

# Dynamics within the Dutch spatial-infrastructure planning process

Analysing two case studies to consider the usefulness of Decision Support Methods within the exploratory phase of MIRT projects

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## Abstract

This research explores the dynamics within the early planning process of Meerjarenprogramma Infrastructuur Ruimte en Transport (MIRT) projects. The MIRT is a large investment program for infrastructural, spatial and transport projects in the Netherlands. The N65 Vught – Haaren and the InnovA58 are depicted as case studies, to make the experiences from practitioners explicit. Analysis shows that there are differences in the success of the planning processes. Differences are assigned to the scope of the projects, the feasibility of the predefined and desired project alternatives and the urgency and necessity of the project. Also the attitudes of the stakeholders, the budget allocation and the (political) cause of the project are of influence on the process of the exploratory phase. Both cases apply Decision Support Methods. The function of the Decision Support Methods is dependent on the characteristics of the exploratory phase. In a politically driven exploratory phase, Decision Support Methods are applied to optimise alternatives. When the exploratory phase does not show any problems, Decision Support Methods are used to bring stakeholders closer together and to justify the preferred project alternative. Further research is necessary to see how the renewed MIRT will influence the process and within the exploratory phase. Besides, future research should consider how to influence stakeholder behaviour to improve the outcomes of the planning process.

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## 1. Introduction

The ‘Meerjarenprogramma Infrastructuur Ruimte en Transport’ (MIRT) is a large investment program that invests in infrastructural, spatial and transport projects in the Netherlands. Projects assigned as a MIRT project are extensive in time and costs. In order to uniform these projects, increase the certainty of developing a project and decrease the time of the process, the steps of the MIRT phases are pre-defined in guidelines. These guidelines are obliged to follow in order to qualify for the financial funding. The MIRT is currently being renewed (Ministerie van Infrastructuur en Milieu, 2014a) and the renewal aims to make infrastructure planning in the Netherlands future resilient (Ministerie van Infrastructuur en Milieu, 2016a). Renewal of the MIRT is necessary as the environment changes faster, technological innovations are often uncertain and projects are increasing in complexity. Additionally, the MIRT was not completely functioning as expected and spatial projects with an integral objective were little executed (RoyalHaskoningDHV, 2014). This renewal wishes to improve the cooperation between the governmental bodies and between the government and other parties, as decentralisation plays an important role these days. This leads to a set of actions to increase a broad view and consider more effects, apply a custom approach and increase cooperation by tackling challenges together with other stakeholders (Ministerie van Infrastructuur en Milieu, 2014c).

Adjustments from the renewal of the MIRT are specifically applicable in the early phases of the MIRT process and irreversible decisions concerning the project alternatives are made early in the process. This makes the

exploratory phase an important phase. Nevertheless, adjustments can only be applied successfully if the exploratory phase is well understood. Therefore, this research paper aims to see how the exploratory phase currently takes place in practice and it aims to see how means such as Decision Support Methods are currently applied within practice, before coming up with improvements for the exploratory phase.

The research questions that will be answered are: “How does the MIRT exploratory phase take place?” and “How are Decision Support Methods currently applied in the exploratory phase?”. The answer on both research questions should consider the assumptions and desires of the guidelines, but it should also explain and consider implicit considerations and behaviour of the stakeholders. In order to give a substantiated answer, this research will analyse the decision making process of two case studies: the N65 Vught - Haaren and the InnovA58. Considering two cases makes it possible to analyse similarities and differences between projects.

This research paper will describe the research method in the next section. Semi-structured interviews are used as a research method. Interviews help to bring up personal experiences, which are likely to remain implicit within the documents and guidelines. Second, in order to analyse these cases accordingly and make these implicit experiences explicit, a theoretic framework is elaborated. This framework helps to pinpoint and discuss the underlying assumptions that influence the process of working towards a decision. Third, this research will discuss the exploratory phases of the two case studies N65 Vught – Haaren and the InnovA58. This analysis will also bring up the experiences of the use of Decision Support Methods within these two cases. Last, this research paper will conclude with recommendations, given the insights from the exploratory phase in practice.

