

CHALMERS



Enhancing collaboration in infrastructure projects

- Three railway construction cases

*Master of Science Thesis in the Master Degree Programme Design and Construction
Project Management*

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Göteborg, Sweden 2010
Report No. E 2010:082

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Printed by Chalmers Reproservice

Göteborg, Sweden 2010

Preface

This Master's thesis has been carried out during February 2010 to June 2010 at the Swedish Transport Administration. The major aim of our thesis has been to investigate how the model of Extended Cooperation is implemented and what differences that exist between the investigated projects.

During this study we have learned a lot about this model and how partnering can be carried out in construction. We believe that the model of Extended Cooperation and partnering within the construction industry will have big impact on the way of working in the future. We also believe that the knowledge gained during our study will benefit our future careers.

In this Master's thesis Meysam Cordi has mainly been responsible for the theoretical frame whilst Mathias Petersson has been responsible for the empirical part. The discussion and the conclusion chapters have been jointly elaborated.

We would like to thank our supervisor Anna Kadefors at Chalmers University of Technology for her guidance and support throughout this thesis. We want to give a particular gratitude to our supervisor Stefan Paterisson at the Swedish Transport Administration for his help and feedback on our thesis.

Finally we would like to thank all involved respondents who shared their experiences and opinions. This has given us a professional insight into the way of working in accordance with Extended Cooperation.

Thanks all!

June 2010, Gothenburg

Meysam Cordi

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Abstract

Large infrastructure projects are characterized by a great number of companies working together in order to finalize project goals. The complexity of work and large capital investments in these projects creates challenges. Disputes, conservative attitudes and low productivity are not unusual. Cost and time overruns, deriving from poor collaboration can put projects in severe distress. Good collaboration and communication is thus crucial in large infrastructure projects. In recent years different approaches have been carried out to achieve better collaboration in the industry.

In this study, a collaboration model called Extended Cooperation used by the Swedish Transport Administration has been investigated. The aim of this study has been threefold: first, to study how the model is implemented and what differences that exist in the field of application, second, what are the involved actors' experiences towards working in accordance with this model and, finally, what can be done in order to improve implementation of this model? Three major railway projects in Sweden have been included in the qualitative study. Interviews with key representatives from client, contractor and consultant have been conducted.

Differences exist in implementation of the model, for example the extent of adaption to different projects. This can however be seen as a sign of that the model should be adapted to each project and its characteristics. The study shows that the majority of respondents were positive towards working in accordance to the investigated collaboration model. Moreover, this study concludes that key actors have to be involved early in the project stage and that continuous effort to support joint collaboration is needed all the way through projects.

Key words: Railway contracts, Collaboration, Partnering, Procurement, Pricing

Sammanfattning

Stora infrastrukturprojekt kännetecknas av stort antal företag som arbetar tillsammans för att uppnå projektmål. Komplexiteten i arbetet och de stora kapitalinvesteringar som görs i dessa projekt kan ibland skapa stora utmaningar. Tvister, konservativa attityder och låg produktivitet är inte ovanliga. Kostnads- och tidsöverskridanden, som följer av dåligt samarbete kan sätta projekt i svårigheter. Bra samarbete och kommunikation är därför viktigt i stora infrastrukturprojekt, och under senare år har olika strategier utvecklats för att uppnå bättre samarbete i branschen.

I denna studie har en samarbetsmodell, Utökad Samverkan, som används av Trafikverket undersökts. Syftet med denna studie har varit tredelat: dels att studera hur modellen har använts och vilka skillnader som existerar inom området, vilka de inblandade aktörernas erfarenheter är med att arbeta enligt denna modell, och slutligen vad som kan göras för att förbättra genomförandet och användningen av denna modell. Tre stora järnvägsprojekt i Sverige har ingått i den kvalitativa studien. Intervjuer med viktiga representanter från beställaren, entreprenören och konsulten har genomförts.

Skillnader i genomförande och användning av modellen existerar, exempelvis anpassningsgraden mellan projekten. Detta kan dock ses som ett tecken på att modellen bör anpassas till varje projekt och dess egenskaper. Studien visar även att majoriteten av de tillfrågade var positiva till att arbeta enligt den undersökta samarbetsmodellen. Vidare visar studien att nyckelaktörer måste involveras tidigt i planeringsstadiet och att fortsatta ansträngningar rörande gemensamt samarbete behövs hela vägen genom ett projekts genomförande.

Nyckelord: Järnvägsentreprenader, Samarbete, Partnering, Upphandling, Prissättning

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1 Introduction

This chapter will provide an introduction to the topic by highlighting some of the challenges and obstacles that have been frequently acknowledged in construction projects. Furthermore a historical overview of the concept of partnering is provided giving the background of partnering in the UK, in view of the fact that the model has had great impact in the UK construction industry. Moreover a brief description of the efforts done by the Swedish construction industry is introduced. Further, the problem description is presented in order to develop an understanding of our aim and research questions.

1.1 Background

The construction industry has historically been dominated by adversarial relationships and conservative attitudes, which must be considered as one of the major obstacles for achieving success in construction projects (Chan et al., 2006). Cost and time overruns, low productivity and conflicts are not unusual in large construction projects. The nature of construction, i.e. fragmented and project based organisations combined with highly competitive climate is described by many researchers as problematic. Short-term relations with focus on short-term profits have been mentioned as root to the problem (Ng et al., 2002; Eriksson et al., 2008). Traditional client-contractor mentality that relies on lowest bid strategy has been questioned and pointed out as a cause of hinder to create successful relationships (Cheung et al., 2003). In Sweden dissatisfaction especially among contractors seems to be a problematic issue, at the same time clients have been reluctant to move away from traditional ways of working (Bröchner et al., 2002).

Looking back at previous infrastructure projects in Sweden it is easy to recognize a certain pattern with a clearly divided responsibility of tasks and risks between involved actors. A process where different functions in construction projects are lined up sequentially has typically been the traditional way of working. This has resulted in reduced possibility of collaborative interaction and knowledge sharing between involved actors throughout the different stages of a construction project (Utökad Samverkan, 2006). However, until recent years, there have been few formal initiatives to increase the cooperation in Swedish projects (Kadefors, 2002).

1.2 Partnering in the UK

In several other countries, notably the UK, government has been more active in promoting change in the construction industry. In the early 1990s, cost overruns, programme delays and poor productivity were perceived as increasingly problematic Dainty et al., (2001). In order to improve the situation, the British construction minister Tony Baldry and representatives from the construction industry initiated a review of the industry. The result was presented in a report year 1994, by Sir Michael Latham, a former Member of Parliament with experience in the construction industry. In his work, "Constructing the Team", Latham stated that the fragmented nature of the industry was a major cause to poor communication. Better collaboration and coordination of work was thus needed in order to make the construction process more efficient (Aouad et al., 2000). Latham also emphasized that the industry have to move

focus from the lowest tender approach and instead base the choice of contractors on soft parameters such as long term relationships, skills and previous performance. “Constructing the Team”, became the first government commissioned report in the UK (Holt et al., 1995).

Another important initiative was taken at the end of the 90s, this time by the Deputy Prime Minister, John Prescott, who set up the “Construction Task Force” which was a work group consisting of major constructors who got the task of reviewing the UK construction industry. The work group got the assignment to find solutions that could improve quality and efficiency in UK construction. Sir John Egan, the chairman of the Construction Task Force, presented the final result in a report with the name “Rethinking Construction”. Building on Latham’s former suggestions of improving the sector, several recommendations were made (Aouad et al., 2000). Among others, five key drivers of change were identified, which were meant to set the agenda for the UK construction sector.

Firstly, the management should believe in and become fully committed to drive forward an agenda for required changes throughout the entire organisation. Focusing on the customers’ needs and providing exactly what the end customer required became the second key driver. This meant that all non value adding activities were to be considered as waste and eliminated. In order to deliver maximum value to the customer, integration of the process and involvement of the team around the product was considered necessary to reduce the fragmented organisation. The agenda also promoted quality improvement issues, which meant total quality thinking where design, materials and the execution were accurate, completed on time and at the right price. Respect and understanding for other participants in the process were also advocated (Egan, 1998).

According to Egan (1998), trust and mutual interdependence had to be built up in order to reduce adversarial attitudes and the traditional blame culture. Commitment to people was therefore stated as an important prerequisite. Furthermore, within the focus for integrated processes and teams, four key elements were acknowledged: partnering, product development, project implementation and production of components were all highly advocated. Rethinking Construction proposed the creation of a movement for change in the construction industry. The movement would function as a network where members could exchange ideas and experiences, in order to increase efficiency and quality. The key message of this report in sum was that the industry and its clients have to jointly and continuously collaborate for better performance (Egan, 1998).

Bresnen & Marshall (2000) declares partnering in UK construction as a relatively well established approach to contracting. Adopting partnering has been a great effort to overcome many of the problems characterized with the construction sector (Barlow & Jashapara, 1998). The reason for partnering having gained such a great recognition during the 90s is according to Naoum (2003), the British Government’s strong support to radical changes in the way of performing in the UK construction industry.

1.3 Partnering in Sweden

The Swedish construction industry has, as well as in the UK, been criticized for conservatism and inflexibility. The public initiatives to develop and spread the concept have not been as powerful as in other countries such as the UK and Denmark (Kadefors, 2002). According to Kadefors (2002), the reason for the relatively low interest in Sweden has been the way of performing, where the collaboration between involved actors has typically been informal and based on personal relations. Conflicts are often solved at operational level and seldom brought to legal mediations (Bröchner et al., 2002).

In 2003, however, a construction forum for civil works was created by initiative of the Swedish Transport Administration and some other key actors consisting of government sector clients with knowledge of partnering within the Swedish construction sector. The purpose of FIA, *Förnyelse i anläggningsbranschen*, which is the name of the forum, has been to encourage Swedish construction companies to jointly strive for renewal in the civil engineering works sector. Focus has been on increasing efficiency in order to achieve higher quality, lower costs and higher profits. Enhanced interaction and collaboration between different actors has been suggested as an approach to reduce adversarial relationships and conservatism. Better incentives for research and development within the industry are another important subject brought up by FIA. Experiences and knowledge from previous projects must also be retained in an appropriate way. Therefore better and more efficient knowledge management is recommended. FIA also has stated that the image of the industry must be improved in order to attract people for the future (FIA, 2010).

FIA presented a Swedish model for partnering, with the name “Extended Cooperation” in 2006. The EC model is meant to function as a tool for efficient collaboration and has been adapted to Swedish laws and regulations. Three levels of cooperation have been declared in EC, which will be described further in section 4.1 – 4.3. (Utökad Samverkan, 2006).

1.4 Aim and research questions

The Swedish Transport Administration has been working with EC since 2006. However, even though work has been performed in accordance with the model of EC within numerous major infrastructure projects in the recent years, there is little information about experiences from using this model. The knowledge of how EC is implemented and differences in the field of application is hence insufficient.

The purposes of this study are to examine how the model is applied in railway projects, actors' experiences and attitudes towards working according to EC, and suggest improvements.

The issues in focus are communication, relationship building, reimbursement principles and decision-making routines. The intention is also to suggest recommendations for improvements of current working model, which can be used by the Swedish Transport Administration in the future.

To fulfil the aims of this study, the following research questions have been formulated:

1. How has the Extended Cooperation model been implemented in projects and what differences exists in the field of application?
2. What are the involved actors' experiences towards working according to the Extended Cooperation model?
3. What can be done in order to improve the implementation of the model?

Three railway projects have been selected for the study, which is based on project documents and interviews.

2 Partnering

Partnering has in the literature been characterized as a complex and complicated concept, consisting of several different aspects. However, some key features can be determined from previous studies (Barlow & Jashapara, 1998; Beach et al., 2005; Cheung et al., 2003; Nyström, 2005). When reviewing literature, there appears to be more similarities than differences when it comes to the definition of partnering (Naoum, 2003).

Workshops, teambuilding, an agreed method of problem resolution and an active search for continuous measurable improvements have been defined as typical characteristic tools in partnering (Nyström, 2005). Partnering is also defined by several researchers as a framework for establishment of common objectives (Bennet & Jayes, 1995).

In general, partnering involves a dedication by organizations to work together and intimately cooperate in order to achieve common business objectives (Bresnen & Marshall, 2000). Partnering is, in essence, an extended method of cooperation strengthening the relationship between client and the involved actors (Fernström, 2003). Partnering is not a contractual tool, but an attempt to bring involved actors together through mutual commitment and open communication (Cheung et al., 2003). According to Winch (2006), partnering is a formal arrangement between at least two members of the project coalition in order to achieve project goals.

2.1 Critical success factors for partnering

Critical success factors in partnering have been investigated by several researchers and their overall view can be considered to be rather uniform. General prerequisites such as top management support and appropriate resources are identified as bases of success, whilst continuous improvement and development are stated as main goals. Mutual trust between the involved parties, early implementation of the partnering procedure and commitment to win-win attitude are defined by Chan et al (2006) as top three decisive factors.

Potential barriers and obstacles when implementing partnering can have different sources. Conservatism, inflexibility and lack of managerial learning are some factors in the cultural category. In construction these factors, combined with adversarial relations, constitute major barriers to partnering. Nevertheless, there exists a consensus among different management researchers about what a successful partnering should be based on (Naoum, 2003). The following section deals with the critical success factors commonly identified in the literature reviewed.

The importance of trust

Trusting the project team in construction is a central part of partnering. Building trust and maintaining a good relationship is not always a simple task. Inexperienced actors often fail to maintain good relationship all the way through projects. The complexity and fragmentation of construction projects are mentioned as roots to the problem (Kadefors, 2004; Barlow & Jashapara, 1998). Bresnen (2007) claims that achieving and maintaining trust within and between organisations is complex and multifaceted.

Furthermore, he states that trust does not always ensure control and success, and that trust is fragile and can easily turn into distrust. In temporary, single project organisations the opportunity of creating deep trust is limited.

Comprehensive monitoring of contractors and particularized contracts supports a culture of distrust. This is identified as a cause to opportunism and hinder to cooperative interaction between involved actors. Enhancing project performance requires high level of trust, it is however important to create trust early in the relationship. This can be done with good and open communication (Kadefors, 2004). Furthermore, creating a “win-win” relationship where everyone strives in the same direction requires trust and teamwork. Fully committed participants have a big impact on whether solid trust can be built in a partnering project, and hence if it becomes successful or a failure (Eriksson et al., 2008).

The importance of committed leadership

Committed leadership is about management believing in and being fully committed to drive forward an agenda that has been agreed upon (Egan, 1998). Full commitment is essential when implementing change. Lack of management support often leads to failure in the implementation (Price & Chahal, 2006). Eriksson and Nilsson (2008) have discussed the issue of low commitment of partners and identified it as a barrier to partnering. Ng et al. (2002), argue that the unwillingness of the client to fully commit to partnering agreements is a major reason for ineffective project partnering.

According to FIA (2006), management has to support and commit to the implementation of different stages in the partnering process. Conditions for collaboration and mutual goal achievements have to be created. Furthermore, it is declared in FIA (2006) that the management must engage and motivate involved people in order to optimize the process.

The importance of open and honest communication

The most significant problem in construction industry is communication (Weippert & Kajewski, 2002). Cheung et al. (2003) have stated that open and honest communication is rare. Kadefors (2004) found team building processes and project-wide communication as very important. Having open and honest communication is hence crucial, especially in the early phases of a project. Furthermore, Kadefors declares that good communication influences the participants' behaviour and facilitates trust-based collaboration. The importance of open communication is also pointed out by Barlow & Jashapara (1998), who state that it enhances the learning process.

