

# CHALMERS



## Collaboration regarding Intermodal Transport between Regional Transport Companies A Study of Five Regional Transport Companies

Master of Science Thesis in the Supply Chain Management Programme

**BETTINA ERIKSSON**  
**PAULINA ROSENBERG**

Department of Technology Management and Economics  
Division of Logistics and Transportation  
CHALMERS UNIVERSITY OF TECHNOLOGY  
Göteborg, Sweden, 2009  
Report No. E2009:048

Collaboration regarding Intermodal Transport between Regional Transport Companies  
- A Study of Five Regional Transport Companies  
BETTINA ERIKSSON & PAULINA ROSENBERG

© BETTINA ERIKSSON & PAULINA ROSENBERG, 2009

Report no. E2009:048  
Department of Technology Management and Economics  
Division of Logistics and Transportation  
Chalmers University of Technology  
SE-412 96 Göteborg  
Sweden  
Telephone +46(0)31-772 1000

Chalmers Reproservice  
Göteborg, Sweden, 2009

A goal without a plan is just a wish.

Antoine de Saint-Exupery

## ABSTRACT

---

During the last decades there has been a dramatic increase of road transport and the European Commission has recognised the increase as an unsustainable development. Intermodal transport is one alternative to decrease the unsustainable development. Intermodal transport can also provide competitive advantages for transport companies by being more cost efficient and more environmentally sustainable than road transport.

This project has been performed for a network of regional transport companies with the purpose to develop a business model that enables collaboration regarding intermodal transport between regional transport companies. The purpose has further been to determine when this business model is applicable. The regional transport companies in this study have realized the importance of intermodal transport as a business opportunity and have therefore been interested in finding a way of utilizing intermodal transport. Since intermodal transport has limitations in its applicability due to its characteristics, collaboration regarding intermodal transport can be a way to enable the utilization of intermodal transport. However, collaboration regarding intermodal transport is complex, due to a large number of actors and influencing variables.

In order for the regional transport companies to successfully utilize the new business opportunity of collaborating regarding intermodal transport, the establishment of a business mode with collaboration strategies to handle the complexity was necessary.

The project has included a theoretical- and an empirical study. The literature study has covered two theoretical areas, prerequisites for collaboration regarding intermodal transport and collaboration strategies. The empirical study has included interviews with five regional transport companies within the studied network of regional transport companies.

Four different levels of collaboration have been identified and these levels of collaboration require different business models. It is possible that different companies are interested in different types of collaboration. The regional transport companies in this study have different experience from intermodal transport and it has been discovered that the regional transport companies' experience affect their interest in collaboration regarding intermodal transport.

The project has resulted in a business model for a joint company utilizing intermodal transport, but the business model can also be transformed to suit companies at other levels of collaboration. The project has also resulted in a conclusion about the applicability of the developed business model. It has been concluded that the developed business model enables collaboration regarding intermodal transport and that it, at the moment, only are applicable for some of the studied regional transport companies.

Keywords: Intermodal transport, Regional transport companies, Collaboration, Business Opportunity

## ACKNOWLEDGEMENTS

---

We would like to thank all involved parties that have participated in making this project possible. First, we want to thank our main supervisor, associate professor Dan Andersson at Chalmers University of Technology, for his guidance throughout the process of writing this report. His support and insightful comment has been truly appreciated.

We would also like to extend our thankfulness to Fredrik Bärthel for providing expert knowledge about intermodal transport and the Swedish transport industry.

We are also thankful for the material support that we have received from WSP. We would also like to thank our co-workers at the department of analysis and strategy for their patience and company during this period of time. A special thanks to Pehr-Ola Persson for his constructive feedback and extensive support.

The successful results of this project are to a large extent due to the regional transport companies providing us with invaluable data. Special thanks to all participants in our study. Thanks also to all participants at the seminar for taking time to listen to our result and providing feedback. The representative for the regional transport companies deserves special gratitude for initialising this project and for his time and interest in the project.

We would also like to give many thanks to Vägverket and Banverket for providing financial support via the virtual FUD-center SiR-C.

Finally, we would like to thank our families for their support and encouragement. We are especially thankful to Marcus Linder and Andreas Myrelid for supporting us during the process and contributing with feedback and advice.

Göteborg, 29 May 2009

  
Bettina Eriksson

  
Paulina Rosenberg

# TABLE OF CONTENTS

---

## PART I

1	INTRODUCTION.....	1
1.1	BACKGROUND.....	1
1.2	PROBLEM DESCRIPTION.....	3
1.3	PURPOSE.....	4
1.4	PROBLEM ANALYSIS.....	5
1.5	RESEARCH QUESTIONS.....	6
1.6	SCOPE OF THE REPORT.....	7
1.7	DISPOSITION OF THE REPORT.....	7
2	REGIONAL TRANSPORT COMPANIES' POSSIBILITIES TO USE INTERMODAL TRANSPORT.....	9
2.1	REGIONAL TRANSPORT COMPANIES' SITUATION IN THE TRANSPORT INDUSTRY.....	9
2.2	POSSIBILITIES TO USE INTERMODAL TRANSPORT.....	10
3	METHOD.....	15
3.1	METHOD FOR APPLIED RESEARCH.....	15
3.2	VALIDITY AND RELIABILITY.....	15
3.3	PROJECT CHARACTERISTICS.....	16
3.4	PERFORMANCE OF LITERATURE STUDY.....	17
3.5	PERFORMANCE OF EMPIRICAL STUDY.....	18
3.6	ANALYTICAL MODELS FOR THE ANALYSIS.....	20
3.7	INTERPRETATIONS OF USED CONCEPTS.....	21

## PART II

4	DEVELOPMENT OF THEORETICAL FRAMEWORK.....	22
4.1	FULFILLMENT OF PREREQUISITES BY COLLABORATION STRATEGIES.....	22
4.2	HIERARCHY OF PREREQUISITES.....	22
4.3	COLLABORATION STRATEGIES REQUIRED IN A BUSINESS MODEL.....	23
4.4	CHOICE OF THEORETICAL FRAMEWORK.....	26
5	PREREQUISITES FOR COLLABORATION REGARDING INTERMODAL TRANSPORT.....	29
5.1	PREREQUISITES FOR INTERMODAL TRANSPORT.....	29
5.2	PREREQUISITES FOR COLLABORATION.....	32
5.3	RELATIONS BETWEEN THE PREREQUISITES IN NEED OF FULFILLMENT.....	34
6	COLLABORATION STRATEGIES FOR THE BUSINESS MODEL.....	37
6.1	RELATION BETWEEN COLLABORATION STRATEGIES AND PREREQUISITES IN NEED OF FULFILLMENT.....	37
6.2	VALUE.....	37
6.3	CUSTOMERS.....	40
6.4	RELATIONSHIPS.....	41
6.5	ACTIVITIES.....	42
6.6	RESOURCES.....	46
6.7	PROFIT.....	47
6.8	MODEL FOR COLLABORATION STRATEGIES FULFILLMENT OF PREREQUISITES.....	48

## PART III

7	ANALYTICAL MODELS DEVELOPED FROM THE THEORETICAL FRAMEWORK.....	53
7.1	DIFFERENT TYPES OF COLLABORATION STRATEGIES.....	53
7.2	COLLABORATION STRATEGIES DEPENDENT ON LEVEL OF COLLABORATION.....	54
7.3	USAGE OF DEPENDENT COLLABORATION STRATEGIES AT DIFFERENT LEVELS OF COLLABORATION.....	58
7.4	COLLABORATION STRATEGIES INDEPENDENT ON LEVEL OF COLLABORATION.....	61
7.5	MODIFIED BUSINESS MODEL FRAMEWORK.....	63

## PART IV

8	REGIONAL TRANSPORT COMPANIES' RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT.....	66
8.1	RTC A'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT.....	66
8.2	RTC B'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT.....	68
8.3	RTC C'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT.....	72
8.4	RTC D'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT.....	75
8.5	RTC E'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT.....	79
8.6	COMPARISON BETWEEN THE REGIONAL TRANSPORT COMPANIES.....	83
8.7	REGIONAL TRANSPORT COMPANIES' POSITION IN THE STAIRCASE MODEL.....	84

## PART V

9	DECISION ON WHEN TO COLLABORATE REGARDING INTERMODAL TRANSPORT.....	86
9.1	REGIONAL TRANSPORT COMPANIES' PERCEIVED PROBLEMS WITH COLLABORATION REGARDING INTERMODAL TRANSPORT.....	86
9.2	EXPERIENCE AFFECT ON THE REGIONAL TRANSPORT COMPANIES' PERCEIVED PROBLEMS.....	90
9.3	APPLICABILITY OF THE BUSINESS MODEL.....	91
10	DECISION OF DEPENDENT COLLABORATION STRATEGIES.....	92
10.1	DIFFERENT BUSINESS MODELS AT DIFFERENT LEVELS OF COLLABORATION.....	92
10.2	DECISIVE PARAMETERS.....	93
10.3	SWOT ANALYSES FOR DIFFERENT LEVELS OF COLLABORATION.....	93
10.4	REGIONAL TRANSPORT COMPANIES' PERCEPTION OF DEPENDENT COLLABORATION STRATEGIES.....	101
10.5	DEPENDENT COLLABORATION STRATEGIES FOR THE BUSINESS MODEL.....	109
11	DECISION OF INDEPENDENT COLLABORATION STRATEGIES.....	113
11.1	DECISIVE PARAMETERS.....	113
11.2	INDEPENDENT COLLABORATION STRATEGIES FOR THE BUSINESS MODEL.....	113

## PART VI

12	BUSINESS MODEL FOR THE COLLABORATION REGARDING INTERMODAL TRANSPORT IN A JOINT COMPANY.....	123
12.1	BUSINESS MODEL FOR JOINT COMPANY.....	123
12.2	APPLICABILITY OF THE BUSINESS MODEL.....	125
13	DISCUSSION ABOUT THE RESULT OF THE REPORT.....	126
13.1	IMPLICATIONS OF THE RESULT FOR THE REGIONAL TRANSPORT COMPANIES.....	126
13.2	BUSINESS MODEL ADJUSTABILITY TO OTHER LEVELS OF COLLABORATION.....	127
13.3	OTHER IMPLICATIONS OF THE BUSINESS MODEL.....	128
13.4	VALIDATION AND RELIABILITY.....	128
13.5	AUTHERS' THOUGHTS ABOUT THE DEVELOPMENT'S EFFECT ON THE RESULT.....	129
13.6	FUTURE RESEARCH.....	130
14	CONCLUSIONS.....	132
	LIST OF REFERENCES.....	133
	APPENDIX A – STUDIED REGIONAL TRANSPORT COMPANIES.....	142
	APPENDIX B – REGIONAL TRANSPORT COMPANIES LEVEL OF COLLABORATIONS.....	143
	APPENDIX C – EXAMPLE OF PROFIT ALLOCATION.....	146

## PREFACE

---

This report has been written as a Master of Science Thesis in the Supply Chain Management Programme at Industrial Engineering and Management. The report has been written at the Division of Logistics and Transportation at the Department of Technology Management and Economics at Chalmers University of Technology.

