

Hazenpad

Research into the terms of guarantee supplied by DBFM to owners of risks that result from incomplete contracts.

Inge de Haas



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¹ The A12 was built during and just after World War II. At the end of WWII, the Germans used the road to flee to Germany. Therefore, the A12 was nicknamed 'Hazenpad' [The Escape Route] (Directoraat-Generaal Rijkswaterstaat, 2000).

Abstract

One of the ways to tackle the propensity to congestion in The Netherlands is the widening of the A12. To this end, the Public-Private-Partnership-Project A12 Lunetten-Veenendaal was established. The private party Poort van Bunnik will implement the thirty-kilometer long widening of the A12 for Rijkswaterstaat (Ministry of Infrastructure and the Environment) based on a Design, Build, Finance and Maintenance (DBFM) contract. The works entail not only the widening of the A12, but also the secondary roads have to be adjusted. The government can make a profit by subcontracting the construction works as well as management to a private party. The profit arises from the efficiency of the private party.

In a bundling contract, it is important to establish ownership. The party who has the ownership also bears the risks. In Public-Private-Partnerships-contracts, the ownership, and therefore the risks, is transferred from the public to a private party. When there is a lack of clarity, the owner has the residual claimant and can decide. Such a lack of clarity can surge from incomplete contracts. In principle, contracts are always incomplete as they are future-oriented. Also the incompleteness can be caused by the influence of third parties. There are risks arising from the incomplete contracts. An unclear ownership thereof is an example. Other risks are information asymmetry, not enough specified wishes, and hold-up situations.

This is the basis of the research question: *To what extent does a DBFM-contract give guarantees that risks resulting from incomplete contracts will be borne by their indicated owner?*

In order to answer this question, looked is into a number of issues that surge from the influence of third parties on the execution phase of the project. These issues comply with criteria: furnished or approved by Infram; caused by a third party; occur in the implementation phase; the size of the issue; the availability of information; an adjustment of contracts and the expenses of the issue. There are six issues analyzed. In the issue 'Zijdewetering' there is a noise barrier that narrows the Zijdewetering, while the Water Authority wants to broaden a diver in the same area. In the issue 'VRI Hoofdstraat' the definition of a traffic control system is indistinct, so it is not clear what Poort van Bunnik should carry out. In the 'remediation emplacement issue' is more contamination than expected which the third party cannot clean in the arranged time. In the 'farm path issue' the farm path disappears in the drawings and an alternative route via an unguarded railroad crossing is blocked by ProRail. In the 'noise barrier issue' residents want a transparent noise barrier while the noise barrier was adopted and approved as a concrete noise barrier. Finally, in the issue about the 'renewal acceleration lane' the third party does not approve the redirection created by Poort van Bunnik while this redirection is within the contract.

Besides Rijkswaterstaat and Poort van Bunnik, the following third parties are involved in the project: Water Authorities, Municipalities, external companies like ProRail and inhabitants and landowners. All these parties have their own wishes and requirements about their area. Rijkswaterstaat wants to include those as much as possible. For example, these wishes and requirements consist of requirements for the degree of modernity of the new traffic control systems.

For each issue, determined is which risks occur. The main risks are attached to not well-specified information. A number of hold-up situations also occur. They can be the result of a lack of specification of the agreements. When the ownership is not clear, it is not clear who bears the risks surging from incomplete contracts. In these issues, there is no confusion about ownership. This can be caused by the fact that, seen from Rijkswaterstaat position as principal, there is clarity about the ownership. In that sense, the risk would be borne by the correct party.

A DBFM-contract does not guarantee a private party takes over the risks from a public party. The contractual owner of the risks in the A12 Lunetten-Veenendaal project is Poort van Bunnik. According to Hart (2003), the public party transfers the responsibility to a private party. This party thus becomes the owner of the risks. In practice, it is not that evident to say that Poort van Bunnik is the owner. An investigation is done to find out which party can bear the risks best with an emphasis on the costs of these risks. Rijkswaterstaat, in its function of road maintenance authority of the A12, bears most of the risks as it has the public responsibility for road maintenance. Besides, Rijkswaterstaat has laid down in the DBFM-contract that it will restore the secondary road network to the same level of functionality and quality as before the widening of the A12.

In a DBFM-contract, Rijkswaterstaat can transfer the responsibility of road maintenance to Poort van Bunnik by means of private contracts. This does not happen though in the way Hart (2003) means, as it does not lead to cost reduction. If Rijkswaterstaat transfers the risks to Poort van Bunnik, they would have to pay for it, regardless whether the risk occurs or not. When Rijkswaterstaat remains the ownership of the risk though, it only has to pay when it occurs. Therefore, risks are not simply transferred from Rijkswaterstaat to Poort van Bunnik. Rijkswaterstaat is also responsible for the 'duty of care', which means it has to take care that wishes and requirements for example about the degree of noise of third parties are not overlooked. Rijkswaterstaat will take care that third parties can jointly take decisions.

A DBFM-contract does not guarantee that a private party takes over the risks from a public party. It is first decided who can bear the risk best. Rijkswaterstaat also wants to keep its honor as road maintenance authority. Rijkswaterstaat self imposes a duty of care, in order to protect third parties in a DBFM project. In short, DBFM does not give guarantees that risks, emerging from incomplete contract, are transferred to the owner, as meant by Hart (2003).

The degree of specificity and the access to information and training are the main recommendations. The more specific an agreement, the less disagreements as there is clarity for all parties. The other side of more specifically, is less efficiency. How more specific a public party is about, for example the type of asphalt, how less innovative and efficient a private party may be. A good preparation, like instructing third parties, can avoid problems with these parties. When, for example, the Municipality understands the content of a DBFM-contract, it will be able to handle it well and thus avoid issues. Rijkswaterstaat should instruct third parties, about DBFM and the agreements that are part of it.

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This thesis covers my research for my Master's degree in Public Administration – Public Management at the University of Twente.

The subject of public private collaboration attracted my attention during the lectures of my Master's track Public Management. I wanted to gain more in-depth knowledge into the relations between the different parties. Some preparatory investigations lead me to Infram. They were interested in research into the incompleteness of contracts between public and private parties and that was how this research came into being.

I want to thank some people who were indispensable for this research. In the first place, there is Patrick Kemperman of Infram who let me browse through the real works. I also want to thank the people of the project team A12LuVe of the department of public works who let me have a glimpse behind the scenes. I am very grateful to Infram, especially to Edward van Os and Patrick, who gave me the chance to execute this research. Patrick and Edward regularly assisted me with constructive criticism and suggestions. I want to thank Piet de Vries and Marc Harmsen for keeping me on the scientific track and for showing me that doing research is also a search into oneself. Finally, I thank Lieve for translating.

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*The A12LuVe is about 30 kilometers long...
but it feels so much longer...*

Borne, December 2012

Inge de Haas

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List of abbreviations

A12LuVe	A12 Lunetten-Veenendaal	9
BO's	Bestuursovereenkomsten – administration agreements	11
DBFM	Design, Build, Finance and Maintenance contract.....	9
GUH	Gemeente Utrechtse Heuvelrug - Municipality	30
PPP	Public-Private-Partnership	9
PvB	Poort van Bunnik.....	10
RD ON	Regionale Dienst Oost-Nederland – department of RWS for traffic safety.....	32
RWS	Rijkswaterstaat – Ministry of Infrastructure and the Environment	9
TB	Tracé Besluit – Route Decision	11
UVO's	Uitvoeringsovereenkomsten – implementing agreements.....	11
UWO's	Uitwerkingsovereenkomsten – development agreements	11
VRI's	Verkeersregelinstantaties – traffic control systems.....	30
WVE	Waterschap Vallei en Eem – Water Authority.....	29

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1. Introduction

The A12 is a so-called hinterland connection, whereby a good traffic flow is an important issue. Traffic is increasing, not only on the A12, but also due to traffic jams on the A12, also on the secondary roads as people choose alternative routes to avoid these traffic jams. Roads are overburdened and traffic also causes environmental problems. The government intends to change this situation by ways of the 'Spoedaanpak Wegen' (Road Emergency Plan). Rijkswaterstaat (RWS – the Ministry of Infrastructure and the Environment) concentrates on thirty persistent bottlenecks to accelerate the traffic flow and decrease travel time. One of these bottlenecks is the A12-Lunetten-Veenendaal (A12LuVe).

In 2007, the government decided to make from the A12LuVe project a Public-Private-Partnership-project (PPP). This project entails the expansion of the A12 through a reconstruction of the road. A PPP is a long-term commitment between the government and a private partner in which both partners retain their own identity and responsibility. They jointly realize a project based on a clear and optimal task and risk division. In exchange for bearing the risks, the private party can execute its own designs. In a PPP, the government collaborates with private partners to Design, Build, Finance and Maintain for example a road in a so-called DBFM-contract. Instead of buying a product (e.g., a road with 2 x 2 traffic lanes), the government buys a service (e.g., an available road). The private partner executes the project and the government controls it. This means more quality for less money. The private partner is given space to innovate and optimize within the contract. In 2011, the government mentions between 10 to 15% of savings. Especially in times of cutbacks, the government must manage its money more efficiently. A PPP is one of the methods to do so without cutting back on quality (PPS Netwerk Nederland, 2011).

In Figure 1, the A12 trajectory is shown. 'A' on the map represent Utrecht Lunetten and 'B' represents Veenendaal.



Figure 1: Trajectory of the A12.

In the A12LuVe project, RWS is the public partner. RWS is an executive of the Ministry of Infrastructure and Environment. It develops and manages the national network of roads and waterways on behalf of the Minister. In this research, 'RWS' refers to the regional services Utrecht that are part of RWS. The regional services Utrecht are responsible for the maintenance, management and construction of roads in this area. Within the regional services there are different teams. One of the teams is involved in the project A12LuVe (Rijkswaterstaat, 2011).

1.1 Background

In the 70's, the relationship between the government and society changed. RWS became an administrator and manager more than a builder and constructor. The management of projects stays in the hands of the government, whereas private partners are increasingly responsible for the execution (Rijkswaterstaat, 2012). The principle of 'market unless' means that RWS prescribes how things should work, but the design and the solutions should be created by the market (Rijkswaterstaat, 2012). Because highways are part of a network including other roads, RWS participates in different strategic alliances with other road authorities, like Municipalities. The different authorities exchange knowledge and experiences, whereby uniformity between the different roads increases. In addition, there is more collaboration with private partners through the PPP's, which are increasingly applied (Rijkswaterstaat, 2011).

Poort van Bunnik (PvB) is the private partner in this particular project. In 2010, PvB was commissioned to execute the project. According to the tender, the expectation was that the project would be ready in 2014. This project includes the widening of 30 kilometers highway, the renovation and construction of bridges and viaducts, the installation of noise barriers, traffic management, and street lighting. At the start of the project, it was expected that it would be ready in March 2013. During the implementation, it turned out that PvB could finish it by August 2012 (Poort van Bunnik, 2012).

PvB is a so-called Special Purpose Vehicle (SPV) or a Special Purpose Company (SPC). An SPV is a company that is established for just one single project. The reason for this formula is to avoid risks for the rest of the company. An SPV limits the participating companies' 'risk exposure'. *It is a financial ring around the project to separate it from any other business activities of the private partner. It prevents financial contamination. A high-leveraged finance structure features the SPV. The debt financiers will demand that the project company shifts the risks to subcontractors or to the public authority. The transfer to the subcontractors additionally obscures the risk exposure of the public sector'* (de Vries, 2010). PvB is a partnership between a couple of BAM-companies, BAM PPP, BAM Wegen (Roads), BAM Civiel (Civil), BAM Infratechniek (Infra-engineering) and BAM Infraconsult (Infra-consulting). A consortium of banks is responsible for financing: BTMU, DZ Bank, Fortis, KBC, KfW and EIB. Advisors are: KPMG Corporate Finance, De Brauw Blackstone Westbroek, Nauta Dutilh, Aon Risk Services, Clifford Chance, Mott MacDonald, Aon Global Risk Consulting and BDO. Advisors of RWS are PWC Advisory and Pels Rijcken & Drooglever Fortuijn (BAM, 2010).

PvB is the executive of this project. The assignment of RWS to PvB entails: widening the A12 for 30 kilometers between Utrecht, Lunetten and Veenendaal; adjusting secondary roads; renewing existing over- and underpasses; constructing two large eco-ducts and wildlife passages; replacing

and installing noise barriers and new portals; renewing and constructing culverts and public lightning. Besides the renewal and construction, PvB is also responsible for the maintenance of the A12 for the duration of 20 years. In 2032, the 30 renewed kilometers of the A12 are transferred back to RWS (Poort van Bunnik, 2011; 2012).

Merely the expansion of the A12 is not enough to solve the problem of traffic jams. The secondary roads have to change too. The expansion of the A12 is part of the DBFM-contract. The changes to the secondary roads are part of this DBFM-contract. The changes to the secondary roads are laid down in three agreements: the administration agreements (BO's), the implementation agreements (UVO's) and the development agreements (UWO's). The BO's are made with operators of secondary roads (Municipalities and Provinces) and contain agreements on main points and on cost sharing. They explain the impact of the DBFM-contract on the Municipality or other public parties. Based on the BO they create an UVO. The UVO is made between RWS and Municipalities or other parties like Water Authorities. In the UVO for example, the starting point of the activities is defined. Based on the UVO the UWO is created, giving for example details on how to collaborate. It is an elaboration of the requirements of the UVO. The UWO is an agreement between public parties and the contractor of RWS (PvB).

The following Figure 2 shows the agreements in sequence of project phase (den Haan & Bouchdak, 2011).

Project phase	Agreement	Content
Exploration	Intention	Broadly defines future developments and identify problem ownership.
Planning phase	Administration agreement (Bestuursovereenkomst: BO)	Establishes framework for cooperation, establish financial contributions of stakeholders and clauses for modification and conflicts.
Dialogue / tender	Implementing agreement (Uitvoeringsovereenkomst: UVO)	Describe similarities and adaptation measures in accordance with Route Decision (Tracé Besluit: TB) and capture liability for damage, starting point, process of incorporation and acceptance.
Realization	Development agreement (Uitwerkingsovereenkomst: UWO)	Agreements about process as specification of UVO are made between contractors and stakeholders.

Figure 2: Agreements in sequence of project phase.

Based on this BO, an implementation agreement (UVO) is made. This is an agreement with a stakeholder (Municipality) whose property has interfaces with the adaptation of the A12. UVO's are negotiated with all stakeholders that have an interface with their infrastructure or property and the adaptation of the A12. The idea behind the UVO is that this agreement between stakeholders and RWS is included in its integrity in the DBFM-contract to ensure that the implementation obligations are submitted as a whole to the contractor. The UVO is agreed between RWS and other public parties. In a UVO, the scope is recorded in detail. Furthermore, the program of requirements and adaptation projects are recorded as well as the way in which to collaborate with each other and with other parties and the alignment are parts of the UVO. The starting date and the procedure for review and acceptance are also part of the UVO. The UVO is elaborated during the tendering phase and preparation for the execution. The specific conditions prevail over the general requirements, i.e.

they can supplement the general requirements, or can replace the general requirements (Rijkswaterstaat, 2011; den Haan & Bouchdak, 2011).

UVO's are annexes of the DBFM-contract. With each Municipality or Water Authority, a separate UVO is made. There are multiple UVO's within one DBFM-contract. The UVO has significant similarities with various attachments or references to, for example, the Route Decision (TB). The elements of a UVO are in general: (1) the definitions, so that it is clear for everyone what everything means; (2) the purpose of the agreements, which means the mutual obligations, whereby the BO is taken as a starting point; (3) a description of the project in which the TB is important; (4) the obligations of both parties; (5) the potential for changes to both parties; (6) the verification of delivery, so how this is done and within what period; (7) the fact that PvB closes a UVO with the public party and the duration of agreement; (8) how the liability and indemnification is regulated and which law is applicable; (9) the contacts of the parties and, (10) the costs and payments. There are also appendices with descriptions of local infrastructure along with the demands of adaptation and maintenance requirements and maps of the grounds.

Based on the UVO, the development agreements (UWO's) are elaborated, which give for example details regarding collaboration. It is an elaboration of the requirements of the UVO. The UWO is an agreement between public parties and the contractor of RWS (PvB).

1.2 Problem description

Hart's (2003) theory lies at the basis of this research. It will be discussed in great detail in the theoretical framework. Hart departs from two situations: firstly, he indicates that there is a difference between bundling and unbundling. Unbundling means that construction on the one side and maintenance and management on the other are separated by contract, while management and construction are executed by one and the same party in the case of bundling. The choice between bundling and unbundling is determined by the degree in which management can be determined. When this cannot be well described, the construction supervisor will try to shape the contract to his advantage, resulting in a different kind of management than anticipated by the commissioner when elaborating the contract (Hart, 2003).

The comparative assessment between unbundling and bundling can best be illustrated by Hart's own example: The authorities want to commission the building and management of a prison. It is difficult though to describe the management of a prison. A prisoner has to be treated humanely, but how does one describe humane without restricting the liberty of the contractor belonging to a bundling contract. In this case, an unbundling contract is a better choice. The authorities take responsibility for the management and commission the construction. In the case of road building, both the construction and the management can be well described. In the case of the A12, the choice was made for a DBFM-contract wherein the contractor is responsible for both construction and management. This is a case of bundling in terms of Hart (Hart, 2003).

Hart's second point is that ownership also includes the risks. In a PPP-contract, the risks are transferred from the commissioner to the contractor; in the case of the A12LuVe from RWS to PvB (see Figure 3).



Figure 3: Relations in DBFM-contracts.

The contractor has ownership of all problems occurring in the course of the contract execution. This party is thus also owner of the risks involved and will want to control them in order to optimize his output. In all contracts, it is important to describe clearly who has ownership and, thus, who bears the risks. In theory this should always work (Hart, 2003) but, whatever theory may indicate, in reality, contracts are always incomplete. This incompleteness causes issues that are the common proposition of this research. These issues include information a-symmetry where one party has more valuable information than the other. The transaction costs, in which is spared in incomplete contracts because writing aspects into a contract may be too costly. The strategic behavior; where parties try to gain as many benefits as possible. Also bounded rationality plays a role. People are unable to decide rationally, so not all relevant circumstances, and actions resulting from these circumstances, are stipulated. Not everything is common knowledge or commonly observable. Some aspects may be unforeseen or difficult to describe in advance by the parties. Contracts are pre-composed, and things can be forgotten, intentionally or not (Couwenberg, 2003; Maskin, 2001).

