Improving risk communication to Dutch municipal councils concerning land development projects

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Preface

In this thesis research I have studied the communication of risks in land development projects to a municipal council. This report presents the results from my graduation project for the MSc Systems Engineering, Policy Analysis and Management at Delft University of Technology. For this research I have done a six month internship with the Rotterdam Audit Office (Rekenkamer Rotterdam), where I worked with the research team that studied the practice of land development in Rotterdam.

I would like to thank the Rotterdam Audit Office for giving me the opportunity to do part of my thesis research with them, and allowing me to participate and learn as a part of the research team. I hope that the results from this thesis and from the work I did for the Audit Office will contribute to making land development information more transparent.

Furthermore, I would like to thank my graduation committee Willem Korthals Altes, Daniëlle Groetelaers and Bertien Broekhans from the TU Delft and Evelien van Rij from the Rotterdam Audit Office for their support and feedback.

Rolf Cozijnsen
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Executive summary

Many Dutch municipalities are actively involved in land development projects. Besides steering possibilities, it offers municipalities more flexibility to react to market conditions, to recover costs and take part of the profits made. However, it also means municipalities take risks. Although land development has long been profitable, the economic recession following the credit crisis of 2008 has hit hard on real estate markets. Research from Deloitte predicts that the credit crisis may have a negative effect of €2.9 billion on land development projects of Dutch municipalities.

In the Dutch municipal political setting the municipal council has to critically assess the municipality's financial situation. However, land development projects and land development finances represent complicated matter and are often a black box to council members. This observation and recent losses in land development projects in Rotterdam have led us to formulate the following research objective:

> *To present improvements to the system of risk communication of the municipality Rotterdam, so that the municipal executive board informs the municipal council adequately about risks in land development projects, in order to enable the councillors to critically assess the municipality's financial situation.*

These improvements are identified by studying scientific literature and good practices in other municipalities.

First, objectives and constraints for a system of risk communication on land development projects have been identified. These requirements have been taken from literature on risk communication to decision makers and politicians, to the public and to individuals. The resulting list of requirements has been refined based on the specific case of land development, Dutch national law and user requirements.

The resulting objectives and constraints have been grouped into a framework, including five categories: components, content, representation, explanation and frequency. In this framework there are interactions between components and content and between content and representation; these parts all have to be up to a certain standard for the system to perform. For example, using the right components does not mean there is good communication if the content is insufficient.

The framework of objectives and constraints has been used to assess the systems of risk communication in a case study in three Dutch municipalities: Rotterdam, Den Haag and Eindhoven.

From this case study we found that the system in Rotterdam falls short of our requirements. Main improvement points for Rotterdam are the inclusion of usable portfolio information, the presentation of more elaborate project information and the clear definition of roles and powers of the board and council in deciding on land development projects. In Den Haag and Eindhoven the systems meet most of the requirements, but also there improvements can be made.

Based on the framework and the findings from the case studies, a sketch design for a system of risk communication has been composed. This system includes a budget and financial statements, both including the paragraphs land use policy and financial resilience, a background document, possibly a large projects report and interim reports and council letters. This design has been based on the system of risk communication in Den Haag. However, transplanting such a system to another municipality might not be as

easy at is appears. It is important that there is sufficient support for the implementation of the new system. To create support there must be consensus that the old model is not sufficient, as well as a sense of urgency. Only when a majority of councillors supports the implementation of this new model, the system can be implemented successfully.

The sketch design and the framework of objectives and constraints have been used to propose recommendations to improve the system of risk communication in Rotterdam. Relatively easy to implement is the measure to send the Multiyear Prognosis Land Development Rotterdam (MPRG) to the council as well. This presents the council with more background information, as well as with the calculations for the required financial resilience.

Furthermore, we have identified six recommendations that require more time and resources to implement. First, the roles and powers of the board and the council regarding decision making on land development projects should be defined and stated in a municipal regulation. Second, sending the MPRG to the council is an improvement, but the current MPRG is not optimal for informing the council yet. Therefore, the MPRG should present more portfolio background information and project risk information. Third, the paragraphs land use policy in the budget and financial statements should focus more on actual portfolio information, instead of on policy information. Furthermore, an overview of the required financial resilience should be included. Fourth, a project appendix should be included in the financial statements in which all projects are recorded and where changes are explained. Fifth, the Monitor Large Projects (MGP) should be revised. There should be more focus on presenting a complete risk overview and more possibilities to include explanations should be included. Finally, the interim reports and council letters should include more risk information.

This thesis research has aimed to take a small step forward in designing effective risk communication. The presented framework can be used in other situations than land development projects as well. First, these situations can be characterised by flexibility in decision making; especially when the decision maker has an opportunity to steer during the project it is very valuable to know the current status and risks of the project. Second, the framework can be used to inform decision makers that are at a distance or that lack specific knowledge of the subject.

To improve on the framework and the sketch design further research is required. Three directions for further research are identified. First, some objectives and constraints are not specific enough yet. Second, criteria have to be designed for the assessment of the functioning of that objective or constraints. Finally, a method to measure the performance of risk communication should be developed.

Contents

1. Introduction

Land use planning in the Netherlands is highly decentralized (Louw, van der Krabben & Priemus, 2003). Land use plans are drawn up and set by municipalities. Municipalities are also involved in the development of these land use plans, by servicing the land. This involvement can take different forms: actively or through public-private partnerships (PPP) (Leväinen & Korthals Altes, 2005; Needham, 2007).

When a municipality is actively involved in land development, the municipality itself acquires the land, services it and then sells it to a development company, housing association or end user. This is the traditional model, in which municipalities consider it their duty to supply land to meet local demand (Leväinen & Korthals Altes, 2005). Since the 1990s private parties, such as developers and construction companies, have also entered the land market, leading to the emergence of alternative models of land development, the PPPs. These can be separated in four different models: exchange of land for building rights, integral development, joint development and the concession model (Groetelaers & Korthals Altes, 2004; Van Rij & Korthals Altes, 2010).

Many Dutch municipalities prefer to be actively involved in land development projects (Buitelaar, 2010; Louw et al., 2003). Besides steering possibilities, it offers municipalities more flexibility to react to market conditions, to recover costs and take part of the profits made. Managing this flexibility calls for risk management.

For many years land development projects have indeed been sources of considerable income for municipalities (Korthals Altes, 2010). Financial setbacks could often be compensated for, preventing cost overruns. This is because land development projects can be divided into sub-projects relatively easy, unlike infrastructure projects (De Bruijn & Leijten, 2008). This flexibility allows project managers to make changes in the projects in order to compensate for extra costs. These practices resulted often in profits from land development projects, which have often been even higher than planned (Korthals Altes, 2010).

However, the economic recession following the credit crisis in 2008 hit hard, especially on real estate markets. As a consequence demand for (new) housing has decreased drastically in the Netherlands (Priemus, 2010). This has two major consequences. First, developers often start a development project only after 70% of the new dwellings are sold. When demand for housing is lacking development is not started and serviced land is not bought from municipalities. Municipalities then often face larger interest costs.

Second, low demand for housing has an effect on housing prices. Most Dutch municipalities use the residual method to calculate land prices. Building costs are subtracted from the housing price to calculate land prices. When housing prices decrease and building costs increase, the land price decreases even more than housing prices. As a consequence municipalities often postpone selling the land, waiting for the demand, and the prices, to increase again. Postponement obviously leads to higher interest costs as well.

These consequences of the economic recession have led to large losses for many municipalities. Research from Deloitte (2010a; 2011) showed that the credit crisis may have a negative effect of €2.9 billion on land development projects of Dutch municipalities. To deal with these real and potential losses and diminishing profits municipalities have to rely on their financial resilience (in Dutch: weerstandsvermogen)

(see Urlings & de Haan, 2011). The financial resilience is the financial capacity to cover the municipality's risks (Gerritsen, 2007, p. 205).

In the latest report of Deloitte (2011) the concern is expressed that 8% of Dutch municipalities may not have enough financial resilience to deal with the expected losses from land development projects. When the financial resilience is insufficient to cover emerging risks these municipalities will be put under so-called article 12 status (based on article 12 of the Dutch *Financiële-verhoudingenwet*). This means that the municipality will be put under receivership of the national government in exchange for extra funding.

1.1 Identification of problem area

1.1.1 Risks and uncertainty

Knight (1921, p. 11) was among the first to define risk and uncertainty in relation to each other. In his definition risk is an objectively measurable uncertainty. When uncertainty can be quantified it is called risk. Non-quantitative uncertainty is considered real uncertainty. After Knight many definitions have been proposed for risk (Johansen, 2010, p. 12). Aven (2010) has recently discussed several. He asserts that uncertainty is an essential component of risk. For this research, we mention two definitions of risk.

First, the most recent international standard for risk management is presented by ISO31000 (2009). In this standard risk is defined as: 'the effect of uncertainty on objectives' (p. 1). Uncertainty is defined as: 'the state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood' (p. 1).

A second definition that is often used in risk management is what Aven (2010) calls the traditional engineering approach: risk is the product of probability and severity, or the product of impact and likelihood. Aven rejects this definition for its inability to distinguish between risks with low likelihood and high impacts and risks with high likelihoods and low impacts (p. 623). However, this definition is still often used in risk analysis for it is easy to handle. This research will follow the definition used in practice of risk communication, which is most often the traditional engineering approach. Therefore, I define risk as the product of impact and likelihood. Impact is defined in financial terms. Risks that do not have a financial effect are outside the scope of this research.

Land development projects are generally more risky than other projects municipalities carry out, as the municipality is more dependent on external factors (Ten Have, 2008). Furthermore, informing the council about risks in land development is complicated due to the nature of these risks. Deloitte (2010b, p. 66) identifies four features of land development projects with consequences for the assessment of project risks.

First, land development projects often have a long time horizon. Projects often run for 10 years or more from start to completion. Assessing risks over such a time span is hard, emphasising the importance of informing the council on a regular basis.

Second, in realising the project the municipality is dependent on the market, third parties and regulation. When market demand for office buildings is lagging behind, this may present large financial effects for land development plans with large office buildings. The dependence on other parties, e.g. building companies, also brings risks. When a builder cannot meet its obligations to build, the municipality will also incur the consequences. An example of dependence on regulation is the procedure for land use

plans, including public participation, which may cause delays. The dependencies are dynamic; some may not be relevant at the start of the project, but become relevant later on. The impact and likelihood of risks resulting from these dependencies may also change over time.

A third feature of land development plans is that plans are drawn from rough to more detailed over time. When the first plans are approved these are often rough estimates. Over time plans are refined and so are the project finances. This way of working may be necessary due to the complexity and long timeframes of projects, but it also causes uncertainty with regard to the (financial) outcomes.

Finally, as mentioned before, active involvement of the municipality can offer the municipality steering possibilities. However, this flexibility also makes it hard to assess the outcomes of the project in advance. Other land development models offer less steering possibilities. However, all types of land development models involve risks; the type of risks may differ.

These features complicate the process of informing the council on land development projects. Understanding all information on land development projects requires specific knowledge from councillors. Not all councillors may possess this knowledge.

1.1.2 Communicating risks and uncertainty to the municipal council

Since 2002 the municipal government in the Netherlands is designed according to a dualistic model. It consists of the elected municipal council and the appointed municipal executive board of mayor and aldermen (in Dutch: college van Burgemeester en Wethouders). The executive board holds the executive powers. The council has budgetary and regulatory powers to set the framework, or assignment, for the executive board. The council also checks the board on whether it fulfils this assignment (Vereniging Nederlandse Gemeenten & Ministerie van Binnenlandse Zaken, 2004).

For the council to be able to set the frameworks for the municipal executive board, that board must adequately inform the council. Without knowledge of the present status, a decision cannot be made about future developments without the risk of unanticipated outcomes. Councillors must for instance have an overview of the municipality's financial situation before they can decide to invest a large sum in land development projects.

To inform the municipal council on risks in land development projects most Dutch municipalities use the regular planning and control cycle, extended with specific reports on the status of the land development portfolio as well as communication on individual projects. We call this the municipality's 'system of risk communication'. This research focuses only on the official communication between the executive board and the council, not on any other (informal) communication. Official is defined here as all communication that is legally required and all communication required by municipal obligations. Based on the information councillors can get from these documents councillors should be able to critically assess the municipality's financial situation regarding land development projects.

1.1.3 Problem statement and research objective

In 2010 the municipal accountant ordered the municipal development agency of the municipality of Rotterdam (Stadsontwikkeling, the former development company Rotterdam, or OBR) to screen all their land development projects. Based on the

screening Rotterdam was forced to take a loss of approximately €200 million. These losses came as a surprise to many. This leads us to present the following problem statement:

> *The current system of risk communication from the municipal executive board (College van B&W) regarding land development projects in Rotterdam does not adequately inform the municipal council on the risks in these projects and therefore councillors are not able to critically assess the municipality's financial situation.*

Based on the problem statement the following research objective can be formulated:

> *To present improvements to the system of risk communication of the municipality Rotterdam, so that the municipal executive board informs the municipal council adequately about risks in land development projects, in order to enable the councillors to critically assess the municipality's financial situation.*

This research does not assess whether the risk analysis itself was adequate. It focuses on the question how the identified risks were communicated to the council, and how to improve this communication. In this research risks are inherently dynamic; risks can change over time. Risks may not have been identified as such at the start of a project. When they are discovered later on, the riskiness of the project changes. Project risks may also be actor dependent; not all actors perceive the same risks and different actors may perceive risks differently (Renn, 2004).

1.1.4 Relevance

This research is both relevant to society and contributing to science. First, the problems that Rotterdam faces are also troubling other Dutch municipalities. As Deloitte (2010a; 2011) shows, the effect of the crisis on the land development finances for all municipalities combined could add up to €2.9 billion. Except for the effect on the profits still to be made, which was expected to become public money, this is public money that cannot be used for other purposes. Furthermore, when the municipal council does not have good information, this may lead to inefficient decisions. This can cause cost overruns and delays, leading to a Pareto-inefficient allocation of resources, or waste (Flyvbjerg, 2007). This research is aimed at improving information for the council, and thus contributing to preventing losses caused by inadequate information in the future.

Second, this research contributes to the current scientific literature on risk communication. As Thompson (2002) states: 'We have a long way to go in developing effective ways to present the results of a probabilistic risk assessment and sensitivity analysis to risk managers and to the public and in ensuring that these results do ultimately lead to improved risk management decisions' (p. 653).

The existing scientific literature on risk communication has largely focused on communicating risks to the public (see for an overview Bier, 2001a or McComas, 2006). It has focused most on public health and environmental policies, and is often concerned with offering insight into very small risks to a lay audience (Krupnick et al., 2006; Morgenstern, Nelson & Krupnick, 2006). Morgenstern et al. (2006) state that although some research has been done on communicating uncertainty to decision-makers (see also Bier, 2001b), no earlier studies have focused on political appointees. In the Dutch municipal constellation these are the appointed aldermen. We, however, are interested in risk communication to elected councillors.

Sager and Ravlum (2005) state that there have been a few studies concerned with matching information demand and supply between politicians and planners, however in practice 'there seems to be little systematic dialogue between politicians and planners' to come up with that match (p. 34). This research will contribute to enhancing this dialogue between politicians and planners, by focusing on risk communication to politicians.

Additionally, land development projects are a form of large projects commissioned by public agencies. In this respect there is some connection with large infrastructure or engineering projects commissioned by public agencies (Korthals Altes, 2010). Therefore, insights from risk communication on land development projects may also be applicable to other large projects by public agencies.

1.2 Research questions

To achieve the research objective several research questions need to be answered. The following main research question has been formulated:

> *How can the system of risk communication from the Rotterdam municipal executive board to the municipal councillors regarding land development projects be improved, based on scientific theory and experiences in other municipalities?*

To structure the answer to the main research question several sub-questions have been formulated. The first sub-question is aimed at finding the objectives and constraints that should be met by a system of risk communication. The second sub-question is used to assess the current system of risk communication in Rotterdam. Then, the third sub-question assesses the system of risk communication in two other Dutch municipalities. Finally, the fourth sub-question is aimed at identifying a design for a system of risk communication based on the insights from the first three sub-questions.

1. *What objectives and constraints apply to a system of risk communication from a municipal executive board to councillors regarding land development projects?*

To be able to assess the system of risk communication from a municipal executive board to the municipal council, we have to know what objectives and constraints apply to such a system. Objectives are the design goals for the system that have to be optimized. Constraints are the design goals that have to be met, but not to be optimized (Herder & Stikkelman, 2004). Objectives and constraints for the system of risk communication are derived from scientific literature, (national) law and interviews with users of the system (i.e. councillors).

2. *What does the current system of risk communication to councillors, regarding land development projects, look like and how does it function in Rotterdam?*

After we have identified the objectives and constraints that apply to the system of risk communication, we can apply these to the current system of risk communication that is used in the municipality of Rotterdam. We will assess both the way the system is designed and the working of the system.

3. *What does the current system of risk communication to councillors, regarding land development projects, look like and how does it function in other Dutch municipalities?*

Third, the objectives and constraints from sub-question 1 are also applied to two other Dutch municipalities, which are deemed to have a well-functioning system of risk communication to councillors. This allows for both a comparison between Rotterdam and the other municipalities, as well as an identification of best practices.

4. *What could the design of a system of risk communication look like?*

Finally, the outcomes of the first three sub-questions are used to make a 'charcoal sketch design' of a system of risk communication. This design is not fully elaborated, but presents a rough sketch of an adequate system.

1.3 Research method and approach

The main research question will be answered based on the answers to the sub-questions. To find the answers to these sub-questions several research methods are used. In this paragraph we discuss these methods first. After that, the limitations of the chosen research methods are discussed.

1.3.1 Research methods

The first sub-question is aimed at finding the objectives and constraints applying to a system of risk communication to councillors. First, scientific literature on risk communication is assessed using desk research. Since there is little literature focusing specific on communication between politicians and planners (Sager & Ravlum, 2005) related studies are also studied, such as risk communication to the public on the environment or public health. The identified objectives and constraints are then refined to be applicable to land development, by examining the nature of land development, relevant Dutch national law and user requirements.

To answer the second sub-question a case in case study is performed in Rotterdam. The identified objectives and constraints are used to assess the design and working of the Rotterdam system of risk communication. One land development project is studied in detail to assess the communication on risks in this project to the municipal council. The case study includes desk research and interviews. The desk research concerns municipal law on risk communication in land development projects and the system of risk communication itself. All relevant documents sent to the council are included.

Interviews are performed with the project manager of the case in case project, a representative of the civil service and at least one councillor. The interview with the project manager is aimed at identifying the risks in the project and the way they are communicated about. When is the council informed about the risk and have they been involved in managing the risks, e.g. through project adjustments? Second, an interview with a representative of the civil service involved in the communication process of risks to the municipal council is performed to map that process. What communication do councillors receive, when do they receive it and who decides what they receive? Third,

the interview with the councillor, also used to answer sub-question 1, is used to assess the information the council currently receives and the usefulness of this information. Do the councillors feel they are in control and that they have a clear overview of the risks that are taken in land development projects?

The same approach used to answer sub-question 2, is used to answer sub-question 3. The other Dutch municipalities that are examined are Den Haag and Eindhoven. These municipalities have been selected for three reasons. First, both municipalities are among the largest in the Netherlands, as is Rotterdam. Den Haag is the third and Eindhoven the fifth Dutch municipality with regard to population. Second, both municipalities have invested heavily in land development projects, as filed on the municipal financial balance as inventory. Table 1.1 summarizes these figures. Finally, these municipalities offer relatively good practices of risk communication system to the municipal council, recommended by Frank ten Have (partner at Deloitte Real Estate Advisory).

Table 1.1: Population and inventory book value of selected case municipalities (CBS, 2011)

Municipality	**Population (in 2010)**	**Inventory (in 2009)**
Rotterdam	593,050	€208.9 million
Den Haag	488,555	€123.6 million
Eindhoven	213,810	€180.9 million

Finally, sub-question 4 is answered using the answers to and insights from the previous sub-questions.

1.3.2 Limitations

The two main research methods used are desk research and case study. All research methods have limitations. The most important limitations of the chosen methods for this research are discussed here.

The quality of the desk research is dependent on the documents that are examined. Although information from public authorities, such as the municipality, is usually public, information regarding land development (projects) may be classified. Disclosure of sensitive information might lead to a disadvantage for the municipality in negotiations with third parties. This sensitive information includes information on risks. Whether classified information can be studied in this research is dependent on the willingness to share of the interviewed people and other contacts.

Case study as a research method provides the opportunity to do in-depth research exploring all nuances in the case. The downside is that case studies provide little basis for scientific generalisation, as only one or a few cases are studied. However, by studying multiple cases the possibilities for generalisation increase (Yin, 2003). In this thesis research three case municipalities are studied, allowing some generalisation. Within these case municipalities only one case project is studied. It may be argued that all projects within a municipality will be reported on in the same way, but by studying several projects in each municipality the possibilities for generalisation would have increased. Due to lack of time, it was chosen not to do so.

Furthermore, this limitation may also be relevant to the application of the model for a system of risk communication that will be presented. This research is focused on large municipalities in the Netherlands. Not all aspects may be relevant to smaller municipalities.

1.4 Thesis outline

The next chapter of this thesis report will present a literature overview on risk communication. A list of objectives and constraints for adequate risk communication is composed. This list will be refined in chapter 3 to present a framework of objectives and constraints that is applicable to Dutch land development projects. The framework is then used to assess the system of risk communication in Rotterdam, Den Haag and Eindhoven in chapters 4 to 6. The findings from these case studies are analysed in chapter 7. Furthermore, a sketch design for a system of risk communication is presented. Finally, chapter 8 will present the conclusions of this thesis research as well as opportunities for a wider application of the findings and directions for further research.

2. Risk communication

2.1 Introduction

In this chapter objectives and constraints for effective risk communication are identified. Objectives are the design goals for the system that should be optimized. Constraints are design goals that have to be met. These do not have to be optimized (cf. Herder & Stikkelman, 2004).

The objectives and constraints are identified using literature on risk communication. There is, however, little to no literature that focuses on the specific problem of risk communication in land development projects. Therefore, we have examined literature from three related policy fields to look for parallels or generally applicable constraints and objectives.

Risk communication literature focuses on specific types of risk communication. A distinction is made between risk communication directed at decision makers and politicians, risk communication to the public and risk communication to individual people for (health) choices. In this chapter literature has been divided in these three categories, although differences may not always be clear-cut.

2.1.1 Chapter outline

For each type of risk communication the following three paragraphs present a general overview of the scientific literature, followed by an overview of relevant objectives and constraints. Each paragraph concludes with an overview of the identified objectives and constraints. In the final paragraph of this chapter the objectives and constraints are grouped into categories.

2.2 Risk communication to decision makers and politicians

The first strand of literature discussed is concerned with risk communication to decision makers and politicians. This type of risk communication is closest related to the case of risk communication in land development.

2.2.1 Literature overview: Risk communication to decision makers and politicians

How can we communicate about risks to decision makers in a way they can really use this information to make sensible decisions? This question has been the subject of a number of studies (e.g. Balch & Sutton, 1995; Morgenstern et al., 2006; Thompson, 2002; Thompson & Bloom, 2000). Many of these studies focus at decision makers in regulatory agencies. Sager and Ravlum (2005) present a study into a political standing committee in Norway, thus incorporating an extra, political dimension.

Bier (2001b) presents an overview of the early research into risk communication to decision makers. She focuses on the aims and objectives of this strand of risk communication, the way uncertainty, variability and dependence are treated in communication and the format of risk communication.

Aims and objectives

Risk communication should be relevant, timely and comprehensible. Bier (2001b) notes that ‘these features are generally desirable in communicating any type of information, but are likely to be particularly important in communicating about risks, since risk

assessments are often difficult to understand, laden with assumptions, and controversial' (p. 152). It should furthermore be noted that notions such as relevance or timeliness are dynamic. What was deemed not relevant at first, might be relevant later on.

Secondly, it is suggested that risk communication can function as an early warning system to raise awareness of a hazard or problem. Therefore, risk communication can also include an informal 'heads-up' warning of problems (Bier, 2001b). For this information to be easily used by managers it should include 'diagnostic feedback and mechanisms for early warnings and quick adjustments in the program followed by feedback on how the adjustments are working' (Balch & Sutton, 1995, p. 166).

Finally, discussing the communication with the receiving party, the decision makers, may prevent problems and/or unjustified expectations (Bier, 2001b).

Impact of uncertainty

A second important issue discussed by Bier (2001b) is the effect of uncertainty in the outcomes of analyses on decision making. Uncertainty is important in decision making, but communicating about it is difficult. Managers and decision makers often lack the (technical) knowledge and experience to deal with results of probabilistic risk analyses. Special care is therefore required to ensure that risk communication is comprehensible.

It may be helpful to decision makers to explicitly divide the uncertainty remaining after the analysis into variability and knowledge uncertainty. Variability applies to the inherent randomness of events, always causing some uncertainty about the outcome. Knowledge uncertainty is the uncertainty remaining because we do not have full knowledge yet. This uncertainty may be solved through additional research. Value-of-information approaches may help decision makers to assess what the costs are of obtaining extra information and help them decide whether or not to obtain it (Morgenstern et al., 2006). For decision makers it is of the highest importance to be able to understand the implications of uncertainty on the decisions they make (Bier, 2001b).

Format

The final focus point of the overview of Bier (2001b) is the format of risk communication. One of the assumptions of rational decision making is invariance: different representations of the same choice problem should yield the same preference (Tversky & Kahneman, 1986). As Tversky and Kahneman (1986) show using several experiments, this requirement is often violated in reality. This leads them to conclude that the axioms of rational choice (including invariance) 'are generally satisfied in transparent situations and often violated in nontransparent situations' (p. 272).

This conclusion has great implications for risk communications, as it suggests that the format of risk communication can influence the way risk is interpreted. Therefore, there have been several studies into the effects of representation of risk on decisions (e.g. Dieckmann, Mauro & Slovic, 2010; Morgenstern et al., 2006; Thompson & Bloom, 2000).

Political process

Most literature discussed focuses on decision makers in regulatory agencies. However, when politicians have to make decisions other, more political, factors come into play. Political decisions are not made solely based on analyses and risk assessments.

Moreover, it is suggested that many risk issues are inherently social and political (Okrent & Pidgeon, 2001).

Several studies have been performed to examine the influence planners (i.e. analysts or risk assessors) have on the political processes of decision making (Nilsson, 1991; Sager, 1995; Sager & Ravlum, 2005). Sager and Ravlum (2005) have a hard time pinpointing the actual input of planners. They suggest this might be because political factors are of central importance to actual effects of advice. They see a confirmation of a thesis by March in the outcomes of their study. March (1994) asserted that '[d]ecision makers gather information and do not use it; ask for more and ignore it; make decisions first and look for relevant information afterwards; gather and process a great deal of information that has little or no direct relevance to decisions' (p. 226). Information is gathered as a symbol of competence (March, 1994, p. 226). As a result it is difficult to point out the actual influence of this information on the decision.

Finally, information supplied to decision makers is rarely innocent itself. Often it may be the object of strategic misrepresentation (March, 1994; see also Flyvbjerg, 2007). Still, decision makers seek cost-benefit analyses and risk analyses to justify their decisions, for 'a decision made by the numbers […] has at least the appearance of being fair and impersonal' (Porter, 1995, p. 8).

2.2.2 Objectives and constraints: Risk communication to decision makers and politicians

In the literature objectives and constraints for a system of risk communication have been identified. Several apply to the conclusions that are included in risk information. The most important is that the conclusions have to be **relevant** to the specific decision or general risk management policy framework at hand (Bier, 2001b). Presenting irrelevant conclusions can only confound decision makers and may lead attention away from the real issues.

A second objective identified from the literature is that conclusions should **leave room for politics**. As discussed in the former paragraph, political decisions are not based solely on risk information, nor should they be. Risk communication is often subservient to politics, and should be used as input in the political discussion (Brown, 2011). Morgenstern et al. (2006) found that political considerations play a large role in decision making and found that many decision makers search for ways to use risk assessments to sell their decisions. Sound risk communication should enable politicians to draw their own conclusions from the outcomes of analyses. It should however present sufficient information to ensure that no false conclusions are drawn.