The project is unique, both being a part of ongoing research within the virtual research, development and demonstration centre SIR-C as well as being an evaluation of a real problem for an operational organization. The organization represents a network of regional transport companies in Sweden. The purpose has been to facilitate the collaboration regarding intermodal transport between the regional transport companies. The organization and the regional transport companies have chosen to be anonymous in this report.

Within SIR-C, the project is related to two separate research projects: “Intermodal transport from a haulier’s perspective” at WSP and Chalmers University of Technology and “Innovative Intermodal Transport Systems for Semitrailers” at TFK.

The project was funded by Vägverket, the Swedish Road Administration and Banverket, the Swedish Rail Administration, via the virtual FUD-center SiR-C - Swedish Intermodal Transport Research Centre ([www.sir-c.se](http://www.sir-c.se)).

Because of the many interests involved in the project, there are two different perspectives on the result. First of all, it provides some practical implications for the regional transport companies regarding future strategies. Secondly, it leads to important implications for the two research projects run by WSP and TFK. Important empirical information has been derived on the future role of the regional transport companies and their future role in intermodal freight transport. Providing data from the transport industry, it also provides important information on the future need for research within the area.

# PART I

---

## 1 INTRODUCTION

---

The introduction chapter will present the topic of this report and explain the reasons for why the study has been performed. The background will provide an overall illustration about why intermodal transport is important for regional transport companies. The problem description will describe what problems regional transport companies need to handle to make intermodal transport applicable in their companies. The problem description will also lead up to the purpose of the report. The purpose will be analyzed in the problem analysis and end up in two main research questions. The research questions will then help to define the scope of the report. In the end of the introduction chapter, the disposition for the report will be presented.

### 1.1 BACKGROUND

---

The transport industry has gone through a major change during the last couple of decades with an increased demand for transport (Drewes Nielsen et al., 2003). The increased demand has been especially apparent for road transport, which has increased in a significantly steeper pace than other transport modes (Vägverket, 2005). The increased demand for road transport is a consequence of business trends such as outsourcing, globalization, centralization and increased customer demands (Lumsden, Hultén & Waidringer, 1998).

The European Commission has recognised the increase of road transport as an unsustainable development. Road transport has large environmental impacts due to emissions, congestion problems and energy consumption (European Commission, 2001). The situation in Sweden is not an exception. The environmental consciousness is continuously increasing in the society and the consumers have high demands on environmental sustainability in the transport industry (Vägverket, 2005). In order to reach environmental sustainability, a solution for decreasing the emissions and reducing the energy consumption is necessary. One solution is a change of transport mode to rail transport, as it is more environmentally sustainable than road transport (Caramia & Guerriero, 2009).

Road transport cannot be replaced by any other single transport mode because of flexibility limitations in the alternative transport modes, making door-to-door transport difficult. A combination of transport modes is therefore required to enable door-to-door transport. Intermodal transport is a way to utilize the strengths of different transport modes by combining them, making it possible to use more sustainable transport modes to a greater extent (European Commission, 2001).

Intermodal transport is defined by the Economic Commission of Europe as:

*The movement of goods in one and the same loading unit or road vehicle, which uses successively two or more modes of transport without handling the goods themselves in changing modes (UNECE, 2001, p. 17).*

Intermodal transport combining rail and road transport utilizes the flexibility of road and the cost efficiency and environmental sustainability of rail. A combination of road and rail transport can thus reduce the cost of transportation and be more environmentally sustainable than road but still more flexible than rail (Flodén, 2007).

In Sweden, intermodal transport is currently on top of the agenda for different kinds of actors in the transport industry. An indication of the relevance of intermodal transport is the establishment of several new intermodal rail operators during the last years (Bergqvist & Woxenius, 2008). Another indication is that the government is encouraging an increased use of intermodal transport (exemplified by Näringsdepartementet, 2008; Godstransportdelegationen, 2004).

Except for the unsustainable situation in using road transport, there are economical reasons for why many transport companies have an interest in intermodal transport. Intermodal transport can provide competitive advantages for transport companies by being more cost efficient than road transport and at the same time strengthen their market position by offering environmentally sustainable transport (Sommar, 2006a).

The competitive situation in the Swedish transport industry has changed during the last decades (Vägverket, 2005). There is a trend for actors in the transport industry to breach their previous niches and become more diverse<sup>1</sup>. The competition has increased and put a downward pressure on prices at the same time as the cost for road transport has increased, due to rules and regulations<sup>2</sup> and increased fuel prices (SPI, 2009).

The increased competition for long distance transport has made intermodal transport an interesting option for regional transport companies to develop their business, as long distance road transport is an important market for them<sup>3</sup>.

Regional transport companies are defined by the authors as:

Supplier owned transport companies, located within a region and operating mainly in that region but can also operate longer distances between the own- and another region.

The studied network of regional transport companies has realized the importance of intermodal transport as a business opportunity<sup>4</sup>. They are interested in finding ways of utilizing this business opportunity of using intermodal transport.

---

<sup>1</sup> Representative for the regional transport companies , 27 of January 2009

<sup>2</sup> Fredrik Bärthel, 23 of February 2009

<sup>3</sup> Representative for the regional transport companies , 27 of January 2009

<sup>4</sup> Ibid

## 1.2 PROBLEM DESCRIPTION

---

The development in the transport industry has increased the importance of intermodal transport for regional transport companies, as described in the previous chapter. Intermodal transport can be a source of value, but intermodal transport also has limitations in its applicability due to its characteristics. For these reasons, there are some prerequisites that need to be fulfilled for intermodal transport to be applicable for the regional transport companies.

One of intermodal transport's characteristics is that it requires changes of transport mode resulting in a large number of process steps with increased costs. The costs for transshipments represent a large percentage of the total cost for shorter distances while for longer distances the transshipment cost is less significant (Lumsden, 2006). Therefore, intermodal transport requires long distances, over 250-500 kilometres, to be profitable<sup>5</sup>. Neither does intermodal transport provide any environmental benefits over shorter distances (Blinge, 1995 in TFK, 1998). Therefore, intermodal transport is only suitable for longer distances.

The possibility to fulfil the customer demands does also affect the applicability of intermodal transport. Requirements on short lead time, reliability in delivery precision and flexibility can make the use of intermodal transport inappropriate. Intermodal transport can be time consuming and the large number of process steps increases the risk of time- and quality deviations (Lumsden, 2006). Intermodal transport also has limited flexibility because of transshipment coordination and fixed schedules (Sommar, 2006b). In the end, the decision of using intermodal transport depends on the fit between the customers' demands and the characteristics of intermodal transport (Cullinane & Toy, 2000).

The regional characteristics are also decisive for the applicability of intermodal transport since access to railway and intermodal terminals is essential (TFK, 1998). The applicability of intermodal transport also depends on what kind of goods that should be transported. Different kinds of load units are suitable for different kinds of goods and different kinds of transport modes (Lumsden, 2006). For intermodal transport to be applicable, the company needs access to load units that are suitable for rail transport and the kind of goods that should be transported.

For regional transport companies to be able to use intermodal transport they need to have presence in the opposite region. Regional transport companies have a strong regional connection but have limited possibilities to operate in other regions<sup>6</sup>. For that reason, regional transport companies need to establish a relationship, either with a horizontal collaboration partner or a transport supplier in the opposite region. In addition to the possibility to use intermodal transport, a collaboration partner can offer additional opportunities compared to a supplier relationship (Gadde, 2004). Another regional transport company is a possible collaboration partner.

---

<sup>5</sup> Fredrik Bärthel, 23 of February 2009

<sup>6</sup> Representative for the regional transport companies, 27 of January 2009

Collaboration is defined by Özner (2008) as:

The process of working together to achieve a common objective that cannot be achieved by individual efforts (Özner, 2008, p. 1).

One important opportunity with collaboration is that it can increase the resource utilization. In all complex transport systems there are generally imbalances in the goods flows. The imbalances between two areas result in low resource utilization for the return flow, which is costly (Lumsden, 2007). If instead the utilization of resources can be maximized through collaboration regarding return flows (Lumsden, 2006), the profitability can be increased. In addition to increased resource utilization, collaboration also provides access to new markets, information- and knowledge sharing (Johnson & Johnson, 1999), increased bargaining position (Chipty & Snyder, 2006) and an increased product portfolio (Kanter, 1994).

However, collaboration regarding intermodal transport is complex, due to a large number of actors and influencing variables with a high level of uncertainty (Lumsden, Hultén & Waidringer, 1998). For that reason, a collaboration strategy to handle the complexity is necessary. In order for the regional transport companies to successfully utilize the new business opportunity of collaboration regarding intermodal transport, the establishment of collaboration strategies is necessary, for the regional transport companies to know how and when to collaborate.

Since the interest for collaboration regarding intermodal transport between regional transport companies is rather new, the existing guidelines and methods are not giving full support to the network of regional transport companies. Strategies for collaboration regarding intermodal transport therefore need to be developed and a business model is a suitable format for presenting these collaboration strategies. A business model is crucial in collaborations as it provides guidelines for how the companies should do business with each other (Osterwalder, 2004).

A business model is defined by Osterwalder (2004) as:

A conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams. (Osterwalder, 2004, p.15)

The regional transport companies are in need of a business model to support the collaboration regarding intermodal transport. This report is aiming at fulfilling this need.

### 1.3 PURPOSE

---

The purpose of this report is to develop a business model, which enables collaboration regarding intermodal transport between regional transport companies and determine when this business model is applicable.

## 1.4 PROBLEM ANALYSIS

---

In order for the business model to be applicable, the prerequisites for intermodal transport, discussed in Chapter 1.2, have to be fulfilled. There are also a number of prerequisites for collaboration that needs to be fulfilled for collaboration regarding intermodal transport to be sustainable.

There are several prerequisites, identified from the literature, which are fundamental for a collaboration to be sustainable. An important prerequisite, according to Porter (1985), is that the business opportunity has to provide a competitive advantage to be of interest for a company. In line with this, the collaboration regarding intermodal transport must provide competitive advantages for the regional companies to be interested in collaboration.

Another prerequisite is that all companies involved in the collaboration have to be separately profitable (Dacin, Hitt & Levitas, 1997). This is especially important when each collaboration partner is an independent company and a general optimisation will not be satisfactory for all parties (TFK, 1998), which is the case for the regional transport companies.