One of the things causing incompleteness are the relations with third parties. In the project A12LuVe, there are different actors and there are multiple agreements between them. These are shown in Figure 4. Besides Municipalities, also other public parties are involved, such as Water Authorities. Therefore, where Municipality is displayed, also other parties can be filled in.

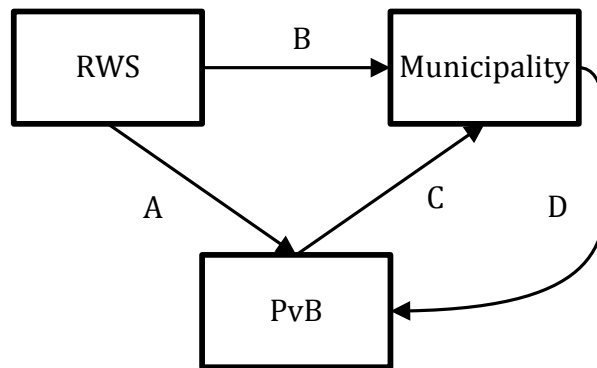


Figure 4: Relationships between the different parties involved.

The blocks represent the parties involved and the arrows, the agreements (relationships) between them. There is friction between these parties. RWS as public partner has a PPP-contract with PvB as private partner (A). PvB implements the plans of RWS; in this case the widening of the A12.

Besides the widening of the A12 for a better traffic flow, also the secondary roads should be adapted. In most cases, these roads are owned by Municipalities. This means there is a relation between RWS and the Municipality (B). In this relationship, RWS is the upper party and the Municipality has to deal with the requirements of RWS. An example of such a requirement is that the highway is increased and therefore, the exit must be adjusted. The exit leads to the secondary road network and must therefore be adjusted. It is also possible that a road has to be closed temporarily; the Municipality must therefore give permission. Work traffic for the construction of the A12 can only get to the building site via the territory of a Municipality. The Municipality has therefore to open its territory. The secondary roads are property of the Municipality, which is why the Municipality also has its requirements versus RWS. In an implementation agreement (UVO), the requirements of RWS and the Municipality are made clear. The requirements are clarified for both parties, but also for third parties such as PvB. They concern for example the start dates, the program of requirements for adapting objects, the method of testing and acceptance of work, etcetera. This defines in general the DBFM-contract.

As said, PvB is de construction firm for the widening of the A12. RWS wants to change the A12. Therefore, they are also allowed to change the secondary road network. Moreover, PvB is RWS's construction firm; it seems therefore logical that PvB executes the changes of the secondary roads. Thus, the Municipality is the indirect client of PvB (C). In a development agreement (UVO), the general lines from the UVO are further elaborated. The UVO forms the basis for the cooperation. This is matched by the UWO, which is an elaboration of the requirements arising from the obligations laid down in the UVO. Herein is exactly described how, for example, the crossroads should be built. Because the activities are executed on the property of the Municipality, the Municipality has to give permission to PvB, by means of permits (D), like for example a building permission.

Municipalities are not always satisfied with the way in which RWS wants to change the secondary roads. They can therefore oppose by not granting permits. As a consequence, PvB cannot build for example the new intersection following RWS's requirements. This in turn gives friction between the Municipality and RWS and between PvB and the public partners. Sometimes Municipalities lay down (or change) their requirements later in the process, which also leads to friction between the parties. Because various parties are involved, the original plan (Figure 3) of a PPP-contract can be changed. One of the reasons why the principle of PPP-contracts sometimes fails is exactly due to the fact that multiple parties need to be heard. RWS focuses on the relationship with Municipalities (B). This relation cannot be considered separately from the relationship between RWS and PvB. The focus is also on the relationship between RWS and PvB (A). The focus of this research is therefore on the relation between RWS and PvB.

1.3 Problem definition and research questions

Through the influence of third parties, the risk transfer between the commissioner and the contractor can be disturbed. A DBFM could therefore not work properly.

The problem definition emerging from this is:

To what extent does a DBFM-contract give guarantees that risks resulting from incomplete contracts will be borne by their indicated owner?

To investigate this, a number of issues have been selected that play a role in case of incompleteness of contracts. How these issues were chosen is explained in the research design and in the first sub-question the criteria. The sub-questions will be answered making use of these chosen issues. For this first sub-question, the different issues involved in the execution of the project A12LuVe are described. Furthermore, we will look into the risks involved. The type of risks will be explained in the theoretical framework. These risks can be seen as an incompleteness in the contracts causing these issues. When it is clear which risks are involved, we can say something about the responsibility. RWS has the public responsibility as administrator of roads, but there are also possibilities in private law to transmit responsibilities to a private party. In practice, the A12 remains property of RWS, but through the DBFM-contract, the responsibilities can be transferred.

1. *Which issues occur during the implementing phase of the project A12LuVe?*
2. *What types of risks are brought about by these issues?*
3. *(a) Who are the contractual owners of the risks and (b) who bears the risks in practice?*
4. *To what degree does RWS bear the risks because it is the administrator of roads or because the agreements were not well elaborated?*

The point of departure of this research is that incomplete contracts cause risks that must be borne by the party who is responsible for these risks. In theory, the correct party is the one that receives ownership through a transfer by the DBFM-contract. In practice, this can change under the influence of third parties like Municipalities. The choice was made to look at this project from the viewpoint of RWS because it is its principal. Due to time constraints, we did not look into other perspectives.

1.4 Aim of research

This research was initiated following discussions with Infram. These discussions showed a number of things that deviated from the initial agreements made during the implementation phase. According to Hart (2003), contracts are always incomplete. The risks arising from this incompleteness must be borne by the party who is responsible. The theory of incomplete contracts shows that risk and reward is clear about who bears the risks: the party who has ownership bears the risks. Practice though shows a different image. The goal of this research is therefore to look into what can go wrong when contracts are incomplete with an emphasis on the risks that ensue thereof. The relevance of this research is that perhaps some issues can be prevented if one is aware of incomplete contracts. This would result in less need to make changes afterwards and therefore, less cost.

1.5 Outline

In chapter 2, the theory of incomplete contracts is elaborated. In the theoretical framework, the outlines of this study are worked out. This chapter also refers to the types of risks arising from incomplete contracts. In chapter 3, the research design is described. It explains exactly how the research is done and the methods that were used for that purpose. Chapter 3 also looks closer into the selected issues. It is concerns the choice of these particular issues. Chapter 4 treats the different issues and their parties involved and chapter 5 elaborates on the causes or the risks of these issues. Subsequently, in chapter 6, we look at the contractual owners of the risks emerging from these issues and who bears the risks actually. Chapter 7 goes deeper into the risks of RWS. We end with chapter 8, containing conclusions and recommendations.

2. Theoretical framework

Many things have been written about the collaboration between public and private parties. Most of it is based on choices that can be made by the authorities. Coase (1937) calls it the principle of make-or-buy; the choice hereby is to either make something oneself, or the buy it from someone (Coase, 1937, p. 404). The basis for the theoretical framework is the article from Hart: 'Incomplete contracts and public ownership: remarks, and an application to public-private partnerships'.

2.1 Public or private

Hart (1997; 2003) gives an example about a prison to clarify the choice between a public or private implementation. The government wants to build a prison because it has to watch over many prisoners. It can choose between different possibilities. The choice will mainly be determined by the costs involved. A first option is to keep both the construction works and the management in one's own hands. A second option is the choice for invoking a private party. A private party could do the construction work while management is kept in one's own hands. One can also transfer the responsibilities for both the building and the management to a private party (private ownership). In this last case, government will also transfer the risks involved in both building and management to the private party. In this last option, the government has the choice to let one party do both the building and the management (called bundling by Hart) or to split them (unbundling) and award building to one and management to another (private) party.

Hart ignores investments by the government, but supposes that the manager can make two kinds of investments. He can invest in efficiency-enhancing ideas that improve the quality, or he can spend time figuring out how to cut costs and quality, while sticking to the letter of the contract. The choice between public and private ownership depends on which of these effects is more important (Hart, Shleifer, & Vishny, 1997). Which ownership structure - public or private owned - is more efficient depends on the extent in which high-powered incentives to invest and innovate are a good idea. In some situations, neither innovation nor cost efficiency is crucial, and contractual incompleteness emerges from the government not knowing exactly what it wants, and not wanting to pay too much when it changes its mind (perhaps because raising tax revenues is expensive). In this situation, the preference is government ownership based on cost savings (Shleifer, 1998).

Whatever the choice, there are pro's and contra's attached. When government chooses to transfer both construction and management of the prison to a third party, it has no more say about the treatment of the prisoners. The private party receives payment from the government for constructing as well as for managing. The risks for the private party then have to be included in the contract. The responsibility for unrest in society in case of an escaped prisoner can be agreed upon. It can also be agreed that the government remains responsible for the prisoners even though the prison is private. A better choice for the government would be to transfer the public responsibilities - like the locking up of prisoners - to a private party. This party constructs and manages and is thus responsible; for the risks. The government pays a fee for bearing these risks. In the contract, the height of this fee, as well as what it entails, must be described exactly.

The government can stipulate certain requirements in compensation of this fee, for example, that prisoners are to be treated humanely; that they have the right to one hour of open air a day. It is possible that the private party has a different notion about what is humane than the government. The private party could for example interpret the right to one hour of open air a day differently from the government and not let the prisoners out, but blow open air in. In order to avoid this kind of different interpretations, the requirements of both parties need to be established clearly.

2.2 Incomplete contracten

Another point of departure of Hart is that he indicates that all contracts are in principle incomplete. This means that contracts are never completely watertight. Not all situations can be predicted and they are therefore difficult to describe. Contracts are future-oriented. The incompleteness can lead to disagreements between the different parties.

When departing from complete contracts, imperfections arise solely from moral hazards or asymmetric information. The organizational form is unimportant; the owner has no special power because everything is specified in the contract (Shleifer, 1998). However, when a contract is incomplete, the ownership does matter. The owner can make all decisions on issues that are not included in the contract, also called: residual control rights. Therefore, the hypothesis of Hart is that incomplete contracts make economic ownership decisive. *'When a contract is incomplete, as they are in practice, the government should be the owner, because the ownership gives the residual control rights'* (Hart, 2003, p. 70).

What is expected of each of the parties has to be laid down clearly in the contract. This does not mean that every trifle must be described. When the product is more specific, the transaction costs are higher. In addition, the less incomplete the contract, the higher the transaction costs (Williamson, 1975). When the government has requirements that are too specific, the private party will have difficulties to comply. It will require a higher price for the works, making it more expensive for the government.

The contract between the government and the private party must be clear concerning the risks and rewards attached to it. The rewards must not be related to the limitation of risks. The reward must bring about a well-executed job by the private party. When the requirements are not well described, the private party will try to do as little as possible to get the reward. In the case of the prison, the private party will refrain from letting the prisoners go outside and will let open air into the prison instead as this could reduce for example the costs of surveillance. The private party will try to stretch the contract to its limits (Hart, 2003). This is why the requirements must be well described and clear for both parties.

A hold-up situation can occur. A hold-up situation is a situation in which two parties are able to work most efficiently by cooperating. However, this situation may give the other party increased bargain power, and thereby reduce its own profits. The case may be that one party requires a specific investment that is profitable for both. After the investment has been made though, it becomes a sunk cost, and the party may attempt to renegotiate the contract so that the other party makes a loss on the investment. Opportunistic behavior and bounded rationality can create a hold-

up situation. This arises from an incomplete contract. One party gets rich on the back of the other. Unforeseen circumstances play a role when contractors achieve below their contract commitments or enforce other conditions. In that case, both public and private parties have the right to go to court to claim unforeseen circumstances. The positions of both the government and the private sector have the same conditions and the same test of reasonability and fairness. The government is both the contracting party as well as the party dedicated to the public interest (Bregman & De Win, 2005).

The owner pays when risks occur. This means that the owner of the risk incurs expenses that compensate for damages. For example: a private party does road construction and management. When a calamity occurs rendering the road unavailable, this private party has not complied with the contract that states that it must deliver an available road. The government will therefore cut the indemnity of the private party. After all, it has not delivered. Besides, the private party has to make the road available, whatever the costs involved. On the other hand, when the road remains available, the private party will receive payment (Rijkswaterstaat, 2010).

2.3 PPP and DBFM

In the prison case described by Hart, it is unlikely that a bundled contract will be made up between the government and a private party. The management of the prison can be seen as a service and this service is difficult to describe and lay down in a contract. The government will therefore not be eager to part with this service. The case of a highway, like the A12, is different though. The construction and the service – a good, available, road – are easier to specify. Government will therefore prefer to transfer both construction and service to a third party. A bundled contract, like the one in this research, is done in the form of a PPP-contract. *‘The PPP gives the private party the opportunity to maintain the service level of the public sector in some parts. It may offer efficiency opportunities the public sector is not famous for. The PPP seems to combine public sector austerity in combination with continued public service responsibility, and private sector efficiency. The contract specifies the services the public partner may expect. The lion’s share of the projects concerns the infrastructure that the public sector traditionally assumes responsibility for. The assignment of this responsibility to the private sector results in a transfer of risks to the private partner’* (de Vries, 2010).

A PPP project is based on a long-term contract that requires specific private sector investments in assets. The use of the assets is specifically defined in the contract and the private partner is necessarily limited as to how the assets may be used (European Commission, 2004). *The economic owner of goods or services, natural resources, financial assets and liabilities is the institutional unit, which is entitled to claim the benefits associated with the use of entity in the course of an economic activity by accepting the associated risks* (van Ewijk & Tang, 2004). The transfer of risks is done by transferring ownership. When a party is the owner, it is automatically responsible for the risks involved.

In general, the duration of a DBFM-contract for roads covers the construction time, and the life span and a single major repair to the road. This adds up to about 20 years on average. In general, the public party starts paying from the moment the performance is achieved. In the case of a road, this performance exists of the availability of the road (Rijkswaterstaat, 2010). If a contract is made for a

longer period, certain costs belonging to the making of each contract are avoided. Alternatively, owing to the risk attitude of the parties involved, they may prefer to make a long- rather than a short-term contract. The longer the terms of the contract, the less desirable it is for the purchasing party to specify what the other contracting party is expected to do (Coase, 1937).

Hart's ideas about risk and reward are difficult to apply in practice. Objective criteria need to be elaborated, laying down the risks and ascribing them to one of the parties. 'Treating prisoners humanely' is not an objective criterion to which a reward can simply be attached. The different parties will have a different understanding of the meaning of 'humane treatment'. In the case of the road under research, these criteria can be elaborated more easily. Agreements can be reached about the level of availability of the road. An example of a requirement by the government could be that: *traffic must be able to make use of a tunnel as long as the traffic situation allows this* (Rijkswaterstaat, 2010). When this tunnel has to be closed for maintenance, there is decreased availability and therefore less reward (Rijkswaterstaat, 2010).

Contracts are difficult to draw up and, attempting to describe what all parties have agreed upon (e.g., the amount and kind of a noise that they may make), would require a lengthy and highly involved document. A long-term contract is therefore desirable. The reason why some activities are not the subject of contracts is the same as the reason why some contracts are commonly unsatisfactory. It would cost too much to put the matter right. Contracts are unsatisfactory because they do not cover all activities (Coase, 1960).

We can conclude from Hart's model that unbundling is good if the requirements of the building can be well specified and that of the service not. Whenever the quality of the service can be well specified, PPP is the optimal choice. There is no overinvestment in cost innovations as the builder is bound to strict output measurements. Quality reducing investments are no longer in the interests of the private party when this means a reduction of quality of the asset below the level agreed upon in the PPP-contract (Habets, 2010; Hart, 2003).

2.4 Risks

A number of risks that can create issues were selected from various articles on PPP and DBFM from, among others, Coase (1937; 1960), Couwenberg (2003), European Commission (2004), Habets (2010), Hart (2003; 1988; 1990), Shleifer (1998), de Vries (2010) and Williamson (1975; 1998). These risks are incompleteness in the agreements. These types of risks form the basis of this research.

Unclear ownership

The first possible confusion is the uncertainty regarding ownership; in other words, who has the property rights and is thus responsible. In this matter, there are differences between public and private parties. In general, the public partner has more obvious responsibilities like traffic circulation for example. It has to be clearly defined who is responsible when something happens. For example, during the construction process, the builder is temporarily the owner and has therefore the responsibility. The owner also has the income rights, and is thus the residual claimant. In summary, Hart (2003) says that with incomplete contracts the owner must be known. The owner

is the one who decides about the project. The owner can in some cases be another party than the administrator. This makes it extra difficult to clarify which party is ultimately responsible. The administrator is responsible, but the owner always has the final say. Hart (2003) does not indicate whether this owner must pay for the consequences of these decisions. An owner will invest in better services. These services exist of creating the road (product), as well as the supply of better service in that sense that the road is always available. If the builder is not the owner, he will only create the road regardless the quality. Hart (2003) indicates that certain services may not be specified, resulting in the executing party searching for the limits of the contract. Hart says that these services should not serve private, because the control of it cannot be executed well.

Information a-symmetry

Information a-symmetry means that one party has an information advantage over the other. It concerns an information advantage of the executing partner with respect to the principal concerning the execution of the contracts. Information a-symmetry causes two things: adverse selection and moral hazard. Adverse selection means that one party has an information advantage over the other. There exists an information a-symmetry between two parties, in this case for example, the builder (PvB) and the owner (Municipality). The builder will have an advantage in terms of knowledge about the choice of material. The Municipality cannot directly verify the actions of the builder because it does not have the proper knowledge to do so (Hart & Moore, 1990).

Moral hazard signifies that the investor is not able to observe the actions of managers, while these actions can affect the interests of investors. This refers to reliability. The behavior of parties changes when they are not directly responsible for the consequence of their actions. This means that they show a more risky behavior because they do not bear the responsibility. In particular, moral hazard may occur if a party with limited liability has more information about its actions and intentions than the party paying for the negative consequences of the risk. Moral hazard occurs when the party with more information about its actions or intentions has a tendency to behave inappropriately from the perspective of the party with less information. Moral hazard arises because one party does not take the full consequences and responsibilities for its actions, and has therefore a tendency to act less carefully than it should, leaving the other party with the responsibility for the consequences of those actions (Hart, 2003).