## **2. Research method**

In order to analyse the practical experiences of the exploratory phase and consider the use and added value of Decision Support Methods as stated in the research questions, interviews are used as a research method to retrieve information. Semi-structured interviews are used, as this provides opportunities for interviewees to come up with suggestions, preferences and experiences (Charmaz, 2006). Next to that, it is helpful to consider the attitude of the interviewee, it creates certain trust with personal communication and it is possible to ask further questions when something valuable is addressed. Therefore, interviews are considered useful to make implicit information explicit. The interview set up is mostly standardized, but questions are adjusted to the specific situation. The interview questions are sent out at least one day before to give the interviewee some time to prepare their answers.

The people are selected on their involvement and knowledge of the exploratory phase of one of the two case studies. First, the project managers are interviewed to get a clear overview of the situation. After each interview, it is asked who should be further considered to get a good overview of the different experiences and interests of the organisations. All people who are addressed are interviewed. This results in six interviews for each case study. These interviews represent the involvement of the organisations in the exploratory process and also consider individual and personal preferences. These interviews provide information about the interests of interviewee’s own organisation, as well as the cooperation between the different organisations.

Each interview is transcribed and a report is constructed, stating the outcomes of the interview. These reports are returned to the interviewees with the possibility to make adjustments and to approve the report to include this within the thesis. The reports and references can be derived in the main report (Oudshoorn, 2017). By considering the information in two steps and by adding the reports in the appendices, it is possible to structure the information and this improves the transparency of the information sources (Corbin & Strauss, 1990).

## **3. Theoretical framework**

The guidelines consider a static process where stakeholders maximize welfare within projects, while the characteristics of the exploratory phase show that this process is often dynamic. This leads to a dilemma between the rational guidelines (what should happen) and the practice of the exploratory phase (what is actually happening) (Flyvbjerg, 2003), where decisions are also dependent on the power of organisations and the political situation that shapes the context of the exploratory phase. Applying one perspective can only consider one of these sides, so in order to deal with these differences in perceptions, three perspectives are proposed. Using three perspectives makes it possible to gain a better understanding of the decision making process in the exploratory phase and it

provides a more complete overview of the situation (Albaek, 1996; Allison, 1971). Next to that, these perspectives propose a structured approach to analyse the exploratory phase and to justify and explain the decision making process (Powell & Buede, 2009).

Allison (1971), Steunenberg & van Vught (1997), Snellen (2002) and Mu (2013) define three or four perspectives, which also called approaches or rationalities. These perspectives contain assumptions and premises to consider the reality (Goulet, 1986). Table 1 shows these four perspectives. However, as the legal perspective involves aspects from all three perspectives, it is decided to consider this as an element of bounded rationality within the organizational perspective, where legal aspects are considered as constraints within and between the functioning of an organisation.

Below, the three perspectives are shortly introduced. These perspectives have different goals and hypotheses, which are discussed for each perspective. It must be noted that there is not a right perspective that can explain everything (Albaek, 1996) and these perspectives are conflicting (Goulet, 1986). Each perspective highlights certain elements that are observable practice. Therefore, by using three perspectives instead of one perspective, it is possible to come up with a more complete view of the MIRT exploratory phase.

Allison (1971)	Snellen (2002)	Mu (2013)	Steunenberg & van Vught (1997)	Oudshoorn (2017)
The rational actor	The economic rationality*	The policy analyst perspective	Political economy-rational choice	Rational perspective
Organizational process	The professional rationality*		Cultural-organizational approach	Organizational perspective
	The legal rationality	The legal perspective		
Governmental politics	The political rationality	The political perspective	Historical-traditional approach	Political perspective

Table 1: Four perspectives to analyse the decision making process

### 3.1 Rational perspective

The rational perspective assumes analytical steps, facts and objectives to derive at outcomes. Decisions are based on expected outcomes and full information in the effects and the consequences of project alternatives is available. This makes it possible to fully compare alternatives based on their benefits and costs, considering indicators and effects (Simon, 1978). Decisions are based on economic efficiency, where the alternative has the highest value under the lowest costs. In this research, the rational perspective covers both a rational process as well a rational outcome (Kørnøv & Thissen, 2000).

This perspective involves several hypotheses, of which one of the most important one is that action is a choice, where goals and objectives are maximized. Next to that, the problem is clearly defined. The decision maker is able to mitigate uncertainties and there is fully insight in the potential options and alternatives. These alternatives can be objectively ranked and prioritized, based on welfare maximization where the preferred alternative has the lowest costs. This follows that the decision maker acts within the best interests of society.

