus on the income stream over the term of the loan, which ensures that they get back their investment and the agreed rate of interest. Consequently, they have to be satisfied with the risk allocation in the project, which is crucial to the outcome and the robustness of revenue streams (Grimsey & Lewis, 2002). Further, lenders earn a relatively low return in contrast to the equity investors, which makes them unable to afford high risks. The government has to keep that in mind, when allocating the risk, since a high level of risk in the private sectors leads consequently to a decrease in attractiveness of the project to lenders. If there are less lenders interested in the project, more costs have to be borne by equity provided by investors, which is usually more expensive (Farquharson et al., 2011). Common opinion states, that the party most capable of dealing with a certain type of risk, is the one to whom the risk should be allocated (Akintoye et al., 2003; Rothballer & Gerbert, 2015; E. Yescombe, 2013). Yet in practice, the public sectors need to achieve value-for-money, and the privates sector need for robust revenue streams can contradict and lead to conflicts (Grimsey & Graham, 2003). At least nine risks, faced by every infrastructure project, can be identified: Technical risk, construction risk, revenue risk, operation risk, financial risks, force majeure risks, project default risk, political/regulatory risk and environmental risks (Chapman & Ward, 2003; Kerzner, 1989; R. C. Smith & Walter, 1990; Thobani, 1998). Since the high complexity and uniqueness off infrastructure projects, there is no set of clear rules for the allocation of risks. However, table 9 below provides an overview of the different risks in different phases of a PPP projects and shows, who will generally assume which category (van Herpen, 2002).

**Table 9: Project risks, phases and managing part scheme**

| | Political | Planning | Design | Construction | Maintenance | Operational | Financial | Usage | Legal & Regulatory |
|---|---|---|---|---|---|---|---|---|---|
| Identification | ✓ | | | | | | | | ✓ |
| Option Analysis | ✓ | ✓ | | | | | ✓ | | ✓ |
| Planning & Approval | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ |
| Implementation | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Post- transaction | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Responsibility of: | Public | Public/ Private | Private | Private | Private | Private | Private | Public/ Private | Public |

Source: adopted from Van Herpen (van Herpen, 2002)

Sensitivity tests, conducted by lenders, are meant to test the robustness of income streams against the risks mentioned above, whereby the are intended to capture the risks remaining with the SPV and not necessarily the risks to the project as a whole. Therefore, certain ratios, explained in the next paragraph, are used (Grimsey & Lewis, 2002).

### 4.1.3 Cover ratios

To assess the ability of the SPV to recover the debt, lenders use several cover ratios. The most important ratios are the loan life cover ratio (LLCR), the debt service cover ratio (DSCR), and the

project life cover ratio (PLCR) (APMG, 2018). The LLCR is commonly used in project finance and provides an estimation of the projects credit quality, and the ability of the SPV to service its debt over the whole term. It is calculated as the NPV of cash flows, available for debt service, divided by the outstanding debt over the loan period. The DSCR indicates the ability of a project to service its debt obligations from its annual cashflow in each year during the contract period. The higher the operating surplus of the project, the higher the DSCR and therefore less risky for lenders. The PLCR represents the capacity of the SPV to make repayments after the original final maturity of the debt. It is defined as the ration between the NPV of the cash flows, available for debt service, available for the remaining project's life, to the outstanding debt within this time (APMG, 2018; Grimsey & Lewis, 2002; Pulido et al., 2018; E. R. Yescombe, 2007).

### 4.1.4 Bankability and lenders concerns

The term 'bankability' of a PPP project refers to the willingness of private parties to invest in it (APMG, 2018). Hereby, not only financial analysis are considered, but also broader aspects like the creditworthiness, legal viability, economic viability, and technical feasibility (Pulido et al., 2018). A set of questions for determining the bankability of a project in those four areas is provided in Appendix II. The bankability of a project is closely interrelated to the major concerns of lenders, which are provided in table 10 below.

**Table 10: Major concerns of project lenders**

| | **Concern of the lenders** |
|---|---|
| - | Certainty of the project cash flows for meeting debt service requirements |
| - | Bankability of public sector obligations |
| - | Soundness and stability of the legal framework for PPP |
| - | Effectiveness and enforceability of the PPP contract and related agreements |
| - | Confidence in the regulatory regime when applicable |
| - | Right to step in if a project fails and availability of alternative contractors |
| - | Ability of contractors to perform and the quality of their management |
| - | Bankability of contractors and quality of contractor guarantees |
| - | Risks that are understood, controllable, finite, and appropriately allocated |
| - | Reputation impact of the project (environmental, social) |
| - | Availability and effectiveness of insurance cover, where needed |

Source: adopted from Farquharson et al. (Farquharson et al., 2011)

### 4.1.5 Banks' criteria

Within the context outlined above, banks define their individual criteria to assess the bankability, and therefore the attractiveness of a PPP project to them. In addition to the aspects mentioned above, more criteria can be found in literature (Delmon, 2005; Laishram & Kalidindi, 2009; Lopes & Caetano, 2015; Regan, Smith, & Love, 2011; Tsunoda, Pai, & Pawan, 2014; Shou Qing Wang, Tiong, Ting, & Ashley, 2000; Working Party on Rail Transport (SC.2), 2012) and, as suggested by Zhu and Chua, categorized into six main-criteria: economic and political environment; legal and regulatory environment; project specificity; project financial structure; third party risk allocation; and contract arrangement (Zhu & Chua, 2018). Whereby the banks are interested in all the criteria, this research aims at identifying those, which are related to project characteristics that can be influenced by the governmental bodies during the decision-making process. A criterion, like the duration of the concession period for example, can be determined during early project stages, whereby currency issues of the euro or the legal framework within the Netherlands will not be affected by any project decision. In addition, certain criteria, for example the availability of water, electricity and internet connection, might be applicable in international projects, but is not considered important since those requirements are met everywhere in the Netherlands. Table

11 gives an overview of the main-criteria, the criteria, and if they are relevant for this research, in respect to the ability of the public authorities to influence them during the decision-making process and the applicability in the Netherlands.

**Table 11: Banks' criteria and possibility to influence them during the project initiation**

| Main-criteria | Criteria | | Under the influence of PA |
|---|---|---|---|
| **Economic and political environment** | - | Economic environment | No |
| | - | Competition condition | No |
| | - | Financial market | No |
| | - | Political environment | Yes |
| | - | Public opinion | Yes |
| | - | Tax policies | No |
| | - | Currency issues | No |
| **Legal and regulatory environment** | - | Legal and regulatory environment | No |
| | - | Legal system | No |
| | - | Regulatory framework | No |
| | - | Enforceability | No |
| | - | Nationalization and expropriation | No |
| | - | Procurement process | Yes |
| | - | Intervention right | Yes |
| **Project specificity** | - | Project definition | Yes |
| | - | Feasibility studies | Yes |
| | - | Capacity of the technology | Yes |
| | - | Site acquisition and access | Yes |
| | - | License, permits, and authorizations | Yes |
| | - | Environmental standards | No |
| | - | Labour force | No |
| | - | Size of the project | No |
| **Project financial structure** | - | Shareholders' credibility | No |
| | - | Public sector's reliability | No |
| | - | EPC contractor's credibility | Yes |
| | - | Financial structure | Yes |
| | - | Financial flexibility | Yes |
| **Third party risk allocation** | - | Insurance arrangement | Yes |
| | - | Environmental and other legal/regulatory issues | Yes |
| **Contract arrangement** | - | Concession[2] agreement | Yes |
| | - | Concession period | Yes |
| | - | Support agreement/guarantee | Yes |
| | - | Termination provisions | Yes |
| | - | Construction contract | Yes |
| | - | Operation and maintenance agreement | Yes |
| | - | Offtake purchase agreement | No |
| | - | Input supplier agreement | Yes |
| | - | Guarantee from multilateral investment agency | No |
| | - | Direct agreement | Yes |
| | - | Catastrophic risk | Yes |
| | - | Arbitration | Yes |

Source: Main-criteria and criteria adopted from Zhu and Chua, additional information added by P. Hoss (Zhu & Chua, 2018)

[2] A concession contract is usually used for BOT contract schemes. However, from an analytical point of view, a DBFM(O) contract is also a concession contract (Hobma, 2009).

### 4.1.6 Project credit assessment by credit rating agencies

In contrast to the banks, which assess infrastructure projects themselves, investment banks and bond holders usually rely on the rating of external credit rating agencies (CRAs) (E. R. Yescombe, 2007). The credit rating agencies have developed their individual methodologies based on their past experiences, and constantly adjusts them to new market needs. All of them follow a similar procedure: First, the entity or instrument, that needs to be rated, is defined. Second, the applicability of the rating methodology to the particular issue or issuer is assed. Next, the CRAs proceeds with a step by step analysis of a set of fixed criteria before they consider adjustment features in the last step (Pantelias, Sfakianakis, & Roumboutsos, 2015). Typically, a so-called scorecard, which provides a detailed overview of the rating factors, is used by the CRA to rate the credit. Each factor and all related subfactors are assessed and scored, based on the project characteristics. Different factors are assigned different weights, based on their relative importance, and aggregated to a final score which represents the quality of the rated credit (Tsunoda et al., 2014). Table 12 below provides rating factors, used by the three major CRAs Standart & Poor's, Moody's and Fitch (Pantelias et al., 2015). In contrast to most banks, the CRAs are more transparent with their scoring procedure, and publish their assessment methodologies including the rating factors, subfactors, their weights and a conversion from the numeric score to their own rating scale.

**Table 12: Credit rating factors by the major three credit rating agency's**

| Category | Rating factors |
|---|---|
| **Construction phase** | - Construction risk<br>- Project/budget timeliness<br>- Complexity of project<br>- Contractors 'track records<br>- Technology<br>- Funding provisions<br>- Project flexibility |
| **Operation phase** | - Operational risk<br>- Performance<br>- Financials<br>- Counterparties |
| **Financial analysis** | - Revenues/cost structure<br>- Capital structure<br>- Cash flow analysis<br>- Debt metrics<br>- Financial flexibility<br>- Liquidity<br>- Refinancing |
| **Counterparties** | - Counterparty risk assessments<br>- Track records of counterparties<br>- Analysis of contracts |
| **Project-specific features** | - Project companies<br>- Managerial/organizational changes<br>- Support from sovereign/parent affiliates<br>- Guarantees |
| **External environment** | - Country/sovereign risk evaluations<br>- Market/competition risk<br>- Risk analysis of external events |

Source: adopted from Pantelias et al. (Pantelias et al., 2015)

### 4.1.7 Choice of criteria

For the research to proceed in the upcoming phases, a set of criteria has to be selected. As discussed above, banks usually asses a project themselves, whereby bond finance relies on external ratings by CRAs. Project risks, cover ratios, and the bankability play an important role, and lead to a variety of assessment criteria mentioned in academic literature and CRA publications. Several considerations are taken into account, when choosing the criteria used for this research. First of all, banks are the main source (85% in 2005) of debt finance and provide most of the capital (E. R. Yescombe, 2007). Second, banks are involved in the project way earlier in the process and play a more important role, not only in providing, but also in arranging the project finance. As explained earlier, they can act as lead arranger, can be involved in contract negotiations, and are generally involved in the project due to the due diligence process. Consequently, the criteria applied by banks are assumed to be more important to a successful project finance and a successful project in general compared to the criteria set by CRAs. Further, those criteria are not independent from each other and most of the criteria, used by CRAs, are taken into account by the banks anyways. Another important consideration for the choice of criteria, is related to RQ1 b) of the research looking at 'Which of those criteria can be influenced by the contracting authority throughout the decision-making process?'. This is an important distinction since some criteria, for example the country's legal framework, the economic environment, currency issues and many more, cannot be influenced by decisions taken by the public authorities in early project stages. Consequently, they are not considered in the following research phases. In addition, the set of criteria is kept flexible during the first two phases of the research, and if the interviews in phase two indicate a need for change in the criteria, this change can be implemented easily. The following table 13 provides an overview of the selected criteria, groups them into six main-criteria, and describes them briefly. As mentioned in the research strategy, this set of criteria is validated by experts in the field of light rail PPP within the first round of interview.

**Table 13: Lenders' criteria grouped into six main-criteria**

| Main-criteria | Criteria | Explanation |
|---|---|---|
| **Economic and political environment** | **1. Political environment** | The lenders favour a project with strong political support and a project in line with policy goals in a stable political environment (Delmon, 2005; Laishram & Kalidindi, 2009). |
| | **2. Public opinion** | A project should be accepted and ideally supported by the common public opinion (Davis & Euromoney Publications PLC, 2003). |
| **Legal and regulatory environment** | **3. Procurement process** | The lenders asses the tender procedure and are interested in the setting of a realistic target date for financial closure (S. Q. Wang, Tiong, Ting, & Ashley, 2000). |
| | 4. **Intervention right** | Lenders asses their possibility to intervene if the project is not going as planned (Delmon, 2005; EBRD, 2007; Farquharson et al., 2011). |
| **Project specificity** | 5. **Project definition** | The projects should be clearly defined and desirable (Delmon, 2005; Laishram & Kalidindi, 2009) |
| | **6. Feasibility studies** | Studies, assessing the projects feasibility, are of great importance to the lenders (Delmon, 2005; Laishram & Kalidindi, 2009, 2009). |
| | **7. Capacity of the technology** | The capacity of the technology should be appropriate for the site and the planned use (Delmon, 2005). Further, The degree to which a technology is successfully used already in commercial projects is important (Laishram & Kalidindi, 2009). |
| | **8. Site acquisition and access** | Lenders assess the site acquisition and access (Delmon, 2005). |

| Main-criteria | Criteria | Explanation |
|---|---|---|
| | **9. License, permits, and authorizations** | Lenders attach great importance to the availability of all necessary licenses, permits and authorizations needed for the project. Pending issues are deterring factors for project delays. Protections provided to the SPV can protect the project from cost overruns or delays in case of changes in the required permits. (Delmon, 2005; Laishram & Kalidindi, 2009; Shou Qing Wang et al., 2000) |
| **Project financial structure** | **10. EPC contractor's credibility** | Since the EPC contractor directly influences the completion risk of a PPP project (Gatti, 2013), the lenders asses the track record of the EPC contractors, their technical, managerial and financial capabilities and their experience in the industry and their involvement in similar projects (Farquharson et al., 2011; Laishram & Kalidindi, 2009). |
| | **11. Financial structure** | The financial structure includes elements such as the debt service cover ratio, the debt equity ratio, a debt service reserve, the commercial plan, the forecast of revenue streams and the sensitivity of those cash flow estimations to different scenarios (Delmon, 2005; Farquharson et al., 2011, 2011; Laishram & Kalidindi, 2009; Shou Qing Wang et al., 2000). Zhu and Chua also mentioned the high importance of the price and adjustment mechanisms, the attractiveness of the main loan agreement, sound financial analysis and minimal financial risk to the clients, based on the results of Zhang Xuegig (Zhang Xueqing, 2005a, 2005b; Zhu & Chua, 2018) |
| | **12. Financial flexibility** | Lenders prefer a high financial flexibility, meaning that the project promoter is able to accumulate resources from a variety of sources (Delmon, 2005; Laishram & Kalidindi, 2009; Zhang Xueqing, 2005a, 2005b) . |
| **Third party risk allocation** | **13. Insurance arrangement** | The SPV's insurance scheme is crucial to their financial capability and should avoid overlapping or gaps in the coverage (Delmon, 2005; Farquharson et al., 2011, 2011; Laishram & Kalidindi, 2009; Regan et al., 2011; Zhang Xueqing, 2005b, 2005a; Zhu & Chua, 2018). |
| | **14. Environmental and other legal/ regulatory issues** | Lenders assess the availability of mechanisms that protect the SPV from sanctions or compensation based on environmental regulations and environmental damage (Delmon, 2005). |
| **Contract arrangement** | **15. Concession agreement** | The concession contract between the SPV and the public authorities contributes to an adequate allocation of risks and is therefore of high importance to the lenders (Gatti, 2013). As mentioned above, in the scope of this research it is the DBFM(O) contract. A rather flexible contract structure is assumed to be beneficial in multiple ways (Roosjen, 2013). |
| | **16. Concession period** | The concession period is related the occurrence of risks, especially for longer periods (Askar Mohamed M. & Gab-Allah Ahmed A., 2002; Delmon, 2000; Schaufelberger John E. & Wipadapisut Isr, 2003) and relates to the duration of the maintenance (and operation), agreed upon in the DBFM(O) contract. |
| | **17. Support agreement/ guarantee** | Support agreement or guarantees are issued by the contracting authorities, decrease the risk for the SPV and therefore increase the attractiveness of the project to lenders (Shou Qing Wang et al., 2000; Zhang Xueqing, 2005a, 2005b). |
| | **18. Termination provisions** | The termination provision is assessed by lenders because they set the rules and conditions for an early contract termination and define the termination payments and therefor protect the lenders from losses (Ehrhardt, 2004; E. R. Yescombe, 2007). In the EPEC guidelines the reasons for early terminations are described (EPEC, 2011) and further a review of European practice including the provisions is provided (EPEC, 2013). |
| | **19. Construction contract** | The EPC contracts determine the allocation of risks from the SPV to the contractors by the means of back-to-back contracting. Therefore, the lenders asses those contracts very carefully to ensure the risk allocation is adequate (APMG, 2018; |

| Main-criteria | Criteria | Explanation |
|---|---|---|
| | | Delmon, 2000; Laishram & Kalidindi, 2009; Roosjen, 2013; Zhang Xueqing, 2005b). |
| | **20. Operation and maintenance agreement** | The maintenance (DBFM) or maintenance and operation contracts (DBFMO) are also determining the risk allocation and are therefore important to the lenders (Delmon, 2000; Laishram & Kalidindi, 2009; Zhang Xueqing, 2005b). |
| | **21. Direct agreement** | Direct agreement contracts are made between the lenders and key subcontractors and are used as a legal instrument that reserves the lenders the right to interfere directly in the project and the SPV's relationships to third parties in the case of a crisis (Gatti, 2013; Hebly & Klijn, 2016; "Lender Issues - Taking Security/Step-in Rights/Government Support \| Public private partnership," n.d.). |
| | **22. Catastrophic risk** | The lenders asses the catastrophic risk, the mitigation and the impacts on cash flows (Delmon, 2000; Qian, 2012; Tiong & Qian, 2008; S. Q. Wang et al., 2000). |
| | **23. Arbitration** | Adequate dispute resolutions should be in place and are identified as a critical risk to a PPP project (Davis & Euromoney Publications PLC, 2003; EPEC, 2011; Zhu & Chua, 2018). |

Source: P. Hoss, dimensions and criteria adopted from Zhu and Chua, other sources mentioned in the table (Zhu & Chua, 2018)

## 4.2 Project characteristics related to criteria

### 4.2.1 Project characteristics overview

This section provides an overview of the project characteristics of a light rail PPP project that are related to the criteria lenders use to assess the attractiveness of the investment. Those characteristics were identified by conducting the first round of interviews with experts involved in the projects of the case study and analysing the data with the thematic analysis approach described in chapter 2.1.4.. It is important to note that is not always a clear distinction between the lenders criteria described in the previous chapter and the related project characteristics. Rather, it's a blurry line with some of the criteria being a high-level project characteristic themselves. However, the concept of criteria and related characteristics is necessary to describe the internal logic and sequencing of this research. The six different main-criteria, used to group lenders criteria, are also used to group the project characteristics.

In a very first step, the degree to which the public authority can influence those characteristics is assessed and rated accordingly. Hereby, only those, which are rated '-', not under the influence of the public authority (PA), are excluded from the list and not used in the next phase of the research.

Project characteristics, which appear to be under the influence of the public authority '+', and characteristics which appear to be under the influence of the public authority to some extend or which cannot be rated with certainty, are ranked as a 'o' and carried on to the next phase of the research. This procedure ensures that no important characteristics are excluded by a false assessment of the researcher and the final judgement about the degree to which they can be influenced is done by the public authority itself in the consequent phase.

Further, the project characteristics only mentioned once, are examined in a two-step procedure to ensure the validity of the results and to avoid differences arising due to the different roles of the interviewees in the project. The first step is to reveal any causal correlations between the project characteristic and the nature of the case. If, for example, a project characteristic mentioned by one of the respondents relates to the compatibility of the rolling stock with other rolling stock in the network, but it is the only project which is actually connected to a bigger network, this is most likely the reason for it not being mentioned in the other interviews. If, however, no such

correlation can be found, a correlation between the project characteristic and the unique perspective of the interviewee is assessed. In addition, one or more respondents from the other cases are asked to evaluate the project characteristic.

Table 14 below provides an overview of all the project characteristics (RQ 2 a) and the extent to which they can be influenced by the public authority (RQ2 c). The following chapters outlines the most important similarities and differenced between the projects of the case study in respect to the project characteristics. Hereby the project characteristics, which are assumed to be not under the influence of the public authority, are only considered if it serves the purpose of explaining another characteristic or the bigger picture in general. The last chapter outlines the differences of light rail and much more successful road PPPs in the Netherlands in regard to the project characteristics (RQ2 b).

**Table 14: Project characteristics related to lenders criteria, mentioning in the interviews and the possibility to be influenced by the PA**

| Main-criteria | Project characteristic related to criteria | Mentioned in interview case*: | | | | | Infl. by PA |
|---|---|---|---|---|---|---|---|
| | | 1. | 2. | 3. | 4. | 5. | |
| **1. Economic & political environment** | Political and economic environment | | | | | | |
| | Level of political support in general | ✓ | ✓ | ✓ | ✓ | ✓ | o |
| | Power of political parties supporting the project | ✓ | ✓ | ✓ | ✓ | | - |
| | Stability of political environment (upcoming elections?) | ✓ | | ✓ | ✓ | ✓ | o |
| | Level of procuring authority (federal, provincial, local) | ✓ | ✓ | ✓ | | ✓ | + |
| | Involvement of different levels of PA | | | | | ✓ | + |
| | Relation of PA to federal government | | ✓ | | | | + |
| | Evidence of political commitment | ✓ | | | ✓ | ✓ | + |
| | Funding through regional taxes | | | | | ✓ | + |
| | Experience of the PA with PPP | ✓ | ✓ | ✓ | ✓ | ✓ | o |
| | Amount of debt (of the PA) | | | ✓ | | ✓ | - |
| | Guarantees from higher level of government | | ✓ | ✓ | | | + |
| | Need to keep it off balance sheet | | ✓ | ✓ | | | - |
| | Strong balance sheet of the PA (of local level) | | | ✓ | | | - |
| | Market situation (Lenders or sponsors market?) | ✓ | ✓ | | | | - |
| | Economic environment in the area | | | ✓ | | | - |
| | Public opinion | | | | | | |
| | Concerns of local businesses | ✓ | | | | | + |
| | Level of public support | ✓ | | ✓ | ✓ | ✓ | + |
| | Alternatives (e.g. bus) discussed with public | ✓ | | ✓ | | | + |
| **2. Legal and regulatory environment** | Procurement process | | | | | | |
| | Level of standardization | ✓ | ✓ | ✓ | ✓ | ✓ | + |
| | Openness for input from the market | ✓ | | | | | + |

| Main-criteria | Project characteristic related to criteria | Mentioned in interview case*: 1. | 2. | 3. | 4. | 5. | Infl. by PA |
|---|---|---|---|---|---|---|---|
| | Expected time of tender | ✓ | | | ✓ | ✓ | + |
| | Experience of the PA with PPP | ✓ | ✓ | ✓ | ✓ | ✓ | o |
| | Strictness of termination provisions | | ✓ | ✓ | | | + |
| **3. Project specificity** | Project definition | | | | | | |
| | Completeness of project definition (specs set and fixed) | ✓ | | | | | + |
| | Completeness of reference design | ✓ | ✓ | ✓ | | | + |
| | Level of technical details in advanced design | | ✓ | ✓ | ✓ | | + |
| | Greenfield vs. Brownfield | | ✓ | | ✓ | | - |
| | Interference between phasing and enabling works | | | ✓ | | | o |
| | Operation included | ✓ | ✓ | ✓ | ✓ | ✓ | + |
| | Rolling stock included | ✓ | ✓ | ✓ | ✓ | ✓ | + |
| | Extension of existing network | ✓ | | | ✓ | | o |
| | Packaging of other works (Tram depots etc.) | | | | | ✓ | + |
| | Feasibility studies | | | | | | |
| | Enabling works by the PA | | | ✓ | ✓ | ✓ | + |
| | Assessment of major risks | | | ✓ | ✓ | | + |
| | Level of cooperation of utility providers | | | | ✓ | | + |
| | Ability of utility providers to do the work according to project schedule | | | | | ✓ | + |
| | Relocation of services done upfront by the PA | ✓ | | | | | + |
| | PA retains risk of unexpected utilities | ✓ | ✓ | | | ✓ | + |
| | PA retains risk of noise and vibration | ✓ | | | | | + |
| | PA retains risk of archaeological findings | | ✓ | | | | + |
| | Capacity of technology | | | | | | |
| | Technical innovation | | ✓ | ✓ | | | + |
| | Unusual or complex structures | | | | | ✓ | + |
| | Shared tracks | | | | | ✓ | + |
| | Train control | | | | | ✓ | + |
| | Site acquisition | | | | | | |
| | Level of risk | ✓ | ✓ | | | ✓ | o |
| | PA retains responsibility of site acquisition | ✓ | ✓ | | ✓ | ✓ | + |
| | License, permits and authorizations | | | | | | |
| | Advanced design detailed enough for permits and licenses | | | | ✓ | | + |

| Main-criteria | Project characteristic related to criteria | Mentioned in interview case*: 1. | 2. | 3. | 4. | 5. | Infl. by PA |
|---|---|---|---|---|---|---|---|
| | Party responsible for permitting | ✓ | | | | | + |
| | PA retains the permitting risk | ✓ | ✓ | ✓ | | ✓ | + |
| | Usages of licensing to squeeze in extra scope | | | | | ✓ | + |
| | Change in law clauses | | | | | ✓ | + |
| | Public transportation permit (15 years?) | ✓ | | | | | o |
| **4. Project financial structure** | Financial structure | | | | | | |
| | Rating of the PA | ✓ | | ✓ | | | o |
| | Guarantees from higher level (state/province) | ✓ | | | | ✓ | + |
| | Share of public funding | | | | | ✓ | + |
| | Level of public funding | ✓ | | | | ✓ | + |
| | Involvement of local banks | ✓ | ✓ | | | | o |
| | Involvement of EIB | | ✓ | | | | o |
| | Protection against changing interest rates | ✓ | | ✓ | | | + |
| | Total value of the project | ✓ | | | | | + |
| | % of SPV costs | | | ✓ | | | o |
| | Contractor credibility | | | | | | |
| | Credit rating of contractors | ✓ | | ✓ | ✓ | | - |
| | Experiences of contractor | | | ✓ | ✓ | | o |
| | Guarantees from higher corporate entities | | ✓ | | | | - |
| | Flexibility | | | | | | |
| | Level of needed flexibility known by the PA | ✓ | | | | | + |
| | Level of flexibility communicated to the contractors early | ✓ | | | | | + |
| **5. Third party risk allocation** | Insurance arrangement | | | | | | |
| | Constructional risk policy | | | ✓ | | | - |
| | Business interruption policy | | | ✓ | | | - |
| | Material damage policy | | | ✓ | | | - |
| | Environmental issues | | | | | | |
| | Additional requirements imposed by the PA | | ✓ | | | ✓ | + |
| | Level of detail of advanced design | | | | ✓ | ✓ | + |
| | Local environmental requirements | | | | | ✓ | o |
| **6. Contract arrangement** | Concession agreement | | | | | | |
| | Number of contracts | | ✓ | | | | + |
| | Rolling stock included | ✓ | ✓ | ✓ | ✓ | ✓ | + |
| | Payment mechanism | ✓ | ✓ | | | | + |

| Main-criteria | Project characteristic related to criteria | Mentioned in interview case*: 1. | 2. | 3. | 4. | 5. | Infl. by PA |
|---|---|---|---|---|---|---|---|
| | Use of standardized contracts | ✓ | | | | ✓ | + |
| | Proof of compatibility with existing system | | | | ✓ | | + |
| | Rolling stock procurement schedule of PA (if not included) | | | | | ✓ | + |
| | Robustness of the contract with the rolling stock provider (not incl.) | | | | | ✓ | + |
| | Provisions for extensions | | | ✓ | | | + |
| | Ridership risk retained by the PA | ✓ | | | | | + |
| | Proportion of phase (if extension/extension planned) | | | ✓ | | | + |
| | Concession period | | | | | | |
| | Duration | ✓ | | ✓ | ✓ | ✓ | + |
| | Fixed period | ✓ | | ✓ | | | + |
| | Ambiguous construction schedule | | | | | ✓ | o |
| | Support agreement/guarantees | | | | | | |
| | Type of guarantees (on first demand?) | | | ✓ | | | - |
| | Termination provisions | | | | | | |
| | Strictness of termination provisions | | ✓ | ✓ | ✓ | | + |
| | Termination provision in case of extension | ✓ | | | | | + |
| | Market standard termination provisions | ✓ | ✓ | | ✓ | ✓ | + |
| | Construction contract | | | | | | |
| | Balance between contracted civil works & rolling stock | ✓ | | | | | o |
| | Amount of risk passed on | | | | | | o |
| | Risk distribution according to market situation | | | | ✓ | | o |
| | Liabilities of the contractors | | | ✓ | | | - |
| | O&M contract | | | | | | |
| | Amount of operating risked passed on | | | | ✓ | | o |
| | Electricity consumption risk | | ✓ | | | | + |
| | Balanced penalties | ✓ | | | | | + |
| | Nature of schedule (defined headway vs. fixed times) | ✓ | | | | | + |
| | Preference at intersections | ✓ | | | | | + |
| | Liabilities of the O&M contractors | | | ✓ | | | - |
| | Willingness of the former rolling stock provider to cooperate (i.a.) | | | | ✓ | | o |
| | Direct agreement | | | | | | |

| Main-criteria | Project characteristic related to criteria | Mentioned in interview case*: 1. | 2. | 3. | 4. | 5. | Infl. by PA |
|---|---|---|---|---|---|---|---|
| | Operator willing to enter into direct agreement with PA | ✓ | | | | | o |
| | Arbitration | | | | | | |
| | Arbitration arrangements | | ✓ | | | | + |

* 1.: RegioTram, Groningen
2.: Brabo II, Antwerp
3.: Tram de Liege, Liege
4.: Net Phase 2, Nottingham
5.: ION Rapid Transit, Ontario

Source: Patrick Hoss

### 4.2.2 Similarities between the cases

Due to the high complexity and the number of interfaces of a light rail project, most of them are quite unique, also in respect to the project characteristics mentioned above. However, examining the five different projects in four different countries still revealed some similarities that seem to be consistent throughout all of them. Those similarities, again grouped according to the six main-criteria, are described in this section.

1. **Economic & political environment**

A first similarity, related to the first main-criteria, is the stability of the political environment. With light rail projects taking a long time to be implemented, all the projects are exposed to risks regarding elections and other changes in political power during their lifetime. The ION Stage 1 project, for example, went through federal and provincial election in an early project stage. Also, the political support, at least in the beginning of the project, was perceived as rather high in all cases. A commonality among the projects regarding the public opinion is a 'normal' degree of resistance from the public, mostly from local residence worried about the disturbance during the construction but also the operating period. Also, the economic environment within the regions where the projects were implemented, seem to be rather positive and stable.

**2. Legal and regulatory environment**

First and foremost, it has to be mentioned that most of the legal issues are interrelated to project characteristics from other main-criteria, rather than being separated and apart from the others. Consequently, they should not be considered without the broader context outlined above and below. Even if the legal framework obviously varies between the cases, the ones in Europe are all subject to European law. Also, all of them can be considered rather complex from a legal point of view, since they combine the concession of public transport, the financing, construction, maintenance (and operation) in one package. Throughout all projects, the intervention rights are usually subject to negotiation, it appears that they are usually rather standard and not changed much for all of the projects. Further, the procurement process is rather standardized as well. The high complexity and need for extensive negotiations lead to relatively long durations of the procurement process, whereby experience and being familiar with the process and documentation, like the parties in Canada, can decrease the duration.

**3. Project specificity**

Most light rail projects are located in densely populated areas and therefor most projects can be described as brownfield projects, meaning the construction is taking place on a site that has been built on before. Consequently, the relocation of utilities plays an important role in all of the projects as well.

Another commonality between the cases is the site acquisition, which is usually done by the PA, since they have the necessary instruments and power to handle and mitigate the risk associated with the site acquisition process.

Further, the risk regarding the necessary permits is born by the PA as well. Even in cases where the SPV is responsible for obtaining the permits, they are protected by guarantees from the PA.

The regulatory, and other issues, are dealt with an advanced design, created upfront by the PA. Whereby this reference design is common among all projects, the level of detail varies as explained in the next chapter.

Enabling works and upfront work packages are commonly used to prepare the site for the SPV. However, the extent to which this is done varies from project to project and is also limited by the construction being scheduled in phases. Consequently, enabling works on a particular section of the project would translate into disturbance due to construction works twice.

### 4. Project financial structure

The project's financial structure varies between the cases. However, a few similarities can be identified. First of all, it is worth mentioning, that PPP projects in general are considered rather attractive for lenders for various reasons also shared by the light rail PPPs in the case study. In a broader context, the risk for the financiers lies within the difference between the different lines of income and costs of the company they invest in.

In all of the light rail PPPs, the revenues of the SPV are usually guaranteed by some form of authority or state and considered less risky than the revenue streams of other entities like a regular company for example. The rating of the PA is used as a benchmark for the risk related to the projects revenues.

The costs on the other hand are mostly guaranteed by the contractors, contracted by the SPV. Consequently, the creditworthiness and rating of the contractors are an important benchmark, since they guarantee most of the costs of the SPV. Only a minor proportion of the operational costs, usually around 10%, is not covered by the contractor's guarantees and remains a risk to the SPV. Those costs, the SPV costs, usually cover expenses such as insurance costs, paying a CEO, CFO etc. Moreover, the financing costs are fixed at the moment of financial close.

Another similarity between the cases is the payment mechanism, which determines the payments made by the PA to the SPV for their service. To retain the ridership risk within the public sector, which is assumed to be the best party to manage it, all of the projects use some form of availability payments. However, the exact calculation of the payment is highly individual and considered to be an important and ideally well thought of decision by the PA.

Further, the financial structure, and the whole DBFM(O) PPP scheme, is perceived as a rather inflexible structure with fewer room for flexibility for the PA, compared to a more conventional contracting approach.

Even if the projects differ in size and financial volume, they are rather large and expensive projects in general. The total value is considered important since a more expensive project usually requires more lenders. On the other hand, an investment below 50 million euro is not considered to be attractive enough for most lenders. This becomes especially important when keeping in mind that most having at least one other lending party involved in the project is a necessity for most lenders.

### 5. Third party risk allocation

The SPV's insurance scheme is crucial to their financial capability and should avoid overlapping or gaps in the coverage. Therefore, all projects have the necessary insurance agreements in

place, whereby they are assumed to be rather standard since the insurance companies are usually experienced in insuring similar light rail projects. To them, a light rail PPP does not differ substantially compared to a conventional contract model. The most important ones are considered to be the constructional risk policy, the business interruption policy and the material damage policy.

Environmental issues are also considered important for every project and capturing all of them is challenging for the project participants. Especially since they can deviate based on their location and are imposed from many different levels and authorities.

**6. Contract arrangement**

The contractual arrangement is really similar when assessing it on a very high level. A SPV is established, enters into the DBFM(O) agreement with the PA and contracts the EPC and maintenance (and operation) contractor as described in chapter 3.4. Further, direct agreements between several project parties, for example the lenders and the PA, are in place to strengthen their legal standing. Another feature of the concession agreement is the payment mechanism, which is, throughout all cases, availability based. Therefore, the ridership risks remain with the PA. Termination provisions are in place for all the projects, whereby they vary in their conditions. Another similarity is, the construction contract and the O&M contract are used to pass on the risks from the SPV to the contractors.

### 4.2.3 Differences between the cases

With the previous section describing the few similarities between the projects, this section outlines the major differences in regard to the project characteristics. Again, the six main-criteria are used to structure the differences accordingly.