This means that, to a certain extent, the builder can pursue his own interests. The incompleteness arises from the fact that the executive party knows more about building in the best or cheapest way. The ordaining party has an information disadvantage. It is therefore possible that the implementation becomes much more expensive than necessary. The incompleteness is also because the performing party withholds things using them to its advantage because of the cost of any extra work for the ordering party. If the information is distributed proportionally, there will be no benefit to any party and therefore the risk of incompleteness will be reduced. Third parties may also cause risks. For example, a third party, like a Municipality comes up later with something that should happen, like a noise barrier. This input could also be given earlier. But because this party does not know exactly what will happen, or because they later realizes what will happen, this input is given at a later point in time.

Not specified enough

If the agreement is not properly specified, it entails the risk of incompleteness. It must be clear how to deal with a problem the moment it occurs. Problems arise when there is time pressure. When the ordering party has not documented its wishes well, it creates opportunities for the executive party to make its own interpretations. The builder will try to do as little as possible in order to achieve the objectives set in the contract. It is hard to capture everything in advance in a contract, especially when it concerns services. Ambiguities may arise that lead to incomplete contracts (Hart, 2003). For example, the quality standards of the road may not be well described. The builder can thus decide to use a type of asphalt that is cheaper and less long lasting. The result is indeed a road, but, because no instructions were given concerning its durability, the asphalt will have to be replaced at an earlier stage, and it will be the ordering party who has to pay for this early replacement. A better specification would have led to a different choice of asphalt and would have saved costs in the long run. Requirements must therefore be well defined and well specified.

Unpredictable future

Another risk is the fact that the future cannot be predicted. An extreme winter with a shutdown of the construction work cannot be predicted; it should be described though. Even unforeseeable circumstances can be foreseeable conditions. External factors, like the weather, have to be taken into account. Who is responsible when it occurs and what the consequences are for the deadlines as defined. There must be an owner for the conditions laid down. Besides weather, there are other circumstances that may occur. An agreement is complete when all such possibilities are recorded. This is however not possible.

Hold-up situations

The last type of risk is the hold-up situation. Hold-up problems arise when contract enforcement is not possible and, when the negotiating positions of the parties change over time. A hold-up problem is an inefficient situation between two parties in which a possibility to collaborate has not been used because one party should invest. This party knows that when that investment is done, the other party gains bargaining power and will thus demand a greater share of the profits. This occurs when there is a difference between the owner and builder and, there is also a difference between public and private parties. The owner cannot oblige the builder to comply because the agreement is incomplete. The builder has more power or freedom, and will use this fully to his own advantage of course. Between RWS and Municipalities, hold-up situations can occur. RWS is the builder and the Municipalities are the owners. In addition, the negotiating positions of the parties change over time. Situations could arise whereby one party enriches itself at the expense of the other. Thus, in certain situations, the agreement is no longer sufficiently complete in order to solve the problem. In time, the contract value is lost. The less complete the contract, the more hold-up situations may arise (Bregman & De Win, 2005; Anderlini & Postlewaite, 2007).

In the case of bundling (the builder is also the operator); the builder will build good quality as he is responsible for the maintenance of the road during a longer period of time. Good quality will therefore cost him less money in the end because there is less need to replace something frequently. The impact of the distribution of property rights is linked to the incompleteness of contractual agreements between the government and the private partner. A private partner will also have

stronger incentives than a public partner to engage in quality improvements and cost reductions. The private partner must create value so he can create profit (Hart, 2003).

2.5 Conclusion

In this research, the contract is bundled because of the DBFM of the contract. PvB is the party who builds the road and maintains (owner for 20 years) it. The contract concerns the agreement between the Municipality and RWS. This contract is not bundled. The Municipality is the owner of the roads, and will maintain them after PvB has finished the construction. Therefore the building and operating is done by two separate parties.

Compliance can be enforced by the court because all information that lies at the basis of the contract is third party verifiable. This results in very high transaction costs. In this case, incomplete contracts are cheaper. A possible solution is to assign control or ownership to the party who does specific investments that are not protected by the contracts. This way, the incentives remain intact for the investments that create most value for the relationship. Bovenberg and Teulings (2000) indicate that through the specificity of investment, the government as a party can best manage the ownership by the non-contract accountable risks. When the government, as an end user, is made owner of the specific capital, the conflict of interests between investor and user is eliminated and the government is protected from inefficient activities of performers (Bovenberg & Teulings, 2000). In de PPP idea of Hart, the private party must carry the ownership. The remark with this idea is that the services should be defined well. In the case of the A12, the services are specified (e.g. an available road), in contrast to the case of the prison discussed in the introduction.

3. Research design

To answer the research questions, certain research methods were used that will largely determine the outcome. In this chapter, the choice for this project as well as the de research method, the case selection and the data collection will be explained.

3.1 Project A12LuVe

This research is executed within one project, making it possible to get more insight in a project as a whole. The choice was made for a single case study. A case study is often used to describe and analyze data. It provides insight into the processes and in the performance of stakeholders. A disadvantage of this form of research is that it cannot be statistically generalized, due to lack of comparison. There is no population from which a case is randomly drawn. Babbie (2007) describes a case study as an in-depth examination of a single instance or a social phenomenon.

The case in this research is the PPP-contract of A12LuVe. The construction firm Infram suggested this research, as it is a project in full operation. Infram is fully involved in the implementation process, which might make it easier to establish contacts. This project is in its executive and final stage. We already mentioned earlier that the execution runs ahead of schedule. Because the project finds itself in this phase of execution, many issues have already been completed which makes a proper evaluation possible. Therefore, this study has an evaluative character. This case can serve as an example for other, future projects although, of course, every project is different. Issues like the distribution of risks get special attention in each project. If agreements and contracts are better adjusted to the situation and to each other, costs can be reduced and less disruption can be caused to people living in the vicinity of the project.

3.2 Research method

To answer the question *‘To what extent does a DBFM-contract give guarantees that risks resulting from incomplete contracts will be borne by their indicated owner?’* we have prepared multiple sub-questions. To determine which method to use, it is important to know the character of the research questions. For this purpose, the following Figure 5 is drawn up. The character determines the research method. Each character has a particular method of research.

	Character	Research method
1. Which issues occur during the implementation phase of the project A12LuVe?	Descriptive	Qualitative research using in-depth interviews
2. Which types of risks are brought about by these issues?	Descriptive	Qualitative research and desk-research using expert opinion
3. (a) Who are the contractual owners of the risks and (b) who bears the risks in practice?	Descriptive and analyzing	Desk-research using expert opinion
4. To what degree does RWS bear the risks because it is the administrator of roads or because the agreements were not well elaborated?	Analyzing	Desk-research using expert opinion

Figure 5: Description of questions.

The first sub-question has a descriptive character. The issues are considered and described with emphasis on the parties involved. How these issues are chosen will be explained in the next paragraph and next chapter. The method used to answer this question is discussing with people involved. These individuals describe the issue following their own experience. The second sub-question has a more analytic character, but is still descriptive of nature. It involves a link between theory and practice. This is where expert judgment comes in. The third sub-question has an analytic character. It concerns the differences between reality and theory. The question exists of two sub-questions itself: (a) concerns the contractual owner, (b) concerns the actual owner in practice, or, who bears the risks in practice. Also the fourth question is an analytic one. It concerns the role of RWS in this project. On the one hand, RWS bears a certain responsibility as manager of roads in general. On the other hand, RWS may also bear risks because the agreements are not well elaborated.

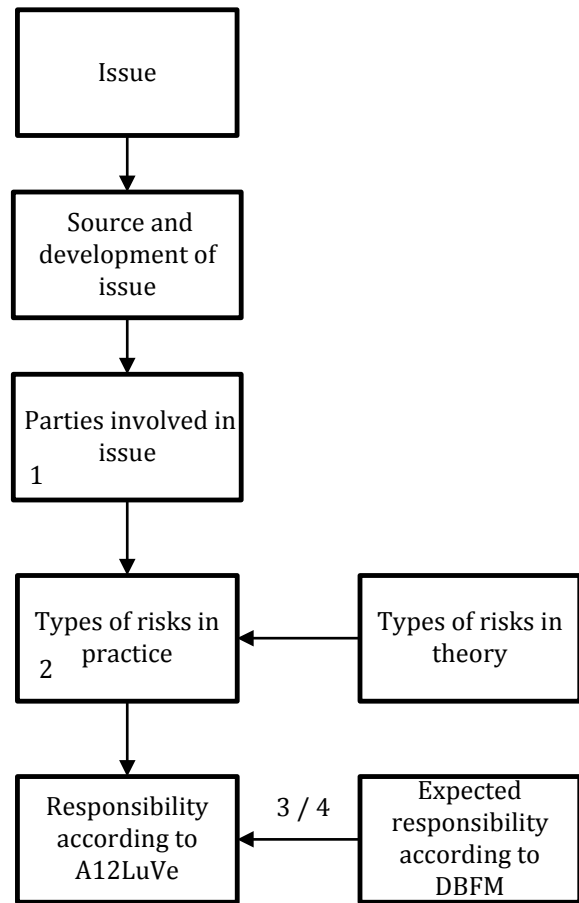


Figure 6: Research method.

Based on Figure 6, the method of research can be interpreted. As mentioned, the study begins with the collection of issues. Therefore, we will first look at the kind of issues that occur. To determine them, we looked in the archives of RWS through ‘snow balling’. From the database of RWS, the collection of issues can be initiated. The documents of RWS will be used throughout this research in order to describe the situation. This method is also called a qualitative desk research. In addition to this desk research, knowledge of employees of RWS will be used. Babbie (2007) indicates that ‘snow balling’ is a proper method for the collection of data. Using this method, new sources can be found in the reference list of earlier sources. In addition, certain terms are used to search for other sources ‘Snow balling’ helps to increase the reliability of the sources. Often literature lists show recurrent sources. We therefore assume that they have a certain value. Thus, a list is established from which a number of types of issues emerge. These issues are then divided into different categories (see Appendix I).

As soon as the issues are divided into categories, a selection can be made out of this list. This selection was made in consultation with Infram because they know what issues are valuable enough to study further. The quality of the issues is determined by the availability of sufficient information and by the availability of people involved. The ‘selection’ should be done in such a way that the properties are not the cause of the observed effects. In other words, the characteristics of the involved actors should not cause the incompleteness. Through Infram’s contacts, stakeholders who

were involved in the project A12LuVe will be selected. This increases the validity, because thus only people actually involved in the project are included. The stakeholders will be aware of the fact that it concerns an investigation; this can affect the results and should be handled with care (Babbie, 2007; Shadish, Cook, & Campbell, 2002).

Figure 6 shows the method of research in steps. The numbers in the quadrants represent the sub-questions. This figure actually consists of two columns. The left column is the practice and the right one the theory. In order to be able to compare, the theory is explained first in the theoretical framework. The types of risks are identified here. Subsequently, practice should be addressed. Hereby we will look at the issues following the steps in Figure 6. The issues have been chosen based on the categories explained in the next paragraph. First, an explanation will be given on how the issue came about and how they were solved. Then follow the parties that are involved and the party that is at its disadvantage; thereafter we look into the type of risks that take place. Finally, we will investigate whether there is a difference between the division of risks in the DBFM in theory and in practice. The emphasis lies on the owners of the risks. We will also look deeper into the role of RWS.

3.3 Case selection

The researched issues are divided into categories to gain more insight into the different issues implicated. First, a shortlist is made to determine which issues need to be addressed. This list contains the issues that emerge from the desk research in the documents of RWS, see also Figure 11 in Appendix I. They can be divided into four categories. The categories are established through an analysis of various documents containing issues. It appeared that the categories below are common. As the separation between these categories is not always clear, Figure 7 was designed.

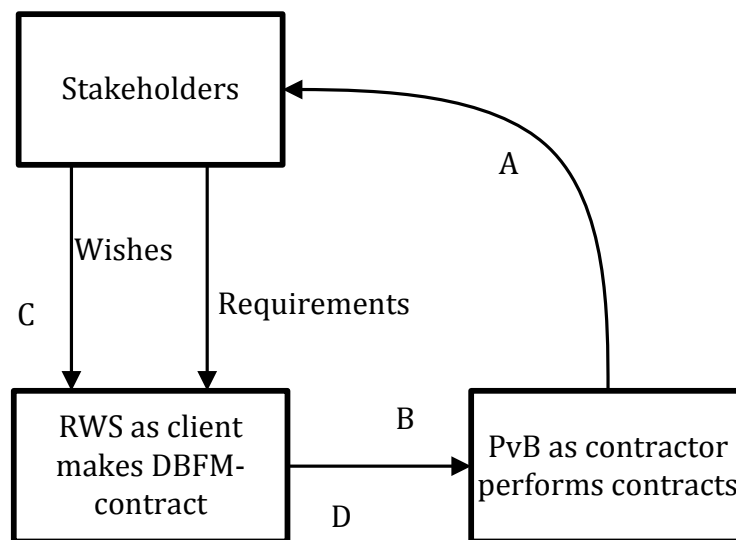


Figure 7: Relationships between types of issues.

The process of this project starts with the stakeholders. They all have certain requirements and wishes that are laid down in the DBFM-contract that RWS prepares with PvB. These requirements and wishes concern for example the amount of noise of traffic. Based on this DBFM- contract, the UVO's are prepared; or rather, the UVO's are an appendix of the DBFM-contract. A type of issue

playing a role is the adjustments in the scope (C). The scope should be seen as the wishes and requirements of the stakeholders, for example Municipalities, based on which PvB executes the contract and agreements. This involves two types of issues: firstly, delays due to shortcomings (B), these are shortcomings that can be caused by both parties. Secondly, there is the implementation that does not meet the predetermined requirements (D). This implies that PvB has not duly implemented the requirements and wishes of the stakeholders. Finally, there may also exist differences in expectations (A). PvB does not meet the requirements and wishes or, in other words, PvB may have interpreted them differently.

A. Differences in expectation / unwanted interpretation

This category includes issues in which there is a difference in expectations between the client and the contractor. This includes unwanted interpretations of the contractor. The client's intentions are different from what has been implemented or, in other words, the client has different expectations than the contractor. The agreements are not clear, which leads to confusion. As shown in Figure 7, PvB executes the contracts differently from the requirements and wishes of the stakeholders. The expectations of the stakeholders are different from the actually performing.

B. Delay due shortcomings

Shortcomings of one of the parties can create delays. It is also possible that a third party causes delays, so the performing party cannot continue the execution. Third parties stand usually above the client, which means that the third party can ensure through the client that the contractor is delayed. The client has agreements with these third parties. Then a third party is too late with something, then the client will be too late, and thus the contractor is delayed. The client then causes the delay, and the contractor is not to blame here, and has no extra costs.

C. Adjustments in scope

It happens, that during the performance, requirements change. Especially third parties can change their minds. Unforeseeable circumstances can also be the source of changes in requirements. It is also possible that during the implementation, new issues appear leading to a necessity for adjustments; this can happen at various stages of the process. In general, an adjustment at an earlier stage has less impact than an adjustment later on in the project. Moreover, adjustments in an earlier stage imply lower costs than when they are made later on, when the project is already in its implementation phase.

D. Does not meet predetermined requirements

PvB has not properly interpreted the requirements and, does therefore not meet the predetermined requirements. A stakeholder may lay down a requirement and PvB does not execute this well enough. This is not what we mean by differences in expectations (A). The difference is that in the 'does not meet predetermined requirements' the requirements are simply not performed. In issues with differences in expectation, PvB is not fulfilling the expectations of the stakeholders as the interpretations differ. This is wider because for example, the requirements do not meet the expectations. That is to say, the requirements are different from the expectations.

We found issues for each category. The number of issues of the project A12LuVe is still more extensive. In Appendix I, a brief elaboration of the issues can be found. To select the right issues some criteria are made up. Criteria are: furnished or approved by Infram; caused by a third party; occur in the implementation phase; the size of the issue; the availability of information; an adjustment of contracts and the expenses of the issue. These criteria are discussed in the next chapter. After consultation with Infram, the selection was narrowed down to eight issues. These issues are good examples of issues that frequently occur in similar projects. The decision was taken to treat two issues from each category in order to expand the image. After intensive research, two issues were abandoned, so six issues remained.

3.4 Data collection

The data about the issues will be collected through interviews with people involved; this will require a questionnaire. In these discussions, the parties involved and the process of the issues will be treated. Through the qualitative method of interviews, further data will be collected. This will enable us to trace the experience or motives. The questions asked during the interviews are related to the issues that have emerged during the implementation phase of the project. To avoid socially desirable answers, the questions must be properly formulated otherwise, 'testing and instrumentation' may occur. Shadish, Cook and Campbell (2002) argued that the type of test can affect the subjects or, in other words, the parties may be influenced by the manner of questioning. A socially desirable answer is an example. Stakeholders may give socially desirable answers because they want to avoid a negative assessment of their work. In addition, one must be aware of 'experimenter expectancies'. The researcher him/herself has certain expectations and should avoid blending those into the conversations. The chosen issues should be as representative as possible. This reduces the 'interaction of the causal relationship with units' and ensures the external validity (Shadish, Cook, & Campbell, 2002).

In the context of time, there are a number of issues that were chosen to be examined in more detail. The expertise of both Infram and RWS will be used. This analysis has to be carefully handled as the amount of issues examined is not very large. This allows the 'low statistical power' occur. Wrong conclusions can be drawn due to the small number (n) of issues. It is important to be aware of the internal validity to ensure that these threats are minimized. For example, it should be understood what the results mean exactly. 'Ambiguous temporal precedence' means that it is necessary to explain that the issues are the results of incompleteness. It should not be the other way around (Shadish, Cook, & Campbell, 2002).

3.5 Conclusion

The research is a qualitative study in which one project is examined. In this project a number of issues are selected that arose during the implementation phase of A12LuVe. In order to examine these issues there is made use of desk-research with the help of experts. A disadvantage of this method is the view from one side. This gives a particular image. Therefore, the conclusions should be drawn carefully.