Third, risk communication should not only present information on risks and uncertainties, but should also conclude what the **implications of uncertainty** are (Thompson & Bloom, 2000). Decision makers need to know what influence uncertainty in analyses can have on the outcomes of their decisions.

This relates to the **value of information** approach. This approach aims to make clear what the costs are of retrieving the missing information and to what extent this will resolve uncertainty about outcomes (Brown, 2011; Morgenstern et al., 2006; Thompson, 2002).

The literature also discusses objectives and constraints regarding the data underlying risk analyses, which should be presented in risk communication. Both Thompson and Bloom (2000) and Morgenstern et al. (2006) performed a study into the effects of different risk communication formats on the decisions made by the decision makers.

Both found that an important factor in risk communication is decision makers' **need for context**. Decision makers require information about the background of an issue and the decisions made earlier in the process. As one decision maker stated: 'tell us why it is what we're doing here is so important' (Thompson & Bloom, 2000, p. 347).

A second constraint is that the **assumptions** underlying the risk assessment should be made explicit (Bier, 2001b; Fischhoff, 1995). The outcome of the analysis depends on these assumptions. By presenting the assumptions to decision makers they can assess, at least partly, the credibility of the analysis and its outcomes, and know its potential weaknesses. 'Unless these assumptions are made explicit, the risk numbers will not speak for themselves' (Fischhoff, 1995, p. 139).

Finally, Bier (2001b) stresses the importance of presenting insight into the **causes of risks**. By presenting the 'driving forces' behind risks, decision makers can get greater insight into the problem and its solutions. It will help them understand the conclusions drawn from the analyses.

Literature provides a number of objectives and constraints regarding what outcomes of risk analyses should be presented to decisions makers. First, all data included should be **complete, timely and correct** (Bier, 2001b). It may be argued that this applies to all communication.

The requirement that data should be complete is not an invitation to include every piece of information that might be connected in any way. It is important to note that **less information** is better. As Lyytimaki, Assmuth and Hildén (2011) found in their study on absent information in risk communication, one of the reasons information gets missing is information overload. Too much information may lead to rejection or forgetting of information. It may also divert attention away from the important issues as people focus on striking, but perhaps less relevant, information. Furthermore, there can be a difference between obtaining optimal (complete) and satisficing information (Simon, 1955).

Third, presenting **risk trade-offs** can improve decision makers' understanding of the choices they have to make (Thompson & Bloom, 2000). It may often be the case that a measure to reduce one risk may have adverse effects on other risks. Making these trade-offs explicit for decision makers will results in fewer unanticipated (adverse) outcomes.

Fourth, risks and benefits are often represented as a single point estimate. However, presenting such a point estimate will appear precise regardless of the analytic confidence in that estimate (Dieckmann et al., 2010). Moreover, a point estimate conceals the underlying distribution and may give a false sense of security to decision makers (Morgenstern et al., 2006). Thompson (2002) therefore states that we should shift away from these practices and present decision makers with a **range of uncertainty** as well. By quantifying the uncertainty in the estimate, it is possible to represent the analytic confidence about the risks (Dieckmann et al., 2010).

Finally, other measures to improve insight in decisions are presenting decision makers with **cost-effectiveness numbers** for the decision options and presenting **real-world data**. Cost-effectiveness numbers improve the possibilities to compare options (Morgenstern et al., 2006). It should however be emphasized that cost-effectiveness is often not the sole criterion; other factors may also play a role. Real-world data can offer additional insight to decision makers besides just information from laboratory experiments (Thompson & Bloom, 2000). Balancing these two types of information is important.

The format of risk communication should first of all be appropriate to communicate risks. Thompson and Bloom (2000) have performed an elaborate study into risk communication formats. They conclude that, with respect to graphical representations of risk, decision makers 'prefer simple charts and graphs that are not too busy or more detailed than required' (p. 347). Morgenstern et al. (2006) have also performed a study into risk communication formats. They conclude that 'tables and PDFs (i.e. probability density functions) are best suited for communicating to high-level decision makers' (p. 19). Both studies have been performed among a small number of respondents and with a limited numbers of decision options. It is therefore hard to draw explicit conclusions. However, it can be concluded that **simple charts and graphs** are preferred over more elaborate formats.

Additionally, risk communication documents should have a proper search structure. Decision makers have to be able to search the information and to probe deeper when necessary (Brown, 2011). Pereira and Corral (2002) have defined this feature as **progressive disclosure of information**. This 'entails implementation of several layers of information to be progressively disclosed from non-technical information through more specialised information, according to the needs of the user' (p. 104).

A related objective is that risk communication should **focus** as much as possible **on the most important numbers** or information for the decision at hand (Brown, 2011; Fischhoff, 1995). Risk managers are reported to appreciate reports that are focused on the most important issues (Thompson & Bloom, 2000). What information is most important depends on the issue at hand.

Furthermore, the importance of supplying decision makers not only with quantitative but also with qualitative information is emphasized in literature. The inclusion of **narrative information**, or storytelling, is suggested to have a large effect on decision makers' judgments (Dieckmann et al., 2010; Slovic et al., 2007; Thompson & Bloom, 2000). The extent to which decision makers are numerate, defined here as able to understand and use numbers, seems to have an effect on the importance of narrative information (Dieckmann, Slovic & Peters, 2009). Less numerate people focus more on narrative information, whereas the more numerate are more likely to use the numerical information. Moreover, in all cases a well told story is believed to be more likely to catch attention, arouse feelings and call people into action than a factual list or table of pros and cons (Sager & Ravlum, 2005).

Finally, ambiguity in risk communication should be avoided. Several studies have shown that people tend to discount information or avoid making a decision when information is ambiguous (Dieckmann et al., 2010).

The way language is used can have a large effect on risk communication. As discussed earlier, situations may violate the premise that 'different representations of the same problem should yield the same preference' (Morgenstern et al., 2006; Tversky & Kahneman, 1986). This has led to the development of a large literature into one aspect of this phenomenon, the 'affect heuristic', describing the importance of affect on decisions (Slovic, et al., 2007). Affect is defined by Slovic et al. (2007) as 'the specific quality of "goodness" or "badness" (i) experienced as a feeling state (with or without consciousness) and (ii) demarcating a positive or negative quality of a stimulus' (Abstract). It is thus stated that language use, and more specifically the use of words

with which people may have a positive or negative connotation, can affect the decisions that are made based on that information.

Moreover, language used in risk communication should be **clear, concise and consistent** to avoid misunderstandings and to deliver the message clearly (Johansen, 2010; Morgenstern et al., 2006). In addition, Bier (2001b) and Dieckmann et al. (2010) state that risk communication should be **understandable** and consumers must be **comfortable** using the results of the analyses. When communication is not understandable or users are not comfortable using it, information will often be discounted or ignored.

Literature furthermore provides objectives and constraints applying to the interaction between parties in risk communication.

First, communication should be adapted to the intended **audience**. Knowing your audience and presenting the information in a way the audience understands it is essential (Balch & Sutton, 1995; Brown 2011). If the audience does not receive the information or if it does not attract their attention, communication fails (Lyytimaki et al., 2011).

Another important issue is **trust** (Bier, 2001b). Decision makers have to base their decisions, at least partly, on the information they receive on risks. If they do not trust the analyses to be accurate or objective, they may ignore the outcomes. This has got implications for both the sending and the receiving party. The communicating party must do anything to ensure it is (and perhaps more important is perceived to be) trustworthy. On the other hand, the receiving party must be open to communication as well.

Third, communication is always a two-way process; some kind of **dialogue**. Decision makers should not just await the information they may or may not receive, but should actively state what information they want and when they need it. Risk assessors should be open to these requests and strive to meet them (Balch & Sutton, 1995; Bier, 2001b).

The final aspect relates to the fact that every situation is different, as are the involved risks. Therefore, risk communication cannot be a standard formula; it has to be tailor-made. It is therefore important that new risk communication formats will be tested using **pilots** (Bier, 2001b)**.**

Literature on risk communication to decision makers and politicians thus provides many objectives and constraints for a system of risk communication. All factors identified in this paragraph are listed below:

- Relevant conclusions
- Leave room for politics
- Implications of uncertainty
- Value of information
- Context
- Assumptions
- Causes of risks
- Complete, timely and correct data
- Less information
- Risk trade-offs
- Point estimates and a range of uncertainty
- Cost-effectiveness data

- Real-world data
- Simple charts and graphs
- Progressive disclosure of information
- Focus on the most important data
- Narrative information
- Clear, concise and consistent use of language
- Understandable and comfortable to use
- Audience
- Trust
- Dialogue
- Pilot testing

2.3 Risk communication to the public

Risk communication in land development projects is less closely related to risk communication to the general public than it is to risk communication to decision makers and politicians. However, public opinion can play a large role in the municipal political setting concerning land development. Relations between the public and municipal councillors may be close. Moreover, there are general lessons to be learned from risk communication to the public. Therefore, assessing risk communication to the public is valuable. In this paragraph we first present a general overview of the literature, followed by an overview of relevant objectives and constraints.

2.3.1 Literature overview: Risk communication to the public

Communication on risks may be sent out to the public every day, whether it concerns health, food, terrorism or other risks. McComas (2006) has listed many 'defining moments' in risk communication between 1996 and 2005, and connects these moments to an overview of literature on risk communication to the public. She examines the reaction of the public, the way risks are represented in the media and possibilities to use risk messages strategically, for example in health risk messages. Her focus is on how risk communication affects society.

Bier (2001a) provides another overview of risk communication to the public. Unlike McComas, she focuses on how to design risk communication in such a way that the intended message is transferred to the public. The article presents an overview of empirical results regarding communication formats, audience differences and stakeholder participation, and the influence of credibility and trust.

Risk communication can serve five purposes: building trust, raising awareness, educating, reaching agreement and motivating action (Rowan, 1991). Reaching a different goal requires a different strategy. The effectiveness of risk communication depends largely on choosing the right format and approach to reach the intended goal (Bier, 2001a).

Another issue in risk communication many studies have focused on is the participation of stakeholders (Bier, 2001a; Wardman, 2008). A growing literature suggests that risk communication should be based on the needs and preferences of consumers, instead of on technical risk assessments alone (e.g. Cope et al., 2010). This strand of research is closely related to the study of mental models. Mental models define how people perceive the world around them, and how they process complex

information. These mental models may have a great influence on how people deal with risks and risk information (Bier, 2001; McComas, 2006).

Finally, trust and credibility are of great importance to risk communication to the public, perhaps even more than for risk communication to decision makers. The public may be more easily influenced by powers such as mass media (McComas, 2006). When such large powers are at play, trust is even more important for authorities communicating risks. It is much easier to destroy trust, than it is to create trust (Bier, 2001a).

Risk communication to the public has also faced criticism. It is said to be used too restrictive, thereby amounting to no more than 'PR' or 'spin' (Wardman, 2008). Power (2004) has called this phenomenon 'the risk management of everything'. He criticizes risk communication for having become a way to hedge a company or authority against reputational risks. If companies or authorities can show they have tried to manage the risks, they will not be held responsible. Hence, companies will apply risk management to everything, reducing risk management and risk communication to a trick and reducing its value (Power, 2004).

2.3.2 Objective and constraints: Risk communication to the public

In the literature several relevant objectives and constraints for a system of risk communication have been found.

Powell (2000) gives a number of guidelines for effective risk communication to the public. One lesson to be learned from communicating risks to the public is to **communicate the efforts** made in managing the risks. People want to know what measures are taken to control the risk and the effects that these measures have on reducing the risks (Powell, 2000; see also Cope et al., 2010).

Wardman (2008) describes transparency as one of the most often mentioned goals of risk communication. However, he notes that full disclosure of information might not result in understanding, but in an information overload. Such an overload may result in ignoring or discarding useful information, thereby reducing understanding. 'Simply providing more information does not in itself necessarily lead to greater understanding' (p. 1626). Therefore **less information** is better.

As discussed earlier, knowing the intended **audience** of the risk communication is important to ensure effectiveness (Bier, 2001a; Powell, 2000). Cope et al. (2010) state that risk communication should be 'based on consumer risk perceptions, concerns, information needs and preferences, rather than basing communication on technical risk assessments alone' (p. 352).

Closely related to this former point is the importance of knowing the **goal of risk communication**. The effectiveness of risk communication depends largely on adapting the message to the goal and the targeted audience (Bier, 2001a). Finally, as discussed in the overview, **trust** is of the utmost importance in risk communication to the public (Bier, 2001a; McComas, 2006).

Finally, one of the most important objectives in risk communication is to **communicate early and often** (Powell, 2000, p. 401). Communicating timely may prevent the situation that communication has to overcome entrenched risk perceptions in society. Moreover, risk communication can serve as an early warning. Early communication may spark possibilities to deal with risks. Delaying communication may cause solutions to expire.

The enumeration below lists the objectives and constraints for a system of risk communication that have been identified from literature on risk communication to the public:

- Communicate what is done
- Less information
- Audience
- Goal of risk communication
- Trust
- Communicate early and often

2.4 Risk communication to individuals

The final strand of literature examined is literature on communicating complex information to individual consumers. Different people handle information differently, due to differences in skills, knowledge and numeracy. Communication should be focused at presenting the information in such a way that the recipient understands.

Most of the literature on risk communication to individuals is focused at communicating healthcare information. Healthcare information is often complex and different sources can present contradictory information (Peters et al., 2007b). Additionally, healthcare decisions often involve risks and most consumers lack specific healthcare knowledge. This presents similarities to the present case of councillors making decisions on land development projects. Land development projects are complex and councillors may lack expert knowledge on these projects. Moreover, the projects often involve many uncertainties and risks.

2.4.1 Literature overview: Risk communication to individuals

It is often assumed that providing health care consumers with all available information will enable them to make the right decision. This is often not true (Peters et al., 2007a; Peters et al., 2007b). Different people may focus on different types of information. Municipal councillors will also have varying skills, knowledge and numeracy. As a result information presentation formats may not have equal effects on all councillors.

Research by Peters et al. (2007a; 2007b) has shown that presenting less information improves the comprehension of complicated information. Also making the most important information easier to evaluate and reducing the required inferences and calculations has a positive effect on peoples' understanding of complicated information.

2.4.2 Objective and constraints: Risk communication to individuals

In literature several relevant objectives and constraints for a system of risk communication have been identified.

First, the aforementioned studies underline the importance of limiting the information load. **Less information** ensures people are better able to comprehend complex information (Peters et al., 2007a).

Regarding the format of risk communication Peters et al. (2007b) notice that an increasing literature suggests that visual displays increase comprehension and risk perceptions (e.g. Lipkus & Hollands, 1999 and Stone et al., 2003). This is in line with the conclusions from Thompson and Bloom (2000) that **simple charts and graphs** are most suitable for risk communication.

Third, research into risk communication to individual consumers emphasizes the importance to **focus on the most important information**. When the most important information is easiest to find, this will ensure people reading it and prevent people from getting distracted, thus ensuring a better understanding of the matter.

Finally, Peters et al. (2007a) focus on the way risk information is presented. They conclude that their findings support 'the idea that presenting information in a "higher is better" frame that is consistent with how individuals think about and process numbers facilitates comprehension and helps consumers make better hospital choices' (p. 186). They underscore the importance of representing information in a way that requires **less cognitive effort** to understand. This means for example presenting costs as a negative and benefits as a positive.

Thus, literature on risk communication to individuals provides four objectives and constraints applying to a system of risk communication:

- Less information
- Simple charts and graphs
- Focus on the most important data
- Less cognitive effort

2.5 Conclusions: objectives and constraints

In this chapter literature has been examined to identify the objectives and constraints applying to a system of risk communication. Below, these objectives and constraints are grouped into seven categories and presented in table 2.1.

Table 2.1: Objectives and constraints grouped per category

Category	**Objective or constraint**
Conclusions	Relevant conclusions
	Room for politics
	Implications of uncertainty
	Value of information
Background	Context
	Explicit assumptions
	Causes of risk
	Communicate what is done
Type of information	Complete, timely and correct data
	Less information
	Risk trade-offs
	Point estimates and range of uncertainty
	Cost-effectiveness numbers
	Real-world data
Format	Simple charts and graphs
	Progressive disclosure of information
	Focus on most important numbers
	Narrative information
	Less cognitive effort

Category	Objective or constraint
Language use	Clear, concise and consistent
	Understandable and comfortable to use
Explanation	Audience
	Trust
	Dialogue
	Pilot testing
	Goal of communication
Frequency	Early and often

The category conclusions contains the need for relevant conclusions and the need to leave room for politics in these conclusions. Furthermore, the presentation of the implications of uncertainty on these conclusions and the value of information are included.

The category background consists of four factors. Background information should at least contain the project context, explicit assumptions underlying the analyses, information on the causes of risks and an elaboration of the undertaken efforts to deal with risks.

Several objectives and constraints refer to the type of information that should be included in risk communication. First, data should be complete, timely and correct. However, less information is better than including too much information. Furthermore, risk trade-offs should be presented. Fourth, point estimates of risk should always include a range of uncertainty. Finally, data on the cost-effectiveness and real-world data should be communicated.

The fourth category consists of five factors, including the need for simple charts and graphs, a structure that enables the progressive disclosure of information, focus on what is most important, the inclusion of narrative risk information and, finally, a strive to present information in such a way it requires less cognitive effort o understand.

The use of language in risk communication should be clear, concise and consistent. Furthermore, it should be understandable and comfortable to use.

The category explanation refers to the relation between the sending and receiving party in risk communication. First, the intended audience should be clear. Second, a certain level of trust is needed. Furthermore, there should be some kind of dialogue between the two parties. New formats should be tested using pilots. Finally, the goal of risk communication should be clear to both parties.

The final category focuses at the frequency of risk communication: this should be done early and often.

3. System of risk communication

3.1 Introduction

In the previous chapter we have used literature to identify objectives and constraints for risk communication. This literature is not specifically focused at land development projects. Therefore, in this chapter the requirements are refined to be applicable to land development projects.

In the next paragraph we examine the specific case of land development projects to find differences compared to other projects, and the implications of these differences for the system of risk communication. After that, Dutch national law is examined, as this sets constraints for risk communication. In paragraph 3.4 user requirements are further assessed, as councillors that will be using the risk communication may present additional objectives or constraints. Finally, a refined framework for risk communication is presented, focused at land development projects in the Netherlands.

3.2 Land development projects

Land development projects constitute a specific type of municipal project (Deloitte, 2010b). In this paragraph we first discuss the main differences in communicating risks from land development projects as compared to other types of risk communication. After that, the implications of these differences for the list of objectives and constraints are presented.

3.2.1 Differences with other types of projects

Risk communication concerning land development projects can differ from other risk communication, due to the nature of land development projects. Below, three features of land development projects are identified that have an effect on risk communication.

First, land development projects involve several specific risks, as discussed in paragraph 1.1.1. Several of these risks lie outside the control of the municipality, for example market forces. Developing land for housing only becomes profitable in the long term (Needham & Verhage, 1998, p. 39), when these dwellings are sold. This also applies to other forms of real estate. However, municipalities cannot control the real estate markets. Furthermore, the municipality is often dependent on third parties and regulation. As a result, the assessment of risks in land development projects is often not an exact science. Skill and experience of the project team is of great importance. This complicates the analysis of risks, but also the communication as the underlying analysis is more subjective.

Second, land development projects are long-term projects. Plans are often broad at the start and consequently refined to more detailed over time, both programmatic and financially (Deloitte, 2010b). This means that during the project flexibility enables the municipality to steer. Therefore, there are more opportunities to respond to changing circumstances, as opposed to, for instance, large infrastructure projects (Korthals Altes, 2010). However, it also complicates forecasting project outcomes.

Finally, it can be hard to quantify or monetise the spatial effects of land development projects. Spatial development brings with it many social benefits (and perhaps costs). Valuing these effects, and thereby making a choice between for example

profit and more social housing, is a political decision, depending on priorities in the municipality at that moment (Needham, 1997, p. 293).

3.2.2 Effects for objectives and constraints

The features of land development projects described in the previous paragraph have implications for the framework for a system of risk communication, as presented in the previous chapter. There are a number of objectives or constraints that do not apply to a system of risk communication for land development projects.

First of all, as described above, quantifying the effects of land development projects is very hard. Valuing (social) benefits may be a political matter more than an objective one. Therefore, cost-effectiveness numbers are of little relevance, and is removed from the framework. Second, risk trade-offs are not relevant for the same reason. As it is very hard to quantify effects exactly, it is nearly impossible to compare trade-offs. Therefore, this requirement is also removed.

Third, risk analysis for land development projects cannot be done in a laboratory. Risk analysis in land development is often based on the skills and experience of those who are involved. The analysis is therefore by definition based on real-world data. The objective to include real-world data is removed.

The final objective that is removed is the value of information. The value of information refers to the cost of obtaining information that would decrease uncertainty. Risks in land development projects are estimated based on skill and experience. Reducing uncertainty in these risks by doing extra research is almost impossible; uncertainty will only be decreased by time. Furthermore, this uncertainty is also caused by the built-in flexibility, which is an inherent part of the way land is developed. It might therefore be detrimental to reduce this uncertainty. A value of imperfect information approach is therefore complicated, if not impossible in risk communication about land development projects.

The four objectives or constraints discussed above are removed from the framework for risk communication to refine the framework and focusing it specifically at land development projects.

3.3 Dutch national law

Two Dutch laws pose constraints for the system of risk management of municipalities. These are the ‘Gemeentewet’ (Municipality law) and the ‘Besluit begroting en verantwoording provincies en gemeenten’ (Bbv, Decree budget and accountability provinces and municipalities). As both are laws that have to be complied with, they provide constraints, not objectives.

3.3.1 Gemeentewet

The Gemeentewet includes four main topics. These are the organisation and composition of the management of municipalities, the powers of the municipal council, executive board and major, the financial organisation of the municipality and the supervision over the municipality. Here, we discuss the articles of the Gemeentewet that have an influence on risk communication.

First, members of the executive board have the obligation to actively inform the council when necessary. This is recorded in article 169, which states that the executive board and all of its members have to justify their actions to the municipal council. They

are obliged to present the council with all information necessary for the council to fulfil their task. The same obligation applies to the major[1].

Second, the Gemeentewet provides the basis for the planning and control cycle of the municipality in article 186. For an elaboration on the required content the article refers to the Bbv. Furthermore, the council must approve the yearly budget and ensure that it is in balance[2]. The municipal executive board is obliged to present a draft budget to the council, before November 15 of the year prior to the budget year. The executive board is to give account of the foregoing year through the annual report and financial statements[3]. The council has to approve these. The reports and statements have to be sent to the council before July 15 of the year following the budget year.

Constraints

The Gemeentewet thus provides constraints for the system of risk communication. The system must ensure that councillors are provided with all the information they require to fulfil their task. This means that the executive board must always inform councillors on important matters, if necessary outside the regular planning and control cycle. More specifically, the Gemeentewet requires the planning and control cycle to consist of (at least) the annual budget and financial statements, which have to be compiled by the executive board and approved by the council. The Gemeentewet also sets the dates prior to which these documents have to be sent to the council. The requirements of a **budget** and **financial statements** will be added as constraints.

3.3.2 Besluit begroting en verantwoording

The Bbv arranges the budgeting and accounting of provinces and municipalities. In this section we will only focus on the implications the Bbv has for municipalities. The Bbv defines the products that are to be presented, the manner of accounting and the information that is to be made public.

First, chapter VIII of the Bbv installs the committee BBV. This committee is to ensure an unambiguous execution and application of the decree. Before the Bbv was entered into force in 2004, the committee presented several underlying principles applying to the municipal budget and financial statements: prior approval from the council (only applicable to the budget), periodicity (budget and financial statements must be presented before the dates set in the Gemeentewet), public accessibility and completeness (Commissie BBV, 2003).

There are also requirements set for the presented financial data. These requirements are transparency, allocation, prudence, legitimacy and the presentation of a faithful image. Transparency means that all users of the budget and financial statements should get as much insight in the data as possible. To this end figures should be usable, systematic, well founded, relevant, material and reliable. The second requirement, allocation, concerns the accounting method of revenues and costs. All costs and revenues should be allocated to the period which they relate to and not to the moment they materialise. Third, prudence also refers to the way of accounting. Losses must be recorded when they are discovered, profits can only be recorded after realisation (see also Korthals Altes, 2010). Legitimacy means that the data presented should conform to all rules and regulations. Finally, the numbers should present the reader with a faithful image of the municipal financial position (Commissie BBV, 2003).

[1] Article 180, Gemeentewet.
[2] Article 189 to 191, Gemeentewet.
[3] Article 197 and 198, Gemeentewet.

Products
Based on the Bbv, the executive board must yearly present a budget, multi-year estimates and financial statements to the council. These documents must give the council sufficient insight to make an informed assessment of the financial position of the municipality and the costs and benefits[4] (Oude Vrielink, 2004). Information on land development projects is to be recorded in at least two places: the paragraphs and the balance sheet.

The budget and financial statements include a number of mandatory paragraphs. For the assessment of the financial position of the municipality in relation to land development projects two paragraphs are most important: the paragraphs financial resilience (in Dutch: weerstandsvermogen) and land use policy (in Dutch: grondbeleid).

The financial resilience is the relation between the financial capital, which are all the resources the municipality has to cover all not budgeted expenses, and all risks that are not covered otherwise. The paragraph financial resilience should include an inventory of the financial capacity, an inventory of the risks and a description of the policy regarding the financial resilience[5] (see also Van der Schaaf, 2011).

The paragraph on land use policy should include at least a vision on the municipal land use policy in relation to the programs in the budget, a description of the way the municipality executes this policy, an up to date forecast of the results of all land development projects, a substantiation of the anticipated profit-taking and the policy principles regarding reservations for risks[6] (Ten Have, 2007).

In the balance sheet, land for development projects is to be included as a current asset. Land development projects that are in progress are considered work in progress; land that is not yet being developed is to be recorded under raw materials. Both work in progress and raw materials are part of the inventory[7]. Changes in inventory must be explained in the notes[8] (see also Commissie BBV, 2012).

Constraints
Several constraints for the system of risk communication follow from the Bbv. First, it obligates the inclusion of the **paragraphs financial resilience and land use policy** in the budget and financial statements. The Bbv also specifies part of the content of these paragraphs. The inclusion of these paragraph is added as a constraint. Second, the Bbv provides the basis for the **financial resilience**, which is pivotal for assessing the financial position of the municipality. This is therefore also added as a constraint.

The Bbv leaves room for interpretation. This is an important feature in the political context in which the budget and financial statements are included.

3.4 User requirements

In communication there are at least two parties, the sender and the receiver. This paragraph examines the user perspective at risk communication. To find user

[4] Article 3, Bbv.
[5] Article 11, Bbv.
[6] Article 16, Bbv.
[7] Article 38, Bbv.
[8] Article 52b, Bbv.

requirements interviews with councillors from the case municipalities have been conducted.

This paragraph first discusses the model of communication used in this thesis. After that, the outcomes of the interviews with councillors are presented, by first assessing how risk communication about land development projects is used by councillors and by identifying objectives and constraints for the system.

3.4.1 Communication as the double construction of text

Each party involved in communication, at least one sender and one receiver, uses their own codes to understand the information that is sent. The more the codes of sender and receiver are alike, the better the understood message by the reader resembles the intended message of the author. This has been called the double construction of text by both author and reader (Eco, 1979, in Faludi & Korthals Altes, 1994).

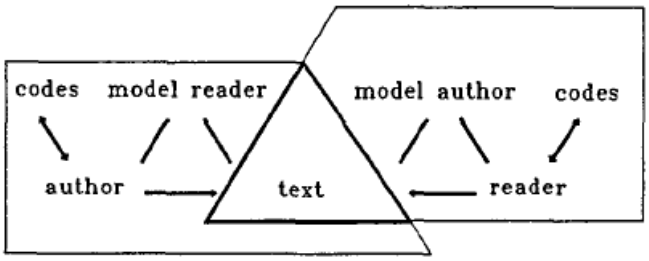

Figure 3.1: Model of communication as the double construction of text (Faludi & Korthals Altes, 1994, based on Witteveen, 1992).