7. **Economic & political environment**

A first difference is the political support throughout the implementation of the project. Brabo II and the Tram de Liege had a strong political support of the project. Even when the first tender of the Tram de Liege failed, politicians remained committed and retendered the project. Net Phase 2 in the UK was strongly supported due to the success of the first phase of the project and the ION Stage 1 project benefited from PPP friendly policy in Canada. In contrast, the Regio Tram suffered from a lack of political support throughout the tender process. Public resistance, especially from local shop owners, divided also the political parties into a supporting and an opposing group. This lack of political support is now acknowledged as one of the major issues leading to the last-minute cancellation of the tender and the project in general.

A strong level of political support also allows the PA to show its commitment through measures like the introduction of a work place parking levy (in Nottingham) to finance the project. In Canada, the government opposes their PPP policy with not granting any funds from a federal or provincial level if their procurement model, which is strongly supporting PPP projects, is not applied. These strong signs of political commitment towards the project and the PPP as preferred method of delivery are also recognized by lenders. However, no such signs could be identified for the Belgium and Dutch projects.

The public opinion regarding the ION Stage 1, Tram de Liege and Brabo II project is perceived rather positive. NET Phase 2 also enjoys strong public support since the people are pleased with the service of Phase 1, which is already in operation.

Another difference is the level of experience of the public authority with large and complex PPP projects. With the Tram de Liege and Regio Tram being the first large PPP contracted by the contracting authorities, they had no experience at all. The public authorities of the NET Phase 2

and Brabo II project already had the experience form contracting the first phase of the project in a PPP scheme as well. Moreover, the City of Nottingham benefited from the long tradition of PFI contracts in the UK. Also, the PA contracting the ION Stage 1 project in Canada benefited from the experience gained from a long tradition in light rail PPPs.

Further, the level of the PA differs as well. The Regio Tram was contracted with a PA on a municipal and provincial level. The Brabo II project had three different counterparties due to their complex structure: the city of Antwerp, the Flemish region and De Lijn (Flemish public transport company). The PA of the Tram de Liege was the Société Régionale Wallone du Transport which is owned by the Walloon Region (51%) and the Walloon municipalities and provinces (49%). NET Phase 2 is contracted by the Nottingham City Council.

Within the economic environment, the experience of the private sector differs considerably. Whereby the private parties in the UK and Canada are relatively familiar with the concept of PPPs, the Dutch and Belgium ones are rather less experienced, especially in (light) rail PPPs.

Another key difference is the necessity of keeping the balance off balance sheet to avoid negative accounting consequences and consequences on their ability to borrow additional money in the future. This difference lead to the retendering of Tram de Liege, after Eurostat imposed its new regulations in 2010, since the PA was not willing to take the project on their balance sheets, whereby the Brabo II project could continue with the PA doing exactly that.

### 8. Legal and regulatory environment

The legal and regulatory environment obviously differs based on the location of the project. In the Netherlands, however, there is no such thing as PPP law. In the UK, with its long history of PFI projects, PPP law is well established, for example the ‘Public Private Partnership policy and guidance’ or the ‘Standardization of PF2 Contracts’. From a legal perspective in the Netherlands, a PPP project is a combination of civil and public law, with the construction of the project and the financing being civil, and with the concession being public law. European and national environmental and procurement law establishes the legal framework for a Dutch PPP project. Civil courts are used for dispute resolution within the Netherlands, whereby the government is reluctant to use the arbitration board for the building industry, since they might be biased towards the private sector. To avoid projects being delayed while waiting for a court decision, legal mechanisms are implemented that allow to deal with change orders or delays on a short-term basis and ensure that the project can go ahead while appeals are brought to court later on without influencing the project progress.

### 9. Project specificity

A first difference regarding the project specificity is the completeness of the output specifications set by the PA. Since technology is rapidly changing and the highly complex inner-city situation, the PA struggles to define what they actually want, and the specifications are changed during the tender process. This is more likely to happen is cases like the Regio Tram and Tram de Liege, where the PA is very unexperienced, whereby PA contracting a second phase, can already use their experience from the first phase to define the specifications more precisely.

Another difference related to the project definition is the use of new technology. Whereby some projects, like the ION Phase 1, use a track system that can be considered rather standard, others, like the two projects in Belgium and the Regio Tram, made use of some technical innovations. Brabo II has a section with no overhead lines and a part with no cables over ground. The Tram de Liege also has a section without overhead lines, which had, at the time of construction, only been used in five places around the world.

In addition, the scope of work bundled and contracted within the PPP scheme also differs. In the Regio Tram project, several civil structures and buildings, next to the two tram lines, had to be adjusted and new structures had to be constructed. The Tram de Liege includes 23 stations, one depot, two park and ride (P+Rs) sites, two sections with a catenary-free system, façade to-façade works, a fleet of 20 trams and some infrastructure works, this also included work at the Atlas bridge, which had to be increased in height. Moreover, the city of Antwerp added a whole package of urban redevelopment to the Brabo II including an underground tunnel and parking whereas the ION Stage 1 project in Canada did not include any additional and complex structures.

Also, the integration of the project in another, already existing network, is a key difference between the projects. On the one hand are the Regio Tram, Tram de Liege and the ION Phase 1, which are completely new light rail systems (Nevertheless, the ION Phase 1 project has a shared section with heavy rail operating during night times). On the other hand, are the Brabo II and Net Phase 2 project expanding an already existing network.

The projects also differ regarding the operation of the system. In the projects in Belgium, the operation is not in the scope of the PPP arrangement, while the PA of all the other cases have allocated the operation to the SPV as well.

Further, some cases include the rolling stock in the contract with the SPV (Groningen, Liege, Nottingham), whereby in others (Antwerp, Ontario), it is procured by the PA separately. Including the rolling stock in the project allows the PA to allocate the interface risks to the private parties and be in control of the rolling stock design, which is assumed to have a high contribution to the user experience. In contrast, it can theoretically limit the market of potential bidders due to the limited amount of rolling stock providers able to fulfil the required specifications and it can lead to a mixed fleet if the PA is extending the system with a new SPV in the future. In addition, the PA is usually used to retain this interface risk, since that is what they do when using a traditional procurement model and the conflicting interest of the rolling stock provider (usually short term) and the O&M contractor (usually long-term) can be difficult to balance.

Enabling works are done upfront by the PA for various reasons. For the NET Phase 2 project, the PA executed an upfront work package to detect utilities that potentially could get in the way of the main construction program. However, it was not possible for them to come up with an advanced utility design upfront since the utility companies were reluctant to get involved in a phase, in which it was not certain if the project would go ahead. The PA in Liege conducted a lot of feasibility studies upfront, with the intention to investigate all potential choke points of the project first before passing on the risks to the SPV. This also included a very detailed advanced design with only minor alterations during implementation, which reduced the risk related to the capacity of technology and the permitting risk. The PA in the Regio Tram project retained the risk related to unexpected utilities, however, specific works on housing due to vibrations and interference with sensitive instruments in a laboratory close to the tram corridor, as well as issues related to noise disturbance where not investigated upfront but simply allocated to the private sector. For the ION Phase 1 project, the PA also did some enabling works, contracted through local contractors, which included the relocation of major utilities like a high voltage transmission line, major water mains and major gas services. This utility relocation was mainly done on a transmission level since their relocation was expected to be more complex.

### 10. Project financial structure

First and foremost, the differences in the project scope explained above, also translates into the total value of the projects. The Regio Tram was expected to cost €550m, Brabo II €230m, Tram de Liege €430m, Net Phase 2 £570m and ION Phase 2 C$818m.

Also, the type and number of lenders can vary from project to project. Nevertheless, there are local lenders involved in most of the projects. This can be seen when comparing the lenders of the two projects in Belgium: 1. Brabo II: AG Insurance, Crédit Agricole CIB, KBC, MFUG; 2. Tram de Liege: EIB, Belfius Bank, BBVA, Natixis, AG Insurance, BBVA, Talanx.

Another difference related to the lenders is the involvement of multilateral institutions like the EIB. On the one hand, they can provide a lot of capital for the projects and their involvement in international projects is perceived rather positive by lenders and enhanced the credibility of the projects. On the other hand, their involvement is not always an advantage for the project itself, since the EIB for example, only confirms their involvement in the preferred bidder phase of the tender and can therefore be an unstable factor in the procurement process. This uncertainty also leads to sponsors having difficulties to give a certain ticket to lenders. In addition, projects in Western Europe are not considered as risky as other projects in an international context, and the EIB or other multilateral institutions are not needed to comfort the lenders. Furthermore, they are taking away part of the funding, which could have been provided by the lenders themselves. Therefore, the EIB was intentionally kept out of the Brabo II deal. However, they contributed with €200m to the Tram de Liege and with £110m to the NET Phase 2 project.

Further, not only the public contribution to the financing of the project varies, but also the level of government providing those funds. The public contribution for the Regio Tram was expected to be borne by the state, the municipality, the province and the region. The project in the UK receives public financing from the central government as well as the local councils. In Canada, the federal government, the region of Waterloo and the government of Ontario are contributing to the project. If public funding is provided from a rather low level, like in Liege, guarantees from higher level, in this case the Walloon region, are in place.

The credit ratings, of the PA used as a benchmark for risk related to the revenues of the SPV and the credit ratings of the contractors used as a benchmark for the costs of the SPV, obviously vary for all the cases since there are different parties involved. Municipalities and Provinces are not rated entities, however, the rating for the Dutch government is AAA (Prime) with a stable outlook (Standard & Poor's, 2019), making a Dutch project with state guarantees highly attractive from this perspective.

## 11. Third party risk allocation

As explained in the previous chapter, the insurance agreements are rather standard and do not vary that much.

However, the environmental legislation and regulations are dependent on the project location, and therefore different for all the cases. An environmental impact assessment, usually done by the PA in the early tender phase, is used as a first evaluation of those issues. Further, a more detailed advanced design allows a better assessment of the environmental issues and can be used to minimize the risks relate to them. This has been done for the NET Phase 2 in Nottingham.

## 12. Contract arrangement

Although the contractual structure of the PPP is always built up around a SPV, it can still vary, not only within the contracts, but also in the configuration of the arrangement, between the cases. The Brabo II project for example, uses three different concession contracts with the SPV. The operator and the Flemish region entered into two DBFM contracts with the consortium for road and tram works along the line, and the city of Antwerp entered into a DBF agreement regarding the urban redevelopment. The other four projects only used one contract between the PA and the SPV. The issue of including the rolling stock within the PPP agreement, which is already discussed above, also adds a new dimension and additional complexity to the contract. In addition, the issue of compatibility between the rolling stock and the tram system needs to be

ensured. If the rolling stock is procured separately are an extension of the system leads to a mixed fleet of vehicles.

Another major distinction is the extent to which those contracts are standardized. The UK and Canada do have standard DBFM(O)/PFI contracts, whereby the Netherlands do not have any for transport infrastructure. Consequently, those standardized documents have been used in the NET Phase 2 and the ION Rapit Transit project, whereby the Regio Tram PA had to make a contract from scratch. However, standardized Dutch DBFM contracts are available for roads which had been used as a baseline for the Regio Tram contracts.

Also, the concession period is different between the projects, reaching from 22.5 years for the NET Phase 2 up to 33 years in the ION Rapid Transit project. The choice of the duration usually follows from consideration regarding the design life and lifecycle requirements of the project assets in combination with the financial structuring. In addition, the duration of the construction differs as well as the duration of the period within the duration of the concession, in which the system actually operates. Further, the end of the concession period can be fixed or be dependent on the end of the construction. A fixed concession period, like in the Regio Tram or the Tram de Liege projects, also implies that the SPV can maintain (and operate) the system for a shorter period in case the construction is delayed. The operation and militance period for the ION Rapid Transit on the other hand, began only with the substantial completion date and was set to 30 years.

### 4.2.4 Differences regarding Dutch road PPPs

Looking at the project characteristics displayed in table 14 above, there can be distinguished regarding Dutch road PPPs, which are, in contrary to light rail PPPs, quite common and well established.

First and foremost, the procuring authority ‘Rijkswaterstaat’, procuring all Dutch road PPPs, can be considered as relatively independent from a political point of view, meaning, there is less interdependence between the projects and the political situation. In consequence, the political stability is not affecting a road PPP in the way it does for a light rail PPP project. The central government also has the legal authority to plan and implement road projects, overruling zoning regulations.

The procurement in the hand of one public body also increases the experience and room for improvement. With ‘Rijkswaterstaat’ having an impressive track record of successfully tendering PPPs and doing a lot of market consultations, they accumulate a lot of expertise and trust. Further, the success seems to be a joint effort of the public and private sector, with the private sector contributing a lot trough the input of their expertise.

With several prospect projects for the future, a steady project pipeline is established, leading, together with an experienced private sector, to a very active and mature market for road PPPs in the Netherlands. For light rail projects, however, no such pipeline exists since there are very few projects in general, whereby each of them is quite unique.

The combination of the factors mentioned above, and highly standardized contracts, with which both, the public and private sector are familiar, shortens the duration and facilitates the procurement process. Recently, mechanisms were are added to the contracts to also increase their flexibility. This allows to process change orders way faster.

Also, the nature of the project differs between road and light rail PPPs. Whereby a light rail PPP bears way more technical complexity and more interfaces, a road project can be considered less challenging and therefore less risky. The technology used in light rail PPPs is often quite new and innovative, whereby the construction process and materials used for roads are well established.

Further, a majority of light rail projects are brownfield projects, whereby roads can be both, which also determines the amount of risk to some extent.

In addition, light rail PPPs usually run through densely populated areas, increasing the difficulties regarding the zoning regulations and the objection from the public, since the disturbance during the construction can usually considered to be higher compared to a road project. This also leads to a higher number of involved parties for light rail projects, making issues more complex.

The inner-city location of light rail projects also leads to more unpredictable traffic streams, with more variables and less available data (compared to roads), making it more challenging to forecast. Also, there needs to be no ridership risk considered for road projects.

All those differences related to the project characteristics, appear to contribute to the current situation, in which road PPPs are way more common and successful in the Netherlands.

## 4.3 Conclusion: Lenders criteria & related project characteristics

Section IV constitutes the first result of the report and answers research question one and two, while assessing the projects from a private perspective.

First, research question one was answered by identifying the criteria used by lenders to assess the attractiveness of an investment in a light-rail PPP project through literature study and a logical line of reasoning (*Chapter 4.1*). The chapter concludes with the final results, in which the criteria are grouped into six main-criteria (Economic and political environment, Legal and regulatory environment, Project specificity, Project financial structure, Third party risk allocation, Contract arrangement) and presented and explained in Table 13.

Afterwards, the project characteristics, related to the lenders criteria, are identified with the help of the interviews in phase two of the research (*Chapter 4.2*). They are presented in Table 14 and grouped into the corresponding main-criteria and criteria, similar to the results of research question 1. Further, the main differences and similarities between the case study projects regarding the related project characteristics are discussed. Finally, the differences between Dutch road PPPs and PPPs in light-rail, are pointed out.

Knowing the lenders criteria, and the related project characteristics, and having answered research question one and two, allows to shift the focus of the research to the public side and their perception of the project, in order to answer research questions three and four.

Those results, the decisions leading to the project characteristics, and recommendations for the public authority regarding those decisions and their impact on the attractiveness of the project to lenders, are subject of the following section (*Section V: Decisions & recommendations for the public authority*).

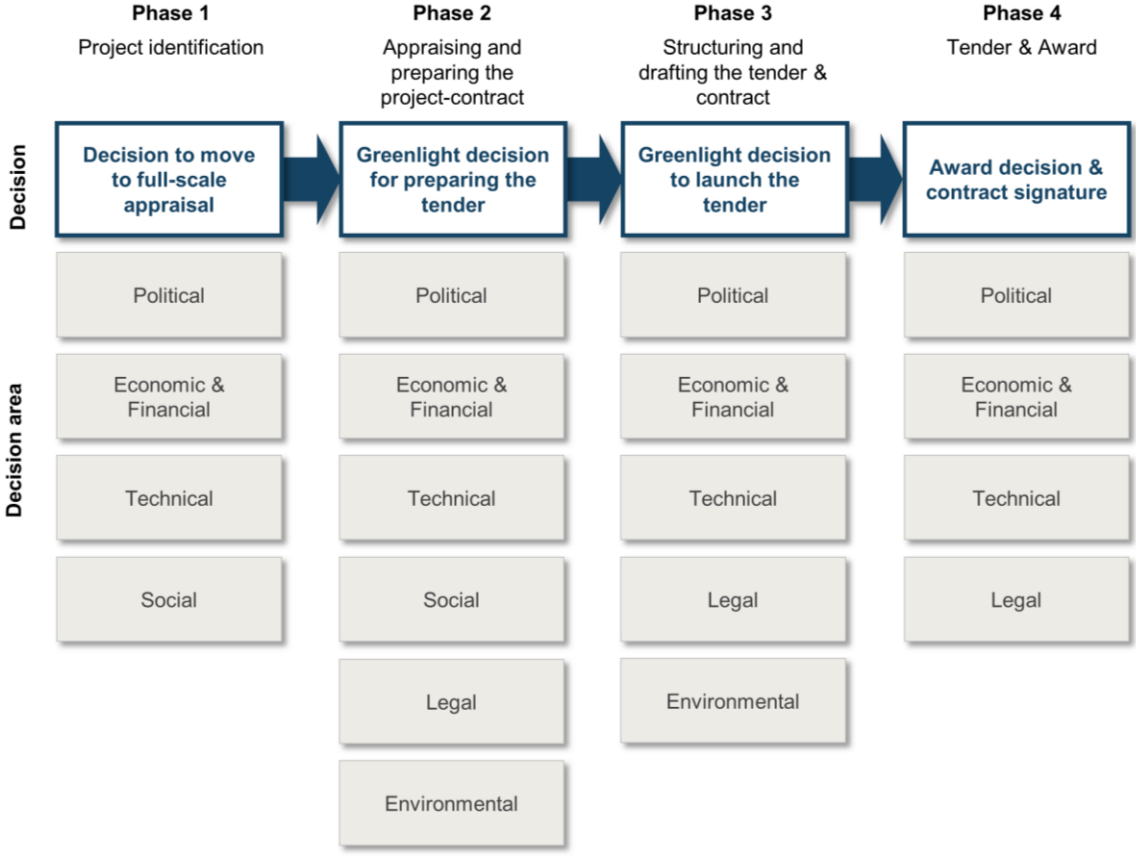
# Section V: Decisions & recommendations for the public authority

## 5.1 Decisions leading to the project characteristics

The main decisions, related to the project characteristics of the previous phase, are go or no-go decision at the end of each project phase, which determine whether the project is ready to proceed to the next phase or not (APMG, 2018). It is an important factor for success that every stage of the project is accepted and approved before the next steps are taken (van Oort et al., 2014).

To make those decisions, a variety of different subjects need to be taken into account, whereby similar subjects are grouped into the same decision area. Figure 13 below outlines the major decisions regarding the four phases, and their relevant decision areas, adopted from Carbonara et. Al (Carbonara et al., 2015) and adopted to the four phase model. Since different decision areas can be more important in one phase than another, they can differ between the phases.

**Figure 13: Decision making areas in the four early project phases**




Source: Adopted from Carbonara et. Al (Carbonara et al., 2015) extended and adjusted by the author

For each subject in every decision area, a set of key questions needs to be answered in order to finally take the major decision. Those considerations influence the project characteristics, identified in the previous chapter.

Table 15 on the following pages provides a more detailed overview for each of the four decisions, their relevant decision areas subjects that need to be taken into account, the set of key questions, the related project characteristics and the decision makers.

Recommendations, regarding the four main decision and their corresponding decision areas, subjects and key questions, are provided in the next and last chapter of the result section.

**Table 15: Decisions areas, subjects and key questions related to the project characteristics throughout the four early project stages**

| Decision area | Subject | Set of key questions | Related project characteristic | Decision makers |
|---|---|---|---|---|
| Phase 1: Decision to move to full-scale appraisal | | | | |
| **Political** | **Political environment** | Is there enough political support for the project?<br>Are there any upcoming elections?<br>Is there a need for new legislation (e.g. innovative funding methods)? | - Level of political support in general<br>- Stability of political environment<br>- Funding through regional taxes<br>- Evidence of political commitment<br>- Funding from which level | National, regional and local government, Contracting authority |
| **Economic & Financial** | **Affordability** | Is the project affordable by the government?<br>What are social-economic returns of the project?<br>Which project will be prioritized? | - Level of political support in general<br>- Share of public funding | National, regional and local government, Contracting authority, Mistry of Finance |
| | **Feasibility** | Is the project financially sustainable?<br>What is an appropriate concession period and payment mechanism? | - Duration of concession period<br>- Payment mechanism | Contracting authority, Ministry of Finance |
| | **VfM analysis** | Is the project delivering good value for money?<br>What is the most appropriate contract form? | - Level of political support in general | Contracting authority, Ministry of Infrastructure and Water Management |
| **Technical** | **Size/scope** | Need for the project?<br>For which user and what purpose?<br>What are the capacity requirements (present and future?) | - Extension of existing network<br>- Total value of the project | Contracting authority |
| | **Alternative solutions** | Are there any other viable solution to meet the needs? | - Alternatives (e.g. bus) discussed with public | Contracting authority |
| **Social** | **Social acceptance of the project** | What is the impact on different interest groups on stakeholders? | - Level of public support<br>- Alternatives (e.g. bus) discussed with public<br>- Concerns of local businesses | Contracting authority |
| Phase 2: Greenlight decision for preparing the tender | | | | |
| **Political** | **Political environment** | Is there enough political support for the project?<br>Are there measures to proof political commitment?<br>Is there a political 'champion' representing the project?<br>Are there any upcoming elections?<br>How experienced is the PA with procuring PPPs? | - Level of political support in general<br>- Stability of political environment<br>- Evidence of political commitment | National, regional and local government, Contracting authority |
| **Economic & Financial** | **Risk assessment** | What risks can affect the project? | - All risk related project characteristics | Contracting authority |

| Decision area | Subject | Set of key questions | Related project characteristic | Decision makers |
|---|---|---|---|---|
| | | What is the impact/likelihood of these risks on the project's cash flow? | - Risk distribution according to market situation | |
| | **Financial structure** | Will the EIB be involved?<br>Which funding mechanism is appropriate?<br>Which payment mechanism?<br>Which debt/equity ratio is favourable?<br>Which incentives and penalties can be used? | - Level of public funding<br>- Rating of the PA<br>- Guarantees from higher level (state/province)<br>- Share of public funding<br>- Involvement of EIB<br>- Project protected against changing interest rates<br>- Total value of the project | Contracting authority |
| | **Feasibility** | Is the project financially sustainable?<br>What is an appropriate concession period and payment mechanism? | - Duration of concession period<br>- Payment mechanism | Contracting authority, Ministry of Finance |
| | **Bankability** | Is the project financially attractive to the market?<br>What is the current market situation? | - Openness to input from the market<br>- Market situation<br>- Total value of the project | Contracting authority, Ministry of Finance |
| | **Eurostat regulations** | Does the project meet the Eurostat regulations?<br>Is the project considered on- or off- balance sheet? | - Other works packaged<br>- Level of detail in advanced design<br>- Need to keep it off balance sheet | Mistry of Finance, Eurostat |
| **Technical** | **Size/Scope** | For which users and for which purpose will the infrastructure be built?<br>What are the capacity requirements (present and future)?<br>Will the operation be within the scope of the PPP?<br>Will the rolling stock be within the scope of the PPP?<br>Will there be civil works necessary?<br>Will there be other facilities packaged in the deal?<br>Will there be a necessity for any unusual or complex structures?<br>Is there any section with shared tracks?<br>If so, will there be train control in place?<br>Will the system be a new system or an extension?<br>How much flexibility is needed in the system? | - Extension of existing network<br>- Proportion of phase (if extension/extension planned)<br>- Economic environment in the area<br>- Operation included<br>- Rolling stock included<br>- Shared tracks<br>- Train control<br>- Unusual or complex structures<br>- Packaging of other works (Tram depots etc.)<br>- Balance between contracted civil works & rolling stock<br>- Level of needed flexibility known by the PA | Contracting authority |
| | **Reference technical design** | What is the reference technical design?<br>What room for flexibility can be allowed in the project? | - Reference design detailed enough for permits and licenses | Contracting authority |

| Decision area | Subject | Set of key questions | Related project characteristic | Decision makers |
|---|---|---|---|---|
| | | Is it detailed enough to involve the utility providers?<br>Is it detailed enough to start the land acquisition? | - Technical innovation<br>- Cooperation of utility providers<br>- Land acquisition risk | |
| | **Technical risk assessment** | What are the technical risks of the project?<br>What is their impact/likelihood?<br>Are there measures to identify, minimize those risks for the private parties? | - Assessment of major risks<br>- Enabling works by the PA<br>- Relocation of services done upfront by the PA | Contracting authority |
| | **Output specifications** | What level of service is expected? | - Nature of schedule<br>- Technical innovation | Contracting authority |
| **Social** | **Refine social impact** | What is the public perception of the project?<br>Is there sufficient public support/acceptance of the project?<br>Who are the main stakeholders? What is their interest? | - Level of public support<br>- Concerns of local businesses<br>- Alternatives (e.g. bus) discussed with public | Contracting authority |
| **Legal** | **Concession period and compensation** | What is the duration of the concession?<br>What type of contract will be used?<br>What type of payment mechanism will be used? | - Concession period<br>- Numbers of contract<br>- Payment mechanism | Contracting authority |
| | **Explore procurement route** | What procurement methods are possible?<br>Which are the most suitable procedures among:<br>competitive dialogue vs. open procedure vs. restricted vs. negotiated, etc.? | - Openness for input from the market<br>- Expected time of tender<br>- Experience of PA<br>- Level of needed flexibility known by the PA | Contracting authority |
| **Environmental** | **EIA assessment** | What are the environmental impacts of the project?<br>How can they be mitigated and compensated? | - Local environmental requirements<br>- Party responsible for permitting<br>- Level of public support | Contracting authority |
| **Phase 3: Greenlight decision to launch the tender** | | | | |
| **Political** | **Decision to go to tender** | Is the project mature enough (completed reference design, completed financial, risk assessment, etc.) to go to the tender?<br>Is there still sufficient public and political support for the project?<br>Are there any means to show evidence of political commitment? | - Level of political support in general<br>- Power of political parties supporting the project<br>- Stability of political environment (upcoming elections?)<br>- Evidence of political commitment<br>- Concerns of local businesses<br>- Level of public support | Ministry/Parliament, Contracting authority |
| **Economic & Financial** | **Financial structure** | Which discount rates are used? | - Involvement of EIB<br>- Project protected against changing interest rates | Contracting authority |

| Decision area | Subject | Set of key questions | Related project characteristic | Decision makers |
|---|---|---|---|---|
| | | Which WACC[3]?<br>Which payment mechanism is appropriate?<br>Is the payment mechanism sufficiently robust?<br>Are there governmental guarantees or tax incentives?<br>Which incentives/penalties can be used?<br>Under what conditions should the project be refinanced?<br>Is the EIB involved? | - Total value of the project<br>- % of SPV costs<br>- Payment mechanism<br>- Guarantees from higher level (state/province) | |
| | **Select bid criteria/ Economic criteria** | What are the economic/ financial criteria to be used in the evaluation of bids?<br>What weighting is given to financial/economic criteria? | - Credit rating of contractors<br>- Experience of the contractors | Contracting authority |
| **Technical** | **Reference technical design** | Is the reference design finalized?<br>How detailed is the reference design?<br>Are all the technical requirements known and fixed? | - Completeness of project definition (specs set and fixed)<br>- Completeness of reference design<br>- Level of technical details in advanced design | Contracting authority |
| | **Technical risk assessment** | Are all the risks identified, allocated and mitigated? | - All characteristics related to the risk allocation of technical risks | Contracting authority |
| | **Select bid evaluation/ Technical criteria** | What are the technical criteria to be used in the evaluation of the tender?<br>What weights are given to the technical criteria? | - Technical innovation<br>- Experiences of contractor | Contracting authority |
| | **Technical monitoring plan** | Which KPIs could be used to measure the project's performance? | - Payment mechanism<br>- Balanced Penalties | Contracting authority |
| | **Output specifications** | Are the output specifications fixed? | - Nature of schedule<br>- Technical innovation<br>- Proof of compatibility with existing system | Contracting authority |
| **Legal** | **Detailed terms of contract** | What is the contract's performance regime (which KPIs to include in contract and how to enforce performance)?<br>What are events of default?<br>What are compensation events?<br>What are relief events?<br>What are force majeure events? | - Strictness of termination provisions<br>- Termination provision in case of extension<br>- Balanced penalties<br>- Level of needed flexibility known by the PA | Contracting authority |

[3] Weighted average cost of capital

| Decision area | Subject | Set of key questions | Related project characteristic | Decision makers |
|---|---|---|---|---|
| | | Which elements should trigger renegotiation?<br>Which conflict resolution process could be adopted? | - Level of flexibility communicated to the contractors early<br>- Arbitration arrangements<br>- Change in law clauses<br>- Additional requirements imposed by the PA<br>- Use of standardized contracts<br>- Robustness of the contract with the rolling stock provider | |
| | **Concession period and compensation** | Duration of concession period?<br>Should the concession period be fixed or variable? | - Fixed concession period<br>- Numbers of contract<br>- | Contracting authority |
| | **Risk allocation and mitigation** | Which is the party most capable of bearing the risk?<br>How can the risks be allocated to the preferred party? | - All characteristics related to the risk allocation but especially:<br>- PA retains risk of unexpected utilities<br>- PA retains risk of noise and vibration<br>- PA retains risk of archaeological findings | Contracting authority |
| | **Select procurement procedures** | Which procurement procedure will be used?<br>Which bid evaluation criteria (technical, economic) should be adopted?<br>What is the expected duration of the procurement process? | - Level of standardization<br>- Openness for input from the market<br>- Expected time of tender<br>- Experience of the PA with PPP | Contracting authority |
| **Environmental** | **Compliant with EIA** | Is the initial EIA respected?<br>Does it need to be updated? | - Additional requirements imposed by the PA<br>- Advanced design detailed enough<br>- Local environmental requirements | Contracting authority |
| **Phase 4: Award decision and contract signature** | | | | |
| **Political** | **Decision to sign the contract** | Are all the processes completed correctly? | - Concerns of local businesses<br>- Level of public support<br>- Level of political support in general<br>- Power of political parties supporting the project<br>- Evidence of political commitment<br>- Level of standardization<br>- Expected time of tender | Ministry/Parliament, Contracting authority |

| Decision area | Subject | Set of key questions | Related project characteristic | Decision makers |
|---|---|---|---|---|
| **Financial** | **Financial evaluation of bids** | Who is the preferred bidder (financial criteria)? | No relation | Contracting authority |
| | **Financial negotiations with bidders** | Have all the financial elements of the tender been fully addressed?<br>Is the project bankable? | - Protection against changing interest rates<br>- Payment mechanism<br>- Total value of the project<br>- Involvement of local banks<br>- Involvement of EIB<br>- Credit rating of contractors<br>- Experiences of contractor<br>- Guarantees from higher entities<br>- Balanced penalties | Contracting authority |
| **Technical** | **Technical evaluation of bids** | Who is the preferred bidder (technical criteria)? | No relation | Contracting authority |
| | **Clarification of technical requirements** | Are there any clarifications required by the bidders?<br>Have the clarifications been communicated to all the bidders? | - Technical innovation<br>- Unusual or complex structures<br>- Level of needed flexibility known by the PA<br>- Site acquisition<br>- Level of flexibility communicated<br>- Termination provisions/KPIs<br>- Openness for input from the market<br>- Usages of licensing to squeeze in extra scope | Contracting authority |
| **Legal** | **Bid evaluation** | Are the bids submitted and evaluated according to the procurement process?<br>Are there any complaints? | No relation | Contracting authority |
| | **Negotiation of agreement** | Are there any additional considerations?<br>Has the process reached a BAFO[4]? | - All characteristics related to the risk legal aspects of the project | Contracting authority |
| | **Finalization of agreement** | Are both parties fully satisfied with the final agreement documents? | | Contracting authority |

Source: Framework from Carbonara et. Al (Carbonara et al., 2015), extended and adjusted by the author

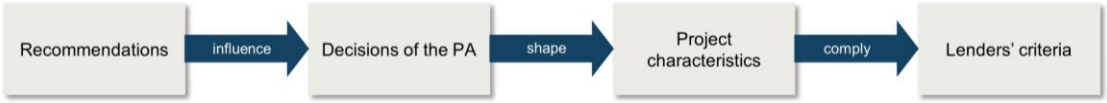
[4] Best and final offer

## 5.2 Recommendations regarding relevant decisions

After identifying the lenders criteria, determining the related project characteristics, and the decisions leading to those characteristics, this chapter provides recommendations for the PA when setting up a light rail PPP project. Therefore, the results of the previous phases and additional information from all the interviews were combined and used to draft the recommendations.

The results should ultimately act as a guideline to support public authorities when assessing the different subjects in the different decision-making areas, to take the four major go- or no-go decisions at the end of each project phase. By taking the right decisions, the project characteristics can be shaped in a way, in which they comply better with the lenders' criteria. This ultimately increase the attractiveness of the project to lenders as displayed in figure 14 below.

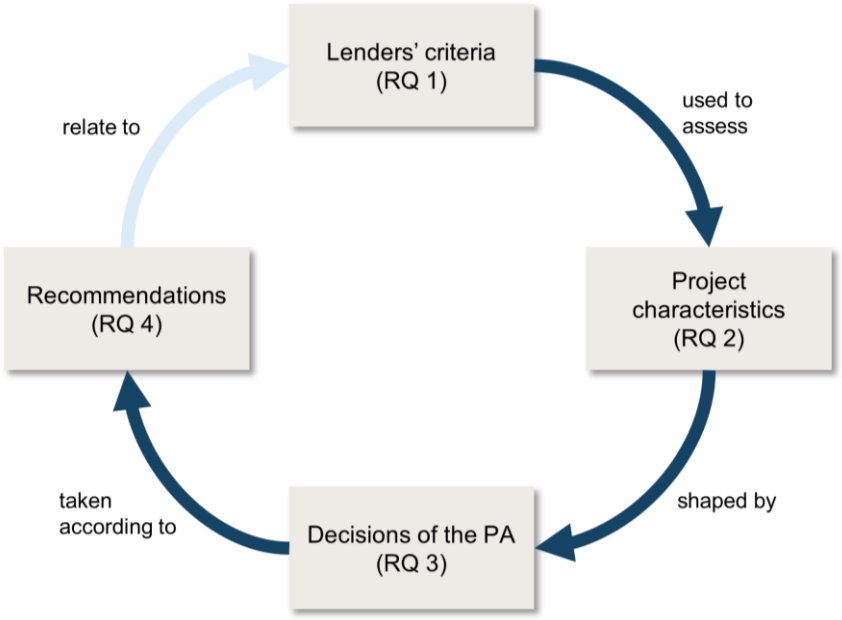
**Figure 14: Recommendations and their effect on the attractiveness to lenders**




Source: P. Hoss

To ensure that the recommendations are also meeting their intended goal, which is to increase the effectiveness to lenders, their relation to the lenders criteria is assessed. The whole research started by identifying lenders criteria and the related project characteristics. Afterwards, the decisions, shaping the related project characteristics, were identified. The recommendations should guide the PA in taking those decisions in a way which increases the attractiveness of the project to lenders. Finally, linking the recommendations to the criteria used by lenders, closes the cycle, displayed in figure 15, and allows to draw conclusions about the impact of recommendations in different phases and the influence of the PA on the attractiveness in general.

**Figure 15: Relating the recommendations to the lenders' criteria**




Source: P. Hoss

Table 16 displays those links and shows; which criteria are influenced by the recommendations in the four different project phases.