4. Issues discussed

In this chapter, we take a closer look into the different issues. As each issue is different, there are different parties involved in each one of them. It is clear that RWS and PvB are important parties, but there are other parties involved, the so-called third parties. To be able to analyze which party bears what kind of risk, we need to work out which parties are involved. The main question of this chapter is: *'Which issues occur during the implementing phase of the project A12LuVe?'* This question forms the basis for the following chapters in this research.

The full description of these issues can be found in Annex II and can be used as background for answering the other sub-questions. As explained in the research design, the issues can be subdivided in different categories. From each category, two issues are further analyzed. The criteria of the issues are mentioned in the previous chapter. All the issues below meet in a certain extent these criteria. The issues were submitted by Infram and RWS. The issue should arise or occur during the execution of A12LuVe and the UVO's thereabout. In addition, a criterion is that a third party caused the issue. Alternatively, a third party should be involved in the issue. Also the size of the issues is important. For example, the issue should not be too small. It would make no sense. In addition, the size of the issue should not be too large. Too large would mean that the issue could not be properly analyzed within the time of research because excessive factors and parties are involved. Another criterion is the availability of information. Sufficient documentation should be available. Also the issues should adjust the contracts in a more or lesser extent. This implies adjustments in the UVO or even the DBFM-contract. Finally, the cost of the issue is a criterion. Hereby is looked whether a party has incurred costs. This is not easy to determine, because the issues are not always completed at the time of the analysis. The issues analyzed conform in greater or lesser extent to these requirements.

4.1 Differences in expectation

Zijdwetering

The essence of the first issue is 'differences in expectations' between the various involved parties. The Water Authority District 'Vallei & Eem (WVE) had different expectations from the contract than RWS and PvB. The installation of a sound barrier at Zijdwetering will cause a narrowing of the Zijdwetering. WVE is not in favor of such a narrowing. Moreover, WVE concluded that the culvert under the A12 needs widening. This was not included in the DBFM-contract, but belongs to the contract area. As a temporary solution, a dirt-collecting place next to the culvert could be introduced to compensate for the narrowing. After a few years, this solution could be evaluated and a final solution could be elaborated.

The parties involved in this issue are the Water Authority, RWS and, to a lesser degree, PvB. RWS is the indirect party, as PvB must perform the construction. Hence, RWS is the main party involved rather than PvB. WVE can be seen as the principal; as water manager, it has the social responsibility to manage and maintain the water management of the district. WVE wants to increase the capacity of the culvert, because of new standards to which it must adhere. At an early stage, WVE submitted its requirements to RWS. RWS needs to add these to the requirements of other parties. The

relationship between both parties is as follows: WVE can make all kinds of demands and RWS has to take them into account. When WVE wants to change or adjust requirements at a later stage, it is very hard for RWS to include them

During discussions between RWS en WVE about the width of the maintenance path, WVE suddenly required the widening of the culvert. This became thus another issue. WVE wanted an increase of the capacity of the culvert under the A12, in order to comply with new standards. When the Zijdwetering is narrowed due to the installation of a noise barrier, WVE cannot meet these requirements. RWS is at a disadvantage; because WVE indicated that only at a later stage that de culvert had to be wide RWS cannot just accept this requirement. The widening of the culvert is not included in the contract with PvB. It should be included though as the culvert is located within the contract area. Narrowing the Zijdwetering in order to maintain the maintenance path is not observed by WVE, which is a disadvantage for RWS. RWS has to recover the error in the TB.

VRI Hoofdstraat N225

Also the second issue is a case of difference in expectations. The three parties involved all have a different expectation from parts of the DBFM-contract or, in other words, they interpret certain concepts differently. RWS is involved in this issue. Or rather, PvB is directly involved, but RWS takes over this role, since it is the principal of PvB. The Municipality Utrechtse Heuvelrug (GUH) is involved as counterparty. Between these two parties, a UVO is prepared with the corresponding BO and UWO. The traffic flow on Hoofdstraat (N225) in Driebergen, managed by GUH, is a very important issue for the Municipality. The opinion of GUH is that the widening of the A12 causes problems to the traffic flow and indicates that RWS has to solve these problems. GUH requires a complete renewal of the entire traffic control system (Verkeerregelininstallatie (VRI)) by PvB in order to ensure a better traffic flow. See also Figure 13 in Appendix II.

The required adjustment due to the widening of the A12 is the responsibility of RWS. The changes will ensure that the VRI's of the Hoofdstraat maintain the same quality and functionality. This was not literally included in the UVO, but by RWS said to GUH. Any additional work necessary is the entire responsibility of GUH. According to RWS, the modernization of the Nijendal VRI and the connection of the VRI's Loolaan and Nijendal with the provincial traffic center are not part of the UVO. RWS is of the opinion that they do not have to pay for the modernization of the VRI's.

There is disagreement between the parties about the modernization of the VRI at the intersection Hoofdstraat/Nijendal. RWS believes that this is not in the contract and should therefore be paid for by GUH. On the contrary, GUH believes that the VRI Nijendal is an integral part of the VRI Loolaan and must therefore be modernized by PvB. GUH wants a connection between VRI's Loolaan and Nijendal and the provincial traffic center. GUH expected that the works would be carried out by PvB. PvB on the other hand has not budgeted this work. GUH expected that PvB would renew all VRI's, but that is not the case. On the other hand, RWS will ultimately have to pay for the extra work. GUH was not explicit enough about its wishes in the earlier phases of consultation, which is why mistakes occurred.

4.2 Delay due shortcomings

Remediation emplacement Maarn

This issue is a matter of 'delay due to shortcomings'. In this case, one party comes short and thus causes delays. Delays are in general avoided as much as possible. In the emplacement Maarn, third parties are also involved. They can also be the cause of delays. In order to widen the A12, the government has bought several parcels: the government has purchased the parcel Maarn from NS-Vastgoed. PvB is commissioned by RWS to carry out works related to the widening of the A12 on this parcel.

As agreed during the sale, NS-Vastgoed is responsible for the remediation of the parcel before PvB can start working. NS-Vastgoed itself is not able to rehabilitate it, but subcontracts the remediation to Stichting Bodemsanering NS (SBNS). The responsibility for remediation is to some extent for RWS and therefore there is discussion about it between RWS and NS-Vastgoed.

RWS will put pressure on NS-Vastgoed to remediate the parcel in time. RWS has to deliver a 'clean' parcel at a preset date to PvB but RWS depends hereby on third parties. When a third party is delayed, RWS is not able to comply with the agreements made with PvB. In order to avoid delays caused by third parties, PvB takes over the remediation. Of course, PvB does not do this for free and RWS will have to pass the costs of the remediation that are outside the concessions to NS-Vastgoed.

4.3 Adjustments in scope

Farm path 86.7-87.2

Changes to the scope can also cause issues. Some things in the scope may expire prematurely; others may have to be adapted afterwards. Requests for adaptations can be brought up by various parties. Besides PvB and RWS, also landowners and/or inhabitants are involved in this Farm Path issue.

PvB is involved in this issue as executive party, and RWS as ordering party. PvB wants to use the farm path as access road for the construction works. In the TB, the farm path is no longer there. By widening the A12, the original farm path disappeared. As a result, residents and / or owners of the arable land only have access to their parcels through an unguarded level crossing. A map of the situation can be found in Figure 14 in Appendix II. The residents and / or owners are involved parties. Another major player is ProRail as there is a railroad crossing which plays a crucial role in the solution of this issue. ProRail wants to drop the unguarded crossing and wants to asphalt the expired farm path.

In short, there are three camps in this issue: firstly, there are the residents and / or owners who lose their access. They are in favor of the preservation, or at least a decent replacement of their entrance; secondly, ProRail wants the unguarded crossing gone as it is not safe. Residents also want to get rid of this dangerous crossing. The solution to adjust the railroad crossing has been provided by RWS. For the implementation of the solution, ProRail would have to make a financial contribution. Finally, RWS cancelled the farm path and is looking for a solution. This solution entails a renewed farm path and a cancelation of the unguarded railroad crossing. ProRail helps RWS to pay for this solution.

Noise barrier near Engweg

Residents are involved in this issue. They want a noise barrier that is adapted to their needs. A concrete noise barrier is being built. The residents do not agree with this barrier as it blocks the sunlight as well as their view. They made complaints to the Municipality Utrechtse Heuvelrug (GUH) although they agreed with a completely concrete noise barrier in the first place. The permits have already been awarded by GUH and are based on a complete concrete noise barrier. PvB is involved as constructor and RWS as principal. In order to go along with the residents, the noise barrier will become partly transparent.

4.4 Do not meet predetermined requirements

Renewal acceleration lane Veenendaal 23-23A

When predetermined requirements are not met, there may be a difference of interpretations of these requirements. In this issue, RWS and PvB are involved as well as the Municipality of Veenendaal where the issue takes place, although the latter is involved in a lesser degree. Another party involved is the Regional Service Oost Nederland (RD ON), who is responsible for the acceleration lane of the exit Veenendaal. RD ON is a service of RWS who must approve the placement of a road. They are mainly concerned with traffic safety. Because of the widening of the viaduct of the secondary road network of the A12, a temporary bypass has to be made. See Figure 16 in Appendix II. This bypass is made via the A12. RD ON disagrees with the way of diverting as suggested by PvB, and is in conformity with the contracts.

The issue is a conflict between PvB and RD ON. RWS finds itself in the middle between these two parties. RWS will try, on the one hand, to satisfy PvB, so that it can proceed with the execution. On the other hand, road safety is a major priority and without the approval of RD ON it is difficult to continue. PvB is at a disadvantage because it incurs additional costs. RD ON disagrees with the option PvB wants to carry out following the contract. On the other hand, the public parties harmed, because PvB proposed at a very late stage modifications and does not communicate well about the ideas so that the pressure increases.

4.5 Conclusion

In order to answer the question: *'Which issues occur during the implementing phase of the project A12LuVe?'* we looked into different issues.

It is clear that both RWS and PvB are involved in all the issues. Possibly, they are also the most disadvantaged parties. In some cases, they sustain financial losses. Other stakeholders that are involved are Municipalities and Water Authorities; they are the owners of the areas to be adjusted or the controlling party. Finally, also inhabitants are involved as owners of plots or as citizens who are faced with the consequences of the interventions and are sometimes directly affected, as in the case where they lose access to a road for a long period of time. What emerges in relation to the different types of issues is the following: in the case of issues with 'difference in expectation', both government parties and the third party are at a disadvantage. In the case of 'delay due shortcomings', RWS is the injured party and in issues in relation with 'scope adjustment' the inhabitants involved are at a disadvantage. Finally, in issues which 'do not meet predetermined

requirements', PvB is affected to a smaller extent and so are public parties. However, there is no real proving for all of this, as no major number of cases was investigated. It is impossible to say whether this also occurs in other projects.

The issues described are observed during the execution of the project A12LuVe. This means that they occurred during the implementation of the agreements. In the implementation phase, everything is put together, so issues can arise. In all issues, RWS takes the initiative to search for a solution. RWS does so because, in its role of client, it must pay for all costs that cannot be recovered from other parties. The parties are brought together in order to look at the various demands of all parties. 'Difference in expectation' issues occur when the (third) parties have different expectations of the agreements than RWS and PvB. Terms in the agreements are interpreted differently, for example the issue of the VRI's. In the case of the issue 'delay due shortcoming', third parties, under the care of RWS cause delays. Indirectly, RWS creates delays, which is why the issue occurs. Issues whereby 'changes in the scope' are involved emerge when there are data or drawings overlap from earlier versions of the agreements. For issues that 'do not meet the predetermined requirements' works are not carried out as required by the parties involved. There are differences in opinion that cause these issues.

5. Types of risk in practice

In this chapter, we look into which types of risks are involved in the issues as well as into the various parties involved. The sub-question: *'Which types of risks are brought about by these issues?'* looks into the kind of risks that are involved in the issues. The different types of risks are clarified in the theoretical framework; the issues are described in Appendix II. For each issue, we examine whether 'owner unclear', 'information a-symmetry', 'not enough specified', 'cannot predict the future' and /or 'hold-up situations' occur. These types of risks may occur in the agreements, rendering them incomplete. They are seen as risks because they may lie at the basis of issues. In the conclusion of this chapter, we find Figure 8 showing how often a certain type of risk occurs. This chapter is subdivided in the categories described in the research design, thus giving an organized image of the issues.

5.1 Differences in expectation

Zijdewetering

In the Zijdewetering issue, we find the risk 'not enough specified'. The width of the access road is not clearly specified in the agreements. The installation of the noise barrier has caused the narrowing of the Zijdewetering and the maintenance path. WVE only realized in a later stage that broadening the access road would lead to a narrowing of the Zijdewetering. Therefore, the requirement of broadening the culvert only came up in a later stage. If RWS would have defined the width of the access road and the Zijdewetering clearly in the agreements, this would have been specified and WVE would have discovered it at an earlier stage. Then most probably, they would have realized that it was more practical to broaden the culvert during the implementation of the DBFM-contract.

VRI Hoofdstraat N225

In the issue VRI Hoofdstraat, GUH did not make its demands clear enough, or assumed that everyone had the same perception of a VRI. In this case, the issue 'not enough specified' occurs. There is miscommunication between the different parties. First, GUH is responsible for clearly transmitting its requirements. Secondly, RWS is responsible for verifying whether the requirements are described sufficiently clear and whether the UVO describes exactly what GUH meant in the composition phase. RWS has a 'duty of care' and should support GUH in drawing up its requirements. If RWS would have asked explicitly what GUH meant by VRI, this issue might not have occurred.

Also a 'hold-up situation' is involved here. GUH holds RWS responsible for the changed traffic flow and believes therefore that RWS should solve the problems. GUH clearly assumed that all VRI's were included. GUH runs no direct risk and therefore behaves likewise. They are convinced that the VRI's will be installed because it was agreed that the original situation would be recreated. This makes them more demanding, requiring also the modernization of devices and a connection to the central traffic control center.

5.2 Delay due shortcomings

Remediation emplacement Maarn

In this issue the 'cannot predict the future' incompleteness occurs. The amount of contaminated soil found at the emplacement Maarn turned out to be much greater than was estimated in the first study. Due to this greater amount of contaminated soil, a new permit has to be granted. Both the request for a new permit and the remediation of a greater amount of soil lead to a delay. This was not foreseen at the time of planning. Through the agreement between RWS and NS-Vastgoed there is a change in planning. The agreement that a third party was going to execute the remediation also caused delays.

A 'hold-up situation' also appears here. NS-Vastgoed is bound to invest in a parcel that does not yield any benefits to them. RWS however does benefit from NS-Vastgoed's investment. It becomes complex where the contract states that NS-Vastgoed must pay for the remediation of a parcel that is not theirs any more. What makes it even more complicated is that RWS pays for the remediation executed by PvB, but has to recover this money later on from NS-Vastgoed. It is unsure whether NS-Vastgoed will pay the amount that RWS has in mind. Arrangements have been made about the different amounts that both parties will pay.

This issue is an example of a problem that occurs when third parties are involved in the implementation of a project. Hiring, or shifting work to third parties should be prevented in order to avoid delays. If the UVO describes that a third party executes the work, the party hiring this party is responsible for its actions.

5.3 Adjustments in scope

Farm path 86.7-87.2

There is an 'information a-symmetry' in the issue farm path. ProRail takes advantage of the fact that RWS is adjusting the farm path. They use this to enhance the unguarded rail crossing. ProRail is assured that the situation is thus improved without the negative consequences of road closure. Besides, the image of ProRail is being improved as they close an unsafe crossing. For this improvement of their image, they just have to cooperate with RWS, and pay. The information a-symmetry is situated between RWS and ProRail. ProRail should have informed RWS about their intention to close the railway crossing during the planning phase. RWS would then have been able to contribute to a solution resulting in the least possible inconvenience to the owners and / or residents. In addition, RWS would perhaps have discovered the 'forgotten' farm path earlier, or would have noticed the disappearance of that the farm path in the TB.

Also the risk of 'not enough specified' is present in this issue. This means that the TB is not well specified, and the farm path disappeared. The actual situation was not clear and therefore no alternative was given for the road. In addition, the right of access for the owners was overlooked. ProRail should have specified its requirements better and should have made them public at an earlier stage. It should be noted that RWS refrained from asking ProRail whether any changes were imminent.

There is a 'hold-up situation' involved too. The choice is made to let PvB execute the works as that is more practical. The road could have stayed outside the DBFM-contract but that might have disrupted relations with PvB. The relationship with PvB may be more important for RWS than saving on the additional costs by hiring another contractor.

Noise barrier near Engweg

In this issue 'not enough specified' occurs. PvB did not read the requirements on the degree of absorption of sound well. PvB holds the opinion that glass does not meet the requirements set for noise barriers but no particular requirements were given. The requirements PvB found referred to other noise barriers. The requirements are not well enough specified, as several interpretations are possible.

A 'hold-up situation' is also in place. PvB could exploit the situation by calculating the adaption from concrete to glass as extra work. The DBFM-contract ensures that the risk allocation is adjusted. This PvB charges a higher price. RWS really wants to implement the changes to the noise barrier and will therefore have to pay the amount PvB wants. The subject was negotiated between RWS and PvB.

5.4 Do not meet predetermined requirements

Renewal acceleration lane Veenendaal 23-23A

The issue here is: 'not enough specified'. RD ON's requirements are not well specified in the contracts. RD ON has not clarified the safety requirements of highways as well as it should have. This made it possible for PvB to come up with a different solution than the one envisioned by RD ON. RD ON should have made clearer specifications of its requirements.

If RD ON had shared its knowledge about road safety, PvB might have come up with another solution. This is a form of 'information a-symmetry'; one party has an information advantage over another party. PvB let time go by, thus ensuring that other parties had to work under pressure. By not sharing their ideas and lacking in communication, frustrations arose. This also falls under 'information a-symmetry', as PvB did not share its information.

RD On insists on the solution as was put forward during the consultation. RD ON can make requirements as it does not bear the risk of delays. RD ON's priority is safety. The consequences of RD ON's non-approval do not really matter as they are not a real party in the DBFM-contract.