In writing a text the author uses his or her set of codes to construct the message. He or she will envision a model reader in doing so. The author will try to adapt the text to this model reader. The reader will use his or her set of codes to understand the message, and will thereby keep in mind a model author. Hence, both parties will try to take the other party into account (see figure 3.1). Still, there may be differences in the way the two parties understand the message (Faludi & Korthals Altes, 1994).

This notion is also applicable to risk communication about land development projects. Risk communication is often composed by the municipal agency, which has a specific knowledge and understanding of the project at hand and the risks therein. The readers are councillors, who have a much more general knowledge and skill set. These readers may or may not know much about land development projects.

It is therefore important not only to assess the supply side of risk communication, but the demand side (i.e. the councillors) as well. What kind of information do councillors want regarding risks in land development projects? How do they assess this information and what do they need it for? This has been the subject of a number of interviews with councillors from the three case municipalities.

3.4.2 How do councillors use risk communication on land development projects?

In general, the role of the municipal council is to set frameworks and to supervise the municipal executive board. In land development projects this means setting spatial, programmatic and financial boundaries for the executive board. The board often has some freedom as to the choice of projects. In the case municipalities the executive board can decide on starting projects, if the projects fit in the set of boundaries. The supervising role of the council is to monitor the developments and to make sure the

project does not transcend its boundaries, in which case the executive board should inform the council and measures might be taken.

When councillors were asked for their involvement in land development projects and which role they see for themselves, they often mention this framework-setting and supervising role. Additionally, they mention the budget right of the council[9]. First, the council has to approve of additional funding in case a project is expected to result in a loss. Second, most land development projects will need to make investments before profits can be gained, therefore the council needs to approve of investment credits.

The councillor in Den Haag[10] added another use of risk communication. He noted that risk information is often used politically, to reach goals through political debate.

3.4.3 Objectives and constraints from user requirements

The second focus point of the conducted interviews with councillors was to identify the requirements users (i.e. councillors) have for the municipal systems of risk communication.

Councillors from the municipality Rotterdam[11] stated that they liked to be informed about the risks in projects. For on-going projects they would like to know about the riskiness of the project, by knowing the largest risks and the measures taken to control these. For new projects they would like to see an overview of risks as well. Furthermore, the importance of narrative information was stressed, in addition to qualitative information. This relates to the councillors emphasising the importance of knowing the project context. The councillors furthermore stated that they want to have insight in the assumptions behind analyses and into calculations. Risk communication should have a good structure, so users can dig deeper if needed. All of the requirements mentioned by the councillors have been included in the framework based the literature.

The councillor from Eindhoven[12] partly mentioned the same requirements. He stressed the importance of a good structure to dig deeper if needed and the importance of project context as well. Regarding risks in land development projects, he seemed to focus less on the risks in individual projects, but he required a more portfolio view of risks in relation to the municipality as a whole. Furthermore, important to risk communication is that it is consistent and understandable. These two factors have already been included in the framework as well. A new factor mentioned by the Eindhoven councillor is that risk communication should be prospective. Documents regarding land development projects should be able to function as early warnings. The council should be able to take protective measures to harness the municipality from potential future events.

The councillor in Den Haag especially stressed the need for overview of the municipal land development portfolio. Having a complete picture of the situation is most valuable to him. Furthermore, he stressed the importance of extensive risk information, including information on the assumptions behind the analyses and a good search structure, as well as an uncertainty range. Finally, transparency and intelligibility are important virtues of risk communication. These requirements have all been included in the framework based on the literature.

Based on the interviews with councillors, the requirement that risk communication should be **prospective** is added to the risk communication framework.

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[9] Article 189, Gemeentewet.
[10] Interview on February 13, 2012.
[11] Interviews on September 19, 2011 and September 28, 2011.
[12] Interview on December 20, 2011.

3.5 Conclusions: system of risk communication

This paragraph presents the conclusions of this chapter. First, the list of objectives and constraints from the previous chapter is refined. After that, the conceptual model for the system of risk communication is presented. Finally, the objectives and constraints and the conceptual model are combined to present the system of risk communication for land development projects that will be used in the next chapters.

3.5.1 Objectives and constraints

In chapter 2 objectives and constraints for risk communication have been identified after studying literature. In total 27 objectives or constraints were identified and grouped into seven categories. In this chapter that list of objectives and constraints has been refined to identify those requirements that are applicable to risk communication on land development projects. Therefore, based on the specific nature of land development projects, four factors were removed from the list: cost-effectiveness numbers, real-world data, risk trade-offs and value of information.

Furthermore, relevant Dutch national law has been studied to identify additional objectives or constraints. This has led to the addition of four constraints: budget, financial statements, paragraphs in budget and financial statements and financial resilience. The first two constraints, budget and financial statements, require the presentation of two distinct documents. Therefore we group these two constraints into a new category named components, as these refer to the components of risk communication. The paragraphs in the budget and financial statements provide background information, and this constraints is therefore included in the category background. Financial resilience refers to a specific type of information to be included, therefore it has been added to the category type of information.

Based on interviews with councillors from the case municipalities one more objective has been added: risk communication should include prospective conclusions. This objective has been added to the category conclusions.

Table 3.1 presents an overview of the objectives and constraints applicable to risk communication on land development projects and the grouping into categories.

Table 3.1: Objectives and constraints for risk communication on land development projects

Category	**Objective or constraint**
Components	Budget
	Financial statements
Conclusions	Relevant conclusions
	Room for politics
	Implications of uncertainty
	Prospective conclusions
Background	Paragraphs in budget and financial statements
	Context
	Explicit assumptions
	Causes of risk
	Communicate what is done

Category	Objective or constraint
Type of information	Complete, timely and correct data
	Less information
	Financial resilience
	Point estimates and range of uncertainty
Format	Simple charts and graphs
	Progressive disclosure of information
	Focus on most important numbers
	Narrative information
	Less cognitive effort
Language use	Clear, concise and consistent
	Understandable and comfortable to use
Explanation	Audience
	Trust
	Dialogue
	Pilot testing
	Goal of communication
Frequency	Early and often

3.5.2 Conceptual framework

To reduce the number of categories, some of the categories listed in table 3.1 are combined. The categories conclusions, background and type of information all refer to what information should be included in risk communication. Therefore these three categories are combined into the category content. The categories format and language use can be combined into the category representation, as both categories refer to the representation of communication and risks.

This presents five main categories: components, content, representation, explanation and frequency. Components are the different information documents that are used to communicate risks. Content refers to the information that is included in the components of the risk communication system. Third, representation concerns the way information in risk communication is represented. Explanation is focused at the relations between the sender of the information and the receiver. Finally, frequency applies to the moments and frequency of communication.

These categories have been structured according to the conceptual model presented in figure 3.2. Components, content and representation can be seen as a whole, including interactions between these framework parts. These interactions represent the notion that the different parts cannot function properly alone. Explanation and frequency apply to the whole of the other three categories.

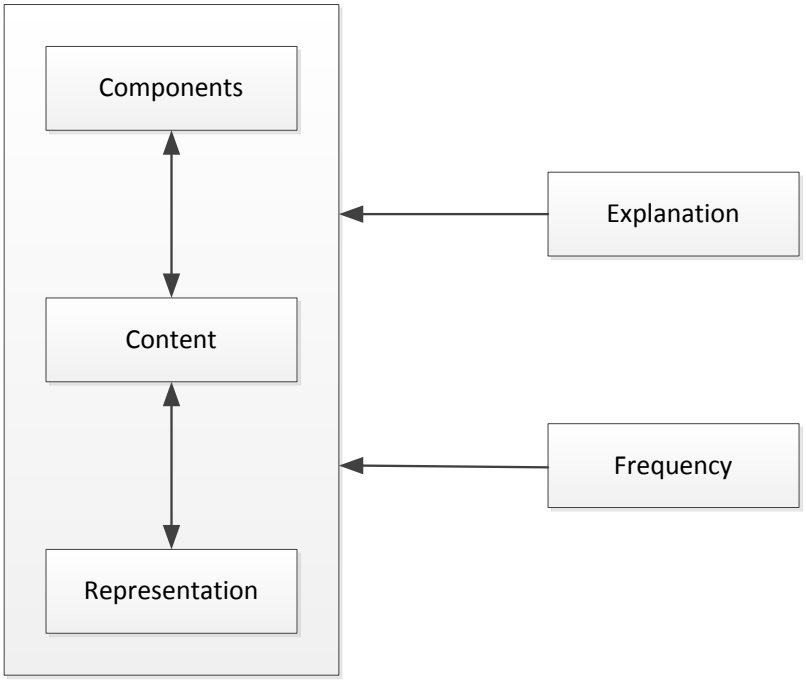

Figure 3.2: Conceptual framework of a system of risk communication on land development projects

In this conceptual model the interactions are important. Components, content and representation cannot function separately. A certain level of interaction is needed to perform adequately. These interactions will be discussed shortly here.

First, the interactions between components and content are discussed. Risk information requires risk communication documents (i.e. the components) to perform. However, these documents can only perform their task if there is a substantive content. Conversely, information content needs to be put in some kind of communication component to be received by the audience. Without some kind of vehicle, information cannot be transferred.

Content needs to interact with representation as well. The information content may be great and elaborate, if it is not represented in a way it can be understood it is useless. The same applies to representation: the format and language use may be outstanding, but when content is missing there is nothing left but rhetoric.

3.5.3 System of risk communication for land development projects

In this chapter the objectives and constraints for risk communication from the previous chapter were refined to be applicable to land development projects. A conceptual framework was presented to structure the objectives and constraints in a system of risk communication. Combining the conceptual framework and the objectives and constraints presents the system of risk communication for land development projects, as shown in figure 3.3.

System of risk communication	Components	-	Budget
			Financial statements
	Content	Conclusions	Relevant conclusions
			Room for politics
			Implications of uncertainty
			Prospective conclusions
		Background	Paragraphs in budget and financial statements
			Context
			Explicit assumptions
			Causes of risk
			Communicate what is done
		Type of information	Complete, timely and correct data
			Less information
			Financial resilience
			Point estimates and range of uncertainty
	Representation	Format	Simple charts and graphs
			Progressive disclosure of information
			Focus on most important numbers
			Narrative information
			Less cognitive effort
		Language use	Clear, concise and consistent
			Understandable and comfortable to use
	Explanation	-	Audience
			Trust
			Dialogue
			Pilot testing
			Goal of communication
	Frequency	-	Early and often

Figure 3.3: Framework of objectives and constraints for a system of risk communication for land development projects

This framework constitutes the answer to sub-question 1, defined in chapter 1: *What objectives and constraints apply to a system of risk communication from a municipal executive board to councillors regarding land development projects?* In the next three chapters the framework will be used to assess the system of risk communication in the municipalities of Rotterdam, Den Haag and Eindhoven.

4. Rotterdam

4.1 Introduction

The first case municipality that is assessed is Rotterdam. The municipality is introduced below. Then, an overview of the roles and powers of the municipal council and executive board are discussed. Finally, an outline of the rest of the chapter is presented.

4.1.1 Municipality of Rotterdam

With approximately 600,000 inhabitants Rotterdam is the second largest municipality in the Netherlands, after Amsterdam (CBS, 2011). It is located in the south of the Randstad, in the western part of the Netherlands. The port of Rotterdam is one of the largest in the world. The old harbours were located near the city centre, whereas in recent years harbour activities have gradually moved out of the city towards the North Sea. As the old city harbours became vacant, these areas are now being redeveloped into urban area.

Besides the redevelopment of old harbour locations land development in the municipality of Rotterdam is mostly concerned with inner-city renewal projects for several more reasons. First, many neighbourhoods were built after the second World War. As the quality of these neighbourhoods does not live up to current standards, many of these are renewed. Second, almost all land in Rotterdam has been built on; the municipality has little possibilities to develop greenfield areas.

The municipality is actively involved in land development projects: in 2009 the inventory had a book value of €208.9 million (CBS, 2011), meaning the municipality invested heavily in land development projects. Furthermore, losses and subsidies are booked as income in Rotterdam, thereby lowering the book value of projects. This means that the actual investments may be much higher. Moreover, booking subsidies which will only be rewarded after realisation may present additional risks.

As described in the introduction of this thesis report Rotterdam has suffered large losses in land development projects in recent years. The goal of this chapter is to analyse the current system of risk communication in Rotterdam and to assess its functioning.

4.1.2 Roles council and executive board

In Rotterdam the municipal executive board decides to start land development projects in practice. Only when projects need additional funding the council is involved, based on their budget right. The general roles and powers concerning budgeting and justification have been recorded in a regulation[13], however no specific regulations have been recorded for land development projects. Neither the memorandum land policy[14], which was installed before the dualisation of Dutch municipal politics in 2002, nor the 2003 framework memorandum land policy[15] makes any reference to the distribution of powers in deciding on land development projects.

4.1.3 Outline chapter

In this chapter the system of risk communication at the portfolio level will first be described and assessed. Then, the case project Laurenskwartier is presented in

[13] Verordening financiële huishouding 2006, Gemeente Rotterdam.
[14] Nota Grondbeleid 1980, Gemeente Rotterdam.
[15] Kadernota Grondbeleid 2003, Gemeente Rotterdam.

paragraph 4.3. After that, the system of risk communication at the project level is assessed based on the case project. The risk communication at both levels is then analysed, including the opinions of councillors. Finally, conclusions are presented regarding the system of risk communication in Rotterdam and its functioning.

4.2 Municipality: system of risk communication

In this paragraph the system of risk communication at the portfolio level is described and assessed using the framework from chapter 3. Each objective or constraint is scored using colours. Green means that the objective or constraint is satisfied. Orange means that improvements are necessary to satisfy the objective or constraint. Red means that the requirement is missing in the system of risk communication.

4.2.1 Components

Budget
Financial statements

The system of risk communication at the portfolio level consists of four different documents in Rotterdam. These are the budget, financial statements (both required by law), interim reports and the Monitor Grote Projecten (MGP, Monitor Large Projects). These document are briefly discussed.

Budget
The annual budget includes the mandatory paragraphs land use policy and financial resilience. Most information on land development projects is included in the paragraph land use policy. The paragraph includes extended information on the land development policies in Rotterdam, but little information on the actual development portfolio. Descriptions of the policy framework and goals of land development are included, as well as an analysis of real estate markets and relevant national policy. However, the only information concerning the actual portfolio in Rotterdam is the estimate for the expected financial result of all current projects. No further information is given on what risks are present or what impact they might have. Information on individual projects is not included.

The paragraph financial resilience shows an overview of the largest risks the municipality is currently subject to, including the total of current risks in land development projects. In the budget for 2012 an additional risk premium for large land development projects was added[16]. A foundation or calculation for these risk estimates is not presented. These underlying calculations are described in the Meerjaren Prognose Rotterdamse Grondexploitaties (MPRG, Multiyear Prognosis Land Development Projects in Rotterdam), which is not presented to the council.

Financial statements
The paragraphs in the financial statements include the same kind of descriptive information as the budget. An extra feature in the paragraph financial resilience is the presentation of the effects of risks that have presented themselves in the past year on the reserves and the financial capacity.

[16] Budget 2012-2015, Gemeente Rotterdam, pp. 188-190.

Furthermore, information on land development projects is shown in the revenue and expenditure account, in the policy field land use[17]. Here, changes in project results (as compared to the budget) are presented and explained. Also, the parameters used to calculate the results of land development projects (interest, costs and benefits) are presented.

Finally, an overview of total investments in individual projects in the past year is presented in the appendices.

Interim reports

The council receives three interim reports per year. In these reports the board presents an update of the budget and shows what goals have been realised so far. Land development projects are discussed only in case of major changes in the portfolio, such as in 2009. The whole land development portfolio was then audited and losses were to be expected. These losses were announced to the council through the interim reports. However, only an estimate for the total loss was presented. No information on individual projects was included.

Monitor Grote Projects

The MGP presents the largest projects of the municipality, including land development projects, and is presented twice per year to the council. Large projects are defined as those projects that take at least three years to complete, have a project balance of at least €20 million and are characterised by high complexity and/or a high risk profile. Each project is described using a format with a stoplight model. The stoplight model includes indicators on money, risks, organisation, time, information, communication and quality. The stoplight colours indicate whether the indicator is on schedule (green), not on schedule but the delay or loss can be fixed without action from the council (orange) or action from the council is required (red).

The MGP does not provide information on the whole land development portfolio, as not all land development projects are included. The MGP will therefore be discussed further with the assessment at the project level in paragraph 4.4.

4.2.2 Content

Conclusions
Relevant conclusions
Room for politics
Implications of uncertainty
Prospective conclusions
Background
Paragraphs in budget and financial statements
Context
Explicit assumptions
Causes of risk
Communicate what is done
Type of information
Correct, timely and complete information
Less information
Financial resilience
Point estimate and range of uncertainty

[17] E.g. financial statements 2010, Gemeente Rotterdam, pp. 241-254.

Conclusions

There is much to be improved in the conclusions presented in risk communication. First of all, both the budget and the financial statements are descriptions of the land development policy, rather than presentations of the status of the portfolio. Therefore, although the development policy is important, not all relevant conclusions are presented.

The same applies to the presentation of prospective conclusions. The only prospective information presented is the aggregated expected end result of all projects combined. This shows some prospective information, but much more can be presented.

Furthermore, the room for politics in the conclusions can be improved. In none of the documents there is a discussion on whether changes should be made to projects or the portfolio; that option is not included. Moreover, from studying reports from council meetings from the last 5 years, it can be concluded that land development projects are often only discussed with the presentation of the MGP. However, as the MGP includes only a limited number of projects, most projects are almost never discussed.

Finally, the implications of uncertainty in analysis are not presented to the council. For example, the expected end results are presented as a single value, not indicating a degree of certainty.

Background

The background information presented to the council satisfies some of the requirements identified. Both the budget and the financial statements include the mandatory paragraphs. Furthermore, in the financial statements some of the assumptions behind the analyses are shown: the parameters interest and cost and benefit development. However, no sensitivity analysis is presented to assess the impact of these parameters on the portfolio results.

Many improvements can still be made as well. As discussed earlier, little information on current projects and the current portfolio is presented. Individual projects are only discussed in the revenue and expenditure account of the financial statements (besides the MGP, which shows only the largest projects). However, these discussions often only mention the changes in financial result. More contextual information on the type of project or progress of the project is not given. Therefore, improvements can be made.

Two objectives or constraints are lacking entirely at the portfolio level. Neither the causes of risks, nor control measures are discussed.

Type of information

Concerning the type of information included in risk communication there are also improvements to be made in Rotterdam. First, little risk information at the portfolio level is presented. Neither the budget, nor the financial statements discuss risk in land development in detail. Furthermore, the timeliness of information can be questioned. For example, after recording substantial losses in the financial statements of 2009 the municipal development agency of Rotterdam started a recalibration of its entire project portfolio. The first interim report of 2010 mentioned the start of this scan[18]. The second interim report mentioned the scan as well and predicted that the financial consequences would be 'substantial'[19]. The third interim report then presented an expected negative

[18] Eerste Bestuursrapportage 2010, Gemeente Rotterdam.
[19] Tweede Bestuursrapportage 2010, Gemeente Rotterdam.

effect of €275 million[20]. However, the financial statements 2010 presented the definite losses, as well as information on what projects caused these losses. It might therefore be argued that the timeliness of information can be improved.

Second, the council receives a lot of information on land development policies every year. Often this information has changed only gradually as compared to the previous year. It might be clearer to present this policy information in a specific memorandum land development, and reserve the paragraph in the budget and financial statements for information on the current status and developments. This way, less information is presented, creating more focus at the important information.

Third, the required financial resilience capital for land development projects is presented. However, this presentation only mentions a required amount of resilience capital. The calculations behind this figure are in the MPRG, which is not sent to the council. Councillors therefore have little insight in the financial resilience and risks.

Finally, numbers and figures are presented as single point estimates only. Ranges of outcomes to represent the uncertainty in underlying analyses are not shown.

4.2.3 Representation

Format
Simple charts and graphs
Progressive disclosure of information
Focus on most important numbers
Narrative information
Less cognitive effort
Language use
Clear, concise and consistent
Understandable and comfortable to use

Format

The format of risk communication in Rotterdam fails to meet many of the objectives and constraints identified. None of the documents include charts or graphs. Simple charts or graphs can increase understanding; not including these is a missed opportunity. Furthermore, there are no opportunities to progressively disclose information. There are no documents sent to the council with an elaboration of background information, which may allow councillors to dig deeper when needed. Moreover, the budget and financial statements include largely the same information.

Improvements can be made concerning the focus on important number and on the use of narrative information. The main information that is presented on the development portfolio is the expected end result of the project portfolio. Although this is important information, focusing only on this information presents a unilateral view. More focus on risks and programme will be major improvements. Second, the use of narrative information to describe risks can be improved. Risks are only discussed narratively. However, little text is included on influence of these risks on the portfolio.

Finally, we conclude that figures and numbers are presented in a way that is intuitive. Therefore, the requirement that the communication format should require less cognitive effort from readers to understand the information is satisfied.

Language use

The language used in risk communication is assessed to be sufficient. It is clear and concise, and information is understandable and comfortable to use. None of the

[20] Derde Bestuursrapportage 2010, Gemeente Rotterdam.

interviewed councillors reported complaints about the language used in risk communication.

4.2.4 Explanation

Audience
Trust
Dialogue
Pilot testing
Goal of communication

All risk communication documents have been composed specifically for the council. Therefore, the audience and the goal of communication have been known. The dialogue regarding risk communication between the council and the development agency can be improved. The council has the opportunity to propose changes to the format of the MGP[21]. However, there is no dialogue on the format of and information in the budget and financial statements. This might have a relation with the trust between the involved parties.

Finally, the use of pilot testing for new formats could not be assessed as no new formats have been implemented in recent years.

4.2.5 Frequency

Early and often

The council is informed about the land development portfolio at several moments, see figure 4.1. The three interim reports enable the board to present updates to the council regularly. However, in practice little information is provided through these reports. Therefore, we conclude that improvements can be made regarding communicating to the council early and often.

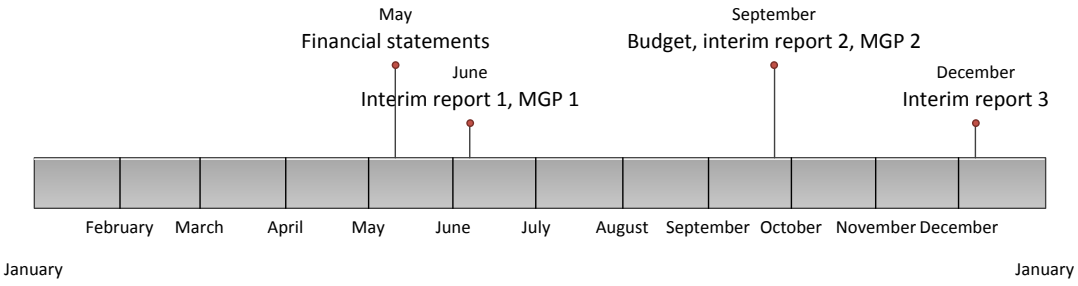

Figure 4.1: Publishing moments of risk communication documents in Rotterdam

4.3 Case project: Laurenskwartier

The case project studied in Rotterdam is Laurenskwartier. First, the project is presented. After that, several of the most important risks in the project are shortly described and then traced back in risk communication. Finally, intermediate conclusions about the communication of these risk are presented.

[21] Interview on November 16, 2011.

4.3.1 Project description

Laurenskwartier is a neighbourhood in the centre of Rotterdam (see figure 4.2). Many of the buildings are built after the second World War, when the centre was rebuilt. At the end of the 20th century these dwellings did not live up to the current standards and plans were drawn to restructure the neighbourhood. The current plans include the construction of around 1400 dwellings, 42,000 m² office space and 23,000 m² of other functions[22].

Figure 4.2: Laurenskwartier plan area[23]

Around 1990 the railway tunnel was completed, replacing the railway that ran through the Laurenskwartier. This opportunity was seized to restructure the neighbourhood. Plan studies were made and in 1997 a first plan was released. These plans included approximately 1550 dwellings and 25,000 m² of commercial functions[24], divided over many subprojects (19 subprojects in 2002). Development activities would first focus on those locations that were most promising.

After real estate markets were affected by the economic recession in 2003, subprojects in Laurenskwartier were prioritised in 2004[25]. Initial focus would be on five subprojects: around 1000 dwellings and 10,000 to 15,000 m² of other functions.

The content of the (sub-)plans changed throughout the years. The current project programme includes around 1400 dwellings, 42,000 m² office space and 23,000 m² of other functions. A number of subprojects have been completed. It is however not clear what part of the total programme has been completed.

[22] Monitor Grote Projecten, Q8 2011, Gemeente Rotterdam, p. 27.
[23] Masterplan Laurenskwartier West 2008, Gemeente Rotterdam.
[24] Rapportage Grondexploitaties 1997, OntwikkelingsBedrijf Rotterdam, p. 99.
[25] Raadsbrief Prioritering Laurenskwartier, January 2004, Gemeente Rotterdam.

Based on the first plans in 1997 a loss of €5 million was expected. Throughout the years plan results have fluctuated. This is partly caused by the way the municipality Rotterdam takes losses in land development projects: additional funding is not set aside in a provision, but added as income to the project balance. Currently the expected plan results are therefore slightly positive (+€0.3 million[26]). However, losses of €5 million[27], €12 million[28] and €3.8 million[29] were taken in 2007, 2008 and 2010.

4.3.2 Risks

In an inner-city land development project such as Laurenskwartier risks are abundant. Here, we discuss six of the most important risks that have occurred in the past or that are still relevant in the project[30].

First, the municipality had to acquire land, for most land in Laurenskwartier was privately owned. When landowners are not willing to sell, this may lead to delays for the land development project. Moreover, acquisition costs are dependent on the results of negotiations, which may cause the budget to be insufficient.

A second risk in Laurenskwartier was in the municipality's strategy to influence owners associations through acquiring dwellings. The municipality planned to get a position in the owners association of certain blocks to force home owners to improve their dwellings. The housing market was expected to go up; therefore, the dwellings were expected to be easily sold later. However, the plan failed as there were insufficient funds to obtain a voice in the owners associations. Moreover, housing markets decreased, leaving the municipality with the dwellings as there was less demand.

Third, the rail tunnel under Laurenskwartier causes risks for the realisation of one subproject. The owner of the tunnel, ProRail, has to give a permit for building activities in the proximity of the tunnel. The subproject Jacobsplaats was planned above the northern tunnel entrance. ProRail is only willing to give the permit if the municipality is prepared to take all risks connected to the new buildings, for eternity. As the municipality was not willing to do that, developments for the Jacobsplaats have been put on hold until at least 2015.

Fourth, the subsoil in Laurenskwartier has presented risks. Many archaeological findings were made during the realisation of subprojects, causing delays and extra costs. Furthermore, when building the Markthal subproject, problems with ground water were feared. Eventually, the undeveloped land was sold to the development company for a lower price. The development company thereby effectively took the risk of extra costs in the land development phase.

A fifth risk is in the market conditions. Original plans for Laurenskwartier were highly ambitious. However, as soon as 2003, demand proved to be lagging and subprojects were prioritised early 2004. After the credit crisis in 2008 markets took a downturn again. For Laurenskwartier this led, among others, to the postponement of the Rotta Nova subproject in 2009, as the development company was not able to realise the project. The municipality is currently negotiating an alternative plan or temporary use with the development company.

Finally, a sixth risk is in the budget for the development of public space. In 2010 the original budget reserved for the public space appeared to be insufficient. Additional

[26] Monitor Grote Projecten, month 8 2011, Gemeente Rotterdam, p. 27.
[27] Financial statements 2007, Gemeente Rotterdam, p. 311.
[28] Financial statements 2008, Gemeente Rotterdam, p. 257.
[29] Financial statements 2010, Gemeente Rotterdam, p. 248.
[30] Based on the interview on April 4, 2012.

funding is needed to realise the intended quality level. However, it is yet to be assigned by the municipality government.

4.3.3 Risk communication

The council is currently mainly informed on risks in Laurenskwartier through the MGP (first composed in 2007) and through letters from the executive board. Furthermore, projects are included in the financial statements when losses have to be taken or profits are realised. In this paragraph the risks mentioned in the previous paragraph are traced back in communication the council received.