The involved companies do also need to be committed to the collaboration and trust need to be present between the collaboration partners (Speakman, Kamauff & Myhr, 1998) for the collaboration to be sustainable. One necessary aspect to achieve commitment and trust is that the involved companies need to perceive the collaboration set-up as fair. The involved companies do also need to have common goals and strategies (Cruijssen, Dullaert & Fleuren, 2007).

The activities between the collaboration partners need to be coordinated for the collaboration to be sustainable (Mohr & Speakman, 1994). Another prerequisite is that the collaboration partners have access to necessary information (Simatupang & Sridharan 2002).

The mentioned prerequisites, in this chapter and in Chapter 1.2, will decide when collaboration regarding intermodal transport is applicable. The prerequisites for collaboration described in this chapter will also form the foundation for the development of collaboration strategies for the business model, to enable collaboration regarding intermodal transport.

For the regional transport companies to achieve common goals and strategies, they need to have a developed collaboration strategy for the overall collaboration. The regional transport companies need to have a developed collaboration strategy for how to gain value from collaboration regarding intermodal transport. It is also necessary for the regional transport companies to have a collaboration strategy for which customer segments that should be a part of the collaboration. Collaboration is difficult since the different actors represent different agendas. Each actor sees to their own and their customers' needs (Thompson, et al., 1991). The relationship between the collaboration partners need to be handled and a collaboration strategy for this is therefore necessary. For all collaboration partners network to be profitable, they have to capture the potential of high resource utilization. A collaboration strategy for handling the activities in the collaboration has to be created. All actors do also have access to different

resources (Jap, 2001). A collaboration strategy for how to handle the resources is necessary for the collaboration to succeed. It is necessary to have common strategies for sharing profit. But uneven goods flows make it difficult to fairly allocate profit between the different parts of the transport chain. To achieve a sustainable collaboration, a collaboration strategy for profit allocation is necessary (Kong, Zhang & Song, 2008).

The problem analysis has highlighted the prerequisites in need of collaboration strategies and suggested areas where collaboration strategies are necessary to enable a sustainable collaboration regarding intermodal transport.

## 1.5 RESEARCH QUESTIONS

---

The two different aspects of the purpose are deconstructed into one main research question each. The main research questions will then be divided into two respective six sub-research questions.

As described in the earlier chapters, the applicability of the business model depends on the fulfillment of prerequisites for collaboration regarding intermodal transport. This will lead to the first research question. The two types of prerequisites will be sub-questions, necessary to answer the first main research question.

RQ 1 - What prerequisites need to be fulfilled for collaboration regarding intermodal transport to create business opportunities for regional transport companies?

RQ 1A - What prerequisites need to be fulfilled for intermodal transport to create business opportunities for regional transport companies?

RQ 1B - What prerequisites need to be fulfilled for collaboration to create business opportunities for regional transport companies?

Both the prerequisites for intermodal transport and the prerequisites for collaboration need to be fulfilled for collaboration regarding intermodal transport to be beneficial. The first main research question will answer for when collaboration regarding intermodal transport can create business opportunities for regional transport companies and they will thereby decide when the developed business model will be applicable.

To enable collaboration regarding intermodal transport, the collaboration strategies in the business model should be developed to fulfill the prerequisites for collaboration regarding intermodal transport. The second main research question will answer for how the content of the business model should look like to fulfill the prerequisites. Six sub-questions will help decide the content of the business model.

RQ 2 - How should a business model be performed to include collaboration strategies that enable a sustainable collaboration regarding intermodal transport between regional transport companies?

RQ 2A - How should value be captured from collaboration regarding intermodal transport?

RQ 2B - How should the customers be segmented to provide a suitable customer base for collaborations regarding intermodal transport?

RQ 2C - How should the relationship between collaboration partners be structured in a collaboration regarding intermodal transport?

RQ 2D - How should the activities be structured in a collaboration regarding intermodal transport?

RQ 2E - How should the resources be structured in a collaboration regarding intermodal transport?

RQ 2F - How should the profits be allocated in a collaboration regarding intermodal transport?

The answers to the second main research question will result in the necessary collaboration strategies and will in the end of this report be presented as a business model for collaboration regarding intermodal transport.

## 1.6 SCOPE OF THE REPORT

---

The scope of the report is focused on the interface between regional transport companies in a horizontal collaboration regarding intermodal transport, including the transport modes road and rail.

The physical activities connected to intermodal transport such as the short distance transport, the terminal activities and the rail transport are important to consider in the intermodal transport system. However, it is not the intention in this report to include a detailed model of the physical activities, since the focus is on the contact between the companies and not on how to operate the short distance transport, the terminal or the rail transport. Neither are the companies' internal procedures included in the scope of this report since the focus is on the interface between the regional transport companies and not on their internal procedures. The physical activities of intermodal transport and the regional transport companies' internal procedures will, therefore, be regarded as a black box, which results in a result on a strategic level rather than on an operative level.

## 1.7 DISPOSITION OF THE REPORT

---

The report is divided into six parts, each including a number of chapters, as showed in the table of content. The first part introduce why this study has been performed and continues with describing the regional transport companies possibilities to collaborate regarding intermodal transport. Last, the method for the study will be presented and explain how the study has made to guarantee a trustworthy result.

The second part of the report is the theoretical framework, where the foundation for the report is laid. First, the development of the theoretical framework is presented, followed by a detailed description of the prerequisites for collaboration regarding intermodal

transport. In the last part of the theoretical framework the collaboration strategies for handling the prerequisites for collaboration is described.

In the third part, after the theoretical framework has been presented, analytical models are developed from the theoretical framework in order to use the theoretical framework to create a business model for collaboration regarding intermodal transport.

The fourth part presents the studied regional transport companies' relation to collaboration regarding intermodal transport from the empirical study.

The analytical models from the third part are used, together with the rest of the theoretical framework, to analyze the empirical data, in the fifth part of the report. The analysis will form a foundation for the result of the report.

The sixth, and final part, presents the result of the report. The result will be presented in form of a business model and by recommendations for when the business model is applicable. The presented result is discussed, including a discussion about implications from the business model for the regional transport companies, a presentation of the adaptability of the business model to other situations, a sensitivity analysis, validity and reliability of the result and other implications of the business model. Furthermore, the discussion chapter will include a discussion about areas that could benefit from future research. At the end of the report the conclusions of the report is presented.

## 2 REGIONAL TRANSPORT COMPANIES' POSSIBILITIES TO USE INTERMODAL TRANSPORT

---

This chapter will discuss the opportunities that exist for regional transport companies to use intermodal transport by first explaining the regional transport companies' situation in the transport industry and then follow with an explanation on how intermodal transport can be applicable for regional transport companies with consideration to their situation.

### 2.1 REGIONAL TRANSPORT COMPANIES' SITUATION IN THE TRANSPORT INDUSTRY

---

In this chapter the regional transport companies' situation is described. First the regional transport companies are presented. This is followed by an overview of the competitive situation with the other actors in the transport industry. Last, the transport flows in the market are presented.

#### 2.1.1 Regional Transport Companies

---

Most regional transport companies are member owned companies, jointly owned by the hauliers operating for them. The hauliers are both transport suppliers to the regional transport companies and use them as coordination- and order centrals, at the same time as the hauliers own a part of the regional transport company (Vägverket, 2005). The structure of having the hauliers as both suppliers and owners to the regional transport company creates a special incitement structure for the regional transport companies. It is important for a regional transport company to be able to have a high level of engagement for the hauliers to ensure their profitability<sup>7</sup>.

Regional transport companies work within a large number of fields within the transport industry. Regional transport companies work with short- and long distance transports, machines operations, terminal operations and storage, material supply including gravel and concrete, maintenance of roads and complete transport solutions. Long distance road transport is a large part of regional transport companies business (Vägverket, 2005) and these transports are the focus for this report.

Regional transport companies are located in all regions in Sweden. The companies have a strong regional rootedness, which is an important part of their business idea<sup>8</sup>.

#### 2.1.2 Competitive Situation

---

The regional transport companies' competitive situation is complex. Regional transport companies are subject to competition from road transport operators, rail transport operators and intermodal transport operators, for long distance transport.

The road transport operators can be divided into three categories: hauliers, regional transport companies and forwarders (SIKA, 2009). The forwarders dominate the transport of less-than-truck load goods on road (Vägverket, 2005). Schenker, DSV and

---

<sup>7</sup> Fredrik Bärthel, 23 of February 2009

<sup>8</sup> Representative for the regional transport companies, 27 of January 2009

DHL are three dominating companies within the forwarding industry in Sweden. The competition for long distance road transport is fierce (Flodén, 2007). The deregulation of the Swedish transport market in the late nineties, permitting cabotage, has increased the competition for long distance transport (Vägverket, 2005). Fierce competition leads to lower price and decreased profit margins for the companies. Among the hauliers, profit margins as low as one to two percent is not uncommon (Flodén, 2007).

Within the intermodal transport segment there is competition between the companies from both rail transport operator, road transport operators and intermodal transport operators that have an interest in the intermodal transport market. Green Cargo offers complete intermodal transport solutions to their customers (Woxenius & Bärthel, 2002). Green Cargo has a strategy to enter the market for full transport loads. This is an important segment for the regional transport companies. There is a risk that the regional transport companies will lose market shares to Green Cargo and be turned into a sub-supplier to Green Cargo instead of selling intermodal transport service directly to the consignors or consignees (Bärthel, 2009a).

On the other hand, the competition for the short distance transport is generally not fierce. Close collaboration between the intermodal transport operator and the local transport supplier reduces competition (Woxenius & Bärthel, 2002).

### 2.1.3 Transport Flows

---

The goods transported with long distance transport include all types of goods including a large part of heterogeneous goods (Lumsden, 2006). Forest products stand for a large part of the transported goods and they are often transported over long distances. Beside forest products, groceries are a large transport group (SIKA, 2008). Groceries have grown significantly during the last decades due to centralized production and a transformation toward smaller households. On rail, goods types including metals and forest products dominate the transports (Lumsden, 2006).

There are imbalances in goods flows to and from different regions in Sweden. Empty road transport stands for approximately 23 percent of domestic road transport (SIKA, 2008).

## 2.2 POSSIBILITIES TO USE INTERMODAL TRANSPORT

---

In this chapter, the regional transport companies' possibilities to use intermodal transport, as a business opportunity, will be examined. This chapter will include a description of intermodal transport and the operations involved, followed by a comparison between road transport and intermodal transport. Last, the infrastructure for the intermodal transport network in Sweden will be described.