### 3.2 Organisational perspective

The organisational perspective states that decisions are dependent on fixed procedures and established organisations. Problems are often complex and organisations select alternatives that are satisfying (Simon, 1957). People and organisations interact in order to fulfil their interests and to influence goals (March & Olsen, 1994). Formal and informal institutions, such as rules and laws but also informal norms and habits, influence this interaction between organisations (Polski & Ostrom, 1999).

This perspective involves several premises to understand and explain decision making in practice. First, a government or organisation has several components, of which their power, interests and actions are dependent on the specific goals and objectives this component has. Actions are constrained by laws and procedures such as habits and previous procedures or behaviour but also by the expectations from other organisations or citizens.

### *3.3 Political perspective*

The political perspective states that actions are driven by individuals. Goals and objectives do not agree with the resulting actions or decisions. This perspective assumes that decisions are for example influenced by persuasion power or voting procedures. The outcomes of the decisions are often influenced by conflicts and consensus between individuals (Moscovici & Doise, 1994). The decision is therefore dependent on the perceptions, positions, power and skills of individuals and the game in which the problem arises (Cyert & March, 1963).

This perspective is driven on the following assumptions. First, the government is divided in players, of which each has different perceptions, interests and skills. The preferred alternative is a result of the discussions, compromises, conflicts and confusions between people and this agrees little with the initial interests. There is little focus on a problem, but it rather focuses on the preferred alternative or decision. This often results in a resultant outcome.

## **4. Spatial planning in practice: two case studies**

This section provides information about the exploratory phase, considering the two case studies N65 Vught – Haaren and the InnovA58. These cases are selected, as they are both from the mobility domain. This domain is often politically and urgency driven, which influences the process to work towards a decision. By taking two projects from the mobility domain, it is possible to compare the outcomes of the case studies. Next to that, these two case studies recently finished the exploratory phase. Recent experiences lead to more viable and current information, which is useful for the renewal of the MIRT. In order to consider all relevant aspects and provide a more complete view of the exploratory phase, the cases are analysed and explained using the three perspectives, which are elaborated in section three.

### *4.1 N65 Vught – Haaren*

The area around the highway N65 between Vught and Haaren showed problems in liveability and safety. This highway crosses residential areas, which caused a barrier between these areas and this led to noise nuisances. The goal of the MIRT project N65 Vught – Haaren was to improve the liveability of the surrounding areas by reducing the problems in barrier function and noise (Ministerie van Infrastructuur en Milieu, 2013b). Several organisations participated in the exploratory phase. The Ministry of Infrastructure and Environment (I&E) initiated the MIRT project together with the province of Noord-Brabant (as a co-client). Also Rijkswaterstaat Noord-Brabant and the municipalities Vught, Haaren and 's Hertogenbosch were involved in the project. The start decision took place in May 2013. Even before 2013, there has been a long history of initiating and prioritising the problems in the surrounding of the N65. The exploratory phase resulted in a preferred decision in June 2016. The initial budget was €100 million, but resulted in a total budget of €107 million, of which €56 million is brought in by the Ministry of I&E and €51 million will be contributed by the region (both province and municipalities) (Ministerie van Infrastructuur en Milieu, 2017).

#### *4.1.1 From a rational perspective*

The scope of the project is set from Vught to Haaren, which covered 7,7 kilometres of road. The problem analysis identified several indicators that should be improved, such as the liveability (noise, air, traffic safety, barrier problems and possibilities to cross the roads), traffic flow and accessibility. Also nature and spatial quality were considered to be important (Ministerie van Infrastructuur en Milieu, 2013b). Generating alternatives led to the consideration of four alternatives for Vught, this included a tunnel, a deepened road and two versions of parallel roads. However, none of these alternatives turned out to be promising based on their problem solving ability and the involved costs. Nevertheless, it was decided to optimise a deepened road as it scored well on the problem solving ability. Adjustments would lead to lower costs (Ministerie van Infrastructuur en Milieu, 2014b). However, none of the adjusted variants were promising. Using different elements and building blocks within a quick scan led to a new promising alternative (AnteaGroup, 2016). This promising alternative was tested (for a second time) within a cost benefit analysis. This showed that the most promising alternative, derived from the