The role of workshops and teambuilding

Shared goals are seen as crucial in successful partnering arrangements. A common approach to achieve this is through partnering workshops. Workshops can promote and ensure that the concept of partnering is fully understood. These kinds of workshops often take place at the beginning of a project and hence allow the team to identify their shared objectives early in the project lifetime (Swan & Khalfan, 2007).

Fernström (2003) has pointed out the importance of workshops and teambuilding. He argues that in most cases, participants in a new project organization are unfamiliar with each other and that there is a need for teambuilding activities. Ng et al. (2002) mentioned preparation and education as important, since involved actors must understand what partnering is and how to apply the way of working. The use of facilitators in teambuilding often eases the learning process of the concept (Chan et al. 2006). Swan & Khalfan (2007) have found out that the group size should not be larger than approximately 30 members. As a consequence, workshop attendees must be selected carefully, i.e. only key actors should be included.

Creating financial incentives

The findings of Kadefors (2005) highlight fairness in the procurement process. She maintains that, when striving for interaction in construction projects, fair pricing can serve to reduce risks and enhance collaboration. The recommendation is to use reimbursable contracts and shift focus from price aspects. Furthermore, Kadefors declares that competence and attitudes of the contractor has to be considered. This is in line with one of the key features in the Egan report (1998), where it has been recommended that clients and the construction industry should rely less on competitive tendering. Naoum (2003) states that incentives can be used to motivate the team in order to focus on completion time rather than cost. Target cost contracts with incentive fee, which basically involves an agreed target cost where the desired profit margin is subtracted and any over-run or under-run is shared, has been advocated by Naoum. According to FIA (2006), pricing is a crucial driver. Target costs with gain share/pain share contracts are recommended, since this form of contracts provides openness in the economy. Hence real efforts can be measured and evaluated by the client.

Importance of contractor selection

Selecting the contractor is one of the most important decisions that have to be made by the client. The outcome of the project relies heavily on this initial decision (Singh & Tiong, 2006). Holt et al. (1995) have pointed out that in comparison to other industries, construction clients choose suppliers long before they know what value for money they will receive, and i.e. it is hard to change the outcome once the contract is signed.

In partnering projects, the contractor is in general involved at an earlier stage than in traditional projects. Here, the contractor typically participates in the design process and has as a consequence major influence on the project from the beginning. It is therefore of great importance that the organizational cultures are compatible. The contractor's ability to participate in and manage the partnering process is something that the client ought to consider in the procurement. Qualities like commitment, trustworthiness, openness, and good communication skills are highly valued. Partnering does thus involve new features that are not included in traditional contractor procurement (Kadefors et al., 2007).

2.2 Pros and cons of entering partnerships

In reviewing the partnering literature, positive and negative features of partnering can be distinguished. There is however a tendency within this literature to concentrate on the success factors (Bresnen & Marshall, 2000).

Benefits of partnering have been discussed in many journals and articles. In a literature review made by Beach et al. (2005), a large number of intangible benefits of partnering have been found. Increased willingness to share risks, reduced exposure to project risks, improved co-operation, less adversarial relationships, better team spirit, more effective communication, improved learning, improved employee skills, improved employee motivation, improved overall company competitiveness and increased customer satisfaction, are some of the intangible benefits identified in the literature. Chan et al. (2006) have pointed out three major benefits: Improved relationship between involved parties, enhanced communication and better productivity. Alderman and Ivory (2007) adds enhanced learning to the list, arguing that closely interacting firms, which have high levels of trust as an operative foundation, will learn more easily and solve problems more effectively. Reduction of conflicts and disputes when interacting closely also has big influence on the project outcome since these often require large amount of resources. Good communication is a prerequisite for long-term relationships which, in turn, are crucial to fulfil jointly agreed goals (Chan et al., 2006).

Latham (1994) has stated that a reduction of approximately 30% in capital costs is achievable. However, according to Naoum (2003), it appears to be complicated to benchmark performance in partnering. The reason is the unclearness about how the benchmarking should be established.

Ng et al., (2002), have highlighted some of the problematic issues with partnering and found that project partnering is not always successful. Involved parties' unwillingness to fully commit to the partnering agreements has been pointed out as the major reason for failure. Other observations have been that lack of continuous open and honest communication may decrease the ability to solve problems efficiently. Lack of training and leadership are also mentioned as problematic issues, since without appropriate information and directives, people will never fully commit to the agreements. Long-term relationships based on mutual trust, mutually agreed objectives, agreed dispute resolution procedures and continuous improvement are some of the factors that have to exist in order to create a successful partnership (Naoum, 2003).

2.3 Implementing change in organizations

Organizations within all fields need to change and constantly improve. Numerous challenges have to successfully be dealt with if they are to remain competitive (Price & Chahal, 2006). New technology, globalization, changing social and political climates, new competitive threats, shifting economic conditions, industry consolidation and change in customer preferences are some of the potential challenges facing contemporary organizations (Hughes et al., 2009).

Implementing change successfully is a complex process. Poor communication and tendency to resistance are main reasons for failure when implementing change in

large organizations. Effective, open and honest communication is therefore highly required (Price & Chahal, 2006; Kline, 2007). Most people seem to resist the process of change, even though the benefits are desirable (Kline, 2007). A study done by Bovey and Hede (2001) has shown that anxiety of the unknown increases during major organizational change. Defence mechanisms are activated and an unconscious resistance to change is often created.

The process of change takes time therefore is long-term planning an appropriate time perspective when managing change (Clegg et al., 2005). The process of change can be divided into three phases. The initial phase starts with awareness of the need for change. Reasons for change usually originate from internal or external pressures (Price & Chahal, 2006). External pressures that affect the organization can derive from client expectations and requirements, but also from the society, e.g. concerns about the environmental impact, etcetera. Internal pressures often originate from norms, values and attitudes within the company. The perception of whether the atmosphere is friendly or hostile highly affects the working climate. The reaction from employees does however differ with the power structure of the organization. Power oriented structures allow little space for the individual worker to participate in decision taking. The individual have to a high extent conform to rules and procedures that are decided by the management i.e. top down leadership style. In a people oriented leadership style i.e. bottom up approach; workers are encouraged to contribute with ideas and solutions (Fryer, 2004).

The second phase involves planning and designing the organizational change. All problems must according to Fryer (2004), be fully identified and recognized before starting the design and planning stage. Clearly stated and realistic goals that are measurable must be set. This part is crucial since the people that are to implement change in the organization should have agreed on the purpose and scope of the change. When the decided change is fully designed and developed time has to be allocated for the implementation. The last phase will put ideas and thoughts into practice (Fryer, 2004).

2.4 Overview of theory

To sum up, the literature indicates that construction in general has great potential to improve its effectiveness and profitability. Partnering which is an attempt to bring involved actors together has been advocated by many authors (e.g. Chan et al, 2006; Egan, 1998; Naoum, 2003). In order to create good conditions for successful partnering numerous components have been identified. The importance of committed leadership, solid trust between involved partners, and open honest communication are some of the components which facilitate success. Since partnering is a relatively new concept for many actors, it often constitutes change of habits and way of working.

As mentioned in section 1.5, this study focuses on how the Swedish Transport Administration implements the Extended Cooperation model recommended by FIA. Moreover it investigates what experiences involved actors have had towards working in accordance to this model. The theoretical frame in previous sections therefore supports our research questions and findings.

The following section describes method and research strategy chosen for this thesis. The theoretical frame and the defined research questions have been taken into consideration when selecting the method in order to provide a good and reliable base for the findings.

3 Method

In this chapter the selection of research strategy for this Master Thesis is presented. Furthermore, underlying theories and reasons for choosing a case study approach combined with qualitative interviews are accounted for.

3.1 Selection of research strategy

Choosing the appropriate research strategy is of great importance and has a major impact on the study as it is essential for the researcher to have access to relevant information. Factors that highly affect choice of strategy have to be thoroughly considered prior to selection. Research questions are key factors and must hence be decisive. Other factors that are of interest are budget, time available and skills of the researcher (Remenyi et al., 1998).

There are two fundamental research strategies: qualitative and quantitative. Bryman (2008) has discussed the differences between quantitative and qualitative research. According to him quantitative research relies on numbers and hard facts, whilst qualitative research focuses more on words, participants' points of view and attitudes. In quantitative research, the researcher controls the investigation, whereas in qualitative research the view of those being studied is in focus and thus decides the course of the study. The distance between the researcher and the object being studied differs a lot between the two strategies. In the quantitative approach the relationship is vague and impersonal. On the contrary, the qualitative approach allows close involvement between the researcher and the research participants. Qualitative research has also, quite the contrary to quantitative research, been defined by Bryman as free and associated with contextual understanding.

Quantitative methods in general have the advantage of providing the researcher with a wide and representative overview of a phenomenon, whilst qualitative methods have the advantage of providing rich and detailed information about an often specific situation that needs to be scrutinized. Quantitative research methods are also structured and standardized, this is not the case with qualitative methods which are often less structured. The flexibility of the qualitative approach is another important issue which allows the researcher to change the outline of the research during the process (Holme & Solvang, 1997). This view is shared by Olsson and Sörensen (2001), who also point out that the results in qualitative research are based on few objects and many parameters. When seeking for rich and deep data that needs contextual understanding, qualitative research is thus the most appropriate method. The reason is that the nature of the qualitative research provides better exploratory findings i.e. focuses on context and meaning of actions.

This study investigates questions concerning decisions and experiences of different actors in large infrastructure projects, therefore has a qualitative research strategy been chosen. We believe that due to the nature of research questions and the fairly limited amount of time, this strategy has been the best way of gathering and analyzing data. Information from both primary, i.e. interviews with key actors, and secondary sources, i.e. literature review, documents and contracts have been analyzed. This Master thesis directs its results and findings to all actors within the Swedish construction industry, which are working, or will work according to Extended

Cooperation. By emphasizing previous experiences, this study can help to enhance and develop the implementation of EC in the future.

3.2 The case studies

There are several methods of doing social academic research and none can be said to be completely wrong or right. A case study is an empirical investigation that scrutinizes a current phenomenon thoroughly and in its actual context. When selecting the suitable method, three conditions are fundamental. The first one is as mentioned earlier, the form of research questions and the type of answers that reflects the questions. The second condition that is of interest is whether the researcher has control over the outcome of the events being investigated or not, i.e. can the outcome be influenced by doing this research? The third and last condition is if the event is a present-day or a historical happening (Yin, 1994).

This study investigates how the model of EC is being implemented in three different railway projects. The aim is to study what differences that exist in the field of application and moreover, to find out what the involved actors' key experiences towards working with EC are. There is neither room nor opportunities for assessing the outcomes of actions, since projects are all ongoing. Consequently, the case study approach has been chosen as the most suitable method for carrying out this study.

Case studies can be used for establishing reliable and valid facts, and can therefore be considered as an evidence-collection device. The case study does also provide enough rich and detailed information that can add value to the body of knowledge (Remenyi et al., 1998). Further, a study by Remenyi et al. (1998) has shown that case studies can be sorted into two groups. The single case study, which can be considered as a sole experiment, has been described as appropriate when investigating a fairly well grounded theory. The single case approach is usually regarded as risky since not enough sufficient evidence can be presented in qualitative research. Evidence from multiple case studies is more convincing due to the possibility of comparing results.

After considering different ways of carrying out the investigation, the multiple case study approach, including semi-structured interviews with different involved key-actors was selected.

The number of case study projects has in this investigation been limited to three railway projects. The type of case study objects has been chosen in a way that they are rather similar and as a result to a large extent comparable. The selection process of case study projects was carried out by limiting the search for projects to only include railway projects with similar size and where EC was applied. This resulted in three ongoing projects that fitted the description. All the study cases are in the construction phase and hence of interest at the present time. A comprehensive description of each project will be presented in section 5. The case study descriptions have however not been validated by those interviewed.

3.3 Interviews

Although interviews are of verbal nature, which can be subject to the problem of bias and misunderstanding, they are an essential part of case study evidence (Remenyi et al., 1998).

Two main types of interviews have been presented by Bryman, (2008). According to Bryman (2008), doing interviews in qualitative research is the most common way of obtaining new information. He states that unstructured and semi-structured interviews are typically used in qualitative researching and that these two methods are sometimes jointly called qualitative interviews.

In qualitative interviews the focus lies on the respondents' experiences and attitudes and hence not so much on the researcher's views. Consequently the selection of interview object becomes really central. Selecting wrong people for interviews can make the entire enquiry non valid (Holme & Solvang, 1997).

Since the qualitative interview approach is rather unstructured and free, follow-ups and side track questions are highly valued as they give the interviewees' personal points of view. Thus the qualitative approach is flexible and allows rich detailed answers. There are however some differences between totally unstructured and semi-structured interviews. In the unstructured interview, the interviewer often has a list of topics that are to be discussed. During the interview, follow-up questions can be asked if necessary, giving the unstructured interview the characteristics of a conversation. In a semi-structured interview a guide is preferably used. The questions on the list have to be asked during the interview; however the interviewer is free to add new questions of interest during the process (Bryman, 2008).

After having carefully localized and selected three projects, we started to search for appropriate individuals with involvement and knowledge of EC regarding its implementation. We found that suitable interviewees would preferably be involved in the cooperation group or have the process leading role.

The respondents were identified as representatives from the client (Swedish Transport Administration), contractors and consultants in each of the three selected cases. The topic was explained in advance by phone, in order to make sure that these individuals were agreed upon the scope and content of the interviews. During the interviews, which approximately lasted around an hour each, an audio recorder was used. The reason for this was to avoid misunderstandings and to pick up as much information as possible. The interviews have all been semi-structured and therefore rather free and flexible.

The material from the interviews has been processed by firstly, transcribing the material from the interviews, and then sorting it into different areas. The information acquired has furthermore been analysed and has been the basis for the qualitative study, particularly the description of each case study in 5.2-5.4. The interviewees are presented below in table 1.

Actor	Project A	Project B	Project C
Client	Project Manager Process Leader	Ass. Project Manager	Ass. Project Manager
Contractor	Project Manager	Project Manager	Purchasing Manager
Consultant	Head Designer	Head Designer	Head Designer
Other		Process Leader	

Table 1 - Performed Interviews

The interviewees were all very interested and engaged about the topic. In total, eleven interviews were conducted and the answers analyzed thoroughly shortly after completion. Moreover, separate guidelines were used for different projects and for different actors in order to suit the interviewee and its project. Examples of interview guides used are attached in Appendix I.

4 Model for Extended Cooperation

This section describes the model created by FIA. As mentioned previously this is a Swedish model for partnering within the civil works sector called “Extended Cooperation”, here abbreviated as EC. Since this thesis investigates experiences and differences in implementation of this model it is important to understand the foundations of EC. The following section is a translation of essential parts of the original report that was written in 2006 (FIA Sverige, 2006). Thus are all recommendations and views the views of FIA. Initially, structure and different roles in the recommended model are described. Furthermore, the different levels and recommended activities are briefly presented. In the end a pricing method is described, which is recommended by FIA to suit well together with the working model.

4.1 Introduction to Extended Cooperation

The name EC has been chosen in order to stress the combination of compulsory and optional elements used when applying the model, in excess of what is stated in the standard contracts AB and ABT. What level and which stages of Extended Cooperation that is to be used are determined by project characteristics and complexity. EC is especially designed for the Swedish civil engineering works industry and is frequently used by the Swedish Transport Administration. The model is applicable in service, maintenance and construction contracts.

The model is designed in three levels of use, where the first one is compulsory when working according to the model. These levels are added to the traditional cooperation, i.e. start-up meetings, design meetings, and project meetings, which are stated as compulsory in the Swedish standard contracts AB 04, ABT 06 and ABK 96. Figure 1 shows a schematic table of the different levels and elements of the model.

The model is applicable in all types of construction contracts, pricing methods and procurement ways used within the industry. The guide explains that the sooner the designer and/or the contractor are involved in the work of the model, the better are the possibilities of finding improvements and solutions throughout the project time.