### 2.2.1 Intermodal Transport

---

An intermodal transport system is characterized by the use of different transport modes for moving goods in one load unit from consignor to consignee. Intermodal transport thereby involves a wide variety of activities, actors and resources (Woxenius & Bärthel, 2008), which needs to be coordinated.

An intermodal transport chain consists of three different physical operations: short distance road transport, transshipment and long distance rail transport. The short

distance road transport is the transport of goods from a consignor or consignee to or from intermodal terminals (Flodén, 2007). Transshipment is the operation that moves the goods vertically between the truck and the train (Lumsden, 2006) possibly including storage if there is a time gap between the train and the trucks arrival to the intermodal terminal<sup>9</sup>. The transshipment requires specialised intermodal terminals with necessary equipment. The long distance transport is performed between two intermodal terminals (Flodén, 2007). The alternatives for how to perform the long distance transport are described below.

Companies can be involved in one or several of the operations in the intermodal transport chain<sup>10</sup>. Intermodal transport requires all the operations to be handled but also a company that coordinates the entire transport chain. Regional transport companies are well suited to handle the short distance transport in the intermodal transport chain since one of their core operations is transport within the own region. Many regional transport companies are also terminal operators and can therefore handle a large part of the intermodal transport chain. The actors responsible for the different operations in the intermodal transport chain often act independently and are thereby difficult to coordinate (Bontekoning, Macharis & Trip, 2004). It can therefore be beneficial to handle a larger part of the physical operations.

There has been an increase in the number of intermodal rail transport operators during the last decade, especially focused on shuttles between large harbors and inland terminals (Bergqvist & Woxenius, 2008). The rail transport market has been deregulated since 1996 and this has made it possible for more companies to enter the rail market (Flodén, 2007), why the development toward more intermodal rail operators can be expected to continue in the future.

The resources for intermodal transport include load units that can differ from the load units for road transport (Bärthel, 2009a). To make the transfer between transport modes efficient, the goods are loaded in standardized load units (Flodén, 2007). Intermodal transport is highly dependent on standardization and the goods are loaded into load units that are suitable for intermodal transport (Bärthel, 2009a). The load units need to be adapted to the limiting overhead contact line and tunnels, which decide the maximum size of the load units for rail. For road transport it is possible to use larger load units than it is for rail transport (Lumsden, 2006). This means that it might not be possible to use the same load units for intermodal transport as the load units that the companies use for road transport. This creates a need for additional load units. There is equipment leasing companies and jointly operated pools that provide load units to interested companies. The main objective of these kinds of set-ups is to offer better resource utilization but also to reduce the need for investments for the transport companies (Woxenius & Bärthel, 2002).

The transshipment at the intermodal terminal is important for the total transport. The function of the terminal is to bridge the gap in capacity, time and frequency (Hultén, 1997). The capacity of the different transport modes varies greatly between road and rail and therefore the goods have to arrive to, and depart from the terminal during a longer period of time. There is often a waiting time for loading and unloading because of

---

<sup>9</sup> Fredrik Bärthel, 23 of February 2009

<sup>10</sup> Ibid

the uneven distribution of arrivals and departures and the limited capacity at the terminal (Lumsden, 2006) which increases the total transport time and decrease the flexibility.

### 2.2.2 Comparison between Intermodal Transport and Road Transport

The choice of transport mode within Sweden is often between road transport and intermodal transport. For that reason, the applicability of intermodal transport often depends on how competitive intermodal transport is compared to road transport. The different transport modes have different effects for the regional transport companies, due to the transport modes characteristics. A comparison between the transport modes clarifies the differences between different transport modes.

Road transport is subject to external threats. The road transport network runs the risk of being congested, which is a problem as congestion causes uncertainty in time and increased pollution (Flodén, 2007). The rules and regulations regarding resting hours for the drivers have hardened, with increased cost for long distance transport by road as a consequence<sup>11</sup>. Road transport is dependent on the price for fuel since the cost for fuel is a large part of the total cost for the transport (Lumsden, 2006). The price for fuel has increased over the last decades (SPI, 2009). A large part of the cost for fuel is environmental taxes (Lumsden, 2006). Increased fuel prices pose a risk for road transport.

Road transport is exposed to risks of regulations and taxes impeding its applicability. The environmental regulations are constantly tightening, as Wu and Dunn indicated already in 1995. In a study by SIKa (2007) it is suggested to introduce a kilometre tax in Sweden in order to better balance the price for the transport with the external costs. The logic behind governmental regulations to internalize external cost is that those who are paying directly for the cost they impose, have more incentives to use resources efficiently and act environmentally sustainable (Litman, 2004). A goal within the EU is that in year 2020 ten percent of all gasoline and diesel should be replaced by bio fuels (Miljödepartementet, 2008).

A study by Jensen (1990) shows that there are potential for great cost savings with intermodal transport, compared to road transport, if the intermodal transport system is designed correctly. Rail transport is often cost efficient due to low energy consumption and economies of scale (Kreutzberger et al., 2003). The cost savings for intermodal transport in comparison to road transport is 10-40 percent for long distances<sup>12</sup>.

Intermodal transport has a lower environmental impact than road transport since it can utilize the environmental sustainability of rail transport on long distances (Kreutzberger et al., 2003). Rail transport has low environmental impact since electricity is mainly used as an energy source for the rail transport and therefore there are no direct emissions from the transport in comparison to road transport that have much direct emissions. The environmental impact from rail transport comes from the production of the electricity (TFK, 1998) and the environmental impact from rail transport is thereby dependent on how the electricity is produced.

---

<sup>11</sup> Fredrik Bärthel, 23 of February 2009

<sup>12</sup> Fredrik Bärthel, 23 of February 2009

Road transport is characterised by flexibility in time and location, which enables the trucks to operate with limited planning and allows changes in the departure, arrival and route planning with short planning horizons. Intermodal transport is more restricted than road transport. The frequency, departure and arrival of trains are strictly defined and predetermined. The use of rail requires coordination with other rail users, as there can be only one train on a specific rail section at the same time. For an efficient use of the tracks, the track access is divided into time-slots that are stipulated by the rail administration for a longer period of time. When the tracks are highly utilized, available time-slots become scarce, resulting in less flexibility and more time restrictions for the transport (Sommar, 2006b). Intermodal transport includes more process steps than road transport and since each step is time-consuming, intermodal transport will have problems with lead time for the transport. The transport time is in average 30 percent longer for rail transport than for road transport (Lumsden, 2006). In conclusion intermodal transport is often less flexible and have longer lead time than road transport.

A study by Sommar & Woxenius (2005) indicates that the transport time reliability of intermodal transport in Sweden is low.

A problem for intermodal transport systems is that it is difficult to offer the same security as with a direct road transport. More operations and actors are involved in an intermodal transport making it more difficult to guarantee the security. For the security aspect, both information and traceability and the handling and securing of the load units is of great importance (Birgander & Persson in Bark, Jonsson & Nelldal, 2008).

The characteristics of road transport and intermodal transport described in this chapter is determining for the applicability of the two transport modes. The regional transport companies' choices of transport mode depend on the evaluation of these characteristics.

### 2.2.3 Intermodal Transport Infrastructure in Sweden

Transport is dependent on the available infrastructure and the regional transport companies' opportunities to use intermodal transport are dependent on the intermodal transport infrastructure in Sweden and how the development of it continues.

Intermodal transport is dependent on physical transport infrastructure such as access to roads, terminals and rail. The infrastructural situation might change with new roads, terminals and railways, which might change the possibilities to use intermodal transport in different regions in Sweden. The Swedish intermodal infrastructure with important goods flows and nodes can be seen in Figure 1. The figure shows the differences between the different regions in Sweden, which means that different regional transport companies have different possibilities.

The rail infrastructure in Sweden is much sparser than the infrastructure for road. The most of the rail infrastructure was built for over 100 years ago and is not adapted to the demands of today (Lumsden, 2006). The Swedish government is aiming at creating the prerequisites for a development of intermodal transport in Sweden with regulations that are necessary for the market to work, both economically and competitively, and development of the necessary infrastructure. The development concerns both rail transport and intermodal terminals (Banverket, 2007).

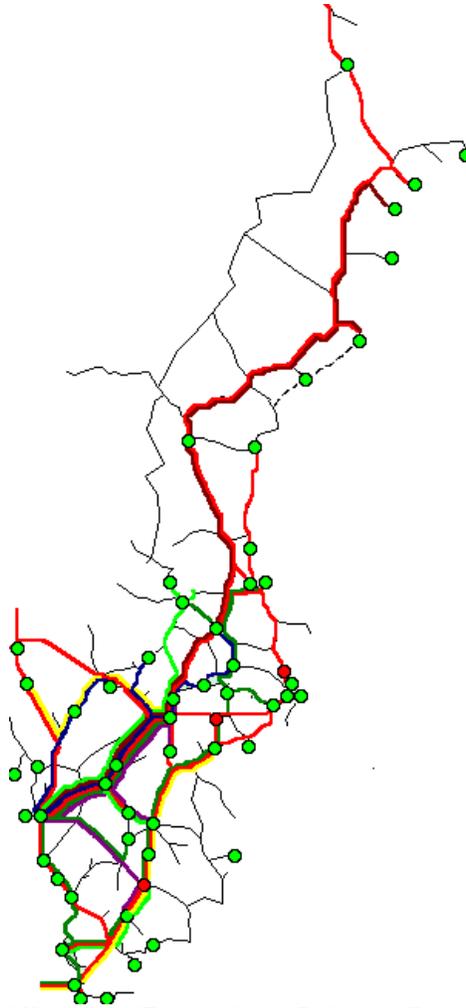


Figure 1 The Swedish Intermodal Network of Terminals and Railways (Bärthel, 2009b).

In 2004, the Swedish government decided on a plan for the investments in infrastructure until 2015. One third of the total investments were allocated to investments in the rail infrastructure. The investments will result in an increased rail capacity and the prerequisites for handling larger transport volumes are created (Banverket, 2004). The Swedish rail system is currently undergoing an upgrade to accommodate transport of bigger and heavier goods and load units (Flodén, 2007). The goal is that the strategic rails and nodes will be able to handle longer trains and to increase the capacity with more tracks (Banverket, 2004). The investments in rail transport will affect the possibility to use intermodal transport in the future.

In Godstransportdelegationen's (2004) observation it is concluded that it is central to facilitate the transshipment of goods since these activities are costly. The conclusion in the report was that it could be an opportunity to have a number of strategically important terminals managed by the government and where the cost are calculated by the cost for the society rather than according to market prices. The Swedish Rail Administration will probably develop a network of terminals according to this principle (Banverket, 2007).