quick scan, was more positive than the initial alternative (AnteaGroup in: Ministerie van Infrastructuur en Milieu, 2016b). Although this led to improvements of the project alternatives, the rational perspective cannot give a fulfilling answer, as the outcome of the second cost benefit analysis was still negative. This means that the costs are considered higher than the benefits. Next to that, benefits are rather derived from accessibility, than an improvement of liveability. This shows two possible problems. First, the project alternative was not sufficient to solve liveability problems and second, the CBA was insufficient to calculate the effects of improving liveability or spatial quality. It can be concluded that the N65 project was not a project that used public money most efficient and thus would not optimize the welfare of all citizens.

#### *4.1.2 From an organisational perspective*

The project organisation involved organisations that had an interest in executing this project. Both Ministry of I&E and the region financially invested in this project. Not only the province financially contributed, but also the municipalities of Vught and Haaren financed the project. Although this was desirable, this was also unique. It is noted that these individual interests influenced the project, as each organisation wants to derive value for their money (interview 14). The Ministry of I&M wished to spend little money on the project, and was a proponent of the sober alternative (interview 7). The province desired to integrate the road project with their spatial challenges (interview 12). The municipality of Vught was from the beginning proponent of the tunnel or a sunken road (interview 6; interview 14). The limited available budget was leading in the process. In order to meet financial constraints, the desired alternative deviated from the initial wishes and ideas. These adjustments led to an unsatisfying alternative for the municipality of Vught (interview 6; interview 7; interview 14). Expectations between the wishes and the available money were not well managed (interview 14). Next to that, it was considered difficult to apply prescribed methods from the guidelines, as the N65 project rather has regional characteristics, than characteristics that are considered in bottlenecks within national roads (interview 6). Although it is desirable to find the best project alternative for the lowest costs, the municipalities had the primary goal to maximize the liveability for their own residents. This led to a dilemma in interests and behaviour (interview 14). Next to that, as the process of working towards a decision took several years and the uncertainties increased, at some point the decision became more important than the preferred project alternative itself. This preferred alternative was rather the result of consensus between the stakeholders.

#### *4.1.3 From a political perspective*

Individuals and political factors were of high influence within this project. The project started as the problems made it to the national agenda and a resolution was accepted in parliament. This resolution led to financial investments of the Ministry of I&E, to look for sustainable solutions to improve the liveability of the area (Tweede Kamer der Staten-Generaal, 2011). While the ministry was aware that money could be spent more efficiently on other projects, the parliament obliged the minister to make money available for the problems on the N65. This project would not have been started if there was no resolution or political lobby from the region (interview 6; interview 7). It is noted that this led a continuous lobby from the region to get more money available or to choose for the most expensive alternative, as this brought money into the region (interview 7). As the budget allocation to one municipality led to less money for the other municipality, this led to continuous discussions between the two municipalities (interview 7; interview 12). Although the province of Noord-Brabant defined spatial challenges (interview 12), this project focuses on infrastructure adjustments (interview 6; interview 7; interview 12) where it was difficult to add spatial elements (interview 14; interview 17). As the project alternatives were unsatisfying, a resolution of the council of Vught led to a reconsideration of the project alternatives. The municipality desired to maintain as much crossings as possible and keep most connections to the N65 (van Woosik, du Maine, Cordes, & Kraamer, 2015). The council and the residents of Vught still advocated for a deepened road and the preferred alternative leaves this option still open (interview 7; interview 14). These preferences did not fit within the budget. The project was able to continue, as the province was able to make money available when a new representative of the province took a seat in the committee (interview 12).