In order to achieve the best possible outcome, according to the guide, EC is to be combined with a pricing method and economic incentives. A combination of fixed price and target cost with pain/gain share is recommended. A recommendation for financial set-up created by the same organization standing behind EC is described in section 4.4. According to FIA, this pricing method creates a driving for efficient production and gives realistic possibilities of fulfilling open accounting between parties involved. Here, management and profit can be included in a fixed price, and the production can be procured with a reimbursable principle with a target price and incentives. Simple pricing methods as lump-sum contracts can also be used together with EC but should in that case be complemented with bonuses for added value such as environmental effects, early completion etc. in order to work with the model.

The guide explains that it is important to have in mind that the usage of EC is not a guarantee for creating trust and achieving project goals, instead it provides good guidelines and well tried structures to follow.

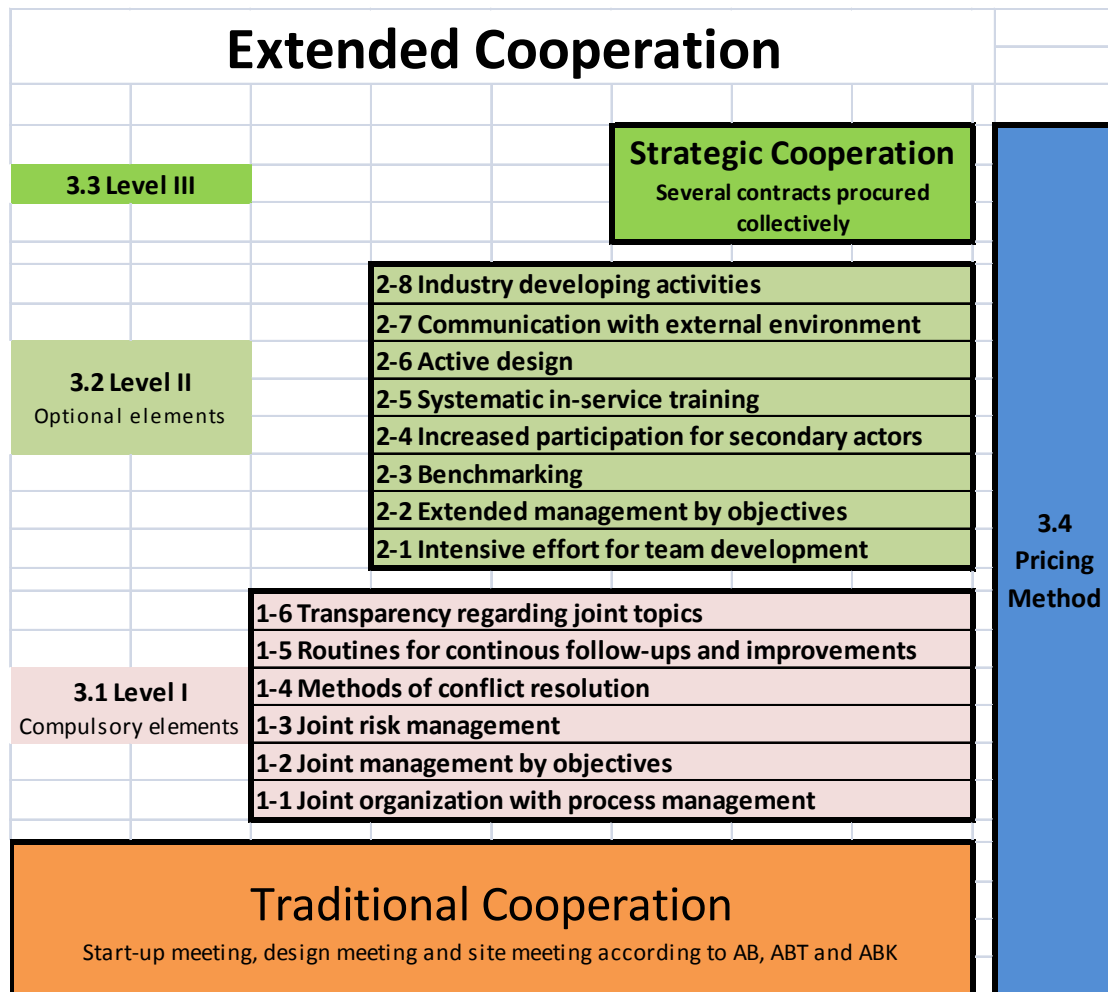


Figure 1 – Levels of Extended Cooperation (FIA, 2006)

4.2 Compulsory - level I

In the following section the elements in level one, illustrated above, are described. These are compulsory when working according to EC. Figure 2 also provides a chart of how the joint organization can be organized.

Important to have in mind is that rules of responsibility are unboundedly applied according to AB 04, ABT 06 and ABK 96, even for contracts or consulting assignments with EC.

Joint organization with process management (1-1)

Extended Cooperation requires all key actors within the project to be committed and accessible in the compulsory and optional elements determined to be included by the client. It is the project management's (steering group's) responsibility to create the proper conditions for this. It implies among others to create suitable conditions for meetings and dialog in order to keep the EC consistent, furthermore the process should be optimized for an efficient implementation. Figure 2 shows an example of how the organization can be developed. The following parts of a joint organization are to be structured according to the model:

Steering group

The role of the steering group's is to deal with questions related to common undertakings in line with an objective document, which should be created by the group at the beginning of the project. In addition their task is to frequently follow up on the project including level of objective fulfilment, implementation of agreed changes in the organization, treat common development questions and handle possible conflicts that have not been able to get solved by the cooperation group. Meetings should be held regularly and frequency is decided according to project requirements. Recommendations are at least one meeting every second month.

Participants in the steering group from the different parties are the legal representatives and project chiefs.

Cooperation group

The main task for the cooperation group is to co-ordinate activities, resources and time schedules and to elaborate and follow up the goal document.

It should suitably consist of the different parties' officers in charge, project chiefs and contract managers. The client, contractor, designer and important sub-contractors should be represented in the cooperation group. The composition is to be adjusted according to the project character. The group's tasks are further described below figure 2.

Process leader

The process leader has a supportive role and should only be linked to the project for Extended Cooperation matters. In small projects, the processing management could be a part of the project manager's job assignment. The process leader should preferably be an independent consult but can in small projects be a part of one of the involved parties' organizations. Tasks are to participate in planning and managing seminars and meetings regarding objective framing, follow-ups, and group development along with participation at information occasions.

Experiences from studied projects when developing the guide for EC show that the demand for the process leader is greatest in the early stages of the project (FIA Sverige, 2006).

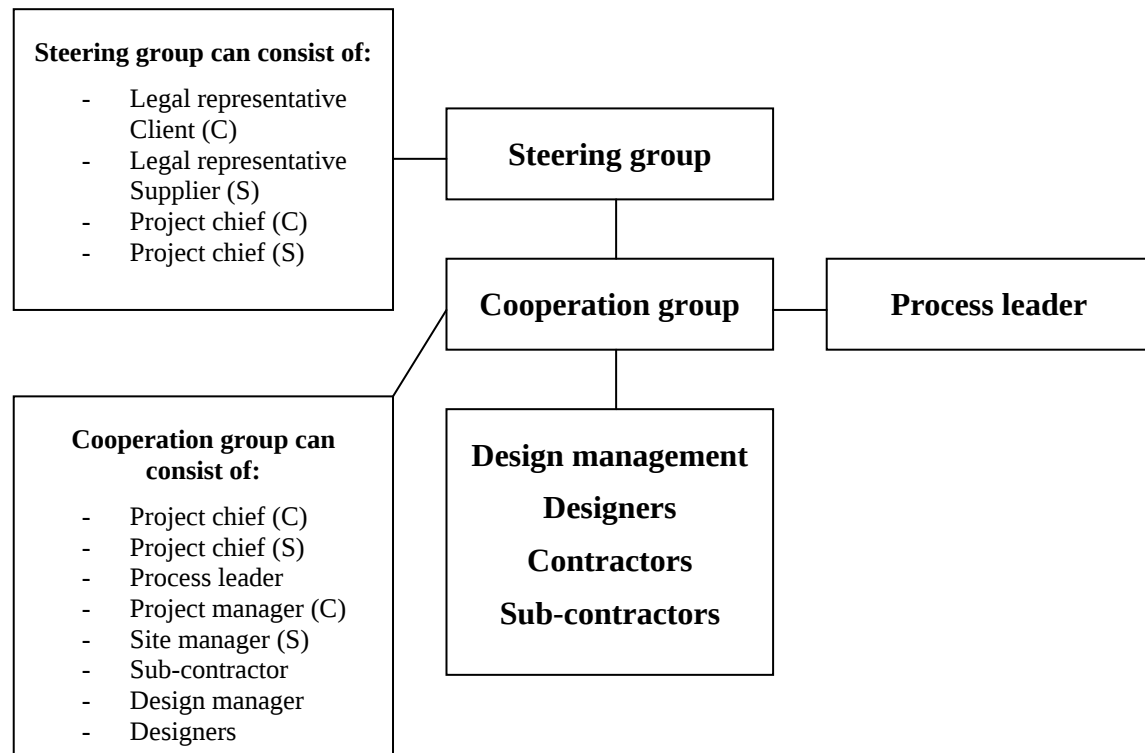


Figure 2 – Example of organization chart for Extended Cooperation

The cooperation group shall according to the model (FIA, 2006) during the initial phase:

Carry out workshops

These are meetings for all involved parties where overall matters are to be treated. These are not meant to be forums for technical or economic discussions on detailed level, but meetings for dialogs concerning e.g. common goals, management, working environment, work processes, cooperation, relations and communication. At the initial meetings, common goals and ways of working are established. The meetings are preferably held somewhere else than the ordinary working surroundings. There should also be enough time for informal conversations. The number of participants should be restricted to no more than 25 people. Participants in the initial workshop are the client, contractor, designer and strategically important sub-contractors. The main topics of discussion could involve, firstly, a company presentation where the different parties' views on the project, cooperation and the expectations on Extended Cooperation are discussed. Furthermore, topics concerning project information, roles and responsibilities, follow-ups, conflict handling and common activities are discussed.

Clarify and define roles and areas of responsibility

In order to make the cooperation work efficiently, the different parties' roles and responsibilities need to be clarified. The importance of this process increases if the way of working is new for any of the involved actors. Part of this work can be dealt with already during the tendering stage, where the client can present the project

organization which they found suitable for the project at that stage. The common project organization is then further developed and established in an initial workshop.

Choose the appropriate personnel

Except for competence and knowledge regarding the work assignment should mutual respect and transparency be main factors of consideration when composing the project organization. These are of vital importance in creating a functioning cooperation. The co-workers should also have good capability in listening and communicating. Other important qualities are the ability of cooperation, overview and lack of prestige.

Spread information to all levels

It is important that intentions, goals and feedback reach out to all levels in the project, in order to achieve the specified goals. This requires efficient planning and good resource allocation. Common goals should be broken down and given a substantial form in activities and actions for the different occupational group respectively.

Emphasize the importance of good leadership

EC can for many people constitute significant change. It can involve the change of old habits regarding work methods and how to behave towards other actors within a project, therefore is good leadership of great importance. The involved actors need to have support from their leaders, e.g. that they are present at decisive moments in the project. It is the leaders' duty to show understanding and to create an accepting environment regarding the change of work method, i.e. an environment where possibilities are noticed and utilized.

Joint management by objectives (1-2)

Goal aiming work strengthens confidence and helps bridging conflicts. When aims are clear and shared by all involved, a workgroup becomes efficient. Involved parties in a project shall therefore allocate time in order to create a clear view regarding joint goals. It is also stated in the guide that awareness regarding goals is an important driving force that increases motivation among project members.

The project directive, where the client states overall objectives for the project, should form a foundation for further work regarding goals.

The cooperation group, with members from the client, contractor, designer and important sub-contractors, shall carry out the work and create an objective document and then work according to it throughout the project. In this document, a plan of cooperation should also be included, which further describes how cooperation and goal satisfaction will be reached.

The objective wording should at least contain the purpose with the contract and the measurable aims. The cooperation document should at least contain collectively stated routines for how cooperation shall be carried out and routines for goal satisfaction. It should also include the cooperation group's organisation with key persons and authorities for the group.

The objective wording with the plan of cooperation is to be documented in this document and agreed by the steering group. The aims are to be measurable or at least be possible to evaluate objectively.

Examples of jointly developed goals for a civil engineering project can involve aims regarding: traffic, working environment, economics, quality, environment, information or development.

Joint risk management (1-3)

Risk management has great impact on project success in civil engineering works. The workgroup FIA has also in another project called “Risk management in tendering documents and tenders” developed a manual for risk management together with a checklist of risks to be considered. Civil engineering works should be carried out according to these models. Risks should with this model be compiled into joint risks and then evaluated together.

Methods of conflict resolution (1-4)

A conflict is a disagreement which can arise between individuals and within groups or organizations. It can be conflicts of interests regarding aims, priorities and demands, or conflicts concerning different fundamental values of outlook or roles.

A working team gets stronger and more efficient when time is allocated to process disruptions. Strong communication and openness between different sub-groups in a project organization does according to the model lead to fewer conflicts. It is important to use the energy in a divergence of opinion in a way so that the outcome leads to better decisions for the project as a whole. In order to succeed with this, conflicts have to be dealt with at an early stage and as close to the source as possible.

The cooperation group should develop and put a routine for conflict handling into practise in order to prevent disputes. Conflicts are preferably handled as soon as possible, problems must initially be discussed in the cooperation group and secondly in the steering group. Processing time at each stage is to be limited. The signed contract is always referred to if the involved parties cannot reach an agreement.

Routines for continuous follow-ups and improvements (1-5)

In order to identify more efficient solutions and develop the project, common follow-up routines and measuring improvements are necessary. A feature for efficient working groups is according to the guide, to evaluate the own work and to be self-critical. It is therefore essential to plan and allocate resources and time for follow-ups throughout the whole project time. The cooperation group shall arrange follow-ups regarding: common goals, plan of action, cooperation and working practise, improvement actions and feedback for project participants.

Transparency regarding joint topics (1-6)

Establishing trust and increasing the level of quality requires high transparency. The possibility of creating transparency of finances depends on the pricing form. Lump-sum contracts signify low or no obligation of transparency for contractors to account for their costs disclosure in a project. In general, open book accounting should always be an aim when working with Extended Cooperation. Remuneration forms with variable costs demand the client to disclose their budget and contractors and consultants are obligated to account for their costs. Consequently, the budget becomes a joint tool for financial control. The finances are discussed in an open dialog between parties involved in the project and decisions of common art are taken together. Budget reviews are realized monthly in order to make sure that a reachable target price is secured and that all parties has a clear view of eventual deviations in the total budget, caused by individual items. It is recommended that all involved parties shall have total insight in the economy, especially in projects where variable costs are used (FIA 2006).

4.3 Optional elements - level II

In the following section are the optional elements of level 2 described, these are as mentioned previously not compulsory and can be added to the elements in level 1. The client is entitled to assign one or several elements, however other involved parties are free to suggest additional elements to take part in the cooperation model. The client then decides in consultation with the other parties which are to be included.

Intensive effort for team development (2-1)

The essential part in this element is to keep a dialog and clarify differences regarding corporate culture and eventual consequences this may create. The importance of this matter especially increases if the different parties are representing different nationalities.

The task in creating an effective, secure and open working group can be boosted by intensive efforts early in the process, through e.g. initial seminars and workshops. These intensive efforts can be extended in projects with long duration over time through the usage of Extended Cooperation. Examples of this can be to identify behavioural profiles for the actors involved in a project, and use these to discover possible consequences these may create in the project team. This can also be conducted for different occupational groups as foremen or design teams. Another example can be joint training for project members, across organisational boundaries.