### 3 METHOD

---

The method chapter will present how the project has been performed and thereby show that the final result is trustworthy. For the report to be trustworthy, the method for the project has to suit the purpose. It is therefore important to know what category the project belong to and what the most suitable method for this category is. Then, it is necessary to know the requirements for a trustworthy report. After this, the structure for the project in order to fulfill the requirements will be explained.

#### 3.1 METHOD FOR APPLIED RESEARCH

---

The project is categorized as applied research, presented by Hart (1998). Applied research is aiming at producing recommendations or solutions to a problem that are faced by a group of people in a certain situation. This project is aiming at producing collaboration strategy recommendations in form of a business model for a network of regional transport companies thinking about entering or developing their usage of intermodal transport. According to Hart (1998), applied research answers questions starting with “how” and “when”. The purpose of this report has two sub parts, one “how” and one “when” part, which confirm the categorization of applied research.

In applied research, theoretical knowledge is necessary and the theory should be developed to suit a real world situation, in order to provide recommendations (Hart, 1998). For these reasons, both theoretical and empirical data are used in this project.

#### 3.2 VALIDITY AND RELIABILITY

---

For the result to be trustworthy, it has to be both valid and reliable (Lantz, 2007). The validity and reliability partly depends on the methods used during the performance of the project and partly on the outcome of the methods. Both the literature study and the empirical study affect the trustworthiness of the result.

The validity relates to the method used to perform the reports and how good the fit between the method and the purpose of the report is. It is necessary that the project studies what it is expected to study without any systematical errors, for the result to be valid. It has therefore been important to support the used methods with theory. An extensive literature study about research methodologies and data collection techniques has supported the used methods and increased the validity. To be able to reach valid results, the definitions used has to be clear, to be able to avoid misunderstandings (Wallén, 1996). For the interviewees, the readers of the report and the authors to have the same definitions for all concepts, the critical concepts have been interpreted in Chapter 3.7.

Reliability is related to the results that are received from a study. The results are reliable if they are confirmed as true. Reliability is achieved through concurrence of opinion from several different sources (Wallén, 1996). To achieve reliability from the literature study, several different sources has been studied to assure that they correspond to the general view.

Interviewees do more or less consciously decide what will be said during the interview and what will not (Lantz, 2007). However, the validity in an interviewee's statement is generally accepted to be of high quality (Gillham, 2008). The interviewees in this empirical study are the CEOs of the regional transport companies. Since they run the businesses, they are expected to have enough insight in the discussed topic. The remaining participants in the brainstorming sessions are chosen by the CEOs because of their special knowledge in the topic and are therefore also seen as reliable. The result from the interviews have been sent back to the interviewees to get feedback, see Chapter 3.5.3, which will increase the reliability.

To assure the quality of the literature study, the literature used has been critically reviewed according to recommendations from Chalmers Lindholmen (2002). The criticism of the sources is based on the reliability of the author as well as the topics they deal with and its relevance to the topic in this report. Most literature used in this report is published in journals or printed books.

The most important aspect of the trustworthiness in the report is that the created business model should be usable for the regional transport companies. The presented result is reliable if it corresponds to the theory, but it also has to correspond to the companies' requirements and goals to be valid. It does not matter how reliable the result is if the companies do not believe that it is suitable for them, and thus valid in their reality.

The result will be implementable in reality if it corresponds to the opinions of the companies. It is important that the conclusions made from a small group will be valid for a larger group, for the results to be valid (Lantz, 2007). A seminar in the end of the project process have assured that the developed business model suit the companies' requirements and fit their way of working. At this seminar, all regional transport companies within the network participated and assured that the results are valid for the entire network and not only for the studied companies.

### 3.3 PROJECT CHARACTERISTICS

---

The reliability of the result partly depends on the type of project, the project organization and the time that is spent on it.

The project has been performed by the two authors. To secure the quality of the result, the project has been guided by four supervisors with profound knowledge in relevant areas. The supervisors have been involved in all project steps throughout the project. Since the supervisors have different views on the project, they have offered different kind of assistance in the development of the report.

Firstly, the supervisor at WSP has provided daily support. He has acted as a coordinator and in the role as a consultant he has provided overall insight into the transport market. Secondly, the supervisor representing the regional transport companies has provided information about the represented companies. He has also provided insight into the regional transport companies' expectations and requirements of the result from the project. Thirdly, the supervisor at TFK has been a neutral platform with expertise within intermodal transport. Fourthly, the supervisor at Chalmers University of Technology has

provided academic support. He has been unbiased in the project and has therefore been able to provide an objective point of view.

The supervisors have, together with the literature study, provided an external perspective to the project. According to Danielsson (1983), two perspectives are often necessary to be able to understand a problem, both an internal- and an external perspective. It is therefore necessary to talk to both academics and practitioners (Burton & Steane, 2004), which in this project has been the supervisors and the regional transport companies. The group of supervisors, together with the interviewees, has provided complete support for the project, as the interviewees has provided an internal perspective.

The project has been performed by the authors as a full time occupation from January to May 2009. The supervisors have also spent significant time during the entire project period to support the project.

### 3.4 PERFORMANCE OF LITERATURE STUDY

---

In this chapter the performance of the literature study will be described to show the trustworthiness of the result.

#### 3.4.1 Theoretical Framework

---

According to Hart (2001), two types of literature studies needs to be performed in a research project, one literature study about the topic of the project and one literature study about research methodology and data collection techniques.

Both the literature study about the topic and the literature study about research methodology and data collection techniques have been performed in the same way, described later on in this chapter. However, the results of the two literature studies have been used in different ways in the report and is presented in different chapters. The result of the literature study about the topic is presented in the theoretical framework, the second part of the report, while the result of the literature study about research methodology and data collection techniques form a foundation for the method, Chapter 3, including the literature and empirical studies as well as the validity and reliability of the report.

The way a research project is performed is highly affected by the literature found during the literature study (Hart, 1998) and the result is affected by the performance of the project (Hart, 2001). For these reasons, the literature study about research methodology and data collection techniques is important for this project and was therefore performed at an initial stage in the project process. In this way, the methods used during the project were chosen consciously rather than randomly. It is important that the purpose of the project form the foundation for the selection of method to avoid adjustments of the purpose (Marshall & Rossman, 1999). The method for the project was chosen to suit the purpose of the report, as described in Chapter 3.1. The literature study also plays a major role for the trustworthiness of the result (Hart, 1998). The literature study has covered several different methodologies and techniques to be able to choose the appropriate ones for this project.

A literature study about the topic is essential for all research projects (Hart, 2001) for several reasons. The literature study is meant to be a justification of the project. The project becomes trustworthy when all statements are backed up by theory, why it has been important to perform a sufficient literature study at an early stage of the project process. It is necessary to have understanding about previous research to be able to develop new research (Hart, 1998). The purpose in this report is to develop the existing theory to suit a specific case. The theoretical framework, in the second part, is therefore of great importance for this report.

Since the literature study is the foundation of the entire research project it is important to not only know what is written about a topic, but also why, when and how it is written (Burton & Steane, 2004). To be able to perform a literature study in an effective way, the literature search needs to be planned before it takes place (Hart, 1998). The literature study in this project was therefore planned before the search for literature was performed. When the literature search began, it was known what information to search for. Only a pre-literature study was made before the literature search was planned, to be able to support the purpose and research questions for the report.

A literature search across different disciplines provides broader understanding and insight. The literature study for this report has included different searching methods and different sources of information. Books and articles are the most common ways to find information (Hart, 2001) and have been used in this project, together with dissertations, working papers, official documents etcetera.

According to Burton and Steane (2004), a broad literature study is achieved if the references from studied literature are used to find additional literature. This method has partly been adapted in the performance of this project. According to Burton and Steane (2004), the literature search is complete when no further information can be found through references. This method is perceived as unsatisfying by the authors, why new information also has been searched in other ways.

The validity of the theoretical framework is confirmed by the use of recognized methods for literature studies.

### 3.5 PERFORMANCE OF EMPIRICAL STUDY

---

In this chapter the performance of the empirical study will be described to show the trustworthiness of the result. The interviews form the foundation of the empirical study. The validity of the interviews is confirmed by feedback from the interviewees concerning the data received from these sessions. The validity of the result is confirmed by feedback from a seminar that will be held in the end of the project.

#### 3.5.1 Choice of Studied Companies

---

The selection of relevant interviewees for the project is an important step in the empirical study (Bryman & Bell, 2003). In order to get a group of companies that can provide insight into all the regional transport companies, Bryman and Bell (2003) indicates that a representative group of interviewees that reflects the entire population should be chosen. According to Gillham (2008), the achieved data is more qualitative if deeper interviews is made with few companies, compared to if a larger amount of

companies are included in a more shallow study. In-depth data from the regional transport companies are necessary to fulfill the purpose of the report.

Therefore, five regional transport companies have been chosen as representatives for the regional transport companies. The regional transport companies in this study were chosen because they are located in different regions in Sweden, have different situations and different experience of intermodal transport.

A representative for the regional transport companies chose five regional transport companies for the study, in accordance to the aspects described above. The five chosen regional transport companies were chosen as representatives for the network of regional transport companies.

### 3.5.2 Interviews

---

Five in-depth face-to-face interviews have been performed with representatives for the five chosen regional transport companies. The interviewees at the different companies are listed in Appendix A. The interviews have either been an individual interview with the representative at a leading position at the company or a group interview with several representatives at different positions in the company that have resemblance with a brainstorming session.

The decision to base the empirical study on interviews was based on the requirement on in-depth data. From the literature, two alternatives to interviews can be found for this type of project, surveys and observations. Neither surveys nor observations would have been suitable for this project. Surveys would have resulted in too shallow data (Gillham, 2008) which would have been useless for the purpose of the project. It would not have been possible to receive any data at all through observations in this study. The regional transport companies in this study do not collaborate regarding intermodal transport yet and therefore it would have been necessary to observe another comparable collaboration. Since no comparable collaboration exists, observations were not a suitable method for the empirical study.

The performed interviews were partly open and partly structured. According to Gillham (2008) these types of interviews result in high quality data since they are both structured and flexible. The achieved data from this type of interview technique is deep, since the interviewee can talk freely about the topic, but still possible to analyze, since all interviewees have answered the same questions (Gillham, 2008). Closed questions have also been avoided to be able to achieve trustable deep data (Häger, 2007).

The interviews with the regional transport companies were performed in a late stage of the project process. The late stage made it possible to avoid one of the most common mistakes, described by Lantz (2007), to collect the data before the problem analysis and purpose of the project are clearly stated. The late stage interviews also provided time to prepare the interviews. A partly opened and partly structured interview technique requires a lot of preparation. The questions for the interview are based on the theoretical framework, which in turn is based on the research questions. During the preparation process, the interview questions have gone through several steps. They have been discussed with all involved parties to end up in their final form. The quality of

the data increases if the questions are well worked through (Gillham, 2008) which lead to valid data from the empirical study, presented in Chapter 3.2.