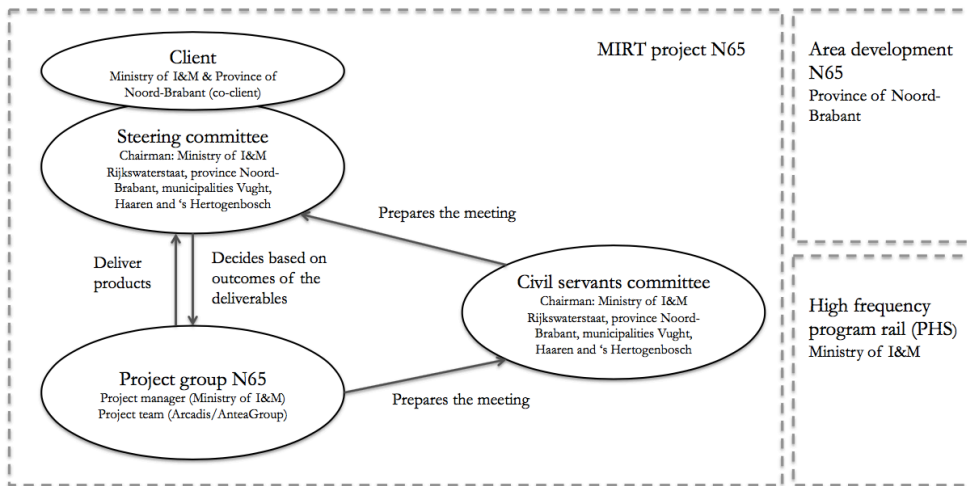


Figure 1: Project organisation of N65 Vught-Haaren

#### 4.2 InnovA58

The A58 is a highway that connects the northern regions to the south and the western regions to the east. It is likely that high economic growth will lead to capacity problems and exceeding travel times. Next to that, traffic jams of freight will have a negative influence on traffic flow and traffic safety. This results to two projects. First, the trajectory Sint Annabosch – Galder is considered (Ministerie van Verkeer en Waterstaat, 2010). Later on, the Eindhoven – Tilburg trajectory is also added as a bottleneck is expected (Ministerie van Infrastructuur en Milieu, 2013a). These two projects were combined into the InnovA58 where innovations would pre-finance the earlier start of the projects. The preferred decision was made in 2016. The budget is €401 million, including €10 million for a living lab.

##### 4.2.1 From a rational perspective

The problems and bottlenecks on the A58 were defined based on the traffic models. The desired speed and travel times on the two trajectories were insufficient. This led to the desire to shorten the travel times. Next to travel improvements, effects such as traffic safety, air quality, noise and nature should be considered. Last, it (social) benefits should have been higher than the costs (Ministerie van Infrastructuur en Milieu, 2013a; Ministerie van Verkeer en Waterstaat, 2010). This led to several alternatives such as a full lane, a peak hour lane, a plus lane or a lane for freight. Separation of traffic flows was considered in four variants in parallel structures and hybrid solutions. Additionally, a capacity expansion of two times four lanes was considered. The cost benefit analysis outcomes of the two times three lanes and the peak hour lane were positive. The two times three lanes showed to be most robust and effective. This gave a more positive balance than the peak hour lane (Albers & Mangelsdorf, 2015a). Also for the trajectory Sint Annabosch – Galder, the two times three lanes turned out to be most promising (Albers & Mangelsdorf, 2015b). However, only two alternatives were considered, other outcomes, such as a more sober alternative, might have led to a higher benefit cost ratio (Visser & de Lange, 2015). Next to that, it was noted that the scope in the start document influenced the alternatives that could be considered, as the shortened trace procedure prevented the consideration of more extensive alternatives. Last, innovations are not included in the exploratory phase, as there was disagreement about the cost effectiveness of these innovations (interview 15).

##### 4.2.2 From an organisational perspective

Four different organisations were part of the project organisation. The Ministry of I&E initiated the project and came up with the start decisions for both trajectories. The province of Noord-Brabant was considered important, as they would pre-finance the project and they would represent the region (Ministerie van Infrastructuur en Milieu, 2013a; Ministerie van Verkeer en Waterstaat, 2010). As the Foundation A58 published

the bid book and proposed to construct and maintain the road, they were also involved (interview 9; interview 15). Last, Rijkswaterstaat was involved as they operated and maintained the A58. It was considered that all parties were proponent of adding road capacity with asphalt (interview 11). The preferred alternative was already stated in the start decision (Ministerie van Infrastructuur en Milieu, 2013a; Ministerie van Verkeer en Waterstaat, 2010) (interview 9; interview 10; interview 11; interview 12). As municipalities preferred to explore other options, the exploratory phase took a broader perspective by incorporating other variants of capacity expansion (interview 9; interview 11). Difficulties were experienced within the innovative workflows (interview 15). The Foundation A58 did not come up with cost effective innovations (interview 10; interview 11; interview 15) and changes in financing structures would increase risks (interview 9; interview 12).