Extended management by objectives (2-2)

An extended approach regarding objectives, intermediate goals, measurements and anchoring can be performed. A high level of ambition and management by objectives shall prevail. This is an extension to the compulsory element of (1-2) joint management by objectives, where a higher level of use of the element is applied.

Benchmarking (2-3)

In order to create a joint frame of reference and a starting point for project related discussions, shall the involved parties systematically gather information from relevant projects and businesses. This could be to have a mutual exchange of knowledge with a project of similar character. An example of a benchmarking activity is to perform study visits at each others' sites.

Increased participation for secondary actors (2-4)

Measures are taken to enhance the involvement of additional project participants such as sub-contractors, systematically in the target setting and follow-up works. This procedure can also be performed further down in the participants' organisations.

Systematic in-service training (2-5)

Extended Cooperation can be used to further carry out in-service training in specific areas for the co-workers in a project. The aim could be e.g. to strengthen the competence in the line of business or to secure future labour recruitment.

Active design (2-6)

This element includes design to be carried out in parallel with construction and to be adjusted to events during the construction phase. The design should always be so far in progress, that the construction never gets lagged behind or disturbed. Furthermore, the design process must be limited so that the highest degree of freedom is withheld regarding changes. Clients and contractors can in many cases decide a new or revised design, for various reasons, e.g. cost savings, quality issues or time related changes in the production.

According to the model, active design is not supposed to provide on-site solutions when problems have occurred but it is meant to contribute with alternative solutions that are pre-designed. This should make it possible to choose the most appropriate solution to carry on work with when a critical area of the construction stage is entered.

Active design is characterised by active and flexible designs with great technical adjustability. Creative executors willing to influence design in the best interest of the project and clients with the comprehension to utilize these recourses are other characteristics. Product development with active design admits a joint evaluation of alternatives with regard to long-term cost effectiveness and quality. Analyses of life-cycle costs are performed on chosen parts according to an agreed model.

Communication with the external environment (2-7)

The joint goals that are elaborated always contain intermediate aims regarding people in the neighbourhood, road-users and pedestrians. Examples can be limitations of disturbances caused by noise, dust or enclosures.

The involved parties should jointly inform the affected external actors. In addition, the option of a dialog with the possibility to influence the project should be available, both before and during the construction phase. A joint organisation is essential in order to manage this task in a successful way.

Industry developing activities (2-8)

When carrying out an individual project, activities that are of importance for the development of the entire civil engineering works industry can be discovered. By realizing one or several of these activities in the project and then share the result for the entire industry, the project will contribute to innovation within the industry and the co-workers will experience stimulation in their work. Examples of these industry developing activities can be:

- Identifying lack of competence which requires specific research and development efforts
- Initiate and support efforts improving knowledge
- Contribute in strengthening the industry's trademark e.g. by offering study tours and share information about the workplace, publish articles about interesting project conditions, arrange seminars related to the project, accept and help doctoral candidates doing research within civil engineering works
- Participate in creating good projects of reference for future recruitment to the industry

4.4 Strategic Cooperation - level III

Strategic cooperation is the third level which in a long-term perspective according to the model could create the most savings in costs and time. Well developed and functioning teams may be given the possibility of performing several contracts in a row. Savings can then be made both in the tendering stage and during the production and administration phases. Strategic Cooperation is most suitable when several similar objects are to be constructed successively. There are however concerns whether this level and its implications can be used for public clients without violating the legislation of the Public Procurement Act.

4.5 Recommendation for pricing method

There are many driving forces and reasons for applying the method of Extended Cooperation in construction projects. These can be high product quality, good environmental management, in-service training and a positive working climate, which all contribute to a high level of efficiency of execution. However, a very influential force is the choice of pricing-method. The implementation of economic incentives as awards for achieved project result favouring or affecting all actors in a project creates a striving for cooperation and a focus for better solutions. This makes involved actors work in the same direction.

A suitable choice of pricing in combination with Extended Cooperation creating a driver for efficient civil engineering works in Sweden is a target price contract with

incentives for the production part, and a fixed price for management including regional and central administration and profits. The incentive should be a pain- and gain-share for deviations from the target price. Reimbursable for actual costs of production should be based on unit prices in competition. This combination of pricing creates opportunities to fulfil the demands for openness and collaboration in the sensitive and heavily costly part that the production part constitutes. Other economic incentives that can be added to the pricing form are bonuses, which should be connected to measurable goals, e.g. time related objectives.

Studies of partnering contracts in Sweden done by FIA strongly imply that the consultant or designer should be a part of the financial structure and thereby take part in the financial result and risks. The consultant's share of the incentive should be determined by the economic share in the project and the possibilities of influence; this can be around five to ten percent depending on project characteristics.

One thing that is of great importance when using target price is to determine rules and regulations for changes regarding target price in the contract, since this is not mentioned in the Swedish standard contracts.

However, according to the report by FIA, three problems have been acknowledged regarding pricing within performed projects by the Transport Administration. Firstly, the client's expectations of transparency regarding statements of costs have not been fully fulfilled. Problems concerning the judgment of which circumstances that should exist to bring about renegotiations of the target price are also mentioned as a major concern. There have also been indications of difficulties in restraining increases of the target prices.

5 Case study projects

In this chapter, each of the three projects in the study is described. The descriptions will explain the set-up of the project and the procurement evaluation, based on project-specific documents and interviews. It will also reflect the interviewees' views within the area of procurement, financial structure and application of the work model. Since the projects all have the same client, i.e. the Swedish Transport Administration, the procurement procedure for the contractors is the same, therefore the procedure will be described firstly.

5.1 Contractor procurement

The procurement of the contractor is carried out in accordance with the Public Procurement Act¹ since the client is a public purchaser. This is combined with a selective contract award procedure, meaning that participating bidders are chosen by the client, in these cases by a prequalifying system called TransQ.

TransQ is an online prequalification system for the Nordic transport organisations. The tool gives buyers the possibility of sharing information about their suppliers. The company running the tool also validates, prequalifies and monitors existing suppliers in the system. As the tool is developed in accordance with EU legislation it can be used as a prequalification system for public procurement (TransQ, 2010).

In the next step of the evaluation process, the tenders are valued according to the added value method into a comparing sum and evaluated. The tender with the lowest comparing sum gets the contract (UFB, 2008). The projects have varied numbers of evaluation criteria in the added value method, which can be entirely economic or so called soft parameters. Each criterion also has a set maximum added value which is obtained for the highest score in each area. The different criteria are described in the procurement documents and shown in the tables for each project in the following sections.

For each criterion, the bidders' tenders are evaluated and awarded an integer mark from zero points up to the maximum mark, where zero is poor and the maximum mark is best. The mark for each criterion is then divided with the maximum mark and multiplied with the maximum value, the result is the added value for each criterion. The final procedure can be described as that the added value for each criterion being subtracted from the tendering sum for the fixed costs portion, the result is then the comparing sum. The lowest comparing sum among the tenders wins the contract (UFB, 2008).

¹ Public Procurement Act (2007:1092) within the areas of water, energy, transportation and postal services, the rules and regulations for procurement above the threshold value are applied.

5.2 Project A: BanaVäg i Väst - New railway track

- Demolition and new construction project

Project type:	A new twin track is constructed on the area of an existing up and running single track. The contract includes rail, electric, signal and telecommunication work.
Contract price:	~ SEK 260 Million
Contract form:	General contract with a partnering model
Pricing:	Cost reimbursable contract with a target cost and incentive, modified with a fixed part.
Cooperation Model:	Extended Cooperation, level 1. Model applied between Client and Contractor
Project stage:	Beginning of construction phase
Est. time:	2-4 years

The project was during the interviews in the early stage of the construction phase. Persons interviewed for this contract have been the project manager from the client's side, the process leader, the contractor's project manager and the head designer from the consultant's side. The entire construction phase is estimated to be about two to three years.

The contract is part of a major infrastructure project between two cities, including 75 kilometres of four-lane road and double railroad tracks. It is constructed in order to enhance safety and increase capacity and accessibility for travellers, commuters and freight transportation (Trafikverket, 2010).

This contract includes the new construction of all railway specifics for a double track with the length of approximately 7.5 kilometres, i.e. rail, electric, signal and telecommunication works. The demolition of all current railway structures is also included, which is an up-and-running single railway track. Furthermore, the construction/demolition of temporary tracks is included, in order for the project to be carried out without disturbing the existing traffic (AFA, 2009).

In addition, the contractor is responsible for the coordination with the other contractors for the ground and bridge work, which on the distance are no less than four different independent contracts (AFA, 2009). Furthermore the contract involves developing the final construction documents from the procurement documents in cooperation with the client and designer. This mostly regards the planning and implementation of the temporary constructions (EKA, 2009).

5.2.1 Contract set-up and procurement

This project had three different evaluation criteria in the added value method, one entirely economic and two soft parameters. The different criteria are described in table 2 , which also shows that the soft criteria were both equally valued.

No.	Evaluation Criteria	Maximum value (SEK)	Max marks
1	Tendering sum	_____	
2	Description of implementation with regards to: - Organization, complementary unit prices, design, method of choice, planning etc.	12 000 000	5
3	Suggested personnel organization with regards to: - Key-persons' competence, experience in similar contracts, experience of work in rail environment and references.	12 000 000	5

Table 2 – Project A's tendering evaluation criteria (UFA, 2009)

The development of the evaluation criteria have been carried out on project level by the project manager and staff from the client's side. There are frameworks from the central organization of the Transportation Administration for how a procurement process is to be carried out, but in this case the model according to the client is elaborated on project level.

The process leader, who was the initial project manager and took part in the development of the procurement, adds that the soft parameters have to be created individually for each project since all projects are unique and therefore need a suitable composition of the project team. There is a foundation in the model for extended cooperation as inspiration, but the actual formation has been done by the client's project team.

The contractor's perspective is that the client procured with regard to individual competence in the tendering organization rather than resources for the project. This opinion very well conforms to the third evaluation criterion described in table 2.

The process leader explains that since the contractor is participating in the design and execution of the temporary constructions, stretching over the entire distance, including all ground and bridge contracts, it is vital to involve them in the co-ordination between the different contracts. The client also wanted to use the contractor's expertise in designing the complex temporaries, hence their early involvement in the project.

The contractor does nevertheless mention a problem regarding the responsibility with the co-ordination. The view is that it is not entirely fair to place the responsibility of this undertaking on a party which does not possess any authority over the contractors that are to be coordinated.

5.2.2 Financial structure

The pricing method for the contractor is a cost reimbursable principle with a fixed part and incentive on the target cost. The fixed part includes such things as management costs, setting up costs, insurances and the contractor's fee. The variable part consists of labour, material and machine costs. The final compensation for the contractor's undertaking is decided by the difference between final cost and target cost, which is illustrated in figure 3 below. If the final deviation is plus/minus ten percent the parties share the profit or loss equally. If the deviation exceeds ten percent, in both directions, the costs or gains for the exceeding part will be the client's (EKA, 2009).

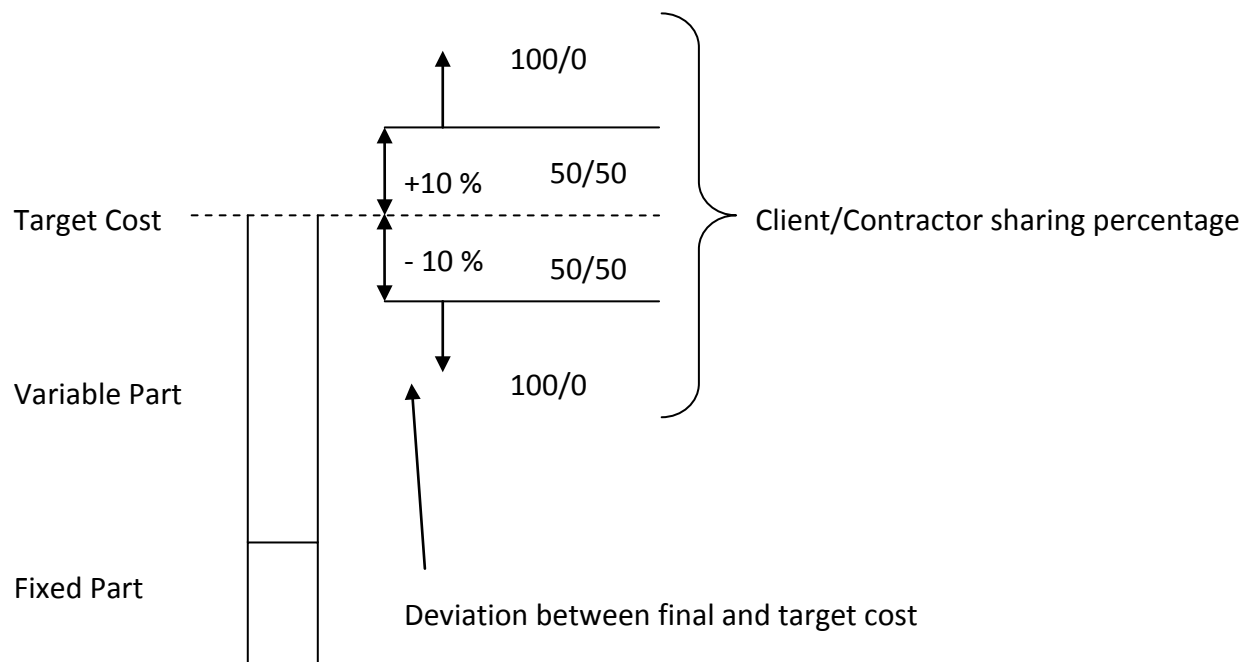


Figure 3 - Financial set-up for contractor in project A

The designer is procured by the client on a similar pricing method as the contractor, a reimbursable contract with a target cost for design work together with an incentive, according to the standard contract of ABK96. However, the initial set-up has been changed and the contract also involves the designing of the temporary solutions, needed during the construction phase. This implies that the target cost now is changed continuously in the course of the project. According to the design manager, there are discussions with minor conflicts regarding the change of target cost, but non that has not been solved.

The contractor company has made an offer which is the basis for the target cost, but this estimation will be changed when the design for the temporary solutions mentioned above has been completed. The contractor understands the idea of the financial set-up but adds that it is very hard to estimate a price for the contract. However, the contractor sees it as a worthwhile experience and has not at the time of the interview any opinion on whether the financial structure is positive or negative.

The client says that the reason for pricing form chosen is the complexity of the project, with regards to the temporaries. He further states that it makes it possible to work in an entirely different way and the risk of getting undesired costs is much lower with this kind of financial structure.

5.2.3 Application of Extended Cooperation

The compulsory level 1 of Extended Cooperation is applied between the client and the contractor. Furthermore, all the other ground and bridge contracts on the distance have their own Extended Cooperation relationship with the client. Moreover, the contractor is responsible for the co-ordination between the different contracts (AFA, 2009).

Joint organization with process management

The set-up of extended cooperation has, according to the client, been developed in cooperation with the contractor. There have been some compulsory items stated in the contract, but the outline of the work with EC has mostly been compiled together.

The process leader for Extended Cooperation in the project is the former project manager from the client's side. He has experience with working according to the model and has also been involved in the organization within FIA which has created the model. Therefore he has both experiences in the field of work and knowledge of project specifics (Client A, 2010).

The steering group in this project consist of the project chiefs and the project's legal representatives from the client's and the contractor's side. According to the client, the group's purpose is to work as a safety valve when issues are not solved by the cooperation group or everyday work.

Participating actors in the cooperation group are the project chiefs, the project managers and the foremen from both sides that are involved in the extended cooperation, which is approximately eight to ten participants. The process leader states that the composition are supposed to match the positions from both sides. The client is of the opinion that size of the group is enough and that more representatives are not needed.