**Table 16: Influence of the recommendations in the four project phases on lenders' criteria**

| Main-criteria | Criteria | | Related to recommendations phase | | | |
|---|---|---|---|---|---|---|
| | | | 1. | 2. | 3. | 4. |
| Economic and political environment | 1. | Political & economic environment | ✓ | ✓ | ✓ | ✓ |
| | 2. | Public opinion | ✓ | ✓ | ✓ | ✓ |
| Legal and regulatory environment | 3. | Procurement process | | ✓ | ✓ | ✓ |
| | 4. | Intervention right | | | ✓ | ✓ |
| Project specificity | 5. | Project definition | ✓ | ✓ | ✓ | |
| | 6. | Feasibility studies | | ✓ | ✓ | |
| | 7. | Capacity of the technology | | | ✓ | ✓ |
| | 8. | Site acquisition and access | | ✓ | ✓ | ✓ |
| | 9. | License, permits, and authorizations | | ✓ | ✓ | ✓ |
| Project financial structure | 10. | EPC contractor's credibility | | | ✓ | |
| | 11. | Financial structure | ✓ | ✓ | ✓ | ✓ |
| | 12. | Financial flexibility | | | ✓ | ✓ |
| Third party risk allocation | 13. | Insurance arrangement | | | | |
| | 14. | Environmental and other legal/ regulatory issues | ✓ | ✓ | ✓ | |
| Contract arrangement | 15. | Concession agreement | | | ✓ | ✓ |
| | 16. | Concession period | | ✓ | ✓ | ✓ |
| | 17. | Support agreement/ guarantee | | ✓ | ✓ | ✓ |
| | 18. | Termination provisions | | | ✓ | ✓ |
| | 19. | Construction contract | | | | |
| | 20. | Operation and maintenance agreement | | | | |
| | 21. | Direct agreement | | | ✓ | ✓ |
| | 22. | Catastrophic risk | | | ✓ | ✓ |
| | 23. | Arbitration | | | ✓ | ✓ |
| Percentage of criteria influenced per phase | | | 22% | 48% | 87% | 70% |

Source: P. Hoss

When assessing the relationship between the recommendations for the four different project phases and the lenders criteria, several things become apparent:

First, not all the phases are related to an equal number of lenders criteria. Phase one seems to be linked to only a few criteria, whereby the others are related 48 - 70 % of them. This can be explained by the fact that more decisions are made throughout the preparation phase and while drafting the tender, whereby the identification is more about gathering information and looking for different solutions.

Second, it appears that some of the criteria identified in the beginning, are not influenced by the recommendations given to PA. The ‘Insurance agreement’ as well as the ‘Construction contract’ and the ‘Operation and maintenance agreement’ are arranged by the SPV with the insurance companies respectively the contractors, and therefore not under the direct influence of the PA.

In addition, the ‘Political environment’ and ‘Public opinion’ is influenced by recommendations given in all of the four phases which is in line with the idea of the high importance of continuous and stable political support.

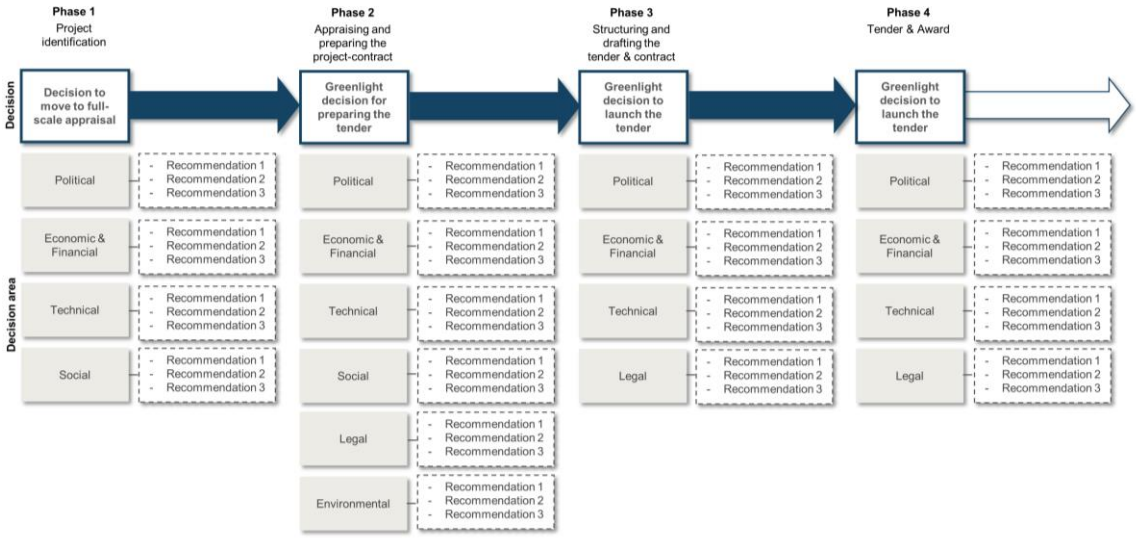
Finally, the higher number of related criteria seems to indicate a high importance of the phases two, three and four. However, one aspect that needs to be taken into account is the fact that phase four only relates to many of the criteria because they are negotiated during the dialogue. Whereby those negotiations are important, they are mostly concerned with very detailed issues and the major decisions are taken upfront when drafting the tender. Consequently, the results are indicating, that the PA has the highest influence on the criteria in the phases two and three.

A brief discussion at the end of this chapter elaborates on the compliance between the recommendations, regarding the attractiveness to lenders resulting from this research, and general recommendations provided in academic literature, institutional guidelines and other sources (RQ4 b).

### 5.2.1 Recommendations overview

To present the recommendations in a structured way, they are grouped into the four main project phases and the corresponding decision area within each phase. Figure 16 visualizes the structure in which the results are presented.

**Figure 16: Structure of the recommendations for the PA**




Source: P. Hoss

Figure 17 and 18 below summarize key recommendations according to phases and decision areas whereby the following four sections provide a more detailed elaboration.

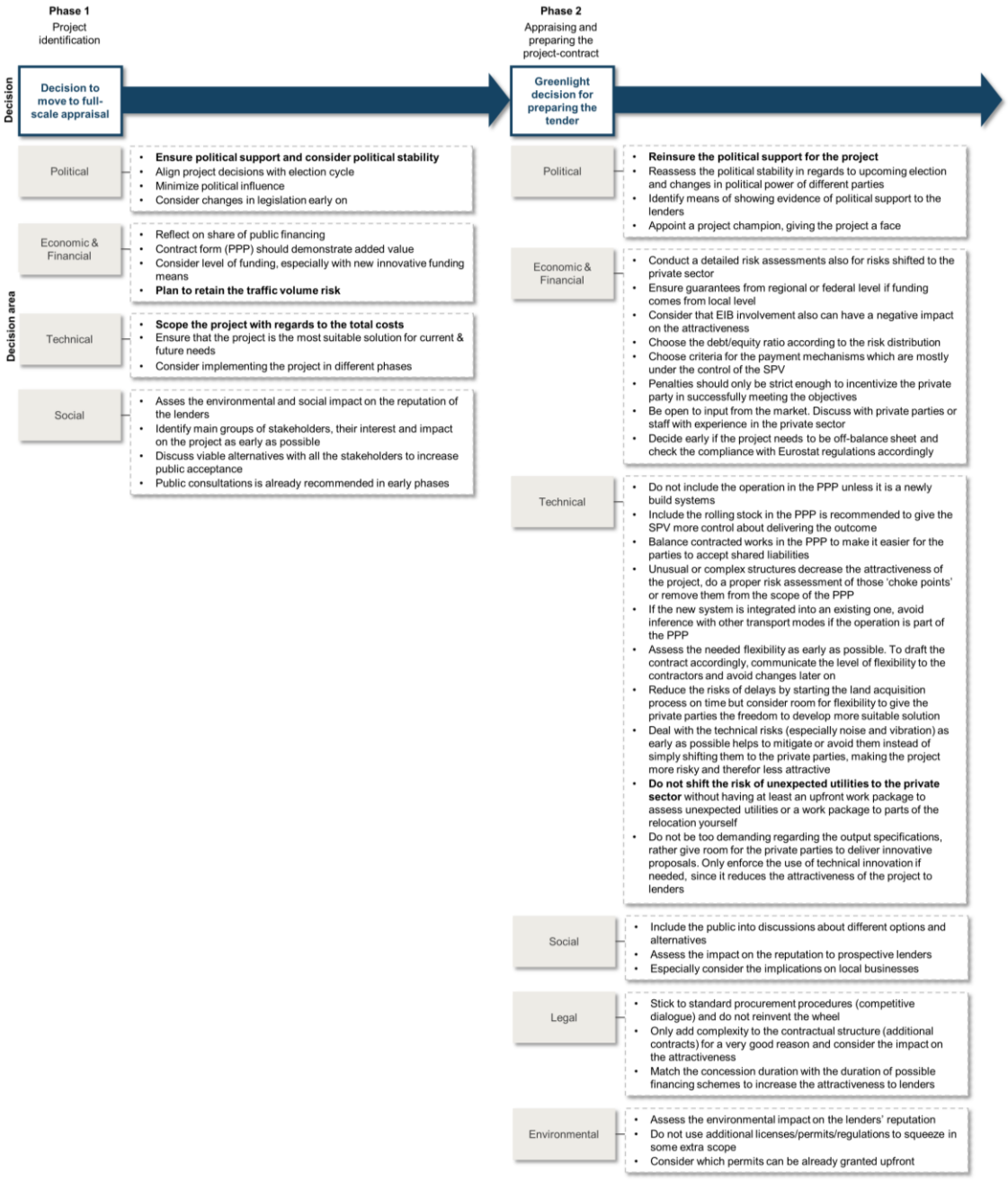
- Information in turquoise indicates to which criteria the recommendations relate
- Information in blue provides real life examples from the case study

A detailed explanation of how the recommendations relate to the criteria can be found in table 17, Appendix V.

Furthermore, some issues appear to be of special importance to the lenders and can be seen as prerequisites for them to get involved. They were mentioned by the experts during the interviews and identified as such.

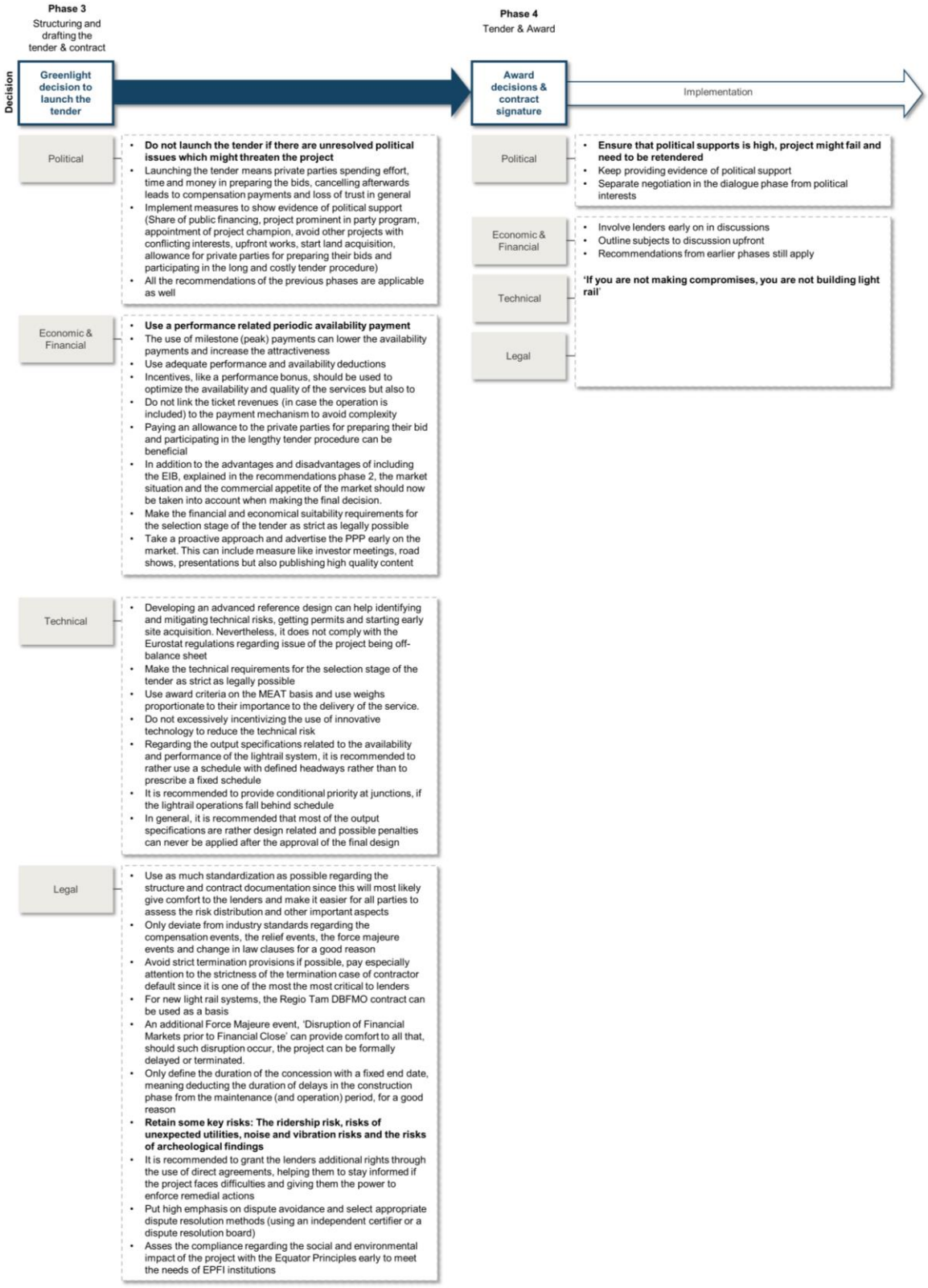
- Recommendations related to those issues are highlighted bold.

## Figure 17: Recommendation in decision areas in phase 1 and phase 2




Source: P. Hoss

## Figure 18: Recommendation in decision areas in phase 3 and phase 4




Source: P. Hoss

### 5.2.2 Recommendations phase 1

**Political:**

Relates to lenders' criteria: 1, 2

It is recommended, that the project should not proceed to the preparation phase if there is no sufficient political support for the project. The support should be ensured throughout all the project phases, starting early in the identification phase. Further, the stability of the political environment needs to be taken into account, meaning that the major decisions should also be aligned with upcoming elections. This helps avoiding a negative impact of changes in political opinion regarding the project in between. It becomes especially important, when looking at the long durations from the initial identification of the project to the actual award of the tender. While this being the case for all PPP projects around the world, the negative experience of private parties with the RegioTram makes this especially important in the Netherlands.

Also, the political influence should be minimized by sticking to the legal decision-making process framework, only involving political parties in the formal decisions, but not in the considerations in between.

With the lack of political support being one of the major factors for the failure of the RegioTram in Groningen, lenders seem to attach high importance to this aspect when assessing similar projects in the Netherlands.

In addition, when considering the implementation of new legal instruments, meant to help establishing the project, the early political support is crucial, since it is needed to get a majority for changing the laws accordingly and the time those legal processes need.

New ways of innovative funding for transport infrastructure are currently discussed by Dutch policy makers. Those include: Using the increasing property values as an alternative source of funding, higher charges for priority lines, mobility-access charges for households and others. However, implementing those new ways of funding is politically charged and not expected to happen in the short term.

**Economic & Financial:**

Relates to lenders' criteria: 1, 2, 11

When assessing the affordability of the project, the share of public money for the financing is something to be considered. On the one hand, a public contribution to the financing signals confidence in the success of the project. On the other hand, it needs to be completely privately financed to comply with the Eurostat regulation in order to be off-balance sheet. Also, the socio-economic returns of the project need be estimated early enough, not only to choose between different alternatives, but also to use those results to accumulate strong and sufficient political support. It is recommended, to contribute to the financing if possible and signal confidence in the project.

Likewise, the choice of the most appropriate contract form is obviously of great importance, since the lenders cannot contribute to the financing if it's not within the scope of the contract. However, when opting for a PPP model, it should demonstrate added value when being assed using a VfM analysis and compared to the private sector comparator.

A recent, but still confidential, report, conducted by McKinsey on behalf of the G4 majors, estimates potentials savings in public expenditures between 10% and 15% when choosing a PPP option.

Another important aspect is the assessment of the funding mechanisms. The lenders look for projects, in which the client has evidence for securing the money. This can include guarantees from higher level of government, if new funding mechanisms are used and the funding comes from a local level.

Currently, the funding for transport infrastructure in the Netherlands comes from the national level. However, new means of funding, so called 'innovative funding methods', are currently subject of ongoing political discussion and should therefore also be considered quite early in the project process.

Further, the provinces and municipalities are, in contrary to the state, not rated entities, which can negatively influence the attractiveness of the project to lenders.

In Ontario, 2/3 of the funding was provided by the national government and 1/3 was a contribution from local taxes. Funding provided from a national level, and the state being a rated entity, gives comfort to the lenders. However, the creditworthiness of local governments is harder to assess.

One more aspect, which needs to be carefully considered, is the payment mechanism. Whereby the detailed payment mechanism will be developed in later project phases, it is important to note, that most lender do not seem to be willing to accept anything beyond an availability-based payment model.

All the projects of the case study use an availability-based payment mechanism, guaranteeing a stable income stream to the SPV, independent of the traffic volume risk.

**Technical:**

Relates to lenders' criteria: 1, 2, 5

When assessing the need for a project, a proper assessment of current and future demand needs to be conducted in order to develop a matching solution. While scoping the project accordingly, this also influences the attractiveness of the project to lenders in several ways.

First of all, the size and scope of the project decisively influences the total costs for the project. The bigger the project, the more complex it usually gets, and more lenders need to be involved in order to finance it. On the other hand, can a smaller, and usually less expensive project, decrease the attractiveness, since most of the banks are not considering investments below €50m. Besides, most lenders feel comfortable having at least one other party involved, and the investors likewise want to get a sufficient (usually €50m+) share of the project. Those considerations imply a minimum contract value of at least €150m, also depending on the share of public financing and the involvement of the EIB regarding the attractiveness to lenders.

Assessing the need for a project can be part of the identification process, but can similarly come from another, more holistic level of planning like a long-term transport development policy etc. If this is the case, it is important that the solution is still the most suitable alternative for the actual need, since a mismatch (for example, if the utilization is below expectations) will not only threaten the financial feasibility but can also decrease the political and public support of the project.

In the same way, the nature of the project itself plays an important role. It can be a new, stand alone, system, it can be an extension to an existing system or one of several parts of a system, which are implemented successively. Implementing a light rail project in different sequences can be one option to achieve a project matching the available funding and/or the current and future needs. In terms of the attractiveness to lenders, it can help to achieve a 'bankable' size in terms of contract volume.

This implementation in different phases is done in the Brabo II, NET Phase 2 and ION Rapid Transit Stage 1 project.

Moreover, if the PPP is an extension to a system, which was implemented successfully and is already in operation, the lenders tend to perceive it as more attractive. It proofs, that the PA is capable of procuring such projects (provided that it was a PPP) and implies, that the main risks, related to the project, are already identified. Moreover, learnings from the previous project are anticipated to facilitate any following project and fare box revenues, already banked, can be checked and compared to previous expectations.

Positive user experience and banked far box revenues of NET Phase 1 gave comfort to the lenders and private parties, bidding for the NET Phase 2 project.

**Social:**

Relates to lenders' criteria: 1, 2, 11, 15

Lenders also consider the level of public support of the project. A lack of public acceptance can also weaken political support and cause delays through a high number of objections. Further, getting involved in a project with a lot of public resistance can negatively impact the reputation of lenders. Hence, it helps to identify the possible social impact on different stakeholder groups as soon as possible, map their interests and consider their objectives. Discussing other viable options with the stakeholders and conducting early public consultations are highly recommended. If the system is an extension, a positive perception of the existing system and a high level of satisfaction regarding the provided service can positively influence the attitude towards the new project. This becomes especially important in the Netherlands, since failure of the RegioTram was closely related to strong public resistance.

An early study, conducted in 2007, confirmed light-rail as the best solution to the mobility needs in Liege. Hybrid buses were running already but reached their capacity limit. This was communicated to the public early on and helped to minimize public resistance.

### 5.2.3 Recommendations phase 2

**Political:**

Relates to lenders' criteria: 1, 2

While the project gets more concrete throughout phase 2, and more detailed information becomes available, it is of great importance to assess the impact of those information on the political support for the project.

Similar to the political support, the political stability should also be considered throughout all the four project phases. Possible scenarios for upcoming election should be assessed with a focus on potential changes in the power of political parties and their attitude towards the project. Important decisions should be aligned with potential changes like upcoming elections.

The ION Rapid Transit project for example, went through local, provincial and federal elections during the project. It was important to ensure that decisions, made before an election, could not be changed again later on.

It is also recommended, to consider having a political project 'champion', giving the project a face and campaigning for political support, like it is done in other countries. Ideally, the champion should link the success of the project closely to the success of his personal political career.

This could not be seen for any of the case study projects, but appears to be common practice in other countries, for example in France.

Further, measures can be taken to show evidence of political support. This can include raising parking prices in the city centre, spending money in upfront work packages, etc. However, on a municipal level, the authorities are legally not allowed to introduce new taxation. Therefore, measures like a work-place parking levy like in the UK are not suitable yet.

This being said, the current G4 discussion in the Netherlands also consider changes in legislation, allowing the municipalities to raise money themselves. The idea of charging the public for better accessibility seems to be logical, since the municipalities in the Netherlands already use similar approaches in other areas (for example a contribute for all households to the connection to the sewages system and the waste-water treatment).

**Economic & Financial:**

Relates to lenders' criteria: 11, 15, 17

In the detailed preparation, the risks, their likelihood and their impact in the project, especially the projects cashflow need to be identified. A sensitivity analysis can help addressing those issues. Regarding the identification and mitigation of risks, it is important to note that, even if the PA decides to shift those risks to the private parties, a better understanding of those risks can be shared with the private parties later on, helping them to better managing it, which ultimately increases the attractiveness of the project to lenders.

The City of Nottingham developed an advanced design for the NET Phase 2 project, which helped analysing and minimizing the major risks of the project upfront.

Regarding the financial structure, it is recommended to take several important aspects into account. First, a decision regarding an appropriate funding mechanism should be made, whereby lenders should be comfortable with the credit rating or the balance sheets of the owner. Guarantees for higher level of government, federal or regional, should be considered and secured if the funding is coming from a local level (like it might be the case if the government agrees to the use of new funding methods in the Netherlands).

The involvement of the EIB usually gives confidence to lenders in riskier environments like developing countries. However, the general legal and political system in the Netherlands can be considered relatively stable, which makes this argument invalid. Furthermore, the involvement of the EIB actually comes with some disadvantages, regarding the attractiveness of the project to lenders. First of all, they are obviously taking away part of the financing which could have been provided by the lenders.

The EIB contributed with EUR200m to the Tram de Liege and with GBP100m to the Net Phase 2 project.

Second, but more important, they do not only require a lot of additional documentation during the whole process, but also confirm their final commitment quite late in the process, usually during the preferred bidder stage. This makes it hard for sponsors to deal with them and difficult to issue certain tickets to the lenders.

Because of this uncertainty, the EIB was willingly kept out of the financing for Brabo II, where the whole financing seemed to be complex enough, regarding the contractual structure.

Also, the debt/equity ratio needs to be considered. On the one hand, it is beneficial for the PA to have a high amount of debt, which is usually cheaper than equity, leading to lower funding requirements. From a lender's perspective, a high amount of equity is favourable, since it not only protects them if the concession's value decreases but also means that the equity investors have enough 'skin in the game' and therefore an incentive for performing well.

To cite one of the project participants of the Net Phase 2 project: “I think the balance that we had 50/50 between the financial investors and the four, what we call the industrial sponsors was quite a good balance, because it focused everyone’s attention on producing a return on investment, but at the same time, supporting the industrial sponsors.”

This consideration is also closely linked to the nature of the payment mechanism. As explained earlier, it is, in regards of the attractiveness of the projects to lenders, recommended to choose an availability-based payment mechanism. However, this also means that the PPP is considered less risky in terms of revenues compared to other forms, since the availability payments are more or less fixed. Consequently, this relatively stable stream of income, which reduces the risks for the SPV, allows the share of equity to be lower compared to PPPs with other payment mechanisms.

Moreover, a first outline of potential penalties for the private party should be explored. However, the penalties should always be balanced according to the risks and used as an incentive for the SPV to proactively maximize the fulfilment of objectives, set by the client. Those considerations are related to the payment mechanism, the concession duration, termination provisions and other aspects of the concession contract.

With more details about the project becoming available, the feasibility and bankability need to be (re-) asset using a cash-flow analysis and conducting a market sounding. Both considerations, however, do not directly influence the attractiveness of the project to lenders, but rather indicate if previous choices are favourable or not. However, openness of the PA to input from the market is highly recommended. This can be done by informal meetings with different parties or hiring experts, who are usually working for the private sector.

This was done in the Regio Tram project, where the PA recognized their lack of experience with light rail PPPs, so they did an extensive market sounding and hired experienced staff, usually working for the private site.

Also, the public authority must decide whether or not the project debt and liabilities should be off-balance-sheet. If they decide to do so, the Eurostat regulations generally state, that ‘…, the majority of the risks and rewards have to be borne by the private partner.’(EUROPEAN COMMISSION, 2010), which implies a lot of consideration in various areas of the project to ensure the compliances with the latest regulations. It affects, for example, the possibility to package other works in the PPP contract. Therefore, it can affect the balance between contracted civil works and rolling stock, the possibility to develop a detailed and very advanced reference design, the provisions for further extensions in the contract, the termination provisions and many more project characteristics which are also important to lenders. The compliance of the project with the Eurostat regulations should be considered early on to avoid changes in later phases. From a perspective of lenders, it would be favourable, if the PA wouldn’t mind if the project is on- or off-balance sheet. Because this would allow them more freedom in adjusting characteristics according to the wishes of lenders.

For the Tram de Liege, the private parties had the chance to negotiate the termination provisions, making the project more attractive to them. However, due to the Eurostat regulations, those termination provisions had to be changed back again later on due the compliance with Eurostat regulations.

The probably most important advantage, taking the project on-balance sheet, is, that the PA is capable of developing an advanced reference design, further explained in the technical recommendations stage 3.

### Technical

Relates to lenders' criteria: 5, 6, 8, 17

In phase 2 of the project, the technical scope will be refined, taking into account the size/scope, a reference design, a technical risk assessment and a clear understanding of the output specifications.

When scoping the projects, simulating and analysing different options, and finally planning and designing the routes of the line(s), a variety of aspects is directly linked to the attractiveness of the project to lenders.

One of the main considerations, regarding the scope, is the decision to include the operation of the system in the PPP contract. Whereby there are many things to be considered here, lenders tend to prefer a DBFM, since the operation usually makes the risk distribution and passthrough to the operating contractor more complex. In addition, the farebox revenue and traffic volume risks is borne by the private parties as well, leading to more uncertainty in the income streams compared to a pure availability-based payment. However, the separation can also lead to discussions regarding the liabilities in the case of delays. The PA can nevertheless benefit from including the operation since they shift the interface and operation risks to the private sector and have only one party held responsible. This is especially true for new systems, where the different parts (signalling, rolling stock, tracks etc.) have to be integrated. For an existing system, the specifications are already well known. On the other hand, they lose a certain degree of flexibility, the possibility to influence the user experience with the quality of the operation provided and are more vulnerable to strikes from the operating staff.

The NET Phase 1 concession contract had to be terminated, in order to extend the system and contract a new concessionaire. The operator of Phase 2 is now also responsible for the operation of Phase 1. However, a compensation had to be paid and the problem regarding the flexibility, when including the operation within the concession contract, becomes apparent.

The second decision, regarding the scope of the PPP, is the procurement of the rolling stock. From a lender's perspective, including the rolling stock is favourable, since it not only increases the total investment volume of the project, but also gives the SPV more control about managing the interfaces and delivering the expected service. The PA, however, might limit the number of bidders, since there are not too many rolling stock providers on the market. They can also not stick to their own rolling-stock procurement schedule (in terms that the system is an extension to an existing network).

ION Rapid Transit in Ontario for example, cannot start operation since the rolling stock provider, contracted by the PA, struggles to deliver and the SPV lacks the skills to add some technical equipment in the delivered vehicles. However, it is interesting to note, that the PA first planned to integrate the rolling stock in the PPP contract, but decided to do otherwise since another city was placing a big order with Bombardier. The systems are quite similar, and the PA only needed a few (14) vehicles compared to a rather large order. Therefore, they had the chance of making a good deal with a good price when ordering everything together. Looking back, the contracts with the rolling stock provider seem not to be strict enough and the interfaces between the SPV and the rolling stock lead to problems.

When scoping the project, the PA gets a better understanding of the civil works, which might be needed to implement the project. When those works should be integrated in the contract, it is important to keep the balance between those works and the value of the rolling stock (if included in the PPP) in mind, since the contractors share liabilities and are more likely to do so if the balance is right.

Further, the need for unusual or complex structures becomes apparent. They add more complexity and technical risk to the projects and tend to make it consequently less attractive to lender. It is recommended to either do a very solid risk assessment, helping the lenders to deal with the risks of those complex structure, or take them out of the contract scope to procure them separately upfront. However, this decreases the complexity within the PPP scope but can also increase potential interfaces.

One example for a complex structure in the Tram the Liege project is the Atlas bride, which had to be increased in high and adjusted to support the light rail line. Even though this appears to be difficult, the PA decided to keep it in the scope of the PPP contract. However, they did a feasibility study to investigate the potential choke point and minimize the risk upfront.

Another example it the relocation of a high voltage transmission line for the ION Rapid Transit project. Here, the PA decided to take it out of the PPP contract scope and do it themselves as part of an upfront work package.

If the new system is integrated into an already existing rail system, some section might have shared tracks with other rail-bound transport systems. However, the risk of interference with the other system should be minimized or avoided by not planning a shared section in the first place, especially if the operation is included in the scope of the PPP.

The ION Rapid Transit Project for example, has a section of 4km which is shared with heavy rail. To minimize the interference, the heavy rail traffic is only running during night times when the light-rail system is not operating.

Closely related to the simulations regarding the current and future needs for the system, is the question of the needed flexibility within the systems. Will it be possible to stop with more vehicles at the tram stops if the use of the system increases? Are there possibilities to extend the system or operate the same system with a higher capacity? Those aspects need to be considered carefully and early on, to be aware of the level of needed flexibility, to be able to communicate it early to the private parties in the next phase, and to avoid changes later on.

For the RegioTram, the provisions for further extensions were discussed intensively and communicated to the private parties during the dialogue. On the other hand, the Brabo II contracts are inflexible and no further extensions are planned. This inflexibility can lead to problems, as in the NET Phase 2 project, where the first concession had to be terminated, and the concessionaire compensated, in order to extend the system.

Additionally, it is recommended that the site acquisition process should start as soon as possible. It usually remains within the responsibilities of the PA, since they have the adequate legal power to deal with it. Whereby some PAs set clear boarders, in which the project must be build (RegioTram), others are more flexible and the SPV can, dependent on their requirements, claim the space they need, and the PA acquires it accordingly. Whereby the second approach gives more flexibility to the contractors in developing the most suitable solution, it is also connected to a higher possibility of delays in the acquisition process.

The SPV of the ION Rapid Transit for example, filed a claim against the PA for not acquiring certain plots on time, even though the SPV communicated their requested within the agreed timeframe.

On the other hand, it also gave the opportunity to acquire extra space later on and replace retaining walls, along one part of the system, with a simple slope, saving a lot of costs. The early identification, ideally even before a detailed planning, of the property required, also allows the PA to purchase it before the prices increase. Also, it allows enough time for lengthy negotiations and expropriation procedures if needed.

In the RegioTram project for example, the PA bought a part of building in Groningen and demolished it in order to make room for the tram tracks. Even though the part of the system had been technical feasible with a sharp curve around the building, it would have led to a decrease in passenger comfort.

To sum it up, a clear outline of the land required facilitates the acquisition process and decreases the risk for delays, whereby some flexibility can lead to a more suitable solution, which is both in the interest of lenders.

Risk workshops, the use of risk registers and simulations can help to identify, and consider the allocation, of technical risks. Doing this in an early stage can have several advantages, for example avoiding a risk, rather than allocating it to the private sector, who then struggles later on to come up with an appropriate solution.

An example is the location of a tram stop, close to a research facility which is very sensitive to vibrations. Instead of shifting this risk to the private sector, who has to come up with a complicated technical solution for the issue, it might be easier to move the location of the stop a few meters in an earlier phase, to avoid or minimize the issue.

The risk assessment can also be shared with the SPV later on, decreasing the risks for them and therefore increasing the attractiveness, also to potential lenders. Early identification also allows mitigation measures for the PA. Main risks, repeatedly mentioned in most of the interviews, are noise and vibration issues and the risk of unexpected utilities and discussed in more detail.

The issue related to the utilities should be taken seriously as well, since most of the projects faced problems regarding unexpected utilities and the reluctance of utility providers to cooperate[5]. The utilities in most inner cities are not properly mapped, services, which are not needed anymore are simply abundant, and there is an endless variety of different providers. Those providers usually have their own construction schedule, more concerned about the availability of their services, rather than the relocation of existing ones. Further, they have seen many projects cancelled during the planning or later stages, which also explains their reluctances to cooperate in early stages. In addition, there are no incentives for utility providers to cooperate.

Brabo II, NET Phase 2, ION Rapid Transit and Tram de Liege faced difficulties regarding the relocation of utilities during the construction phase.

Measures which can be taken by the PA are the upfront assessment of utilities or an upfront work package, already relocating some of the services.

For the Brabo II project, the PA did a detailed assessment of utilities, which helped the private sector to take on the risk.

In the UK, an advanced work package was conducted to detect utilities first and to avoid getting in the way in main construction program for the NET Phase 2 project. However, even this upfront work package took longer and was more expensive than expected.

Similar to the UK, enabling works through local contractors were used to relocate transmission utilities, which are usually bigger and more complex than the ones for distribution, for the ION Rapid Transit project. Those works included transmission lines, major water mains and major gas services.

[5] An interviewee, also involved in the light rail PPP in Sydney, Australia, mentioned that the project just hit the mark of 15.000 unexpected utilities, leading to cost overruns of hundreds of million dollars.

Another issue to consider are the output specifications that are needed. This is, again, closely linked to the assessment of current and future needs. Additionally, they should also open the possibility for the private sector to come up with innovative ideas. Enforcing the private parties to make use of innovative and new technologies which is perceived riskier by the lenders, should thus be avoided.

The public authority in Antwerp was prescribing a section without overhead lines for the Brabo II project. This technical innovation was a point of concern to lenders.

However, there is also a tendency of the private sector to just mirror the input from the PA in their bids, without the self-initiative to introduce innovative solutions.

For the ION Rapid Transit project, the PA changed the contract form from a DB to a DBFM because they hoped for a more innovative solution. However, the proposals only fed back what the PA gave them.

Further, a highly advanced reference design and very detailed output specification, limit the possibilities for innovation. Consequently, the recommendation that can be given is to demand innovation only, if it is necessary. Otherwise, gave them more freedom to develop innovative solutions within the output requirements. To encourage more innovation, the award criteria can be adjusted in phase 3 or the innovation can be discussed in the dialogue in phase 4.

**Social:**

Relates to lenders' criteria: 1, 2

With a more detailed planning, also the social impacts of the project can be assed more reliable. A positive social impact influences the public support for the project, and therefore directly and indirectly the political support as well. Again, the social impact has, similar to the ecological impact, also an influence on the reputation of perspective lenders. Stakeholder meetings and public consultations are measures to ensure the public support. It is recommended to pay particular attention to the concerns of local shop owners, since the disturbance during the construction can have a negative impact on their business. If they are furthermore not even within the catchment area of a future tram stop, they might reject the project and form a strong resistance, also with the ability to influence the local politicians accordingly.

Local shop owner, especially in a very narrow part of the inner city, rejected the RegioTram in Groningen and contributed to the lack public and also the lack political support.

Different options regarding the exact alignment of the tracks, as well as alternative solutions, should be discussed with the public to minimize resistance above the average level which cannot be avoided.

**Legal:**

Relates to lenders' criteria: 3, 11, 16

One aspect, which can be grouped in the legal decision-making area, is the definition of the procurement route. Whereby the PA should consider, next to the legal and regulatory aspects, the experience they themselves and the private sector has with the chosen procedure. A standard procedure, familiar to the private parties, can help to shorten the duration of the procurement process and make them feel more comfortable submitting a bid.

A well-established process, like in Canada and the UK, seems to facilitate the whole tender phase.

Hence, it is, with regards to the attractiveness of the PPP to lenders, highly recommended not to 'reinvent the wheel' with the use of new, and innovative ways of tendering the project. Better make

use of existing (EU-based) procurement legislation and the competitive dialogue procedure. The choice of the right procedure influences not only the experience of the parties, but also the duration of the tender process and the possibility of input (design and contract wise) from the market.

Another consideration, which can be allocated into the legal decision area, is the contractual structure of the concession. Even though the details of the contract are drafted in the next stage of the process, basic consideration should be taken into account in phase 2 already. Main considerations are the number of contracts that are used, the duration of the concession and the legal feasibility of the payment mechanism.

The concession period should, next to many other considerations, match the duration of possible financing schemes, to increase the attractiveness to lenders. More detailed information about the concession period is explained in the recommendations of the next phase.