#### 4.2.3 From a political perspective

The InnovA58 has partly a political cause, as the lobby of the Foundation A58 proposed a bid book to get the trajectory Eindhoven – Tilburg on the agenda (interview 10). Although they did not (financially) contribute, they influenced the preferred alternatives by their opinions and interests. The foundation A58 was responsible for the innovations but they came up with little innovative project alternatives (interview 10; interview 11; interview 12). Innovative companies stepped out of the foundation to participate in the tender and conservative contractors remained in this organisation (interview 10; interview 15). This led to a focus on alternatives considering capacity expansion. Next to that, the preferred alternative was already decided in the start document. The exploratory phase was rather a confirmation of thoughts to justify the desired two times three alternative (interview 9). It is noted that this did not lead to discussions, as the preferred alternative fitted within the available budget and all stakeholders agreed on the initial preferred alternative (interview 9; interview 10). However, it was not possible to come up with innovations to provide money for pre-financing. This project was able to continue, as another project in the region was taken off the agenda (interview 12). A successful lobby from the province kept the money in the region, which led to the allocation of money to the InnovA58 project (interview 10).

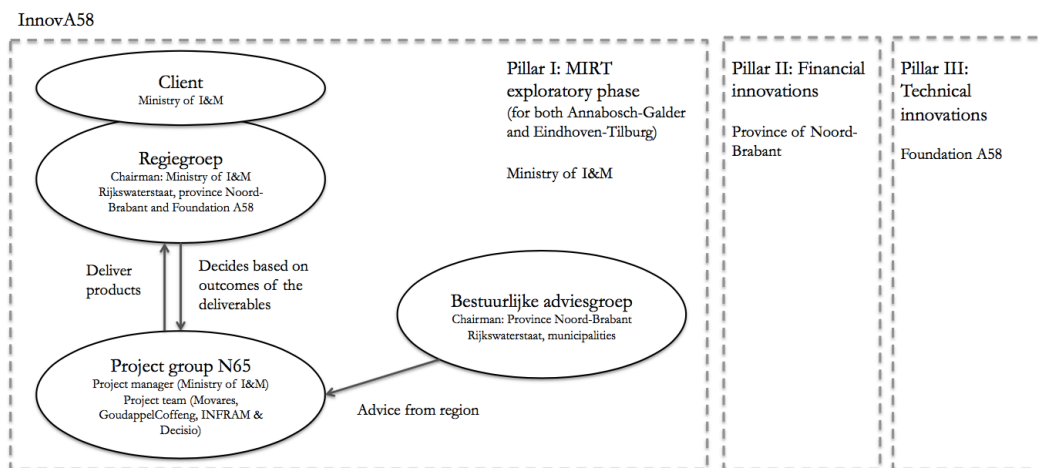


Figure 2: Project organisation of InnovA58

## 5. Decision Support Methods in practice

This section will analyse the use of Decision Support Methods in these two exploratory phases to see how means are currently applied and to see how Decision Support Methods can be of added value in improving the exploratory phase. As shown in section four, the exploratory phases of the N65 Vught – Haaren and the InnovA58 show differences in the outcomes of the cost benefit analysis, the influence of stakeholders and the political context. Both cases apply a cost benefit analysis and a plan MER within their exploratory phase. Furthermore, both case studies contain a value engineering study. As the exploratory phases show differences, this section aims to see if the added value of Decision Support Methods is also different per project.

A Value Engineering study was provided in both projects. For the InnovA58, this was helpful as the municipalities wanted to consider other alternatives, next to the predefined two times three lanes from the start document (interview 9). It was useful in showing the added value of the two times three lanes over the other alternatives, proposed by the municipalities. It is noted that this session was valuable to identify different interests (interview 11). The N65 organised the value engineering session two times. The first session did not lead to promising outcomes, as alternatives were too costly and were insufficient to solve the problems (interview 16). The second session helped to identify building blocks, to optimise the alternative and come up with a variant with lower costs and higher problem solving capacity. For both case studies it was experienced that the people who were involved or who facilitated the session influenced the outcomes of the value engineering session, as their input is often coloured (interview 16; interview 17).