To achieve as much data as possible from an interview, it is important to have a thorough knowledge about the discussed topic, to be able to grasp the information revealed during the interview in a productive way (Gillham, 2008). An early stage literature study, presented in Chapter 3.4.1, was made to increase the knowledge about the topic. To be able to formulate valid conclusions from the interviews, the interviewer also needs to have knowledge about interview techniques (Lantz, 2007). For that reason, a literature study about interview techniques was performed before the interviews, as described in Chapter 3.4.1.

During the interviews, a voice recorder was used to assure the quality of the outcome data. Gillham (2008) argues that the usage of a recorder makes the interviewers listen more carefully on the interviewee, and in that way the outcome data reflects the interviewee in a more true way. Notes were also taken during the interviews. One of the authors was the leader of the interview, while the other one was taking notes.

The group interview structure resembled a brainstorming session. In a brainstorming session, ideas are brought forth through joint free association (Andersen & Schwencke, 1998). Brainstorming is useful for attacking specific issues where a collection of new ideas is needed (Harris, 1998). Brainstorming is suitable for this study because new ideas are necessary to understand the internal perspective of the project.

The participants in the brainstorming sessions are a group connected to the respective studied regional transport company. A representative in a leading position at the studied regional transport companies have participated in the brainstorming session and was responsible for selecting the participating group, see Appendix A.

### 3.5.3 Feedback on Interviews

---

After the interviews were made, the collected data was broken down and coordinated into different topic areas. A compilation of the data from the interviews was sent out to the interviewees for them to validate the data before it was used in the analysis.

### 3.5.4 Seminar

---

A seminar was held in the end of the project, together with the authors, supervisors and all CEOs at the regional transport companies. The purpose of the seminar was to validate the result. All comments and thoughts from the involved parties at the seminar also helped to develop the project further.

## 3.6 ANALYTICAL MODELS FOR THE ANALYSIS

---

Two analytical models will be used for the analysis in this report. The first analytical model is a SWOT analysis that will be used to analyze the theoretical framework. Experience and learning is the second analytical model presented in this chapter that will be used to analyze the empirical data. The analysis was made with the help of these two models as a comparison between the theoretical framework and the empirical data. In the analysis more models have been developed by the authors and used later in the analysis.

### 3.6.1 SWOT analysis

---

In order to decide for what type of collaboration regarding intermodal transport the business model should be performed for, it can be useful to do a SWOT analysis, as suggested by McDonald (2008). A SWOT is a summary listing of internal differential strengths and weaknesses in comparison with competitors and external opportunities and threats. By identifying the critical success factors for the collaboration regarding intermodal transport, and important outside influences and their implications, the key issues to be addressed will emerge. McDonald (2008) means that having completed a SWOT analysis fundamental assumptions on future conditions can be made relating to the aspect under consideration. A SWOT analysis is therefore made in order to determine what collaboration strategies the business model for collaboration regarding intermodal transport should include.

### 3.6.2 Experience and Learning

---

A company's experience has great effect on how a company perceives the reality and learning changes a company's perception of reality according to Burgoyne & Hodgson (1983 in Cope & Watts, 2000). Therefore, it is important to take experience into consideration when analyzing the result from the empirical study. The result from the empirical study has to be set in a context (Bryman & Bell, 2003). Bryman and Bell (2003) argues that it is not possible to understand the views of a company other than in terms of the specific situation in which they are present. How experience effect learning is explained by Marsick & Watkins (1990 in Cope & Watts, 2000) who means that learning is often experienced based, non-routine and tacit. Learning through experience is a continuous process indicates Cope and Watts (2000), which would mean that the more experience a company have of a specific area, the more the company has learned. Learning by doing, changes the company's attitude towards a problem. Companies get a background consciousness by handling certain situations and this consciousness change gradually and the perception of an aspect changes (Burgoyne & Hodgson, 1983 in Cope & Watts, 2000).

## 3.7 INTERPRETATIONS OF USED CONCEPTS

---

Many concepts that are used continuously throughout the report can be ambiguous or easy to misunderstand. Interpretations of these concepts are necessary to support a precise understanding of the context in the report.

#### Network of regional transport companies

The network of regional transport companies for which this project has been performed.

#### Studied regional transport companies

The five regional transport companies, in the network of regional transport companies, which participated in the empirical study.

# PART II

---

## 4 DEVELOPMENT OF THEORETICAL FRAMEWORK

---

The theoretical framework has two parts, connected to the two main research questions. One chapter is about the prerequisites for collaboration regarding intermodal transport. The other chapter is about collaboration strategies. In this chapter it is described how these two theoretical chapters have been developed. As the purpose of the report is to develop a business model, the business model framework that will be used to present the collaboration strategies will also be presented in this chapter, as the collaboration strategies will be developed according to it.

### 4.1 FULFILLMENT OF PREREQUISITES BY COLLABORATION STRATEGIES

---

The prerequisites for collaboration regarding intermodal transport have two implications, as stated in Chapter 1.5. First, the prerequisites will be used in themselves to determine when collaboration regarding intermodal transport is applicable. Then the prerequisites will act as the foundation for the collaboration strategies, which will be presented in the business model. It is necessary to conclude the prerequisites for collaboration regarding intermodal transport before it is possible to develop the collaboration strategies that is necessary to fulfill the prerequisites. The collaboration strategies are the solutions created to solve the fulfillment of the prerequisites. For that reason it is important that all prerequisites that exist are brought up in the theoretical framework.

All prerequisites are constant, but the possibility to fulfil the prerequisites can change. The collaboration strategies should therefore affect the possibility to fulfil the prerequisites in the extent suitable for the type of collaboration.

### 4.2 HIERARCHY OF PREREQUISITES

---

As stated in Chapter 1.4, there are two kinds of prerequisites, one kind connected to intermodal transport and one kind connected to collaboration. Together they form the prerequisites for collaboration regarding intermodal transport, see Figure 2.

The prerequisites for intermodal transport are the most basic prerequisites. To enable collaboration regarding intermodal transport, intermodal transport must first be enabled. For that reason, it is important to fulfill the prerequisites for intermodal transport before the prerequisites for collaboration is considered. Collaboration regarding intermodal transport will not provide any value if it is not possible to use intermodal transport.

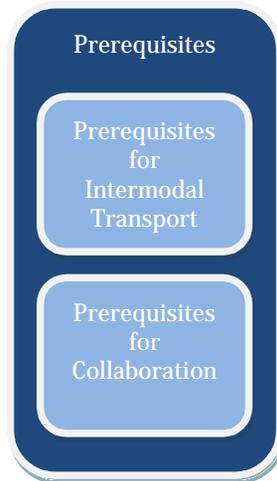


Figure 2 Prerequisites for Collaboration regarding Intermodal Transport

The prerequisites for intermodal transport include some aspects that are difficult to affect while the prerequisites for collaboration only depend on the collaboration strategies.

### 4.3 COLLABORATION STRATEGIES REQUIRED IN A BUSINESS MODEL

---

A business model is a suitable way to present collaboration strategies. In this chapter, the business model framework will be decided. Thereafter the content of the business model framework will be presented and the relation between the business model framework and the collaboration strategies will be clarified.

#### 4.3.1 Choice of Business Model Framework

---

A business model is, as described in Chapter 1.2, a guide for how a company should do business. Linder and Cantrell (2001) have identified three characteristics of a successful business model. First, the business model must offer a unique value to the companies' customers. This value can either originate from a new idea or from a new combination of resources. Second, a successful business model builds barriers to entry and is difficult to imitate which keeps it profitable over a longer period of time. Last, a successful business model is grounded in reality and based on accurate assumptions.

A business model should not be a static element. It should be continuously changed and innovated in order for a company to keep its competitiveness (Osterwalder, 2008). Companies often have multiple and coexisting business models and it is a strategic differentiator for the company to be able to create new business models for new business opportunities (Osterwalder, 2004). The business model created in this report is not a substitute for the regional transport companies' current business models. Instead it is a complementary business model, only concerning the collaboration regarding intermodal transport between the regional transport companies.

In the literature, several different frameworks for business models can be found (e.g. Chesbrough & Rosenbloom, 2002; Johnson, Christensen & Kagerman, 2008; Linder & Cantrell, 2000; Osterwalder, 2004). A choice of business model framework is therefore necessary. The chosen business model framework will be used to present the collaboration strategies for the regional transport companies, in Chapter 12.1.

In the literature, almost all business models are based on similar building blocks (for a review, see Osterwalder, 2004). Therefore, the result of the business model will not be dependent on the choice of framework, only the presentation of it will differ.

The chosen business model framework has to be specific enough for the regional transport companies to be able to use it as a strategy for the collaboration and at the same time it has to be general enough to suit all regional transport companies in the network (Flodén, 2009). Flodén (2009) has described a general business model, Local Cooperation Model, for local actors collaborating regarding intermodal transport in different parts of the transport chain. The Local Cooperation Model is based on the business model framework by Osterwalder. Osterwalder's business model framework is a hybrid of other previously made business model frameworks (Flodén, 2009) and to be able to create the business model framework, Osterwalder (2004) did a major investigation about existing business model frameworks. The building blocks in Osterwalder's business model are used in this report because they are thoroughly reinforced and closely connected to the Local Cooperation Model and therefore a suitable framework for a business model for a collaboration regarding intermodal transport between regional transport companies.

The framework of Osterwalder's (2004) business model contains a set of nine building blocks that describe the logic behind the business presented in Figure 3, in the next chapter. To be able to develop a business model, it is necessary to know what to include in the different building blocks. The content in the business model should depend on the specific characteristics of the collaboration partners, on their strengths and weaknesses as well as the collaborations opportunities and threats (Osterwalder, 2004).

#### 4.3.2 Content of the Business Model Framework

Osterwalder's building blocks is categorized into four categories, see Figure 3 below.