Risks in the acquisition of land were mainly relevant in the early years of the project. The council was involved in the acquisition of land, as additional funding was often necessary. The council received letters from the board in 1999[31] and 2001[32] regarding the acquisition of plots. No risks were discussed in these letters.

The strategy to influence the owners associations through the acquisition of dwellings was started early in the project. In the reconsideration of the project in 2003 it was already noticed that the strategy did not have the intended effects[33]. However, these risks were not communicated to the council until the first MGP of 2009. Before 2009 the approach was not mentioned in any MGP or letter to the council. Perhaps the ownership of the dwellings was not considered a risk, because housing prices were expected to rise. When housing prices decreased in 2009 because of the economic recession, it suddenly appeared a large financial risk was taken.

The risks concerning the permits to build near the rail tunnel were communicated to the council first in 2008, through the MGP. In 2010 the decision was made to put the subproject on hold until 2015[34]. Consequently, the risk was no longer included in communication. However, it is not clear whether the problems are solved and the subproject is sure to be realised in 2015, or that the required permits might cause new problems.

The complications in the subsoil of the Markthal subproject were communicated to the council in 2008 and 2009 through the MGP. Later in 2009 a letter was sent to the council in which the board proposed to sell the undeveloped land to the developer and take the loss. By agreeing on that proposal, the risk was bought off.

Fifth, the lagging market conditions around 2003 and from 2008 onwards were communicated to the council as well. Early 2004 the council was informed by a letter that the projects in Laurenskwartier were suffering from decreasing market demand and that subprojects were prioritised[35]. The disappointing market conditions in 2008 were communicated through the MGP. Since 2009 the communication in the MGP focuses mainly on the subproject Rotta Nova, which was postponed.

Finally, the risks in the budget for the public space were revealed in 2010. It was first included in the first MGP of 2011. This risk is still relevant.

4.3.4 Conclusions

In recent years most of the important risks were eventually communicated to the council. However, risks are often only communicated after they emerge (e.g. the risks in

[31] Raadsvoorstel Aankoop onroerende zaken in het Laurenskwartier in het kader van de Wet voorkeusrecht gemeenten, 99SOB03485, Gemeente Rotterdam.
[32] Raadsvoorstel Aankoop Cebeco-complex, SOB47118, Gemeente Rotterdam.
[33] Interview on April 4, 2012.
[34] Monitor Grote Projecten, Q1 2010, Gemeente Rotterdam, p. 3.
[35] Raadsbrief Prioritering Laurenskwartier, 03/4809, Gemeente Rotterdam.

the owners association strategy and in the Markthal project subsoil). This means the council is always one step behind. Furthermore, it must be emphasised that the information presented through the MGP is limited, as only a few risks are included in the MGP. Moreover, no information on risk likelihood or impact is included. Councillors are therefore not able to assess the relevance and importance of these risks.

Besides the risks discussed above, several other risks were reported to the council through MGPs. These risks are not consequently described, and some are included once or twice and then removed again. This way, it is not clear whether the risk is still relevant to the project, or that it is just not communicated anymore.

4.4 Laurenskwartier: system of risk communication

In the previous paragraph the case project Laurenskwartier was described and the system of risk communication at the project level was presented by analysing past and present risks. In this paragraph the system is assessed using the framework from chapter 3.

4.4.1 Components

Budget
Financial statements

Risk communication at the project level is mainly presented to the council through letters or the MGP. Occasionally losses are taken described in the financial statements. Project information accompanying these losses is at a bare minimum[36].

The objectives and constraints in the category components do not apply to a system of risk communication at the project level.

4.4.2 Content

Conclusions
Relevant conclusions
Room for politics
Implications of uncertainty
Prospective conclusions
Background
Paragraphs in budget and financial statements
Context
Explicit assumptions
Causes of risk
Communicate what is done
Type of information
Correct, timely and complete information
Less information
Financial resilience
Point estimate and range of uncertainty

Conclusions

Like with the portfolio level, project level conclusions in risk communication can be improved. Relevant conclusions are not always presented. Moreover, the MGP does not

[36] E.g. financial statements 2008, Gemeente Rotterdam, p. 257: a loss of €12 million is explained in one sentence.

present an overall conclusion for each project. A glance at the stoplight model colours presents an impression of the project, however the indicators do not provide a complete overview of the project. The fixed format may also cause important conclusions to be underexposed. Furthermore, an overall conclusion of the status of the project and the progress is often lacking. Council letters often do include a relevant conclusion, especially when the letter includes a proposal to the council.

The same applies to room for politics and prospective conclusions. In council letters there is room for politics, because these letters often include a specific proposal to the council and because the letters are often discussed in the council. The MGP is also discussed, but the information does not present any choices to the council. Consequently, there is little room for councillors to have a political discussion. Prospective conclusions in the MGP are limited to the expected end date and financial results. More detailed information might be much more informative for council members.

Finally, all information presented in the MGP and in council letters is represented as exact values for risks and end results. No information is presented on uncertainty or its effects on the end result.

Background

The background information the council receives on land development projects is limited and seems somewhat random. For instance, the council does receive information about the control measures taken to deal with risks. However, little information is presented on the causes of risk, and no information is included on the likelihood of occurrence or impact of risks. Furthermore, the rigid format of the MGP makes it hard to add explanations to the colours of the stoplight model. Therefore, much context information is missing. Explicit assumptions that underlie the analyses are lacking altogether.

Finally, letters to the council are generally brief, not including extensive background information on the project or on project risks.

Type of information

The information included in the MGP reports may be falling short of the constraint that it should be complete, timely and correct. Not all risks are included in the MGP, and criteria as to which risks to include are not clear. Therefore, important risks may be missing and councillors are not presented with a complete risk overview. Furthermore, the fixed format of the MGP and the process of composing it (up to 1.5 months[37]) may cause the information to be outdated by the time it is sent to the council. The format also includes much information that is of little relevance to councillors. For example, the MGP shows how many dwellings were to be built according to the original plans and according to the current plans. More informative would be to know how many dwellings are to be built and how many have yet been realised. Plan changes should be reported to the council otherwise.

Furthermore, two important constraints are lacking. First, it is impossible to assess the project's impact on the financial resilience, because neither risk likelihood nor impact is quantified. Therefore, it is not possible to assess the riskiness of the project. And second, as discussed earlier, values are presented without attention to the influence of uncertainty in the analyses.

[37] Interview on November 16, 2011.

4.4.3 Representation

Format
Simple charts and graphs
Progressive disclosure of information
Focus on most important numbers
Narrative information
Less cognitive effort
Language use
Clear, concise and consistent
Understandable and comfortable to use

Format

The format of the MGP does not include graphs or charts. Although information can be transferred without, simple charts do enhance the understanding. Second, the MGP does not allow for any progressive disclosure of information; councillors do not have the opportunity to dig deeper into the information if they want to. The MGP presents a number of indicators for each of the largest projects, but does not offer the possibility to know what is behind the colours in the stoplight model.

The format of the MGP is designed to direct focus to the stoplight model. It might be argued however that the indicators included are not those that provide the most insight, as described earlier. Focus is therefore directed at some important numbers, however other important numbers are missing and some of the information focused upon is less relevant to the council.

Furthermore, narrative information is included in some parts of the MGP. However, not at the places it is most needed. The introduction of the project is presented narratively, as is risk information. However, this risk information is not quantified, thereby not presenting a complete overview of the riskiness of the project. Furthermore, there is no narrative information included in the stoplight model. Here, narrative information would be useful to explain the nuances that are lost in the colouring of the indicators.

Finally, the information included in the MGP and in council letters is presented in such a way that the effort required is not too large. Numbers are presented in an intuitive way. The colours in the stoplight model are intuitive as well; green is good, red means problems.

Language use

The language used in the MGP and in council letters is generally understandable to councillors. However, the consistency of descriptions can be improved. Risks are not consistently described through different MGPs. For example, until 2010 MGPs report the risk of a drop in demand. In 2011 this drop is still relevant, however the MGP now focuses solely on the risk of not being able to realise the Rotta Nova subproject. The more general risk of a drop in demand is not mentioned anymore. These changes in description might cause less-informed council members to lose track of developments.

4.4.4 Explanation

Audience
Trust
Dialogue
Pilot testing
Goal of communication

Some of the objectives and constraints regarding explanation are sufficient, while others can be improved upon. The risk communication documents are composed for the council, therefore the audience is known. Furthermore, there is some dialogue between the council and the board regarding the format of the MGP. The MGP is discussed in a joint council committee hearing and questions can be asked. Remarks regarding the format of the MGP can be made and are followed up by the board.

However, the improved format of the MGP is not tested through pilots before it is implemented. The process of improving the MGP is therefore one of incremental steps, which are improved by trial and error. Further improvements can also be made in adapting the communication to its goal. Although the audience is known, the information is not always presented in the way that enables the best understanding.

4.4.5 Frequency

Early and often

Council members receive two MGP reports per year. These MGPs do not include all land development projects. Furthermore, the council occasionally receives letters regarding individual projects. These letters include only limited project information. Altogether the council is not informed often on projects. Moreover, on many projects the council is not informed at all.

4.5 Analysis

In this paragraph the outcomes of the assessments of the system of risk communication at both the portfolio and the project level are analysed. Finally, the opinions of interviewed councillors on how risks in land development projects in Rotterdam are communicated are presented.

4.5.1 Portfolio level communication

The system of risk communication at the portfolio level complies with the constraints set by national law, i.e. in the Gemeentewet and Bbv. The executive board presents yearly a budget and financial statements to the council. Both include the paragraphs land use policy and financial resilience. The paragraphs comply with regulation from the Bbv as well, although the paragraph land use policy includes the bare minimum.

However, when assessing the system of risk communication using the framework from chapter 3, many objectives and constraints are not satisfied, or are lacking. Most notably, there is almost no specific risk information included. No information is presented to councillors on the causes of risks and control measures or on the uncertainty in analyses and the impact of this uncertainty. Risk context is only provided marginally.

Interactions are often unclear. There are only a few system components (budget, financial statements and interim reports), each with a specific purpose in the general municipal planning and control cycle. However, in Rotterdam this distinct purpose is not defined in relation to land development. As a result, the paragraph land use policy for the budget does not differ much from the land use policy paragraph in the financial statements. The interactions between content and representation are not adequate either. There is little difference in representation between various content types.

Information is presented narratively or quantitatively, but not in relation to each other. Concluding, the lacking of risk information makes the system components more alike, causing interactions to become unclear.

Thus, the most important improvement that should be made is that more specific information concerning risks at the portfolio level should be included. Further improvements to the system could be made in two main directions. First, no real conclusions are drawn concerning land development. None of the documents present a clear conclusion on where the project portfolio stands and whether policy changes are needed. Second, councillors are provided with information on developments in land development policies, but they do not receive any information on the actual land development portfolio in Rotterdam. It is not clear how many dwellings are built, when these will be realised or what total amount has been invested in projects. Without this information no councillor can have an overview of the portfolio.

4.5.2 Individual projects

The system of risk communication at the project level can be improved at many points. Many objectives and constraints from the framework in chapter 3 are not met or are lacking completely.

The interaction between the framework parts can be improved. Interactions between the components (MGP and council letters) and content are functioning to a certain level. Both types of components have a specific goal, to which content is adapted. However, to both the MGP and the letters applies that the content is not sufficient for councillors to have a complete view of the project. Project context is often missing in letters altogether. The MGPs present a lot of information, but fail to present an overview of the riskiness and the progress of the project, which is essential information.

The interactions between the content and representation can be improved as well. The MGP contains a rigid format, which leaves little room for nuances or specific information and leaves out important information. Quantitative information is often not explained.

The risk communication at the project level can be improved by focusing more on the information that presents an overview of the actual status of the project. This includes information on project risks and the general riskiness of the project, and information on the progress of the project. The current risk information includes only a small number of risks, which are not quantified. Over time, these risks are not communicated consistently. Furthermore, risk communication can be improved by presenting more background information, which presents councillors with a more complete overview of the project. Finally, providing more information about projects that are not included in the MGP ensurse councillors to be informed about smaller projects as well.

4.5.3 Opinion of councillors

Three councillors were interviewed in Rotterdam: George van Gent and Jan-Willem Verheij (both VVD, liberal party)[38] and Jan Schonk (D66, Democrats ‘66)[39]. They agree that the council is currently receiving little information on land development projects. Furthermore, the council is not involved sufficiently when new projects are started. The powers and roles of the board and council are not clear.

[38] Interview on September 19, 2011.
[39] Interview on September 28, 2011.

The financial statements present information that is too aggregated. Therefore, the basis of the numbers is unclear and the information is hardly usable for councillors. An example is the losses taken in the financial statements of 2010. The losses added up to around €200 million, but the council only received an overview of the losses per project. Little information was included on the underlying reasons and mechanisms.

The MGP lacks readability, because of the rigid format and few possibilities to add explanations. Furthermore, information is often outdated due to the lengthy process of composing. The councillors would like to see a MGP with a better search structure, which is more focused on changes in the projects and an explanation for these changes. In general, councillors wish to have more insight in the project, through an overview of the programme, the risks involved and the progress of the project.

4.6 Conclusions

In this chapter the system of risk communication in the municipality of Rotterdam has been described and assessed using the framework from the previous chapter. Thus, this chapter presents an answer to the second sub-question of this thesis research. The main conclusions of this chapter are presented below.

Overall, the system of risk communication in Rotterdam meets the legal requirements set in national law, but fails to meet many of the objectives and constraints from the framework used in this research. The interactions between the system parts can be improved. Risk information is often missing, thereby causing interactions to be unclear. The interviewed councillors agree that the current system does not inform them in a way that enables them to perform their task well. The three most important shortcomings are discussed.

First, at the portfolio level no information is presented concerning the actual project portfolio; only information on land development policies is presented. The council receives no overview of the total development programme, or of cash flows and expected future losses or profits. The required financial resilience is presented, but no information on calculations or other background data is given. The interviewed councillors indicate that the information is too aggregated to be useful. This is only part of the problem. The information is not only too aggregated, but important pieces of information are missing. Councillors cannot have a complete overview of the municipality's financial position without knowing what losses or profits can be expected from land development projects next year.

A second shortcoming is the presented information at the project level. The MGP contains a fixed format including several indicators. However, risks are only described in a narrative way and neither the impact nor the likelihood is quantified. Furthermore, information on the progress of the project is not included. The councillors emphasise the poor readability of the document, due to the rigid format and the little room for explanation. Furthermore, they add that the information in the MGP is often outdated when it reaches the council. The MGP includes too many indicators of which some are not relevant for the council. For instance, information on the project programme should be included, but not as an indicator where the current programme is compared to the original programme. If the programme changes this should be communicated to the council through a specific letter. The inclusion of information on the project progress is more informative for the council.

A final point of improvement is in the relationship between the council, the executive board and the municipal development agency. The interviewed councillors indicated that the roles and powers of the council and executive board in deciding on land development projects are not clear. More clarity will improve the mutual understanding and will also provide more insight into what information councillors need to fulfil their tasks.

5. Den Haag

5.1 Introduction

The second case municipality is Den Haag. An introduction to the municipality is presented below, followed by an overview of the roles of the executive board and the municipal council. Finally, the outline of the chapter is presented.

5.1.1 Municipality of Den Haag

Den Haag is the third largest municipality in the Netherlands, after Amsterdam and Rotterdam, with around 500,000 inhabitants (CBS, 2011). It is located in the Randstad, in the western part of the Netherlands. Many of the municipal development projects are restructuring projects.

The national government of the Netherlands is located in Den Haag, therefore many government offices are located in the city. Furthermore, Den Haag presents itself as the international city of peace and justice.

Den Haag was selected as a case municipality for several reasons. First, it is one of the largest municipalities in the Netherlands, where future development projects are most likely inner-city projects. Second, the municipality has invested much in land development, as the municipal financial statements over 2009 show that the inventory had a book value of €123.6 million (CBS, 2011). Finally, Den Haag was recommended by Frank ten Have (partner at Deloitte Real Estate Advisory) as a good practice regarding risk communication from the executive board to the council.

5.1.2 Roles council and executive board

In Den Haag the executive board has the right to start land development projects, as long as these projects are within the boundaries of the Investeringsprogramma Stedelijke Ontwikkeling (IpSO, Investment Programme Urban Development). The IpSO presents the programmatic and financial boundaries for land development projects in Den Haag and is yearly approved by the municipal council. A further elaboration of the process and procedures concerning land development projects are laid down in a regulation[40] and an executory decision[41].

5.1.3 Outline chapter

This chapter starts with the description of the current system of risk communication at the portfolio level. This system is then also assessed using the framework from chapter 3. In paragraph 3 the case project Laakhaven West is presented. This case project is used in the fourth paragraph to examine the risk communication at the project level. After that, the risk communication at both levels is analysed. Finally, conclusions regarding the system of risk communication of Den Haag and its functioning are presented.

5.2 Municipality: system of risk communication

In this paragraph the system of risk communication at the portfolio level is described and assessed using the framework from chapter 3. The colours used in the assessment are explained in paragraph 4.2.

[40] Verordening Beheersregels Grond- en Ontwikkelingsbedrijf 2011, Gemeente Den Haag.
[41] Uitvoeringsbesluit Beheersregels Grond- en Ontwikkelingsbedrijf 2011, Gemeente Den Haag.

5.2.1 Components

Budget
Financial statements

In Den Haag the system of risk communication consists of several documents. First, the budget and the financial statements, which are required by law, include the mandatory paragraphs land use policy and financial resilience. Furthermore, in the interim report (called Halfjaarbericht) projects are discussed and a half-yearly financial update is included. The Meerjaren Prognose Grondexploitaties (MPG, Multiyear Prognosis Land Development) and the IpSO present specific information on land development projects. Finally, GRIP reports inform the council on specific projects.

Budget
In the budget, the paragraph land use policy presents the most elaborate information on land development projects. This paragraph starts with an introduction of the land development policy in the municipality. After that, an overview of the required financial resilience for land development projects is presented. These calculations are taken from the MPG. Finally, a prognosis for the financial reservation for the development agency is presented, also based on the MPG. Individual projects are not discussed in this paragraph.

The paragraph financial resilience takes the calculations of the financial resilience for land development projects from the land use policy paragraph. When additional risks related to land development projects are relevant, such as plan adjustments that cannot be paid for by the reservation, these are discussed and quantified.

The appendix presents an overview of all land development projects in the municipality. In this overview the current expected results are compared with those in the previous financial statements.

Financial statements
The financial statements in Den Haag exist of two documents: the financial reports (in Dutch: jaarverslag) and the appendices (in Dutch: jaarrekening). The reports include the paragraphs land use policy and financial resilience.

As in the budget, the paragraph land use policy contains most of the information on land development projects. The paragraph starts with an overview of the municipal land development policy. Second, the current land development projects are discussed. This discussion includes an overview of the updated project results, including an explanation for incurred changes. Furthermore, the realised costs and benefits and a cash flow prognosis are presented. After that, an overview is shown of all transfers between project balances, reservations and provisions. Finally, the result of the reservation land development is determined and the required financial resilience is presented, based on the MPG.

The paragraph financial resilience does not include much information on land development. As in the budget, only risks not included in the calculations for the required financial resilience are discussed.

Finally, the appendices show an overview of the expected results of land development projects. Changes in the expected results are explained for all of the 40 largest land development projects and all projects that incurred changes over €250,000 in turnover or result.

Interim report
The interim report includes an elaborate half-year update of land development projects. It includes an overview of and explanations for incurred changes in expected results, like in the financial statements. Furthermore, the required financial resilience and reservation for land development are updated.

MPG and IpSO
The MPG and IpSO include information specifically on land development projects. The IpSO presents the programmatic and financial boundaries for land development projects and is to be approved by the council. The executive board can then start or revise projects within these boundaries. The MPG is used to inform the council on land development. Therefore, the council does not approve the MPG.

In Den Haag, the MPG is presented once a year, in September. It presents information on both the total portfolio and the 40 largest land development projects in the municipality, which amounted to 95% of the turnover in land development projects in 2011. The MPG is the only document containing explicit risk information.

The most important information is included in a summary at the start of the MPG. The main text starts with a general introduction and an introduction to the land development policies in Den Haag. Then, land development finances are discussed. An overview of the costs, benefits and results of all projects together is presented, as well as an overview of the turnover and expected result of each individual project. After that, totals are shown for the development programme. This is followed by a market analysis. Sixth, the required financial resilience is calculated, based on the quantification of project and portfolio risks. Finally, the consequences for the financial reservation for land development are presented, as well as a prognosis for the development of this reservation. In the confidential appendix of the MPG extensive risk information is presented per project, including project context, a programme overview, risk information (both likelihood and impact quantified) and a cash flow analysis.

GRIP reports
Finally, the council can appoint large projects for the so-called GRIP reports (short for 'grip on large projects'). These reports inform the council yearly about the largest land development projects in the municipality. As these reports focus on the project level they will be further discussed in paragraph 5.3.

5.2.2 Content

Conclusions
Relevant conclusions
Room for politics
Implications of uncertainty
Prospective conclusions
Background
Paragraphs in budget and financial statements
Context
Explicit assumptions
Causes of risk
Communicate what is done
Type of information
Correct, timely and complete information
Less information
Financial resilience
Point estimate and range of uncertainty

Conclusions

The MPG, budget and financial statements all include a conclusion at the end, explaining how the documents relate to each other. These conclusions often refer to the IpSO as that is where the real decisions can and should be made by the council. As a consequence, the other documents are less concerned with leaving room for politics, although debate can be held based on these documents. In general, the components in the system present prospective conclusions, providing a forecast for the reservation land development and the cash flow. The MPG presents more prospective information, for example on the financial resilience and the consequences for financial reservations.

A major point of improvement for Den Haag is that no information on uncertainty is included in risk communication. All information is presented as a point value, without a range considering the uncertainty in analyses. It is therefore not clear to council members how much confidence they should have in these figures.

Background

Both the budget and the financial statements include the paragraphs land use development and financial resilience. These paragraphs include all topics required by the Bbv.

The MPG contains extensive (risk) information concerning the land development portfolio, including context, assumptions, risk causes and control measures. This information is presented in a more aggregated form in other documents, such as the budget and financial statements. For example, the MPG shows overviews of portfolio finances and programme and an extensive market analysis. This information is discussed in the other documents in a more aggregated form.

Type of information

The interviewed council member indicated to be satisfied with the information the council receives. In his opinion the information is correct, timely and complete[42]. From this research there have been no indications that suggest otherwise. Moreover, due to the clear documents and the distinct purposes there is no information overload. The information included in documents is adjusted to this purpose.

[42] Interview on February 13, 2012.

The calculation of the financial resilience is described in the MPG and included, in a more aggregated form, in the budget and financial statements. To calculate the financial resilience one scenario is presented. This scenario presents assumptions considering decreasing land revenues, delays in the emission of developed land and increasing interest rates. These assumptions are determined by the land development agency. However, because only one scenario is used there is no presentation of a range for uncertainty. This may present calculations that are easier to understand, but it also shows a one-sided perspective and may provide a false sense of security to the council.

5.2.3 Representation

Format
Simple charts and graphs
Progressive disclosure of information
Focus on most important numbers
Narrative information
Less cognitive effort
Language use
Clear, concise and consistent
Understandable and comfortable to use

Format

The formats of the risk communication documents are generally adequate. However, there are some points of improvement. First, some charts or graphs that are included in the documents are hard to understand, for instance the graphs depicting the transfers between the reservations and provisions, included in the financial statements[43]. This charts shows too many relations, which may lead council members to lose focus and disregard the figure.

A second weakness is the structure of the interim reports and financial statements. Such an amount of information is included, that the structure becomes unclear. First, the changes in expected results are described in general, and later these are described per project. There seems to be an overlap here, and connections between the document parts are unclear.

Furthermore, most of the requirements considering the risk communication format are satisfied. The whole of budget, financial statements, MPG and interim report present a proper search structure, enabling progressive disclosure of the information. The budget and financial statements present the outline of the portfolio, the MPG presents the underlying analyses. Because of this well-designed consistency a large amount of information can be included, without the reader losing focus.

Second, risks are presented both quantitatively and narratively. This enables a better understanding of the information. Finally, the calculations of the required financial resilience do not require more effort than needed to understand. Negative risks are presented as a negative figure, while positive effects are presented positively.

Language use

The language used in the documents is clear and concise. It is also well understandable. The interviewed councillor indicated that the documents are well usable[44].

[43] E.g. financial statements 2010, Gemeente Den Haag, p. 179.
[44] Interview on February 13, 2012.

5.2.4 Explanation

Audience
Trust
Dialogue
Pilot testing
Goal of communication

Risk communication documents in the municipality Den Haag are all composed specifically for the municipal council. It is therefore clear who the intended audience is. Furthermore, purposes of documents are clearly stated, so the goal of communication is known. The council has faith that the executive board informs them timely on important matters in land development projects[45]. A point of improvement might be the dialogue between these two parties. Adaptations to formats of communication take time to be realised[46].

Pilot testing could not be assessed because no new formats were implemented concerning the portfolio level.

5.2.5 Frequency

Early and often

Finally, risks should be communicated both early and often. The system of risk communication in Den Haag includes documents that all have a more or less fixed publishing date. These documents all are published once a year. Therefore there are only two moments the council receives information (see figure 5.1). On the other hand, the executive board always has the possibility to inform the council through an additional letter. The board also uses this possibility.

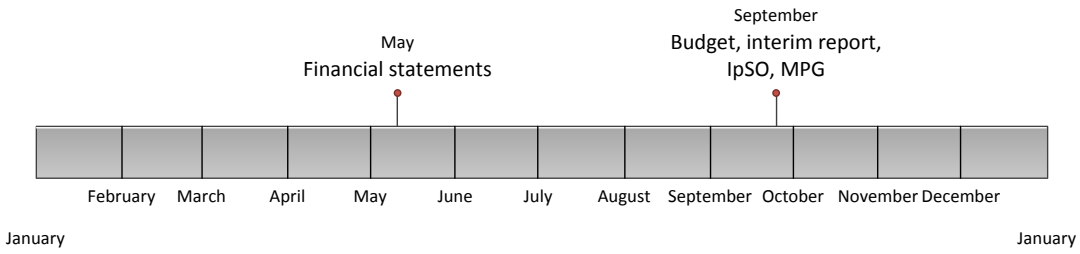

Figure 5.1: Publishing moments if rick communication documents in Den Haag

5.3 Case project: Laakhaven West

Laakhaven West was studied as the case project in Den Haag. First, a project description is presented. After that, risks in the project and communication about these risks are discussed. Finally, intermediate conclusions concerning the risk communication are drawn.

5.3.1 Project description

The project Laakhaven West is part of the larger Laakhaven area: a former harbour area near the city centre that is to be transformed into a mixed zone with housing, offices and

[45] Interview on February 13, 2012.
[46] Interview on February 13, 2012.

other functions (see figure 5.2). Laakhaven West is one of the four subprojects in Laakhaven, although all have separate financial arrangements. A distinction between the different projects is always made in risk communication to the council (except in GRIP reports).

In Laakhaven West 830 dwellings and approximately 15.000 m² of business area will be realised[47].