5.5 Conclusion

With the question '*Which types of risks are brought about by these issues?*' we look into six issues to see whether they are previously determined risks. Figure 8 below, shows the different types of issues and their relation to the different types of risks. Based on the issues described, this table is filled in.

The table shows that 'not specified enough' is the most prevalent risk. This means that not specifying information sufficiently appears to be the biggest risk. In these issues, there is no confusion about ownership. Probably, this is caused by RWS's viewpoint that, as project coordinator, they know exactly who the owner is. Several hold-up situations also occur. The hold-up

can be a result of ‘not enough specified’. In a hold-up situation, one party utilizes the other in a joint collaboration. Possibly RWS wants to maintain good relations with other parties because they may be involved in other projects. RWS often ‘needs’ them. PvB has the privilege to perform most of the extra work. RWS could hire other parties for this, but that would provide much more extra work on communication, planning and coordination.

One would expect information a-symmetry in the category ‘difference in expectation’. A difference in the amount of information causes a difference in expectations. This is not revealed in the issues. This may be caused by the choice of issues or by the fact that the difference in amount of information is not the cause of the difference in expectations.

In ‘delays due shortcomings’, we find no particularities. The shortcomings that cause delays are often shortcomings beyond the power of the parties involved. In ‘scope adjustments’ something may have gone wrong during the negotiations. In the explored issues this was not revealed. What emerges is that ‘not specified enough’ causes scope adjustments. This corresponds with what stakeholders indicated. A number of adjustments are made later because they were not specified enough before. This may be because by the fact that it was not possible to specify more clearly at the time of signing the agreements, or because of negligence. In case of ‘not meeting predetermined requirements’, ‘information a-symmetry’ and ‘not specified enough’ may occur.

Categories of issues → Types of incompleteness ↓	Differences in expectation		Delay due shortcomings	Adjustments in scope		Do not meet predetermined requirements
	<i>Zijde-wetering</i>	<i>VRI Hoofdstraat N225</i>	<i>Remediation emplacement Maarn</i>	<i>Farm path 86.7+87.2</i>	<i>Noise barrier near Engweg</i>	<i>Renewal acceleration lane Veenendaal 23-23A</i>
Unclear ownership						
Information a-symmetry						x
Not specified enough	x	x		x	x	x
Unpredictable future			x			
Hold-up situations		x	x	x	x	

Figure 8: Relation between types of incompleteness and categories of issues.

Hart (2003) focuses on contractual incompleteness, and more specifically, on the idea that ownership of assets gives the owner control and bargaining power in situations where contracts do not specify what has to be done. Hart says that it is important that there is clarity about ownership. The owner makes decisions about that what is not described in the contract and has the residual control rights. The analysis of the issues shows that the owner is clear. Hart says that this is important to avoid incomplete contracts. In addition, Hart says that the government must be the owner, because ownerships give the residual control rights. This emerges from the analysis. Because the government (RWS) is the owner, they ultimately determine how the issues are going to be solved. There is also another side to this, namely that the government should pay for everything other parties do not pay for.

Hart (Hart & Moore, 1988) argues that the transaction costs set a limit to the complexity of contracts. In other words, not all details can be specified because the contract would become too complicated. The analysis shows that 'not specified enough' occurs frequently. A reason could be fear of high transaction costs.

6. Contractual owner vs. actual owner

In this chapter, we will look into the difference between theory and practice. The question ‘(a) *Who are the contractual owners of the risks* and (b) *who bears the risks in practice?*’ consists of two parts. The second part will be answered by looking into the issues who bears the risks in practice, or, according to Hart’s theory, who has ownership. The first part of the question refers to the contractual owner. Who should have ownership in this project and is thus responsible for the risks. In this chapter, we understand the following situations as risks: ‘owner unclear’, ‘information asymmetry’, ‘not enough specified’, ‘cannot predict the future’ and /or ‘hold-up situations’.

6.1 Contractual owners of the risks

The type of contract in this project is a DBFM-contract which is a kind of PPP. In a PPP-contract, all but some contract risks are the responsibility of the principal; the idea is to transfer as many risk as possible. The transfer of risks from RWS to PvB gives (financial) clarity to the government at an early stage, rendering the project manageable. The price to be paid for this is that RWS renounces control over the development process (Kenniscentrum PPS, 2006). The difference between a general PPP and a DBFM-contract is that, in a DBFM, the risks are placed with the party who can control them the best in order to achieve a maximum financial result. Herein lays the difference between the theory concerning a PPP and the practice of a DBFM (Korsten & Eversdijk, 2009).

In practice, it is not so simple to roll out Hart’s (2003) idea of bundling. In a DBFM-contract, the agreements concerning risk transfer are included. These agreements are based on the idea that the party who bears the risks is the most capable one to do so. Thus, added value is created as the responsibility is shared between the principal and the party executing the works. The responsibilities can be divided as shown in Figure 9 (Rijkswaterstaat, 2010).

Principal (RWS)	Executing party (PvB)
Preparation and acquisition of parcels	Design, construction, funding, management and maintenance
Infra provider and traffic manager	Construction permits
Payment compensation for availability	Operational management
Communication with public	Guarantee basic maintenance-level (BON)
Incident management	Technical communication
Final responsible for the section	(Rijkswaterstaat, 2010)

Figure 9: Division of responsibilities in DBFM.

The influence of third parties is a risk that arises from the fact that contracts are incomplete. According to Hart (2003), the ownership – and thus the risks – is transferred to third parties in the case of bundling. In the case of a PPP, the private party will have to bear these risks. The third parties, mostly Municipalities, control the secondary road network. They are the owners in this case and therefore the bearers of the risks. It is therefore not that simple to say who bears the risk of the third parties. The party that does not make sound agreements must bear the risks, or, in other words, must bear the risk of incomplete contracts; this applies to all parties involved.

When we follow the basic ideas of Hart (2003) concerning a PPP, PvB should bear the risks. In practice, this is not the case. The idea is to transfer as many risks as possible, but the private parties must be able to bear them. The costs will have to be assessed and then, an assessment is made of the ability of PvB to bear the costs and of the height of the reimbursement versus the costs to bear the risks oneself. If from a financial point of view, it is more favorable to bear the risks oneself, RWS will not transfer the risks even though this is against the basic idea of a PPP. In the initial phase of the A12LuVe, a risk list has been elaborated. This is a list of risks that can be anticipated, like the increase of the volume of traffic. In the tender, private parties could indicate which risks they were willing to bear. For every risk on the list, RWS had stipulated a fictitious price. When the private party was willing to take over the risk, this price is deduced from the bid, making the bid price lower and making that private party more interesting for RWS.

In the case of a DBFM-contract, RWS buys the availability of the A12 from the constructor PvB. Functional requirements are established that form the basis of the contract. One of the requirements is the availability of the road. The contract also contains requirements that must be executed by the principal, so the constructor can execute its services during the validity of the agreement (Rijkswaterstaat, 2010). If something goes wrong, for example with the design, PvB would be the party that has to bear those risks. An example could be the incomplete design of sound barriers. The adaptation costs, or the new design, are for PvB. They are responsible for the design in the DBFM-contract.

6.2 Bearer's risks in practice

Practice will be analyzed making use of the earlier analyzed issues. In the course of the A12LuVe, issues have occurred that emerged under the influence of third parties. This shows that in practice, it is not so evident that PvB should bear the risks, although it is the contractual owner.

In the Zijdewetering issue, mistakes were made by WVE as a third party. It discovered the dirt-collecting place too late. Furthermore, WVE does not agree with a widening of the Zijdewetering, causing the necessity of an adjustment of the maintenance road. The risks for the changes that WVE wants are born by RWS. RWS pays for the extra costs made because of PvB's extra construction works. The risk belongs therefore to RWS where, in theory, it should belong to PvB as the constructor and thus owner of the works belonging to the DBFM-contract A12LuVe.

In the issue VRI Hoofdstraat N225, there is a lack of clarity about the VRI's. RWS and PvB have agreed to restore the secondary road network to the original conditions adapted to the new situation of the widened A12. GUH wants VRI's fitting the most modern technologies. Besides, more VRI's are being constructed. The extra works to be executed by PvB must be paid for. RWS will pay along or, in other words, RWS pays for the 'mistakes' made by GUH. If GUH had been more specific from the start about the number of VRI's, no extra works for PvB would have been necessary. RWS pays for this issue and thus bears the risk of the third party. In principle, PvB bears the risk of faulty (design) specifications.

The issue of the remediation of the emplacement of Maarn implies the engagement of third parties. The risk bearing party is the one hiring those parties. Here, RWS bears the responsibility for NS-Vastgoed. In this case, things are slightly different as NS-Vastgoed, in its contract with RWS, has stipulated that it is responsible for extra remediation. NS-Vastgoed pays for the remediation executed by PvB. RWS though finds itself in the middle of this. RWS pays for the works instead of NS-Vastgoed, the risk that NS-Vastgoed does not repay these bills to RWS is borne by RWS.

In the issue Farm path 86.2-86.7, it is RWS itself that made a mistake by cancelling the farm path. On top of that, ProRail figured that also the unguarded level crossing had to be cancelled. The costs of a renewed farm path, as an alternative for the unguarded level crossing, are paid for by RWS and ProRail. ProRail could have indicated at an earlier stage that the unguarded level crossing would be closed. PvB then could have included that in the plans earlier. The risk for the third party is borne by RWS. This is also due to the fact that RWS was present when the plans were drawn up and it has the contacts with the third parties. The theory of a DBFM giving all design responsibility to PvB does not work in practice, as RWS continues to participate in the execution of the design.

After complaints by inhabitants, adjustments are made to the sound barriers near the Engweg. As this is done after approval of all the plans, the adjustments will be paid from incidental expenditures. It is difficult to say who the bearer of this risk is. On the one hand, complaints of inhabitants are a risk for both PvB and RWS as they are adapting the A12 together. On the other hand, it is mainly RWS, as principal, who is focused on a good image for itself and the project and it will therefore make the adjustments and pay for them too.

In the issue of the acceleration lane Veenendaal 23-23A that needs to be extended in order to create a temporary route, dissension arose about whether the mistakes made were caused by shortcomings of the principal or by special circumstances. PvB is convinced that they remained within the limits of the contract with their alternative route, while RD ON takes the view that the re-routing is not safe enough. The lax attitude of PvB also plays a part; they indicated their alternatives and answered RWS's questions very late. In this issue, PvB complies with the requirements that were stipulated, but not with the requirements as RD ON interprets them. The risk that PvB interprets requirements differently is borne by RD ON and, therefore, by RWS. At the time of writing the discussion about who bears the responsibility and who should pay is still ongoing.

The issues partly came into existence through incompleteness of the contracts. Incompleteness of contracts results in RWS taking (back) part of the risks. These are mainly the risks related to third parties. According to Hart (2003), PvB should bear those risks. In reality, RWS stays with the risks related to third parties.

6.3 Conclusion

In answer to the question '*(a) Who are the contractual owners of the risks and (b) who bears the risks in practice?*', we can say that there is a discrepancy between theory and practice in this project. According to Hart (2003), RWS transfers the risks to PvB and PvB gets reimbursement in return.

In practice, the agreements say that all parties should make an effort to create provisions that make the realization of the project possible within the limits of each ones possibilities. This means that all parties bear a part of the risks involved. Furthermore, certain tasks are awarded to a certain party. The Municipality for example has the task to provide the necessary municipal permits in time and to grant access to the grounds on which the works will be executed. The costs Municipalities make to assess and prepare changes proposed by the principal, are paid for by RWS but are passed on to PvB. RWS's risk is that PvB does not want to pay back certain costs. In case the Municipality itself wants to make changes, the costs for the preparation of such a change are borne by the Municipality itself.

The agreements also contain the points of departure of RWS: the quality and functionality delivered must be minimally the same as the quality and functionality before the execution of the works. RWS bears the risk and the costs for the realization of the project A12LuVe. RWS is also responsible for the execution of adjustments and the maintenance by PvB as described in the law and regulations concerned. RWS always bears the final responsibility and therefore also the risks.

According to Hart's (2003), PvB should bear the risks here in theory. In practice, it is RWS who bears the costs although it has transferred the ownership to PvB. This is possibly caused by RWS's duty of care. *When damage is caused by third parties, the principal is responsible for the repairs based on the final responsibility it bears for the performance of the system. The principal cannot be accountable for costs of non-availability due to an incident. The principal can be made accountable for the execution of repairs within a stipulated amount of time by order of the road maintenance authority so that availability is restored* (Rijkswaterstaat, 2010). An example is the replacement of a crash barrier. As road maintenance authority, RWS has an administrative responsibility concerning the A12. The A12 remains property of RWS with all concerns and obligations belonging thereto. By contract, RWS has agreed to take the responsibility for bringing the secondary road network back to its original state after the widening of the A12. Due to its responsibility, RWS must bear part of the risks itself and they can thus not be transferred to PvB according to the PPP norms.

7. RWS as bearer of risks

This research was executed from the viewpoint of RWS. RWS is the road maintenance authority of the A12. It is not wholly responsible for the secondary roads. Usually, the Municipalities are responsible when roads are located on their municipal territories. Also the Province of Utrecht is responsible for parts of the secondary road network. RWS is the principal of the project. The secondary roads have to be adjusted because of the adaption of the A12. Municipalities and Provinces are obliged to collaborate, both for their own sake, but also for the common good, which is: good traffic flow for all road users. The question of this chapter is: *'To what degree does RWS bear the risks because it is the administrator of roads or because the agreements were not well elaborated?'* We look into this question from the viewpoint of RWS.

7.1 RWS as road maintenance authority

RWS is the road maintenance authority for the A12 and not for the secondary road network. The Municipalities and the Province are responsible for the latter. See Figure 10 (Rijkswaterstaat, 2012) below: the A12 is managed by RWS, the N225 by the Province and the smaller roads by the Municipalities.

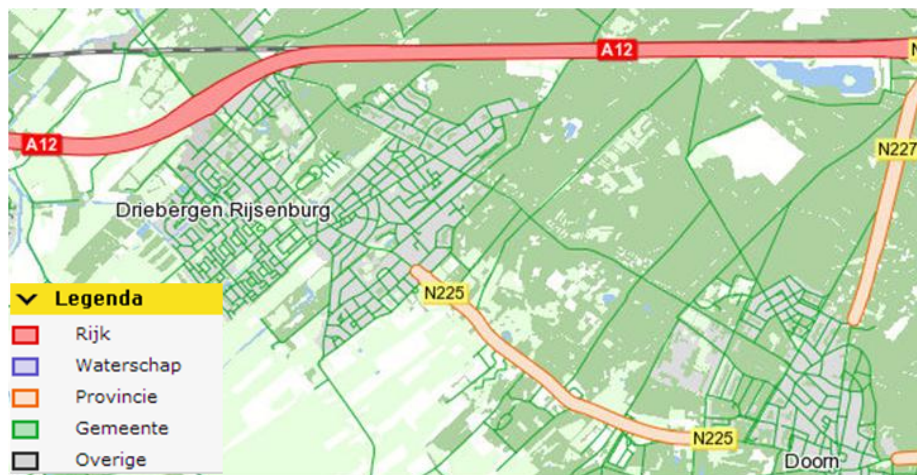


Figure 10: Road maintenance authorities.

Each authority is responsible for its own road. Nevertheless, RWS takes up the general responsibility. An example is the issue VRI Hoofdstraat. GUH is the maintenance authority of the Hoofdstraat but still RWS throws in a hand to solve this issue. This is due to the principle RWS employs in the agreements. RWS wants to achieve that the adjusted roads are minimally of the same quality and functionality after the execution of the works. Therefore, it bears the risks and bills for the realization of the A12LuVe project.

In practice, it turns out that RWS sticks to many of the risks, as in the VRI Hoofdstraat, where it pays along in order to solve the issue. This can be due to the administrative provisions RWS has to comply with. This duty, described in the contracts as 'restoring minimally the same quality and functionality', is responsible for the fact that RWS takes up the 'duty of care'. RWS attends to the fact

that third parties like Municipalities, collaborate and supply the correct information and permits so PvB can execute the works.

When looking into Hart's (2003) idea, wherein PvB has to bear the risk as the one executing, we find that this is not the case in practice. In reality, RWS remains the final responsible, also due to the duty of care. This duty stems from the administrative provisions concerning the A12. The A12 remains the property of RWS, which is why RWS continues to bear a part of the risks itself and does not transfer them, as it should according to the PPP-idea.

RWS could transfer the risks belonging to the ownership of the A12 to PvB. Thus, also the risks stemming from third parties would be borne by PvB. But RWS, as the principal, does not transfer the risks automatically to PvB. One of the reasons is that this would be very costly. Transferring costs entails high transaction costs (Williamson, 1998). For RWS, to transfer the risks, there should be some reward attached. The division of risks in reality does not concern who is able to manage the risks best, but who can manage the costs of these risks best. In other words: who can bear the costs best instead of who can bear the risks best.

Certain public risks can be transferred by way of a PPP. A reason to transfer public risks to PvB is increased efficiency. The government – and therefore also RWS – is rather cumbersome; taking decisions could therefore take more time. A reason not to transfer the risks is a possible loss of influence. Less supervision can thus be exercised while this is important as it is a matter of public interest (NederLandBovenWater, 2012). Besides, lots of risks are difficult to estimate and they can incur high costs. Financial grounds are the reason to keep the risks with RWS. When the risks would be transferred to PvB – following the PPP-idea – RWS would have to pay a lot of money. After all, high risks and risks that bring about high costs will be charged by PvB. RWS would thus have to pay, no matter how, whether the risk occurs or not. When RWS bears the risk itself, it will only have to pay when it happens.

7.2 Elaboration agreements

RWS is responsible due to its public function of road maintenance authority. There are private possibilities though to transfer these responsibilities to a private party. This can be done through agreements and contracts. Agreements can be not well elaborated. The costs of issues that stem thereof must be borne by one of the parties. There is always someone who bears the risks. From practice emerges that RWS takes on the costs in some cases as in the case of the Zijdwetering, where RWS partly pays for the adjustments. The reasons why RWS does this, although they are not obliged according to the PPP-idea of Hart (2003), can be various: image, ignorance and duty of care are some of them.