The cost benefit analysis was positive for the InnovA58. This positive outcome helped to ensure the effectiveness of the preferred alternative from the start decision and it helped in justifying the added value of the project (interview 9). It is noted a higher Net Present Value could be possibly achieved when considering a more sober alternative (Visser & de Lange, 2015). Additionally, it was difficult to add innovations in the analysis, as the benefits are often uncertain and unknown (interview 12). For the N65, the outcomes of the cost benefit analyses were negative. The outcomes of the first cost benefit analysis led to adjustments in the alternative. The second cost benefit analysis showed improvements as costs were lower (interview 16). This method helped in adjusting and optimising the alternatives. However, it was noted at the beginning that the outcome of the cost benefit analysis of this project was expected to be negative. This shows two potential problems. First, it was difficult to incorporate aspects on liveability in the CBA and second, the infrastructure alternative did not solve the experienced problems in liveability. The benefits were only obtained from improvements of accessibility, while this was not the initial goal of the project.

## **6. Conclusion and recommendation**

It is possible to derive several conclusions from the interviews and the analysis of the exploratory phases. This section provides an answer on the research questions “How does the MIRT exploratory phase take place?” and “How are Decision Support Methods currently applied in the exploratory phase?”, while also considering the differences and similarities between the two case studies. This section includes recommendations for practitioners and recommendations for further scientific research.

The first conclusion is that these two case studies show differences in their exploratory phases. Where the exploratory phase of the InnovA58 did not encounter many problems, the exploratory phase of the N65 Vught – Haaren was extensive and showed difficulties in coming up with a preferred project alternative. These differences are assigned by several factors, such as the scope of the projects, the feasibility of the predefined and desired project alternatives and the urgency and necessity of the project. But also the attitudes of the stakeholders, the budget allocation and the (political) cause of the project are of influence on the success of the exploratory phase.

Another interesting conclusion is that the outcomes of Decision Support Methods and the motive of why using the Decision Support Methods is different per case. Although both cases used the same Decision Support Methods in the same phase in the exploratory phase, their effects are different. The InnovA58 applied Decision Support Methods to have stakeholders on board and to justify the initial preferred alternative. The N65 Vught – Haaren case used Decision Support Methods fundamentally to adjust and improve the alternatives. This shows that the added value of the method depends on the situation in which the method is applied.

The three perspectives were considered useful to gain a systematic overview of the different characteristics of the exploratory phase, using only one perspective would have led to a narrow and incomplete analysis of the process. When improving the exploratory phase according to the renewal of the MIRT, it is important to consider these factors and acknowledge the different realities that exist. Especially the organisational and political perspective can help in stakeholder management and the increased complexity and political trade-offs when considering other modalities.

This research shows several limitations, especially concerning the insights retrieved from the political component. It was difficult to provide full and complete insights in the political aspects, as only civil servants were



interviewed. Next to that, people are often reluctant to open up about their strategic behaviour and political influences, which leads to so-called irrational behaviour. The interviews were useful in bringing up this information, however it takes time, effort and trust to make these experiences explicit.

For further research, it would be useful to come up with a process design with the aim to improve the exploratory phase. It is recommended to make a first step in analysing how an exploratory phase takes place under the renewal of the MIRT. From a more practical view, it will be useful for practitioners to see how the interventions from the renewal (such as adaptive planning and flexibility in budget allocation) will influence the behaviour of stakeholders. In addition to that, this research gave a start in identifying the diversity of MIRT exploratory phases. It would be interesting for practice to further analyse the driving forces behind a 'successful' and 'unsuccessful' exploratory phase.

From a scientific point of view, it would be possible to compare the decision making process in infrastructural planning with other public domains, where high costs, long term planning and stakeholder involvement are of high influence on the success of the process. A last recommendation for further research is to analyse the added value of Decision Support Methods from literature. Currently, the added values are derived from practical experiences. It would be interesting to see how research considers the added value of Decision Support Methods and how this agrees with practice.