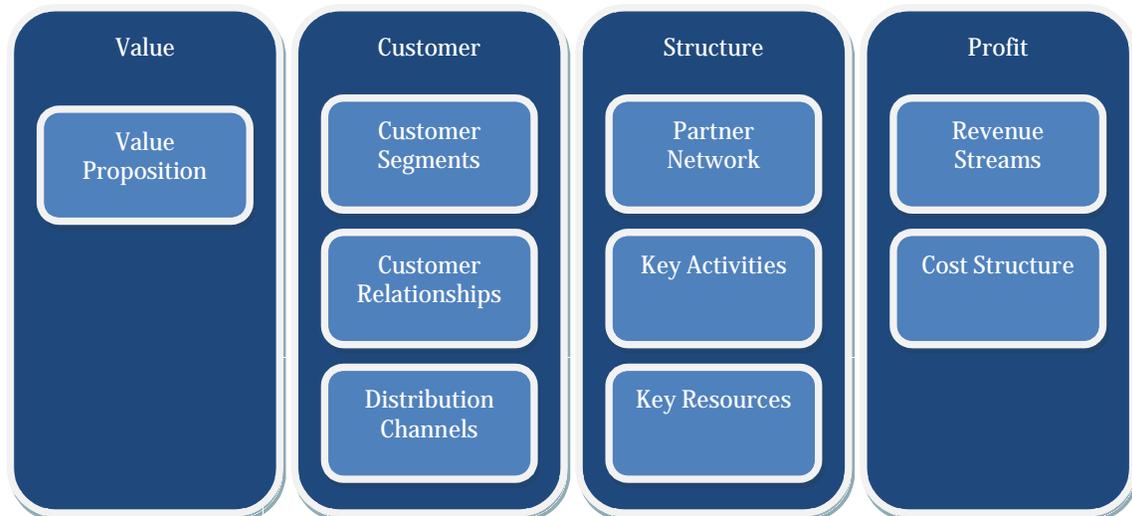


Figure 3 Business Model Framework (based on Osterwalder, 2004)

The value proposition describes a company's offer to its customers (Osterwalder, 2004). Creating a value is necessary for a company to profit from its business model

(Chesbrough & Rosenbloom, 2002). Value can be created for both the company and its customers.

The customers are arranged into customer segments with similar needs and characteristics. Customers have different needs and characteristics and thereby require different offerings from the company (Osterwalder, 2004).

The customer relationships are outlined in relation to the customer segments (Osterwalder, 2004). A company with information about customer needs can discover new and profitable business opportunities and improve customer satisfaction (Osterwalder, Lagha & Pigneur, 2002).

The business model also describes in which channels the company communicates with its customers. Through the distribution channels, the company offers its value proposition to the customers (Osterwalder, 2004). The above-mentioned building blocks define the value for each customer and show how it is communicated to the customers in relation to the customer needs (Johnson, Christensen & Kagerman, 2008).

A business model is often the result of collaborations between companies. The partner network describes the collaboration partners that the company needs to provide the value proposition and how the relationship is organized with consideration to activity and resource organization. Since collaborations are voluntary arrangements between independent companies, commonly negotiated terms and conditions are necessary (Osterwalder, 2004).

At the basis of the business model are the activities that need to be performed by the company itself or within a network of partners (Osterwalder, 2004). For a company to be successful it must have operational and managerial activities that allow it to deliver value (Johnson, Christensen & Kagerman, 2008).

At the basis of the business model there also is a set of resources a company must have access to, to make its business model work. The resources can include everything from human resources to brand (Osterwalder, 2004). A company that integrates its resources in a unique way almost always can create a long lasting competitive advantage (Johnson, Christensen & Kagerman, 2008).

The revenue streams are important to identify the customer segments contribution to the overall revenues. Companies that collaborate and offer joint value propositions, profit from shared revenue streams. The cost structure identifies the most important costs resulting from the business model (Osterwalder, 2004). The cost structure will mainly be driven by the cost for the key resources required by the business model (Johnson, Christensen & Kagerman, 2008). In the business model for collaboration, an appropriate profit allocation has to be included (Flodén, 2009).

#### 4.3.3 Relation between the Business Model Framework and the Collaboration Strategies

---

One part of the purpose of the report is to perform a business model including collaboration strategies. The theoretical framework therefore needs to include theories connected to the content of the business model. The business model framework will, for

that reason, be used as a foundation for the theoretical framework. The business model building blocks show the interesting theoretical areas that are necessary to create a business model with strategies for a collaboration regarding intermodal transport.

The business model framework is transformed as it is pulled through the filter of prerequisites for collaboration regarding intermodal transport. The parts of the framework that is irrelevant for the fulfillment of the prerequisites are captured while the rest are let through. The parts of the framework that is relevant for the fulfillment is transformed into collaboration strategies that are aiming at fulfilling the prerequisites for collaboration regarding intermodal transport, see Figure 4.

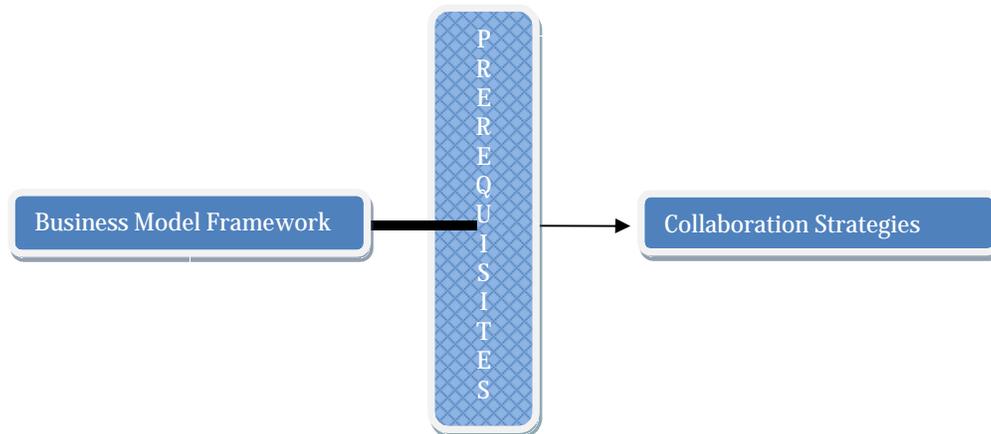


Figure 4 Relation between Business Model Framework and Collaboration Strategies

#### 4.4 CHOICE OF THEORETICAL FRAMEWORK

---

The theoretical framework consists of two parts, which will each be presented in a theoretical chapter. The two parts of the theoretical framework is the prerequisites and the collaboration strategies. The collaboration strategies will build on the result from the first theoretical framework about prerequisites.

In the first theoretical chapter, it is important to separate the prerequisites for intermodal transport and the prerequisites for collaboration, since they have different characteristics, see Figure 5.

As the prerequisites for collaboration regarding intermodal transport should be the foundation for the second theoretical chapter, the two types of prerequisites needs to be summarized before the second theoretical chapter is presented. The relation between the prerequisites in need of fulfillment is presented and leads to the collaboration strategies that are presented in the second part of the theoretical framework.

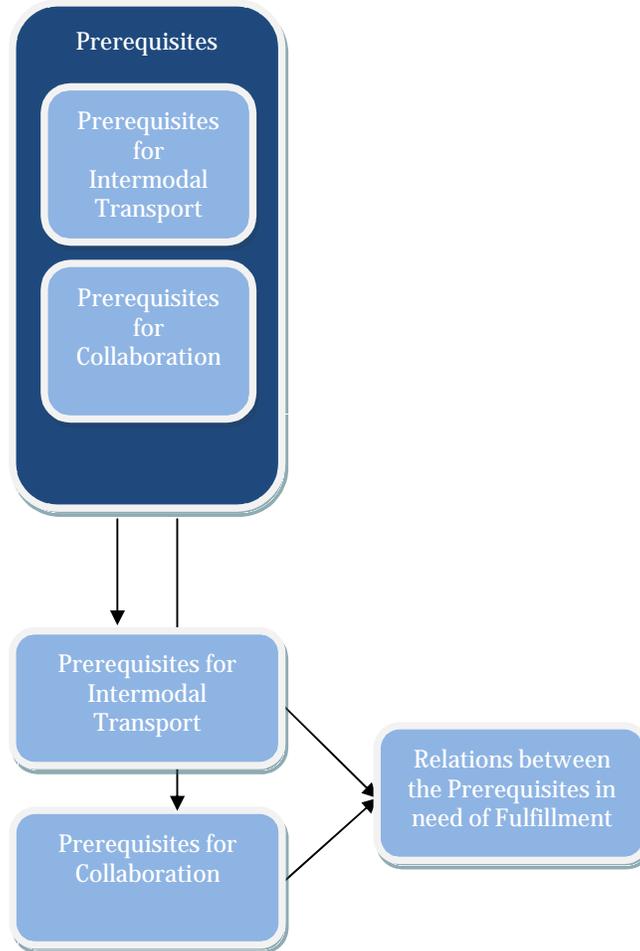


Figure 5 Theoretical Chapters about Prerequisites for Collaboration regarding Intermodal Transport

The second theoretical chapter contains the theory needed to create a business model for the collaboration regarding intermodal transport. The chapter is based on the building blocks in Osterwalder's business model framework, presented earlier in this chapter, see Figure 6.

To be able to create the collaboration strategies fulfilling the prerequisites for collaboration regarding intermodal transport, the prerequisites in need of fulfillment must first be identified. This chapter was therefore developed from the first part of the theoretical framework.

The building blocks concerning the structure will be divided into three chapters, as seen in Figure 6. An import issue in intermodal transport is to have system thinking. The key elements of a network, actors, activities and resources (Anand & Mendelson, 1995), must be well coordinated for the system to be fully utilized. The different parts of the system must work together (Flodén, 2007) since they are closely dependent on each other. As the structure of relationship, activities and resources are a large part of a collaboration, these three parts will be described in one chapter each, in contrast to the other categories of the business model framework.

The six theoretical chapters connected to the building blocks needs to be concluded into a model to show how the collaboration strategies will fulfill the prerequisites for collaboration regarding intermodal transport that are in need of fulfillment, presented in the first part of the theoretical chapter.