One start workshop has been held in the beginning of the project. The agenda for the meeting was at first a draft developed by the process leader but was sent to the contractor to be elaborated with this actor's viewpoint before the workshop.

Participants in the workshop were the cooperation group's representatives. The meeting was half a day including the evening, placed away from the area of the workplace. The meeting involved an introduction to the project, a review of the companies and presentation of participating persons followed by joint discussions of values, expectations and goals for the project (Client A; Contractor A; Process leader A, 2010).

The contractor is of the opinion that all involved actors should be represented in the cooperation group and therefore would prefer if representatives from the designer and the other involved contractors regarding ground work also were involved. The designer view is that it would be positive to be included in a project at an early stage

and take part in the forming of joint goals in some kind of working model like partnering.

Joint management by objectives

At the time of the interviews no joint goals have yet been set, but the client and the contractor adds that the area is highly prioritized and that a time and date is to be set for this activity. The contractor is of the view that these documents should be created before the actual start of the production phase, but this has not been the case as the process is behind schedule. Furthermore, the client adds that it is important to set these common goals for the project but he does not think that the joint goals will be based on directives from the steering group. According to the contractor, the joint goals will be spread throughout the project organization.

The process leader explains that in the first meeting, the participating actors should shared their view on goals and objectives for the project and these are discussed and formulated into joint goals. There should be so called soft parameters included e.g. how to behave towards each other. Other topics can e.g. be work environment, cost and time related goals or general social ways of behaving. The purpose is to make the parties work in the same direction however it is important to always have in mind that the legal contract always contains the provisions in force (Process leader A, 2010).

Joint risk management

All of the interviewees' view is that joint risk management is a very important and essential issue that is to be carried out on the same meeting as when the joint goals are stated. The actors own risk management will be compared and complied into a joint risk analysis. The process leader adds that this is a so important issue that the joint risk management will be conducted frequently throughout the project time. The actors risk management has been gathered and inserted into a common risk management document continuously throughout the construction phase.

Methods of conflict resolution

The process leader hopes that a sufficient foundation for cooperation has been developed so that the need for stated method of conflict resolution will not be an issue. The process leader has experiences from previous projects with extended cooperation and conflicts have never reached the cooperation or steering group. Another important factor is that the client has worked with the same contractor before and the people therefore already knows each other organizations, making it easier to be open towards each other helps to prevent conflicts.

The client and the contractor are of the same opinion and add that problems should be dealt with as soon as possible at the source. In the scenario of a conflict that cannot be solved at the origin, they add that the cooperation and steering group exist as a backup.

Routines for continuous follow-ups and improvements

The project is in such an early stage that it is not set if and how follow-ups of joint goals or improvements with regards to them are to be carried out. However, the contractor assumes that this will be dealt with further on during the project execution and its cooperation group meetings.

Transparency regarding joint topics - financial

The client is of the opinion that they have full insight in the contractor's finances. They do however not have the same financial systems making it possible to go into each other's systems and costs are therefore accounted for continuously by the contractor. The contractor view is that they put more time into accounting because of the relatively new way of working. Furthermore, the client explains that this financial set-up for the contract takes away all conflicts of interests with regards of correctional and additional work, and therefore decreases the time put in for financial discussion during the execution of the project.

Regarding the change of target cost, no criteria have been established. The target cost is at the time of the interviews the initial winning bid from the contractor, but will be changed as soon as the final construction documents have been established. However, the contractor does mention that the target cost will be changed when and if large alterations in the construction are needed. According to the client the target cost should be changed if a larger change in the construction documents is a fact. There are no criteria stated in the contract regarding the change of target cost, more than when large changes from the original document have been done. The contractor adds that this issue is something that will be dealt with jointly between the two parties when the circumstances arise.

5.2.4 Communication and decision making

Education within Extended Cooperation

According to all of the interviewees, no education in Extended Cooperation knowledge has been conducted, except from the introduction at the start workshop. The client explains that working according to the model and with this project's financial set-up demands a new way of thinking and that the contractor has needed to review its way of working. The contractor's project manager has however been on a partnering course which was recommended by a colleague, but this was an initiative of the contractor itself.

The process leader further says that it is stated in the contract that the model and its way of working are to be applied and therefore the client expects the contractor to have some knowledge of the subject.

The process leader also adds that the clients' organization mostly consist of consultants hired for the project. Their companies are all members of the workgroup FIA which has developed the model and therefore the client expects them to have certain knowledge about the model of Extended Cooperation. It is also stated that the

working method will be according to the EC model when the consultants which are to represent the client are procured.

Meetings

The frequency for cooperation group meetings have been decided jointly to be approximately four times a year, but this is not fixed and will be changed according to the needs throughout the project. Cooperation group meetings are held during half days away from the working environment and participants are those of the cooperation group. The meeting starts with an introduction by the process leader and the contractor's project chief, then an introduction of all of the participants where only social aspects are taken up e.g. spare-time activities. This is followed by a project presentation where upcoming challenges are brought up. After this presentation the different parties evaluate each other and this is then brought up and discussed together, this evaluation is then used at the next cooperation group meeting as a foundation for the follow-up. According to the process leader, the outline of these meetings has been developed jointly on project level. The client adds that also target documents will be developed from the discussions and that joint risk management is conducted. This outline of meetings is comparable to cooperation meetings, workshops and follow-up meetings are merged into one get together called cooperation meetings if related to the FIA model.

Regarding differences in meetings compared to a traditional contract one thing is mentioned by the interviewees, namely that the contractor is participating in the design meetings. This has been described as very positive by all parties, since a better integration between designer and contractor has led to better knowledge sharing and also to fewer changes in the design.

The decision making order is the same as in a traditional contract, this is due to that the standard contracts always are the legal foundation of a procurement. However, one thing is pointed out by the process leader as a difference indirectly affecting decision making. This is that the openness within the project organization making it possible to share information about the decision making process, e.g. when, how and by whom a decision will be made giving the other party clear directives. This clarity helps bridging problems due to bad communication.

Co-location

Regarding co-location of the different actors' project offices, the client says that it has been up for debate regarding co-location with the contractor in the early stages, but that it has not been possible in this project since the total project organization would have been too large. Both the process leader and the contractor is of the same opinion, five large contracts would have elaborated into too many people. In this contract is the issue not considered very important as the distance between the client's office and the establishment of the contractors is no more than a short walk.

They do however add that the idea of having a common office is tempting the contractor stresses the major importance of having well functioning communication route as one of the most essential aspects of a large infrastructure project. The process

leader adds that the issue of co-located offices is discussed frequently in the industry and believes that it is a future way of working.

The client is of the opinion that co-location with the designer is less prioritized as their involvement in the project decreases more and more throughout the project timeline. The consultant agrees and adds that they are not procured as individuals connected to the project on full-time, which he feels is necessary for successful co-location.

General views

The aspect mentioned most by the interviewees is the importance of involving all parties in the Extended Cooperation and also to work frequently and fully with the work concerning the model. The process leader feels that the consultant as well should be involved in the EC cooperation as they already are participating in some of the work, but nothing about the model is stated in the consultant's contract. The process leader's view is that it is important to get this party involved with the work concerning EC and therefore it should also be stated in their contract when they are procured.

The contractor's view on the matter is that it is strange that the ground work contracts on the stretching are not involved in the same EC group as themselves, even though the contractor is responsible for the coordination of all the ground contracts and also are very dependent on them for their own construction work. As it is today, the client has one EC group for each of the five contracts on the stretching. This is something that the contractor is not very satisfied with, and would like them all to be involved in the same EC work e.g. having the same cooperation group meeting and creating joint goals for the entire project stretching.

The client points out the most favourable element in this contract to be the financial set-up which has lowered the costs substantially compared to if the contractor was to be procured with a traditional fixed price. However it is not possible to actually measure the savings, but it would almost not have been possible to set a fixed price on this contract. The amount of correctional and additional work due to the many temporary constructions needed would have been huge, contributing to a lot of conflicts.

Furthermore, the feedback for the designer and input for the contractor are mentioned as positive by the client, the knowledge sharing between the contractor and the designer contributes to a decrease in design changes and to an increase in knowledge for both parties.

Regarding additional elements of the EC model, the process leader mentions the importance of Active Design as a form of risk management in the design. Different scenarios are to be evaluated and plans to be elaborated continuously throughout the project, especially in a project like this with so many temporary solutions during the construction phase. Additionally, the process leader adds that benchmarking has been used in the sense of information gathering from the northern contracts of the entire railway project. These two elements maybe should have been stated in the contracts, but they have however been used to some extent. The importance of gathering information from previously realized projects is one of the most essential parts to carry out when starting a new project (Process leader A, 2010).

Some final statements from the interviews are that the contractor is of the opinion that the process leader should be an externally hired consult which was advocated on the partnering education which the project manager participated in.

The process leader's view on the actual model for EC is that it recently has become more extensive, containing more and more information, contributing to a resistance of using it. He believes that the way of working does not have to be described in such a complicated way it all comes down to creating trust between the different parties and the creation of joint goals to strive towards.

The client highlights the importance of not forgetting the actual roles of the different parties involved in a project even though you work together towards a joint goal.

The process leader's experience from previous projects when working as a client is that all involved parties have felt positive working according to Extended Cooperation as a whole as very positive.

5.3 Project B: Malmö C - Railway yard

- Refurbishment and rebuilding project

Project type:	A railway yard is refurbished and rebuilt from a cul-de-sac station into a run-through station The contract includes ground, rail, electric, signal and telecommunication work
Contract price:	SEK 265 Million
Contract form:	General contract with a partnering model
Pricing:	Cost reimbursable contract with target cost and incentive, modified with a fixed part
Cooperation Model:	Extended Cooperation, level 1 and three elements from level 2. Model applied between Client, Contractor and Designer
Project stage:	Middle of construction phase
Est. time:	~ 2 years

The project is one of the most complicated railway projects at the moment in Sweden. It involves reconstruction of all railway tracks, platforms, points and signalling systems in a railway yard. The work is also to be carried out without major disturbances for the current railway traffic on the up-and running railway station (Banverket, 2009).

When the interviews were conducted the project was in the middle of the construction phase. The assistant project manager from the client's side, the contractor's project manager, the consultant's head designer and the external process leader has served as interviewees. The total construction phase is estimated to be around two years.

5.3.1 Contract set-up and procurement

This project had nine different evaluation criteria in the added value method, all with varied maximum added value, two entirely economic and seven so called soft parameters. The different criteria are described in table 4 below, which also shows the personnel organization to be the most valued criteria in the procurement.

No.	Evaluation Criteria	Maximum value (SEK)	Max marks
1	Tendering sum for fixed costs portion	_____	
2	Personnel Organization Personnel including CV, Organization, Resource Planning, Interaction between individuals, Previous Experiences – for contract specific work and working in a operating environment, Experiences with the contracting form.	27 000 000	3

3	Project Management Plan – Financial The contractors system/plan for management and follow-ups of costs, General Plan, General Method, Planning System, Budgetary controlling system, Follow-up systems for time, recourses, costs and cost-management.	12 000 000	3
4	Project Management Plan – Time Resource planning or labour, Time Planning system, overall solution, set-up, project specific application, working methods	12 000 000	3
5	Environmental Management Environmental plan with project specific application	3 000 000	3
6	Total Quality Management Workplace organisation, Quality plan with project specific application	3 000 000	3
7	Electric and Rail Safety Management Tendering inspection of in-house program	6 000 000	3
8	Job Scheduling Plan Adaption of Business, general arrangement, placement of construction sheds, transportation roads and accounting for stages	3 000 000	3
9	Target Cost and Incentive set-up The differential of the clients estimation for target cost with regards to an incentive outturn and the bidders suggested structure and target cost (The smallest difference +/- is awarded with the highest mark) 0 – 5 MSEK gives 3 point, >5 – 10 MSEK gives 2 points, >10 – 15 MSEK gives 1 point, >15 MSEK gives 0 points	12 000 000	3

Table 4 - Project B's tendering evaluation criteria (UFB, 2008).

The contractor's view on the evaluation criteria was that they were out of the ordinary and somewhat hard to understand. The contractor's organization and knowledge about the work was higher valued than the actual financial bid. Thus, the contractor stated that they had a rather large organization tied to the project in relation to what was to be built. For the project as a whole, this seemed to be very positive. However, having a large organization was mentioned as resource demanding for the contractor, as individuals were procured and tied up for a long time. The contract form is, as mentioned above, a general contract between the client and the contractor. The contractor has in its turn assigned a large sub-contractor. According to the contractor, the sub-contractor in this case acts as a cooperation partner to the contractor who possesses required railway-specific competence, although they legally are a sub-contractor.

5.3.2 Financial structure

The financial set-up is a cost reimbursable contract modified with a fixed part and incentives. The fixed part includes management costs and the contractor's fee. The variable part is a target cost contract which consists of the contractor's reimbursable costs, such as labour and material. If the final variable cost differ from the target cost, the client and the contractor has a pain/gain share incentive where they share these costs or benefits 50/50 respectively (EKB, 2008), see figure 4 below.

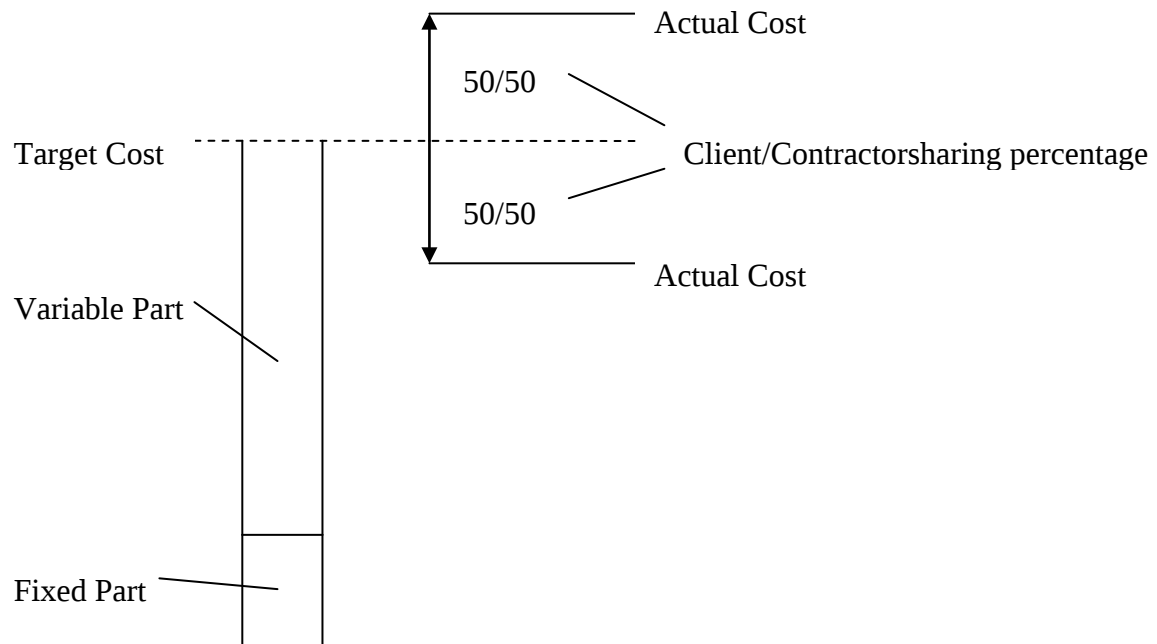


Figure 4 - Financial set-up for contractor in project B

According to the client, there have been some bonuses throughout the project time and they will probably develop some additional. These bonuses have mostly been related to time and critical stages where a part of the project has had to be finished. Bonuses have consequently been paid if the contractor has managed these goals. The client also explains that they have chosen to mostly work with bonuses instead of penalties because of the positive motivation power it implies, contrary to the negative force of penalties. These views were shared by the contractor, who claimed to be satisfied with bonuses instead of penalties as it created enthusiasm. Furthermore, it emerged that the pricing form functioned well since incentives and bonuses were shared equally between the main contractor and the sub-contractor.