A complex contract structure seems to increase the complexity and therefore the risk of the project. However, if the project needs to be off-balance sheet but other works, not directly related to the light rail system, are needed, those can be contracted under an additional contract.

For the Brabo II project, a structure using three different contracts, was used. A DBFM contract with the transport provider De Lijn and one with the Flemish region for all the tram and road works, and an additional DBF contract with the City of Antwerp for urban redevelopment.

Nevertheless, from a lender's perspective, a simple framework using one contract is always favourable (with the exception of the direct agreement between the PA and the lenders, further explained in the legal recommendations phase 3).

**Environmental:**

Relates to lenders' criteria: 9, 14

The PA has to conduct an Environmental Impact Assessment (EIA) to identify the environmental impacts of the projects and ways to mitigate and compensate them. On a large scale, light rail always seems to be a very sustainable and environmentally friendly solution compared to other modes of transport. The outcome of the EIA is not only necessary from a legal and regulatory perspective, but also important when considering the impact of the project to the reputation lenders.

Another aspect to consider is, that environmental issues can, unlike other regulations, differ locally even within one country or province. Thus, their implications are difficult to assess for lenders and thus perceived rather risky, which makes an appropriate assessment even more important. Consequently, it is not beneficial to the attractiveness of the project to lenders, if the PA tries to squeeze in some extra work, demanding compliance with additional licenses or regulations which are not necessary.

It is also recommended, that the PA not only identifies the necessary permits, but gets them, if possible, already upfront to minimize the risk in later phases. An advanced reference design can help obtaining permits at an early stage. Following the idea of allocating risks with the party most capable of handling it, it is recommended to be retained by the PA.

### 5.2.4 Recommendations phase 3

**Political:**

Relates to lenders' criteria: 1, 2, 3

Before the decision, to launch the tender, is made at the end of phase three, the tender and contracts need to be structured and drafted carefully. During this phase, it is, like in all the other phases, still important to secure sufficient political support for the project. If there is doubt regarding the support for the project at this stage, it is advised not to proceed until the relevant issues are dealt with and the support is ensured. This is important to remember, since the private parties are spending a lot of work, time and money in preparing their bids as soon as the tender is published.

If there is, for whatever reason, a decrease in political support during the tender, or the tender does not get awarded, like in the case of the RegioTram, the lenders not only lose a lot of money, which the PA has to (partly) compensate, but their bad experience also harms the reputation of using PPPs for lightrail in the Netherlands.

All the recommendations, given in earlier phases, are applicable for phase three as well. Moreover, the means to show evidence of political support, which should be identified in stage two already, should now be implemented. Some of them are connected to other decision areas and partly discussed in the recommendations given there. However, a short summary is provided here as well: Co-finance the project with public money, make the project prominent in the party program of powerful, supporting parties, appoint a project champion, do not commit to other projects which might conflict with the lightrail system (like planning a car park in the city centre) conduct an upfront work package, acquire some of the land, decide to develop an advanced reference design, raising parking fees in the city centre or decide to pay allowance for the private parties to prepare their bids and participate in the lengthy tender procedure.

Nottingham is charging a work place parking levy as a way to raise money for the local contribution to the project. Whereby this is a probably an unpopular measure, it is also a clear sign of strong political support for the NET Phase project.

Also, the money (€1.2m), spent by the city of Liege on enabling works signals strong commitment to the lenders.

On the other hand, planning an underground car park in the city centre, like it was done in Groningen, can have the opposite effect, since it contradicts the idea of a light rail system.

**Economic & Financial:**

Relates to lenders' criteria: 11, 12, 15

When structuring and drafting the tender, the financial structure is of great importance, not only to the success of the project, but also to the attractiveness to lenders. This includes the choices of adequate discount rates, the WACC, the details of the payment mechanism, the use of financial incentives and penalties and the choice for financial/economic award criteria and their ratings.

The nature of the payment mechanism is of high importance to the lenders, since it is directly linked to the income stream of the SPV. During the term of the DBFM(O) agreement, the SPV should receive a performance related periodic availability payment. The PA can also include milestone (peak) or progress payments to lower the availability payments and to allow the SPV to have some income before the operating phase stared.

For the RegioTram Groningen, five lump sum payments when achieving completion worth €40 m, where planned.

For the Tram the Liege, progress payments are used and payed quarterly to the SPV according to the progress of the Non-Configuration Works.

The payment regime should include incentives, like a performance bonus, to optimize the availability and quality of the services to be provided, for example in connection with availability, safety, nuisance, complaint handling and quality of the Public Transport. It is also recommended to use adequate availability and performance deductions.

To avoid an overly complex structure, the income stream from the user charges should not be linked to the payment mechanism. If the system is mostly segregated, it is favourable for the private parties if most of the value is linked to the reliability and punctuality of system, which is in their control.

Further consideration can include paying an allowance to the private parties, partly covering their costs for preparing the bid and participating in the lengthy tender procedure.

An allowance was paid to private parties, submitting their bids for the Tram de Liege and Brabo II project in Belgium.

In addition, discussions with the EIB are needed, if the PA decided to include them in the project. This decision not only depends on the advantages and disadvantages, already explained in the recommendations for phase 2, but also on the market situation and the resulting commercial appetite from other banks. In a weak market, it is important to get their support, in a rising market you do not necessarily depend on them.

For awarding the tender in a competitive dialogue, the PA will select suitable candidates in a first stage. In this selection stage, interested parties can qualify for participating in the dialogue, based on a set of requirements. Even though those shortlisting criteria have to be proportional to the necessary capabilities needed for the project, they ensure the minimum financial and economic capabilities of the contractors. For this reason, they are not only important for the PA, but also of high importance to the lenders. Consequently, they should be as demanding as legally possible. However, bear in mind that this can limit the number of potential bidders and there is a minimum of participants needed to be selected for the dialogue phase (usually three).

And finally, the potential lenders should be aware and familiar of the project. The more familiar they are, the more likely they are going to consider an investment. Again, the involvement of local banks, increases the attractiveness to foreign lenders. Consequently, it is recommended to take a proactive approach and advertise the PPP early on already. This can include measure like investor meetings, road shows, presentations but also publishing high quality content in industry publications or other suitable platforms.

**Technical:**

Relates to lenders' criteria: 3, 5, 6, 7, 8, 9, 10, 14, 15

The development of a reference design is closely linked to the project characteristics, which are important for the attractiveness of the project to lenders. In general, a very detailed and advanced reference design allows the PA to asses and deal with risks in earlier project stages but might also imply, that the project cannot be off-balance sheet.

The ION Rapid Transit had a very detailed advanced design available, since they first thought about procuring the project in a DB contract, the Tram de Liege had a fairly advanced reference design as well, due to the fact that they already tendered the project ones.

The PA of the NET Phase 2 project in Nottingham made the conscious decision to make a very detailed reference design to identify and minimize risks early on, even if the idea technically

contradicts the idea a PFI, to rather use output specifications and let the private party develop the best suitable solution.

Brabo II and the RegioTram on the other hand, stuck to the idea of using output specifications and didn't develop a detailed reference design themselves.

The advantages of having a detailed reference design are multifarious. An advanced utility design allows upfront works and the relocation of utilities. The feasibility studies can be made available for the SPV, it is possible to get main permits already early in the process, which gives confidence to lenders

Tram de Liege: The Authority obtained the "Permis Unique" on 16 May 2014 based on the reference design. The duration of the validity of this permit is unlimited regarding the construction requirements, provided that the works have begun in a significant way by 16 May 2022, but only has a 20-year validity for the Operational Phase until 16 May 2034, after which it will need to be extended.

It also shows commitment to the project; it helps assessing the main risk areas and likewise allows to start the land acquisition process quite early.

Similar to the financial and economic shortlisting requirements, the bidders should also have the necessary technical capability of executing the project. Again, this is important to lenders and the requirements should therefore be as strict as possible.

For awarding the contract in a competitive dialogue procedure, the PA can only use criteria on the MEAT basis. The ratio of the price and quality elements should be weighted to be proportionate to their importance to the delivery of the service. The same should be done for any sub criteria. Not excessively incentivizing the use of innovative technology since this will most likely reduce the technical risks and consequently also the attractiveness of the project to lenders.

Output specifications given by the Authority include both functional and technical aspects whereby it is favourable if a large number of the output requirements are design related and approved and agreed designs should ensure that the penalties need never be applied (like for example specifications regarding the functionality: handrail positioning, number of tram doors, pitch of seats etc.).

The nature of schedule, demanded through the output specifications, should also be considered. In general, it is favourable to have schedule, from which it is easier to recover from in the case of a delay. This is important to lenders since the performance is linked to the availability payments through the payment mechanism. Therefore, it is for example recommended to rather use a schedule with defined headways rather than to prescribe a fixed schedule.

Another aspect, related to the performance of the system, is the priority of the tram at junctions. Ideally, the operating system and related payment mechanism should be based on a tram system with conditional priority. Conditional priority means that a tram will receive priority at a junction when it is behind schedule. Absolute priority at traffic junctions, for all trams across all periods of the day, will unlikely be feasible in most cases.

**Legal:**

Relates to lenders' criteria: 3, 4, 14, 15, 16, 17, 18, 21, 22, 23

Structuring and drafting the tender is always related to a lot of legal issues, like the risk allocation and mitigation, details on the events of default, relief events, force majeure events, the concession period and my others.

However, a general recommendation, applicable for all lightrail, and probably for any other PPP, is to use as much standard documentation as possible. Standardized contracts give comfort to the lenders and make it easier for all parties to assess the risk distribution and other important aspects. Unfortunately, there are no standardized DBFM(O) contracts for transport infrastructure in the Netherlands.

Bits and pieces from the standardized, and well developed, road PPP contracts from Rijkswaterstaat, were used for developing the RegioTram DBFMO contract. In general, the interviews state that the contractual framework was very well-built and could be used for future new light rail PPPs in the Netherlands.

Further, contract details like the events of default the compensation events, the relief events, the force majeure events and change in law clauses should not deviate from industry standards without a good reason. An additional Force Majeure event, 'Disruption of Financial Markets prior to Financial Close' can provide comfort to all that, should such disruption occur, the project can be formally delayed or terminated.

The RegioTram contract had an additional Force Majeure event, namely the 'Disruption of Financial Markets prior to Financial Close.

Especially strict termination provisions can decrease the attractiveness to lenders. Especially the termination case of contractor default is critical since this can lead to a case in which the lenders will not be payed fully.

Another recommendation is to consider the need for possible extensions early on and include the necessary termination provisions in the contract. However, the termination provisions must also comply with the Eurostat regulations.

Another legal aspect to consider is the concession period. Not only should the concession period, next to many other considerations, match the duration of possible financing schemes, to increase the attractiveness to lenders but it can also vary in its duration. It can be fixed, ending a set date in the future, or variable, running from the substantial completion date for a fixed amount of time.

A fixed concession period is meant to incentivize the SPV for short construction times. However, in case of delays, the losses due to a shorter period of maintenance (and operation) are immense. For that reason, it is only recommended to use this approach for a good reason, since it is perceived very negative from a lender's perspective.

For the Tram de Liege and the Brabo II project, a fixed concession period was used, punishing the SPV with a shorter operation and maintenance period in case of delays during the construction.

The RegioTram, ION Rapid Transit, Net Phase used a variable concession period, starting from the substantial completion date and running for a defined amount of time.

Further, the risk allocation and mitigation are ultimately set out in the detailed terms of the contract. This is probably also one of the most important factors, determining the attractiveness of a light rail PPP to lenders. Obviously, shifting the risks to the private sectors is one of the key drivers to choose for a PPP in the first place. However, form a lenders perspective it is desirable to decrease the risks in the private side of the project. Whereby the whole allocation of risks therefore always remains a trade-off, the interviews identified some key risks that the PA should retain in order to increase the attractiveness of the project to lenders. Those are the ridership risk, risks of unexpected utilities, noise and vibration risks and the risks of archaeological findings. Although those risks are ultimately allocated in the details of the contract, they are discussed in more detail in the recommendations within their corresponding decision-making area.

Another important aspect to consider is entering into a direct agreement with the lenders. This is especially important since it typically is the only legal connection between the PA and the lenders. It defines the step-in rights, allowing the lenders to intervene if the SPV is in default. In general, those rights theoretically enable them to replace subcontractors, however, this is seldom done in reality. Instead, it rather constitutes a tool, which ensures that the lenders are informed early on if difficulties arise and gives them the power to enforce remedial action. Consequently, it is recommended to grant the lenders additional rights through the use of direct agreements.

Additionally, it is advised to strongly emphasis dispute avoidance.

Within the Netherlands, civil courts are used for dispute resolution, whereby the government is reluctant to use the arbitration board for the building industry, since they might be biased towards the private sector

However, specialized arbitration boards or other third parties can help to facilitate dispute resolution.

For the Tram the Liege and the Brabo II project, specialized arbitration boards have been used as a successful way of dispute resolution.

The ION Rapid Transit projects uses an independent certifier, helping to resolve any arising issues. The costs of the certifier are shared between the private and public parties.

This is an important aspect the success of the project and accordingly also to the attractiveness to lenders. It is recommended to include effective dispute resolution mechanism in the PPP contract.

Further, the social and environmental impact of the project has to comply with the Equator Principles. The Equator Principles are an industry approach for financial institutions in determining, assessing and managing environmental and social risks in project financing. The 10 Equator Principles apply to projects over US$10 million. The Equator Principles Financial Institutions (EPFI) will only provide loans to projects that conform to Principles. Projects are categorized and with a light rail projects usually falling into category B (Category B: Projects with potential limited adverse social or environmental impacts that are few in number, generally site specific, largely reversible and readily addressed through mitigation measures).

RegioTram Groningen Equator Principles categorization: The project will be realized in the city of Groningen, which means it will have limited impact on the environment but will have a medium social impact. Mitigation strategies as far as implications caused by construction works have been adopted during the different stages of the project (concept, design). Also, the Operation phase will have an impact on the local environment due to increased use of the line (tram traffic, travellers, etc.) and can have a social impact mostly for households near the new tramway due to noise and vibration hindrance. This social impact can also be a positive impact since the public transport in Groningen will improve. On our reading of this project in terms of its type, location, sensitivity and scale of the project, as well as the nature and magnitude of its potential impacts, we consider the project falls under Category B.

### 5.2.5 Recommendations phase 4

**Political:**

Relates to lenders' criteria: 1, 2

The recommendations regarding the political support of the project remain the same. It gives lenders confidence in the project during the tender procedure and, in case of the unfortunate event that the tender will be cancelled, increases the changes of retendering the project. A lack of political support can ultimately lead to the failure of the project.

After the first tender of the Tram de Liege failed because the contract was not complying to the new Eurostat regulations, the project was retendered due to the high level of political support. For the RegioTram on the other hand, the failure of the tender due to the lack of political support, lead also to the cancellation of the project in general.

Further, continuously providing evidence of political support, with the measures already discussed, is recommended.

Another issue to consider is the political influence during the negations in the dialogue phase. Those discussions are meant to serve a clear objective, set out upfront, and not be mixed up with other political issues.

**Financial, technical, legal:**

Relates to lenders' criteria: 3, 4, 7, 8, 9, 11, 12, 15, 16, 17, 18, 21, 22, 23

In general, it is to notice, that the PA is free to discuss all aspects of the contract with the candidates in the dialogue phase of a competitive dialogue. Therefore, subjects of discussion do not only have to relate to technical aspects, but also to financial aspects and legal aspects (European Parliament, 2014).

Since the issues, subject to negotiation in the dialogue phase, are already mentioned upfront, the same recommendations apply when discussing them in more detail.

However, it is always recommended to not only set the objective of the dialogue, but also the topics subject to negotiation, upfront.

Moreover, it is recommended to involve the lenders in the negations as early as possible to consider their interests and getting their commitment.

Finally, the last recommendation is best expressed by citing one of the interviewees 'If you are not making compromises, you are not building light rail'.

### 5.2.6 Compliance of the recommendations with general PPP recommendations

With the recommendations given above, meant for increasing the attractiveness of the project to lenders, this chapter elaborates on their compliance regarding existing PPP recommendations from academic literature, guidelines, frameworks, workshops, conferences and round tables.

Even though increasing the attractiveness to lenders is often associated with retaining risks, and thus with difficulties for the public side, there is a big variety of recommendations that are in line with existing frameworks and increase not only the attractiveness but also a successful project outcome without entailing any disadvantages to the public side.

The necessity to ensure incessant political support throughout all the project phases, which is one of the key recommendations in the political decision-making area, is evident in a broad range of publications. Political stability is claimed to be one of the key issues for success (Orobio de Castro,

2018), political will (Mott MacDonald, 2016; Working Party on Rail Transport (SC.2), 2012) and major political support for all project decisions is important (van Oort et al., 2014). A committed government is identified as one of the four main factors to establish a PPP framework (Cuttaree & Mandri-Perrott, 2011). When lacking high level political support, or facing major change in political climate, the project is most likely to fail (Hankinson, Sanghi, & Sundakov, 2007; van Oort et al., 2014). The more specific recommendation, to align the projects schedule and important decisions with upcoming elections is also stated as a factor for successful light rail projects (van Oort et al., 2014). The recommendation, to minimize the political influence on the project, is mentioned as one of the major priorities to mobilize private financing (Noël & Brzeski, 2005). Further, the idea of appointing a project champion is in line with the importance of project owner and leadership (Farquharson et al., 2011), their political standing and its stability (Noël & Brzeski, 2005) and a strong focus on leadership, which can help to de-risk infrastructure PPPs (Mott MacDonald, 2016).

However, the importance of questioning the real reasons for the political support is equally important (van Herpen, 2002). The project should be the best possible solution to meet the needs of the users and deliver the best value for money compared to other alternatives (Bijl, Oort, & Bukman, 2018, p. 7; Mott MacDonald, 2016). This is in line with the recommendation to discuss viable alternatives early on.

Further, the recommendations, regarding the importance of the social impact, are in line with other recommendations. Stibbe explains that the stakeholder management, especially taking into account public stakeholder, is the biggest bottleneck of private financing if transport infrastructure in the Netherlands (Orobio de Castro, 2018). The social impact and the participation of residents is important to the success of a project, and the 'why' of the project must be communicated effectively in the five domains of: Effective mobility, Effective city, Economy, Environment and Equity (Bijl et al., 2018, p. 7). Improving the stakeholder management by involving them in early steps is also recognized as a factor to de-risk investments in transport infrastructure (Mott MacDonald, 2016). Factors to successful light rail projects include the early involvement of citizens, open and clear communication on all relevant issues, the personal involvement of stakeholders and the use of contemporary communication channels like Facebook and Twitter (van Oort et al., 2014). Not to do this early enough is being identified as a common mistake and should be avoided (Farquharson et al., 2011).

In addition, literature states that large projects should be split up since they are more difficult to finance if they get to expensive (Bijl et al., 2018, p. 7; Cuttaree & Mandri-Perrott, 2011) which is in line with the recommendation, to keep the total costs of the project and the implications on the bankability in mind when scoping the project.

Also related to the scope of the project, is the idea to implement large projects in phases, to decrease the complexity. Scope minimization is recognized as success factors for light rail projects (van Oort et al., 2014) and the idea of splitting up the project in phases not only related to the attractiveness to lenders, but also to the successful implementation of the project in general (Bijl et al., 2018, p. 7; Cuttaree & Mandri-Perrott, 2011). This is also in line with the recommendation to take out unusual or complex structures of the scope of the PPP. The recommendation to consider the proportion of the phasing is matching the idea to start with a smaller part first, to build trust and minimize risks, whereby the lessons learned can help to implement the proceeding, and larger, phases of the project (Bijl et al., 2018). However, this can contradict to the idea that a smaller extension of the previous phase can be more likely handled by the same consortium compared to a relatively bigger one.

Additionally, the project goals, the scope, as well as the project requirements, should be clearly defined before launching the procurement and communicated to all the stakeholders (Bijl et al., 2018; Farquharson et al., 2011; van Herpen, 2002; Working Party on Rail Transport (SC.2),

2012). Moreover, changing the scope is identified as one factor for failure of light rail project (van Oort et al., 2014). Those findings are in line with the recommendations to set the project scope including the output specifications in phase 3, to communicate it, and not to change it anymore.

The allocation of risks in general follows the principle to allocate risks to the party, best capable of handling it (van Herpen, 2002; Van Valkenburg & Nagelkerke, 2017). However, a fair risk allocation is always important and shifting risks to the private sector usually comes with a higher price (Cuttaree & Mandri-Perrott, 2011; van Herpen, 2002). Nevertheless, it is shown that allocating the risks of land acquisition, the traffic risk, and to some extend the utility risk, are common mistakes, leading to a less successful project. Therefore, the recommendations, given with regards to the attractiveness of the project to lenders, to retain those risks, is in line with the common practice.

Further, the project should make use of proven technology as much as possible (Bijl et al., 2018, p. 7; van Herpen, 2002), which is coherent with the recommendation not to enforce innovative technology.

Closely related to the retention of the traffic risk, is the nature of the payment mechanism and contractual structure. The SPV revenues should be isolated from the fare box revenues, and consequently the traffic volume (Cuttaree & Mandri-Perrott, 2011), which automatically points towards an availability payment mechanism, also recommended regarding the attractiveness for lenders. Further, competition, and therefore enough bidders, are important for the success of the project (van Herpen, 2002), whereby the use of an availability based payment model tends to attract a wider and larger group of, not only investors, but also contractors (KPMG, 2009).

Hereby, guarantees from federal government should be in place before moving to the tender phase (Cuttaree & Mandri-Perrott, 2011; Noël & Brzeski, 2005) which is in line with the recommendations regarding public guarantees, given in phase three.

The recommendations, to pay the bidders for participating in the tender, as done for the projects in Belgium, is similar to the idea of compensating the unsuccessful bidders (Mandri-Perrott, 2010).

Regarding the legal aspects, best practice standards should be used for the contract, the specifications, standards and the tender procedure itself (Mott MacDonald, 2016). This means sticking to a well prepared and clear tender process (Cuttaree & Mandri-Perrott, 2011) instead of innovative forms of tendering, which have been proven not to be successful for light rail (van Oort et al., 2014). This matches the recommendations to stick to a DBFM (O) contract, with as many standardized parts as possible and to make use of the competitive dialogue tender procedure without reinventing the wheel. This is also in line with the findings from the Working Party on Rail Transports' workshop, which supposed to avoid surprises for the private parties and to stick to the DBFM(O) contracts (Working Party on Rail Transport (SC.2), 2012).

Further, the contractual structure should match the strategy for growth (Cuttaree & Mandri-Perrott, 2011), which is also recommended by ensuring that the PA is aware of the level of needed flexibility.

Despite all those recommendations, matching findings in academic literature and other sources, it is important to mention that light rail projects are always highly complex and unique, and not all recommendations are suitable for all projects (Bijl et al., 2018).

Therefore, the discussion above is not supposed to transform the recommendations regarding the attractiveness to universal applicable recommendations, which are automatically leading to a more successful project. Also, it does not mean that the recommendations can be applied without checking their implications on other areas for the specific project. Instead, it should be regarded

as a thought-provoking impulse, contradicting the common opinion, that increasing the attractiveness to lenders always entails disadvantages for the public side.

## 5.3 Conclusion: Decisions & recommendations for the public authority

The first part of this section identified the decisions, influencing the related project characteristics. Four major go- or no-go decisions at the end of each project stage are taken to determine whether or not the project can proceed to the next stage.

When taking those decisions, a lot of subjects in different decision areas need to be considered. A set of key questions, related to the project characteristics, is identified for each subject and decision-making area in each of the four stages.

Based on those results, a set of recommendations, helping the PA to increase the attractiveness of a light-rail project to lender, is developed. The recommendations are grouped in the same way as the decisions, namely into the project phase and the corresponding decision-making area.

Lenders seem to be willing to negotiate most of the issues, however, some can be considered deal-breakers and are highlighted in the recommendation overview.

When linking back the recommendations to the initial criteria of lender, two main issues become apparent. First, recommendations in phase two and phase three seem to affect most of the lenders criteria and are therefore critical when trying to increase the attractiveness of a project to lenders. And second, some of the lenders criteria are related to decisions of the SPV, and therefore not directly under the influence of the recommendations for the PA.

Finally, the results of the literature study show, that most of the recommendations are in line with general PPP recommendations, and that increasing the attractiveness to lenders not necessarily implies a disadvantage to the public side.

However, it is important to keep in mind that the recommendations are aiming at increasing the attractiveness to lenders, and that other considerations need to be taken into account when making decisions. Further, light-rail projects are highly complex and unique in nature, and subsequently, each recommendation and its consequences should be considered carefully before being applied.

# Section VI: Discussion

## 6.1 Attractiveness to lenders

Despites the recommendations above, there are several things to be considered when assessing the findings regarding the attractiveness of a light-rail project to lenders. As already explained, the research indicates that only a few characteristics of the project are deal-breakers and most of the issues are negotiable from the lenders side.

This might be due to the fact, that a PPP concession for a light-rail project, using an availability-based payment mechanism, appears to be attractive to lender by nature. Ultimately, the amount of risks defines the attractiveness, and most of the risks regarding the cash flow, are linked to the revenues and the costs. Since the revenues, via the availability payments, are usually payed from a national level, they can be considered way more reliable than, for example the revenues streams of a normal company. Hereby the credit rating of the public authority is the benchmark for the risks associated with the income stream. The costs, on the other hand, are, after the construction of the system, mostly spend on maintenance (and operation). However, the risks, associated with those costs, are mostly passed on to the contractors and are not borne by SPV. Again, the benchmark is the credit rating of the involved parties, being the contractors of the SPV. Only a minor proportion, the so call 'SPV costs' which are usually around 10%, are not contracted and remain as a risk to the SPV.

In addition, increasing the attractiveness to lenders, can also be seen as a trade-off between retaining and shifting risks to the private sector. The more risks are shifted to the private site, the less attractive the project gets. However, one of the main ideas of a PPP is to allocate risks to the party best capable of handling them. Furthermore, shifting a lot of risks to the private parties usually not only decreases the attractiveness to lenders, but also increases the price.

The extend, to what the private parties are willing to accept a lot of risks, is not only dependent on the risk distribution and the compensation, but also on the market situation. If there is a lot of capital available, the public authority is in a better position to negotiate and competition forces the lenders to compromise. If, however, there is a scarcity of debt, and it is difficult for the public authority to find lenders for large construction projects, the lenders have more leverage in the negotiations.

Another aspect, which needs to be considered, is that this research focuses on recommendations for the public authority related to a specific project. Nevertheless, there are also more holistic measures, which could be taken into account, to increase the attractiveness of light-rail PPPs in the Netherlands in general. First, the establishment of a project pipeline, where upcoming projects are identified, and lenders have a current stream of upcoming investment opportunities, rather than a one-off investment, could help to improve the attractiveness. Second, working on a standardized contract framework, like it is done by Rijkswaterstaat for road PPPs, is also expected to be beneficial. Moreover, a professional project organization, maybe including a national knowledge centre, is an additional factor to be considered. This can facilitate the communication with lenders, and professionalism can help to create trust between the private parties and the experts on the public side.

Nevertheless, it needs to be clear, that the lenders ultimately enter into an agreement with the SPV, and have, with the direct agreements being an exception, no direct contact with the public authorities. Therefore, they can set the right framework conditions, but are ultimately limited in their influence.

## 6.2 The bigger picture, light rail PPPs in the Netherlands

When discussing all the aspects mentioned above, it is indispensable to place them in the context of the current situation in the Netherlands.

First of all, it is important to note that not only the financing, but also the funding of new light-rail projects, is problematic. Further, the government can lend money at low interest rates, for example from the BNG, so from this perspective, there is no incentive to finance it at higher rates with market parties.

Funding is an important issue, since the cabinet does not want to explore new infrastructure until there is 75% of the funding available. The funding is currently coming exclusively from a national infrastructure fund, whereby it might change towards a mobility fund in the future. However, the current infrastructure fund has no criteria for city development. This implies, that there needs to be a mobility problem first, before resources can be allocated. Thus, it is complicated to combine city developments and investments in transport infrastructure in an integrated packaged business case. Moreover, the profits by increasing tax income and the rise of property values is not retained by the cities but rather collected and distributed on a national level. Whereby the funding coming from a national level, the city development happens on a regional, local level. The OECD did a research for the city of Amsterdam on the mismatch between the planning system and the financing system, which seems to be unique for the Netherlands (OECD, 2017). Usually the local governments have some ways of raising money themselves.

To solve this problem, innovative funding methods are discussed. However, the methods themselves are not innovative in nature, but rather called to increase their political attractiveness. Instruments, presently being discussed, are the introduction of a congestion charge, a mobility tax on households, a tax effective on employees working in the areas with increased accessibility, or higher pricing for priority parts of the network, like a connection to the airport. Inducing one or more of those instruments is not only a legal challenge, which might require changes in current legislation, but also a political one, since most of the issues are highly political charged.

Further, the idea to include the benefits from rising property values and housing developments in the value capturing, is pursued and the first integrated business cases are already being developed. However, including additional sources in the value capturing can be dangerous, since it's hard to directly or indirectly profit from those sources because the control on these functions is often in the hands of parties, which aren't part of the contract (van Herpen, 2002). Moreover, private parties have a different time horizon for their return of investment compared to the public side. They want to see a return of investment way faster (within 5 years) whereby the government can easily deal with periods of 20-30 years.

Also, the political situation needs to be taken into account. With the cities of Amsterdam and Utrecht being rather left on the political spectrum, it is rather difficult to introduces measures like increasing the fares for premium parts of the network or introducing a new tax on households. Moreover, and probably even more important, the political situation also affects the idea to combine the new investments in transport infrastructure with the profits from property development. In fact, the property developers already have to comply with a rather high percentage of social housing, demanded by the governments. Making them contribute to the transport infrastructure would mean charging them twice.

In general, the short- and medium-term policy regarding transport infrastructure is more concerned with expanding minor proportions of the network and improving the exploitation of existing parts rather than implementing new networks or big expansions. For example, the line from Lijden to Rotterdam should change from Sprinters (regional trains) to light train in 2030. This change will shorten stops and increase the frequency or the new extensions, running 3km through the new developed Binkhorst area in The Hague. Despite the McKinsey report promising cost

savings when opting for a PPP, it is questionable if the choice is suitable for such a small part only.

An addition aspect to consider, it the legal power of the planning authorities. Whereby it seems that the government can plan and implement new roads with ease, they are lacking the legal power to enforce light-rail lines in the same way. Furthermore, competition law restricts the public authorities in their attempts push light-rail solutions by regulating other services.

At the very moment, meetings with private currently take place on a local level, to investigate if and how, they could profit and contribute from and to new investments in transport infrastructure. On a national level, policy makers are discussing the 'innovative' ways of funding new transport infrastructure.

With the outcome of those discussion being unclear, it appears that investments in local transport infrastructure is a national issue and a high level of political courage is needed to take the right decisions. Moreover, the department for infrastructure planning, the department for internal affairs and the financial department need to work closely together, despite not working for the same cause.

# Section VII: Limitations and recommendations for further research

## 7.1 Limitations

The results of the research have to be seen in the light of several limitations. This chapter provides an overview of the most important ones, explains them briefly and proposes a direction for further research.

The main limitations of this research are the sample size, the measure used for data collection, the use of self-reported data, time constrains, and the validation of the recommendations.

First of all, it is to mention that light-rail projects are usually very complex and have, due to their location in densely populated areas, a high number of interfaces with their surroundings, which makes them quite unique in nature. Even though assessing the five case study projects was helpful to answer the research questions, it is very unlikely that assessing five projects only provide all the possible information there is. Hence, the limited number of cases might reduce the extent to which the recommendations can be applied to every generic light-rail PPP in the Netherlands.

Further, the measure used for data collection, the semi-structured interviews, also limits the findings of this research. First of all, scheduling, conducting, and evaluating the interviews is time consuming and therefore only a limited number of interviews have been conducted. Second, for most of the cases, only one person was interviewed to one specific theme of the research. This might lead to a biased perspective, influenced by the personal experience of the interview with the project.

In addition, the data collected during the semi-structured interviews can be categorized as self-reported data. Various problems, like selective memory, telescoping, attribution or exaggeration can affect the reliability of the data. Further, not all of the statements made by the respondents could be validated by the researcher.

Time constrains not only lead to a limited number of cases and interviews, but also allowed to assess the past and current situation of the projects only. However, some issues related to the topic of the research might only become apparent in later stages during the projects' lifecycles.

Finally, the validation of the recommendations was not part of the research scope and is only done with linking the recommendations back to the initial criteria.

## 7.2 Recommendations for further research

Even though the recommendations can be used by Mott MacDonald for advising governmental clients, a validation of the recommendations is recommended. This could be either done by the verification of the criteria by experts in the field of light-rail PPPs or with additional research.

Possible directions for further academic research:

1. The validation for the recommendations by theoretically applying them on a real life case and analysing the impact on the attractiveness.
2. Expanding the research scope from a project to a national level and identify measures, to increase the attractiveness of light rail PPPs to lenders in the Netherlands in general, including burdens and ways to implement them.

3. The exploration and evaluation of innovative funding methods, including their legal and political implications.
4. Identifying and assessing the risks of using rising property values to fund transport infrastructure, including measure to mitigate them.
5. Possible ways of aligning the expectations of property developers, regarding short term profits, with the long transport planning investment horizon.

# Section VIII: Conclusion

Section I of the report introduces the problem of the funding gap for light rail infrastructure and PPP as a possible solution. Further, the objective of the research, to investigate and understand the factors that determine the attractiveness of a light rail PPP project to lenders and when they need to be considered by the contracting authority throughout early project stages, is explained.

To achieve the objective, a research framework is established, which allows the identification of the four specific research questions and sub questions. The general approach is to start with the identification of the criteria, used by lenders to assess the attractiveness of a light rail project. Second, the project characteristics of light rail projects, which are related to the lenders criteria are identified. Afterwards, the decisions, taken by the public authority when implementing the project, influencing the project characteristics, are investigated. In the last step recommendations regarding those decisions can be provided to the public authority.

Section II explains the methodology, used to answer the research questions and achieve the research objective. The lenders criteria are identified with a literature study and a case study, among five light-rail PPP projects, to contribute to the answers of the other questions. More precisely, semis-structured interviews with respondents, involved on the private side of the project, are used to identify the project characteristics of the case study projects. Afterwards, the perspective changes and semi-structured interviews are conducted with respondents from the public side, to identify the decisions made by the public authority, which lead to the project characteristics. Finally, all of the previous results are used to provide a set of recommendations for the public authority.

Section III provides the necessary background, introducing key concepts of the research and explaining the setting in which the research takes place.

Section IV presents the results of the first two research questions. The 23 criteria used by the lenders are identified, explained, and categorized under the six main criteria. Furthermore, the results of the first round of interviews, the 101 project characteristics, related to the lenders' criteria, are presented and grouped in the same way as the criteria.

Section V includes the results of the second and third research questions. With the help of the interviews with respondents from the public side, the decisions, which lead to the project characteristics, are identified. The research indicates, that there are four major decisions, closely related to the four early project stages, namely the 'Project identification', the 'Preparation', the 'Drafting the tender', and the 'Tender & Award' phase. Those decisions determine, if the project is ready to proceed to the following phase, by considering several subjects in different decisions making areas.

Finally, the 82 recommendations, provided to the public authority meant to increase the attractiveness to lenders, are presented and grouped into the different decision areas within each of the four different phases. Whereby some of the recommendations appear to be a trade-off between retaining risks and increasing the attractiveness to the lenders, some others give the impression to increase the attractiveness without entailing any disadvantages to the public authority. In general, many of the issues, linked to those recommendations, are negotiable. However, the research also indicates that a continuous and stable political support, a suitable size of the project, an availability-based payment mechanism, retaining of the traffic volume risk, retaining the risk of archaeological findings, and an appropriate solution to deal with unexpected utilities, can be deal-breakers to lenders. Furthermore, it appears that the public authority has the

highest influence of the attractiveness on the project to lenders during the ‘Preparation phase’ and ‘Drafting the tender’ phase.

Additional issues, related to the attractiveness to lenders and the general situation in the Netherlands, need to be taken into account. This includes the fact, that the influence of the public authority is ultimately limited to setting the right framework conditions, because the lenders enter into an agreement with the SPV and not the public authority themselves. Further, the attractiveness of light-rail projects can not only be increased on a project basis, but also by taking measures on a national level. Those considerations are discussed in Section VI.