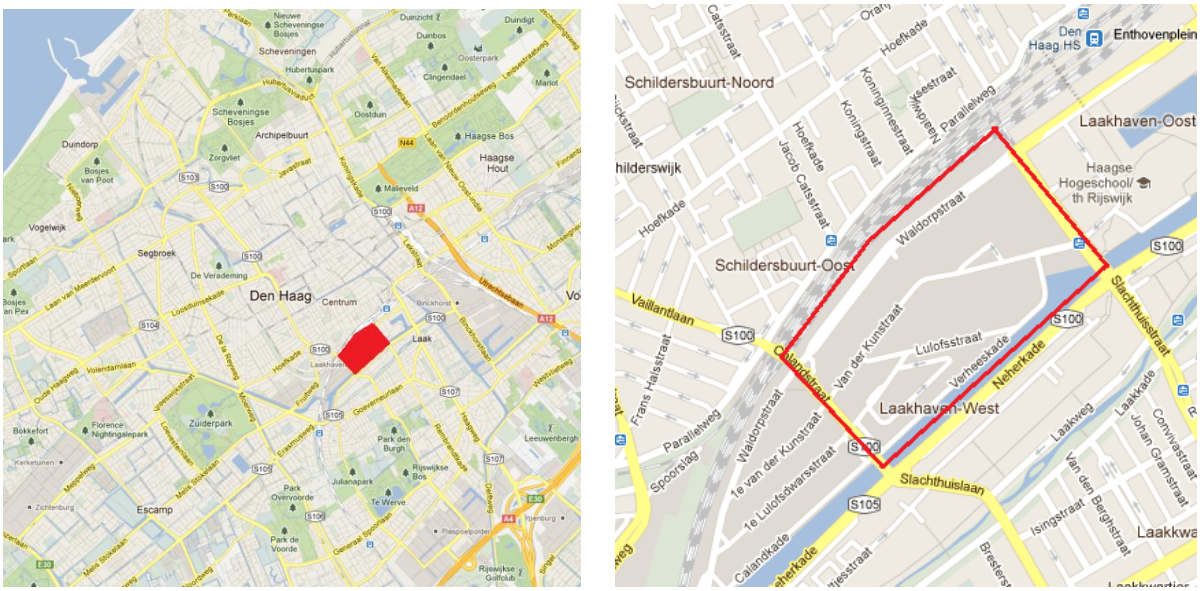

Figure 5.2: Laakhaven West plan area in Den Haag

The plan process for restructuring Laakhaven West was started around 2000. Early plans were to provide around 67,000m² of business area, but were deemed not feasible in 2004. Then, new plans were drawn, providing a mix of business area and housing. These were laid down in an urban design that was approved in 2007[48].

To realise the plans a cooperation agreement was signed in 2006 with a development combination, consisting of two developers and a housing cooperation. However, in 2011 actual development had not yet started, due to declining real estate markets. These market conditions led the municipal executive board early 2011 to put the project on hold for four years[49]. Later in 2011 the municipality decided to restart the project, but investments will only be made when there is immediate development and benefits[50]. These development will probably be on a smaller scale than originally envisioned[51].

A revised project plan was approved by the executive board at the end of 2011[52]. For Laakhaven West, this revision concerned a number of plan changes, such as a sound wall, the outplacement of a gas station and noise-reducing asphalt. These plan adaptations are necessary before the new land use plan can be approved by the council. The new development approach, including small scale developments, is not yet recorded in a project revision.

[47] Stedenbouwkundig Plan Laakhaven West, 2007.
[48] Stedenbouwkundig Plan Laakhaven West, 2007.
[49] MPG 2011, Gemeente Den Haag, p. 31.
[50] IpSO 2012, Gemeente Den Haag.
[51] Interview on January 16, 2012.
[52] Raadsinformatiebrief, Herziening projectdocumenten Laakhaven, December 2011, Gemeente Den Haag.

In a feasibility study in 2006 the project Laakhaven West was estimated to have a loss of €26.8 million; this sum was reserved by the council. The project document and urban plan showed a more positive prognosis in 2007: a loss of €22.1 million. Due to delays in the project the result gradually worsened to –€26.6 in 2011[53]. The plan changes of end 2011 caused the result to drop further to a loss of €31.5 million. Additional funding for the plan was found in national funding for urban restructuring (ISV3) and the land development reservation of the municipality itself.

5.3.2 Risks and risk communication

In Den Haag project risks are communicated most elaborately through the confidential appendices of the MPG. All land development projects are discussed in these appendices and all risks (positive and negative) are presented, including likelihood and impact[54]. Furthermore, since 2011 the council can appoint projects as GRIP projects, after which the council will be informed more often on this project. Laakhaven as a whole (also including Laakhaven Holland Spoor, Laakhaven Centrum and Laakhaven Petroleumhaven) is one of the ten current GRIP projects. These GRIP reports present an overview of the projects, including risk information. Risk information is presented both on project and market risks, including likelihood, impact and control measures.

Finally, besides these GRIP reports, updates on individual projects are presented through the financial statements and interim report, and through council letters concerning individual projects.

All identified project risks are reported to the council in the MPG and GRIP reports. It was not possible to receive a full list of risks, because of confidentiality. Therefore, the risks reported in (public) Laakhaven documents are discussed here. In the 2007 project document for Laakhaven West[55] three risks are mentioned. These are risks in land acquisition, in land use plan procedures and environmental risks. Furthermore, the document contained confidential land development calculations and a complete overview of risks.

The risks in land acquisition result from the fact that much of the plan area was owned by private landowners. In 2007 and 2008 the municipality acquired land and real estate in the plan area[56].

A second risk was in the land use plan procedures. As land use changes from business area to a mixed use, land use plans had to be changed to enable development. A new land use plan was approved December 2011.

The third risk is related to the previous risk. In 2007 a number of environmental risks were identified. These issues had to be dealt with and included in the project plans before the land use plans could be approved. The revised project document of December 2011 resolved these issues. In 2007 it was expected that risks could be in soil contamination, external safety due to a gas station, noise nuisance and air quality. In 2011 measures were taken to reduce noise nuisance and to outplace the gas station. Soil contamination and air quality did not require measures. The inclusion of the extra measures in the plan presented extra costs of €4.3 million net present value.

[53] Meerjaren Prognose Grondexploitaties 2011, Gemeente Den Haag.
[54] Interview on December 6, 2011.
[55] Projectdocument en Stedenbouwkundig Plan Laakhaven West en Petroleumhaven, April 10, 2007, Gemeente Den Haag.
[56] Procesdossier Laakhavens, Gemeente Den Haag, July 2010.

5.3.3 Conclusions

The municipal council was informed elaborately about project risks in individual land development projects. This risk information is presented mainly through the MPG, which includes information on all risks in the 40 largest land development projects, which include Laakhaven West. Additionally, for selected large projects there are GRIP reports, including extensive risk information as well.

Documents focusing on a specific project, such as Laakhaven West, occasionally include risk information, however this information in not always quantified. In such cases the MPG or GRIP reports can provide this risk information. However, both reports are only presented once a year, so risk information may be outdated when a decision is required.

5.4 Laakhaven West: system of risk communication

The previous paragraph described the case project and the system that is used to communicate risk information to the council. This system of risk communication is assessed using the framework composed earlier.

5.4.1 Components

Budget
Financial statements

The constraints budget and financial statements are only applicable to risk communication at the portfolio level; they do not apply to the project level.

5.4.2 Content

Conclusions
Relevant conclusions
Room for politics
Implications of uncertainty
Prospective conclusions
Background
Paragraphs in budget and financial statements
Context
Explicit assumptions
Causes of risk
Communicate what is done
Type of information
Correct, timely and complete information
Less information
Financial resilience
Point estimate and range of uncertainty

Conclusions

At the project level, the MPG and financial statements present mostly updates on projects, including progress and the state of risks. These updates do not involve conclusions regarding projects. Individual documents focused at the project, such as council letters, do include relevant conclusions.

Room for politics regarding projects is generally sufficient. Yearly the council is provided with an overview of projects and choices regarding these projects in the IpSO.

Furthermore, council letters also leave room for politics, partly dependent on whether the goal of these letters is to inform or to approve.

Prospective conclusions are included in all documents through the expected end results and the progress of the projects.

Finally, none of the documents includes information about the uncertainty behind the presented numbers. All figures are presented as a point value, thereby masking an uncertainty range.

Background

When risks are presented in the MPG and in the GRIP reports, most of the objectives for the background information are met. Risks are discussed including the nature, impact, likelihood and control measures[57].

The presentation of project context in the financial statements and interim report can be improved upon, as these financial updates are presented without much background information on the projects. The level of understanding of the information may be less as a result.

Type of information

At the project level, all risks are described in the MPG and GRIP reports; information is therefore complete. A downside to including all risks in the communication is that it might result in an information overload. In Den Haag this information is in the appendices, so it does not affect the readability of the main text.

In the MPG all projects are compared on their overall riskiness, by summing up all risks. This way, it also is made clear what the impact of one project is on the total financial resilience. The relative riskiness is easily assessed that way.

Finally, as discussed earlier, risks are presented as point estimates only, masking a range of uncertainty.

5.4.3 Representation

Format
Simple charts and graphs
Progressive disclosure of information
Focus on most important numbers
Narrative information
Less cognitive effort
Language use
Clear, concise and consistent
Understandable and comfortable to use

Format

The format of risk communication at the project level is generally sufficient in Den Haag. The few charts and graphs that are included are simple and understandable. Risks are quantified and discussed narratively, and presented in a way they can be easily understood.

A downside is that almost all project information in the MPG is included in the appendices. The main text includes only little project information, especially regarding risks. On the other hand, the financial statements and interim reports provide this project information, but these documents lack the extensive background information

[57] Uitvoeringsbesluit Beheersregels Grond- en Ontwikkelingsbedrijf 2011, Gemeente Den Haag, p. 4.

from the MPG. Overall, all information is presented to the council, but the structuring to enable councillors to dig deeper when needed could be improved.

A second point of improvement is the focus of the documents. Almost all documents are focused at the expected end results of projects. Although this is very important, other important factors, such as riskiness of the project, may be overlooked.

Language use
The language used in project risk communication is, like at the portfolio level, clear, concise and consistent. Councillors can easily understand the information.

5.4.4 Explanation

Audience
Trust
Dialogue
Pilot testing
Goal of communication

Like in the communication on the portfolio level, the project level communication is composed for the council specifically. Therefore, the intended audience and goal of communication are known. Both the interviewed councillor and the representative of the development agency indicated that they judged the trust relation to be sufficient[58]. However, the dialogue between council and agency might be improved, as the development of the GRIP reports and optimising the format, take a lot of time, according to the interviewed council member.

On the other hand, part of this long time may be caused by the fact that the GRIP reports were tested using pilots when they were introduced in 2011.

5.4.5 Frequency

Early and often

The same remarks that are applicable to the portfolio level apply to the project level: although the documents all have fixed publishing dates, it is possible to send additional information to the council through letters. Therefore, the frequency of communication is sufficient.

5.5 Analysis

After the assessment of the system of risk communication at both the portfolio and the project level, the outcomes are analysed in this paragraph. First, we look more closely at the assessments and the interactions between the system parts. Finally, the opinion of the interviewed councillor about the risk communication on land development projects is discussed.

5.5.1 Portfolio level communication

The system of risk communication complies with the constraints set by national law, in the Gemeentewet and Bbv. Annually, the budget and financial statements are presented, including the mandatory paragraphs. These paragraphs include the required content.

[58] Interviews on December 6, 2011 and on February 13, 2012.

The system of risk communication at the portfolio level also satisfies almost all objectives and constraints from our framework. The interactions between the different components of the system are adequate. The system exists of the components budget, financial statements, interim report, MPG and IpSO. These documents have their own purpose and the content is adapted to this purpose. For example, the MPG contains the most elaborate information on land development project, whereas the budget aggregates this information. The representation of risks is dependent on the content of the documents. In the MPG risks are presented more elaborately, both quantitatively and narratively. The budget and financial statements present risks more aggregated and only qualitatively.

The system is lacking one important feature: risks are presented only as point estimates. The land development agency estimates the risk and determines the most likely outcome. The risk is then presented as if it is precisely known. This provides a sense of certainty that cannot be sustained. This also applies to the calculations for the required financial resilience; one scenario is chosen and applied.

Further improvements may be made in the format of risk communication documents. Including risk information in other documents than only the MPG will improve the readability of these documents.

5.5.2 Individual projects

At the project level the current system of risk communication also satisfies most of the objectives and constraints. The system interactions between components and content function sufficiently. All individual documents have a purpose, and content is adapted to that. For example, the financial statements provide financial data for the projects and the interim report presents updates for this data. The MPG presents more elaborate information, including risks. Finally, individual documents, such as council letters, present information in case of decision moments or other important moments.

The interactions between content and representation can be improved. The MPG lacks an overview of the most important issues in projects, whereas the financial statements does provide one, but lacks background information, e.g. project context. Therefore the reader needs both documents to have all information.

Finally, as described earlier in the analysis of the portfolio level, information about the uncertainty in risk analyses is lacking, thereby disregarding a range of possible outcomes.

5.5.3 Opinion of a councillor

In Den Haag one councillor has been interviewed: Bas Sepers (Partij van de Arbeid, Labour Party)[59]. In his opinion the municipal council in Den Haag is informed adequately about risks in land development projects. He feels that there will always be opportunities for improvement though, as land development information is often complicated. However, the current risk communication enables councillors to have a debate about land development. What information is considered most important is dependent on the political viewpoints of the councillors and their party.

Furthermore, the councillor indicated that many councillors use the MPG as a frame of reference. It is not thrown away, but kept for future debates.

[59] Interview on February 13, 2012.

5.6 Conclusions

This chapter has provided a partial answer to the third sub-question: What does the current system of risk communication to councillors, regarding land development projects, look like and how does it function in other Dutch municipalities? The system of risk communication in the municipality Den Haag has been described and assessed in this chapter. In the next chapter the municipality Eindhoven will be examined. Here, the main conclusions regarding Den Haag are presented.

Overall, the system of risk communication in Den Haag satisfies almost all objectives and constraints included in the framework in chapter 3. The interactions between the components and content, and content and representation function adequately. This conclusion is supported by the opinion of the interviewed councillor who indicated that the current risk information is enabling the council to fulfil its tasks adequately.

Still, the system can be improved at some points. First, in all risk communication risks and other numbers are presented as point estimates. A range of outcomes to represent the uncertainty in the analyses is not presented. From the interview, the councillor does not seem to mind, or he does not realise that this information might be very helpful. However, this information should be included for three reasons. First, showing a point estimate may provide the council with a false sense of security. A risk may turn out to be much larger than was expected based on the point estimate. By presenting a range, council members get more information on the risks and are better able to decide whether or not they want to take that risk. Second, councillors must be able to know the full range of outcomes, to be able to compare projects. Third, the presentation of a single point estimate might be more vulnerable to strategic behaviour. In some cases it might be tempting for the development agency to present lower risks. Councillors cannot know whether a point estimate is cautious or not. Presenting a range enables councillors to make that estimate for themselves.

Second, improvements to the system can be made in some of the formats of risk communication, mainly in the structure of the financial statement and interim report. These include a lot of (financial) information, on the portfolio level and on the project level. However, this amount of information is not structured clearly and almost causes an information overload. Still, this information is valuable to councillors, but in order for the information to be understandable, it should be better structured.

Finally, the structuring of the risk communication documents at the project level can be improved as well. The project information in the financial statements and interim report lacks the background information on the project that is included in the MPG. However, as was indicated by the interviewed councillor many councillors keep their copy of the MPG. This way they do have all information. This might fix some of the issues with the interaction between content and representation. On the other hand, the risk information in the MPG might also be outdated when used later.

6. Eindhoven

6.1 Introduction

The third case municipality is the municipality of Eindhoven. A short introduction of the municipality is presented here, as well as an overview of the roles of the council and executive board of Eindhoven. After that, an outline of this chapter is presented.

6.1.1 Municipality of Eindhoven

Eindhoven is the fifth largest city in the Netherlands with a little over 210,000 inhabitants, after Amsterdam, Rotterdam, Den Haag and Utrecht (CBS, 2011). It is located in the south, near the Belgian border. Like Rotterdam and Den Haag, nearly all land in the municipality has been built on. Future land development projects will therefore most likely be inner-city projects[60].

Philips has traditionally been the most important employer in Eindhoven. Now, many of the old Philips factories in the city have to be restructured (e.g. the Strijp S project, where old factories will be restructured into apartments and office buildings).

Eindhoven has been selected as a case for several reasons. First, it is a large municipality where future projects are likely to be inner-city projects, like Rotterdam. Second, the municipality of Eindhoven has been actively involved in land development in the past. The financial statements of the municipality show that the inventory had a book value of €180.9 million in 2009 (CBS, 2011). This means the municipality has invested large sums in building projects. Finally, Eindhoven was recommended by Frank ten Have (partner at Deloitte Real Estate Advisory) as a good practice municipality regarding risk communication to the council on land development projects.

6.1.2 Roles council and executive board

In Eindhoven the municipal executive board is allowed to start land development projects, if these projects satisfy three conditions:

- The project has to be at least budget neutral.
- The project risks have no negative influence on the municipal financial resilience.
- The project is in line with the executive board's program.

The first condition is derived from the budget right of the council. If a new project is expected to result in a loss, only the council can decide to supply the extra funding. The second condition concerns the risks in the new project. These cannot have a negative influence on the municipal financial resilience. In reality (almost) every project will have a negative influence on the municipal financial resilience, as every land development project entails risks. Finally, the board program presents the policy goals for the board's term. New projects have to comply with this program.

These conditions have been recorded in an internal memorandum principles and a memorandum on the planning and control cycle. Projects that do not satisfy these conditions have to be approved by the municipal council.

6.1.3 Outline chapter

This remainder of this chapter starts with a description of the current system of risk communication at the portfolio level. After that, the case project Blixembosch Buiten is

[60] Interview on December 9, 2011.

presented. The risks in the project are described and traced back in risk communication. In paragraph 4, the system of risk communication at the project level is assessed. The two levels of the system of risk communication are then analysed in paragraph 5. Finally, conclusions are presented.

6.2 Municipality: system of risk communication

This paragraph presents the current system of risk communication at the portfolio level. The framework from chapter 3 is used to describe the system and assess whether objectives and constraints are satisfied, using the colours explained in paragraph 4.2.

6.2.1 Components

Budget
Financial statements

This paragraph presents an overview of the documents the council receives regarding portfolio risks in land development projects. First, the budget and the financial statements, which are required by law, are discussed. Followed by the interim reports and, finally, the Meerjaren Prognose Grondbedrijf (MPG, Multiyear Prognosis Land Development Company), which is comparable to the MPG in Den Haag.

Budget
The budget yearly presents the proposed policies and its consequences on the financial position of the land development company, as well as on the expected end results for the land development projects. The most information regarding land development projects is presented in the paragraph land use policy. Additional information is included in the paragraph financial resilience and the paragraph projects.

The paragraph land use policy starts with general information on land development policy, including a description of the mission and vision of the municipal land development company and the goals of the municipal land use policy. Furthermore, an overview of the required financial resilience for the land development activities and a forecast of the development of the financial reservation for land development are presented.

The paragraph financial resilience presents an overview of the municipal financial capacity and current risks. Land development projects account for a large part of the risks. The calculation of these risks is provided in the MPG.

The additional paragraph projects is included at the explicit request of the municipal council. It contains several types of projects, including land development projects. Land development projects are defined as projects where land is produced and sold. In the project paragraph an overview of land development projects is presented which lists all projects and the realized and expected costs and benefits. It contains an overview of the total costs of projects and the way these are funded. Finally, a total of the yearly costs and benefits is presented. These yearly costs and benefits constitute the total that is to be invested annually in projects (in Dutch: jaarschijf).

Financial statements
Like in the budget, most information on land development is in the paragraph section of the financial statements. Furthermore, information on all individual land development

projects is presented in the appendices. This project information will be discussed in paragraph 6.4.

The paragraph land use policy in the financial statements includes, like the paragraph in the budget, general information about land development and overviews of the financial resilience and the reservation. Additionally, the financial statements are focused on the achieved results of land development projects. It presents the expected end results of projects, as well as changes in results incurred in the past year (all changes above €500,000 are explained). The implications of these changes for the financial reservations and the provision for negative plans are discussed.

The paragraph financial resilience shows the calculation for the required financial resilience for land development projects, which has been taken from the MPG.

The projects paragraph in the financial statements contains an overview of the costs and benefits per land development project, like the budget does. Furthermore, it presents the realised costs in relation to the expected costs of the project.

Interim reports

In the interim reports the executive board gives an update of the goals in the budget and the extent to which these have been realised. In Eindhoven the interim reports are presented twice a year. If major changes emerged during that budget year, adjustments can be proposed in the interim reports.

In 2010 the second interim report contained a 'mini-MPG' based on a quick scan of the land development portfolio. As of 2011 an update of the MPG is included in the second interim report.

MPG

Since 2005, the land development agency of the municipality of Eindhoven composes the MPG to inform, among others, the municipal council on land development projects. The MPG is to be approved by the executive board. Until 2011, the MPG was an annual document presenting a forecast for the land development portfolio. Since mid-2011 three MPGs are published each year. The main MPG will be presented together with the financial statements. A second MPG accompanies the annual budget and will focus more on land development policy. The third MPG will be sent to the council with the second interim report and will be a financial update of the main MPG.

The MPGs in Eindhoven inform councillors about the latest information on land development projects. Therefore, the MPG presents an overview of the land development portfolio, showing both a programmatic and a financial overview of the development plans. For the entire portfolio the sensitivity to a number of parameters is presented: cost rise, benefit rise and interest rates.

Individual projects are divided into four groups in the MPGs, based on high or low importance and high or low riskiness. Importance is judged in a workshop with plan economists, based on a number of criteria. Projects with a total project risk above €500,000 are deemed to have a high risk. A total below €500,000 constitutes a low risk. All projects in groups 1 (high importance and high risk) and 2 (high importance and low risk) are individually discussed in the MPG. In this discussion plan context and the most important risks are described. Projects in groups 3 and 4 are only discussed if these projects have incurred changes over €500,000 compared to the previous MPG.

After these individual projects, the required financial resilience for land development projects is calculated based on the expectations of the involved project managers and plan economists. Two scenarios are used: a most likely and a worst case

scenario. Furthermore, effects on the reservation for land development projects and the provision for negative land development plans are discussed. A forecast of the expected development of the reservation in the future is presented.

Finally, market analyses for the housing, office and business plot markets are presented. Based on this information, a number of conclusions regarding the land development portfolio are drawn.

6.2.2 Content

Conclusions
Relevant conclusions
Room for politics
Implications of uncertainty
Prospective conclusions
Background
Paragraphs in budget and financial statements
Context
Explicit assumptions
Causes of risk
Communicate what is done
Type of information
Correct, timely and complete information
Less information
Financial resilience
Point estimate and range of uncertainty

Conclusions

Most of the objectives and constraints regarding the conclusions in risk communication are satisfied in Eindhoven. First, the most elaborate conclusions are presented in the MPG. These conclusions are then used in the budget and financial statements as well. In general, the conclusions are found to be useful to council members[61].

The council is to approve both the budget and financial statements. However, it does not approve the MPG. This might affect the possibilities for the council to influence land development. However, MPGs are presented and discussed extensively in the council, ensuring room for politics.

Third, risks at the portfolio level are only quantified in the calculation of the financial resilience. The use of the two scenarios creates a range of outcomes, although this uncertainty is not directly related to uncertainty in the analyses. Therefore, improvements can be made on this objective.

Finally, the MPGs are focused most on presenting prospective information: forecasts are included for the building programmes and developments in financial reservations. The budget is also prospective, although this information is more aggregated.

Background

The budget and financial statements present an overview of information on land development in the two mandatory paragraphs. Most of this information is presented more elaborate in the MPG.

This MPG presents a lot of background information on the portfolio, including context information, assumptions, causes of risks and control measures. Context information is for example presented through market analyses for real estate markets.

[61] Interview on December 20, 2011.

Assumptions are made explicit in the calculation of the required financial resilience. Causes of risk and control measures are discussed throughout the MPG.

Type of information
The budget, financial statements and interim reports are produced primarily for the municipal council. The information in these documents is relevant to councillors and up to date. The MPGs, however, are sent to both the council and the executive board. Therefore, some information is included in a MPG that is not relevant to council members, e.g. the discussion of a new portfolio management approach[62]. Better specifying what information should be sent to the council, might prevent risking an information overload.

The required financial resilience for land development projects is discussed extensively in the MPG. Calculations are presented, based on two scenarios. The budget and financial statements include a brief overview of this information as well.

Finally, the required financial resilience is presented in a quantitative way, including a range for uncertainty. However, other numerical information is presented as a point estimate, not showing an uncertainty range.

6.2.3 Representation

Format
Simple charts and graphs
Progressive disclosure of information
Focus on most important numbers
Narrative information
Less cognitive effort
Language use
Clear, concise and consistent
Understandable and comfortable to use

Format
Risk information is mainly presented in narrative form and in tables; very little use is made of graphs and charts. Only the MPGs contain charts, of which most are clarifying[63]. However, including more (simple) charts may improve understanding.

Progressive disclosure of information is achieved when all documents are put together: the budget and financial statements show the most important information, whereas the MPG presents the calculations and considerations behind it. The MPG itself has an adequate structure, with a summary at the start and more extensive information in the underlying chapters.

The focus of the information is on the required financial resilience for land development projects and the effects of project results on the reservation for land development. This includes much of the most important information for councillors, as it is their task to assess the municipal finances. More focus could be put on the progress of projects.

Finally, both the inclusion of narrative information and the required effort to understand the information are sufficient. Information is generally provided in a clear way, demanding not too much cognitive effort to understand it. Figures are presented in intuitive ways (benefits are positive, costs are negative).

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[62] Meerjaren Prognose Grondbedrijf 2011, Gemeente Eindhoven, pp. 43-44.
[63] E.g. MPG 2011, figure 2.2, p. 38: on the relation between risks, required financial resilience, financial resilience and the available financial capacity.

Language use
The language used in communication is clear, concise and consistent. Also it is generally understandable and usable for councillors. An exception is the technical information in the MPGs. Furthermore, the inclusion of information not relevant for councillors affects readability[64].

6.2.4 Explanation

Audience
Trust
Dialogue
Pilot testing
Goal of communication

In Eindhoven the municipal council and executive board (and the development agency) communicate about risks and risk communication. The paragraph projects, which was added at the request of the council, is a result of this communication. Furthermore, presentations are given to councillors whenever a new MPG is released. Informing the councillors and making them understand is seen as a task of the development agency[65]. Councillors on the other hand, trust that the agency presents all relevant information[66].

As discussed earlier, the goal of the communication documents is clear. However, improvements can be made to the MPGs, as these are currently used to inform both the council and the executive board. This may lead to the inclusion of irrelevant and confounding information.

Finally, pilot testing is not used in Eindhoven. In 2011 new update-MPGs were presented, optimising the format is done incrementally through trial and error.

6.2.5 Frequency

Early and often

The municipal system of risk communication on the portfolio level consists of the annual budget, financial statements, two interim reports and three MPGs. The MPGs focus specifically on land development projects. Information from the MPGs is often used as input in both the budget and the financial statements. Publishing dates are more or less fixed. This limits the possibilities to respond quickly to changes, however the number of documents and the spread throughout the year to ensure regular updates. Furthermore, in case of urgent development, the council is informed through letters.

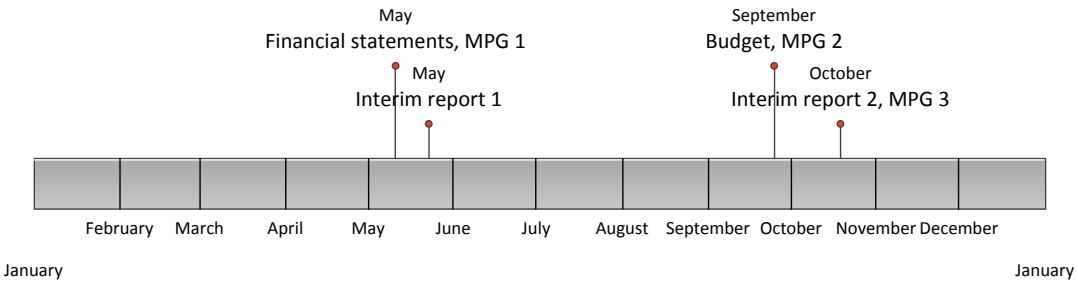

Figure 6.1: Publishing moments of risk communication documents in Eindhoven

[64] Interview on December 20, 2011.
[65] Interview on December 9, 2011.
[66] Interview on December 20, 2011.

6.3 Case project: Blixembosch Buiten

In Eindhoven the project Blixembosch Buiten has been studied as a case project. First, a description of the project is presented. Then, the most important risks are described and traced back in the risk communication that was sent to the council. Finally, intermediate conclusions are presented.

6.3.1 Project description

Blixembosch Buiten (formerly called Blixembosch Noordoost) is a land development project in the north of Eindhoven. Approximately 430 dwellings are to be built in the project, as well as a school.