As mentioned in the beginning of the chapter, the procurement of this project has been very difficult. The major reason appeared to be that the construction area consists of an existing up-and-running railway yard and thus demands a lot of temporary solutions in order to not disturb the traffic. Plenty of these temporary constructions were not designed at the time of procurement and many of these challenges demanded solutions to be elaborated continuously. As a result, there were not many other options than to choose a cost reimbursable principle and try to develop a team which could work as efficiently as possible (Contractor B, 2010).

The head designer in this project is hired by the client on a cost reimbursable contract and gets paid per hour. The hourly fee is dependent on type of work and is stated already in the tender. The standard contract ABK with variable remuneration is used for this actor. According to the Contractor, the difference in contractual structure for the designer and the contractor has had a negative effect on the project. The problem is that the designer is not bound contractually to the project success in the same way. They are participating in the collaboration and the working model but are not included in any of the incentives or bonuses.

5.3.3 Application of Extended Cooperation

Extended Cooperation is applied between the client, the contractor and the designer. The contractor's cooperation partner which legally acts as a sub-contractor, is however not involved in the working model. The compulsory level 1 is used and three elements from level 2 added: *Intensive efforts for team development*, *Benchmarking* and *Active Design* (SB, 2009). What they imply are described in section 4.2 about Extended Cooperation.

It is stated in the administrative provisions, (AFB, 2008), that the cooperation form of EC is to be applied. Furthermore, it states that the parties undertake to work in close co-operation with an active mutual exchange of information and that good routines of collaboration are to be developed. The purpose is to create an integrated organization between the client and the contractor (AFB, 2008). It is described in the contract agreement EKB (2008), that the client and the general contractor should strive to reflect each other's organizational structures, compositions of meeting groups that are to be developed are also illustrated in the document.

According to the client, to use EC has been mentioned early in the feasibility study, long before the actual procurement. The choice is influenced by central units in the client's organization. The client also brings up the importance of having an open minded and perceptive project manager when working in accordance to EC.

The current process leader's opinion regarding the procurement is that the project has such a tight time schedule that they had to create an organization which was able to work in parallel, contrary to the traditional sequential way with separate design and construction.

Joint organization with process management

The initial cooperation group consisted of important persons from all of the involved actors, the group could amount up to sixty members at some times. The group was then restructured into a small group consisting of only the project manager from each actor, giving the group a decision making power which the initial consistency of the group had lacked.

The current process leader is an externally hired consultant, although it emerged that during the interviews, this was not the initial process leader. The first one had been from the client organization and only been involved in the early stages of the procurement. A new externally hired process leader was introduced to the project during a time where a lot of disagreements had grown in the relatively large cooperation group. According to the current process leader, restructuring the group

had been done in order to improve the situation. The restructured cooperation group only involved key individuals with decision making authority.

Joint management by objectives

According to the client, goals and objectives should be set in order to complete the project on time and not to disturb the ongoing traffic. It also appeared that general goals in this project had been broken down and specified into primary targets with improvement of communication as result. Measurable and realistic goals were pointed out as valuable, whilst intangible and unrealistic goals were identified as resource demanding. In order to reach out with the goals to all involved people, a monthly newsletter was distributed as a complement to the electronic information. The contractor's view was that the monthly newsletters had enhanced the information amongst the workers on site.

Joint risk management

A systematic risk management procedure has been used for the project from the early stage. The client declared that the project had been nominated for a pilot development which concerns a new risk management system and that this was governed centrally in the organization. The client also argued that it is of great importance to find opportunities and not only focus on risks. Interestingly, the contractor had the opinion that most of the risks derived from the consultants and as a consequence a good joint risk management was important.

Methods of conflict resolution

Conflicts are to be solved within the cooperation group. Conflicts that are not solved within this level should be passed up to a higher level i.e. the steering group.

According to the client all conflicts until now had been solved in the cooperation group due to fast and efficient conflict management. The process leader shared this opinion and added that the reason might be that the involved actors are perceptive and open minded. Any special routines for conflict management have thus not been necessary. Dealing with problems at an early stage is often enough according to the client.

Routines for continuous follow-ups and improvements

The cooperation group is the entity that mobilizes follow-up workshops. The frequency of follow-up workshops has roughly been one per quarter of a year. The purpose of these workshops has been to look back on and identify mistakes in the process, in order to improve and learn how to better collaborate. According to the process leader this has been a tough task since focus always has been on future activities.

Transparency regarding joint topics - financial

Open book accounting has been applied between the contractor and the client. This has according to the contractor been a positive way to deal with the payments. A problem that was brought up both by the client and contractor was the sub contractor's financial system, which was described as old fashioned and not compatible with the others. The main advantage according to the respondents has been the increased trust that has been built between the parties. Transparency regarding joint topics has led to less need to control and thus less resource demand. According to one manager, when everything is transparent there is no need to distrust.

Intensive effort for team development

There has been extra effort put into the team development in this project. The process leader argued that different stages of a project required different kind of strategies and efforts in order to strengthen the team. Therefore were the outline of the workshops applied to fit the upcoming construction stage in order to create a better team development for these tasks.

Active design

FIA defines active design as having several completed alternative designs ready and to use the best solution during the construction. Even though active design has been agreed upon in the contract, it has not been used in this project. The reason for this has been the tight schedule forcing the construction to go on rapidly. Instead, the design and construction has been integrated and the best solutions chosen jointly.

Benchmarking

In this project the client and the consultant had been visiting a similar project i.e. a railway yard refurbishment project, quite early in the project. During the interviews, it emerged that a process exists within the organization that deals with previous experiences where these are reported in to the client organization. However, it was stated by the interviewed client that the process worked as a one way communication flow. The information about previous experiences seemed to get lost in the organization and not used properly in the future projects. This was something that the project manager from the client organization really wanted to change.

5.3.4 Communication and decision making

Education within Extended Cooperation

According to the contractor, no further education within EC has been conducted, except the information obtained during the start workshop and the follow-up workshops. The opinion of the contractor is that changing the way of working takes time. However, experience of EC will make involved individuals more familiar and prepared for future projects.

Meetings

Cooperation group meetings are held approximately every third week. The agenda for the meetings has been elaborated within the cooperation group, and has evolved somewhat during the project. The topics that are discussed do not derive from technical issues, but rather from organizational and collaboration issues. People outside the group are only informed of carefully selected issues that are discussed and decided upon during the meetings. It is according to the client important to control the outgoing information in order to keep an open atmosphere within at the cooperation group meetings. The group members can then more freely express themselves etcetera. The monthly newsletters mentioned earlier appeared to be the key information channel used for this purpose.

The open atmosphere at the meetings, mentioned by the client is also an important advantage that EC has contributed to. The client stated that openness and better working climate within the meeting group were the biggest differences, comparing to traditional meetings.

When it comes to decision making routines, this project has a special set up. As mentioned previously the current cooperation group only involves key individuals with decision making authority. The group constitutes of four delegates, assistant project manager (Client), process leader (External), project manager (Contractor) and project manager (Consultant). This set up which implies that the group have executive power, was described as enabling fast and efficient decision making.

Co-location

The client and the contractor are situated at the same project office, which according to all of the respondents have been an effective way of creating better cooperation between the parties. According to the contractor, the foundation for cooperation lies in co-location and hence most of the problems can be solved at the project office. It appeared that only some key individuals from the consultant's side have been located at the projects office during the early stages. However, it is of all involved actors' opinion that the consultant also should have been co-located. Involving the consultant would have improved the project success by fewer design changes and fewer communication issues. The obstacle and reason that hindered co-location of consultants in this case appears to be the procurement form, since the consultants were acquired as resources and not as individuals connected to the project on full time. (Consultant B, 2010).

General views

According to the client, differences in competence between the contractor and consultant exist. The contractor has more knowledge about EC than the consultant and this has caused some irritation. However, the client still believes that the consultant is positive towards working in accordance with EC. When interviewing the consultant, the representative acknowledged that EC was a new approach to working and collaborating. The overall view of the working method seemed to be positive and optimistic.

Furthermore, it was stated that key individuals should be procured on full time in order to get a strong and united team. The process leader emphasized the importance of strong initial efforts. All involved key actors should be involved early in the process. Information and knowledge about EC must be spread in an efficient way. The contractor had the view that more effort from the client was needed in order to motivate involved actors.

5.4 Project C: Stockholm City Line

- *New railway tunnel project*

Project type:	A new railway tunnel under the city of Stockholm is constructed. The contract includes tunnelling, rail, electric, signal, telecommunication and underground station work.
Contract price:	~ SEK 1500 Million
Contract form:	General contract with a partnering model for Client and Contractor
Pricing model:	Cost reimbursable contract with a target cost and incentive, modified with a fixed part
Cooperation model:	Extended Cooperation, level 1 Model applied between Client, Contractor and Consultant
Project stage:	Beginning of construction phase
Est. time:	~ 5 years

The contract is part of a major underground commuter train tunnel in Stockholm. The project includes about six kilometres of railway tunnel, two underground stations in the city centre and a railway bridge. The contract in our study is the single largest contract in the project and consists of tunnelling works and an underground station beneath Stockholm central station (Trafikverket, 2010).

At the time of the conduction of interviews the project was in the early stages of the construction phase. Persons interviewed were the assisting project manager from the client's side, a representative from the contractor's side who assisted the process leader in the initial phase, now working with purchasing in the project, and the project manager for the head designer from the consultant's side. The entire construction phase is estimated to be about five years.

According to the client the documentation of the contract is classified as confidential, and therefore will the tendering evaluation criteria and the financial structure for this project not be presented similarly to the other projects in the study.

5.4.1 Application of Extended Cooperation

The compulsory level one of Extended Cooperation is applied between the client, contractor and designer. Because of the confidentiality of the directives, it is unclear if any other parts from level two of EC are prescribed. According to the client, the project is of such a complex kind that everybody needs to work together towards joint goals in order to succeed with the completion of the project.

Joint organization with process management

The contractor says that the importance in cooperation is to plan and carry out activities and the structure of work jointly. The work started with a start workshop where a cooperation declaration was established.

The process leader is from the contractor's company and only connected to the project for cooperation matters. According to the contractor, this is a good set-up, where the process leader has good knowledge in partnering and also feels like an external resource. The consultant adds that the process leader possesses a good foundation for the cooperation works but that the agendas and work program is elaborated jointly between all involved parties.

The steering group consists of the project chiefs and the project's legal representatives from the client's, contractor's and consultant's side. According to the consultant, the group's purpose is to create guidelines for the joint goals that are to be developed. This group has a meeting frequency of once every quarter of a year.

The cooperation group consists of the key actors from the three parties and has a meeting frequency of every month.

A start workshop has been carried out with around thirty key actors from the involved parties. During this workshop, a target document was elaborated and signed by the participants. Some examples of the joint goals were to maximize bonuses and have a good working environment (Client C, 2010). According to the contractor, this document which in the project also is called "Moral Contract", is posted on several project billboards in order to remind people of how we should address and behave towards each other.

Joint management by objectives

As mentioned in the previous section, a target document was created and signed by the participants during the start workshop. This document contains general goals for the project. According to the consultant, follow-up and evaluation work is described in the cooperation declaration, which is a document created by the cooperation group. Enclosed is also a description of how target success is to be measured.

The consultant also adds that evaluation of joint goals is carried out during the cooperation group meetings. A colour system is used in the evaluation process, visualizing the current status of each particular goal at the time being. The system thereby visualizes which goals that need to be given more attention and which that can be left with less attention at the current project phase. For each goal, a person is also specified to be responsible for that particular goal.

Follow-up workshops have also been performed, these have had different themes which have been chosen to fit the state of the project at the time of the workshop. According to the consultant, one issue has been to create joint views on the project goals e.g. to consider the blueprints as "ours" by all involved actors in the project. The consultant further adds that the workers from the production also are participating in some of these. This is a way to spread the goals also on the production level.

According to the contractor the main challenge regarding goals is how to spread these out to all persons involved in the project, especially the skilled workers. In this project a joint information meeting is held every third month, where the project chief and

representatives from the client present project related information to all involved workers.

According to the client, a model for joint risk management has been developed, where risks from involved parties and external actors are compiled and evaluated. Example of an external actor participating is SL, which is Stockholm's public transport company. Furthermore, every actor has a specified person responsible towards the client for risk management purposes. The contractor adds that they have a person on full time working with their risk management which also is reported to the client's risk management model.

Methods of conflict resolution

The client says that a system for conflict resolution exists. The maximum amount of time until a conflict is resolved on a specific level in the project organization before the issue is transferred up in the organization is set. The project's steering group has the final decision making authority.

Routines for continuous follow-ups and improvements

The project has continuous follow-up meetings, some as follow up workshops, for evaluation of cooperation goals every sixth month. Routines are to have sent out questionnaires beforehand, with the set up cooperation goals through an online based system to involved actors. The result from these questionnaires is then used in the follow up meetings as a base. A problem mentioned is however to involve the blue collar workers with their lack of access to computers. It is also hard to know how much they have been involved in creating or introduced to the cooperation goals set in the project. The client adds that the follow-ups also are essential to carry out for another reason, the reason that the result is a base for some bonuses.

Transparency regarding joint topics - financial

According to the client, the project finances are not fully transparent, open books accounting is something that is desired from their side but has at the time of the interviews not been entirely reached. The contractor is of the opinion that their way of accounting is a form of business secret and therefore, the client has not been given total access (Client C, 2010). The client also adds that the issue has been taken up by the steering group.

Furthermore, the client believes that about the same amount of time is used on financially related work compared to a more general pricing method as a fixed price contract. Furthermore, all invoices are audited by the client, but this is according to the client due to that the client possesses all financial risk and therefore needs to check everything. However, the client does add that no time is put into correctional and additional work discussions, which often is seen as a negative influence in the industry. This is something that the client points out to be very positive with the financial set-up used in this project.

Regarding target cost changes, a criterion of that an "essential change of function" in the building specification needs to exist, the change also needs to exceed SEK 5

Million (Client C, 2010). According to the contractor, there have been some changes of target costs due to the uncertainty regarding foundation conditions in the project area.

Active design

This element has been used in the tunnelling works. Just before all places where the tunnel front is entering a critical stage, e.g. under a building with low rock coverage, a go/no go - border has been set. Here the progress is not allowed to continue until the consultant has done a quality analysis of the blasted rock just before the border, and checked that the design for the following part is suitable for the estimated rock quality. The consultant has for all critical stages developed three different designs beforehand, one so called normal solution, and the others for conditions above or below normal.

Benchmarking

The client mentioned that they have from the client's side acquired knowledge and experiences from a similar project in London, which also was a very complex project and where a similar pricing and contract form had been used.

5.4.2 Communication and decision making

Education within Extended Cooperation

According to all interviewees, no direct education in Extended Cooperation knowledge has been performed in this project, except from the information given in the start and follow-up workshops.

The client does however add that information about the contract form with financial set-up has been spread to everybody involved in the project, including skilled workers. This has been done in order to enhance the understanding and way of acting in this kind of partnering project, so that bad decisions not are made due to lack of knowledge within the subject. According to the consultant, similar information has been spread internally within his own organization, also in order to enhance the understanding of the project set-up. The contractor adds that they have an education plan for everybody working for the contractor's firm, where partnering education is a part.

In the beginning of the project, the contractor experienced that the client organization was not an established group and had trouble finding their roles and positions in their own organisation. This could be due to that the client's project organization largely is made up of externally hired resources. Furthermore, the personnel from the contractor's organization were ready to position themselves better as they were more closely united as an organization. The contractor does nevertheless praise the client's project chief for being a strong and clear leader who has managed to steer and create a base for how to act in a partnering project within the client organization.