As every research, the results of this research are constraint by some limitations. Those limitations, namely the sample size, the measure used for data collection, the use of self-reported data, time constrains, and the validation of the recommendations are briefly described in Section VII. Further, recommendations for Mott MacDonald and recommendations for further research are provided in Section VII.

To conclude, therefore, it appears that the public authority can apply the recommendations to increase the attractiveness when implementing a light-rail PPP in the Netherlands but should also keep in mind this meaningful truth:

‘If you are not making compromises, you are not building light rail.’

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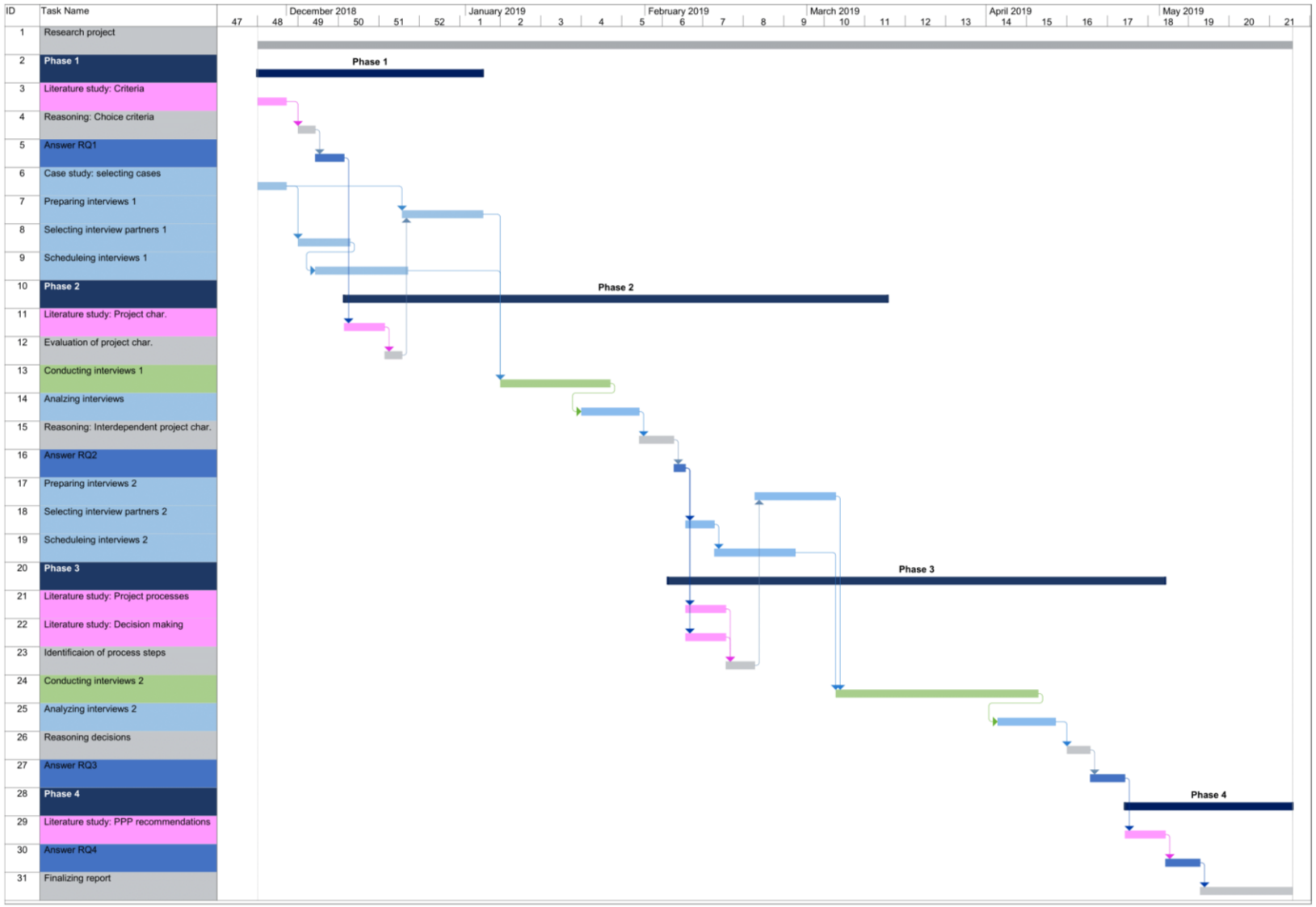
# Appendix

## Appendix I: Gantt chart – Research activities



## Appendix II: Factors influencing project bankability

| Project Aspects | Questions for determining the bankability |
|---|---|
| **Creditworthiness** | - Do project developers have adequate capacity and incentives to deliver sustainable long-term operational performance? Do they derive significant value from ancillary activities outside of the concession company (for example, local property development and turnkey construction contracts)?<br>- Can the grantor meet its financial obligations to the project?<br>- How certain are project revenues? Who bears ridership and farebox risk, and how realistic are ridership forecasts?<br>- Are project cash flow sufficient to support envisaged levels of debt?<br>- Does the project benefit from any grantor or sovereign guarantees; does the project benefit from guarantees or insurance on its debt (for example, partial risk or credit guarantees and political risk insurance)?<br>- Is there sufficient equity cushion to protect lenders if the concession's value decreases? Do project developers have sufficient 'skin in the game' (that is, value at risk)?<br>- In the event of termination, what mechanisms guarantee debt repayment?<br>- Do the project's financial ratios meet lender expectations (for example, principal and interest cover ratios, debt service cover ratio, loan life ratio, and debt-equity ratio)? |
| **Legal viability** | - Does the grantor have the authority to grant the concession or PPP?<br>- Will the project require any additional legislation (for example, a PPP law)?<br>- How strong are the project's contractual arrangements with input suppliers (such as rolling stock suppliers)?<br>- What legal protections or channels for recourse do investors have in the project's jurisdiction (for example, access to international standard arbitration)?<br>- Are legal decisions enforced in the project's jurisdiction (rule of law)?<br>- How strong are property rights in the project's jurisdiction? Is there potential for regulatory 'clawback' if ridership numbers exceed estimates and revenues are well above forecast? |
| **Economic viability** | - Is there a market for the project's services? Does urban rail offer sufficient value to customers?<br>- Are there threats from competing services (for example, buses) or technological obsolescence (for example, ticketing systems)?<br>- Is the system's route aligned with target markets or population centres?<br>- Does regulation protect against the threat of new market entrants? How stable is that regulatory environment?<br>- Are project inputs (for example, electricity) available at reasonable prices? How stable are input supplies? Will new urban rail services require dedicated input suppliers (for example, a dedicated power plant)?<br>- How stable is the project's macroeconomic environment? How would changes in inflation, foreign exchange, and interest rates affect project cash flows? How will such risks be mitigated in the contract? Have any standby credit facilities been arranged to deal with potential lags between financial shocks and tariff adjustments? |
| **Technical feasibility** | - Does the project use proven technology?<br>- Are construction costs reasonable and realistic?<br>- Is the construction and commissioning timetable realistic?<br>- Does the project rely extensively on proprietary technology?<br>- What standards govern the construction of civil works, rolling stock, signalling, and communication systems? Are local standards available, adequate, or appropriate?<br>- How flexible is the systems design? Can simple alterations to rolling stock configurations increase system capacity? Are stations and platforms designed for additional growth?<br>- Is the proposed technological solution appropriate for local conditions and the availability or scarcity of skilled labour? |

Source: adopted from Pulido et. al (Pulido et al., 2018)

## Appendix III: Interviews, phase 2

The questions in blue are the same for the interviews in phase 2 and the interviews in phase 3. The questions in black are the ones related to the specific purpose of the interview.

1. Tell about research purpose:
    - Civil engineering and management student at the University of Twente, Netherlands.
    - Master thesis project looks at the gap between funding for light rail infrastructure and the need for new investments and at PPPs as one possible solution.
    - Goal is to increase the attractiveness of light rail PPPs in the Netherlands for lenders.
        - First step: to see what the project characteristics are that determine the attractiveness of a light rail PPP to lenders
        - Second step: to find out when and how those characteristics can be influenced by the contracting authority.

2. Are you fine with me recoding this interview?

3. Tell me about your background in the company?
4. …about your role and the company's role in the project?

5. A) As I said in the beginning, the first stage aims at identifying the project characteristics that determines the attractiveness to lenders. What are the most important ones in your opinion for the attractiveness of light rail PPP's **in general**?

   B) Academic literature groups them into six main-criteria. When looking at those main-criteria individually, **what project characteristics of the project** can you think off that were important to the lenders?

6. What was the role of the public authority to achieve those characteristics?
7. When looking at the characteristics we just discussed, which of them and to what extend can they be influenced by the contracting authority / the client?

8. (Involved in road PPP's?) How do they differ from road infrastructure project characteristics? What's the reason why other PPP's are so much more successful?)

9. Do you have someone in mind who might has additional information or a different view on this topic?
10. Is there anything else you'd like to tell me?
11. Can I send you a short summary to be validated?
12. Can I contact you if I have further questions when analysing the interviews?

## Interview summary: Regio Tram Groningen; John Laing, Head of Investment Team

Tell me about your background in the company?

…about your role and the company's role in the project?

John Laing originally English company, 1848, first 160 years was a construction company, 2001 they sold their construction business. Investing and developing infrastructure for public authorities, global basis. Core business is to invest equity in greenfield projects, preconstruction, manage through construction, consider exit if project is operating. Developer profit is the main revenue stream. Invest in three core areas 1. Infrastructure PPP (Transport, Social…) 2. Renewable energy 3. New Digital Infrastructure. Developed light rail in UK, largest one in Australia, bidding on two light rail schemes in Canada, two large lightrail in Tel Aviv prepared atm. Mr. Tillburgs is head of the European Investment team (with the company for 11 years). Studied in Rotterdam, business administration, clear financial focus. Gave presentation about light rail at the APFI (International project finance association) seminar hosted by Stibbe in 2018 about the call for light rail funding from the 4 majors of the Randstad cities, about RegioTram Groningen (lessons learned and global perspective)

As I said in the beginning, the first stage aims at identifying the project characteristics that determines the attractiveness to lenders. What are the most important ones in your opinion for the attractiveness of light rail PPP's in general?

Two reasons that are essential.

1. Ridership risk: Who bares the risk of people using the light rail? If risk is allocated to project companies it's very difficult to finance it, especially hard to find an equity investor. (behaviour cannot be influenced by the private parties, parking fees etc.) Municipality can influence the behaviour so there for the risk should remain with them.

2. Relocation of utilities: many projects globally have been negatively impacted, inner city project, not properly mapped (Sydney project 15000+ unknown utilities  hundreds of millions of construction cost overrun). Israel has concluded to retain the utility risk within the public sector for project in Tel Aviv and Jerusalem since other projects failed. Take care of the relocation upfront. Not only assessment also the relocation itself done by public authority.

3. PA struggle to define what they want, technology is changing rapidly, high complexity in inner city situation, during the tendering phase the specs. are changing since they are developing their wished and specification through the tender process. Many projects start of without the authority having finalized all the specs., more tendering time, more costs

Academic literature groups them into six main-criteria (attachment). When looking at those main-criteria individually, what project characteristics of the project can you think off that were important to the lenders?

**1. Economic and political environment**

- Political environment

Where RegioTram failed, did not had full political support. Shop owners concerned about construction period; municipality council first united in favour of the project started to have diverse views.

Two big lessons: 1. Never again engage in such a large-scale project with a regional authority (local authorities are lacking experience and more unstable and general censes about supporting the project)

- Public opinion

Population divided into pro and against

2. Legal and regulatory environment

- Procurement process

Completely not standard, started with a blank contract. Interested parties invited to join a debate (2 years), open for input but also a lot of effort and money to engage in the process. Public authority acknowledge that they didn't have the necessary experience, so they hired advisors who would normally work for the private parties (good choice). Took a long time to achieve a bankable and investable solution.

- Intervention right

**3. Project specificity**

- Project definition

PA struggle to define what they want, technology is changing rapidly, high complexity in inner city situation, during the tendering phase the specs. are changing since they are developing their wished and specification through the tender process. Many projects start of without the authority having finalized all the specs., more tendering time, more costs.

- Feasibility studies

Positive thing about RegioTram, unexpected utilities risk was allocated to the PA.. Specific works on the housing due to vibrations and interference with a lab, as well as the noise was risk for the private sector

- Site acquisition and access

Site acquisition wasn't an issue.

- License, permits, and authorizations

Permitting would have been done by the private consortium but the risk itself was allocated to the PA. Compensation if permits not granted.

**4. Project financial structure**

- Financial structure

Payments made by Province and Municipality, from a credit perspective looking at Province not at Mun. (not entirely comfortable, some lenders could not support the project because they only go for rated entities (state level) and Provinces aren't rated. If all the other aspects would have been good, this wouldn't have blocked the project. Local lenders still interested (BNG etc.) but a state guarantee helps → more lenders.

- Financial flexibility

PA tendering a few lines, part of a bigger network, PA struggling with the extend of the operational scope. One choice: PAs don't want to include operation since they are also operating other services or the network. Other choice: PA wants the operation included to avoid discussions about delays. If the operation is allocated to the private parties, it's hard to do it for 25-30 years. They want to have flexibility for extension or even flexibility to the rolling stock. PA has to define the flexibility they need upfront not start to introduce those demand in the process. Partners in the consortium must be able to cope with the flexibility demanded.

**5. Third party risk allocation**

- Insurance arrangement

Not an important point, standard package of insurance (insurance companies used to insure Tram projects)

- Environmental and other legal/ regulatory issues

**6. Contract arrangement**

- Concession agreement

(fixed), flexibility for the operational scope and flexibility to break the concession agreement if the PA wants to add line but cannot reach an agreement with SPV

Payment mechanism, important choice by the PA, do you want to have a defined headway (Tram every 4 min.) or a specific schedule (with times). Headways much better, fixed schedule is harder to recover from. If one goes wrong, they all go wrong. All the things around the schedule (travel times, preference at intersections) is hugely important. Usually underestimated by the PA, essential to develop a payment mechanism that works.

- Concession period

Fixed

- Termination provisions

If they want to add lines

- Construction contract

Civil contractor and rolling stock provider couldn't agree on how to do it in a project in Belgium. The lenders prefer the rolling stock provider and civil scope is one package whereby the rolling stock provider and the civil contractor are under joint and several liability. If the scope is not evenly spread, the party with the smaller share might not be willing to join the shared liabilities. (in case its uneven, the PA can take out work like tunnel, bridges, utilities etc.) to create a nice balance.

- Operation and maintenance agreement

The O&M scope is not overly complex, but the penalties can be huge, misbalance between penalties and work. Penalties can erode the full availability payment, which is not only for the operation but also for repayment of debt. Include rolling stock to make the project bigger (more attractive) and to ensure optimization between vehicle and system.

- Direct agreement

RegioTram with Arriva as operator, PA wanted to have a direct agreement with Arriva to ensure that they would still operate the trains in case the SPV would fail. New to Arriva Netherlands, struggled to accept the obligations to continue operating a bankrupt project without having payments etc.

When looking at the characteristics we just discussed, which of them and to what extend can they be influenced by the contracting authority / the client?

Don't start reinventing the wheel, use experience and see where it goes wrong and what works. Try not to out beat history, ridership risks should not be allocated to the private parties, nor utility risk. Follow lessons from the past.

(Involved in road PPP's?) How do they differ from road infrastructure project characteristics? What's the reason why other PPP's are so much more successful?)

Complexity and procuring authority, Rijkswaterstaat doing a good job procuring the road PPP's, they listen to the market, the improved, they roll it out in a way that worked. Light rail usually procured by the local authority, less/no experience without pipeline of projects.

Do you have someone in mind who might has additional information or a different view on this topic?

Regulatory site (issues for RegioTram), in case they would have won the tender, they would have needed a public transport permit (by law 15 years valid) but concession much longer, only one aspect. Speak to a lawyer.

Is there anything else you'd like to tell me?

In Europe there is money to offer, external strategy consultant determines light rail as an important infrastructure in the future. Lightrail needed, max. capacity of asphalt research.

## Interview summary: Regio Tram, Stibbe, Lawyer

Tell me about your background in the company?

Studied Civil Law in Amsterdam, small law firm in Amsterdam for two years, 25 years for Stibbe. Started out in construction law, public procurement law, project finance transaction. Involved in first ''HSL-Zuid Infrastructure Provider contract'' for state afterwards followed by many PPPs. Also involved in the procurement of transport concessions.

…about your role and the company's role in the project?

Involved in Regio Tram, legal advice for the Consortium LinQ (Heijmans, Macquarie Group and Movares), but they left stepped back from their participation early in the procurement process (23. Nov. 2011).

A) As I said in the beginning, the first stage aims at identifying the project characteristics that determines the attractiveness to lenders. What are the most important ones in your opinion for the attractiveness of light rail PPP's in general?

Complexity (not technical) but combination of concession of public transport, construction work and financing quite challenging. It's not only construction but sometimes operation and providing services to the public, in some cases even charging the public for those services, then it gets some complicated. Risk allocation is important, less risks for the private sector makes it more attractive to lenders.

B) Academic literature groups them into six main-criteria (attachment). When looking at those main-criteria individually, what project characteristics of the project can you think off that were important to the lenders?

**1. Economic and political environment**

- Political environment

Political stability is essential, long construction and concession period. Contractors less interested in bidding for such projects due to the unfavourable risk allocation.

**2. Legal and regulatory environment**

- Procurement process

Procurement process is tested and works quite well, tender procedure and documentation is clear but can be improved. Risk allocation needs to improve to the benefit of the contractors (for example making data about soil conditions available and reliable for the contractors)

Takes time to run a proper procurement process and negotiate the documentation etc.

- Intervention right

Direct agreements in place that work. Some more radical step in rights can be used for the PA. But in general, not up for debating.

Construction project and project finance deal is civil law, but a transport concession is public law, so they have to be combined. It can be done, however, as soon as the private

sector would be responsible for charging the public for the service it would become really complicated from a legal perspective.

**3. Project specificity**

-License, permits, and authorizations
Difficulty is several provinces, municipalities etc. Several zoning plans, objections in one area need to be treated the same way in the other area etc. Special planning is complicated. Zuiderzeelijn (Amst-Gron.) not realized because very difficult to coordinate. Central government could play a role (like in planning roads), those instruments should be used for planning light rail connections as well.

**4. Project financial structure**

- EPC contractor's credibility

Important, contractors need to be robust. Some of the contractors (Heijmans, BAM) not that financially strong. Contractors willing to do the projects, but if they team up the partnership should be strong enough.

- Financial structure

Fixed rate vs. floating rate. Income stream for the SPV is important. Payment mechanism needs to be availability based. Payment mechanism should not be linked to the actual income stream from user charges since it makes things much more complicated.

- Financial flexibility

PPPs less flexible in general. Change orders needs to be signed off by a lot of parties (lenders, contractors etc.) and it takes a lot of time. In recent road PPP projects changes where process quite fast (2-3 months).

**5. Third party risk allocation**

- Insurance arrangement

Good insurance advisors can be complicated issues but the case for all projects.

- Environmental and other legal/ regulatory issues

Noise is important issue. Run through densely populated areas, zoning. Risks should not be shifted to private sector (not fair nor efficient). Local authorities need to strongly support the project.

**6. Contract arrangement**

- Concession agreement

Standard DBFM contracts available for roads, a DBFMO for prisons and courthouses but not for public transport. But the one for Groningen was developed quite far. Could be used for a tender today and updated (also in respect to road PPPs). For Groningen they took the DBFM for roads and adjusted it to public transport.

Needs to be a combination of public and civil law arrangement. It's there and can be done but its challenging.

Including the rolling stock makes things more complicated. Looks like one interface less but in reality, it can lead to a lot of complications. Different views on the projects (lenders and contractors) than operators and rolling stock suppliers. Long term vs. short term interests. Balancing those quite difficult. PA more flexible if rolling stock not included in the concession. PA used to retain the interface risk since that's how it works if they procure it through a traditional model.

- Concession period

Is important, sufficient flexibility in regulatory framework to have long term concessions matching the durations for the financing schemes.

- Construction contract

- Operation and maintenance agreement

In one hand?

- Catastrophic risk

Standard list of force majeure, works, no debate needed.

- Arbitration

Civil courts used for dispute resolution in the Netherlands, private sector would be also happy with the arbitration board for the building industry but government reluctant since the arbitrators might be biased towards the private sector. Construction project cannot wait for a court decision for three years, mechanism needed to continue the project. Fast mechanism included in the contract to deal with change orders and delays on short term basis and later on you can appeal to the courts. Important to ensure a project will not get stuck.

### Presentation at IPFA: Key message?

Explained how public transport PPP works, it's a good way for public sector to transfer risks to private sector (especially looking at Oekselijn and Uithoflijn), good way to control costs.

### (Involve in road PPP's?) How do they differ from road infrastructure project characteristics? What's the reason why other PPP's are so much more successful?)

Standardized DBFM contracts available for road PPPs. Central government uses legal instruments to plan new roads so there are no issues regarding the zoning. Road is less complicated. More stakeholders for light rail PPP projects. Role of Rijkswaterstaat did a good job developing the procedures, a lot of market consolations. Joint effort of private and public sector. ProRail reluctant to PPP. Investors, Contractors and lenders a bit more reluctant due to the failure of the Regio Tram project, they might need a little more political commitment.

### Contacts PA for Regio Tram

- Arent van Wassenaer (no longer active as lawyer)

- Paul Peekel, Structon

### Is there anything else you'd like to tell me?

Current obstacles are political, central government is using idea of private financing to save money. And the coordination between the authorities is very important. For example, a new connection to Schiphol would need a close cooperation between the municipality of Amsterdam and the region of Amsterdam (who is responsible for public transportation).

Number of light rail projects, Hoekse lijn and Uithof lijn exceeded the budget. The government might have been in a better position to control those costs if it would have been a PPP.

Competition law issue if PA wants to make light rail scheme more attractive by regulating other services (like bus etc.)

Demands a lot from different level of governments to work together.

De Hague is looking at combination of project development and project finance, which is also interesting but complicated. Costs of infrastructure would be covered by new housing projects. However, housing market not stable in terms of prices. Even during the construction phase the prices can change, not a stable basis.

## Interview summary: Brabo 2; BAM PPP, Tender manger

### What is your background? Work in BAM PPP?

Master of business administration, specialization in corporate finance, Rebel group (financial consultant), focus on financial modelling, ING bank (infrastructure lending and advisory team), BAM PPP (investment arm of BAM, working together with Dutch pension fund, PGGM, strong mandate)

2010 Eurostat regulation, Tram de Liege retendered, contracting authorities accepted the consequences (on balance sheets) for Brabo II.

### What are the most important things that lenders would look at when accessing light rail PPP's in general?

Main features of concession agreement.

- Availability based? Operating or demand risk remaining with the private sector? Most banks won't go for anything beyond availability based in the Benelux.

- Scope (just infrastructure (rails signalling) or rolling stock?) No rolling stock in Brabo 2, Rolling Stock in Tram the Liege (drives what parties bid), Rolling stock provider than has to be part of the SPV, limits the market of bidders since they are only a few rolling stock providers

- Technical complexity (inner city project, complicated planning, logistic) greenfield > brownfield not always easier, rely on existing infrastructure (risk)

- Operating risk (electricity consumption risk, pure authority or shared? Usually authority risk but if you overconsume it becomes a private risk. Who is providing the staff (usually the public transportation authority), Vandalism risk (allocated to private side at tram de Liege)? Lenders do not look at the first instance.

- Lenders cannot be too critical in the beginning, since it's only a draft contract and still room for negotiations they cannot turn down every opportunity to bid.

- Theoretical framework of how risks should be allocated, theory and practice can differ

- Sponsors market or lenders market? After financial crisis, scarcity of debt, difficult to find lenders for large projects. more leverage for lenders to negotiate. Now completely different, low cost of debt, makes it easier for sponsors

### Project characteristics related to the six criteria?

**1. Economic and political environment**

– Availability based, good rated counterparty (like the Netherlands) no big issue, more interesting if construction risk is involved as well

- Political environment is important, long term financial exposure, EU, OECD is considered attractive, foreign banks ask a lot of questions about the political system. Brabo had several counter parts 'Flemish transportation company' De Lijn, really Flemish region risk or from a lesser credit worthy entity, the city of Antwerp. Three contracts, 2 light rail, and one with the city of Antwerp (inner city reconstruction). Cities are always considered shaky, not the same credit standing, no credit rating, strong requirements for guarantees from the region.

- Public opinion:

Sufficient support for Brabo II, want the tender not to be cancel, transaction costs of 5-6 million euros 'what investors hate', low compensations are typical. Harm from Groningen to public sector,

especially projects run by municipalities are seen critical from lenders. Less players interested, which drives up the price.

**2. Legal and regulatory environment**

The less familiar they are with the market the more questions they ask; they rely on the presence of local banks. Selling point together with local bank, usually a prerequisite. Multilateral involvement the same (EIB), considered an advantage in general, however in western European countries more important to have other commercial banks in the deal and rather a disadvantage because EIB only confirms they involvement during the preferred bidder phase, therefore unstable factor in the bidding process and the EIB does take away part of the funding requirements that could have been provided by commercial banks. Sponsors find it difficult to deal with EIB and give a certain ticket to lenders. Brabo 2, moving market, EIB overpriced (kept out of the deal for Brabo 2) in 2013.

- Procurement process standardized process rather than experiments, the tighter the management the better, Liege (first time of Walloon government doing it)

- Intervention rights standard, negotiated document (usually ANNEX) usually no changes. Between the lender and grantor, others: contractor and lenders

**3. Project specificity**

Risk of cables and ducts, Antwerp a historical city, no clear picture, lots of utility companies, lot of services to be removed and relocated. How to assess the situation? How about the cost of direct and indirect delays? Archaeological findings. Had to make site available to archaeologists.

- Capacity of the technology

No overhead electricity, Alstom had experience before (in Reins), some parts with no cables over ground (Tram de Liege)

- Site acquisition and access

Is a risk, needs to be dealt with, no launch if it's not dealt with

- License, permits, and authorizations

Permits one of the biggest problems in Belgium (prerequisite), lenders protected by guarantees by the public authorities is permits not permitted, compensates enough to repay it (standardized guarantees). Risk considered relatively high due to lot of interfaces.

**4. Project financial structure**

- EPC contractor's credibility

All important, creditworthiness (enhanced by parent companies, higher in the cooperate tree) most important and the liabilities that they are willing to assume. Entities in the concession were not really considered strong enough to absorb the liabilities in worst case (realistic assessment) so they gave a guarantee from the royal BAM group (highest entity in the whole group). Policy of companies tries to avoid giving parent guarantees, when than from an entity as low in the corporate tree as possible. Most contractors are not rated entities. Lenders asses balance sheets. Cofely Fabricom didn't have a parent guarantee

- Financial structure

Equity bridge facility, bridges gap where you can't take cash out of the project, real cash equity injected in the end of construction, used to repay the equity bridge facility lenders, project will start

producing cashflows. The close the moment of injection and the beginning of cashflow can brought together, the cheaper it is for the project. The more leverage sponsors have, depending on the market, the shorter the period (2years to six months now). Use of mini perm structure, loan repaid before it has amortized (still 50% replayed but you have to refinance it), made tender much shorter, more possible for the banks to make the deal, absence of a refinancing the project cash would need to go to the banks and there would be a very steep amortization.

Cash reserves for debt service, cash reserves for major maintenance (should the maintenance contractor collapse, the SPV needs funds to pay other companies for the work) covered by the debt service account facility (DSRA) nowadays. Reserve to deal with cash flow issues. Brabo was the first project in Belgium where the DSRA replaced the cash reserves.

- Financial flexibility

PPP are not that flexible, due to structure and the swaps which are inflexible in time if there are delays, they come with higher costs, usually covered by contractors if delay is due to their fault or covered by authority, have to consider the cost of the resettlement of swaps, if there is an early project termination, the cost for cutting the swaps (1:08)

**5. Third party risk allocation**

- Insurance arrangement

Third party liability insurance (for various scenarios) no other ways to deal with than insuring it (quite standard)

- Environmental and other legal/ regulatory issues

Project must be in line with the Equator principles (A financial industry benchmark for determining, assessing and managing environmental and social risk in projects) by the banks, also environmental standards-imposed trough the concession agreement if important enough for the public authority.

**6. Contract arrangement**

- Support agreement/ guarantee

Liability of EPC and O&M Security package, amount to which they will assume liabilities, always fixed price contract, if there are cost overruns, they will absorb that, liabilities (consequential damage, like delays) up to certain % (30-35%) of contract price (assessed by LTA's), capped in a way that worst case is covered (takes into account retendering at higher price, resettlement of swaps due to delays, penalties, transaction costs). Part of liabilities backed by liquid support, even if SPV cannot pay themselves, you have at least a bank.

Type of guarantees from banks? Guarantee of first demand (no questions asked) or based on certain conditions.

- Termination provisions

Super important, termination case of contractor default (most important one) lenders not fully paid necessarily but usually looks at value that works which has been delivered and value of concession contract → in Belgium a two staged process: 1 accessing the value of a stepping in SPV based on a real retendering (at least 2-3 bidders with reasonable offers) those results determine the compensation for the SPV which might or might not be enough to repay the lenders since they are more senior than the investors. 2.no liquid market, not enough bidders more theoretic approach with evaluation of experts (lenders want to see those assessments upfront),

incentivizes a well-structured approach (emerging market more lender friendly market) not ideal from value for money perspective from public side.

all the other circumstances lenders would get their money back (authority default, voluntary termination by authority)

- Operation and maintenance agreement

For O&M 100% of ongoing average maintenance costs on an annual basis (cap) in case of concern, 200% if contract is terminated.

- Catastrophic risk

Fairly standard to covers the lenders completely and the sponsors partially

- Arbitration

External expert judgements, arbitration court (can be faster than courts)

**Other main-criteria?**

Light rail not the fav. sector of investors due to complexity, mitigation through security packages, market prefers projects without rolling stock, less complicated, less interface risks for the SPV, availability based is a prerequisite for most of the lenders. Depends on where the market is, huge availability of capital atm. PPP model well suited and proven in this sector. Counter party close to central government, usually not that case in light rail (usually regional level), not ideal, less experience, less effectiveness of the tender process, higher risks of cancelled projects. The bigger the project the more banks you need. (100-200 mil.) local banks. Minimum for PPP 100 mil., sponsor consideration: min. 50 million. Lenders want to be with at least one other bank (also 50 mil. min). They earn upfront fees, compensation for their work, interest for risk and making available funds, bonuses (not driven by interested rate but more the upfront fee). Smaller deal not necessary less work.

### What could the contracting authorities could do to achieve those?

Scoping, earning model (availability based), municipality might think more adventures models are interesting for the market as well. Need to be aware what makes the private sector attracted to a certain transaction, risk allocation, public guarantees very important (at least from province!) early on in process.

### Anyone else to talk to?

Rolling stock provider, SIEMES, Alstom

DIF

INFRANEWS website

BAMPPP

### Other things you would like to tell me?

Brabo interesting since they are in trouble now, BAM filed a claim 100 million to authority, argue that the reference design was incomplete as a result they incurred massive costs and delayed the project. Huge costs overruns.

### Interview summary: Tram de Liege; DIF, Equity investor

Tell me about your background in the company?

…about your role and the company's role in the project?

BSc. Of Economics, MSc. in finance, almost three years for DIF now, origination department. DIF three different departments, acquire investments, they are managed and sold. Role in the origination process (finding investments and running through the acquisition process).

As I said in the beginning, the first stage aims at identifying the project characteristics that determines the attractiveness to lenders. What are the most important ones in your opinion for the attractiveness of light rail PPP's in general?

Key of what makes it attractive mostly the fact that it's a PPP in the first place.

Determines 80% the lenders look at it (road, rail etc. not that important)

PPP. Amount of risk defines the attractiveness. Depending on risk there is a large or small market. Example: Dutch state loans are extremely wanted (low level of risk).

PPP 10-20% lowest risk (on scale from state loans to nearly bankrupt retailer).

Low level of risk to lenders: Risk determined by the risks in different lines on incomes and costs. Financial statements

1. first item is the revenues/income for the PPP usually guaranteed by some form of authority or state. Low risk of SPV compared normal companies in terms of revenues. The rating of the PA is the benchmark for the risk of the project Tram de Liege, Walloon region, rating A.

2. costs: PA payments mostly spend on maintenance (after construction) Tram de Liege for maintenance on trams and rails. The costs are guaranteed by contracting parties. Colas builds all the rails and ground infrastructure. CAF supplies all the trams across the rails. They guarantee 90% of the costs. Second benchmark of risk, the credit rating of the contracting parties. SPV dependent on the contractor to meet their obligations. Remaining costs not covered by contractors (SPV costs) operational cost that keep the project going but are not any form of maintenance (used for paying CEO, CFO, insurance costs etc.) around 10% of total operational expenses. Minor portion is not contracted, risk in this part for the SPV, but only small proportion. Financing costs, entirely fixed at moment financial close (lenders are asked how much they are willing to rent and at what interest rates), asked the contractors what the costs for the rails and trams during the period of the concession, on that basis can the SPV calculate the costs they have each year. Based on that they can say how much money they need from the PA. Fixed interest rates, no floating interest rates, project protected against changing interest rates.

In a nutshell: Revenues guaranteed (Risk equal to PA credit rating), 90% of costs guaranteed by contractors (guaranteed by their credit rating), Debt is entirely fixed again.

Municipalities needs strong balance sheet or experienced in lightrail PPP. The smaller the riskier.

Might be possible to conduct a PPP without state guarantee, risk perceived quite high, costs of financing increases because not many lenders are willing to take that much risk. Better for municipalities to arrange a state guarantee.

Academic literature groups them into six main-criteria (attachment). When looking at those main-criteria individually, what project characteristics of the project can you think off that were important to the lenders?

Project in general. 13km tram line, construction and trams packaged in one deal, tram depots, 20 trams, section without overhead lines (technical innovation), period of 30 years (3.75 construction, 27.25 years of operation). Number of parties limited due to rolling stock and no overhead section. Including rolling stock, PA outsourcing the risk. PA wants to allocate a lot of risk to the private sector and or governments wants to have it off balance sheet.

**1.Economic and political environment**

Economic is doing well in Walloon region, reliable counterparty, Belgium has a large amount of debt, therefore important to keep the project off balance sheets

- Political environment

Relatively positive.

Belgium stable in bigger picture, but within western Europe Belgium is a little more political unstable. Project was tendered twice. First consortium almost got to financial close but was cancelled right before. PA wanted to have the project off balance sheet. Especially important in Belgium, consequences are impairing their possibilities to borrow further money and a number of accounting consequences. Walloon region hasn't done a PPP in the past, no track record.

- Public opinion

Lender mentioned that the cost for a light rail are way higher compared to buses. In practice this could be a topic of discussion. Tram upfront costs why higher

**2. Legal and regulatory environment**

- Procurement process

Check tender guidelines!

Guideline for PPP are standard in general, but in practice it needs to be adjusted (not the split of risks or the procedure itself) but different issues that pop up. For example, lot of documents, PPP contract 200 pages, financing 500 pages, those determines the risk in detail with a different risk allocation. But on a higher lever perspective, the risk allocation is similar, operational cost risk for the contractors, interest rate risk entirely covered for. Standard in bigger picture (allocation of risks), details very unique

- Intervention right/step in rights

Termination rights are negotiated, although most of them are determined by PA, deviate a little bit but not too much. PA has a termination right after 12 months.

**3. Project specificity**

- Feasibility studies

Lot of feasibility studies done by the PA. Pollution of areas due to industry, potential noise, Atlas bridge (increased in height), large bride, not very new. Done on every key topic. All choke points investigated.

- Capacity of the technology

New technology topic of questions (only three places in the world with the rolling stock providers trams driving on batteries purely.) used between 5 years. It's a concern, not the biggest concerns of the lenders.

- License, permits, and authorizations

Permits are PA risk

**4. Project financial structure**

- Financial structure

Ratios are important to lenders as well. Cover ratios determine the stability of a project. More important than debt-equity ratio but nevertheless important. Not enough equity means losses are very quickly become losses at the expense of lenders. Usually min. prerequisite, max leverage ratio.

- Financial flexibility

5. Third party risk allocation

- Insurance arrangement

Most important three. Constructional risk policy (EPC risks of construction accidents etc.), Business interruption policy (if anything goes wrong during operation and revenues are lost), material damage policy.