Figure 6.2: Blixembosch Buiten plan area[67]

The opportunity to develop the area emerged around 2000, when Rijkswaterstaat made plans to restructure the traffic junction just north of the already existing residential area Blixembosch. This junction connects the motorway A50/A58 to the Kennedylaan leading to the city centre, shown in figure 6.2. The municipality was able acquire the land that became vacant after the restructuring, in exchange for the construction of a sound barrier along the new course of the motorway and the remediation of the old barrier.

[67] Beeldkwaliteitsplan/Definitief Ontwerp Stedenbouwkundig Plan Blixembosch Buiten, Gemeente Eindhoven.

Figure 6.3: The urban design for Blixembosch Buiten[68]

The project exists of two parts: the "fields" ("de velden") and the "terraces" ("de terrassen"). The fields is the lower part of figure 6.3. The dwellings in the northern plan part will be built on the slope of the sound barrier, creating a terrace landscape.

After acquiring the land, the municipality planned to develop the project in only two years[69]. To realise this, two development companies were selected after a tender. These companies were asked to develop the plans. However, it soon became apparent that the development could not be realised within two years.

The same developers then made more gradual plan. A first normative plan and the first financial calculations (in Dutch: grondexploitatieberekening) were approved by the municipal executive board in 2005[70]. Two years later a preliminary urban design was approved[71], and in 2010 the board approved the final urban design[72]. In both instances the financial calculations were refined and established as well. Then in 2011 the council approved the land use plans for the area.

These plan changes have had an effect on the financial end results of the project. At the start of the project an end profit goal of €12 million was set for the project. In the first normative plan in 2005 for Blixembosch Buiten the end result was lowered to €8 million. When the final urban design was approved in 2009 the forecasted end result was increased again to €13.8 million. Due to plan changes in 2010 and 2011 the end result is now expected to be €10.6 million[73]. In the MPG 2011 the end date of the project was postponed from 2017 to 2022.

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[68] Beeldkwaliteitsplan/Definitief Ontwerp Stedenbouwkundig Plan Blixembosch Buiten, Gemeente Eindhoven.
[69] Raadsvoorstel inzake Woningbouwproductie 2005-2010, 07.R1924.001, Gemeente Eindhoven.
[70] Raadsvoorstel Grondexploitatie A50/A58 en Blixembosch Noord, 05.R1460.001, Gemeente Eindhoven.
[71] Raadsinformatiebrief Betreft woningbouwproject Blixembosch Noordoost, 07.R2302.001, Gemeente Eindhoven.
[72] Raadsinformatiebrief Betreft Definitief Ontwerp Stedenbouwkundig Plan, Grondexploitatie ontwerpbestemmingsplan en concept Beeldkwaliteitsplan woningbouwplan Blixembosch Noordoost, 10.R3753.001, Gemeente Eindhoven.
[73] Meerjaren Prognose Grondbedrijf 2011, Gemeente Eindhoven.

6.3.2 Risks

In this paragraph the most important risks in the project Blixembosch Buiten are identified. First, risks that have presented themselves in the past are discussed. After that, the current risks in the project are presented.

Past risks

First, there were risks in the acquisition of the land. In order to obtain the land from Rijkswaterstaat the decision to build the sound barrier had to be made. It may be argued that this is not a real risk, as the municipal council is the party that can decide on the construction of the barrier. However, the project was started and investments were made before the land was acquired and the sound barrier was built[74].

Second, for the development project to be possible, a border adjustment and exchange of land with the neighbouring municipality of Son en Breugel had to be agreed on. The municipality border was in the middle of the A50/A58 motorway. Since the motorway was moved to the north, the land south of the motorway was only partly within the municipality of Eindhoven.

A third risk incurred in the project, was uncertainty whether the chosen construction for the sound barrier (on which the terrace-part of the project was to be built) was indeed sufficient to build on. Due to problems with land subsidence, adjustments to the design had to be made.

A fourth risk that presented itself was the fact that a gas pipe of the Gasunie ran through the project area. In the original design this was not taken into account. This resulted in a second plan adjustment.

Finally, in 2011 a badger was spotted in the plan area. Since badgers are a protected species extra research had to be performed to assess whether the badger actually lived in the area. Badger traces were found in the area, however no burrows were found.

Current risks

Currently, the project team monitors five risks in the project[75]. First, the market circumstances are seen as a risk to the project. Lagging demand may prevent dwellings from being sold, thereby delaying the project and causing an increase in interest costs. Second, there is still some uncertainty as to whether the current design for the sound barrier is sufficient. Adjusting the barrier may have consequences for the project design and finances. Third, there may be a delay in the procedure for the land use plans. If plans are not approved, development cannot start. A fourth risk is in the cables and pipes that are in the subsoil. During the construction the discovery of unexpected cables and pipes may cause extra costs or delays.

Finally, the project team has also identified a positive risk: there may be unexpected benefits in the tendering of the construction work.

6.3.3 Risk communication

Information on individual projects is presented in the budget, financial statements and MPGs and through letters specifically focused at the project.

In the annual budget projects are discussed briefly; little information is presented regarding individual projects. Occasionally[76] an overview is given of all major projects,

[74] Raadsvoorstel Grondexploitatie A50/A58 en Blixembosch Noord, 05.R1460.001, Gemeente Eindhoven.
[75] Interview on December 22, 2011.
[76] E.g. the budget 2011-2014, appendix 8, Gemeente Eindhoven, p. 208.

including information on future developments that might have financial consequences. Such a project overview is not included every year.

The annual financial statements consist of two parts in Eindhoven: the financial statements (in Dutch: concernverslag) and the appendices (in Dutch: concernrekening). All major projects, including Blixembosch Buiten, are discussed briefly in the financial statements and changes with financial consequences are presented. In the appendices all individual projects are discussed. In the financial statements over 2010 all risks currently monitored in the project were mentioned, but no information on impact or likelihood was presented.

The project Blixembosch Buiten has been discussed in the MPGs yearly. Financial changes as compared to the previous year are presented and explained. Until 2010 no information on risks was presented. In 2011 two important risks for the project were mentioned: the design of the sound barrier and the accessibility of the area. The risk impact and likelihood are not presented. The update MPG presented with the second interim report in 2011 mentioned that risks were estimated higher due to a screening of the project, although the same risks remain.

Finally, the council has received information specifically on this project at several moments through council letters. The first time was in 2005 when the council approved a first financial plan for Blixembosch Buiten, and decided to make available a credit of €10,800,000 for the project. This proposal included information on the project and a number of appendices of which some were confidential. These included a first overview of project risks[77]. After that, the council received information letters on the project in 2007[78], 2009[79], 2010[80] and 2011[81]. In 2007 the council was informed on the approval of the program of requirements by the municipal executive board. In 2009 it was informed on the approval of the preliminary urban design, which was followed by the approval of the final urban design in 2010 by the board. In 2011 the council was informed on the agreement to sell building land to the selected development companies. None of these council information letters contained information on risks or risk impacts.

6.3.4 Conclusions

Overall, the council in Eindhoven receives very little information on specific risks in individual projects. Since 2010 there seems to be an improvement: more information is included in the annual budgets and financial statements. In an interview councillor Hans van Zijl[82] confirmed this impression by stating that the supply of information to the council has been rather non-transparent in the past. The executive board appointed after the municipal elections in 2010 made transparent communication one of their focus points. The effects of this focus are said to be clearly noticeable. Although risks are now mentioned in communication, the impact and likelihood of these risks are not stated.

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[77] Raadsvoorstel Grondexploitatie A50/A58 en Blixembosch Noord, 05.R1460.001, Gemeente Eindhoven.
[78] Raadsinformatiebrief Betreft woningbouwproject Blixembosch Noordoost, 07.R2302.001, Gemeente Eindhoven.
[79] Raadsinformatiebrief Betreft tussenbesluit woningbouwproject Blixembosch Noordoost, 09.R3090.001, Gemeente Eindhoven.
[80] Raadsinformatiebrief Betreft Definitief Ontwerp Stedenbouwkundig Plan, Grondexploitatie ontwerpbestemmingsplan en concept Beeldkwaliteitsplan woningbouwplan Blixembosch Noordoost, 10.R3753.001, Gemeente Eindhoven.
[81] Raadsinformatiebrief Betreft verkoopovereenkomst Blixembosch Noordoost, 11R4496, Gemeente Eindhoven.
[82] Interview on December 20, 2011.

6.4 Blixembosch Buiten: system of risk communication

In the previous paragraph a description of the case project was presented. This paragraph describes the assessment of the system of risk communication, based on the framework from chapter 3.

6.4.1 Components

Budget
Financial statements

The two objectives concerning the components of the system are not applicable to risk communication at the project level.

6.4.2 Content

Conclusions
Relevant conclusions
Room for politics
Implications of uncertainty
Prospective conclusions
Background
Paragraphs in budget and financial statements
Context
Explicit assumptions
Causes of risk
Communicate what is done
Type of information
Correct, timely and complete information
Less information
Financial resilience
Point estimate and range of uncertainty

Conclusions
Most of the requirements regarding conclusions at the project level are satisfied. Council letters include relevant conclusions: either the board made a decision or the council has to make a decision. The MPG and financial statements offer project status updates. These include statements as to whether the project is on schedule and expectations for future developments.

The information in council letters leaves room for the council to practice politics. The MPG and financial statements are discussed in the council as well, and if necessary questions regarding the included projects can be discussed.

Finally, implications of uncertainty are presented rarely. An example is the cost of remediating the old sound barrier and the construction of the new one. Due to uncertainty about the costs it was decided to take the worst case situation into account to be cautious[83], however no full range of possible outcomes is presented.

[83] Raadsvoorstel Grondexploitatie A50/A58 en Blixembosch Noord, 05.R1460.001, Gemeente Eindhoven, p. 4.

Background
At the project level, background information is not presented abundantly. The only exception is project context information: the motivation for the project and previous decisions are discussed extensively.

Information regarding assumptions or causes of risks is not included in communication documents. Risks have only been presented at the start of the project. For councillors it is therefore not clear what the current total of project risks is. Measures to control these risks are mentioned incidentally, although costs and effects of these measures are not presented.

Type of information
As shown in the previous paragraph, very little specific information about project risks is included in risk communication. Although less information is better, a minimum of information should be included.

Financial or otherwise quantitative information is often not presented. The focus is on qualitative information for the decision at hand. As (almost) no quantitative risk information is presented, there is no range of uncertainty presented, neither is an overview of the required financial resilience on the project level.

6.4.3 Representation

Format
Simple charts and graphs
Progressive disclosure of information
Focus on most important numbers
Narrative information
Less cognitive effort
Language use
Clear, concise and consistent
Understandable and comfortable to use

Format
The few charts or graphs that are included are clear. Most documents provide the information for the decision at hand, but not much more. The information is always in narrative form. The included information is easy to understand and does not require excessive cognitive efforts.

Improvements can be made to ensure the possibility of a progressive disclosure of information. Documents do not include appendices or summaries. Neither is there a possibility to find additional (technical) information in other places. Councillors that want a more extensive knowledge of the project cannot obtain that information.

A second improvement is in the focus on important information. Risks constitute an important part of the information. However, risk information, especially quantitative risk information, is often disregarded at the project level in Eindhoven.

Language use
The language used in the project documents is clear, concise and consistent. The information is generally understandable and usable for councillors. Furthermore, the project information in the MPG and financial statements is more complicated, but understandable.

6.4.4 Explanation

Audience
Trust
Dialogue
Pilot testing
Goal of communication

The project documents have been composed for the council. The audience and the goal of the communication are therefore clear, and the message has been adapted. The documents are either discussed in the council or in a council committee. Trust and dialogue are discussed earlier in paragraph 6.2.5.

Pilot testing could not be assessed, as there have been no recent changes in communication formats on the project level.

6.4.5 Frequency

Early and often

The council regularly receives letters concerning projects from the board, more often than in the other case municipalities. Additional project information is provided through the MPGs and the appendices of the financial statements. This setup ensures the council is informed early about important moments.

6.5 Analysis

In this paragraph the systems of risk communication at the portfolio and project level is analysed, based on the previous paragraphs. After that, the opinion of the interviewed councillor on the functioning of the system is presented.

6.5.1 Portfolio level communication

Risk communication in Eindhoven complies with the requirements set by national law, in the Gemeentewet and Bbv. Both the budget and the financial statements include the paragraphs financial resilience and land use policy. The Bbv requires a number of topics to be presented in the paragraph land use policy. The paragraphs in Eindhoven satisfy these requirements. Additional information on land development projects is provided through the MPGs, which provide much input for the budget and financial statements.

The interactions between the system parts are sufficient. Each document has its purpose and content is adapted to that. The main MPG contains most of the background information and calculations, while the other documents update this information or use the most important outcomes. The interactions between content and representation function slightly less well. Information is occasionally represented too complicated (e.g. in the MPG) and risks are not quantified, when they could well be.

There are no objectives or constraints that are completely lacking, although there are a number of improvement points. First, background information is presented almost exclusively in the MPGs. Including some background information in the budget and financial statements will improve the contents of these documents. Furthermore, risk information is only presented quantitatively in the calculation of the required financial resilience, and it is not elaborated on much. Finally, the MPGs are also used to inform the board; therefore they include too much information for councillors. Understanding can be improved by better specifying what information is relevant.

6.5.2 Individual projects

Information on individual projects is provided regularly through the MPGs and the project information in the appendices of the financial statements. Additionally, the council is informed separately at major decision moments, or when the council is asked to make a decision itself.

The interactions of the system are not optimal at the project level. The content of the documents is adapted to the type of document; for example when the council is to decide, more project context is provided to motivate the decision. However, documents include very little specific information on risks. Therefore, documents are more alike.

The interactions between content and representation present the same view. The content included is represented in an adequate way. However, because risk information is missing there is little numerical information. Moreover, because background information is scarce there is little possibility to dig deeper into the information when desired.

The lacking of risk information at the project level, and often risks altogether, keeps councillors from having a complete overview of the project, for they cannot assess the riskiness of the project.

6.5.3 Opinion of a councillor

In an interview councillor Hans van Zijl (GroenLinks, GreenLeft)[84] indicated he felt he had sufficient insight in the land development agency of Eindhoven. Communication about projects and risks has improved over the last years and has become more transparent. He trusts that the agency will inform the council when problems emerge.

Regarding on-going projects he considers prospective information most valuable, as the steering possibilities for councillors during a project are limited. Therefore, he wants to know what the end results of the projects are expected to be, and what measures can and should be taken in case of an expected loss.

The information the council currently receives is deemed to be sufficient. However, the complicated nature of the information requires the councillors to have a certain basic knowledge. According to van Zijl, this will probably be hard to solve. Furthermore, the current MPGs include too much information, affecting the readability of the documents. He hopes that the new structure, with three MPGs per year, will produce more compact documents.

6.6 Conclusions

This chapter presents a description and assessment of the current system of risk communication in the municipality Eindhoven. The main conclusions are presented below.

The interviewed councillor indicated that he feels the current risk communication is adequate and enabling the council to perform its tasks. However, based on the framework presented in chapter 3 two major shortcomings are identified in Eindhoven.

The first shortcoming is in risk communication at the project level. The council receives very little information on the project risks and other background information.

[84] Interview on December 20, 2011.

The councillor either does not realise he could have that information or he does not mind not having that information, as he indicates he wants to be informed on the outlines and as prospective as possible. However, more quantitative information about the current situation of the project and the risks in the project should be presented to the council for two reasons.

First, councillors must be able to have a complete overview of the project for themselves. This enables them to assess the riskiness of the project. Only showing an overview at the start of the project may cause councillors to lose overview, as small incremental changes occur every year. Additionally, most land development projects take more than four years, which is the usual term for a councillor. New councillors must also be able to create an overview of the project for themselves.

A second reason for the inclusion of more quantitative project information is that the council should be able to compare projects. By including more project information councillors can compare projects and detect possible irregularities in projects earlier.

A second shortcoming of the Eindhoven system of risk communication is in the risk communication at the portfolio level. Overall, much information is communicated to the council through the budget, financial statements and MPGs. However, the MPG is used not only to inform the council, but also to inform the executive board. Therefore, the MPG often contains too much information for councillors, affecting the readability. Splitting the MPG into two documents, one for the board and one for the council, will improve the understanding under councillors. On the downside, the creation of an extra document on land development projects will probably entail extra costs.

7. Analysis

7.1 Introduction

In the previous three chapters the case municipalities Rotterdam, Den Haag and Eindhoven have been described and assessed using the framework from chapter 3. The results and conclusions from these case municipalities are combined in this chapter to present conclusions that are applicable to all three municipalities.

First, in paragraph 2, the framework from chapter 3 is assessed once more using the results from the case chapters. The framework parts and interactions are discussed. Finally, the framework and the included objectives and constraints are reviewed. After that, in paragraph 3 a sketch design for the a system of risk communication for land development projects is presented. Finally, paragraph 4 compares the current systems from the case municipalities to the sketch design and discusses the implementation of such a designed system in the real political context.

7.2 Framework of risk communication

In this paragraph the findings from the case municipalities are discussed based on the framework from chapter 3. The way the case municipalities have filled in the different framework parts is discussed. After that, the interactions between the framework parts are discussed. Finally, based on these discussions, the framework is reconsidered.

7.2.1 Components

In all three case municipalities the executive board reports to the council about land development projects using the budget and financial statements. Furthermore, in all municipalities the council receives one or more documents specifically focused at land development.

Councillors in Den Haag receive three reports on land development: the MPG and IpSO, concerning land development at the portfolio level, and the GRIP reports, providing information on the largest projects. In Eindhoven the council is presented with the MPGs which are focused mainly at the portfolio level. However, these reports include project information as well. In Rotterdam, the council receives the Monitor Grote Projecten, informing the council about the largest projects. The MGP focuses only on the project level. The council of Rotterdam does not receive portfolio information through specific land development reports.

7.2.2 Content

The category content is discussed using the different subcategories.

Conclusions

When looking at the objectives and constraints regarding conclusions at the portfolio level it can be concluded that Den Haag and Eindhoven do a good job when it comes to presenting relevant, prospective conclusions and leaving room for politics. In Rotterdam however conclusions regarding the portfolio level are provided between the lines, but often not directly.

Furthermore, in none of the case municipalities the council receives clear information on the uncertainty in analyses and the implications of this uncertainty.

However, uncertainty and its implications are important information for councillors, as they should know not only the most likely outcome, but also what range of outcomes may be realised.

In all three case municipalities the conclusions at the project level can be improved. Although project information is provided extensively in council letters or through other reports, this information often lacks a conclusion regarding the status of the project or actions to be taken.

Background

Background information regarding the land development portfolio is presented partly in the mandatory paragraphs land use policy and financial resilience in both the budget and the financial statements. The paragraphs often discuss the national and municipal land development policies and present aggregated portfolio information. In Den Haag and Eindhoven more extensive background information is presented in the MPG, including information on context, assumptions, risk causes and control measures.

The council of Rotterdam receives little background information. The paragraphs in budget and financial statements show some information, however in the absence of a document comparable to the MPGs in Den Haag and Eindhoven more extensive information is not presented to the council.

At the project level, the council in Den Haag receives complete background information in the appendices of the MPG and the GRIP reports. Furthermore, council letters include sufficient project context. In Eindhoven the council letters include context information. However, altogether little risk information is presented, which makes the riskiness of projects hard to assess. In Rotterdam the council is informed on large projects through the MGP, which presents several indicators. However, the rigid format of the MGP prevents the inclusion of sufficient explanation. Furthermore, council letters provide little project background information in Rotterdam.

Type of information

The most important objective regarding the type of information is that the information should be complete, timely and correct. In practice, particularly information regarding risks and riskiness is often disregarded. This does not apply to Den Haag, where risk information is presented extensively at both the portfolio and the project level. In Eindhoven on the other hand, little risk information is presented at the project level. In Rotterdam some risk information is provided at the project level, but little to no information is presented at the portfolio level. When risk information is incomplete it is impossible to assess the riskiness of the project or the land development portfolio.

Furthermore, as pointed out earlier, information regarding the uncertainty in analyses is not provided or only provided marginally in the case municipalities. Financial results and risks are presented as if the outcomes are precisely known, giving councillors a false sense of security.

7.2.3 Representation

The category representation is discussed along the two subcategories.

Format

In the municipalities Den Haag and Eindhoven the documents concerning the land development portfolio enable councillors to progressively disclose information. The budget and financial statements present the most important information in an aggregate

form. When councillors want to know more, they can consult the MPG for more elaborate information. In Rotterdam the council does not receive an extra document, like the MPG, neither do the budget and financial statements include extensive appendices concerning land development. Progressive disclosure of information is therefore hardly possible.

Furthermore, all case municipalities present risk information at the portfolio level mainly in narrative form. Although narrative risk information is valuable it should be accompanied by quantitative risk information. In Den Haag and Eindhoven some quantitative information is included, mostly in the MPG. In Rotterdam the council receives almost exclusively narrative information on the portfolio level. On the other hand, information in the MGP, concerning the project level, is lacking narrative explanation.

Additionally, in all three case municipalities little use is made of graphs and charts to support the information. Graphs and charts help to direct focus to the most important information for the council. This information should not be limited to the expected financial end results of projects, but should also include the riskiness of projects and potential consequences for the municipal financial situation. In Den Haag and Eindhoven this is, for example, shown through forecasts for the reservation for land development. In Rotterdam the council is not presented with such an overview. Furthermore, it is important to note that including graphs or charts alone is not enough. All figures should be accompanied by a clear explanation, so the content is not misunderstood.

Language use

The language used in risk communication in all three case municipalities is generally well understandable for councillors. Information is often described in a clear, concise and consistent way. The description of risks in the Rotterdam MGP is however an exception: not all risks are described consistently, complicating full understanding of the risk situation.

In general, documents in all municipalities are well readable. However, the readability of the MPG of the municipality Eindhoven might be improved. The MPG includes additional information not necessary for councillors, which affects the readability.

7.2.4 Explanation

Overall, the information concerning land development projects is composed specifically for the municipal council, except for the MPG in Eindhoven which is also used by the board.

Furthermore, the goal of communication is generally known for all documents. However, it appears that knowing the goal is not sufficient to ensure all information is usable and understandable. The development agency, which provides the information, not always seems to understand the information councillors require. Therefore, the dialogue between the different parties (council, board and development agency) is very important. The extent to which this dialogue functions varies between the municipalities.

Finally, pilot testing is hardly used when new formats for risk communication are developed. However, constant incremental improvements often ensure adequate formats.

7.2.5 Frequency

Regular updates of the project and the portfolio status are most important regarding the frequency of communication. All project changes above a certain threshold should be clearly explained to the council at least once a year. More urgent changes or developments in projects or in the portfolio can be reported to the council immediately through a council letter.

7.2.6 Interactions

In the framework used to assess the municipal systems of risk communication interactions between several framework parts, i.e. between the system components and the content and between the content and representation, play an important role.

Regarding the first type of interactions, those between components and content, it is clear that the better the purpose of the different system components is known, the better the content can be adapted and interaction can take place. For example, in Den Haag there are many types of components (budget, financial statements, interim report, MPG and IpSO), all with their own purpose. Because these purposes are clearly stated content can be well adapted and the whole is more informative. On the other hand, in Rotterdam portfolio information is supplied only through the budget, financial statements and, occasionally, interim reports. These documents present little information specifically on land development projects, which may be caused by a lack of clarity of what information should be presented.

Related, a certain amount of risk information is needed to enable interaction. When too little information is presented, different components are more alike. The council should receive at least once a year a document in which project and portfolio risks are presented elaborately and where other documents can refer to. This way there is differentiation between documents and each document can be focused at its specific purpose.

The previous point also applies to the interaction between content and representation: different information should be represented differently. However, when little information content is included, there is little opportunity to adapt representation. Well-functioning interactions are therefore dependent on clearly stated purposes and sufficient risk information.

Furthermore, in communication at the project level in Rotterdam it is noticeable that a rigid representation format, such as the MGP, can cause important information to be excluded. There should always be an opportunity to include additional information as no two projects are completely the same. Likewise, there should always be an opportunity to explain quantitative information, for these numbers to be informative. Adequate representation is therefore needed for the content to be transferred.

Additionally, based on the analyses of the different framework parts earlier in this chapter, it can be concluded that many of the shortcomings reported have a connection with other parts of the system of risk communication. For example, the lack of background information in Rotterdam is connected to the fact that the Rotterdam council does not receive a document like the MPG in Den Haag and Eindhoven. In those municipalities background information is mostly provided through the MPG. Furthermore, creating such a document containing background information increases the possibilities for progressive disclosure of information.

Another example is in the trade-off between including all relevant information and the objective that less information is better. Information content is obviously higher

when more information is included, but too much information can lead to an information overload. A well-structured system of risk communication helps solve this paradox: when information can be progressively disclosed it can prevent the more detailed information from overshadowing key information. The objective to include less information should never be an invitation to exclude valuable information.

7.2.7 Conclusions

The objectives and constraints in the framework from chapter 3 have been assessed again. Based on the analyses of the case municipalities in this chapter an additional constraint is added and the relevance of other factors is examined.

First, a constraint is added to the category components. The municipal system of risk communication should include at least one document concerning background information on the land development portfolio and projects, like for example the MPG in Den Haag and Eindhoven.

The council of Rotterdam currently does not receive such a document. All information has to be included in the budget and financial statements. However, the information is not included, probably because the board strives to keep the paragraph land use policy concise and to the point. Creating an obligation to compose a special background document stimulates the agency to include more background information, without affecting the conciseness of the paragraphs. Furthermore, the background document can be kept by councillors and used in future debates. Finally, the presentation of the background document in the council can serve as a moment to discuss the municipal land development policy.

Regarding the portfolio level the document should include information on the status and programme of the portfolio, financial information and risk information. At the project level information on project progress and riskiness should be presented.

Second, it is striking that the two objectives and constraints regarding uncertainty in analyses are not met fully in any of the case municipalities. None of the case municipalities present the implications of uncertainty clearly and point estimates are almost never accompanied by a range of uncertainty. This sparks the question whether these requirements should be removed from the framework as the municipal systems of risk communication seem to function without them.

However, there are three reasons not to remove these requirements. First, presenting only a point estimate provides decision makers with a false sense of security and precision. Second, councillors should have full knowledge of all potential outcomes of a project when they approve it. They should not only know the most likely outcome, but also know how likely it is that results turn out differently. Therefore, the two objectives and constraints concerning uncertainty in analyses are maintained in the framework. And third, by presenting the uncertainty range there is less opportunity for strategic behaviour by the development agency. It is harder to downplay the riskiness of a project, as councillors can judge the riskiness for themselves.

Finally, risk communication literature, discussed in chapter 2, stresses the inclusion of narrative information (e.g. Dieckmann et al., 2010; Slovic et al., 2007; Thompson & Bloom, 2000). This literature assumes, implicitly or explicitly, that risk information is presented in quantitative form. Additional narrative information can then increase understanding. However, from the analysis of the case municipalities it can be concluded that most risk information about land development projects is presented in narrative form. The best understanding though is obtained through both narrative and quantitative information; narrative risk information alone is not sufficient to inform the

municipal council. To stress this notion in the framework the objective that narrative information should be included is changed into the objective that both quantitative and narrative information should be included.

In figure 7.1, a new framework is presented, which includes the changes described above. Furthermore, the interactions between components and content and between content and representation have been indicated in the framework by the two white arrows.