Who bears the risks is mostly determined by how the agreement was elaborated. More risks could be transferred to the private party according to Hart. The fewer specifications, the more risks can be transferred in order to make it more profitable. With fewer specifications, the private party has more freedom to execute the construction to its own interpretation. When a great part of the risks is borne by the public party though, the private party will put less effort in avoiding risky investments. It will take exactly more risks when that diminishes its cost. The result is poor quality and a

government maintaining high risks (Habets, 2010). The government has to assess whether to stick to some risks and thus bear their costs or to transfer both risks and costs.

In the case of a DBFM-contract, the risks are shared in such a way that it is favorable for both parties. The risks that cannot be borne by the private party, as they are too expensive for example, remain the responsibility of the government. In this way, the PPP-idea of Hart (2003) is adapted to practice. This is also caused by incomplete contracts; in practice, there are more than just two parties involved. These other parties are one of the reasons of incompleteness, like information asymmetry, not enough specified and hold-up situations through risks. The owner, as meant by Hart (2003), cannot bear the risks. If projects would stand-alone and have no interfaces, risks could be avoided. But there are always interfaces that can cause hold-up situations or information asymmetry. The interfaces in the A12LuVe project are situated in the secondary road network, involving third parties like Municipalities. It is therefore important that in all agreements it is clearly specified what belongs to who.

When an agreement is badly elaborated, it may not be clear who is responsible and, consequently, who bears which risks. In this project, this is mainly related to third parties who also have influence on the execution. Municipalities and Water Authorities also have certain requirements and wishes that have to be complied with. They also exercise their influence on the execution by, for example, requiring adjustments at a later stage as in the case of WVE. When the agreement is not well elaborated, it is difficult to establish who will have to pay for the adjustments. On one side, there are the third parties, like GUH, that are of the opinion that RWS wants to adapt the A12 and is therefore responsible for adjustments to the secondary road network or in other words 'RWS wants adjustments so they have to pay'. This is one of the reasons why in not well-elaborated contracts, RWS bears the risk.

On the other side, there are also third parties who are ignorant. RWS, as a big government body, is mainly involved in projects executed in the PPP way. A Municipality like GUH is suddenly confronted with such a project. They can co-decide because they are a road maintenance authority, but they lack the knowledge about this kind of contracts. This can create lacuna in the agreements; as Municipalities do not know the procedures exactly and therefore, do not communicate all requirements straight at the beginning. This is why third parties, like Municipalities, are taken under the care of RWS. This way, RWS takes both the responsibility and the risks that emerge from ignorance of third parties under its wing. The learning process of Municipalities is the reason why RWS bears risk it should not wear.

When we look into the issues in practice, it turns out that RWS supports the risks of third parties in order to avoid further issues. In the Zijdewetering issue, WVE brings along extra requirements. WVE comes very late with these requirements through ignorance or inattention. The costs of the adjustments that have to be made to the plans are borne by RWS. In this issue, it is not so much an incomplete contract that makes RWS bear the risks, it is that they are landed with the results of late reactions of third parties. This could have been avoided by explaining the procedures to WVE or by involving WVE earlier in the design process.

The issue of the VRI's is full of vagueness. For example, it is not clear for the involved parties what a VRI is exactly. As the VRI's have to be adjusted to the new traffic flow anyway, RWS and GUH pay together. In this issue, certain obscurities on certain aspects apply. It is difficult to state here that RWS pays along because the agreement was badly elaborated. There exists a link though. In the issue with NS-Vastgoed, RWS pays the costs initially. This way, delays are avoided. The risk that NS-Vastgoed does not pay up in the end is borne by RWS. This issue is not so much a badly elaborated agreement but rather the future that cannot be predicted.

In the issues farm path and unguarded railway crossing, the reason for RWS paying along with ProRail is not an incomplete contract either. ProRail should have been involved at an earlier stage of the planning, which might have resulted in an earlier awareness about the planned disappearance of the unguarded railroad crossing. The consequences of involving ProRail too late are incomplete plans, i.e. no passageway for the inhabitants and owners.

In the issue of the acceleration lane near Veenendaal, differences in interpretation cause problems. This may be due to an incomplete contract. RD ON's requirements are not well elaborated and therefore incomplete. In principle, PvB has to present a new proposal to RD ON and RWS is herein no party. It is difficult to say here that RWS bears the risk.

A reason why RWS prefers to solve certain issues itself is its image. We already saw this in the issue of the sound barrier, where RWS and PvB accompany the wishes of the inhabitants while they are not obliged to do so. A citizen who is dissatisfied gets vexed easily while a satisfied citizen can accept that the installation of a sound barrier comes with certain inconveniences. When the image of RWS is good, it works as a buffer in other issues like the temporary closure of a road. As a good image is worth so much, RWS will sometimes choose to pay for things that are not its responsibility.

7.3 Conclusion

It is possible for RWS to transfer public responsibilities surging from road management to a private party. It can do so by private contracts like a DBFM-contract. In this chapter, we saw that RWS does not always transfer responsibilities to PvB. We looked into the reasons why RWS would want to bear certain risks. The sub-question *'To what degree does WRS bear the risks because it is the administrator of roads or because the agreements were not well elaborated?'* can be split up in two parts. First, we looked into the road management of RWS, and then we entered into the incomplete agreements that have an influence on the risks borne by RWS.

In short, RWS bears some risks not just because it is the road maintenance authority, but also because it takes up the final responsibility for rendering everything to the same quality and functionality level. The costs of transferring risks are outweighed by the advantages for RWS if all risks were borne by PvB. It is too easy to say that RWS bears the risks because agreements are badly elaborated. RWS tries to solve issues that are caused under the influence of third parties. In that sense, RWS bears the responsibilities and therefore the risks of third parties. There are many reasons why RWS takes the responsibility, like its chosen duty of care, which it should not take according to the PPP-idea of Hart.

8. Conclusion

In order to answer the research question *'To what extent does a DBFM-contract give guarantees that risks resulting from incomplete contracts will be borne by their indicated owner?'*, sub-questions have been established. These sub-questions have been answered in the previous chapters.

From the first question *'Which issues occur during the implementing phase of the project A12LuVe?'* emerges that besides RWS as principal, and PvB as constructor, also other parties are involved. These parties can be subdivided in other governmental parties like Municipalities and Water Authorities and residents and / or landowners. From the investigated issues emerges finally that also other parties are involved in the execution like ProRail and NS-Vastgoed. All these third parties have their own interests and RWS assumes responsibility to act in their interest as much as possible.

With the second question: *'Which types of risks are brought about by these issues?'* we looked into six chosen issues to see whether a number of determined risks are in question. These risks are established in the theoretical framework. They mostly stem from incompleteness of agreements. We could say that the main risks are attached to not well-specified information. A number of hold-up situations also occur. They can be the result of a lack of specification of the agreements. When the ownership is not clear, it is not clear who bears the risks surging from incomplete contracts. In these issues, there is no confusion about ownership. This can be caused by the fact that, seen from RWS's position as principal, there is clarity about the ownership. In that sense, the risk would be borne by the correct party.

To the third question *'(a) Who are the contractual owners of the risks and (b) who bears the risks in practice?'*, the answer is that there exists a difference between theory and practice in this project. According to Hart (2003), PvB should bear the risks. In practice though, RWS bears the risks even though RWS has transferred ownership to PvB. This can be due to RWS's duty of care. RWS has agreed in the contract that it will take care for restoring the secondary road network to its original state after the widening of the A12. RWS, as road maintenance authority, bears the public responsibility of the A12. The A12 remains the property of RWS, including all care and duties. Due to this responsibility, RWS has to bear a part of the risks itself and it cannot transfer them to PvB as would be logical following the PPP-idea. The contractual owner of the risks is divided. A part of the risks is transferred by RWS to PvB. An example is the design of the sound barrier. Under the influence of third parties that have other requirements, RWS becomes involved in the design. RWS takes the responsibility back from PvB. Following Hart's theory, PvB should bear the risks of the design.

The fourth question looked into is: *'To what degree does RWS bear the risks because it is the administrator of roads or because the agreements were not well elaborated?'* In principle, RWS is the road maintenance authority of the A12. Municipalities and Provinces are responsible for the secondary road network. Certain responsibilities are attached to being the road maintenance authority. These public responsibilities entail for example to keep the road accessible to the public. By means of a DBFM-contract, private responsibilities can be transferred to PvB. Then PvB would bear the risks belonging to the road maintenance authority. In the A12LuVe project, not all risks are

transferred to PvB. This is also due to the fact that this would be very costly and therefore financially unattractive. When PvB bears an expensive risk, it wants to be paid for that, regardless of the fact whether the risk occurs. When RWS bears the risk itself, RWS has to pay up only in case the risk occurs. RWS has also taken the final responsibility for restoring everything to the same standards of quality and functionality as before. It seems that RWS does not so much bear the risks of a badly elaborated agreement, although this cannot be deducted from the issues. What seems to be happening more is that RWS feels responsible for the influences on third parties. Therefore, it wants to solve the issues. Other factors – like the self-induced duty of care – make RWS want to bear the risks that should be borne by PvB according to the PPP idea of Hart.

Returning to the research question of this research *'To what extent does a DBFM-contract give guarantees that risks resulting from incomplete contracts will be borne by their indicated owner?'* DBFM gives 'no' guarantee that the risks are borne by the contractual owner. In practice, RWS, as road maintenance authority, remains responsible for a number of risks that should be transferred from the principal to the constructor according to Hart (2003).

Incomplete contracts can create issues. These issues are also caused by influences from third parties like in the disagreement concerning VRI's. The influence of the third parties can be interpreted as a risk in the contract. It is possible that a third party does not comply with agreements made, like in the decontamination issue. It is also possible that a third party has another interpretation of the agreement. The other interpretation is a risk stemming from incomplete contracts. If the contract had been complete, it would have been clear to all parties what was meant by a VRI.

Hart (2003) is very clear about ownership. In a bundled contract, like a DBFM, the risks are transferred from the public to the private party. The private party thus takes up all responsibilities that pertain to ownership, including the risks of incomplete contracts. According to private law, it is possible within a DBFM-contract to transfer risks. When one of the parties does not comply with the contract, this can be settled by a qualified civil court. RWS can transfer the risks of the third parties to PvB. This has not happened because RWS has imposed upon itself a 'duty of care'. This duty makes that RWS takes the third parties under its wings and the third parties therefore see RWS as the responsible party. Because of the adjustment of the A12, the secondary road network has to be adjusted too. RWS has therefore indicated in the DBFM that it takes the responsibility of restoring minimally both quality and functionality. Third parties, like Municipalities, will hold RWS responsible for this.

In practice, it turns out that the risks of the ownership are not as easily transferred from RWS to PvB. This is due to the high costs incurred. The risks of a road maintenance authority can be very expensive. A closed road costs a lot of money to society. Transferring these public tasks does not come cheap. When RWS wants to transfer a high risk to PvB, PvB will in return demand a high compensation. RWS will have to pay this regardless of the fact whether the risks occurs. When RWS stays in command of this risk, it will only have to pay in case the risk occurs. The owner, as meant by Hart in a DBFM, does not bear all risks.

A DBFM-contract does not guarantee that a private party takes over the risks from a public party. It is first decided who can bear the risk best. RWS also wants to keep its honor as road maintenance authority. RWS self imposes a duty of care, in order to protect third parties in a DBFM-project. In short, DBFM does not give guarantees that risks, emerging from incomplete contract, are transferred to the owner, as meant by Hart, like in the discussion about the VRI's.

8.1 Recommendations

Degree of specificity

The degree of specificity is one of the main points in incomplete contracts. According to theory, data have to be amply specified in contracts. Too much specification leads to high transaction costs, while too few specifications can lead to issues and costs afterwards. When data are too well specified, the idea behind a PPP and a DBFM is lost. This idea is exactly that the (free) market results in lower costs. When the government over-specifies, there is less creativity because the private party cannot take any more decisions. This ensures that there is less innovation and efficiency. On the other hand, when the requirements are not well specified, issues can emerge that cost money. These costs may not be higher than what is saved by signing a DBFM-contract. The decision between investing beforehand and keeping control or investing afterwards in order to solve issues, is one that has to be taken for each project. A balance needs to be found between the two.

It is advisable to prepare agreements well. This means that sufficient investments have to be made in the collection of requirements and wishes. By clarifying things at an early stage, making them more specific or informing third parties about the possibilities of wishes and requirements, several issues can be avoided. The saying: 'the first blow is half the battle' certainly applies here. The other side of it is that lots of time has to be invested in the establishment of the agreement. The question is whether this time is available and whether this thorough preparation pays up. It has to be avoided that the costs for the preparation become so high that the agreement yields less.

Access to information and training

When the parties share information, there is less chance of confusion between them. An example is that RWS has to ask Municipalities clearly what its plans are. RWS has to know the exact plans of each party. What are the interests and how can they be implemented in the agreements. RWS will have to clarify the interests before. This is part of the 'duty of care' of RWS. This is expressed in the contracts of RWS. RWS has to share information or make clear what is going to change. Besides it has to inform the Municipalities about what is expected from them; how they have to formulate their requirements; which requirements they can make and when they have to communicate them. Thus, a Municipality becomes a full partner and can communicate in the same way as RWS. Communication between the various parties is also necessary. Things have to be transferred or said at certain points in time. This way, the other parties have time to prepare the next step and can anticipate on new ideas or events.

Third parties, like Municipalities or Water Authorities, must be involved in the plans regularly. During the planning, for example of a road widening, third parties must already be involved. Their requirements and wishes can thus be included 'at the drawing table'. Including wishes at an early stage, reduces the costs of adjustments. Besides, when Municipalities are involved at an early stage,

they are also aware of what will happen and can introduce new wishes. A way to involve third parties like Water Authorities in the process of planning is training them and thus introducing them in the system. In general, Municipalities are not well informed. They are not daily confronted with DBFM-contracts and are not sure what is expected from them. When they are not well trained, they are no efficient partners in the process and issues will arise. Training can be done through courses, presentations etc. so third parties get to know the content of DBFM-contracts. When RWS creates more awareness about this kind of contracts, communication will be smoother as Municipalities also know how to discuss.

Further research

This research only goes into a small part of a very big contract. Possible further research should not only look into the issues stemming from UVOs, but should be broadened to, for example, secondary agreements of a DBFM-contract. More problems can be analyzed here. Investigating more issues gives a higher degree of reliability. In this research, the choice was made to analyze one project. A comparison between various projects could possibly give more insight as each project has other parties involved.

This research was executed from the perspective of RWS. An eventual further research could also look into other perspectives of private parties or third parties like Municipalities. This would present another view on the problems as each party has its own vision and has experienced the problems in its own way. A comparison of various insights gives a more complete image of a problem, but more time will be necessary to prepare and to make contacts. The analyzed issues are mainly issues that are already solved and the involved parties already 'left the scene'. This makes it more difficult to hear all sides to the story. In further research, one could look into the process leading up to the issues. In other words, the research should not take place during the execution phase, but before that, for example during the elaboration of the UVO and UWO.

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Appendix I - Overview of issues

As stated in the research design, there are several categories of issues. In the Table below, Figure 11, these issues are shown. After that, a brief explanation will follow.

	Category	Issues
A	Differences in expectation	
A1		Zijdewetering
A2		VRI Hoofdstraat N225
A3		Unknown status third area location Mollebos
A4		Interpretation public lightning
B	Delay due shortcomings	
B1		CityTec too late with lightning plan
B2		Remediation emplacement Maarn
C	Adjustments in scope	
C1		Bone roundabout
C2		Replacement sewage system N418
C3		Farm path 86.7-87.2
C4		Noise barrier near Engweg
D	Do not meet predetermined requirements	
D1		Renewal acceleration lane Veendaal 23-23A
D2		Contrasts in scope of Laagerseweg in UVO and drawing

Figure 11: Overview of issues.

A1. Zijdewetering

This issue consists of two parts. Firstly, WVE has laid down a protection zone in the 'Waterlegger' on either side of the Zijdewetering. The Zijdewetering is a primary or secondary waterway with maintenance zones. The question is whether these zones should be maintained or that a sound barrier can be placed in this area. In the TB the placement of a sound barrier on the slope of the Zijdewetering is included. Therefore, there is no area left for a maintenance zone. Secondly, WVE wants to realize a dirt-collecting place. This dirt-collection place is necessary because otherwise the widening of the culvert under the A12 is not possible. The dirt-collection place must be unlocked through an access road. RWS has given no approval for this access road.

A2. VRI Hoofdstraat N225

There is disagreement about the modernization of the VRI at the intersection Hoofdstraat/Nijendal. According to RWS and PvB this VRI does not belong to the scope, while GUH argues that the VRI is an integral part of the VRI Loolaan and should therefore also be modernized. GUH also wants a connection between the provincial traffic center and the VRI's Loolaan and Nijendal because these VRI's are sharing an automat. There is uncertainty about the concept VRI. GUH assumes that a VRI refers to the series of VRI's on the Hoofdstraat, as they are interconnected, while RWS (and PvB) argue that the concept of VRI stands for one installation per intersection.

A3. Unknown status third area location Mollebos

Through the unknown status, the third area in relation with both the contract- and plan boundaries is not clear enough. The contractor sees no distinction between areas that RWS manages and areas where RWS is the interested party. An example is the Location Mollebos. On this location, a wildlife crossing is build. The grounds belong not only to RWS, but also to the estate Noordhout and nature and forest parties.

A4. Interpretation public lightning

There is a difference in the interpretation of an article of the UVO between RWS, GUH and PvB. RWS and GUH understood that PvB would temporary account for the public lighting while PvB is working on the secondary road network. PvB interprets it as a requirement of coordination of the temporary public lighting.

B1. CityTec too late with lightning plan

CityTec was hired by the Municipality to design the lightning plan. CityTec ignores the architectural design of the artworks, like bridges. The Municipality GUH is responsible for its control. This can cause problems in the design of the pipes and fittings. PvB designed on basis of the (wrong) data of CityTec. CityTec only supplied lighting plans for the artworks and not for the street lighting. As a result, RWS cannot verify the costs of the lighting.

B2. Remediation emplacement Maarn

RWS has carried out additional ground investigations near the railway emplacement Maarn. RWS bought this emplacement from NS-Vastgoeds and has requested the contractor to clean up the contaminated ground. These are additional activities for PvB. During the procurement phase, it is explicitly indicated that the remediation should be done by a third party, and it is therefore not included in the scope of the contractor. Through the extra contamination, the third party cannot remediate on time.