- Environmental and other legal/ regulatory issues

**6. Contract arrangement**

- Concession period

The duration of the construction is estimated to 3.75 years, in practice not really easy to estimate how fast it can be done (ground sinks away, too much noise). One of the key concerns was how long it takes to construct the project. 30 years fixed. 27.25 of operation. Length of concession will not extend if there is a delay in the construction, delays lead to a shorter operational period and to less revenues. One key difference.

- Support agreement/ guarantee

Guarantees standard for a market standard %

- Direct agreement

Are in place

When looking at the characteristics we just discussed, which of them and to what extend can they be influenced by the contracting authority/the client?

PA make aware choices of risk, more attractive to lenders (trade off) also riskier for PA

1. Delay risk, termination → loss of money (TRAM de Liege, looser termination provision)

2. Fixed concession period

3. PA risk of archaeological findings

(Involved in road PPP's?) How do they differ from road infrastructure project characteristics? What's the reason why other PPP's are so much more successful?)

Road less technical complex, riskier. Roads more successful because there is an active market, a lot of financial investors, market is mature (everyone knows what to do) processes go rather smoothly. Gov. gets projects done on short notice, fixed price, fixed risk. Investors are interested as well. Concepts that tends to work for all parties involved.

### Is there anything else you'd like to tell me?

Financial close is coming close, additional information will be available soon. Early next week.

## Interview summary: NET Phase 2; Nottingham City Councils, Tender manager

Tell me about your background in the company?

…about your role and the company's role in the project?

Working for the city of Nottingham, was involved in NET phase 2, from start till current stage, Team Leader for the Nottingham city council, involved in procurement.

As I said in the beginning, the first stage aims at identifying the project characteristics that determines the attractiveness to lenders. What are the most important ones in your opinion for the attractiveness of light rail PPP's in general?

- most important: risk distribution

- rate of return

- NET phase two, learnings used from PFI NET phase one

Academic literature groups them into six main-criteria (attachment). When looking at those main-criteria individually, what project characteristics of the project can you think off that were important to the lenders?

**1. Economic and political environment**

- Political environment

Stable authority, positive factor for lenders. Same party in the council for a long period, strong political support.

- Public opinion

Work place parking levy charged an annual fee for all businesses with ten or more parking spaces. Money used as local contribution (gov. 2/3, local 1/3), unpopular approach, political strong enough and agreed upon before the contract was signed, sign of commitment to lenders.

Public enquiries, some subjections, mostly local people. Polls showed support for line

**2. Legal and regulatory environment**

- Procurement process

Standard European procedure, lot of sub market testing, experienced layers with PFI, comfortable with the process

Standard contract

**3. Project specificity**

- Utilities

in underground biggest issues regarding the construction program. UK gov. no control over utility diversion, massive risk. Advanced work package to detect utilities first to avoid getting in the way in main construction program, longer and more expensive than expected. Not General problem in the UK. Not possible to come up with an advanced utility design (like in other areas) cause utility companies reluctant to get involved until they were very sure that the project was going to happen (other cities where projects not happened at the end).

- Feasibility studies

Reference design, feasibility made available to the SPV

- Capacity of the technology

Technical details specified in advanced design, only minor alteration later on

- Site acquisition and access

City responsible for land acquisition 40-50 million pounds, risk of public authority

- License, permits, and authorizations

Advanced design, done upfront to reduce risk

**4. Project financial structure**

- EPC contractor's credibility

Vinci contractor, worldwide company experienced, financially strong standing, group of big names, Operator also worldwide operating company

Proffered bidder stage: Designer involved in the SPV got into financial problems sticky point, contracting authority helped to get new designer (MM) who also developed the reference design

**5. Third party risk allocation**

- Environmental and other legal/ regulatory issues

Big area tackled with the advanced design

**6. Contract arrangement**

- Concession agreement

Including rolling stock in the SPV to allow the SPV to be in full control of the project. Up to the bidder to choose a provider. Different providers (from phase 1), SPV proof for combability. Rolling stock not included might be risk for the lenders, Interface risk (big issue) within the consortium.

- Concession period (2032, signed 2011 22years)

- Construction contract

Lot of risks passed on to the contractor → only two bidders, potential other consortia couldn't find any contractors willing to take on the amount of risk. Right time in the market, market was looking for work (after financial crisis), now market might push back on it.

- Operation and maintenance agreement

Operator from NET phase 2 took over operation from phase 1, terminating the first contract was difficult and complicated, rolling stock supplier didn't want to give all the information to the new SPV, few rolling stock suppliers. NET phase2 contract has provision to avoid termination and restart with a new operator again. Phase 3 would be procured from the SPV, included in the contact already. Phase 1 to phase 2 was a massive increase in scope, now any increase is smaller in proportion.

What was the role of the public authority to achieve those characteristics?

Looked at the riskiest parts and tried to minimize them.

- advanced design with risk analysis to minimize risks (design risks, permissions from authorities, approvals (highway authority), design of most challenging and difficult areas in advance with approval from the authorities

- payments based on performance (25 performance criteria), 80% of value based on reliability and punctuality, more in the SPVs control, lot of the system is segregated, risk for delays in highway crossing addressed by the advanced design done upfront, priority at junctions

- Farebox revenue already banked from phase 1 makes it less risky

What are you doing to minimize the risks/make it more attractive/achieve those characteristics?

Transfer the risk to private sector to gain benefit from expertise, trying to identify the areas with biggest risk and help with those upfront but did not try to change risk proportion. Pay more upfront, bidding costs higher (risks involved) to ensure the risks is not on public site any more. Ensures quick delivery because incentives for delivery for SPV.

6. (Involved in road PPP's?) How do they differ from road infrastructure project characteristics? What's the reason why other PPP's are so much more successful?)

Not really involved in other things of infrastructure. UK started to do PPP in light rail because it became the only alternative (20 years ago). Light rail higher risks. Roads more control of your site, mostly greenfield. Less complicated, less interfaced with environment.

7. Do you have someone in mind who might has additional information or a different view on this topic?

Person leading the TramLinq through the procurement, Phil Huwitt (now in charge of Tram in Birmingham)

## Interview summary: ION Rapid Transit (Stage 1); GrandLinq, General manager

Tell me about your background in the company?

…about your role and the company's role in the project?

Civil and structural Engineering background, Contract Administration & Construction Law Diploma, Australia, worked on the Sydney light rail project in 1995 for two years, Melbourne overhead electrification for Melbourne Trams. Malisa, Kula Lumpur, new central station overhead work (Project/Program manager), contractor site. Dublin lightrail (worked for PA), railway procurement agency (plan, deliver, operate light rail in Ireland), worked as a contract & program manager (2005-2011). Relocated to Canada, first three years for consultancy. May 2014 general manager for GrandLinq right after financial close. (half of career on private/half on public site, mostly rail and tram sector). Wasn't involved prior to financial close (still a lot of insights but not in detailed). →Published reports on gov. website.

As I said in the beginning, the first stage aims at identifying the project characteristics that determines the attractiveness to lenders. What are the most important ones in your opinion for the attractiveness of light rail PPP's in general?

1. Risk, what sort of risks

2. Reward

Use technical advisor to assess the risks during the bidding phase, how ambiguous is the timeline? Cutting edge technology? Unusual risk allocated to the private parties? PA would retain the land acquisition responsibilities (power of expropriation), not expected to be passed over to the private sector. How close is the risk distribution to the 'normal' template? Track and overhead system rather standard in ION and no unusual structures, no bridges, tunnels. One unusual section, 4km shared track with freight (freight at night) not interfering with light rail schedule, unusual because the design for the biggest load (freight load), light rail running and heavy rail track. LTA asses those things. Track record of PPP projects? Success rate of such projects, delays?

Academic literature groups them into six main-criteria (attachment). When looking at those main-criteria individually, what project characteristics of the project can you think off that were important to the lenders?

**1. Economic and political environment**

- Political environment

Canada has three tiers of gov., federal, provincial, municipal. This project is unusual because there are two levels of municipal/local gov.. Project in the city of Kitchener and the city of Waterloo, both cities part of the region of Waterloo, the city of Kitchener is a local government but the region of Waterloo a municipal gov. Two teared local gov. system, this created some challenges. The municipal gov. consists of some elected members from the region of Waterloo. Funding from the regional gov. side by a tax to ring fenced pay for the light rail, set on a regional level. Cities (Cambridge) part of the local tax is going towards the light rail project even if the city is not part of the system (yet). Challenge for the region to get all the cities on board. Public funding comes from three levels of government (fed. 200mil, provincial 200mil). Three level of gov. makes it complex. During the project local, provincial and federal elections. Winning parties not the most pro LRT but also not anti LRT ones. At least general support.

- Public opinion

Fairly good, projects disrupting during construction phase, reconstruction of entry streets. Good communication still some complaints (normal level of issues). People now (delayed 2 years) just want to see it open. Vehicle supplier delayed with the delivery of the rolling stock. Not part of the scope of work (contracted by PA). Public is exited that the system is coming. Experience: When it opens the people get excited and like the convenience even if they have been sceptical at first. (Dublin resistance in the first phase, support for the second phase due to benefits from the first).

**2. Legal and regulatory environment**

- Procurement process

Ontario Infrastructure process, but a little bit unusual because not procured by usual parties but done by the Region of Waterloo and Infrastructure Ontario (not co. sponsors but procurement advisors) Region of Waterloo retained full ownership. Request to qualify, qualification period and bid period. Three bidders selected; 2014 preferred bidder selected.

**3. Project specificity**

- Project definition

Region specified that in some section of the alignment there is train control in place (usually not for street running light rail). Because of the shared section.

- Feasibility studies

Mix between PA assessment and risk in private sector, PA did enabling work packages through local contractors, some infrastructure moved upfront (high voltage transmission line), PA looks at bigger utilities (transmission lines, major water mains, major gas services). More transmission than local distribution since this is usually more complex and longer durations. Wet utilities (sewage and storm water) part of the contract with the private parties. Gas not part of the scope bud coordinated by the SPV. Relocation not in the scope but they had to coordinate with the service providers. Work scheduled in stages.

- Site acquisition and access

Not done and completed upfront, normally the PA points out the land they are going to acquire for the project and they start the process. Try with negations first, only expropriation if no other solution. Cooperation with land owners, lots of property closed at time, some delayed due to longer negotiations (extra land -> slope instead of retaining wall, no maintenance). No impact in general. Some issues but not unusual. PA struggles to get the utility providers to carry out the work in the timeline necessary for the LRT project. Primary driver of the utility companies is to service the clients and extend the grind rather than relocating existing services. Also, priority for breakdowns and urged works.

- License, permits, and authorizations

Change in law clause, change in legislation or standards after financial close the SPV is protected. Costs related to the change.

**4. Project financial structure**

- Financial structure

High contribution from government (80%), lenders see the high commitment of the PA by putting that much money in it. Balance not that much unusual for Canada. S&P rated the SPV, rating increased during the project.

**5. Third party risk allocation**

- Environmental and other legal/ regulatory issues

Lots of environmental issues, Region does the environmental impact study during early procurement phase, lots of environmental law, lots of different agencies. Part of the project close the grand river (Grand river conservation authority). Extracting and discharging water. One of the biggest challenges is to capture all those requirements, typical issues: leakage from hydraulically equipment, historical road (delay of two months) for the assessment by licensed archaeologists. Some of those risks get passed on the O&M. Soil contamination but known upfront and protected through the project agreement. However, not major issues. Safety requirements consistent everywhere you work, but environment is not (different tears, state, province, local level. Need experienced people.

6. Contract arrangement

- Concession agreement

Bad experience with the rolling stock provider, problems in delivery, delayed and affected the project. For other deals Infrastructure Ontario is looking at including the rolling stock in the PPP contract. Transfer of interface risk to the private parties. Downside: if PA has an existing system and plans to extend, it's better to avoid a mixed fleet. PA has a 5-year rolling stock procurement schedule (the time it takes from first negotiations to the delivery depends on how busy the market is). Limiting the numbers of providers (especially in Canada) due to 'Canadian Content Ratio' which prescribes the amount of value that has to be from within Canada. Early phase of consultation done by the procuring authority PA and handing over the results the to SPV. Forces the supplier upon the SPV. For ION they excluded it for the extension, which is good, however, they had a contract with Bombardier which was not robust enough. Usually worked well in other projects. From user experience perspective 90% of the user experience is the vehicle, vending machine and app the rest. Client has to get the vehicle right. The model (of not including the rolling stock in the PPP) is good but the contract was not ideal. Pro's and Con's for every option.

- Concession period

30 years fixed concession from substantial completion date. Permanent end date.

- Termination provisions

Nothing unusual, normal termination provisions (termination for defaults (standard definition, lots of warning notices must be send upfront)

- Construction contract

D&C requirements passed on to construction contractor

- Operation and maintenance agreement

O&M requirements passed on to the O&M contractor

**Other main-criteria?**

Important to lenders to appoint the right technical advisors, someone who understands the real risks, knowledgeable in the area. Rail and PPP knowledge. On both, public and private site, people with the right level of experience (don't overreact on issues and don't miss issues).

### Difference between Canada and Europe?

Canadian PPP model quite advanced, in Ontario every project with capital value of more than 50mil. must go through PPP assessment. The compare traditional and PPP approach. Usually recommend PPP approach, reasonable standard documents help to get projects to procurement

stage relatively quickly. Industry is fairly familiar with the model, standard forms of contracts, risks are known and easier to assess from an industry perspective. Funding from provincial or federal gov. only if their procurement model is used (which typically end in a PPP). Kind of forces people into PPP. The more people using it the more efficient it becomes. Assessing properly is important. If a lot of decisions are not made or there are major changes expected PPP might not be the right choice. Enabling works to manage the risk. Normal issues are permitting (how to make sure to have all the permits, how to ensure they are all current, see if the permits are realistic and not used by the PA to squeeze a little bit of scope into the contract through the permitting process), utilities (what utilities have been move, have they been moved in time, unknown utilities?) and property (hast it been procured, has it been procured on time, what's available, what's not available). PA manages those risks and provides and plane and clear field to the SPV, helps setting the project off to succeed. Project which might have been done in stages before are now bundled in large and complex contracts. Planning stage take longer due to size.

(Involved in road PPP's?) How do they differ from road infrastructure project characteristics? What's the reason why other PPP's are so much more successful?)

Easier, no ridership risks, within the control, roads easier to forecast, light rail not as easy, complex models, many variables, fare box risk transferred or shared? Easier for road project.

## Appendix IV: Interviews, phase 3

The questions in blue are the same for the interviews in phase 2 and the interviews in phase 3. The questions in black are the ones related to the specific purpose of the interview.

1. Tell about research purpose:
    - Civil engineering and management student at the University of Twente, Netherlands.
    - Master thesis project looks at the gap between funding for light rail infrastructure and the need for new investments and at PPPs as one possible solution.
    - Goal is to increase the attractiveness of light rail PPPs in the Netherlands for lenders.
        - First step: to see what the project characteristics are that determine the attractiveness of a light rail PPP to lenders
        - Second step: to find out when and how those characteristics can be influenced by the contracting authority.

2. Are you fine with me recoding this interview?

3. Tell me about your background in the company?
4. …about your role and the company's role in the project?

5. As I said in the beginning, the second stage aims at identifying the main decisions in early project phases that determine the attractiveness to lenders. Early project phases refers to the exploration and planning stage being divided into four phases (show diagram):
    1. Project Identification.
    2. Appraising and preparing the project contract.
    3. Structuring and drafting the tender & contract.
    4. Tender & Award.

    A) What, in your opinion, are the most important decisions, determining the attractiveness of light rail PPP's **in general**?

    B) The questionnaire shows a list of project characteristics. In which phase have the decisions, leading to those characteristics, been taken and by whom have they been taken **in the project**?

6. Can you think of any choices, made by the public authority, which could improve the attractiveness of the project to lenders without entailing any disadvantages to the public side?

7. Is there anything else you'd like to tell me?
8. Can I send you a short summary to be validated?
9. Can I contact you if I have further questions when analysing the interviews?

### Interview summary: Regio Tram Groningen; Allen & Overy, Legal advisor

Are you fine with me recoding this interview?

Yes

Tell me about your background in the company?

…about your role and the company's role in the project?

He was in private practice first as lawyer, for Norton Rose Fulbright, Allen & Overy, always involved in construction practice for those firms. Focused on procurement law in PPP projects, tender disputes, advice public parties in setting up the tender to make the project successful. Successful relates to the MANTRA:

• The project should be completed within the time required.
• The project should be completed and operated within everyone's budget with a fair return for those involved in constructing and operating it (provided they do a good job).
• The project should meet the requirements of those who will be using and operating it.
• The project should be built and operated without hindrance to the relevant neighbours, the environment, other affected communities and users and the end- result should not be detrimental to them.
• The project should be built and operated without 'hassle', i.e. without disputes between the various stakeholders involved.

He was involved in the draft of the first tenders (HSL south, N31, Ministry of finance etc.) where there was still a high level of distrust (because of the 'construction fraud'). Several initiatives to restore trusts where he was involved and also in the standardization of the DBFM contracts for Rijkswaterstaat. Competitive Dialogue was introduced, which helped to use the DBFM contracts.

Legal assistance for the RegioTram and other forms of collaborative contracts. Turned 60 three years ago, so he had to retire from his position at Allen & Overy so he became self-employed and founded the 'Faithful Goose'. He is not a lawyer anymore. Wrote a book about successful construction projects. Now he helps setting up projects and advices them through all phases. Ensure communication between different parties and resolve disputes if necessary.

Netherlands in the process of becoming a new legislation (Omgevingswet 2021) that allows to involve stakeholders in a very early stage. Instead of planning first and waiting for objections later on, the stakeholders could be involved in the early planning already.

As I said in the beginning, the second stage aims at identifying the main decisions in early project phases that determine the attractiveness to lenders. Early project phases refers to the exploration and planning stage being divided into four phases (Appendix A: Explanation of Project Phases):

A) What, in your opinion, are the most important decisions, determining the attractiveness of light rail PPP's in general?

Main risk is not to be able to trust the public party, so the main decision is to ensure that all the main stakeholders are on board. And not only on paper but that they are fully committed to the project. Also, necessary support from the public. For a project to be successful, all the relevant objectives of all the stakeholders need to be considered. Identification of stakeholders and interests, mapping and understanding them. Project can only go ahead if everyone understands the underlying issues and the need for the project. When pushing it through there will be a lot of resistance.

B) The questionnaire shows a list of project characteristics. In which phase have the decisions, leading to those characteristics, been taken and by whom have they been taken **in the project**?

Can you think of any choices, made by the public authority, which could improve the attractiveness of the project to lenders without entailing any disadvantages to the public side?

PA should demonstrate professionalisms and experience within the project organization, also in regards of the political support. Should only use the best people and best standards and the best skilled people from all areas. This will have a positive effect on the lenders. Communicate well, answer the questions by lenders and able to deal with issues well to create trust.

Is there anything else you'd like to tell me?

No

Can I send you a short summary to be validated?

Yes

Can I contact you if I have further questions when analysing the interviews?

Yes

# Questionnaire

| Main-criteria | Project characteristic related to criteria | Phase 1. Project Identification | | Phase 2. Appraising and preparing the project | | Phase 3. Structuring and drafting the tender documents | | Phase 4. Tender & Award | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Economic & political environment** | Political and economic environment | | | | | | | | | |
| | Level of political support in general: | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Should be there in all phases of the project, needs to be taken into account early on. Needs to be managed. Legal framework for decision making and the public bodies involved. Legal framework for decision making and public parties been involved and the formal decision making. Framing the narrative. |
| | Stability of political environment (upcoming elections?) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | Upcoming election cycle needs to be taken into account and the important decisions should be made upfront to ensure that the project is no influenced. Also, decisions should be made at certain gateways, prescribed in the process, to ensure that there is no other political influence on the project. |
| | Level of procuring authority (federal, provincial, local) | / | | | | | | | | Regional level, by the nature of the project. Regional usually or Municipality. Always one or several Municipalities and the Province. |
| | Different level involved at the same time? | / | | | | | | | | Not a decision more in the legal nature of the project, agreements between several parties in place (not or the RegioTram, still in negotiation phase) should be done early. |
| | PA close to central government? | / | | | | | | | | Not a decision more in the legal nature of the project. |
| | Evidence of political commitment | ✓ | ✓ | | | | | | | Needs to be considered, however, no strong political commitment thought-out the project. |
| | Funding through regional taxes | / | | | | | | | | Clear rules about funding projects in the Netherlands, funding from a national level, no legal instruments for local governments so far. |
| | Experience of the PA with PPP | / | | | | | | | | Helps but also not something that can be decided. |
| | Guarantees from higher level of government | | | | - | - | - | | | Owner should have evidence for securing the money for availability payments. Doesn't matter how. Commitment by the PA should be there before tender. |
| | Public opinion | | | | | | | | | |
| | Concerns of local businesses | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Important, should be considered early on (new legislation), but important in all phases. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level of public support | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Important, should be considered early on (new legislation), but important in all phases. |
| | Alternatives (e.g. bus) discussed with public | ✓ | ✓ | ✓ | ✓ | ✓ | | | | Part of the previous, the business case should be presented and if light rail is the best solution this should become evident from the business case. |
| **2. Legal and regulatory environment** | Procurement process | | | | | | | | | |
| | Level of standardization | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | Standardization helps, however, no PPP construct for an operational Tram network in the Netherlands so far. RegioTram contract was quite well developed. Could be used for a new system. Based on the standard for roads and buildings. Whole chapter added for the rolling stock. The higher the standardization the easier it is for the private parties to assess the risks. |
| | Openness for input from the market | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Market sounding always done. Increasing interest in market parties. |
| | Expected time of tender | | | | | ✓ | ✓ | | | Ambition is fine, but realism is more important. Schedule as much time as needed. |
| | Experience of the PA with PPP | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Project organization should demonstrate the required level of expertise, also hiring external parties. Like in the RegioTram where the PA hired advisors usually working for the SPV and having a lot of experience in those projects. |
| | Strictness of termination provisions | | | | | ✓ | ✓ | | | Termination provision in standards. Should not be changed. |
| **3. Project specificity** | Project definition | | | | | | | | | |
| | Completeness of project definition (specs set and fixed) | | | | | ✓ | ✓ | | | Should be fixed before tender starts. Tender should not be published before the output specifications are fixed. |
| | Completeness of reference design | | | | | ✓ | ✓ | | | Same issue |
| | Level of technical details in advanced design | | | | | ✓ | ✓ | | | Same issue, also how much data is passed on (geo data, data about subsoil conditions and vibration issues) Groningen had issues with the vibration. In what point of time is the private sector able to guarantee the price of the project. Interface between their design and the reference design. Two teared process, a design stage first and the EPC and O&M will be fixed and that will be financed, and then the project goes further. So, there can always be an exit when the budget cannot be achieved. |
| | Interference between phasing and enabling works | | | | | ✓ | ✓ | ✓ | ✓ | Impose only restrictions if you need to, leave as much freedom to the private parties as possible |
| | Operation included | | | | ✓ | ✓ | ✓ | | | Thinking about it early but leaving it open until prior to tender, but keep the option to get rid of it later on, default on time |
| | Rolling stock included | | | | ✓ | ✓ | ✓ | | | Thinking about it early but leaving it open until prior to tender but keep the option to get rid of it later on, default on time |
| | Extension of existing network | ✓ | | | | | | | | Nature of the project |
| | Other work packaged (Tram depots etc.) | ✓ | ✓ | ✓ | ✓ | | | | | Possible, makes sense of entirely new system. However, be careful with Eurostat regulations |
| | Feasibility studies | | | | | | | | | |
| | Enabling works by the PA | ✓ | ✓ | ✓ | ✓ | | | | | Case by case basis, can also be carried out by the private sector to identify risks for themselves, can have a positive impact. Depending on timing, |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Assessment of major risks | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Joint effort, beginning quite early but continuing throughout the project, joint risk registers |
| | Level of cooperation of utility providers | ✓ | ✓ | ✓ | ✓ | | | | | Big risk, no incentives for utility providers. They have their own agenda. This risk cannot be transferred to the private sector. |
| | Utility providers able to do the work according to project schedule | | | ✓ | ✓ | | | | | Should be fine |
| | Relocation of services done upfront by the PA | | | ✓ | ✓ | | | | | |
| | Risk of unexpected utilities borne by PA? | | | ✓ | ✓ | | | | | Risks by the public sector, dealing right from the start, but private sector should be engaged in the mitigation and management of those risks. Focus on how to work together effectively. |
| | Noise and vibration private risk? | | ✓ | ✓ | ✓ | ✓ | ✓ | | | Should not be shifted to the private sector to fast. The decisions earlier (foundation of tracks, even the location of tracks) might have a huge impact on the vibration issues. (easier to allocate the track away from the laboratory instead of demanding a system with less vibration), alignment of the track |
| | Risk of archaeological findings | | | ✓ | ✓ | | | | | Public risk |
| | Capacity of technology | | | | | | | | | |
| | Technical innovation | | | ✓ | ✓ | ✓ | ✓ | ✓ | | PA should not to be demanding, should be covered by the market consultation, not overdemanding. |
| | Unusual or complex structures | | ✓ | ✓ | ✓ | | | | | Vibration close to sensitive objects, should be taken into account early to avoid unusual or complex measure |
| | Shared tracks | / | | | | | | | | Not applicable |
| | Train control | / | | | | | | | | Not applicable |
| | Site acquisition | | | | | | | | | |
| | level of risk | | ✓ | ✓ | ✓ | | | | | Issue but public risk, expropriation issues, deal with it right from the start. |
| | responsibility of the PA | | ✓ | ✓ | | | | | | Yes |
| | License, permits and authorizations | | | | | | | | | |
| | Advanced design detailed enough for permits and licenses | | | | | | | | | Should follow from the legal framework 'Omegevingsvet' |
| | Permitting done by whom? | | | ✓ | ✓ | | | | | Follows from legal framework, agreement within public authorities to find a leading authority who is responsible for arranging all the permits. If the new input after the close of the tender will be taken into account in the final design, the PA is responsible for the compliance of the early design with the requirements. |
| | Risk of permits on public side? | | | ✓ | ✓ | | | | | yes |
| | Usages of licensing to squeeze in extra scope | | | | | | | | | Not aware |
| | Change in law clauses | | | | | ✓ | ✓ | | | standard |
| | Public transportation permit (15 years?) | | | | | | | | | EU resolution gives max. of 15 years |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **4. Project financial structure** | Financial structure | | | | | | | | | |
| | Rating of the PA | / | | | | | | | | No decision |
| | Guarantees from higher level (state/province) | / | | | | | | | | Funding from national level anyways |
| | Share of public funding | | | ✓ | ✓ | ✓ | ✓ | | | Private (equity) sector doesn't like a lot of public money, no share of public funding, public will do some bullet payments to lower the availability payments. Done by financial advisor. |
| | Public funding from which level | / | | | | | | | | National fund in the Dutch system |
| | Involvement of local banks | | | ✓ | ✓ | ✓ | | | | Enough appetite among Dutch banks (for example BMG), Making sure the private parties (not only the contractors) are familiar with the project, market consultation also with financial industry. |
| | Involvement of EIB | | | ✓ | ✓ | | | | | Pros and Cons. Strict documentation requirements. Depends on commercial appetite from other banks. Terms of crisis its important, in a bull market you do not need the EIB. PA has to talk to the EIB, always, done in the preparation phase. |
| | Project protected against changing interest rates | | | ✓ | ✓ | ✓ | ✓ | | | Something considered in the preparation phase and fixed in drafting the contracts |
| | Total value of the project | ✓ | ✓ | | | | | | | Scope |
| | % of SPV costs | / | | | | | | | | Not aware |
| | Contractor credibility | | | | | | | | | |
| | Credit rating of contractors | | | | ✓ | ✓ | ✓ | | | Setting the standards regarding the tender, however, most comply with standards |
| | Experiences of contractor | | | | ✓ | ✓ | ✓ | | | Same as above |
| | Guarantees from higher corporate entities | | | | | | | | | Financially strong standing of the contractor favourable |
| | Flexibility | | | | | | | | | |
| | Level of needed flexibility known by the PA | | | | ✓ | ✓ | ✓ | ✓ | ✓ | There will be changes in the long term. Big issue in Groningen. Flexibility and changes were one of the most important topics in the competitive dialogue. Contract important. Scenarios tested. Could be the basis for disputes. |
| | Level of flexibility communicated to the contractors early | | | | | | | ✓ | ✓ | Should be subject and developed in the dialogue |
| **5. Third party risk allocation** | Environmental issues | | | | | | | | | |
| | Additional requirements imposed by the PA | | | | | ✓ | ✓ | | | No |
| | Advanced design detailed enough | | | ✓ | ✓ | | | | | No very detailed advanced design |
| | Local environmental requirements | | | ✓ | ✓ | | | | | Taken care of in phase 2 |
| **6. Contract arrangement** | Concession agreement | | | | | | | | | |
| | Number of contracts | | | | ✓ | ✓ | ✓ | | | One |
| | Rolling stock included | | ✓ | ✓ | ✓ | ✓ | ✓ | | | Yes, whole package, considered quite early already |
| | Payment mechanism | | | ✓ | ✓ | ✓ | ✓ | | | Very important |
| | Use of standardized contracts | / | | | | | | | | Recommended, no standard in light rail PPP contracts, Groningen used PPP contracts from roads |
| | Proof of compatibility with existing system | / | | | | | | | | Not applicable |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Rolling stock procurement schedule of PA (if not included) | / | | | | | | | Not applicable |
| | Robustness of the contract with the rolling stock provider (not incl.) | / | | | | | | | Not applicable |
| | Provisions for extensions | | | | ✓ | ✓ | ✓ | ✓ | ✓ | Was though of and discussed during the dialogue |
| | Ridership risk retained by the PA | | ✓ | ✓ | ✓ | ✓ | ✓ | | | No, shifted to the private sector, one of the reasons to opt for a PPP |
| | Proportion of phase (if extension/extension planned) | / | | | | | | | | Not applicable |
| | Concession period | | | | | | | | | |
| | Duration | | | ✓ | ✓ | ✓ | | | | Early decision, important |
| | Fixed period | | | | | ✓ | ✓ | | | Operation phase should be fixed, otherwise too much of a penalty, part of the contract |
| | Ambiguous construction schedule | | | | ✓ | ✓ | ✓ | ✓ | ✓ | The shorter the construction period the better (less disturbance, less costs for contractors, a lot can done prefab), should be considered in the preparation phase, award criteria? And the dialogue. |
| | Termination provisions | | | | | | | | | |
| | Strictness of termination provisions | | | | ✓ | ✓ | ✓ | | | Standard |
| | Termination provision in case of extension | | | ✓ | ✓ | ✓ | ✓ | | | Taken into account, refer 'Level of flexibility' |
| | Market standard termination provisions | | | | | ✓ | ✓ | | | Yes |
| | Construction contract | | | | | | | | | |
| | Balance between contracted civil works & rolling stock | / | | | | | | | | By the nature of the project itself |
| | Amount of risk passed on | | | | | | | | | |
| | Risk distribution according to market situation | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | Three bidders |
| | O&M contract | | | | | | | | | |
| | Amount of operating risked passed on | | | | | | | | | |
| | Electricity consumption risk | | | | | ✓ | ✓ | ✓ | ✓ | Should be considered by PA and discussed in the Dialogue |
| | Balanced penalties | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Nature of schedule (defined headway vs. fixed times) | | | | | | | | | |
| | Preference at intersections | | | | | | | | | |
| | Willingness of the former rolling stock provider to cooperate (i.a.) | / | | | | | | | | Not applicable |
| | Direct agreement | | | | | | | | | |
| | Operator willing to enter into direct agreement with PA | | | | | | ✓ | ✓ | ✓ | Discussions |
| | Arbitration | | | | | | | | | |

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| | Arbitration arrangements | | | | | ✓ | ✓ | | Should be a high emphasis on dispute avoidance, a dispute avoidance board is always recommended. Maybe specialized arbitration boards, or courts. Construction arbitration. Should be in the contract. |

### Interview summary: Regio Tram Groningen; Municipal Council, Former Project Director

Are you fine with me recoding this interview?

Yes

Tell me about your background in the company?

…about your role and the company's role in the project?

Working for the public sector for 40+ years, 25 years for the department for infrastructure and water management, before traffic and water management. Afterwards for private sector for 40 years in total, mostly for private parties in the field of infrastructure and mobility. Background in light-rail: Project director for the RegioTram, working now for a light rail project in Maastricht, working for Amstelveenlijn.

5. As I said in the beginning, the second stage aims at identifying the main decisions in early project phases that determine the attractiveness to lenders. Early project phases refer to the exploration and planning stage being divided into four phases (Appendix A: Explanation of Project Phases):

A) What, in your opinion, are the most important decisions, determining the attractiveness of light rail PPP's in general?

Differs, parties starting with an idea or ambition, mostly to get a lobby for gathering the money. Better to start with a clear understanding of the problem, the underlying issues and the different alternatives to solve the problem. Light-rail not the solution to all transport problems. Only a solution on lines with sufficient number of travellers, electrical buses might be an alternative (carrying the same amount of people). Assess the best solution, also in terms of money and environmental impact. Example (Haarlem to Schiphol) where there was a bus lane with the possibility to be transformed in a light rail system later on, huge success of buses, no one thinking about making it a tram anymore. Buses with frequency up to every 5 min in rush hours on other lines around Amsterdam. Important to be considered upfront.

Ideal on a local level, then they have to get funding from the national level. A lot of steps need to be taken (Problem assessment, how to solve it, alternatives (bus etc.), prisonization). Common attitude in the Netherlands to go for something better (more expensive) if the money is lent from someone else ('why not build sth. a little better than?'). What can I do myself? What can I put on the table myself to get the national government involved? Connecting the light rail funding with housing development: There is a possibility but do not overestimate the means you can get from it. 10.000 per house would be a lot of money for new public transport. However, costs of tracks, land, rolling stock but also maintenance and replacement (very often forgotten). Business case need to be on life cycle basis, so you need a lot of money. But there is money enough, especially municipalities can lend money (perhaps 1-2% interest) but paying back the money including the interest is the problem. The revenues from building houses can help but is not enough, you need a mix of resources, revenues from the tickets, housing development, raise prices for tickets on dedicated tracks (10-20%, to airport etc.), taxes from houses and offices. Municipalities have also own money. Also, a matter of prisonization, money for infrastructure provided by the government not a lot compared to education, social system, healthcare etc. 7billion euros a year, not enough for all projects. However, the Netherlands are able to invest in future development. More than short term problem solving. Long time between realizing and planning to solve the problem and actually fixing it (8-10 years), important

to think ahead, a strategic long-term view. Investments leading to economic growth, should be payed by the municipality itself.

B) The questionnaire shows a list of project characteristics. In which phase have the decisions, leading to those characteristics, been taken and by whom have they been taken in the project?

Can you think of any choices, made by the public authority, which could improve the attractiveness of the project to lenders without entailing any disadvantages to the public side?

The way of cooperation and organizing and dealing, dividing the risk is very important. No black and white (only public only private), difficulties in the past, distrust in the sector. Schiphol Lijn, bouwfraud where lenders mislead PAs. The A15, A2, experiences are not good, makes botch, public and private reluctant. What type of PPP fits in the Netherlands?

G4 meetings: The four cities are not pleased with the McKinsey analysis, too much focused-on ways of getting money which do not fit in the Netherlands. Not too much weight on getting money from developing areas. Very expensive analysis, 250.000 euros, high expectations. Issues are local taxes by the municipalities, ticket prices not a popular thing to do. Political debate between municipalities and authorities (raising the ticket prices), big amount of money to invest. Discussions of making legal instruments (5+ years to develop) → make use of existing instruments, it's about courage and choice, you have to make the decisions and you have to have the courage to do it. Not the quality of PA. Amsterdam not for the north south Lijn.

Long term possibilities for light rail PPPs to happen. Work together, sit on one table but still have two different responsibilities. Remove distrust, PA distrusts lenders, lenders think PA is unreliable in political commitment. Lenders think they get all the trouble and risks and profit is on the public site. Rijkswaterstaat movement to go to alliances. Dutch companies doing PPPs in other countries.

Is there anything else you'd like to tell me?

No

Can I send you a short summary to be validated?

Yes

Can I contact you if I have further questions when analysing the interviews?