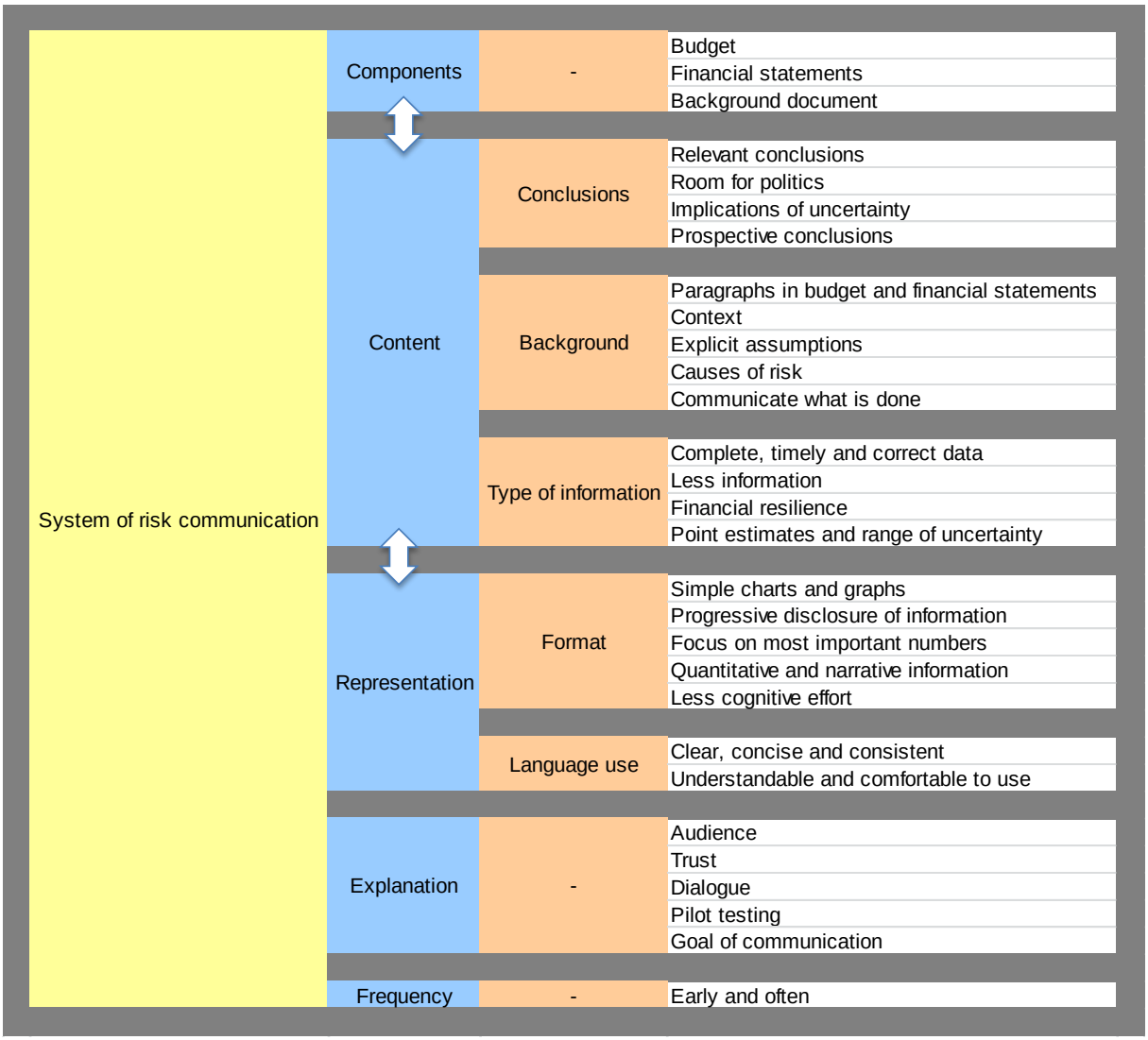

Figure 7.1: Framework of objectives and constraints for a system of risk communication for land development projects

7.3 Sketch design of a system of risk communication

Based on the new framework of objectives and constraints and the results of the case study a sketch model of a system of risk communication is presented. This model shows a proposed design of the system of risk communication for land development projects. The different components of the model are discussed, as is the content. Finally, some remarks on representation and explanation are made.

Budget
The council receives the yearly budget most often in September or October. Information on land development projects must be concentrated in the paragraph land use policy. Furthermore, the paragraph financial resilience shows the required and available financial resilience for land development projects.

The paragraph land use policy describes the municipal land development policy. Furthermore, the developments in the municipal portfolio are discussed, including the development programme and the most important portfolio risks. These developments are translated into the calculations for the required financial resilience for land development projects. In the paragraph land use policy the calculations are presented briefly with a reference to the more elaborate calculations in the background document. Finally, the implications of the expected developments on the land development reservations and provisions are included.

Financial statements
The financial statements are sent to the council in May or June, at the latest before July 15. Like in the budget, information on land development projects is in the paragraphs land use policy and financial resilience, which contain the same kind of information as the paragraphs in the budget. More information on individual projects is included in an appendix regarding land development projects.

In this appendix all land development projects are briefly discussed. A short overview presents the project's programme, expected end results and key features. Furthermore, all project changes with a financial effect above a certain threshold amount, e.g. €250,000, are explained. The precise level of this threshold can depend on the political context in the municipality and the number of projects. Moreover, the most important risks in each project must be briefly described.

Background document
Third, the council receives a background document concerning land development projects once a year, a few weeks before the presentation of the budget, i.e. in September. This document includes an elaborate main text and an appendix providing project information. It is important that the purpose of the background document is clear. If the council is to be informed on land development only, decisions concerning land development should be made in an additional document, like in Den Haag, or in the budget. If decisions are made through the background document, the council should be well aware and have the power to record the document.

The main text in the background document describes the important developments in the land development portfolio and projects. This includes a discussion of the most important individual projects and portfolio context information such as a market analysis. Furthermore, elaborate calculations for the required financial resilience are presented, including explicit assumptions and context information. Finally, conclusions are presented, as well as the consequences for municipal reservations and provisions.

The background document furthermore includes an appendix concerning all individual land development projects. This appendix includes information on the project context, finances, programme and risks. All project risks should be discussed, including risks causes and control measures.

Large project reports
When many projects are realised simultaneously or when some projects are considerably larger than others the council may want to receive more elaborate updates on the most important projects. The board could then compose a special large projects report. This report can provide an extensive update of the information from the project appendix of the background document. Furthermore, information on the project context and the most important risks is included. Due to the overlap with the information in the background document, this report should be sent to the council preferably early in the year, in February or March. If it is sent later, there may be overlap with the financial statements.

Letters and interim reports
Finally, any additional or urgent information considering land development or risks in the portfolio or projects can be sent to the council through council letters or in interim reports.

Representation and explanation
This description of a sketch design for a system of risk communication is focused mainly on the components and content of the system and the frequency of communication. Objectives and constraints concerning representation and explanation have been discussed more implicitly. In general, the framework presented earlier in this chapter should be followed. There are however a few issues that should be discussed.

First, the inclusion of simple charts and graphs increases understanding. If only narrative information is presented, readers may lose track of relations. Explaining figures help shed light on these relations, also reducing the required cognitive effort to understand the information. For example, simple charts and graphs may well be included to explain the calculations of the required financial resilience and the implications on municipal reservations and provisions. Furthermore, charts are well suited to compare projects on riskiness.

Second, the language used in the risk communication documents should meet the objectives set in the framework. It should be clear, concise and consistent in order to prevent lack of clarity. Furthermore, the information should be understandable for councillors and comfortable to use. This means that information is presented orderly and well explained.

Third, the importance of dialogue between the council at one hand and the board and the development agency at the other hand is very important. There must be room for an open and honest discussion about land development projects and risk communication. Such an environment can only exist if actors trust each other.

Finally, very important for an adequate performance of the system is that it is sufficiently legislated in byelaws. The council should state clearly what information it expects from the board and the development agency, when it expects it and how. The regulations from the municipality Den Haag[85] can provide an example of how the council can adequately record their expectations.

[85] Recorded in the Verordening Beheersregels Grond- en Ontwikkelingsbedrijf 2011 and the Uitvoeringsbesluit Beheersregels Grond- en Ontwikkelingsbedrijf 2011, Gemeente Den Haag.

7.4 Conclusions

In this chapter a sketch design of a system of risk communication was presented. To conclude this chapter this sketch design is compared to the current systems of risk communication in the case municipalities. After that, issues important for the implementation of such a system are discussed.

7.4.1 Comparing current situations to the design

For all three case municipalities the current system of risk communication is compared to the sketch design. We discuss the features that are lacking and major improvements points.

Rotterdam

Much is to be changed in the system of risk communication of Rotterdam to resemble the sketch design. The budget and financial statements are sent to the council, including the (mandatory) paragraphs land use policy and financial resilience. The paragraph land use policy is to include more information on the development programme and risks. Furthermore, the financial statements should include an appendix focused at individual land development projects. Currently, all projects should be recorded at year's end. Therefore, information is available.

Furthermore, the municipal council currently does not receive a background document. However, the development agency does compose the MPRG, which is not sent to the council. This MPRG could serve as a background document. Moreover, more uncertainty information is currently included in the MPRG than is in the MPG of Den Haag and Eindhoven, as multiple scenarios and ranges of outcomes are presented. For the MPRG to meet the description from the sketch model a project information appendix should be added and information on causes of portfolio risks should be extended.

Third, the MGP should be revised fundamentally. The format must include more possibilities for explanation. Furthermore, more information on the development programme and risks should be presented.

Finally, the council currently receives letters on individual projects and interim reports. A point of improvement here is that risk information in letters is often very brief.

Den Haag

The system of risk communication in Den Haag is very close to the described sketch design. All components are included and content and representation function generally well. A point of improvement is the presentation of uncertainty. In all documents, but most notable in the background document (MPG) and large project report (GRIP report), the presentation of implications of uncertainty in the analyses will improve the information content significantly.

Eindhoven

The system in Eindhoven includes all components, except for the large project report. As Eindhoven is the smallest of the three case municipalities such a report might not be deemed necessary by the council. Furthermore, the content of the paragraphs in the budget and financial statements are up to the standards of the sketch design system. The project appendix of the financial statements however should include more (detailed) project risk information.

The background document (MPG) presents adequate information at the portfolio level. Project information is presented in the main text as well, but not in an appendix. Including this information in an appendix will present a better overview of each project. In fact, an overview of riskiness per project is currently lacking. Finally, interim reports and letters to the council are well used. However, the risk information in letters should be extended to present a complete overview of riskiness.

7.4.2 Implementation

The presented design for a system of risk communication is a sketch. The precise interpretation of the system is dependent on, for example, the political situation in the municipality or the number of land development projects that are realised simultaneously. A more detailed system should therefore be tailored to the municipality it is intended for.

The presented sketch model is based on the systems of risk communication from the municipalities Den Haag and Eindhoven. As these are large Dutch municipalities, like Rotterdam, implementation of such a system in Rotterdam might seem rather straightforward. However, practice might prove to be disappointing.

The system of risk communication of a municipality can be seen as an institution in that municipality, using Hodgson's (2006) definition that institution are 'systems of established and prevalent social rules that structure social interactions' (p. 2). As it is often easier to copy something than to reinvent it, the transplantation of such institutions between countries has been studied (e.g. De Jong, 1999). Knowledge from these studies can be used to examine the institutional transplantation between Dutch municipalities as well.

Institutions that are transferred are often formal institutions: the legal rules of the game. These are transferred into an environment with potentially different informal institutions: the social practices based on values and norms (De Jong, 2004). The more the new environment resembles the original environment, the easier the transplantation could be expected to be. As De Jong (2004) states: 'the assumption that institutional transplantation between similar countries can be done with greater facility is plausible' (p. 1056). Moreover, by this logic, the institutional transplantation between large Dutch municipalities would be expected to be even easier. However, as De Jong (2004) explains there are pitfalls that have to be kept in mind, especially when transplanting between similar authorities.

More specifically, it must always be kept in mind that it is the local actors that have to work with the new system of risk communication. Transplantation will always create a struggle in the domestic policy area, as does any other policy innovation. This means it is important to be aware of local specificities and needs, consider multiple models, create a sense of urgency, forge a coalition that is strong enough to push through the initiative and wait for a window of opportunity (De Jong, 2004, p. 1066).

For the case of Rotterdam this means that the implementation of a new system of risk communication cannot be done overnight. The implementation of a new system of risk communication must be the outcome of a political decision making process, in which the council forces the board to improve the system.

The first step in this process is that councillors realise that the current system of risk communication does not function sufficiently. The recent losses in land development projects may serve as a way to generate a sense of urgency with councillors. In the search for an improved system of risk communication the sketch

design could then be proposed. Whether it is actually implemented, and in what form, is the outcome of political debate.

8. Conclusions

8.1 Introduction

The focus of this thesis research is on risk communication from the municipal executive board to the council concerning land development projects. This research was set up based on a number of observations.

First, land development projects represent complicated matter, which not all councillors may understand. Second, land development projects are generally more risky than other municipal projects (Ten Have, 2008) and involve a number of specific risks (Deloitte, 2010b). Third, many municipalities, including Rotterdam, are experiencing large financial losses on investments in land development (Deloitte, 2011). This has led to the following research objective:

> *To present improvements to the system of risk communication of the municipality Rotterdam, so that the municipal executive board informs the municipal council adequately about risks in land development projects, in order to enable the councillors to critically assess the municipality's financial situation.*

To achieve this objective scientific literature on the communication of risks was examined. Furthermore, a case study has been performed in three Dutch municipalities: Rotterdam, Den Haag and Eindhoven. A framework of objectives and constraints was developed for a system of risk communication and a sketch design was presented. Based on these findings recommendations for improvements can be made for the municipality Rotterdam. In the next paragraph the answers to the sub-questions and main research question are presented.

8.2 Conclusions and recommendations

This paragraph first presents the answers to the sub-questions. After that, the answer to the main research question is presented.

> *Sub-question 1: What objectives and constraints apply to a system of risk communication from a municipal executive board to councillors regarding land development projects?*

The first sub-question is focused on identifying relevant objectives and constraints for risk communication concerning land development projects. To identify these factors several strands of literature have been examined in chapter 2: literature on risk communication to decisions makers, to the public and to individuals. This has led to a generally applicable list of objectives and constraints, which was refined to present a framework of objectives and constraints especially applicable to land development projects in chapter 3. This refinement was based on the specific case of land development projects, Dutch national law and user requirements. Finally, based on the findings from the case studies of the municipalities the framework has been modified in chapter 7 to present the final framework (figure 8.1).

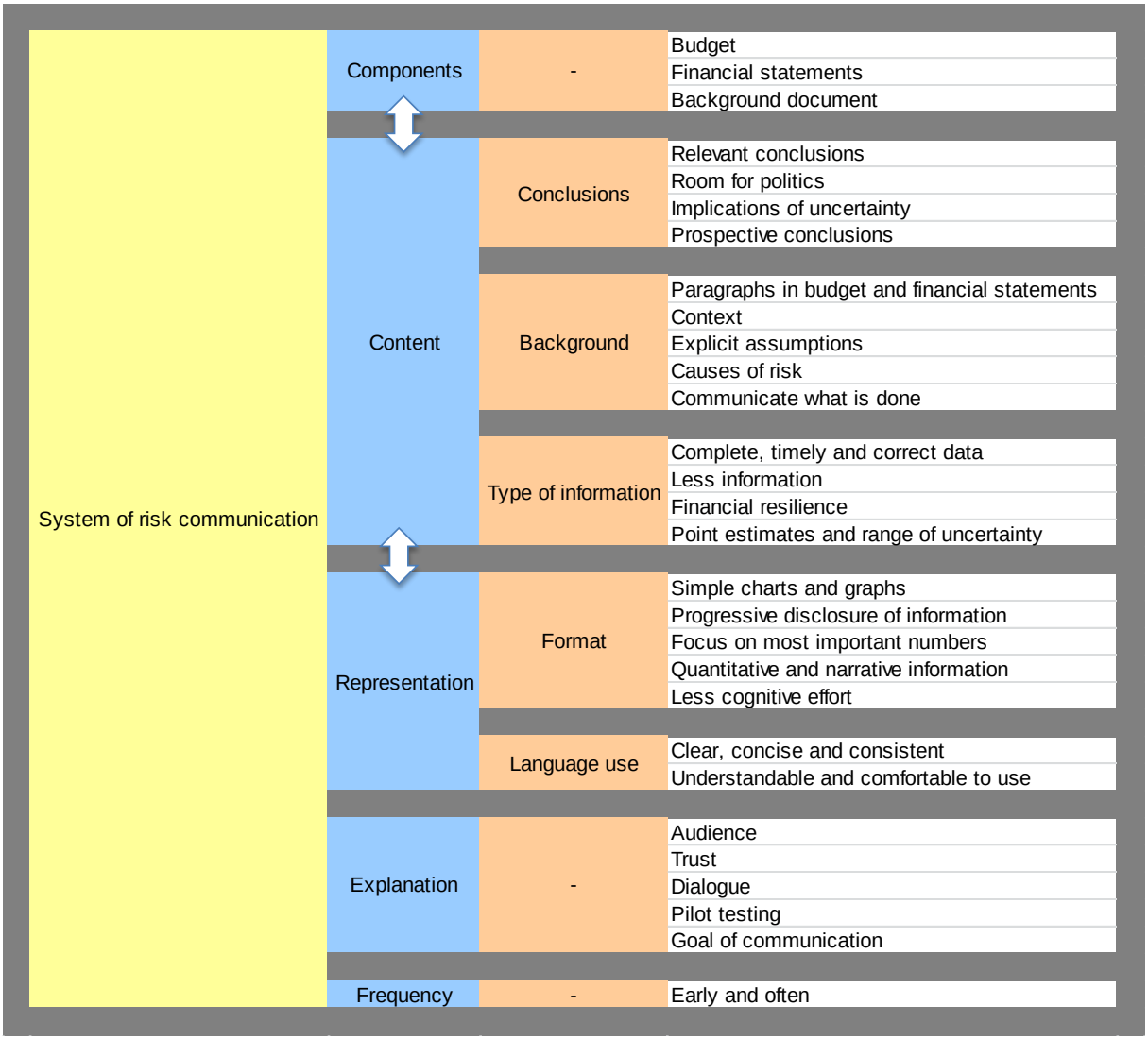

Figure 8.1: Framework of objectives and constraints for a system of risk communication for land development projects

> *Sub-question 2: What does the current system of risk communication to councillors, regarding land development projects, look like and how does it function in Rotterdam?*

The answer to the first part of the question is presented in chapter 4; the current system of risk communication is described at both the portfolio and the project level. To answer the second part of the question, the system of risk communication was assessed using the framework of objectives and constraints. From this analysis we conclude that the current system does not meet many of the objectives and constraints. Interactions between framework parts are often insufficient, caused by a lack of included risk information, which decreases opportunities for interaction. The three main shortcomings of the system of risk communication in Rotterdam are briefly discussed here.

First, information on the actual land development portfolio is often missing, while relatively much information is presented on land development policies. Councillors cannot form themselves a complete overview of the financial situation of land development in their municipality.

Second, the information presented at the project level is insufficient. Most project risk information is presented through the MGP, which includes only the largest land development projects. The format of the MGP is rigid and there is little room for explanation, which affects the readability. Risks are presented only narratively, without a quantification of the impact or the likelihood of occurrence.

Third, the relationship between the council and the land development agency does not seem to functioning optimally. An important reason might be in the lack of clarity about the distribution of roles and powers between the council and the board when it comes to land development projects.

> *Sub-question 3: What does the current system of risk communication to councillors, regarding land development projects, look like and how does it function in other Dutch municipalities?*

To answer this question two municipalities have been studied: Den Haag and Eindhoven. These municipalities were recommended by Frank ten Have, partner at Deloitte Real Estate Advisory, as relatively good practices of risk communication regarding land development. The current systems of risk communication have been described in chapters 5 (Den Haag) and 6 (Eindhoven) of this thesis report. The answer to the second part of the question, regarding the functioning of the current systems in both case municipalities, is discussed here.

In Den Haag the system of risk communication functions well in general. Most objectives and constraints from the framework are satisfied and interaction between the framework components is sufficient. However, there are some improvement points.

First, risks and other numerical values are always presented as point estimates. Uncertainty in the analyses is therefore not shown to the council. This may provide councillors with a false sense of precision and security. Second, councillors should have full knowledge about the full range of outcomes. And finally, the presentation of a single point estimate might be more vulnerable to strategic behaviour.

Second, the information regarding land development projects in the financial statements and interim reports should be better structured. Both documents provide much valuable information, however in the current format this information is not well usable.

Third, the project information in the MPG on the one hand and in the financial statements and the interim reports on the other hand should be better coordinated. The financial statements and interim reports present much financial information, but lack background information on the projects. This information is presented in the MPG only. Including some of this information in the other documents improves readability.

In Eindhoven the system of risk communication functions well at the portfolio level. Most of the objectives and constraints are satisfied and the interactions between the framework parts are adequate. However, at the project level the system performs less well, because too little risk information is presented. Two main shortcomings are identified for the system in Eindhoven.

First, the council receives very little information on project risks and other background information. A complete overview of project risks has only been provided at the start of the case project. If the council does not receive a regular update on risks councillors cannot have an up to date overview of the riskiness of a project.

Second, in Eindhoven both the council and the board use the MPG. Some included information is therefore not relevant for council members. By providing a more precise specification what information is to be sent to the council and what is not will improve readability.

> *Sub-question 4: What could the design of a system of risk communication look like?*

In chapter 7 a sketch design of a system of risk communication was presented. This system exists at least of a budget, financial statements and a background document. The budget presents only the most important portfolio risks in the paragraph land use policy. A few weeks before the budget the council should receive a background document on land development. This contains project risk information in the appendices. Furthermore, the main text presents the portfolio risks, context information and an elaborate calculation of the required financial resilience. The financial statements present an update of the information from the budget in the paragraphs. In an appendix all individual projects are recorded and major changes are explained. Furthermore, dependent on the situation in the municipality, a large projects report can be composed. A more detailed description of the system is presented in chapter 7.

The system of risk communication should be adapted to the municipality's political situation. Therefore, only a sketch of the system is presented.

> *Main research question: How can the system of risk communication from the Rotterdam municipal executive board to the municipal councillors regarding land development projects be improved, based on scientific theory and experiences in other municipalities?*

Based on the answer to sub-question 2 we conclude that the system of risk communication in Rotterdam should indeed be improved on many points. These have been divided into two groups of recommendations. First, one recommendation requires a relatively small effort to realise. The second group of recommendations requires more time and resources to realise.

First, the council should receive the MPRG from now on. This document presents background information on the land development portfolio and the calculations for the required financial resilience. By presenting the MPRG the information councillors receive improves, although it is not sufficient yet. Currently the MPRG is not composed for the council, and as a result the included information may be too complicated for most councillors. Furthermore, the calculation of the required financial resilience should be described more clearly.

Besides this recommendation that can be implemented relatively easy there are six recommendations that will require more time and effort to implement. These recommendations will be discussed here.

First, the roles and powers of the municipal executive board and the council with regard to land development should be defined explicitly and recorded in byelaws. Currently there is uncertainty as to whether and when the council should be involved in land development decision making. Explicitly stating the roles and powers will also clarify what information the council requires. These information requirements have to

be recorded as well, including what information is required and how and when it should be presented.

Second, as mentioned above, the current MPRG is not optimal to inform councillors. The current main text contains much complicated information that councillors do not need, and some may not understand. Furthermore, portfolio risks should be presented more elaborately. The individual portfolio risks should be presented and more context information, including causes and control measures, should be included. Furthermore, the MPRG does not include an appendix with project information. This should be developed.

With regard to the paragraph land use policy in the budget and financial statements the focus should be more on the land development portfolio, instead of on land development policy. The paragraphs should present information on the development portfolio and the most important risks. Furthermore, the calculations of the required financial resilience should be explained briefly.

Fourth, the financial statements currently do not include an appendix in which all land development projects are recorded. Because all projects have to be recorded at the end of the year the information should be available and could be presented to the council. This appendix should include an explanation for all major changes.

Fifth, the MGP should be modified fundamentally in order for it to be informative for councillors. The format should be changed, moving away the current stoplight model. Information on the programme and progress should be presented, as well as context and project risk information. This information should be presented quantitatively where possible, but it should always be accompanied by a narrative explanation. The GRIP reports of the municipality of Den Haag can serve as an example.

Finally, the interim reports and council letters regarding land development should be improved as well. These can be improved by including more specific risk information. Currently the general message comes across, but background information concerning risks is missing.

These recommendations concern mostly the components and content of the risk communication system. Furthermore, the objectives and constraints from the framework regarding the representation of risk information should therefore also be kept in mind.

Moreover, it is important to note that the implementation of a new system of risk communication is not a simple task. As discussed in the conclusions of chapter 7, the implementation of a system, even if based on a system in a similar setting, is dependent on the local (political) support. To be able to implement the recommendations support is needed from a majority of councillors. To create this majority council members should realise that the current system is not functioning adequately and a sense of urgency is to be created. The recent losses in land development projects may be used to create this sense of urgency. Whether the proposed sketch design will be actually implemented, or that another design is chosen, will be dependent on the following political debate.

8.3 Wider application and further research

The findings from this thesis research can be used in a wider context. First, we discuss the possibilities to apply the results, and more specifically the framework of objectives

and constraints, in a wider context. After that, some directions for further research are identified.

8.3.1 Wider application

A decade ago Thompson (2002) stated that 'we have a long way to go in developing effective ways to present the results of probabilistic risk assessments and sensitivity analyses to risk managers and to the public and in ensuring that these results do ultimately lead to improved risk decisions' (p. 653). In this thesis I have aimed to take a small step forward on this long way.

A framework of objectives and constraints has been developed for a system of risk communication concerning land development projects to a Dutch municipal council. Using this framework a sketch design for a system of risk communication has been made. This design can be used in any Dutch municipality to inform the council about land development. The design is focused on large Dutch municipalities; therefore, the complete system might be too elaborate for smaller municipalities. In that case the background document could be removed. The information from that document should then be included in the budget and financial statements.

Furthermore, the framework of objectives and constraints can be used in other situations. It is not possible to define all situations it can be used in. However, we can present some of the characteristics of the context in which the framework can be used.

First, the framework can be used to design a system of risk communication for complex projects that involve uncertainty and flexibility in decision making. Especially when the decision maker has opportunities to steer during the project, like in land development projects, it is important to know the risks in the project. This framework presents an overview of how to represent this information, so decision makers can base their decisions on it.

Second, the framework is suitable to inform decision makers that do not have full knowledge of the matter at hand, or decision makers that are at a relatively large distance of the project. Not all councillors may have full knowledge of the matter of land development projects, as it requires specific knowledge. Furthermore, municipal councillors are often at a distance regarding land development projects. This framework ensures that councillors are informed in an understandable way and that they receive regular updates to stay informed, even though they are not involved daily. These two characteristics, the 'lay decision maker' and the decision maker at a distance, may be applicable to many other projects as well.

To use the framework of objectives and constraints it may be necessary to adapt the framework to the subject matter at hand. To this end the generally applicable list of objectives and constraints from chapter 2 can be used. This list can be refined to fit the subject matter. Objectives and constraints can be added or removed based on several grounds:

- The specific problem,
- The relevant political or decision making situation,
- Law and regulations,
- (Additional) user requirements.

8.3.2 Further research

This thesis research has been a first step to identify requirements for a system of risk communication. Further research is required to improve the framework of objectives

and constraints and to ensure wider application. We have identified three areas for further research.

First, some objectives or constraints are not specific enough yet. For example, the objective that simple charts and graphs should be included is quite generic. Risk communication literature hitherto has not been able to define this objective more specifically (e.g. Dieckmann et al., 2010; Morgenstern et al., 2006; Thompson & Bloom, 2000). Further research is required to define what kind of graphs or charts are most suitable in any situation. This also applies to other objectives an constraints.

A second and related direction for further research is in defining criteria to score objectives and constraints. Objectives and constraints have been used in this research to assess the current systems of risk communication. However, criteria for successful or adequate risk communication are not yet defined. Defining these definitions will enable a more precise assessment of risk communication systems. The interactions in the system of risk communication however may complicate the identification of criteria, as the system only functions properly when the interactions are functioning properly as well.

The problem of definition is related to a third issue: the issue of measuring communication. How does one measure communication? Especially in an area where other (political) interests play an important role in decision making it might be difficult to pinpoint the influence of risk communication (see also Sager & Ravlum, 2005). An interesting parallel may be in literature on communicative planning (e.g. Faludi & Korthals Altes, 1994). Faludi and Korthals Altes (1994) propose to evaluate the influence of strategic planning not by measuring the conformance of the outcomes to the plan, but rather by looking at if and how the plan is used in decision making. This might also be the way to measure the effectiveness of risk communication in the political arena: not by looking whether politicians do exactly what was communicated, but by assessing how often risk communication is referred to or used in decision making. Furthermore, other literature on communication and effects of communication might prove helpful in defining a way to measure risk communication in a political context.