Meetings

Cooperation group meetings are held once a month, they all have different character dependent on the project needs at the current phase.

According to the consultant, this project is so complex and requires an extreme amount of building documents which are created continuously throughout the major part of the construction phase. The consultant explains that they have five different kinds of design areas, and every area has what can be seen as an organization of its own within the consultancy firm. This has made it almost impossible for the client and contractor to participate in all design meetings, due to shortage of resources, which has been seen as an issue by the consultant.

However, this has been solved by having the design meeting for each of the areas in parallel, e.g. in adjoining meeting rooms and at the same time, making it possible for the client and contractor to be present where they have something to add to that specific meeting. Furthermore very strict and precise meeting agendas are used which also are sent out to everybody one day in advance, thereby showing where and when a specific issue of a certain area is raised (Consultant C, 2010).

Regarding differences in meetings compared to a traditional project, three major distinctions are pointed out by the interviewees. As described in the previous selection, the consultant mentions that the client and contractor both participate in the design meetings. This is seen as very positive, as it enables a knowledge sharing and furthermore leads to less changes and errors in the construction documents and also a better final solution with the increased knowledge among all involved actors.

According to the client the major difference is found in the construction economy meetings, where no contradictory interests between the different parties exist due to the joint economy of the project. For example, there are no discussions regarding correctional and additional work.

The contractor opinion is that all meetings have a nicer atmosphere, due to the fact that all participants and involved parties are more open and generous with sharing information when working in a partnering project like this.

Co-location

The client's construction management is situated at the contractor's establishment which is viewed as very positive by the contractor who adds that informal meetings on the workplace should not be underestimated. Furthermore is the project manager from the consultant situated at the client's project office and therefore does also a lot of the communication with designers take place through this project manager.

General views

Something mentioned by all interviewees is that the project is so complex with its size, surrounding environment and technical difficulties which would have made it impossible to complete the project in a more traditional way of working. According to the consultant the design works would still be going on and the construction would not even had started at the time of the interviews and the final construction documents would have contained numerous defects and inaccuracies. The client adds that in such

a complex project as this, everyone's knowledge is needed and all involved need to work towards a common goal in order to succeed to carry through the project at all.

One thing that is very positive with working together in a joint organization with all involved parties is the knowledge feedback which strengthens everyone's proficiency within their field of work. According to the consultant the designers has not during recent decades of work almost never got any feedback from the contractors and the construction process, except from when something has gone very wrong. This due to that the design during the past almost all the time has been established before the actual construction has started. The knowledge feedback designers get when working in close collaboration with the contractors is inestimable for the development of skilled designers and therefore for the entire industry. This makes it possible for designers to create documents and blueprints that are more and more construction suitable. The project form in this project can as a whole be seen as an industry developing activity (Consultant C, 2010).

The contractor view is that the pricing form is financially secure in the way that the risks of making large losses is low and therefore also the possibilities of making a great winning, i.e. the profit margins are better. The client has a fixed budget and it is in all actors' interest to be careful with the projects finances. A personal view of the contractor is that the psychological working environment is better.

6 Discussion

In this chapter several issues that concerns main findings from this Master Thesis are analyzed and discussed. Important issues such as project characteristics and joint elements that constitute the core of a successful collaboration are brought up.

6.1 Reasons for partnering

Several researchers have pointed out construction as a complex and fragmented industry e.g. (Egan, 1998; Kadefors, 2005). Major railway projects in particular, can be complex depending on the current conditions of the surroundings e.g. topography, geological situations and if any temporary solutions must be used. In this study it clearly emerged that all three studied projects were of complex nature. The complexity mainly derived from the strict regulations and requirements concerning the ongoing train traffic. Disturbances and all kinds of interference with the traffic were prohibited or strictly regulated. According to all interviewed managers, working in urban areas without disturbing existing traffic demands extra planning and caution. BanaVäg i Väst, a new twin track constructed on the area of existing single track, Malmö C, a railway yard refurbishment and finally a section of Stockholm City Line, a tunnel beneath existing underground railway have all required additional arrangements.

According to our observations, one specific issue has been the vulnerability of the ongoing train traffic. In order to avoid any disturbances in the train traffic, constructing several temporary solutions during the projects have been the only solution. The route of design and construction has hence differed from the traditional plan method. Delivering design documents on time can in these cases become a major challenge. The sequence of required design documents must be synchronized with the contractor's plans of performing the temporary arrangements. In particular, designing the temporary solutions has been done in parallel with the construction of the main tracks.

Using temporary solutions in railway projects also contributes to uncertainty in estimation of total cost and makes the procurement more complex. For this reason, fixed price contracts have not been alternatives in the investigated projects. It is also assumed that fixed price would have implied too many changes in the contract sum and the designing phase would have been extremely time consuming. The overall view of involved managers at the studied projects was that working in accordance to EC and with cost reimbursable pricing has contributed to a smooth course of action with hardly any conflicts. However, it should be mentioned that the way of working has been new for many parties and individuals. As a consequence, adaption to this new approach has required time and effort. This is in line with findings of Clegg et al (2005), who have stated that long-term planning is essential when managing change.

The above mentioned issues put extra requirements on good and clear communication. It also shows that joint collaboration and trust amongst the parties are essential when working in complex environments. Extended Cooperation, which is an approach to improve collaboration, has therefore been used and applied early in the

projects. Chan et al (2006) have defined early implementation of partnering as important and this is also somewhat underpinned in the interview results.

6.2 Communication and meeting procedure

As stated by Weippert and Kajewski (2002), communication is a central part in construction projects, but also the most significant problem. One of the initial questions we asked the interviewees concerned the layout of Extended Cooperation and how EC had affected the meeting procedure. The findings showed that the set-up at all three studied cases was decided at project level. The significance of joint planning and mutual involvement of collaboration strategies was often emphasized by the respondents who meant that creating joint view on strategies required good communication.

Furthermore, we observed that all respondents were satisfied with working in accordance to EC. More efficient decision making routes and more open communication can be considered as the major reasons for satisfaction. The aspect of open communication is in line with findings of Kadefors (2004), who has declared good communication as a driver for participant behaviour and trust building.

Comparing traditional way of working with the practise of EC, the major differences that could be distinguished were the initial workshops and the cooperation meetings held during the collaboration. When looking at the three different projects, the frequency of cooperation meetings deviated. At the Malmö C project, cooperation meetings were held every third week, whilst the other projects had less frequent meetings. This however can be interpreted as an approach to adapt the model of EC to project characteristics and needs.

6.3 Education

Educating involved people in partnering and making them understand the concept is important (Ng et al., 2002). However, according to our observations, in all investigated cases little or no effort had been put into education. An interesting issue that can be discussed is that large fractions of the project organizations were hired externally. This may have affected routines for educating involved parties. For example one process leader declared that they as client assumed externally hired personnel to already possess adequate knowledge about partnering and EC. Another manager from the client side stated that the need for education varied widely between different actors. Furthermore, it emerged that EC does to a large extent involve interpersonal behaviours hence attitudes towards working according to the model are important.

The start workshops described in section 4.1 were pointed out as essential in view of the fact that they contributed to cohesiveness amongst the group members, early in the process. Moreover, they appeared to function as the only formal source of education. A representative from one of the contractors stated that many participants did not have sufficient knowledge about EC before the start workshop. Nevertheless it appeared that they were eager to establish good relationships with each other.

6.4 Feedback

An advantage identified when working in accordance to EC was the direct and instant feedback between consultants and contractors. Traditionally this is not prioritized since information usually flows through the client. Feedback is important since it helps the construction process to become more efficient. According to Barlow and Jashapara (1998), the learning process can be enhanced if feedback and good communication are available. It is nevertheless important to share the knowledge gained. This can be done by using benchmarking as a continuous improvement tool. Benchmarking is in the EC model stated as a non-compulsory activity FIA (2006). It appeared that whether benchmarking was used or not depended on the existence of suitable benchmarking projects. Benchmarking in early stages and directives for spreading knowledge from previous work have thus to be set in order to improve the knowledge management in future projects.

6.5 Co-location

Another aspect that was brought up by respondents, which can enhance communication and decision making, was co-locating of human resources, i.e. individuals representing client, contractor and consultants. As previously described in the project descriptions, this simply implies that involved key actors are located at the same office. Malmö C is a case where co-location has clearly created a good atmosphere for efficient decision making. However, it has to be mentioned that co-location mainly took place between client and contractor and that a desire from the respondents in this project was to also include the consultants.

6.6 Setting joint goals

Fryer (2004) acknowledges the essence of clearly stated and realistic goals. Identifying common and measurable goals are hence crucial when implementing change in an organization. Furthermore, an agreed view upon strategies creates committed participants. According to Eriksson et al (2008), common goals are important since trust can more easily be built and as a result have positive impact on the outcome. Looking at the management by objectives in selected projects, we observed the majority of the respondents stressed the importance of jointly setting up common goals and objectives. During the study, it was many times emphasized by different managers that involved key actors should be included in the collaboration. Participation in the development of goals appeared to be really important. One of the consultants view was that the start workshops are a good place to set the common goals at. Deciding on common goals early in the collaboration can help to reduce future conflicts and create better working climate.

Short-term wins and rewards encourage people to stay motivated (Kotter, 1995). In accordance with this view, we found that breaking down goals into sub targets and celebrating achievements were emphasized by one of the interviewed process leaders.

It appeared that abstract general goals in one of the studied cases had been reduced and specified into primary targets. This had led to improvement of communication and collaboration, since the goals were more tangible. Measurable and realistic goals

are thus to be preferred, whilst intangible and abstract goals are to be avoided and considered as resource demanding.

6.7 The influence of process leader

We found early in the study, that EC was applied rather differently between the selected projects. It emerged that implementation of EC in the project organizations had been very dependent on the process leaders' ambitions. Whether the process leader had been an internally or externally hired individual also seemed to have affected the implementation of EC.

As brought up in section 5.3.3, the Malmö C project had experienced both an internal and an external process leader. An externally hired process leader had been introduced to the project during a time where lot of disagreements had grown in a cooperation group that was described as too large. This observation is rather interesting, since Swan & Khalfan (2007) in the literature have stated that the size of a group should be limited. Furthermore it is recommended that only key actors are selected. Looking at early stages of collaboration in the case with Malmö C, a large number of participants and the fact that they lacked decision making power had created an infected atmosphere. As explained in the chapter about Malmö C, restructuring the group and only involving individuals with decision making authority had been the solution. This involvement of the EC model can to a large extent depend upon the external process leader who had new and innovative ideas from outside the project.

Another important aspect is neutrality of the process leader, which also during the study was advocated. An internal process leader might not be neutral in cases of conflicts and disputes. On the contrary, an external process leader's decisions tend to be more neutral. The reason to this can be found in that the assigned external consultant is not involved in the actual project, but has the only task to deal with issues regarding to EC. This also allows the work to be more concentrated and therefore efficient.

Comparing Malmö C with the other studied projects where the process leaders were representatives from the client organization (BanaVäg i Väst) and the contractor organization (Stockholm City Line), the Malmö C project appeared to have the most innovative set up of collaboration since the model of EC had been adapted to the project conditions.

6.8 Managing risk and conflicts

According to Beach et al (2005), partnering contributes to improved risk sharing between involved actors. In FIA (2006) joint risk management has been highly advocated. During this study it emerged that there was an agreement among the interviewees about the fact that risk management issues should be set up at an early stage. One of the managers argued that in large and complex projects, systematic risk management was essential. Preventing risks requires continuous work and professionalism. Nevertheless, focusing on risks should not limit the creativity and opportunities to try new solutions.

One of the contractors meant that the source of risks largely derives from consultants, whilst the consultants' views often are that risks derive from the client side. This shows that different parties have different views on where project risks arise. Therefore it is important to gather parties and to jointly work thorough the problems.

Conflicts are not unusual in large construction projects, according to the literature one major reason is the nature of the industry being fragmented and project based e.g. (Ng et al., 2002; Eriksson et al., 2008). According to FIA (2006) conflicts have to be dealt with as soon as possible. As described earlier, it is the cooperation group's responsibility to set up routines regarding conflict resolution and to make sure that unsolved disputes are communicated to the steering group.

Looking at the projects in general, it seemed that only few conflicts had arisen. Working according to EC creates good knowledge about different actors' expectations and hence reduces conflicts. Whether conflicts arise or not seems to be vastly related to personal relations. The interviewed contractor representative at Stockholm City Line stated that in some cases, it is better to replace individuals that do not fit in the team rather than putting effort into solving conflicts that arise due to bad personal relations.

The overall view can be summarized into that no particular routines regarding conflict management were required. However, the respondents shared an agreed view of that issues should be solved as soon as possible and non solved conflicts should be transferred to a higher level in the project organization. Any routines in excess of that were according to the interviewees not needed.

6.9 Economic transparency and incentives

FIA (2006) advocates open book accounting. It is recommended that all involved parties shall have insight into the project accounting, particularly in cases that involve cost reimbursable contracts. Results from the findings showed that open book economy had lead to increased trust between participants. According to one manager from the client side there is no need to distrust when everyone has full insight into the other parties' accounting. However, it showed that in some cases technical systems i.e. computer software that was compatible with each other's financial control system was requested. This kind of systems can help to make the economy more transparent.

As mentioned previously in section 5.3.2, bonuses related to time for completion of critical stages had been set up at the Malmö C project. Bonuses and incentives can according to Naoum (2003), be used to motivate the team in order to achieve goals. The result also indicated that the contractor in this project was more than satisfied with bonuses instead of penalties as it creates positive motivation. Comparing this with BanaVäg i Väst where only penalties for delays were used, we found that bonuses would have been preferred by the contractor because of the more positive motivational driving.

When investigating whether the amount of time and effort put on financial control had changed compared to a traditional procurement with fixed pricing, different views were distinguished. For example, at BanaVäg i Väst both client and contractor had the opinion that compared to a traditional procurement more time had been spent on financial control.

According to our observations, however the reason for this may be the lack of previous experience with the financial form within the project organization. Quite the contrary to BanaVäg i Väst, at Malmö C much less and at Stockholm City Line less or same amount of time had been put on financial control. This can be due to higher familiarity with and knowledge of open book accounting in these projects.

The financial set-up for the projects shows that incentives only exist for the client and contractor. The consultants do thus not have any economic incentives relating to project performance. As one of the consultant representatives stated, the only incentive the consultants seem to have when working in accordance to EC regards enhanced knowledge sharing and communication between themselves and the contractor.

The consultant at Stockholm City Line claimed that even though they as consultants are involved in the Extended Cooperation, there is no contract between them and the contractor. Furthermore, no economic incentives exist. According to our observations, the general appreciation of the consultants regarding EC, in all three projects has been rather moderate. Incentives and bonuses for involved consultants would make them more motivated to perform better and to follow up the work more carefully.

7 Conclusions and Recommendations

In this section the main conclusions are presented along with some recommendations for improvements regarding the implementation of Extended Cooperation. The conclusions and recommendations are based on findings from our research. Furthermore, a few suggestions regarding future research in this field will be given.