Yes

# Questionnaire

| Main-criteria | Project characteristic related to criteria | **Phase 1.** Project Identification | | **Phase 2.** Appraising and preparing the project | | **Phase 3.** Structuring and drafting the tender documents | | **Phase 4.** Tender & Award | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Economic & political environment** | Political and economic environment | | | | | | | | | |
| | Level of political support in general: | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Should be considered throughout all the phases. One of the biggest risks is the city council. Important for the project to have a champion, a major or an alderman, who is fully committed to the project and gives the project a face (as in France). Project team can deliver facts and stories, but politicians need to 'get' the political commitment. |
| | Stability of political environment (upcoming elections?) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | same |
| | Level of procuring authority (federal, provincial, local) | / | | | | | | | | Municipality or Transport Authority in some areas |
| | Different level involved at the same time? | / | | | | | | | | Prescribed by legal framework |
| | PA close to central government? | / | | | | | | | | Prescribed by legal framework |
| | Evidence of political commitment | ✓ | ✓ | | | | | | | One of the hardest issues, Groningen wanted the tram, but they also wanted a parking garage in the city centre and a big marketplace. If you opt. for light rail, you need to make parking more expensive. Difficult |
| | Funding through regional taxes | / | | | | | | | | Funding always from a national level |
| | Experience of the PA with PPP | ✓ | | | | | | | | Difficult in the Netherlands, there are some experienced people within the transport authorities but in the Netherlands, you do not only opt for one solution, you always consider different once, but only black and white in terms of how things are organized (all market vs. all private), makes it difficult. Mistakes from the past leads to concerns today. Rijkswaterstaat had first discussion in the beginning of 80s, since then a lot of different forms and they learned it. You need the experience. Netherlands are not the UK, not Australia, not Canada. If you make the design, you are responsible for mistakes. Barriers you cannot cross, Rijkswaterstaat going for alliance models. Contract is used to provide some kind of security, RegioTram was a very extensive contract, maybe to extended. However, the main purpose of |

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| | | | | | | | | | | making the contract should be to get confidence between the parties to work together and not to lock every party in their part of liabilities. |
| | Guarantees from higher level of government | / | | | | | | | | Money from national level anyways |
| | Public opinion | | | | | | | | | |
| | Concerns of local businesses | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Very important, |
| | Level of public support | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Important throughout all stages, should be considered in the preparation |
| | Alternatives (e.g. bus) discussed with public | | ✓ | ✓ | ✓ | | | | | Important, early on. |
| **2. Legal and regulatory environment** | Procurement process | | | | | | | | | |
| | Level of standardization | | ✓ | ✓ | ✓ | ✓ | ✓ | | | Use what is there already, do not reinvent the wheel. Tender strategy based on the project and the money you have. DBFM is not the main solution. Can have an advantage, like shifting the interfaces to the private sector and have it within one party. If you cut it in pieces (HSL-Zuid) interfaces are hard to manage for the PA. The 'F' managed by flour for Infraspeed (HSL) managed the process well, however wished to do sth. additional but wasn't possible because of the financing. |
| | Openness for input from the market | ✓ | ✓ | ✓ | ✓ | | | | | Do market sounding properly, be open when drafting the contracts |
| | Expected time of tender | | | | ✓ | ✓ | ✓ | ✓ | | Take the time necessary, when developing the project together with private parties, think about the time that is necessary in the preparation already |
| | Experience of the PA with PPP | | ✓ | ✓ | | | | | | Acknowledge that there is no experience and hire advisors, work together with a private party accordingly |
| | Strictness of termination provisions | | | | ✓ | ✓ | ✓ | | | Stick to normal ones |
| **3. Project specificity** | Project definition | | | | | | | | | |
| | Completeness of project definition (specs set and fixed) | | | | | ✓ | ✓ | ✓ | ✓ | Go together in the competitive dialogue, long discussions and lot of effort but at the end a result where the private parties can say' If you ask this, we can build it in time and within budget' |
| | Completeness of reference design | | | | | | | ✓ | ✓ | |
| | Level of technical details in advanced design | | | | | | | ✓ | ✓ | The PA has to be capable of testing if the level of technical details is correct. More as reference for yourself (for pricing) but definite design by the private party which can be challenged later on. If they do not develop it themselves, it's hard for them to judge the private designs sufficiently (example of Rijkswaterstaat with the decision to stop all the inhouse technical knowledge within the 'bouwdienst'). |
| | Interference between phasing and enabling works | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Operation included | | | | ✓ | ✓ | ✓ | | | Very important decision, the interfaces, need to be with one party to be managed well. (security, signalling, rolling stock). Especially if you order |

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| | | | | | | | | | everything new (signalling, rolling stock etc. Different for an existing system where you know the specifications already very well. |
| | Rolling stock included | | | | ✓ | ✓ | ✓ | | Same |
| | Extension of existing network | | | | ✓ | ✓ | ✓ | | ✓ |
| | Other work packaged (Tram depots etc.) | | | ✓ | ✓ | ✓ | | | Possible, but only a few combinations of companies can do both. But housing development would give ways to finance for the private party. Pillar because of soil conditions -> gives private parties the chance to deal with soil issues themselves. |
| | Feasibility studies | | | | | | | | |
| | Enabling works by the PA | | | ✓ | ✓ | ✓ | | | PA has to deliver what they know; they are the most capable to get the information. Private parties have to verify this information. |
| | Assessment of major risks | | | | ✓ | ✓ | ✓ | ✓ | |
| | Level of cooperation of utility providers | | | ✓ | ✓ | | | | |
| | Utility providers able to do the work according to project schedule | | | | ✓ | ✓ | ✓ | | |
| | Relocation of services done upfront by the PA | | | ✓ | ✓ | | | | |
| | Risk of unexpected utilities borne by PA? | | | | ✓ | ✓ | ✓ | | |
| | Noise and vibration private risk? | | | | ✓ | ✓ | ✓ | | |
| | Risk of archaeological findings | | | | | ✓ | ✓ | | |
| | Capacity of technology | | | | | | | | |
| | Technical innovation | | | | ✓ | ✓ | ✓ | | Open possibility for innovation, do not ask for it. Gave output specification (zero emission) and give possibility to think about innovation. Discussion in the dialogue |
| | Unusual or complex structures | | | ✓ | ✓ | | | | |
| | Shared tracks | / | | | | | | | Not applicable |
| | Train control | / | | | | | | | Not applicable |
| | Site acquisition | | | | | | | | |
| | Level of risk | | ✓ | ✓ | ✓ | ✓ | | | Before the planning because the prices rise as soon as plans arise, but mostly starts when you have an executable project, have the means of funding and the planning. Mostly in public space. Groningen bought half of a building to avoid a curving of the line |
| | responsibility of the PA | | | ✓ | ✓ | | | | Yes, they have the means |
| | License, permits and authorizations | | | | | | | | |
| | Advanced design detailed enough for permits and licenses | | | | | | | | |

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| | Permitting done by whom? | | | ✓ | ✓ | | | | | |
| | Risk of permits on public side? | | | ✓ | ✓ | | | | | |
| | Usages of licensing to squeeze in extra scope | | | | | ✓ | ✓ | | | |
| | Change in law clauses | | | | | ✓ | ✓ | | | |
| | Public transportation permit (15 years?) | | | | | | | | | |
| **4. Project financial structure** | Financial structure | | | | | | | | | |
| | Rating of the PA | / | | | | | | | | No decision |
| | Guarantees from higher level (state/province) | / | | | | | | | | Not applicable since money is coming from national level anyways |
| | Share of public funding | | | ✓ | ✓ | | | | | See what you need and how much you (the PA) can pay with public money. Also, in terms of getting money from the national level. |
| | Public funding from which level | / | | | | | | | | National |
| | Involvement of local banks | | | ✓ | ✓ | ✓ | | | | |
| | Involvement of EIB | | | ✓ | ✓ | ✓ | | | | |
| | Project protected against changing interest rates | | | | | ✓ | ✓ | | | |
| | Total value of the project | ✓ | ✓ | ✓ | ✓ | | | | | |
| | % of SPV costs | | | | | | | | | |
| | Contractor credibility | | | | | | | | | |
| | Credit rating of contractors | | | | | ✓ | ✓ | | | |
| | Experiences of contractor | | | | | ✓ | ✓ | | | |
| | Guarantees from higher corporate entities | | | | | | | | | |
| | Flexibility | | | | | | | | | |
| | Level of needed flexibility known by the PA | | | | ✓ | ✓ | ✓ | ✓ | | |
| | Level of flexibility communicated to the contractors early | | | | | ✓ | ✓ | ✓ | ✓ | |
| **5. Third party risk allocation** | Environmental issues | | | | | | | | | |
| | Additional requirements imposed by the PA | | | | | | ✓ | ✓ | ✓ | |
| | Advanced design detailed enough | | | | ✓ | ✓ | ✓ | | | |
| | Local environmental requirements | | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| **6. Contract arrangement** | Concession agreement | | | | | | | | | |
| | Number of contracts | | | ✓ | ✓ | ✓ | ✓ | | | More contracts are asking for trouble. Works in Maastricht, they try to get as close to an integrated contract as possible. |

| | | | | | | | | | | |
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| | Rolling stock included | | | ✓ | ✓ | ✓ | ✓ | | | |
| | Payment mechanism | | | | ✓ | ✓ | ✓ | ✓ | ✓ | Should have a rough idea and discuss in dialogue |
| | Use of standardized contracts | | | | | | | | | |
| | Proof of compatibility with existing system | / | | | | | | | | Not applicable |
| | Rolling stock procurement schedule of PA (if not included) | / | | | | | | | | Not applicable |
| | Robustness of the contract with the rolling stock provider (not incl.) | / | | | | | | | | Not applicable |
| | Provisions for extensions | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Identify, draft in the contract and discuss in the dialogue |
| | Ridership risk retained by the PA | | ✓ | ✓ | ✓ | | | | | |
| | Proportion of phase (if extension/extension planned) | / | | | | | | | | Not applicable |
| | Concession period | | | | | | | | | |
| | Duration | | | ✓ | ✓ | | | | | 22-25 years at least, can be changes |
| | Fixed period | | | | | ✓ | ✓ | | | No, other means to 'punish on delay' |
| | Ambiguous construction schedule | | | | | ✓ | ✓ | ✓ | ✓ | |
| | Termination provisions | | | | | | | | | |
| | Strictness of termination provisions | | | | ✓ | ✓ | ✓ | | | Market standard |
| | Termination provision in case of extension | | | | | ✓ | ✓ | | | Market standard |
| | Market standard termination provisions | | | | | ✓ | ✓ | | | |
| | Construction contract | | | | | | | | | |
| | Balance between contracted civil works & rolling stock | | ✓ | ✓ | ✓ | | | | | Scoping and dividing the risks upfront |
| | Amount of risk passed on | | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Risk distribution according to market situation | | | | | | | | | |
| | O&M contract | | | | | | | | | |
| | Amount of operating risked passed on | | | | | ✓ | ✓ | ✓ | ✓ | |
| | Electricity consumption risk | | | | ✓ | ✓ | ✓ | | | |
| | Balanced penalties | | | | ✓ | ✓ | ✓ | | | |
| | Nature of schedule (defined headway vs. fixed times) | | | | | | | | | |
| | Preference at intersections | | | | | ✓ | ✓ | ✓ | ✓ | |

| | | | | | | | | | | |
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| | Willingness of the former rolling stock provider to cooperate (i.a.) | / | | | | | | | | Not applicable |
| | Direct agreements | | | | | | | | | |
| | Operator willing to enter into direct agreement with PA | | | | | ✓ | ✓ | ✓ | ✓ | Operator little bit reluctant in the beginning |
| | Arbitration | | | | | | | | | |
| | Arbitration arrangements | | | ✓ | ✓ | ✓ | ✓ | | | |

### Interview summary: Brabo II; Flemish Region, Director of Finance

Are you fine with me recoding this interview?

Yes

Tell me about your background in the company?

…about your role and the company's role in the project?

Commercial engineering background, Director Finance for Belgacom for 10 years (Main responsibilities were budgeting, planning, financial part Strategic Plan, project & recurring network investments, reporting (both financial as operational). De Post for four years. Now CFO&CIO of De Lijn, responsible for the Financial and ICT function at the Flemish public transport company for the past 10 years.

As I said in the beginning, the second stage aims at identifying the main decisions in early project phases that determine the attractiveness to lenders. Early project phases refer to the exploration and planning stage being divided into four phases (Appendix A: Explanation of Project Phases):

A) What, in your opinion, are the most important decisions, determining the attractiveness of light rail PPP's in general?

One of the things is the value capturing.

B) The questionnaire shows a list of project characteristics. In which phase have the decisions, leading to those characteristics, been taken and by whom have they been taken in the project?

Can you think of any choices, made by the public authority, which could improve the attractiveness of the project to lenders without entailing any disadvantages to the public side?

It is quite attractive already. Favourable for lender, doesn't want to make it even more attractive to them. Structure is stable, and market oriented already. Fee for the participants to participate in tender

Is there anything else you'd like to tell me?

No

Can I send you a short summary to be validated?

Yes

Can I contact you if I have further questions when analysing the interviews?

Yes

## Questionnaire

| Main-criteria | Project characteristic related to criteria | Phase 1. Project Identification | | Phase 2. Appraising and preparing the project | | Phase 3. Structuring and drafting the tender documents | | Phase 4. Tender & Award | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Economic & political environment** | Political and economic environment | | | | | | | | | |
| | Level of political support in general | ✓ | ✓ | ✓ | | | | | | Needs to be backed sufficiently |
| | Stability of political environment (upcoming elections?) | | ✓ | ✓ | ✓ | | | | | Is an issue in Belgium, always an issue, needs to be considered early on. Huge PPP take a time to set up, needs to be considered in the identification and preparation phase already. Difficult if there are no written agreements when the government changes. |
| | Level of procuring authority (federal, provincial, local) | ✓ | | | | | | | | PA always the region, Flemish region, defined by the system itself. |
| | Different level involved at the same time? | | | ✓ | ✓ | ✓ | ✓ | | | Involving the city with the third contract for the civil works |
| | PA close to central government? | ✓ | | | | | | | | Yes region → fed. Gov, defined by the nature of the system in Belgium |
| | Evidence of political commitment | | | | ✓ | ✓ | ✓ | | | Government was getting the permits first to get the lenders on board, and proofed that the money is available |
| | Funding through regional taxes | ✓ | | | | | | | | Regional funding |
| | Experience of the PA with PPP | | | | | | | | | De Lijn is experienced with procuring large PPPs |
| | Guarantees from higher level of government | | | ✓ | ✓ | ✓ | | | | |
| | Public opinion | | | | | | | | | |
| | Concerns of local businesses | | ✓ | ✓ | ✓ | | | | | Taken into account early on |
| | Level of public support | | ✓ | ✓ | ✓ | | | | | Always some people against it. People always involved in very early phases |
| | Alternatives (e.g. bus) discussed with public | ✓ | | | | | | | | Second phase extension |
| **2. Legal and regulatory environment** | Procurement process | | | | | | | | | |
| | Level of standardization | | | ✓ | ✓ | | | | | Yes, standardized procedure, |
| | Openness for input from the market | | | ✓ | ✓ | ✓ | ✓ | | | Market consultation in phase 2, mainly 3 |
| | Expected time of tender | | | | ✓ | ✓ | ✓ | | | Was enough |
| | Experience of the PA with PPP | | | | | | | | | Nothing to be decided, De Lijn experienced |
| | Strictness of termination provisions | | | | | ✓ | ✓ | | | Standard |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **3. Project specificity** | Project definition | | | | | | | | |
| | Completeness of project definition (specs set and fixed) | | | | ✓ | ✓ | ✓ | | PPP always uses output specifications and therefore not a reference design. More functional needs. Design up to the private party. If you want to keep it off budget, it is not possible to make a very detailed advanced design. |
| | Completeness of reference design | | | | ✓ | ✓ | ✓ | | Usually not complete but rather basic |
| | Level of technical details in advanced design | | | | ✓ | ✓ | ✓ | ✓ | Less technical details, very basic, up to the SPV to develop |
| | Interference between phasing and enabling works | | ✓ | ✓ | | | | | No enabling works |
| | Operation included | | ✓ | ✓ | | | | | Operation not included, should be off balance sheet, therefore should be considered as operational renting. By definition |
| | Rolling stock included | | ✓ | ✓ | | | | | Extension of existing network. Trams need to work in other systems as well. No sense to include it, too costly. |
| | Extension of existing network | | | | | | | | No further extensions in the contract. Predefined project. Inflexible contract. Current consortium can bid again, otherwise new tender. |
| | Other work packaged (Tram depots etc.) | | | ✓ | ✓ | | | | You can package whatever you want but makes it even more complex. Other type of civil work and maintenance needed. (Included one Tram depot), bad experience. Tender out clusters of depots |
| | Feasibility studies | | | | | | | | |
| | Enabling works by the PA | | | ✓ | ✓ | | | | Nothing major |
| | Assessment of major risks | | | ✓ | ✓ | | | | Done by the PA |
| | Level of cooperation of utility providers | | | | | | | | Issue for the private parties to deal with |
| | Utility providers able to do the work according to project schedule | | | | | | | | Issue for private parties |
| | Relocation of services done upfront by the PA | | | ✓ | ✓ | ✓ | ✓ | | No, responsibility of the private parties, one of the reasons to go for a PPP. Not negotiable |
| | Risk of unexpected utilities borne by PA? | | | | | | | | No, private risk |
| | Noise and vibration private risk? | | | | ✓ | ✓ | ✓ | | yes |
| | Risk of archaeological findings | | | | ✓ | ✓ | ✓ | | Risk retained |
| | Capacity of technology | | | | | | | | |
| | Technical innovation | | | | | | | | Section without overhead line. Brabo II mainly basic infrastructure. Up to the contractor. They came up with new security software |
| | Unusual or complex structures | | | | | | | | Complex by itself, different parties (City, Flemish Gov, DeLijn) |
| | Shared tracks | | ✓ | | | | | | No |
| | Train control | | ✓ | | | | | | No |
| | Site acquisition | | | | | | | | |
| | Level of risk | | | | | | | | Low, no issues, PA specifically outlines the corridor and land available |

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| | responsibility of the PA | | | | | | | | | Yes, they define and buy it |
| | License permits and authorizations | | | | | | | | | |
| | Advanced design detailed enough for permits and licenses | | | | | | | ✓ | ✓ | No huge issue, usually getting the permit of times, the private parties |
| | Permitting done by whom? | | | | ✓ | ✓ | ✓ | | | Responsibility of the PA |
| | Risk of permits on public side? | | | | | | | | | Yes |
| | Usages of licensing to squeeze in extra scope | | | ✓ | ✓ | | | | | Not in this project |
| | Change in law clauses | | | | ✓ | ✓ | ✓ | | | Standard |
| | Public transportation permit (15 years?) | | | | | | | | | Not the Netherlands |
| **4. Project financial structure** | Financial structure | | | | | | | | | |
| | Rating of the PA | | | | | | | | | No decision |
| | Guarantees from higher level (state/province) | | | | | | | | | Not needed, region strong |
| | Share of public funding | | | ✓ | ✓ | | | | | |
| | Public funding from which level | | | | | | | | | Region |
| | Involvement of local banks | | | | ✓ | | | | | Local and international banks |
| | Involvement of EIB | | ✓ | ✓ | ✓ | ✓ | ✓ | | | yes |
| | Project protected against changing interest rates | | | | | ✓ | ✓ | | | Used fixed interest rates |
| | Total value of the project | | | ✓ | ✓ | ✓ | ✓ | | | |
| | % of SPV costs | | | | | | | | | |
| | Contractor credibility | | | | | | | | | |
| | Credit rating of contractors | | | | | ✓ | ✓ | | | Considered while preparing the tender |
| | Experiences of contractor | | | | | ✓ | ✓ | | | Considered while preparing the tender |
| | Guarantees from higher corporate entities | | | | | | | | | |
| | Flexibility | | | | | | | | | |
| | Level of needed flexibility known by the PA | | | | ✓ | ✓ | ✓ | | | Quite fixed and tight contract |
| | Level of flexibility communicated to the contractors early | | | | | ✓ | ✓ | | | Communicated quite early |
| **5. Third party risk allocation** | Environmental issues | | | | | | | | | |
| | Additional requirements imposed by the PA | | | ✓ | ✓ | ✓ | | | | No |
| | Advanced design detailed enough | | | | | | | | | See above |
| | Local environmental requirements | | ✓ | ✓ | | | | | | Need to comply and deliver “clean soil” to the SPV, responsibility of the PA, risk not transferred. Due to legal structure, they allow them to build on their lands, therefore they have to provide it according to the regulations |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **6. Contract arrangement** | Concession agreement | | | | | | | | | |
| | Number of contracts | | | ✓ | ✓ | ✓ | ✓ | | | Yes |
| | Rolling stock included | | | ✓ | ✓ | | | | | |
| | Payment mechanism | | | | | ✓ | ✓ | ✓ | ✓ | Structure fixed upfront but also discussed with bidder during the tender |
| | Use of standardized contracts | | | | ✓ | ✓ | ✓ | ✓ | | No, taking bits and bytes from other contracts, individual projects require individual solutions. Parts are also improved each contracted based on previous experience. |
| | Proof of compatibility with existing system | | | | ✓ | ✓ | ✓ | | | No rolling stock included; design of infrastructure is pretty straight forward. |
| | Rolling stock procurement schedule of PA (if not included) | | | ✓ | ✓ | | | | | Considered in the preparation |
| | Robustness of the contract with the rolling stock provider (not incl.) | / | | | | | | | | Not applicable |
| | Provisions for extensions | | | | | ✓ | ✓ | | | |
| | Ridership risk retained by the PA | ✓ | ✓ | | | | | | | |
| | Proportion of phase (if extension/extension planned) | ✓ | ✓ | ✓ | | | | | | Phases need to be considered upfront |
| | Concession period | | | | | | | | | |
| | Duration | | | | ✓ | ✓ | ✓ | | | 30 years |
| | Fixed period | | | | | ✓ | ✓ | | | Yes, delays in construction are leading to a shorter maintenance period |
| | Ambiguous construction schedule | | | | | | | | | |
| | Termination provisions | | | | | | | | | |
| | Strictness of termination provisions | | | | ✓ | ✓ | ✓ | | | |
| | Termination provision in case of extension | | | | | ✓ | ✓ | | | |
| | Market standard termination provisions | | | | | ✓ | ✓ | | | |
| | Construction contract | | | | | | | | | |
| | Balance between contracted civil works & rolling stock | | | | ✓ | ✓ | ✓ | | | |
| | Amount of risk passed on | | | | | ✓ | ✓ | | | |
| | Risk distribution according to market situation | | | | ✓ | ✓ | ✓ | | | |
| | O&M contract | | | | | | | | | |
| | Amount of operating risked passed on | / | | | | | | | | Not applicable, operation retained |
| | Electricity consumption risk | | | ✓ | ✓ | | | | | Public side linked to the operation |
| | Balanced penalties | | | ✓ | ✓ | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nature of schedule (defined headway vs. fixed times) | | | | | | ✓ | ✓ | ✓ | Max. number of trams on a part of the network per day, not possible to ask for fixed times 30 years upfront, will have an impact on the maintenance |
| | Preference at intersections | | | | | | | | | Na/ since operation retained on the public side, |
| | Willingness of the former rolling stock provider to cooperate (i.a.) | | | | | | | | | Not applicable/excluded |
| | Direct agreements | | | | | | | | | |
| | Operator willing to enter into direct agreement with PA | | | | | | | | | Not applicable |
| | Arbitration | | | | | | | | | |
| | Arbitration arrangements | | | | ✓ | ✓ | ✓ | | | Arbitration board, written down in the tender. |

### Interview summary: Tram de Liege; Walloon Region, Director of Finance

Are you fine with me recoding this interview?

Yes

Tell me about your background in the company?

…about your role and the company's role in the project?

CFO of the public transport company of the region since September 2017. Public transport power is shared between three regions, with the Walloon region being one of them. Before she was project manager of the Tram de Liege PPP project. Worked in all the phases. Project began with the government studying to find ways to meet the increasing demand of public transport in Liege. Technical analysis lead to using a Tram. Then she entered the project due to the idea of the government to have an off-balance sheet project. Project was managed from the financial department, rather than a technical department, cause of this issue.

As I said in the beginning, the second stage aims at identifying the main decisions in early project phases that determine the attractiveness to lenders. Early project phases refers to the exploration and planning stage being divided into four phases (Appendix A: Explanation of Project Phases):

A) What, in your opinion, are the most important decisions, determining the attractiveness of light rail PPP's in general?

Decision if the projects has enough political support. Decision if the projects receives the principal permit is really important. Permit was very important in the first tender phase. For the lenders it's very important to see a standardized approach, no surprises. Transparent and standardized risk sharing approach and contracts. Risk managed by the party most capable of dealing with it. Public party has to retain 'their' risk, for example the permitting risk. When they deviated from the standards of risk sharing, they faced a lot of questions and had to convince the lenders to participate.

B) The questionnaire shows a list of project characteristics. In which phase have the decisions, leading to those characteristics, been taken and by whom have they been taken in the project?

Can you think of any choices, made by the public authority, which could improve the attractiveness of the project to lenders without entailing any disadvantages to the public side?

Covered already

Is there anything else you'd like to tell me?

Take the benefits from using station advertisement into account. In the project the design was done and approved, but it turned out that the exposure of the space wasn't good enough, so there was no one willing to pay for it. The income generated by those advertisements was intended to go to the private sectors as an income stream, who is now facing a problem.

Can I send you a short summary to be validated?

Yes

Can I contact you if I have further questions when analysing the interviews? Sure

## Questionnaire

| Main-criteria | Project characteristic related to criteria | Phase 1. Project Identification | | Phase 2. Appraising and preparing the | | Phase 3. Structuring and drafting the tender | | Phase 4. Tender & Award | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Economic & political environment** | Political and economic environment | | | | | | | | | |
| | Level of political support in general | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Start of the project, due to choosing for one solution, being the tram. First step in phase 1. But important throughout the whole project. Since phase two also under the control of the SRWT since they had the necessary contacts and influence. |
| | Stability of political environment (upcoming elections?) | | ✓ | ✓ | ✓ | | | | | Plays a role, first decision in favour of the tram right before the election, big vague decision with a lot of promises. Asking the new government to find a solution to make it happen. Construction phase can also not be just before the election. |
| | Level of procuring authority (federal, provincial, local) | / | | | | | | | | Public transport system in Belgium is regionalized. City just has to express wishes but they do not pay or execute anything. They are only involved in the planning. But all the responsibilities stay within the Walloon regional government. |
| | Different level involved at the same time? | / | | | | | | | | |
| | PA close to central government? | / | | | | | | | | |
| | Evidence of political commitment | | | | ✓ | ✓ | ✓ | ✓ | | Public sectors realized that the risk of unexpected services was too big for the private party, they decided to do it themselves. Phase 2: decisions to shift it to private sector, phase 3/4: decision to retain it (early tender phase) |
| | Funding through regional taxes | / | | | | | | | | Typically, taxes from the region. The regions are indecent in terms of funding, but no special taxes or other means for funding the project itself. |
| | Experience of the PA with PPP | / | | | | | | | | No decision |
| | Guarantees from higher level of government | | | ✓ | | | | | | No guarantees from the national government, but from the Walloon government. Decided when consulting the financial advisors. |
| | Public opinion | | | | | | | | | |
| | Concerns of local businesses | | | ✓ | ✓ | | | | | No major issues, permit received without any objections. |
| | Level of public support | ✓ | ✓ | ✓ | | | | | | Public opinion in favour of the project, solution to transport problems in Liege. To many buses, quality not good enough. Also spent a lot of money in upfront works, so rather difficult to cancel the project completely after the first tender failed. |

| | | | | | | | | | | |
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| | Alternatives (e.g. bus) discussed with public | ✓ | | | | | | | | No discussion because early study (in 2007) with clear outcome in favour of the tram. An already operating with hybrid buses but capacity and quality not high enough. |
| **2. Legal and regulatory environment** | Procurement process | | | | | | | | | |
| | Level of standardization | | | ✓ | ✓ | ✓ | ✓ | | | Look for high level of standardization, in phase 2 when consulting with financial and legal advisors. |
| | Openness for input from the market | ✓ | ✓ | ✓ | ✓ | | | | | Phase 1 and Phase 2, they looked at other Networks in Germany and Austria. Rolling stock providers invited them. Before the tender phase since its illegal during the tender. |
| | Expected time of tender | | | | | ✓ | ✓ | | | Government wanted to get the project done for an international exposition in the first place. However, Liege wasn't selected for hosting the expo, so they were really happy and could use a more realistic schedule. But pressure from the government can be an issue |
| | Experience of the PA with PPP | / | | | | | | | | Liege was the first and biggest project in the Walloon region. No experience on this scale before. |
| | Strictness of termination provisions | | | ✓ | ✓ | | | | | Standard |
| **3. Project specificity** | Project definition | | | | | | | | | |
| | Completeness of project definition (specs set and fixed) | | ✓ | ✓ | ✓ | | | | | They were really prepared, also because they needed money from the EIB. Good quality of the design. Permit almost received by that time, high level of technical details. |
| | Completeness of reference design | | ✓ | ✓ | | | | | | Very complete, used to use standard model where they do the design themselves, also necessary for the permit |
| | Level of technical details in advanced design | | ✓ | ✓ | ✓ | | | | | High level, not too much room for innovation |
| | Interference between phasing and enabling works | | | | | | | | | |
| | Operation included | ✓ | | | | | | | ✓ | Excluded, earlier than phase one. No strikes by private drivers. However, new government for 10 years so they can imagine changing in the construction. |
| | Rolling stock included | ✓ | ✓ | ✓ | ✓ | | | | | Included, good thing for the Region |
| | Extension of existing network | / | | | | | | | | Not applicable |
| | Other work packaged (Tram depots etc.) | ✓ | ✓ | ✓ | | | | | | All facilities needed for the new network are included, public spaces around the line are included as well. Not too much because of the Eurostat and tax authority regulations. Decided in early phases |
| | Feasibility studies | | | | | | | | | |
| | Enabling works by the PA | ✓ | ✓ | | | | | | | 33 million upfront work packages |
| | Assessment of major risks | | | ✓ | ✓ | | | | | Risk matrix in preparation phase during whole lifecycle. Identification and allocation |
| | Level of cooperation of utility providers | | ✓ | ✓ | ✓ | | | | | Utility providers live in their own world. Hard to cooperate with them, that's why they also did the extensive upfront work package. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Cooperation risk retained by the PA because they had more power (extra chapter), difficult for private party to deal with |
| | Utility providers able to do the work according to project schedule | | | | | | | | | |
| | Relocation of services done upfront by the PA | | | ✓ | ✓ | ✓ | | | | High risk, PA retained big part of the risk of the relocation, used a lot of money for upfront works |
| | Risk of unexpected utilities borne by PA? | | | | | | | | | |
| | Noise and vibration private risk? | | | | | | | ✓ | ✓ | |
| | Risk of archaeological findings | | | ✓ | ✓ | | | | | Clearly identified, agreements with archaeological department of the Walloon region. |
| | Capacity of technology | | | | | | | | | |
| | Technical innovation | | | ✓ | ✓ | | | | | Not too much room since a lot of details prescribed by the very advanced pre-design. |
| | Unusual or complex structures | | ✓ | ✓ | ✓ | | | | | No unusual or complex structure |
| | Shared tracks | / | | | | | | | | Not applicable |
| | Train control | / | | | | | | | | Not applicable |
| | Site acquisition | | | | | | | | | |
| | level of risk | | | ✓ | ✓ | | | | | Risk of the PA, studied in phase 2, when the project got greenlight from the government, the PA started to buy and expropriate all the way until phase 4. |
| | responsibility of the PA | ✓ | | | | | | | | Yes |
| | License, permits and authorizations | | | | | | | | | |
| | Advanced design detailed enough for permits and licenses | | ✓ | ✓ | ✓ | | | | | Very detailed upfront to obtain the main permit |
| | Permitting done by whom? | | | ✓ | ✓ | | | | ✓ | Main permit on PA side, if private parties want to make changes, they are responsible. |
| | Risk of permits on public side? | | | ✓ | ✓ | | | | | |
| | Usages of licensing to squeeze in extra scope | | | | | ✓ | ✓ | | | |
| | Change in law clauses | | | | | ✓ | ✓ | | | |
| | Public transportation permit (15 years?) | | | | | | | | | Not applicable |
| **4. Project financial structure** | Financial structure | | | | | | | | | |
| | Rating of the PA | / | | | | | | | | |
| | Guarantees from higher level (state/province) | | | | | | | | | |
| | Share of public funding | ✓ | ✓ | | | | | | | Eurostat does not like public financing, so if off-balance, it needs to be completely privately financed. EIB 50% |
| | Public funding from which level | / | | | | | | | | Regional level prescribed by the Belgium system |
| | Involvement of local banks | / | | | | | | | | No decision, up the private parties |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Involvement of EIB | ✓ | ✓ | ✓ | ✓ | | | | | EIB involved (50% of financing), idea in phase 1, get in touch in phase 2, discussion in phase 3 |
| | Project protected against changing interest rates | ✓ | ✓ | | | | | | | Idea of PPP in 2008 just after the crisis, so they build the contract to be crisis resilient. |
| | Total value of the project | ✓ | ✓ | | | | | | | |
| | % of SPV costs | | | | | | | | | |
| | Contractor credibility | | | | | | | | | |
| | Credit rating of contractors | | | | | ✓ | ✓ | | | Award criteria |
| | Experiences of contractor | | | | | ✓ | ✓ | | | Award criteria |
| | Guarantees from higher corporate entities | | | | | | | | | |
| | Flexibility | | | | | | | | | |
| | Level of needed flexibility known by the PA | | | | ✓ | ✓ | ✓ | | | Thought about in phase 2, studied in phase 3. Changed because of Eurostat. Possibility to extend the network (new contractors new rolling stock providers?) was reduced a little bit due to the Eurostat regulations. Possibility is still in the contract but a little bit 'hidden' |
| | Level of flexibility communicated to the contractors early | | | | | | ✓ | ✓ | | |
| **5. Third party risk allocation** | Environmental issues | | | | | | | | | |
| | Additional requirements imposed by the PA | | ✓ | | | | | | | Tram good by itself, no additional requirements. No point of interest |
| | Advanced design detailed enough | | ✓ | | | | | | | |
| | Local environmental requirements | | | | | | | | | |
| **6. Contract arrangement** | Concession agreement | | | | | | | | | |
| | Number of contracts | | | ✓ | ✓ | | | | | Agreed to have one DBFM contract, they thought about having two contracts because of the Eurostat requirements but it seemed to get to complicated. |
| | Rolling stock included | | | | | | | | | See above |
| | Payment mechanism | | | | | ✓ | ✓ | | | When writing the contract |
| | Use of standardized contracts | | | ✓ | ✓ | ✓ | ✓ | ✓ | | Standardized with old Belgium PPP project, some chapters like the PF2 (termination), Eurostat guide PPP 9stayed really close to the guide). Example of Tramway in guide is in guideline. Quite late, not beneficial for the lenders and private partners |
| | Proof of compatibility with existing system | / | | | | | | | | Not applicable, new system |
| | Rolling stock procurement schedule of PA (if not included) | / | | | | | | | | Not applicable, rolling stock included in the concession |
| | Robustness of the contract with the rolling stock provider (not incl.) | / | | | | | | | | Not applicable, rolling stock included in the concession |
| | Provisions for extensions | ✓ | ✓ | ✓ | ✓ | | | | | Short network kept in mind from beginning since they had plans for a bigger network already. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | - Add net trams (new contract)<br>- Extend the network (new contract)<br>Contract forces the private parties to maintenance (even new ones, agreed on fair price already) |
| | Ridership risk retained by the PA | | | | | | | | | |
| | Proportion of phase (if extension/extension planned) | | ✓ | ✓ | | | | | | |
| | **Concession period** | | | | | | | | | |
| | Duration | | | ✓ | ✓ | ✓ | ✓ | | | |
| | Fixed period | | | | | ✓ | ✓ | | | They changed their mind in the second tender. Fixed period of 31 years. Years of operation 31- construction. Decisions taken in phase 3 |
| | Ambiguous construction schedule | | | | ✓ | ✓ | ✓ | ✓ | | |
| | **Termination provisions** | | | | | | | | | |
| | Strictness of termination provisions | | | | | ✓ | ✓ | | | Not really complete, old cases have to be taken into account, there should no interpretation possible. Penalties must reflect the responsibility. |
| | Termination provision in case of extension | | | | | ✓ | ✓ | | | |
| | Market standard termination provisions | | | | | ✓ | ✓ | | | Causes are clear. Changed from private sector first (way of calculating the penalties), charged because of Eurostat later. |
| | **Construction contract** | | | | | | | | | |
| | Balance between contracted civil works & rolling stock | | | ✓ | ✓ | ✓ | ✓ | | | |
| | Amount of risk passed on | | | | | ✓ | ✓ | | | |
| | Risk distribution according to market situation | | | | ✓ | ✓ | ✓ | | | |
| | **O&M contract** | | | | | | | | | |
| | Amount of operating risked passed on | | | | | | | | | |
| | Electricity consumption risk | | | ✓ | ✓ | | | | | Kept by the PA, in the operation (trams + system). Depots and buildings for private partners. Solar panels for private sector (intended for PA) |
| | Balanced penalties | | | | | ✓ | ✓ | | | |
| | Nature of schedule (defined headway vs. fixed times) | | | | ✓ | ✓ | ✓ | | | |
| | Preference at intersections | / | | | | | | | | Operation excluded |
| | Willingness of the former rolling stock provider to cooperate (i.a.) | / | | | | | | | | Not applicable |
| | **Direct agreement** | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Operator willing to enter into direct agreement with PA | / | | | | | | | Not applicable |
| | Arbitration | | | | | | | | |
| | Arbitration arrangements | | | | | ✓ | ✓ | | Arbitration provisos with third party. |

## Interview summary: NET Phase 2; Nottingham City Councils, Tender manager

Are you fine with me recoding this interview?