C1. Bone roundabout

An adaptation of the bone roundabout and the N226 is required, because of an underpass of ProRail. An example in this issue is the desire of the Municipality to perform the conductors with pearl gravel in asphalt. This means more work for PvB.

C2. Replacement sewage system N418

At the Nieuweweg –north (N418) the sewer system should be replaced. The N418 and N233 cross each other. PvB does not reconstruct the road N233; thus, there is no synergy. Moreover, after renewal, HWA is not longer possible.

C3. Farm path 86.7-87.2

The A12 runs along the farm path 86.7-87.2. Through an error in the TB, this farm path disappeared during the widening of the A12. A result is that two agricultural parcels are no longer accessible. An alternative route via a railway crossing also expires because it is an unguarded crossing. ProRail wants to close this transition. Therefore, the farm path should remain.

C4. Noise barrier near Engweg

A noise barrier near the Engweg had to be made transparent, based on an initiative of the environment (residents). These residents want to keep sufficient light and do not want their view obstructed. A transparent noise barrier was the original intention. However, for unknown reasons, this was not included in the agreements.

D1. Renewal acceleration lane Veenendaal 23-23A

Regarding the traffic situation near Veenendaal, RD ON did not agree with the proposed solution of the contractor. This solution was contractually appropriate though. RD ON expressly required that the proposed handling of the traffic was authorized only if use were made of a temporary acceleration lane. This is an additional requirement for the contractor.

D2. Contrasts in scope of Laagerseweg in UVO and drawing

There are contradictions between the DBFM and the requirements of the stakeholders. In addition, there are also contradictions between the UVO and the annexes of the UVO. The scope in the UVO for Laagerseweg is different from the (contract) drawings.

Appendix II - Description of the six issues

1. Zijdwetering

Along the northern driveway Veenendaal, a 95 meters long noise barrier is installed. This appears at the upper side of the current talus. This does not create a maintenance path of 4 meter wide on the south side of the Zijdwetering, which was defined in the founder of the Water Authority Vallei and Eem (WVE). This access road, or actually maintenance path, must be 4 meters wide, in order to do properly maintain this side of the Zijdwetering. In the TB is described that the access road is created by narrowing the Zijdwetering. In Figure 12 below, the issue is depicted.

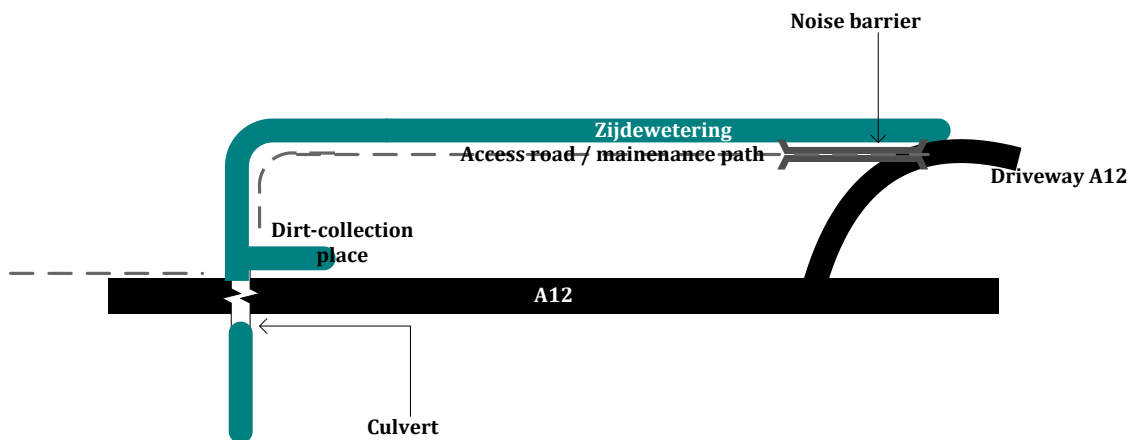


Figure 12: Situation Zijdwetering.

According to WVE, an unacceptable situation arises because of this narrowing. The flow profile is reduced and it creates a risk of limiting the flow of floating debris. WVE wants to maintain the existing situation according to the founder of the Water Authority. In this founder appear, for example, the measurements, debtors and liabilities. During discussions between RWS en WVE about the width of the maintenance path, WVE suddenly came up with the message that the culvert had to be widened. This was another issue. WVE wanted an increase of the capacity of the culvert under the A12, according to new standards. The widening of the culvert is not included in the contract with PvB although it should have been as the culvert is located within the contract area. The narrowing the Zijdwetering for maintaining the maintenance path was not noticed by WVE. RWS had to recover the error in the TB.

WVE is of the opinion that the TB and the water management plan set out the main lines; the details are filled in later. In addition, WVE requires that RWS agrees to cooperate in solutions to bottlenecks in advance. RWS thinks that it is not possible just to change anything in the TB and the ensuing DBFM. WVE believes that RWS is responsible for the proper functioning of the culvert under the A12. This impasse threatens the progress of the realization of the A12LuVe. In the initial phase, WVE has not made enough use of existing (legal) ways and tries to make up for that afterwards. In addition, it tries to fit the culvert into the existing agreements. PvB (and RWS) should adhere to the TB.

The Zijdwetering is not narrowed at the location of the noise barrier. To solve the problem concerning the maintenance path, it was decided to relocate the maintenance path to the other side of the noise barrier. On this side a farm access road is planned. The only thing that has to be adapted to this path, so it meets the requirements of WVE, is that it should be widened from 3 to 4 meters. The issue with the culvert, that will (eventually) have insufficient capacity, is resolved by creating a (temporary) dirt-collection place. The culvert has to be widened eventually because WVE concluded that in the future this culvert will no longer meet the requirements. The new dirt trap is made on rich ground. RWS is willing to cooperate with WVE to broaden the culvert during the operational phase. This is possible outside the DBFM-contract through adjustments in the contract, because the culvert is outside the contract territory.

WVE designs the dirt trap and performs the preparatory work. It also contributes to the realization of the dirt trap and thereby agrees with the contractor (PvB). The costs of these preparations are a contribution of WVE. WVE also provides the legal anchoring and its costs, i.e. adjust the layer of water. The notary and land registry fees for establishment of legal and property rights are also for WVE. In addition, the maintenance of the dirt trap is WVE's responsibility. The government then takes charge of the design and the (preparatory) work for the realization of the maintenance path for the dirt trap. Also the design and (preparatory) work of the realization of the maintenance path at the back of the noise barrier, goes to the government. In addition, it provides the legal anchoring of this work, i.e. Public Works Management Act permit. The costs of this work are borne by the government, just as the maintenance of the sound barrier and maintenance path.

The realization of the culvert is independent of the implementation of the A12LuVe project. WVE wishes a rapid realization, because that reduces the consequences to a minimum. No later than a few months after the widening of the A12, the culvert should be realized. RWS provides assistance to come to an early realization. WVE carries out an evaluation in 2017/2018 to see what effect the dirt trap has. Then, the decision will be taken whether the culvert will be widened. The solution of this issue is brought forward.

The solution of the dirt trap was made possible because it was impossible to widen the culvert during the execution of the DBFM-contract. A DBFM-contract cannot easily be adjusted without high transaction costs through changes in risks. The contract does allow changes in the contract. This can be done through suggestions both by the client and by the contractor. Probably, a change costs more than a solution included in the contract. The widening of the culvert is not possible within the contract because it was not included. When it is carried out, it is counted as extra work and the schedule must be adjusted. This may cost more than a dirt trap in itself. In addition, the widening of the culvert is not required at this moment, but may be in the long term.

There are costs incurred to create the dirt trap, but these are not included in the project estimate and therefore fall outside the DBFM. At the time of writing, the solution is not yet implemented, so the costs are not clear. Because these costs fall outside the contract, they are not that important. Probably there will be an increase of costs for the widening of the access road from 3 to 4 meters on the other side of the sound barrier. There are also other expenses, as there has been much discussion between RWS and WVE about solutions. In these consultations, there were many

frustrations. Legally, WVE may not use this issue improperly. Examples are the delay of the selection permit or set out unreasonable conditions to PvB. WVE can also frustrate other projects.

2. VRI Hoofdstraat (N225)

The traffic flow on Hoofdstraat (N225) in Driebergen, managed by GUH, is a very important issue for the Municipality. This flow is strongly influenced by the railway crossing in the north of the A12 and some traffic control systems (VRI's) between the A12 and Driebergen. The opinion of GUH is that the widening of the A12 causes the traffic flow problems and indicates that RWS has to solve them. GUH wants the entire row of VRI's renewed by PvB in order to ensure a better traffic flow. The following map (Figure 13) shows the VRI's by using traffic lights. The pink line is the contract boundary, which belongs to the DBFM-contract. Everything within the contract boundary (left of the line) is included in the contracts and agreements. PvB includes the VRI's inside this area. The changes will ensure that the VRI's of the Hoofdstraat maintain the same quality and functionality.

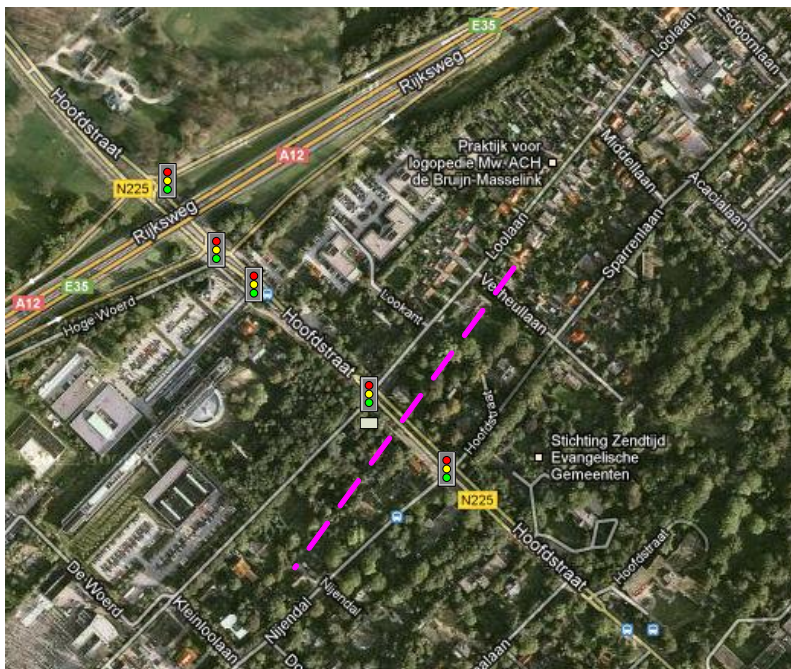


Figure 13: VRI's Hoofdstraat

GUH addressed the bottleneck at the intersections Hoofdstraat / Loolaan and Hoofdstraat / Nijendal. Hereby there are several points of misunderstanding. Firstly, there is confusion about the concept of VRI. GUH assumed that the term refers to a series of traffic facilities on Hoofdstraat that are linked with each other. The VRI's Nijendal and Loolaan are linked and the device that regulates them is within the contract area. See the gray box on the map. RWS believes that VRI is an installation per intersection. The modernization of VRI Nijendal is therefore not within

the scope, especially since the intersection is not changed and the VRI is outside the contract area. The crossing area is adapted in the Hoofdstraat / Loolaan, and therefore that VRI is adjusted.

Secondly, PvB, starting from the assumption of one VRI per intersection, states that the renewal and modernization of the VRI Loolaan is outside its scope. In the UVO, the readjustment of the VRI connection Driebergen/Hoofdstraat is included. In all draft-UWOs between PvB and GUH a renovation of the VRI Loolaan is mentioned. In addition, RWS assumed that, due to the adjustment of the crossing Hoofdstraat/Loolaan, the VRI Loolaan did fall within the scope. In short, there are two misunderstandings between GUH, RWS and PvB. First, GUH assumes that VRI Nijendal is within the scope - because of its definition that a VRI is a series of linked VRI's - and will therefore be

adapted. RWS and PvB indicate that it is not within the scope because the crossing plane does not need to be changed and a VRI stands for just one VRI. Second, PvB believes that VRI Loolaan has not to be renovated. GUH and RWS assume that this is within the scope and therefore PvB should do the renovation.

Finally, there is an issue with the concerns of GUH about the traffic flow on the Hoofdstraat. At the entrance of the National Police Agency (KLPD), the third traffic light from the left, a VRI is placed. This is an extra VRI in line, which according to GUH worsened the flow further. The flow is the main reason to link the VRI's. According to GUH, major problems arise when only a few of the VRI's are being modernized, because of interference sensitivity between the old and new devices. RWS (and PvB) are of the opinion that the linking of the VRI's can also be done without a connection to the provincial traffic center. The requirement of at least the same functionality and quality does not indicate that the devices for VRI's Loolaan and Nijendal have to be modernized.

In addition, GUH thinks that the maintenance costs and traffic flow are minimized using the connection between the VRI's and the traffic control center. The VRI's Nijendal and Loolaan must be modernized in order to be able to connect the apparatus to the device. PvB is willing to do the extra work provided it is indicated as a modification of the client. GUH is willing to refund the costs of extra work to RWS and for fiber to the joint device. GUH is also willing to contribute to the costs of modernizing the VRI Nijendal. This is agreed, keeping in mind that the VRI Loolaan falls within the scope and the extra costs are around 30.000 Euros. According to PvB, the extra costs for the modernization of the VRI's Loolaan and Nijendal are around 150.000 Euros. GUH - as owner and operator - had the responsibility to insert the appropriate scope in the UVO. They should have made the correct contract boundary. In addition, GUH and RWS are responsible for the consistency in the description of the scope of the work. It must be said that RWS has a 'duty of care' to ensure that GUH knows what is expected of a Municipality. RWS cannot simply assume that GUH knows exactly what to do in earlier phases of the UVO.

In earlier drafts of the program of requirements, the VRI connection 20 is described as the A12 connection with Hoofdstraat, Loolaan, Nijendal and National Police Agency. VRI connection 20 is named after exit 20 of the A12. In later versions, this description is no longer included. The errors in the concept raised the expectation of GUH that RWS would also modernize VRI Nijendal. Therefore, GUH has failed to clarify VRI 20 in the UVO. It is also not reasonable to expect from PvB that they would modernize VRI Nijendal. In the UVO, this connection 20 is the connection of the Hoofdstraat on the A12. In addition, the extension of the VRI with a traffic light at the entrance/exit of the National Police Agency was discussed. It could be inferred that VRI includes all traffic lights.

When the wishes of GUH are fulfilled, the scope should be expanded to include the modernization of VRI Nijendal and the device should be updated. RWS has realized a cost sharing with GUH and hereby assumed that the VRI Loolaan is within the scope and will be modernized. Because the device is linked to the VRI Loolaan, this should also be renewed and the connection to the traffic control center should be established. The renewed connection allows better monitoring of the VRI's and entails lower costs and fewer failures of operation and maintenance. GUH pays these extra works and costs. During consultations about the UVO, PvB promised to do the extra work of the modernization of VRI Loolaan and Nijendal. By renovating the device and adding a fiber link to the

existing device of the VRI Hoofdstraat/A12, the VRI's are linked to the provincial traffic center. The total extra costs are 144.650 Euros, which is divided between RWS and GUH. GUH pays 70.000 Euros and gets what it wanted.

3. Remediation emplacement Maarn

In order to widen the A12, the government has bought several parcels; the parcel Maarn was purchased from NS-Vastgoed. On the parcel, PvB is commissioned by RWS to carry out activities related to the widening of the A12. In addition, the Province as competent authority wants to minimize aftercare locations after completion of the A12. This means that the contaminants may only reach a certain value, so that follow-up care is not necessary.

At the moment of purchase of the facilities Maarn, it was known that there was contamination. This emerged during preliminary investigations. The expenses and risks of this contamination are for NS-Vastgoed. The costs arising from any serious contamination that was not detected before the closing of the contract of sale, and for ten years after the signature, is reimbursed by NS-Vastgoed. With the purchase of the parcel, an agreement on how to handle the pollution was described. PvB must take responsibility for the remediation work by SBNS, commissioned by NS-Vastgoed.

RWS has to deal with a contaminated parcel. Additional investigations showed that the parcel was more polluted than was expected before the sale. More remediation is necessary, and this takes more time. As agreed during the sale, NS-Vastgoed is responsible for this, and NS-Vastgoed should remediate the parcel before PvB can start working. NS-Vastgoed cannot rehabilitate the parcel itself but wants the remediation to be carried out by Stichting Bodemsanering NS (SBNS). The responsibility for remediation is to some extent for RWS and therefore there is discussion between RWS and NS-Vastgoed about it. RWS will put pressure on NS-Vastgoed to remediate the parcel in time.

The contaminants are not related to the use as highway and fall outside the ten-meter mark. Because this relationship is not there, the remediation is addressed as a separate procedure. For other remediation projects within the DBFM, a master remediation plan is drawn up. This remediation falls together under the same procedure as the contaminants that are associated with the use of the A12. The contamination at Maarn is not caused by the A12, but is present within the project boundaries of the A12, since an access road is realized and a secondary road is present. The contamination is related to the use of the railway. The PCB² contamination is caused by oil-cooled power lines (NS activities) and the PAK³ contamination is caused by storage and handling of coal in the yard. This means that a recovery plan must be submitted with an adjusted execution by SBNS.

RWS wants an investigation into the quality of the soil. The design and results of the study are submitted to NS-Vastgoed and SBNS for review and approval. The cost of the soil remediation shall be borne by NS-Vastgoed. The cost of supervising, the investigation and supervision of the execution

² PCB stands for Polycloorbifenyyl and was mainly used for insulating fluid or coolant in transformers and prohibited since 1985.

³ PAK stands for Polycyclic aromatic hydrocarbons and generated by the incomplete burning of, for example, fossil fuels.

(if PvB executes), are for RWS. When the results are known, RWS together with SBN will go to the Province of Utrecht as the competent authority, to discuss and obtain agreement. The study shows that there is serious soil contamination with PCBs and PAKs. These contaminants are, according to the Soil Protection Act (Wbb), not urgent to be remediated and are assessed as not complex by the Province of Utrecht. However, the contaminants are not in the disposal of SBNS, who would perform the remediation. A new disposal application to the Province takes time, which is just not available, because PvB has its planning and RWS should keep to this schedule.