## References

- Albaek, E. (1996). Why All This Evaluation? Theoretical Notes and Empirical Observations on the Functions and Growth of Evaluation, with Denmark as an Illustrative Case. *The Canadian Journal of Program Evaluation/La Revue Canadienne D'évaluation de Programme*, 11(2), 1–34.
- Albers, N., & Mangelsdorf, B. (2015a). *MIRT Verkenning A58 Eindhoven - Tilburg*.
- Albers, N., & Mangelsdorf, B. (2015b). *MIRT Verkenning A58 Sint Annabosch - Galder*.
- Allison, G. T. (1971). *Essence of Decision, Explaining the Cuban Missile Crisis*. Boston: Little, Brown and Company.
- AnteaGroup. (2016). *Notitie Voorkeursalternatief MIRT-Verkenning N65 Vught - Haaren*.
- Charmaz, K. (2006). *Constructing Grounded Theory*. London: SAGE Publications.
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3–21.
- Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice Hall.
- Flyvbjerg, B. (2003). Rationality and Power. *Readings in Planning Theory*, 318–329.
- Goulet, D. (1986). Three rationalities in development decision-making. *World Development*, 14(2), 301–317.
- Kørnøv, L., & Thissen, W. a. H. (2000). Rationality in decision- and policy-making: implications for strategic environmental assessment. *Impact Assessment and Project Appraisal*, 18(3), 191–200.
- March, J. G., & Olsen, J. P. (1994). Institutional Perspectives on Governance. In *Systemrationalität und Partialinteresse* (pp. 249–270). Baden-Baden, Germany: Nomos.
- Ministerie van Infrastructuur en Milieu. (2013a). *Startbeslissing MIRT-verkenning A58 Eindhoven - Tilburg*.
- Ministerie van Infrastructuur en Milieu. (2013b). *Startbeslissing MIRT Verkenning N65 Vught - Haaren*.
- Ministerie van Infrastructuur en Milieu. (2014a). *MIRT 3.0: Wenkend perspectief voor de vernieuwing van het MIRT*.
- Ministerie van Infrastructuur en Milieu. (2014b). *Notitie Kansrijke Alternatieven MIRT Verkenning N65 Vught - Haaren*.
- Ministerie van Infrastructuur en Milieu. (2014c). *Vernieuwing MIRT in één oogopslag*.
- Ministerie van Infrastructuur en Milieu. (2016a). *Aanbieding kabinetsreactie IBO Flexibiliteit in Infrastructurele Planning*.
- Ministerie van Infrastructuur en Milieu. (2016b). *MIRT-Verkenning N65 Vught – Haaren*.
- Ministerie van Infrastructuur en Milieu. (2017). *MIRT Overzicht 2017*.
- Ministerie van Verkeer en Waterstaat. (2010). *Startbeslissing MIRT-verkenning voor de A58 knooppunt Sint Annabosch - Galder*.
- Moscovici, S., & Doise, W. (1994). *Conflict and Consensus: A General Theory of Collective Decisions*. London: Sage.
- Mu, R. (2013). *Transit-Oriented Development in China*. Technische Universiteit Delft.

- Oudshoorn, F. C. (2017). *Decision support methods within spatial planning projects*.
- Polski, M. M., & Ostrom, E. (1999). An Institutional Framework for Policy Analysis and Design by. *Development, Workshop i*, 49.
- Powell, R. A., & Buede, D. M. (2009). *The project manager's guide to making successful decisions*. Vienna, VA: ManagementConcepts.
- RoyalHaskoningDHV. (2014). *Nieuwe verhoudingen, veranderde patronen*.
- Simon, H. A. (1957). *Models of Man: Social and Rational*. *Journal of Philosophy*. New York: John Wiley & Sons.
- Simon, H. A. (1978). Rational Decision-Making in Business Organizations. *The American Economic Review*, 493–513.
- Snellen, I. (2002). Conciliation of Rationalities: The Essence of Public Administration. *Administrative Theory & Praxis*, 24(2), 323–346.
- Steunenberg, B., & van Vught, F. (1997). *Political Institutions and Public Policy: Perspectives on European Decision Making*. Dordrecht: Springer Science+Business Media.
- Tweede Kamer der Staten-Generaal. (2011). *Vaststelling van de begrotingsstaat van het Infrastructuurfonds voor het jaar 2011*.
- van Woesik, G., du Maine, M., Cordes, B., & Kraamer, W. (2015). Motie raadsvergadering 2 december 2015 - Voorkeursvariant N65.
- Visser, J., & de Lange, M. (2015). *Second opinion MKBA A58 Sint Annabosch – Galder en MKBA Tilburg – Eindhoven*.