Sure

Tell me about your background in the company?

…about your role and the company's role in the project?

(see first summary)

As I said in the beginning, the second stage aims at identifying the main decisions in early project phases that determine the attractiveness to lenders. Early project phases refer to the exploration and planning stage being divided into four phases (Appendix A: Explanation of Project Phases):

A) What, in your opinion, are the most important decisions, determining the attractiveness of light rail PPP's in general?

Think really well about risk identification and how far the PA wants to deviate from the norm. Advanced design, even if against nature of PFI to tackled most challenging areas upfront and to gain the necessary license and permits already. Upfront risk identification.

B) The questionnaire shows a list of project characteristics. In which phase have the decisions, leading to those characteristics, been taken and by whom have they been taken in the project?

Can you think of any choices, made by the public authority, which could improve the attractiveness of the project to lenders without entailing any disadvantages to the public side?

Identifying the risks and help the SPV dealing with it. Do not change to risk proportion since the idea is to shift the risks to the private sector, however, higher costs. Nevertheless, help them dealing with those risks as good as possible. PFI incentivizes delivery for the contractor.

Is there anything else you'd like to tell me?

Good luck with the project

Can I send you a short summary to be validated?

Yes

Can I contact you if I have further questions when analysing the interviews?

Yes, email but very busy

## Questionnaire

| Main-criteria | Project characteristic related to criteria | Phase 1. Project Identification | | Phase 2. Appraising and preparing the project | | Phase 3. Structuring and drafting the tender documents | | Phase 4. Tender & Award | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Economic & political environment** | Political and economic environment | | | | | | | | | |
| | Level of political support in general | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | Stable authority, same party (supporting the system) for a quite a long time already |
| | Stability of political environment (upcoming elections?) | ✓ | ✓ | | | | | ✓ | | |
| | Level of procuring authority (federal, provincial, local) | ✓ | | | | | | | | City council, local level |
| | Different level involved at the same time? | / | | | | | | | | no |
| | PA close to central government? | / | | | | | | | | |
| | Evidence of political commitment | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | Phase 1 support, Work place parking levy, local contribution, unpopular approach which shows commitment |
| | Funding through regional taxes | ✓ | ✓ | ✓ | ✓ | ✓ | | | | No |
| | Experience of the PA with PPP | | | ✓ | ✓ | ✓ | ✓ | | | Yes, done the first phase PFI already |
| | Guarantees from higher level of government | / | | | | | | | | Not applicable |
| | Public opinion | | | | | | | | | |
| | Concerns of local businesses | | | ✓ | ✓ | | | | | Only regular objections regarding the construction |
| | Level of public support | | ✓ | ✓ | ✓ | | | | | Quite positive, only people against close to the tracks, first part of the system successful, reference design also discussed with public |
| | Alternatives (e.g. bus) discussed with public | | ✓ | ✓ | ✓ | | | | | Na/ extension of existing system |
| **2. Legal and regulatory environment** | Procurement process | | | | | | | | | |
| | Level of standardization | | | ✓ | ✓ | ✓ | ✓ | | | Quite standard, European process, transparent, open, lot of submarket testing |
| | Openness for input from the market | | | ✓ | ✓ | ✓ | | | | Yes, submarket testing |
| | Expected time of tender | | | ✓ | ✓ | ✓ | ✓ | | | |
| | Experience of the PA with PPP | | | ✓ | | | | | | Experienced using PFI |
| | Strictness of termination provisions | | | | | ✓ | ✓ | | | Nothing special, standard |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **3. Project specificity** | Project definition | | | | | | | | | |
| | Completeness of project definition (specs set and fixed) | | | | | ✓ | ✓ | | | Fairly advanced design, |
| | Completeness of reference design | | | | | ✓ | ✓ | | | Very detailed and complete |
| | Level of technical details in advanced design | | | ✓ | ✓ | | | | | See above |
| | Interference between phasing and enabling works | | | ✓ | ✓ | | | | | |
| | Operation included | | | ✓ | | | | | | Yes |
| | Rolling stock included | | | ✓ | | | | | | Yes |
| | Extension of existing network | - | | ✓ | | ✓ | | | | Yes, cancelling the existing operation and maintenance concession of phase 1 |
| | Other work packaged (Tram depots etc.) | | | ✓ | ✓ | | | | | |
| | Feasibility studies | | | | | | | | | |
| | Enabling works by the PA | | | ✓ | ✓ | | | | | Advanced work package which removes some utilities first, not enough |
| | Assessment of major risks | | | ✓ | ✓ | | | | | Partly done with the reference design next to normal risk assessments |
| | Level of cooperation of utility providers | | | ✓ | ✓ | ✓ | ✓ | | | PA does not have control over utility diversion, they need a legal order. Utility companies reluctant since they are unsure if the project goes ahead or not. |
| | Utility providers able to do the work according to project schedule | | | | | | | ✓ | ✓ | Thy just work when the project is confirmed |
| | Relocation of services done upfront by the PA | | | ✓ | ✓ | | | | | Yes, also planned to do more for phase 3, not the means to make the utility design as detailed as other areas |
| | Risk of unexpected utilities borne by PA? | | | ✓ | ✓ | ✓ | ✓ | | | |
| | Noise and vibration private risk? | | | ✓ | ✓ | | | | | |
| | Risk of archaeological findings | | | ✓ | ✓ | | | | | |
| | Capacity of technology | | | | | | | | | |
| | Technical innovation | | | ✓ | ✓ | | | | | |
| | Unusual or complex structures | | | ✓ | ✓ | | | | | |
| | Shared tracks | / | | | | | | | | Not applicable |
| | Train control | / | | | | | | | | Not applicable |
| | Site acquisition | | | | | | | | | |
| | Level of risk | | | ✓ | ✓ | ✓ | ✓ | | | Risk of the public authority, protection for the SPV if PA failed to deliver land matching their specifications |
| | responsibility of the PA | | | | ✓ | ✓ | | | | Yes, was in the responsibility of the PA (40-50million pounds) |
| | License, permits and authorizations | | | | | | | | | |
| | Advanced design detailed enough for permits and licenses | | | ✓ | ✓ | ✓ | | | | Doing a detailed upfront design to identify areas which need permissions. Minimizing surprises to lenders |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Permitting done by whom? | | | | | ✓ | ✓ | | | Public party |
| | Risk of permits on public side? | | | | | ✓ | ✓ | | | No, but public did the advanced design to mitigate the risk for the private parties |
| | Usages of licensing to squeeze in extra scope | / | | | | | | | | Not applicable |
| | Change in law clauses | | | | | ✓ | ✓ | | | |
| | Public transportation permit (15 years?) | / | | | | | | | | Not applicable |
| **4. Project financial structure** | Financial structure | | | | | | | | | |
| | Rating of the PA | | | | | ✓ | ✓ | | | Not a choice |
| | Guarantees from higher level (state/province) | ✓ | | | | | | | | State funding already |
| | Share of public funding | | | | | ✓ | ✓ | | | 2/3 gov, 1/3 local |
| | Public funding from which level | | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | Involvement of local banks | | | | | ✓ | ✓ | | | |
| | Involvement of EIB | | | | | ✓ | ✓ | | | |
| | Project protected against changing interest rates | | | | | ✓ | ✓ | | | |
| | Total value of the project | | | | | ✓ | ✓ | | | |
| | % of SPV costs | | | | | ✓ | ✓ | | | |
| | Contractor credibility | | | | | | | | | |
| | Credit rating of contractors | | | | | ✓ | ✓ | ✓ | | Vinci quite strong, |
| | Experiences of contractor | | | | | ✓ | ✓ | ✓ | | high |
| | Guarantees from higher corporate entities | | | | | | | ✓ | | Not involved in that |
| | Flexibility | | | | | | | | | |
| | Level of needed flexibility known by the PA | | | | | | | | | |
| | Level of flexibility communicated to the contractors early | | | | ✓ | ✓ | ✓ | ✓ | | Yes |
| **5. Third party risk allocation** | Environmental issues | | | | | | | | | |
| | Additional requirements imposed by the PA | | | | | ✓ | | | | |
| | Advanced design detailed enough | | | ✓ | ✓ | | | | | Yes, advanced design detailed enough to minimize risk of permits etc. |
| | Local environmental requirements | | | ✓ | ✓ | | | | | Dealt with the advanced design |
| **6. Contract arrangement** | Concession agreement | | | | | | | | | |
| | Number of contracts | | | | | ✓ | ✓ | | | One, previous phase PFI already |
| | Rolling stock included | | | | | ✓ | ✓ | | | Yes, DBFMO, SPV needs full control of the project |
| | Payment mechanism | | | | ✓ | ✓ | ✓ | | | 25 PFIs, 80% of the value around punctuality and liability. More in their control. Still some risks, on highway sections for example, but in the |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | advanced design the risks are mitigated by doing as much segregated section as possible. |
| | Use of standardized contracts | | | | | ✓ | ✓ | | | PFI rather standardized |
| | Proof of compatibility with existing system | | | | | ✓ | ✓ | ✓ | ✓ | Mixed fleet, SPV had to demonstrate that they are compatible with the existing system (Bombardier, Alstom) |
| | Rolling stock procurement schedule of PA (if not included) | | | | | | | | | NA |
| | Robustness of the contract with the rolling stock provider (not incl.) | | | | | | | | | NA |
| | Provisions for extensions | | ✓ | ✓ | ✓ | ✓ | | | | Was though of quite early since they had the problem with the extension of phase 1 to phase 2 already, new contract has provision not to terminate the old concession, rather the current concessionaire is procuring the new extension within the SPV |
| | Ridership risk retained by the PA | | | | | | | | | |
| | Proportion of phase (if extension/extension planned) | | | | ✓ | ✓ | ✓ | ✓ | | 1 → 2 was a huge increase, 3 might be smaller in proportion to phase 2 |
| | Concession permit | | | | | | | | | |
| | Duration | | | ✓ | ✓ | | | | | 22 years |
| | Fixed period | | | | | | | | | |
| | Ambiguous construction schedule | | | ✓ | ✓ | ✓ | ✓ | | | Yes, especially regarding the unexpected utilities |
| | Termination provisions | | | | | | | | | |
| | Strictness of termination provisions | | | | | ✓ | | | | |
| | Termination provision in case of extension | | | | | | | | | See above |
| | Market standard termination provisions | | | | | ✓ | ✓ | | | Yes |
| | Construction contract | | | | | | | | | |
| | Balance between contracted civil works & rolling stock | | | | | ✓ | ✓ | | | |
| | Amount of risk passed on | | | ✓ | ✓ | | | | | High, not a lot of contractors, only two bidders |
| | Risk distribution according to market situation | | ✓ | ✓ | ✓ | | | | | Only two bidders, lots of risks shifted to the private parties, higher cots but PFI chosen for this reason in the first place. |
| | O&M contract | | | | | | | | | |
| | Amount of operating risked passed on | | | | ✓ | ✓ | ✓ | | | |
| | Electricity consumption risk | | | | | ✓ | | | | |
| | Balanced penalties | | | | | | | | | |
| | Nature of schedule (defined headway vs. fixed times) | | | ✓ | ✓ | | | | | |
| | Preference at intersections | | | ✓ | ✓ | | | | | Highways interface document |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Willingness of the former rolling stock provider to cooperate (i.a.) | | ✓ | ✓ | ✓ | | | | Previous concession cancelled |
| | Direct agreements | | | | | | | | |
| | Operator willing to enter into direct agreement with PA | | | | | ✓ | ✓ | | |
| | Arbitration | | | | | | | | |
| | Arbitration arrangements | | | | | ✓ | ✓ | | |

### Interview summary: ION Rapit Transit Stage 1; City Council's Tender manager

Are you fine with me recoding this interview?

Yes

Tell me about your background in the company?

…about your role and the company's role in the project?

Went to University of Waterloo, Civil Engineering, graduated in 1994, 25 years of experience in various transportation, transit planning for the Region of Waterloo. Four years for the ION Stage II project. Expertise in PIW (Public Infrastructure works) which come along with the light rail project (sewers and watermains needed to be upgraded), watermains deep (3m underground), utilities relocation.

As I said in the beginning, the second stage aims at identifying the main decisions in early project phases that determine the attractiveness to lenders. Early project phases refers to the exploration and planning stage being divided into four phases (Appendix A: Explanation of Project Phases):

A) What, in your opinion, are the most important decisions, determining the attractiveness of light rail PPP's in general?

Risk is the biggest factor, unexpected utilities, archaeological findings. That type of risks needs to be mitigated for the lenders.

And dispute resolution measures.

B) The questionnaire shows a list of project characteristics. In which phase have the decisions, leading to those characteristics, been taken and by whom have they been taken in the project?

Can you think of any choices, made by the public authority, which could improve the attractiveness of the project to lenders without entailing any disadvantages to the public side?

Do more design upfront before tender, remove surprises, identifying risk, designers of the PA hired by the SPV. When doing a DBFM you lose some flexibility regarding changes. More design upfront in the project agreement since things which are not clear (like "a standard transit driver facility") will become subject of dispute later on. More design upfront to also ensure that the PA gets what they want and the learns have less surprises.

Is there anything else you'd like to tell me?

If you are not making compromises, you are not building light rail

Can I send you a short summary to be validated? Can I contact you if I have further questions when analysing the interviews?

Yes

## Questionnaire

| Main-criteria | Project characteristic related to criteria | **Phase 1.** Project Identification | | **Phase 2.** Appraising and preparing | | **Phase 3.** Structuring and drafting the tender | | **Phase 4.** Tender & Award | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Economic & political environment** | Political and economic environment | | | | | | | | | |
| | Level of political support in general | ✓ | ✓ | ✓ | | | | | | Had to get project approved twice, had an election in the middle of the project, politics played a huge role, probably biggest project for the region, risky for the politicians. Integration of land use and transportation strategy in 2001. Usually the land developers used to tell about their plans and the transport planners planed accordingly. This time the other way around, they planned the light rail and thought about possible new developments and new jobs new riders. Revers to a normal process. More transit focused development. |
| | Stability of political environment (upcoming elections?) | ✓ | ✓ | | | | | | | Election during the project, project had to be confirmed again. Two election, however not a lot of change. Politics stayed steady. |
| | Level of procuring authority (federal, provincial, local) | ✓ | ✓ | | | | | | | Four levels: 1. The cities (Waterloo, Kitchener, Ontario and Townships) they look after water and gas distribution, local roads, parks and recreation 2. Region of Waterloo: Transit was taken over by the region in 2001, key measure to create the LRT (before they had two different Transit authorities), Wastewater, Water, Major roads, Airport, 3. Province: Ontario, 4. Federal level: Government of Canada. Funded by the Province and the Federal Government, and through local taxes. Department on provincial level (Infrastructure Ontario) were contributing a lot the project agreement. |
| | Different level involved at the same time? | ✓ | ✓ | | | | | | | |
| | PA close to central government? | ✓ | ✓ | | | | | | | No, but experience from Provincial level used |
| | Evidence of political commitment | | ✓ | ✓ | ✓ | ✓ | ✓ | | | Paid money for proposals, a lot of funding through taxes and from federal and provincial level. Political stability even though a lot of objection in the beginning. Evidence in integrating the transit planning and development planning to create the LRT. |
| | Funding through regional taxes | ✓ | ✓ | ✓ | ✓ | | | | | Yes |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Experience of the PA with PPP | | ✓ | ✓ | ✓ | | | | | Infrastructure Ontario (provincial level) experienced with PPPs and this experience used helping the Region of Ontario. Hired external advisors, working in the offices of the Region. |
| | Guarantees from higher level of government | ✓ | ✓ | | | | | | | Funding from highest level |
| | Public opinion | | | | | | | | | |
| | Concerns of local businesses | | | | | | | | | |
| | Level of public support | | ✓ | ✓ | ✓ | | | | | Half wanted it, half didn't, car culture in Ontario, but also a lot of Tech companies and people who favoured a more innovative and sustainable solution (light rail) |
| | Alternatives (e.g. bus) discussed with public | ✓ | ✓ | ✓ | | | | | | About a year of consulting to agree on the technology. Buses are cheaper, Surveys about capacity revealed that a bus line would only be sufficient for about 10 years. LRT gives capacity for long-term. All the stations are designed for two vehicles. |
| **2. Legal and regulatory environment** | Procurement process | | | | | | | | | |
| | Level of standardization | | ✓ | ✓ | ✓ | ✓ | ✓ | | | No standard DBFM contract. Other cities have troubles as well. Taking bits and pieces from other contracts. Infrastructure Ontario and engineering consultancies contributed to the contract, which had done a lot of PPPs already. Nothing for Light rail Transit. Sometimes the contract wasn't clear enough and sometimes to prescriptive. Room for future improvement. |
| | Openness for input from the market | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Expected time of tender | | | | | | | | | |
| | Experience of the PA with PPP | | ✓ | ✓ | ✓ | | | | | Infrastructure Ontario (provincial level) experienced with PPPs and this experience used helping the Region of Ontario. Hired external advisors, working in the offices of the Region. |
| | Strictness of termination provisions | | | | | ✓ | ✓ | | | |
| **3. Project specificity** | Project definition | | | | | | | | | |
| | Completeness of project definition (specs set and fixed) | | | ✓ | ✓ | ✓ | ✓ | | | More towards DB in the beginning but choose for DBFM because they hoped for more innovative solution. Proposals only fed back what they give them. Leave a lot of freedom to the private parties, but this also led to problems (going back to the same property owner three times because they needed property, didn't had the money). Made compromises, |
| | Completeness of reference design | | | ✓ | ✓ | ✓ | | | | See above |
| | Level of technical details in advanced design | | | | ✓ | ✓ | | | | |
| | Interference between phasing and enabling works | | | ✓ | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Operation included | | | ✓ | ✓ | | | | | Operation privatized with Keolis, however, not included in the PPP but they finance the project. Ontario successfully privatized their garbage pick-up and wastewater, best option to control their costs (because governments struggle to make money). |
| | Rolling stock included | | | ✓ | ✓ | | | | | TTC made a huge order with Bombardier, gone through procurement already. So, they joined the order and got a great deal with a great price, whereby the Ontario system is much smaller and only a few vehicles (14). Looking back, it might make sense to include it in the PPP. The SPV was supposed to equip the trains with special equipment and they didn't have the skill to do it. Lot of finger pointing when things go wrong. |
| | Extension of existing network | | | | | | | | | |
| | Other work packaged (Tram depots etc.) | | | ✓ | ✓ | | | | | Everything packaged, driver facilities, stations, public infrastructure, replacement of sewers, new roads, signalling. Some changer orders added later on when they realized that those parts where conflicting with the LRT |
| | Feasibility studies | | | | | | | | | |
| | Enabling works by the PA | | | ✓ | ✓ | | | | | Sub surface utility study done by the PA upfront, undisclosed utilities was a big issue. Huge delay claims against the Region due to the utilities. |
| | Assessment of major risks | | | | ✓ | ✓ | ✓ | ✓ | | Done by the PA but also part of the paid proposal but the private parties. |
| | Level of cooperation of utility providers | | | ✓ | ✓ | | | | | Agreements with providers, they have to move within a certain timeframe after the notice. Different ones, working in a different way. |
| | Utility providers able to do the work according to project schedule | | | | ✓ | ✓ | ✓ | | | |
| | Relocation of services done upfront by the PA | | | | ✓ | | | | | Partly |
| | Risk of unexpected utilities borne by PA? | | | ✓ | ✓ | ✓ | ✓ | | | Yes, however, other PPP model using the same contract changed this but delayed their tender process because they had a pushback from the market regarding this new risk distribution (one-year delay) |
| | Noise and vibration private risk? | | | | | | | | | |
| | Risk of archaeological findings | | | | ✓ | ✓ | ✓ | | | |
| | Capacity of technology | | | | | | | | | |
| | Technical innovation | | | ✓ | ✓ | ✓ | ✓ | | | Gave room, but didn't demand anything, also didn't get a lot of innovative designs back from the private parties. |
| | Unusual or complex structures | | | | ✓ | ✓ | | | | |
| | Shared tracks | | | ✓ | ✓ | | | | | |
| | Train control | | | ✓ | ✓ | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Site acquisition | | | | | | | | |
| | level of risk | | | | | | ✓ | ✓ | ✓ | High, because private parties slow with the design, changes, identified the need for property quite late |
| | responsibility of the PA | | | | ✓ | ✓ | ✓ | | | Yes, PA responsible to acquire land for private parties if they communicate the need for doing so. Private responsibility to identify it in time. Expropriation can take up to two years. Give notice 2,3 times, then to council and if the person doesn't agree there will be a hearing for necessity. Takes time. |
| | License, permits and authorizations | | | | | | | | |
| | Advanced design detailed enough for permits and licenses | | | ✓ | ✓ | ✓ | ✓ | | | Doesn't matter since it was up to the consortium to get the main permits |
| | Permitting done by whom? | | | | ✓ | ✓ | ✓ | | | By private parties |
| | Risk of permits on public side? | | | | ✓ | ✓ | ✓ | | | No |
| | Usages of licensing to squeeze in extra scope | | | | | ✓ | ✓ | | | |
| | Change in law clauses | | | | | | ✓ | | | |
| | Public transportation permit (15 years?) | / | | | | | | | | Not applicable, only in the Netherlands |
| **4. Project financial structure** | Financial structure | | | | | | | | |
| | Rating of the PA | ✓ | | | | | | | | High credibility |
| | Guarantees from higher level (state/province) | ✓ | | | | | | | | Funding from fed. Level, no need for guarantees |
| | Share of public funding | | | | | | | | | |
| | Public funding from which level | ✓ | ✓ | ✓ | ✓ | | | | | Funded by the Province and the Federal Government, and through local taxes |
| | Involvement of local banks | | | | | | | | | Yes, banks from Toronto involved |
| | Involvement of EIB | / | | | | | | | | Not applicable |
| | Project protected against changing interest rates | | | | | ✓ | ✓ | | | |
| | Total value of the project | | ✓ | ✓ | ✓ | ✓ | ✓ | | | $818m |
| | % of SPV costs | | | | | | | | | |
| | Contractor credibility | | | | | | | | | |
| | Credit rating of contractors | | | | | ✓ | ✓ | | | |
| | Experiences of contractor | | | | | ✓ | ✓ | | | |
| | Guarantees from higher corporate entities | | | | | | | | | |
| | Flexibility | | | | | | | | | |
| | Level of needed flexibility known by the PA | ✓ | ✓ | ✓ | | | | | | Council approved the idea to have an LRT in 2009 through the whole region in two stages, wish for extension was clear and considered upfront. Stage 2 planning already started, however, not enough funding so far and no positive business-case developed yet. But rail |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | transit as a whole is approved. If stage two gets approved, they can open up the contract and the current SPV can either bid for the second stage or there will be some else awarded with the new contract. If this happens, the old SPV will still remain in charge for maintaining the phase 1 network for the rest of the concession period (30 years) |
| | Level of flexibility communicated to the contractors early | | | | | ✓ | ✓ | ✓ | ✓ | |
| **5. Third party risk allocation** | Environmental issues | | | | | | | | | |
| | Additional requirements imposed by the PA | | | ✓ | ✓ | | | | | No |
| | Advanced design detailed enough | | | ✓ | ✓ | | | | | |
| | Local environmental requirements | | ✓ | ✓ | ✓ | | | | | |
| **6. Contract arrangement** | Concession agreement | | | | | | | | | |
| | Number of contracts | | | ✓ | ✓ | | | | | Only one contract |
| | Rolling stock included | | | | ✓ | ✓ | | | | No |
| | Payment mechanism | | | | | ✓ | ✓ | ✓ | ✓ | Hasn't kicked in yet, cover cost while waiting for the trains, but if the operation starts, they have to pay according to hours and vehicle km and other variables. Payed every month, getting reports according to KPIs. |
| | Use of standardized contracts | | | | ✓ | ✓ | ✓ | | | No |
| | Proof of compatibility with existing system | | | | | | | | | New system |
| | Rolling stock procurement schedule of PA (if not included) | | | | | | | | | Rolling stock not included |
| | Robustness of the contract with the rolling stock provider (not incl.) | | | | | ✓ | ✓ | | | Wasn't taken into account well enough, causing troubles for the PA now |
| | Provisions for extensions | | ✓ | ✓ | ✓ | ✓ | | | | Considered early on and put in the contract |
| | Ridership risk retained by the PA | | ✓ | ✓ | | | | | | No, privatized to Keolis |
| | Proportion of phase (if extension/extension planned) | ✓ | ✓ | | | | | | | Taken into account by policy already |
| | Concession period | | | | | | | | | |
| | Duration | | | | | ✓ | ✓ | ✓ | | 30 years from substantial completion, not yet happened |
| | Fixed period | | | | | | ✓ | ✓ | | Yes, 30 years starting with |
| | Ambiguous construction schedule | | | | | | | | | |
| | Termination provisions | | | | | | | | | |
| | Strictness of termination provisions | | | | | ✓ | ✓ | ✓ | ✓ | KPIs also connected to the termination provisions |
| | Termination provision in case of extension | | ✓ | | | | ✓ | | | Mentioned above |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Market standard termination provisions | | | | | ✓ | ✓ | | | yes |
| | Construction contract | | | | | | | | | |
| | Balance between contracted civil works & rolling stock | / | | | | | | | | Not applicable, no rolling stock |
| | Amount of risk passed on | | | | | ✓ | ✓ | ✓ | ✓ | |
| | Risk distribution according to market situation | | | | | ✓ | ✓ | | | |
| | O&M contract | | | | | | | | | |
| | Amount of operating risked passed on | | | | | ✓ | ✓ | | | |
| | Electricity consumption risk | | | | | ✓ | | | | Retained by the PA, huge risk, not easy to plan for but PA owns it. |
| | Balanced penalties | | | | | ✓ | ✓ | ✓ | ✓ | Yes, Connected to the KPIs |
| | Nature of schedule (defined headway vs. fixed times) | | | | ✓ | ✓ | ✓ | ✓ | | Based schedule about every XX minutes. |
| | Preference at intersections | | | | | | | | | |
| | Willingness of the former rolling stock provider to cooperate (i.a.) | | | | | | | | | Not applicable |
| | Direct agreement | | | | | | | | | |
| | Operator willing to enter into direct agreement with PA | | | ✓ | ✓ | | | | | Yes, private operator outside the PPP |
| | Arbitration | | | | | | | | | |
| | Arbitration arrangements | | | | | ✓ | ✓ | ✓ | | Whole chapter in the contract, independent certifier (third party), costs split. Disputes go to her and she makes a determination who's risk. |

# Appendix V: Relation between recommendations and lenders‘ criteria

## Table 17: Relation between recommendations and lenders‘ criteria

| Recommendations in decision area | Related lenders’ criteria | Relationship |
|---|---|---|
| Phase 1: Project identification | | |
| Political | 1. Political environment | Aligning project decisions with the election cycle, minimizing political influence and the consideration of changes in law from an early stage lead to a more favourable political environment for lenders. |
| | 2. Public opinion | With the recommendations ensuring the political support, the public is also more likely to support it compared to a very controversial project. |
| Economic & financial | 1. Political environment | If the contract form demonstrates added value, the political support is more likely to increase. |
| | 2. Public opinion | Considering new level of funding, like local taxes, can influence the public opinion on the project. |
| | 11. Financial structure | Planning to retain the traffic volume risk, as well as considering the share of public financing and the level of public funding, has an influence on the financial structure of the project. |
| Technical | 1. Political environment | Ensuring that the project is the most suitable solution for current & future needs increase the likelihood of a favourable political opinion. |
| | 2. Public opinion | Ensuring that the project is the most suitable solution for current & future needs increase the likelihood of a favourable public opinion. |
| | 5. Project definition | Scoping the project with regards to the costs and considering an implementation in different project phases affect the project definition. |
| Social | 1. Political environment | By identifying the main groups of stakeholders, their interest and their impact, as well as with discussing viable alternatives, the likelihood of political support is expected to increase. |
| | 2. Public opinion | By identifying the main groups of stakeholders, their interest and their impact, with discussing viable alternatives, and with public consultations, the likelihood of public support is expected to increase. |
| | 11. Financial structure | Discussing viable alternatives early on can affect the financial structure of the project. |
| | 15. Concession agreement | The chosen alternative influences the most suitable concession agreement. |
| Phase 2: Appraising and preparing the project-contract | | |
| Political | 1. Political environment | All the recommendations are expected to have a positive influence on the political environment of the project. |
| | 2. Public opinion | Increased political support, and the appointment of a project champion, is expected to also increase the level of public support for the project. |
| Economic & financial | 11. Financial structure | Most of the recommendations, provided in this decision areas, clearly affect the financial structure of the project. |
| | 15. Concession agreement | Penalties and the payment mechanism are ultimately agreed upon in the concession agreement. |
| | 17. Support agreement/ guarantee | Ensuring guarantees from regional or federal level if funding comes from local level |
| Technical | 5. Project definition | The considerations about the rolling stock, the operation, the balance of contracted works, complex |

| Recommendations in decision area | Related lenders' criteria | Relationship |
|---|---|---|
| | | structures etc. are clearly affecting the project definition. |
| | 6. Feasibility studies | Dealing with the technical risks (especially noise and vibration) as early as possible helps to mitigate or avoid them instead of simply shifting them to the private parties means also conducting the necessary feasibility studies. Also, the recommendation to assess chokepoints is clearly related to the project characteristic. Further, the recommendation regarding the utilities also make feasibility studies indispensable. |
| | 8. Site acquisition and access | Reducing the risks of delays by starting the land acquisition process on time but consider room for flexibility to give the private parties the freedom to develop more suitable solution. |
| | 17. Support agreement/ guarantee | Ensuring the points mentioned above is expected to help to agree upon the support agreements. |
| Social | 1. Political environment | Considering the implications on local businesses, who are expected to have a high political influence, can lead to a more favourable political environment. |
| | 2. Public opinion | Including the public into discussions about different options and alternatives is expected to increase the public support of the project and therefore influence the public opinion. |
| Legal | 3. Procurement process | Sticking to standard procurement procedures (competitive dialogue) and not reinventing the wheel, as well as, adding complexity to the contractual structure (additional contracts) only for a very good reason affects the procurement process. |
| | 11. Financial structure | Adding complexity to the contractual structure (additional contracts) only for a very good reason affects the financial structure. |
| | 16. Concession period | Matching the concession duration with the duration of possible financing schemes to increase the attractiveness to lenders affects the concession period. |
| Environmental | 9. License, permits, and authorizations | Not using additional licenses/permits/regulations to squeeze in some extra scope and considering which permits can be already granted upfront affects this project characteristic. |
| | 14. Environmental and other legal/ regulatory issues | Not using additional licenses/permits/regulations to squeeze in some extra scope and considering which permits can be already granted upfront affects this project characteristic. |
| Phase 3: Structuring and drafting the tender & contract | | |
| Political | 1. Political environment | Implementing measures to improve the political support are expected to positively influence the political environment. |
| | 2. Public opinion | Some of the measures (for example the appointment of a project champion) and the strong political support are also expected to positively influence the public opinion. |
| | 3. Procurement process | Starting into the tender phase with sufficient political support positively affects lenders' perception of the procurement procedure. |
| Economic & financial | 11. Financial structure | Most of the recommendations are about financial issues and therefore linked to the financial structure of the project. |

| Recommendations in decision area | Related lenders' criteria | Relationship |
|---|---|---|
| | 12. Financial flexibility | While deciding upon financial details, the financial of the project is affected. |
| | 15. Concession agreement | Most of the recommendations are about financial issues and set out in the concession agreement with the SPV. |
| Technical | 3. Procurement process | Making the technical requirements for the selection stage of the tender as strict as legally possible affects the procurement process and the potential bidders. |
| | 5. Project definition | Developing an advanced reference design, output specifications and not incentivizing innovation to much is affecting the project definition. |
| | 6. Feasibility studies | The advanced references design allows more detailed feasibility studies. |
| | 7. Capacity of the technology | Not excessively incentivizing the use of innovative technology is supposed to have a positive effect on the capacity of the technology since innovation is usually associated with risk. |
| | 8. Site acquisition and access | The clearer the requirements are set out and the more advanced the reference design is, the earlier the site acquisition process can start and the risk for delays can be reduced. |
| | 9. License, permits, and authorizations | The clearer the requirements are set out and the more advanced the reference design is, the earlier the licenses, permits and authorizations can be arranged. |
| | 10. EPC contractor's credibility | Making the technical requirements for the selection stage of the tender as strict as legally possible might limit the number of capable contractors. |
| | 14. Environmental and other legal/ regulatory issues | The clearer the requirements are set out and the more advanced the reference design is, the earlier the Environmental and other legal/ regulatory issues can be considered. |
| | 15. Concession agreement | Details like the conditional priority at junctions, are affecting the concession agreement. |
| Legal | 3. Procurement process | Use of standardisation and not deviating from industry norms has a positive effect on the procurement process. |
| | 4. Intervention right | Use of standardisation and not deviating from industry norms also ensures that favourable intervention rights are in place. |
| | 14. Environmental and other legal/ regulatory issues | Checking the compliance regarding the social and environmental impact of the project with the Equator Principles early to meet the needs of EPFI institutions is expected to have a positive impact on Environmental and other legal/ regulatory issues. |
| | 15. Concession agreement | Most of the recommendations regarding this cession area ultimately affect issues which are set out in the concession agreement |
| | 16. Concession period | Only defining the duration of the concession with a fixed end date, meaning deducting the duration of delays in the construction phase from the maintenance (and operation) period, for a good reason affects the nature of the concession period. |
| | 17. Support agreement/ guarantee | The recommendations affect the possibility of establishing the necessary agreements. |
| | 18. Termination provisions | Use of standardisation and not deviating from industry norms ensures that termination provisions are in place. |

| Recommendations in decision area | Related lenders' criteria | Relationship |
|---|---|---|
| | 21. Direct agreement | The recommendations affect the possibility of establishing the necessary agreements. |
| | 22. Catastrophic risk | Establishing an additional Force Majeure event, 'Disruption of Financial Markets prior to Financial Close' can provide comfort to all that, should such disruption occur, the project can be formally delayed or terminated. |
| | 23. Arbitration | Putting high emphasis on dispute avoidance and select appropriate dispute resolution methods (using an independent certifier or a dispute resolution board), positively influences the arbitration resolution. |
| Phase 4: Tender & Award | | |
| Political | 1. Political environment | Keeping on providing evidence of political support and Separating negotiation in the dialogue phase from political interests increase the stability of the political environment. |
| | 2. Public opinion | Ensuring that political supports is high is also expected to be beneficial for the public opinion |
| Economic & financial<br>Technical<br>Legal | 3. Procurement process | As explained in chapter 4.2.5, are the issues affect during the tender phase only affected due to the negotiation of some aspects. However, those aspects, and their relation to the criteria, is already covered with the previous phases. |
| | 4. Intervention right | |
| | 7. Capacity of the technology | |
| | 8. Site acquisition and access | |
| | 9. License, permits, and authorizations | |
| | 11. Financial structure | |
| | 12. Financial flexibility | |
| | 15. Concession agreement | |
| | 16. Concession period | |
| | 17. Support agreement/ guarantee | |
| | 18. Termination provisions | |
| | 21. Direct agreement | |
| | 22. Catastrophic risk | |
| | 23. Arbitration | |

Source: P. Hoss