8.4 Reflection

This report describes my Master's thesis research, for which I have done a six month internship at the municipal Audit Office Rotterdam. In total I have spent a little over nine months working on this thesis. This is slightly longer than expected in advance. Part of this delay can be contributed to my internship, where I also worked as a research team member on the Audit Office research. Furthermore, the definition of my research design took more time than expected to get it right.

My internship at the Audit Office Rotterdam has been helpful in several ways. First, it has helped me understand the municipal politics better, as well as the relations between the municipal politicians and the land development agency. Furthermore, it has helped me to get entrance into the other case municipalities for interviews. The people I interviewed from Den Haag and Eindhoven were often proud to be regarded as good practices and were willing to share their view on risk communication. Furthermore, they were interested in the comparison of their municipality to others. With regard to the interviews in Rotterdam I had expected some reluctance to cooperate, as people may be reluctant to speak to the Audit Office. However, I did not experience this. People were willing to cooperate and give their opinion.

Second, I reflect on the methods used in this research and the consequences of my choices. First, literature on the communication of risks is rather scattered. There is not yet a solid body of requirements for adequate risk communication. This complicated the identification of relevant literature. On the other hand it also allowed me to consider different strands of literature.

Furthermore, a case study has been performed. This was done in an exploratory way to assess good practices, and to identify what objectives and constraints were actually satisfied and what the effects were. A case study is suitable for exploratory research. On the other hand this means that generalising is harder.

Most complicating was the scoring of criteria for the objectives and constraints. Due to the absence of criteria for these requirements, it was hard to score the systems of risk communication. Therefore, I have chosen to use colours to score requirements. These scorings have been underpinned by references to interviews, presenting examples or references to the original communication documents. As discussed in the previous paragraph, evaluative planning may provide an example of how to score measure the performance of communication. However, this would have required a different research design.

Altogether this thesis research presents a start into defining adequate risk communication for land development, by bringing together literature and presenting an overview of objectives and constraints.

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Appendices

Appendix A: Scientific article

Communicating risks in land development projects to the municipal council

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Abstract

Many Dutch municipalities are actively involved in land development, which means risks are taken by the municipality. The municipal council has to be informed about these risks, to be able to critically assess the municipality's financial situation. However, land development projects represent complicated matter that not all council members may understand. Therefore, this article aims to present a system of risk communication to adequately inform the municipal council on land development projects. To achieve this goal a desktop study into literature on risk communication and a case study in three large Dutch municipalities have been conducted. Based on the findings, objectives and constraints for a system of risk communication have been identified. Furthermore, a sketch design for a system of risk communication for land development projects is presented.

Keywords: Communication, land development, municipal council, risk, the Netherlands, uncertainty.

1. Introduction

In the Netherlands the municipal council (in Dutch: *gemeenteraad*) sets the policy frameworks for the municipal executive board (in Dutch: *college van Burgemeester en Wethouders*) and checks whether the board fulfils these. Furthermore, the council critically assesses the municipality's financial situation (Vereniging Nederlandse Gemeenten & Ministerie van Binnenlandse Zaken, 2004).

To perform their task the council is to receive all information it requires from the board. This includes the yearly budget and financial statements, and interim reports. Furthermore, the council can request documents on specific topics. These documents should pay sufficient attention to the (financial) risks the municipality is subject to. We define the whole of these documents as the *system of risk communication* of the municipality.

To assess the municipal risks the concept of financial resilience (in Dutch: *weerstandsvermogen*) has been defined in Dutch national law. The decree budget and accountability provinces and municipalities (in Dutch: *Besluit begroting en verantwoording provincies en gemeenten*, Bbv) defines financial resilience as the relation

between (financial) risks the municipality is subject to and the capital it has to deal with these risks (Gerritsen, 2007).

One of the most complicated and most important topics in municipal financial management is land development. This kind of projects is generally more risky than other projects municipalities carry out (Ten Have, 2008). Furthermore, informing council members is complicated due to the nature of risks in land development projects. In a report by Deloitte (2010a) four complicating features are identified:

- A long time horizon;
- Dependence on the market, other parties and regulation;
- Plans are drawn from rough to more detailed over time;
- Flexibility allows steering during the project, but it also complicates forecasting the outcomes.

Moreover, land development finances are complicated. 'For many council members the finances of the land-development agency represent a black box, and insight is often lacking about the relationship between decisions on the plan and its financial consequences' (Korthals Altes, 2010, p. 938).

This article aims to shed light on what factors are of importance when informing decision makers about risks in complicated policy areas. The following research question is formulated: What could be an adequate system of risk communication to inform the municipal council about the municipality's land development projects? We use a desk research to identify the objectives and constraints the system should satisfy. Furthermore, a case study is performed into the systems of risk communication in three Dutch municipalities: Rotterdam, Den Haag and Eindhoven.

Section 2 of this article discusses the land development practice in the Netherlands and the role of municipalities. After that, the objectives and constraints applicable to land development are described. These objectives and constraints are used to assess the systems of risk communication in the case municipalities in section 4. Section 5 then discusses the findings from the case studies and presents a sketch design for a system of risk communication land development projects. Finally, section 6 presents the conclusions, as well as directions for further research.

2. Land development in the Netherlands

Land use planning in the Netherlands is highly decentralized (Louw, van der Krabben & Priemus, 2003). Land use plans are drawn up and recorded by municipalities. Municipalities are also involved in the development of these land use plans, by servicing the land. Involvement can be in different forms: actively or through public-private partnerships (PPP) (Leväinen & Korthals Altes, 2005; Needham, 2007).

If a municipality is actively involved in land development, the municipality acquires the land, services it and then sells it to a development company, housing association or end user. This is the traditional model, in which municipalities consider it their duty to supply land to meet local demand (Leväinen & Korthals Altes, 2005). Since the 1990s private parties, such as developers and construction companies, have entered the land market, which led to the emergence of alternative models of land development, the PPPs. Four different models can be identified: exchange of land for building rights, integral development, joint development and the concession model (Groetelaers & Korthals Altes, 2004; Van Rij & Korthals Altes, 2010).

Many Dutch municipalities prefer to be actively involved in land development projects (Buitelaar, 2010; Louw et al., 2003). Besides steering possibilities, it offers municipalities flexibility to react to market conditions and to recover costs and take part of the profits made.

For many years land development projects have indeed been sources of considerable income for municipalities (Korthals Altes, 2010). Financial setbacks could often be compensated for, preventing cost overruns. This is because land development projects can be divided into sub-projects relatively easy, unlike infrastructure projects (De Bruijn & Leijten, 2008). This flexibility allows project managers to modify projects in order to compensate for higher costs. These practices often resulted in profits from land development projects, which were often even higher than planned (Korthals Altes, 2010).

However, the economic recession following the credit crisis in 2008 hit hard, especially on real estate markets. As a consequence demand for (new) housing has decreased drastically in the Netherlands (Priemus, 2010). This has led to large losses for many municipalities. Research by Deloitte (2010b; 2011) shows that the credit crisis may have a negative effect of €2.9 billion on land development projects of Dutch municipalities. The importance of the council being able to monitor the financial situation, especially with regard to its land development portfolio, is therefore greater than ever.

3. Literature: Objectives and constraints

This section presents the objectives and constraints for effective risk communication about land development projects that have been identified. Objectives are the system requirements that should be optimized. Constraints are requirements that have to be met, but do not have to be optimized (cf. Herder & Stikkelman, 2004). To identify the objectives and constraints we have studied literature and Dutch national law. Furthermore, several councillors have been interviewed.

Three strands of literature have been studied: literature on risk communication to decision makers and politicians, on risk communication to the public and on risk communication to individuals. Municipal council members can be shared under decision makers or politicians. However, these studies often assume that the decision maker is well informed and experienced in the subject matter. Council members however may be inexperienced and may lack knowledge of land development. Therefore, we have also studied literature on risk communication to the public and to individuals. These studies are more focused at presenting the information to uninformed people in a way the message is easily understood.

Two Dutch national laws provide additional constraints for the system of risk communication concerning land development projects: the Gemeentewet (Municipality Law) and the Bbv.

Finally, at least one councillor was interviewed in each case municipality. One of the goals of these interviews was to retrieve what councillors expect to be informed about and in what way.

Table 1 presents an overview of the identified objectives and constraints. The requirements have been structured into five categories: components, content, representation, explanation and frequency. Together these categories represent the framework of objectives and constraints for a system of risk communication. Figure 1 shows the conceptual model that defines the relations between the categories.

The model shows interactions between components and content and between content and representation. The system can only function properly when there is sufficient interaction between these framework parts. For example, the reader is not informed adequately, if there is no proper risk information (content) included, even though the right risk documents (components) are presented.

Table 1: Framework of objectives and constraints for a system of risk communication for land development projects

System of risk communication	Components		Budget
			Financial statements
	Content	Conclusions	Relevant conclusions
			Room for politics
			Implications of uncertainty
			Prospective conclusions
		Background	Paragraphs in budget and financial statements
			Context
			Explicit assumptions
			Causes of risk
			Control measures
		Type of information	Complete, timely and correct data
			Less information
			Financial resilience
			Point estimates and range of uncertainty
	Representation	Format	Simple charts and graphs
			Progressive disclosure of information
			Focus on most important numbers
			Narrative information
			Less cognitive effort
		Language use	Clear, concise and consistent
			Understandable and comfortable to use
	Explanation		Audience
			Trust
			Dialogue
			Pilot testing
			Goal of communication
	Frequency		Early and often

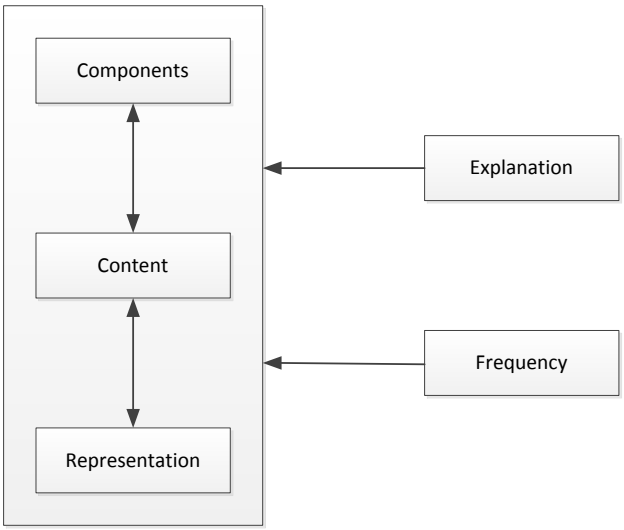

Figure 1: Conceptual model of a system of risk communication

Components
Literature does not provide requirements regarding components, as the components are determined by the context of risk communication, in this case the municipal authority. Therefore, only Dutch national law provides constraints. Based on the Gemeentewet the municipal board is obliged to provide the council with all the information it requires to perform its task[86]. More specifically, the board is to present the budget and the financial statements annually to the council[87].

Content
Many objectives and constraints concern the content of risk communication. These can be divided into requirements concerning the presented conclusions, the background information and the type of information included.

First of all, conclusions have to be relevant to the decision at hand (Bier, 2001a). Irrelevant conclusions can only confound and distract. However, decision makers should be able to draw their own conclusions from the information to some extent. Therefore, conclusions should leave room for politics (Brown, 2011; Morgenstern, Nelson & Krupnick, 2006). Furthermore, the conclusions should provide information on the implications of uncertainty in the analyses, as decision makers should know what range of outcomes is possible (Thompson & Bloom, 2000). Finally, based on the interviews with councillors we add that prospective conclusions must be included in risk communication. Council members stress that it is important to know what profits or losses to expect when projects are completed.

Besides conclusions decision makers should receive background information regarding land development. This includes information discussing the project context and explaining why the project or the decision is important (Morgenstern et al., 2006; Thompson & Bloom, 2000). Furthermore, information should be presented on which assumptions have been made (Bier, 2001a; Fischhoff, 1995), the causes of risks (Bier, 2001a) and the efforts made to control risks (Cope et al., 2010; Powell, 2000). Moreover, the Bbv states that both the budget and the financial statements have to include paragraphs on land use policy (in Dutch: *Grondbeleid*) and financial resilience[88].

[86] Articles 169 and 180, Gemeentewet.
[87] Articles 189-191, 197 and 198, Gemeentewet.
[88] Articles 11 and 16, Bbv.

Third, the information presented should be complete, timely and correct (Bier, 2001a). However, it must be stressed that too much information can create an information overload (Lyytimaki, Assmuth and Hildén, 2011). Therefore, paradoxically, less information is better (Wardman, 2008). Third, risks are often presented as single point estimates. Underlying uncertainty in analyses is masked and decision makers are provided with a false sense of security. Therefore, point estimates should always be presented with a range of uncertainty (Dieckmann, Mauro & Slovic, 2010; Thompson, 2002). Finally, the Bbv states that information regarding the financial resilience must be presented[89].

Representation

Many of the objectives and constraints identified concern the representation of risk information. These requirements concern either the format or the language in risk communication.

An adequate format is necessary to get the message across to decision makers. Several studies have shown that simple graphs and charts increase understanding (Morgenstern et al., 2006; Peters et al., 2007b; Thompson & Bloom, 2000). A proper structure in documents is also important. Through progressive disclosure of information readers can dig deeper into the (technical) information when needed (Brown, 2011; Pereira & Corral, 2002). Third, the format should direct focus to the most important information for the decision (Brown, 2011; Fischhoff, 1995). Furthermore, studies stress the inclusion of narrative information, in addition to quantitative information, to improve understanding (Dieckmann et al., 2010; Slovic et al., 2007). Finally, information should be presented in a way that requires the least cognitive effort from readers to understand (Peters et al., 2007a).

Language is of great importance in communication. To avoid misunderstanding and deliver the message clearly language in risk communication should be clear, concise and consistent (Johansen, 2010). Furthermore, risk communication should be understandable and presented in such a way readers are comfortable using the information (Bier, 2001a; Dieckmann et al., 2010).

Explanation

The fourth category concerns the explanation of risk communication. First, information must be appropriate for the intended audience (Bier, 2001b; Balch & Sutton, 1995; Brown, 2011). If not, understanding will be insufficient. Another important factor is trust between the decision maker and the analyst (Bier, 2001a). If parties do not trust each other, risk information may be disregarded. This relates to the third factor: dialogue. Risk communication should be a two-way process (Balch & Sutton 1995). Fourth, new risk communication formats should be carefully tested using pilots, before implementation (Bier, 2001a). Finally, risk communication should be adapted to the goal it is intended to have (Rowan, 1991).

Frequency

The frequency of risk communication is the final category. Risk communication should take place early and often (Powell, 2000). This prevents the situation that communication has to overcome entrenched risk perceptions. Furthermore, it may serve as an early warning.

[89] Article 16, Bbv.

4. Case study: Results

Three Dutch municipalities have been examined in the case study research: Rotterdam, Den Haag and Eindhoven. In each of these municipalities we have studied risk communication at both the portfolio level, concerning all land development projects together, and the project level, concerning one project. In each municipality two employees of the land development agency were interviewed, one at the portfolio level and one at the project level. Furthermore, at least one councillor per municipality was interviewed to assess the usefulness of the information.

First, we present a brief introduction of the case municipalities. After that, the results of the case study are presented by discussing four issues in communicating risks in land development projects.

Case municipalities

Rotterdam is the municipality with the second highest population in the Netherlands. Land development in Rotterdam is mostly concerned with inner-city renewal projects and redevelopment of old harbour locations. The municipality of Rotterdam is actively involved in land development: in 2009 the inventory had a book value of €208.9 million (CBS, 2011), meaning the municipality is investing heavily in land development projects (see also table 2).

Den Haag is the third largest city in the Netherlands. Like in Rotterdam, the municipality is often actively involved in land development, as shown by an inventory book value of €123.6 million in 2009 (CBS, 2011).

Eindhoven is the fifth largest city of the Netherlands, located in the south. As nearly all land in the municipality has been built on, future land development projects will most likely be inner-city renewal projects. The municipality has been actively involved in land development, shown by the inventory book value of €180.9 million in 2009 (CBS, 2011).

Table 2: Population and book value of inventory of case municipalities (CBS, 2011)

Municipality	**Population (in 2010)**	**Inventory (in 2009)**
Rotterdam	593,050	€208.9 million
Den Haag	488,555	€123.6 million
Eindhoven	213,810	€180.9 million

Background document

A striking difference between Rotterdam and the other two municipalities is that the council in Rotterdam does not receive a specific background document on land development. In both Den Haag and Eindhoven the council does receive such a document, besides the regular planning and control documents. These background documents, called MPG (Multiyear Prognosis Land Development), include extensive background and risk information and the calculations for the required financial resilience for land development. Furthermore, the MPG in Den Haag includes an extensive project appendix, presenting complete risk information. In Eindhoven, this project information is presented throughout the main text.

The council in Rotterdam does not receive much of this portfolio information. Some of the information is included in the paragraphs land use policy of the budget or financial statements. However, most of the portfolio risk information, which is presented in the Den Haag or Eindhoven MPGs, is not presented to the council in Rotterdam.

Moreover, in Rotterdam the calculation of the required financial resilience is described in the MPRG (Multiyear Prognosis Land Development Rotterdam), which is not sent to the council. The council therefore has no knowledge of the underlying figures or assumptions.

Project risk information

The presentation of project risk information to the council can be largely improved on in both Rotterdam and Eindhoven. The council of Den Haag is presented with extensive project information overviews through the appendix of the MPG, which includes all projects, and the GRIP reports, covering the largest land development projects.

In Rotterdam, many projects are reported on very little. Changes in expected project results are discussed in the financial statements, although the explanations are often very brief. Furthermore, the largest projects are discussed in the MGP (Monitor Large Projects). This MGP has a rigid format, including several indicators. However, the format provides little room for explanation and not all risks are included. Therefore, council members do not have a complete overview of the riskiness of these projects. On many other projects the council receives even less information.

Third, in Eindhoven project information is included in the main text of the MPG and in the financial statements. However, there is no overview including all risks, nor are these quantified. Therefore, council members are not able to assess the riskiness of a project.

Uncertainty in analyses

It is furthermore striking that in none of the case municipalities the council receives full information on the uncertainty in analyses, or on the implications of this uncertainty. In Eindhoven some uncertainty information is presented by using two scenarios in calculating the required financial resilience. However, in other cases figures are always presented as if they are precisely known. This may provide councillors with a false sense of security.

Roles and powers council

Finally, large differences appear in the roles and powers of the municipal council and executive board in deciding on land development projects. In Den Haag the distribution of powers and roles is clearly recorded in a regulation and executory decision. These specify when the council has to decide and when the board can decide. In Eindhoven the roles and powers are recorded in an internal memorandum.

However, in Rotterdam there are no regulations for decision making powers specifically focused on land development projects. In practice, the board decides often, except when additional funding is required. Only the council can decide to provide this additional funding, based on the budget right. The lack of clarity on powers and roles leads to a lack of clarity on what information the council needs for its task.

5. Discussion

Based on the findings from the case studies we make two changes to the framework of objectives and constraints. First of all, we add that a background document concerning land development must be sent to the council at least once a year, like currently in Den Haag and Eindhoven. Such a background document enables the inclusion of much background information on context, assumptions and risks, which should all be included in the paragraph land use policy otherwise.

Second, risk information is often presented in a narrative way. Quantitative risk information, both on the likelihood and impact of risk, is often not presented. Based on the literature we have included the requirement that risk information should be presented in narrative form as well. However, this implies that quantitative risk information is presented. As this proves to be untrue in many situations the constraint is adapted to ensure both quantitative and narrative information is included. These two modifications in the framework lead to the improved framework in table 3.

Furthermore, using the complete framework of requirements and the findings from the case studies a sketch design for a system of risk communication is made. This design is based on the system used in Den Haag, complemented with features from the other case municipalities and literature. The design is discussed based on the components. Finally, we discuss the process of implementation of such a system.

Budget

Information on land development projects in the budget is concentrated in the paragraph land use policy. The developments in the municipal portfolio are discussed, including the development programme and the most important portfolio risks. These developments are reflected in the calculation of the required financial resilience for land development projects. This calculation is explained briefly with a reference to the more elaborate calculations in the background document. Finally, the paragraph presents the implications of the expected developments on the land development reservations and provisions.

Financial statements

Like in the budget, information on land development projects is concentrated in the paragraph land use policy, which contains the same kind of information as the budget. More information on individual projects is included in an appendix regarding land development projects.

All land development projects are briefly discussed in this appendix. An overview presents the project's programme, expected end results and key figures. Furthermore, all project changes with a financial effect above a certain threshold amount, e.g. €250,000, are explained. Moreover, the most important risks in each project are described briefly.

Background document

Third, the council is to receive a background document concerning land development projects once a year, a few weeks before the budget is presented, i.e. in September. The main text of this background document describes the most important developments in the land development portfolio and projects. This includes a discussion of the largest individual projects and portfolio context information, e.g. a market analysis. Furthermore, it presents elaborate calculations for the required financial resilience, including explicit assumptions and context information. Finally, conclusions are presented, as well as the consequences for the municipal reservations and provisions.

The background document includes an appendix concerning all individual land development projects. This appendix presents information on the project context, finances, programme and risks. All project risks are discussed, including risks causes and control measures.

Large projects reports
When many projects are realised simultaneously or when some projects are considerably larger than others the council may want to be informed about the most important projects more often. The board could then compose a large projects report. This report provides an extensive update of the information from the project appendix in the background document. Furthermore, information on the project context and the most important risks is included.

Interim reports and council letters
Finally, additional or urgent information considering land development or risks in the portfolio or projects can be sent to the council through council letters or in interim reports.

Implementation
The presented design for a system of risk communication is a sketch. The precise interpretation of the system is dependent on many factors, including the political situation in the municipality or the number of land development projects that are realised simultaneously. A more detailed system should therefore be tailored to the municipality it is intended for. However, it is possible to make some remarks on the implementation of a system like this.

The implementation of such a model system of risk communication is a form of institutional transplantation (see De Jong, 1999). Implementing a system in another municipality might seem straightforward, but practice might prove disappointing.

The institutions that are transferred are often formal institutions: the legal rules of the game. These are transferred into an environment with potentially different informal institutions: the social practices based on values and norms (De Jong, 2004). The more the new environment resembles the original environment, the easier the transplantation could be expected to be. As De Jong (2004) states: 'the assumption that institutional transplantation between similar countries can be done with greater facility is plausible' (p. 1056). Moreover, by this logic, the institutional transplantation between large Dutch municipalities would be expected to be even easier. However, as De Jong (2004) explains there are pitfalls that have to be kept in mind, especially when transplanting between similar authorities.

More specifically, it must always be kept in mind that it is the local actors that have to work with the new system of risk communication. Transplantation will always create a struggle in the domestic policy area, as does any other policy innovation. This means it is important to be aware of local specificities and needs, consider multiple models, create a sense of urgency, forge a coalition that is strong enough to push through the initiative and wait for a window of opportunity (De Jong, 2004, p. 1066). Implementation is therefore not a matter of drawing a plan and recording it in a regulation, but there has to be sufficient political support, as well as from the land development agency.

6. Conclusions
From several strands of literature we have identified objectives and constraints that apply to a system of risk communication. Furthermore, the practice of land development in the Netherlands, Dutch national law and user requirements have been used to complete the requirements. Table 3 presents the framework of objectives and constraints for a system of risk communication for land development projects.

Table 3: Framework of objectives and constraints for a system of risk communication for land development projects

System of risk communication	Components		Budget
			Financial statements
			Background document
	Content	Conclusions	Relevant conclusions
			Room for politics
			Implications of uncertainty
			Prospective conclusions
		Background	Paragraphs in budget and financial statements
			Context
			Explicit assumptions
			Causes of risk
			Control measures
		Type of information	Complete, timely and correct data
			Less information
			Financial resilience
			Point estimates and range of uncertainty
	Representation	Format	Simple charts and graphs
			Progressive disclosure of information
			Focus on most important numbers
			Quantitative and narrative information
			Less cognitive effort
		Language use	Clear, concise and consistent
			Understandable and comfortable to use
	Explanation		Audience
			Trust
			Dialogue
			Pilot testing
			Goal of communication
	Frequency		Early and often

Based on these objectives and constraints and the findings from the case studies in Rotterdam, Den Haag and Eindhoven a sketch design for a system of risk communication for land development projects was presented. This design includes a budget and financial statements, including the paragraphs financial resilience and land use policy, and a background document on land development. Furthermore, a large project result can be composed. Urgent developments are reported to the council through interim reports or council letters.

The framework of objectives and constraints may also be used in other situations than Dutch land development. It is not possible to define all situations, however we can present some of the characteristics of the context in which the framework can be used.

First, the framework can be used to design a system of risk communication for large complex projects that involve uncertainty and flexibility in decision making. Especially when decision makers have opportunities to steer during the project, like in land development projects, it is important to know the risks in the project. This framework presents an overview of how to represent this information, so decision makers can make their decisions.

Second, the framework is suitable to inform decision makers that do not have full knowledge of the matter at hand, or decision makers that are at a relatively large distance of the project. Not all councillors may have full knowledge of the matter of land

development projects, as it requires specific knowledge. Furthermore, municipal councillors are often at a distance regarding land development projects. This framework ensures that councillors are informed in an understandable way and that they receive regular updates to stay informed, even though they are not involved daily. These two characteristics, the 'lay decision maker' and the decision maker at a distance, may be applicable to many other projects as well.

Further research

This article describes a first step in identifying requirements for a complete system of risk communication. Further research is required to improve the framework of objectives and constraints and to ensure wider application. We have identified three areas for further research.

First, some objectives or constraints are not specific enough yet. For example, the objective that simple charts and graphs should be included is quite generic. Risk communication literature hitherto has not been able to define this objective more specifically (e.g. Dieckmann et al., 2010; Morgenstern et al., 2006; Thompson & Bloom, 2000). Further research is required to define what kind of graphs or charts are most suitable in any situation. This also applies to other objectives an constraints.

A second and related direction for further research is in defining criteria to score objectives and constraints. Defining these definitions will enable a more precise assessment of risk communication systems.

The problem of definition is related to a third issue: the issue of measuring communication. How does one measure communication? Especially in an area where other (political) interests play an important role in decision making it might be difficult to pinpoint the influence of risk communication (e.g. Sager & Ravlum, 2005). An interesting parallel may be in literature on communicative planning (Faludi & Korthals Altes, 1994). Faludi and Korthals Altes (1994) propose to evaluate the influence of strategic planning not by measuring the conformance of the outcomes to the plan, but rather by looking at if and how the plan is used in decision making. This might also be the way to measure the effectiveness of risk communication in the political arena: not by looking whether politicians do exactly what was communicated, but by assessing how often risk communication is referred to or used in decision making.

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Appendix B: List of interviews

Bronkhorst, Esther. Project economist Laakhaven, municipality Den Haag, interview on January 16, 2012.

Hendriks, Aart. Department manager plan economy, municipality Den Haag, interview on December 6, 2011.

Keldermans, Freek. Project management office, municipality Rotterdam, interview on November 16, 2011 (interview with Rekenkamer Rotterdam).

Mertens, Guido. Overall plan economist, municipality Eindhoven, interview on December 9, 2011.

Schonk, Jan. Councillor municipality Rotterdam (D66), interview on September 28, 2011 (interview with Rekenkamer Rotterdam).

Sepers, Bas. Councillor municipality Den Haag (PvdA), interview on February 13, 2012.

Stanicic, Matija. Process manager Laurenskwartier, municipality Rotterdam, interview on April 4, 2012.

Van Zijl, Hans. Councillor municipality Eindhoven (GroenLinks), interview on December 20, 2011.

Verbeek, Thomas. Plan economist Blixembosch Buiten, municipality Eindhoven, interview on December 22, 2011.

Verheij, Jan-Willem and van Gent, George. Councillors municipality Rotterdam (VVD), interview on September 19, 2011 (interview with Rekenkamer Rotterdam).

Expert meeting Rekenkamer Rotterdam, on October 11, 2011.