- The implementation and set-up of Extended Cooperation has in all three investigated projects been done at project levels. Differences in how EC has been applied clearly existed. The major difference has been the extent of adaption of EC to project conditions e.g. which actors to include in the collaboration and the frequency of collaboration meetings.
- The overall experiences of working in accordance to EC from the involved actors' point of view have been positive. Open communication and more efficient decision routes were the most important reasons for satisfaction. Moreover, it appeared that education regarding EC and how to work in accordance to the work model is needed in order to inform the persons concerned.
- The process leader's role is important and should thus not be underestimated. As it is stated in FIA (2006) the process leader should be an external consultant. The findings of this Master thesis suggest that an external process leader tends to be more ambitious. The external process leader can also have better focus on the implementation of EC, since he/she is not involved in the actual execution of construction work.
- Co-location of human resources is often suitable in cases of high project complexity. Individuals working at the same project office can meet spontaneously, which enables opportunities for discussion and exchange of ideas. The level of communication and collaboration between co-located parties will thus increase. Nevertheless, only key actors should be co-located. This has to do with practical issues such as shortage of space, but also that non key individuals without decision making authority, would not add any specific value by being co-located.
- Complex and project based assignments engage a lot of actors. The outcome of a project depends in principle on the joint efforts made by the team. It is important to carefully consider which actors to involve in the collaboration. Furthermore it is important to adapt the model of Extended Cooperation to project characteristics. Different elements that are suitable should be selected in the set-up of the collaboration.
- New and unfamiliar work routines take long time to phase in. The implementation of Extended Cooperation requires continuity and strong efforts especially in the initial stage. Working in accordance with this model should not be perceived as a burden. In order to create a uniform sense of

meaningfulness among involved actors, a clear structure of future work and efforts regarding Extended Cooperation needs to be introduced early in the process. The progress should also be continuously followed-up and evaluated in order to enable possibilities for improvement.

- As it is today, few incentives exist for the consultants. We believe that this can impede the development and evolvement of future ideas. Better incentives for the consultants are thus needed. Moreover, consultants should be procured as individual and not resources. This will motivate the consultants to fully engage in the collaboration.

Further research should preferably focus on possibilities and prospects of developing the model of Extended Cooperation. Research could also be done on how clients that use Extended Cooperation gather relevant information and experiences. An interesting study would moreover be to follow if information from previous projects is used in a way that optimizes future collaboration between involved actors.

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APPENDIX I – Interview guides

This section contains examples of interview guides used:

Client/Process Leader

Contractor

Consultant

Interview guide – Client – Project A

General questions

- A. Company _____
- B. Name - Title/position/role _____
- C. Part of what/which cooperation group _____

Organization, collaboration and pricing

Project specifics

- D. Kan ni beskriva projektets genomförandeform?
 - Upphandling - entreprenad form? Entreprenör? Projektör? UE?
 - Utökad samverkan? För vilka? Några moment utöver nivå ett?
- E. Hur ser ersättningsformen ut för entreprenörer respektive konsulter? Hur togs dessa modeller fram? Fördelar/nackdelar?
 - Incitament
 - Bonussystem
 - Hur sattes riktkostnad?
- F. Vilka faktorer har legat till grund för att BV valt att upphandla entreprenaden på det sätt som man gjort i detta projekt?
 - Teknisk osäkerhet
 - Ökad samverkan, projektering-produktion
 - Sänka kostnader
 - Banverkets policy/FIA
 - Annat?
- G. Utvärderingskriterier - upphandling
 - Vilka?
 - Viktning?
 - Inspiration från?
- H. Vilken roll har Banverket centralt haft i utformningen av upphandlingen?
 - Utökad samverkan
 - Ersättningsform
 - Utvärderingskriterier

Gemensam processledning

- I. Vem har styrt upplägget av Utökad Samverkan?
(Beställare, Banverket centalt, gemensamt)
- J. Process ledare
 - Vem?
 - Varför har ni själva valt att vara det/anlitat extern?
 - I vilket skede kom processledaren in i projektet?
 - Tidigare erfarenheter av samverkan/partnering och processledning?
 - Vilken roll har processledaren haft i projektet?
(Leda workshops, bollplank/resurs i projektupplägg)
 - Vilken inverkan har processledaren haft på processer som finns i "traditionella upphandlingar"?
- K. Styrgruppen
 - Vilka medverkar?
 - Hur ser gruppens direktiv för samverkansarbetet ut?
 - Hur följer gruppen upp projektets gång angående exempelvis konflikter, utvecklingsfrågor, organisationsförändringar mm.?
- L. Vilka ingår i samverkansgruppen?
 - Varför? Vilka kunde mer ha ingått?
 - Hur används styrgruppens direktiv i gruppen?
- M. Startworkshop
 - En eller två dagar? Annan plats än "kontoret"?
 - Medverkande? Hur bestämdes det?
 - Upplägg? Vad diskuterades?
 - Hur bestämdes upplägget?
 - Erfarenheter/åsikter (vilken betydelse har den haft?)

Kan medföra upprepning

Gemensam målstyrning

- N. Vilket arbete har bedrivits för att skapa en gemensam syn på projektets mål?
 - Målformuleringar? Samverkansplan?
 - Bygger de på direktiv från styrgruppen?
 - Hur sprids uppsatta mål ut till alla inblandade? Även ner i organisationen?
(konsulter, entreprenörer, underentreprenörer)
 - Erfarenheter/åsikter

Gemensam riskhantering

- O. Hur har riskhantering bedrivits?
 - I förfrågningsmaterialet?
 - Gemensamt efter upphandling?

Konfliktlösningsmetoder

- P. Har ni något system för konfliktlösning och i så fall hur ser det ut?
- Vem/vilka har utarbetat/fastslagit denna rutin?
 - Tider för lösning på respektive nivå? (innan uppflyttning)
 - Har det används?

Öppenhet i frågor av gemensam art – ersättningsform/ekonomistyrning

- Q. Öppen kostnadsredovisning - Uppföljning
- Hur öppen upplevs projektets ekonomi?
 - Har entreprenörer de system som krävs?
 - Hur ofta har ni budgetuppföljning med inblandade parter?
 - Vilken kontroll görs av fakturor? Av vem?
 - Hur mycket mer tid anser ni läggs på ekonomistyrning jämfört med ett projekt med en traditionell ersättningsform?
- R. Riktkostnadsändring
- Vilka kriterier finns för riktkostnadsändringar? Varför valdes dessa?
 - Finns det fastställda beslutsvägar för riktkostnadsändringar?
 - Har det varit många riktkostnadsändringar i projektet?
 - Har det uppstått konflikter kring dessa? I så fall varför?

Communication and Decision making

- S. Utbildning i "Samverkanskunskap"
- Har det bedrivits? I så fall för vilka?
 - Hur har utbildningen bedrivits?
 - Hur har detta bestämts?
- T. Samverkansmöten
- Vad diskuteras? Hur bestäms mötesinnehåll?
 - Vilken mötesfrekvens? Hur har detta bestämts?
 - Hur sprids informationen ut till medverkande i projektet?
 - Finns det några faktorer som utgör hinder för spridningen?
- U. Projekterings-, Samordnings- och Byggmöten
- Hur skiljer sig dessa från ett traditionellt projekt?
(klimat, dagordning, medverkande)
 - Hur har mötesformer och dagordningar bestämts?
 - Medverkar entreprenören i projekteringsmöten? Hur kommer det sig?
 - Medverkar projektören även i byggmöte? Varför/varför inte?
- V. Andra skillnader jämfört med ett traditionellt projekt?
- Beslutsordning
 - Bemanning eller roller
 - Samlokalisering: Finns projektkontor? Varför/varför inte? Vilka sitter där och varför? Vem har bestämt det?
 - Andra former för kreativ samverkan – nya mötesformer, etc.?
 - Har det blivit bättre integrering av projektering och produktion? Mer kreativ samverkan?
 - Annat

- W. Uppföljning och utvärdering av samverkan och samverkansmål
- Hur går det till? Enkätssystem?
 - Uppföljningsworkshops? Hur ofta? Upplägg/förberedelser?
 - Vem/Vilka har fastställt detta?
 - Hur genomförs återkoppling till berörda projektdeltagare?
- X. Vid ett större problem eller ändring, hur långt upp i organisationen måste man gå för att ta ett beslut? (måste exempelvis beslutet tas på huvudkontoret?)
- Hur lång tid kan det ta?

General experiences and views towards Extended Cooperation

- Y. Vilka ansträngningar har ni som beställare gjort för att projektör och entreprenör skall ta till sig modellen för Utökad Samverkan? Beskriv dem
- Z. Hur tror ni att projektör och entreprenör upplever att arbeta enligt modellen?
- Å. Kan ni nämna några konkreta faktorer som ni tycker har påverkats positivt/negativt att arbeta enligt Utökad Samverkan?
- Ä. Har det skett några förändringar med anknytning till Utökad Samverkan under projektets gång? I så fall vad?
- Ö. Hur upplever ni att utökad samverkan modellen följts i detta projekt?
- AA. Vilka ytterligare moment i modellen för Utökad Samverkan tror ni skulle kunna ha positiv inverkan på projektet? (av de beskrivna i nivå två) Varför?
- BB. Finns det något som ni skulle vilja ändra i modellen? I så fall vad och varför?

Interview guide – Contractor – Project A

General questions

- A. Company _____
- B. Name - Title/position/role _____
- C. Part of what/which cooperation group _____

Organization, collaboration and pricing

Project specifics

- D. Vad tycker ni om projektets genomförandeform?
 - Upphandling - entreprenadform
 - Skulle ni vilja ändra på något? I så fall varför?
- E. Vad tycker ni om ersättningsformen? Fördelar/nackdelar?
 - Incitament
 - Riktkostnad
 - Bonussystem?
- F. Underentreprenörer
 - Hur är de upphandlade? Hur bestämdes det?
 - Står det om Utökad Samverkan i deras kontrakt?
 - Är de delaktiga i Utökad Samverkan?
 - Vem/hur sprids information om Utökad Samverkan?
- G. Vad tycker ni om utvärderingskriterierna i upphandlingen? Motivera

Model of Extended Cooperation – level 1

Gemensam processledning

- H. I vilken utsträckning har ni medverkat i planeringen av samverkansaktiviteterna?
- I. Process ledare
 - Vilken roll har processledaren haft i projektet?
(Leda workshops, bollplank/resurs i projektupplägg)
 - Vilken inverkan har processledaren haft på processer som finns i
"traditionella upphandlingar"?
- J. Startworkshop
 - Upplägg? Vad diskuterades?
 - Hur bestämdes upplägget?
 - Erfarenheter/åsikter (vilken betydelse har den haft?)

Kan medföra upprepning

Gemensam målstyrning

- K. Vilket arbete har bedrivits för att skapa en gemensam syn på projektets mål?
- Målformuleringar? Samverkansplan?
 - Bygger de på direktiv från styrgruppen?
 - Hur sprids uppsatta mål ut till alla inblandade? Även ner i organisationen?
 - Erfarenheter/åsikter

Gemensam riskhantering

- L. Hur har gemensam riskhantering bedrivits?

Konfliktlösningsmetoder

- M. Finns det något system för konfliktlösning och i så fall hur ser det ut?
- Vem/vilka har utarbetat/fastslagit denna rutin?
 - Bestämd tidsram för lösning på respektive nivå? (innan uppflyttning)
 - Har det används?

Öppenhet i frågor av gemensam art – ersättningsform/ekonomistyrning

- N. Öppen kostnadsredovisning - Uppföljning
- Hur öppen upplevs projektets ekonomi?
 - Har ni respektive beställaren de system som krävs?
 - Vilken kontroll görs av fakturor? Av vem? Vad tycker ni om det?
 - Hur mycket mer tid anser ni läggs på ekonomistyrning jämfört med ett projekt med en traditionell ersättningsform?
- O. Riktkostnadsändring
- Hur sattes riktkostnaden?
 - Vilka kriterier finns för riktkostnadsändringar? Hur valdes dessa?
 - Finns det fastställda beslutsvägar för riktkostnadsändringar?
 - Har det varit många riktkostnadsändringar i projektet?
 - Har det uppstått konflikter kring dessa? I så fall varför?

Communication and Decision making

- P. Utbildning i "Samverkanskunskap"
- Har det bedrivits? I så fall för vilka?
 - Hur har utbildningen bedrivits?
 - Hur har detta bestämts?
- Q. Samverkansmöten
- Vad diskuteras? Hur bestäms mötesinnehåll?
 - Vilken mötesfrekvens? Hur har detta bestämts?
 - Hur sprids informationen ut till medverkande i projektet?
 - Finns det några faktorer som utgör hinder för spridningen?
- R. Projekterings-, Samordnings- och Byggmöten
- Hur bestämdes mötesformer och dagordningar?
 - Skiljer de sig från mötena i ett "traditionellt" upphandlat projekt? (klimat, dagordning, medverkande)

- S. Andra skillnader jämfört med ett traditionellt projekt?
- Beslutsordning
 - Tror ni att det hade varit en fördel/nackdel att sitta tillsammans med beställare/projektör? Har ni erfarenheter av detta?
 - Annat
- T. Uppföljning och utvärdering av samverkan och samverkansmål
- Hur går det till? Enkätssystem?
 - Uppföljningsworkshops? Hur ofta? Upplägg/förberedelser?
 - Vem/Vilka har fastställt detta?
 - Bedriver styrgruppen någon uppföljning av sina direktiv?
 - Hur genomförs återkoppling till berörda projektdeltagare?
- U. Vid större problem och ändringar, hur upplever ni beslutsprocessen?
- Hur långt tid kan det ta innan ni får ett beslut från beställaren?

General experiences and views towards Extended Cooperation

- V. Vilka ansträngningar har beställaren gjort för att ni skall ta till er modellen för Utökad Samverkan? Beskriv dem
- W. Hur upplever ni att arbeta enligt modellen?
- X. Kan ni nämna några konkreta faktorer som ni tycker har påverkats positivt/negativt att arbeta enligt Utökad Samverkan?
- Y. Har det skett några förändringar med anknytning till Utökad Samverkan under projektets gång? I så fall vad?
- Z. Hur upplever ni att Utökad Samverkan modellen följts i detta projekt?
- Å. Vilka ytterligare moment i modellen för Utökad Samverkan tror ni skulle kunna ha positiv inverkan på projektet? (av de beskrivna i nivå två) Varför?
- Ä. Finns det något som ni skulle vilja ändra i modellen? I så fall vad och varför?

Interview guide – Consultant – Project A

General questions

- A. Company _____
- B. Name - Title/position/role _____
- C. Part of what/which cooperation group _____

Organization, collaboration and pricing

- D. Hur ser ert uppdrag för BEST-entreprenaden ut?
- E. Hur ser ersättningsformen ut? Fördelar/nackdelar?
 - Incitament?
 - Om rikt kostnad, hur bestämdes den?

Endast om rikt kostnad finns.

- F. Rikt kostnadsändring
 - Vilka kriterier finns för rikt kostnadsändringar?
 - Finns det några fastställda beslutsvägar för rikt kostnadsändringar?
 - Har det varit många rikt kostnadsändringar?
 - Har det uppstått några konflikter kring dessa? I så fall varför?

Utökad Samverkan

- G. Utökad Samverkan
 - Vad vet ni om modellen?
 - Erfarenheter med att arbeta enligt den?
 - Har ni involverats i eller påverkats av processerna och systemen? (gemensamma mål, riskhantering, konfliktlösning mm.)
 - Tror ni det hade varit positivt/negativt att medverka i den? Motivera

H. Projekterings-, Samordnings- och Byggmöten

- Vilka medverkar ni på?
- Hur bestäms mötesformer och dagordningar?
- Skiljer de sig från mötena i ett "traditionellt" upphandlat projekt?
(klimat, roller, dagordning, medverkande)

I. Har ni märkt någon skillnad i detta projekt jämfört med andra "traditionella" projekt?

- Har det blivit bättre samarbete mellan projektering och produktion?
- Antal projekteringsändringar?
- Beslutsordning eller tider vid ändring
- Bemanning eller roller
- Samlokalisering: Tror ni att det hade varit en fördel/nackdel för er att sitta tillsammans med entreprenör och beställare? Har ni erfarenheter av detta?
- Annat