There is a strong contamination, and a third party does not succeed in performing this remediation within the time PvB planned. This causes discussions between PvB and RWS about the fact that RWS makes available the parcel too late. Moreover, it concerns who has to pay for it. Given the time constraints of the project, its location and the contamination around the A12, as well as the possible coordination problems that arise when working simultaneously on the same area, RWS prefers for the remediation to be done by PvB. This can be done through a scope change. NS-Vastgoed also agrees. PvB has an efficiency advantage because it does all the work itself, which makes the remediation cheaper. This is an advantage for both RWS and NS-Vastgoed. The advantage for RWS is that they deliver the parcel in time to PvB and for NS-Vastgoed that it has to spend less on remediation of a parcel that does not belong to them anymore.

In the tender phase, the emplacement was explicitly excluded. PvB is therefore not responsible for the remediation work. Since the remediation of this parcel falls outside the scope of the rehabilitation plan, and a decision has been given by Province of Utrecht, PvB was allowed to assume that they did not have to remediate the parcel. RWS has carried out an additional ground investigation and has requested PvB to remediate the contaminated ground. To avoid delays, PvB does the extra work. PvB has therefore acquired a 'powerful' position, which it can use in this renegotiation situation. For example PvB may require high amounts for the extra work.

In order to resolve the matter, the parties reached an agreement. Once the settlement is executed, the parties can lay no more claims on each other. They discharge one another. The settlement is intended as stated in title 15 of book 7 of the Civil Code and seeks a declaration of rights and obligations of the parties. The parties may not derive any rights from other agreements. And given the circumstance, the settlement set a precedent. The Dutch law is applicable thereto, and both parties disclaim any rights to dissolve, cancel or destroy the agreement. However, should a dispute arise under this settlement, then that is judged by a competent court.

According to the contract, NS-Vastgoed must reimburse the costs resulting from serious contamination. Given the pressure on the planning, it will be difficult to reach an agreement with NS-Vastgoed about the payment. Therefore, RWS will pay to PvB and pass on the account to NS-Vastgoed. The risk for RWS is that NS-Vastgoed does not want to pay all costs. The total remediation of the parcel Maarn costs around 100.000 Euros. The parties have made an allocation of 48% for the seller and 52% for the buyer. To settle the dispute, the seller- NS-Vastgoed - will pay 35.000 Euros to the buyer RWS. This includes all costs, interest and claims that both parties think are involved. The work is a slight modification of the DBFM-contract. The consequence is that PvB gets paid 100.000 Euros extra, but there is no critical delay.

An alternative is to charge NS-Vastgoed with all costs including those of the delay. NS-Vastgoed will probably not agree and what follows is a legal dispute that should be solved in court. In practice, this choice will not easily be made because of the additional time and costs that are incurred as well as a lot of frustration for both parties.

4. Farm path 86.7-87.2

Between 86.7 and 87.2 kilometers of the A12 on the north side, an Agricultural access road for a number of Agricultural parcels is located, with a connection to the Heuvelsesteeg. See also Figure 14, below, where this road 'Groep' runs right along the A12. North of this road is a river, and across it lies the railway, with in the top left of the map the unguarded railroad.

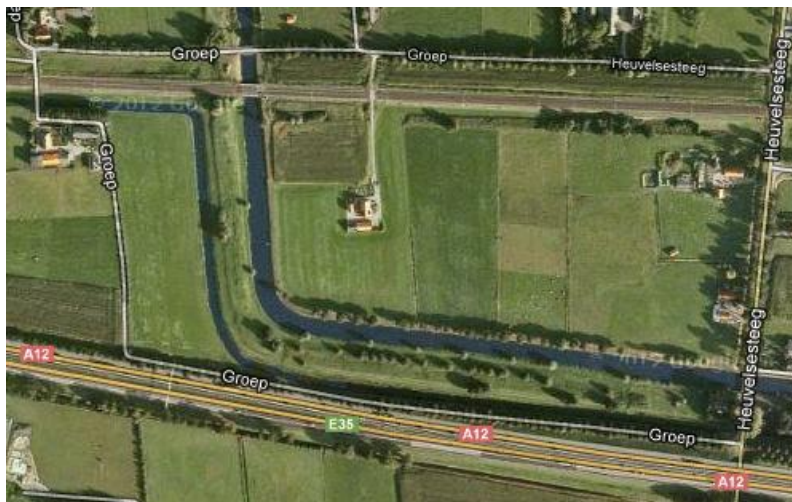


Figure 14: Situation Farm path 86.7-87.2.

In the TB, the farm path disappeared and the inhabitants and / or owners can only reach their parcels through the unguarded railroad crossing and the parcel of one of the residents. When the TB is carried out like this, the parcels are no longer reachable. The width between the new A12 and the water is 1.5 meters. This is not sufficient for any agricultural vehicle. There is a difference between reality and the contract. The TB and DBFM-contract do not provide the farm path while in reality, it should remain intact. Possibly, the parcels are accessible through the unguarded railroad crossing on the north side. This option was initially given. However, ProRail wants the traffic that now goes through the unguarded railroad crossing to go through the farm path. ProRail would like to see the farm path changed into an asphalt access road. RWS wants to block the road to the south and have the traffic pass through the northern opening, while ProRail wants exactly the opposite.

The issues occurred during the execution of the DBFM-contract. The farm path is unjustly left out of the TB, rendering two parcels inaccessible. If nothing is done, the farm path will be eliminated and RWS loses face as they are the cause of this conflict. In addition, RWS cannot just remove a farm path. The owners need access to their own parcels. The farm path has to remain or an alternative should be designed. In a later stage, it emerged that all residents and property owners have the right to cross the railroad. The issue should be resolved as quickly as possible since there is an unsafe situation at the rail crossing. A permanent access through the unguarded railroad crossing is not an

option because ProRail wants to close it down for safety reasons. The design is finally adapted in consultation with local residents. Safety is a strong requirement of the resident and / or landowners.

A temporary solution was found through the residential area of an adjacent parcel and the unguarded crossing. The condition put by the residents is that a final solution is achieved in the short term. The temporary solution has 'bought time' to create a definitive solution. The final solution consists of an alternative access. The desire of ProRail to drop the railroad crossing is taken into account. The extra costs will be paid by ProRail. There is a decommission plan by ProRail and NS, in which the diver and railroad crossing will be removed. A prerequisite is that a new access is achieved with gives access to the parcels. In the design for this solution, the presence of the monument Grebbelinie must be taken into account and a monumental gate should be created. In alignment with ProRail, RWS creates a physical space that shifts the Woudenbergse Grift northward by means of a dam wall, so that an opening can be constructed for agricultural traffic. The Woudenbergse Grift is situated within the cadastral boundaries of WVE. The extra space provides enough room for the farm path with a connection to the Heuvelsesteeg. The maintenance of the road falls under GUH because RWS is not going to do that itself. The maintenance is bought out by GUH for 20 years. The cost of buying is largely done by ProRail and partly by RWS.

The solution is executed through a change indicated by RWS as client. The original estimate that PvB made for the implementation was approximately 175.000 Euros, whereby the farm path was soberly furnished and unpaved. In addition, the transition remains. The final solution, costs about 300.000 Euros. ProRail pays 125.000 Euros and RWS the rest. The costs consist of the construction costs by PvB. In addition to these costs, ProRail makes extra costs paid by themselves, such as land acquisition, deeds and redemption management. ProRail helps to pay for the farm path because the unguarded railroad is canceled. Moreover, ProRail wants as few unguarded railroad crossings as possible because they are not safe.

A dispute exists when one of the parties says so. Then, a consultation must take place in order to find a possible solution. If no solution can be found, a competent civil court must settle the disputes. Landowners are entitled to a passage. For RWS, it is important that this passage continues to exist. To come to a solution, a consultation between all parties involved took place. No court case was necessary.

When the farm path would have been taken into account in the plan in the first place, this would have been more efficient than having to arrange things later on. The farm path was tendered under competition, which saves costs. PvB now implements the road. The farm path therefore incurs extra costs for RWS rather than for PvB. The subsequent change is generally more expensive than when it is taken into account in advance. RWS had procurement of the farm path, which is probably different in price than what it costs now. PvB charges higher prices because it shares another risk due to the DBFM-contract.

5. Noise barrier near Engweg

Near the Engweg (km 80.425 – 80.90 north side), a noise barrier is established that is made of sound absorbing concrete. In the following Figure 15, the situation can be seen. The sound barrier is included in the agreement between PvB and GUH. The residents who live beside the noise barrier believe that the barrier will reduce their living pleasure. Some residents complained to the Municipality saying that a concrete noise barrier eliminates a part of their view and sunlight in the houses adjacent to the A12. The Municipality previously agreed to an entirely concrete noise barrier. The permits have been awarded by GUH and are based on a completely concrete noise barrier.

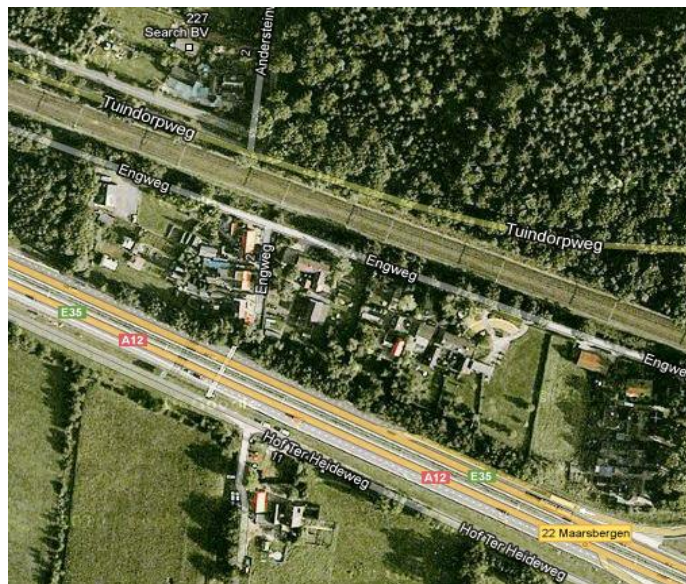


Figure 15: Engweg near the A12.

The residents would like a noise barrier made partly out of transparent material – upper three meters over the length of 90 meters – instead of concrete. The lower 1 meter remains closed. This would result in less visual pollution, because there is no shadow effect. PvB believes that a transparent screen does not satisfy the requirements for a noise barrier as they need to be sound absorbent.

The complaints from residents about visual pollution emerged after the period of the WAB⁴ (Weg Aanpassingsbesluit) had expired. Formally, the residents had exhausted all possibilities to interfere with the plans. But, because they are directly affected, something must be done. RWS is not willing to harm its image, and agrees with the Municipality to see what can be done. Somehow, in the first version of the plans, the noise barriers were transparent. For some unknown reason, this was later adapted. Through a revision of the WAB, an adjustment can be made. This is not unlikely because all

⁴ A road adjustment decision (WAB) is a description of the project and the impact of the adjustments on the interests of the parties involved, as well as how these interests are taken into account. It acts as a preparatory decision, which the Municipality is required within one year after it has become a final WAB to adjust the zoning plans.

residents and the Municipality agree to the adjustment to a transparent noise barrier. GUH discusses the adjustment with the residents to ensure that they agree. Also, GUH itself agrees with the adjustment. In addition, RWS also agrees that the noise barrier has to be transparent. Because the WAB had become irrevocable, GUH must prepare a revision permit in cooperation with RWS. Through this revision permit, a portion of the noise barrier can be made transparent.

As mentioned earlier, PvB believes that a transparent noise barrier does not meet the noise requirements. RWS is of the opinion that there are no demands imposed on the absorption of the noise barrier at the Engweg. The requirements in the agreements relate to other noise barriers. The transparency of the noise barrier can therefore continue. It has no effect on the schedule, because the noise barrier remains structurally identical. The adjustment from concrete to glass is a slight modification of the DBFM-contract by the client RWS. Early ordering does not affect the delivery, so the glass can be incorporated into the implementation and this implies no delays. Cleaning the glass can be combined with other activities, so that no additional traffic measures need to be taken. The transparency of the noise barrier has an effect on the contract scope. The adjustments may include extra work for the contractor PvB. The expected extra costs of glass panels instead of concrete panels are 65.300 Euros. This amount will be added to the contract budget from the contingencies.

This can create precedence. However, the situation is very specific and conscious residents are significantly disadvantaged. The probability that one can rely on such a case is therefore not large. RWS therefore agreed to the change of the noise barriers because the situation is so specific. If that would not be the case, it is likely that RWS would not easily have agreed with the glass in the noise barrier. The actual appearance of the issues is not explicitly defined. Not specified can mainly be solved afterwards. The adjustment from concrete to glass can be carried out by means of a revision permit.

If nothing would have been done to the noise barrier and they would not have listened to the complaints of the residents, the barrier would have remained of concrete. This would have saved money. The money now invested in the adaptation from glass to concrete comes from the contingencies. If a good inventory had been made by RWS as to the requirements of the stakeholders, it would probably have been revealed that the residents do not want to lose their light and view. The first design with glass would not have been adapted to full concrete.

6. Renewal acceleration lane Veenendaal 23 – 23A

Due to the widening of the A12, the viaduct Veenendaal-West should be adjusted. The existing viaduct is replaced by a version that is longer and wider. During the demolition and construction phase, only two traffic lanes are available, so the queues can become so long that the surrounding intersections are blocked. Safety issues may arise because the queues at the exit will emerge to hit back on the deceleration line. The choice was made to build an acceleration lane between the ramps Veenendaal West (23) and exit Veenendaal (23A), to improve the traffic-flow. This eliminates the traffic's inserting and exiting, and the transit traffic is not disrupted. On the top of the exit, the traffic will be adjusted to the traffic that follows the bypass. This adaptation must ensure that the traffic flows with minimal delays. The traffic is then routed according to the following Figure 16.



Figure 16: Bypass near Veenendaal.

According to the DBFM-contract, the road authorities should deliver a permit for the required traffic regulations. These permits are for example temporary road closures or diversions or, as in this case, adjustments. The road authority Regionale Dienst Oost Nederland (RD ON) is a service of RWS and must approve the placement of a road section. It is mainly concerned with traffic safety. In the UVO, there are no strict requirements on the level of traffic on the main roads. It is only concerned with the minimum disruption that road users may encounter on the main roads. Hereby, the secondary roads are not mentioned clearly during the negotiation phase. Therefore, PvB could make a deviant design, which did not comply with RD ON. RD ON is responsible for the maintenance, management and construction of highways and must agree to changes in the road network. In consultation, RD ON must ensure a smooth and safe flow of traffic. PvB has stated that road users should experience minimal discomfort. Therefore, there are high expectations of RWS and RD ON. The plans PvB made are passed on to RD ON for verification. RD ON does not accept the plans, since the previous requirements are made on closures and exits, rather than on capacity constraints of the secondary road network.

In addition, at a late stage it became clear that big capacity reductions would occur with the variation of PvB. RD ON believes that these reductions cannot occur without control management. Therefore, they hold on to the two through lanes and an acceleration lane (see Figure 17 below). There are optimizations possible to reduce costs. PvB does not want to create an acceleration lane, but they want to use the plus lane. This is an affordable and fair variant. By crossing the plus lane, a smooth transition will take place (see Figure 18 below). The lane will be the third lane there, and it continues as regular right line.

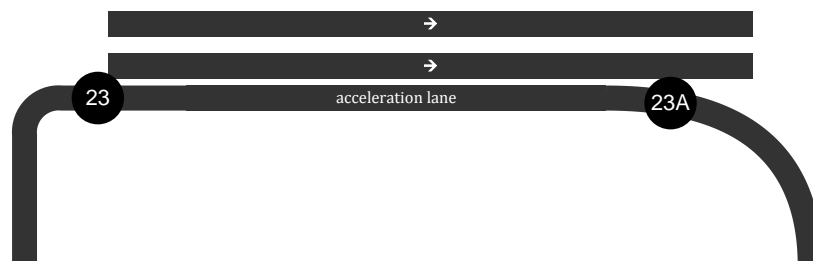


Figure 17: Option of RD ON.



Figure 18: Option of PvB.

RD ON has serious objections to the proposed plans of PvB. In other projects, experience is gained and too many accidents occurred. In its role of road manager, RD ON will not participate in this variant. RD ON proposes a variant with two through lanes and an acceleration lane. PvB as traffic manager does not communicate enough about its ideas. Moreover, it has underestimated the phasing, so that it does not coordinate well with RD ON. In addition, the impact of the peak line is underestimated. Besides this underestimation, PvB picked this up very late in the process. This creates pressure on the other parties. PvB itself was late with its proposals and therefore other parties have had less time to give their opinion about them.

The project team of A12LuVe has accepted the variation of two lanes with an acceleration lane. RD ON wishes that this is guaranteed. The commitment of the project team is essential for RD ON. RD ON gives permission. If the project team had not given a warranty, RD ON would not have given its agreement. This project is under time pressure, since the viaduct is partially demolished and there is no other solution. The solution is a modification of the DMFM-contract and must be performed by PvB. This relates to the realization of a bypass Veenendaal 23-23A, in which an acceleration lane has to be applied and there are technical measures necessary for the intersection. There is no critical delay with respect to the entire project.

The financial consequence is 280.000 Euros. The decision-making about Veenendaal-West is very slow and costly as well as time-consuming. According to RWS, there is no failure from the client and therefore they are not going to pay the cost. RWS is of the opinion that they, as assignor, did not fail so that valuable time was been lost. PvB came up late with new ideas and did not share its plans. PvB considers that there are special circumstances as described in the DBFM-contract, whereby RWS should pay the costs. PvB has given a possible solution, which was not approved by RD ON. PvB will therefore not pay for this issue alone. Several parties are involved in the decision-making. An error analysis examines how the costs should be divided among the various parties involved. The costs are distributed based on the errors made by the parties.

The solution is a modification of the DBFM-contract which must be performed by PvB. The agreements will be adapted to the new situation. This is done by indicating the changes and, if both parties agree, it is included in the agreements. If no agreement is reached, the dispute goes to the arbitration committee.