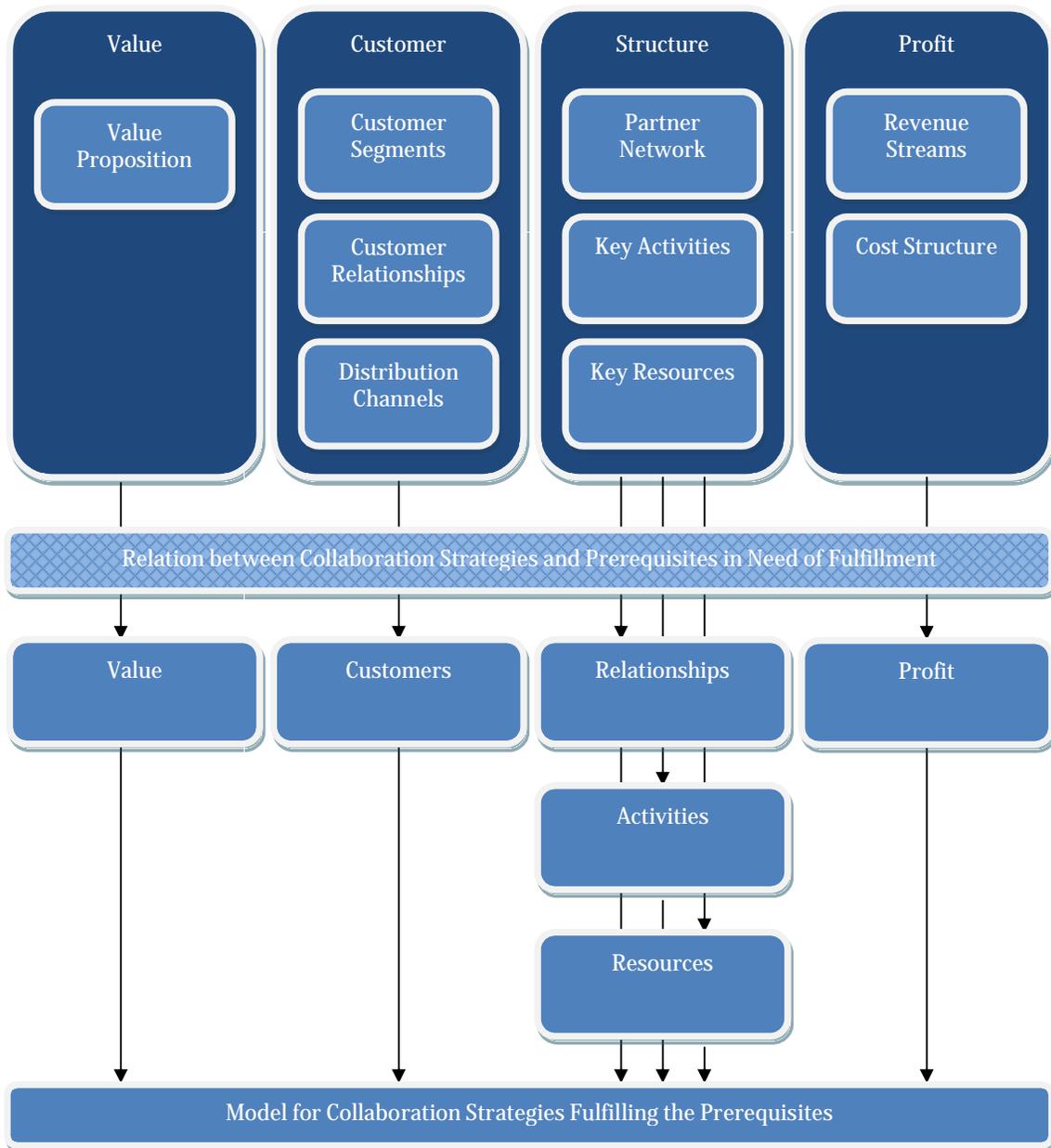


Figure 6 Theoretical Chapters about Collaboration Strategies

## 5 PREREQUISITES FOR COLLABORATION REGARDING INTERMODAL TRANSPORT

---

Prerequisites for collaboration regarding intermodal transport include both prerequisites for intermodal transport and prerequisites for collaboration, that need to be fulfilled for collaboration regarding intermodal transport to be applicable. In this chapter, the two types of prerequisites will be presented. In the end of the chapter, a summary of all prerequisites for collaboration regarding intermodal transport will be presented where the relations between the different prerequisites will be shown. The summarized prerequisites will be used as a foundation for the next theoretical chapter.

### 5.1 PREREQUISITES FOR INTERMODAL TRANSPORT

---

In this chapter the prerequisites for intermodal transport will be described. There are three categories of prerequisites that affect the applicability of intermodal transport: value for the regional transport company, value for the customer and access to necessary resources. These three prerequisites can be divided into more prerequisites, which in different extent are related to each other.

#### 5.1.1 Value for the Company

---

Three prerequisites have been identified in the literature as necessary for intermodal transport to provide value for the company. First, intermodal transport must provide a competitive advantage for the company. Second, intermodal transport must lead to profitability for the company. Last, intermodal transport must enable high resource utilization for the company.

A competitive advantage is important for a company to gain value from intermodal transport. For intermodal transport to be of interest, it must provide a competitive advantage for the company (Porter, 1985). A competitive advantage will ensure the long-term survival of the business but it is also crucial for the company's possibility to enter the new market (Jensen, 1990) for intermodal transport. Companies need to possess and offer competitive advantage superior to those of its competitors (Cunningham & Culligan, 2000) to be successful.

There are two aspects to consider regarding profitability for intermodal transport: costs and revenues. The cost naturally affects the profitability for the transport. The price for transport is often more dependent on the market situation than on the actual costs for the transport, why the revenues also are important. The cost for the transport is both actual transport costs, such as costs for the transport and transshipments, and other costs, such as administration, insurance and fees. There are many costs for the transport that are dependent on distance and time (Lumsden, 2006). The distance to, from and between terminals are of interest to decide however intermodal transport is profitable.

The regional transport companies are member owned companies that are owned by the hauliers operating for them (Vägverket, 2005), as stated in Chapter 2.1.1. It is therefore important for the regional transport companies that the hauliers are profitable as well<sup>13</sup>.

---

<sup>13</sup> Representative for the regional transport companies, 27 January 2009

Since intermodal transport involve two operations that road transport does not, transshipment and short distance transport, the extra costs that are incurred by the transshipment and the short distance transport must be outweighed by the cost savings incurred by the long distance transport (Flodén, 2007) for intermodal transport to be profitable. For this to happen, the distance has to be long enough long to gain enough cost savings. It is not possible to calculate an exact distance for when intermodal transport is profitable because there are too many aspects to consider (Floden, 2009). The minimum distances vary, according to how efficient the transport chain is (Flodén, 2007) but also on how high the resource utilization is. The literature varies in some extent, but distances between 250-500 kilometres are often considered to be the minimum distance for intermodal transport to be profitable<sup>14</sup>.

The cost for the short distance transport also affects the total costs and can therefore not be too long. It is hard to specify an exact distance for when the short distance transport makes the transport unprofitable, since it depends on the long distance transport as well as on the direction of the short distance transport. The maximum distance for the short distance transport also varies according to the efficiency of the transport chain (Flodén, 2007) and on the resource utilization, as for the minimum distance for long transport. Concerning intermodal transport within Sweden, a total distance of approximately 100 km for the short distance transport in both ends of the rail transport can be seen as maximum (Woxenius, 2006 in Zrinscak, 2006).

High resource utilization is important in order for intermodal transport to create value for the company. Through high resource utilization the need for resources can be lowered in the transport chain. A high resource utilization lead to higher productivity and thereby better profitability for the company (Lumsden, 2006). High resource utilization increases the profitability for the company, as described by Lumsden (2006), and in this case, both for the regional transport companies and the hauliers operating for them.

### 5.1.2 Value for the Customers

---

Value for the customers is created when the customers' demands are fulfilled. The opportunity for intermodal transport to provide value for the customers depends on the fit between the customer demands and the characteristics of intermodal transport (Cullinane & Toy, 2000).

A study by Lundberg (2006) concluded that the most important aspect for customers is price. The transport customers in Sweden are extremely price sensitive, an effect of the extensive competition in the transport industry. After price, the transport customers have high demands on the transport time and reliable. Environmental sustainability is valued by the customers but they are unwilling to pay an additional cost for environmentally sustainable transport (Lundberg, 2006). Nelldal, Troche and Wajsman (2000 in Lundberg, 2006) have identified flexibility as important, such as the possibility to effect departure and arrival times. Security is also an important factor (Jensen, 1990; Karlsson, 2009). Six important aspects to provide value for the customers are thus price, lead time, reliability, environmental sustainability, flexibility and security.

---

<sup>14</sup> Fredrik Bärthel, 23 of February 2009

The customer demands on transport time in Sweden is generally that the transport is made over night, meaning that the goods is loaded in the afternoon and delivered the next morning (Nelldal, Troche & Wajzman, 2000 in Lundberg, 2006). Intermodal transport often takes longer time than road transport because of the changes in transport modes and subsequent terminal handling (Lumsden, 2006). If the transport cannot be handled overnight it often requires another 24 hours before it can be delivered (Woxenius, 1998). Timing requirements, as late departures and early arrivals, prevent a large share of the transported goods to go with intermodal transport (Sommar, 2006b).

A study by Sjögren (1996 in Flodén, 2007) shows that most customers do not have interest in the choice of transport mode for the goods. Most customers are satisfied as long as their demands are met. Some customers, however, have specific demands on for example environmentally sustainable transport. In general, the more goods the customer sends, the higher is their interest in the transport (Woxenius, 1994 in Flodén 2009).

### 5.1.3 Access to Resources

---

For intermodal transport to be possible, it requires access to different types of resources. The literature brings forth that access to railway, terminal, trucks, load units and drivers are necessary physical prerequisites for intermodal transport.

Intermodal transport requires access to railway which means that the company needs access to railway to the required node, a train that operates the distance at the required time with free space on it. There is limited capacity at the railway with difficulties to find free slot times, as described in Chapter 2.2.3. This can make it difficult to find a train that operates the required distance and still fulfil the other prerequisites, for example the customer demands. Bäckström (2008) have identified that accessibility of rail transport is dependent on the time that the train operate the node. The time window at the terminal affects the companies' possibilities to use intermodal transport since it can be in conflict with the prerequisites for fulfilled customer demands.

Intermodal transport requires access to an intermodal terminal. The intermodal terminal must be at a suitable distance from the consignor or consignee, have the right equipment to handle the transshipment and be able to handle the transshipment efficiently. The distance between the consignor and consignee and the terminal is important for the applicability of intermodal transport. Therefore it is a prerequisite for intermodal transport to have access to an intermodal terminal at a sustainable distance. For the terminal to be useful, it is necessary that it can handle the different load units<sup>15</sup>.

Intermodal transport requires access to trucks. Changing from road transport to intermodal transport requires changes in resources for the transport companies as the trucks needs to be adapted to the load units for intermodal transport (Sommar, 2006a).

Intermodal transport requires access to specialized load units that are adapted to intermodal transport, described in Chapter 2.2.1. Therefore, intermodal transport might

---

<sup>15</sup> Fredrik Bärthel, 23 of February 2009

require changes in the resource base (Flodén, 2007) for the regional transport companies.

Intermodal transport requires access to drivers for the short distance transport. Intermodal transport requires organizational changes in behaviour, such as adaptations of schedules for the drivers. The use of intermodal transport most often results in less need for long distance transport drivers and night drivers while the need for short distance transport drivers increase (Sommar, 2006a).

## 5.2 PREREQUISITES FOR COLLABORATION

---

In this chapter the prerequisites for collaboration will be described. For the collaboration between companies to be sustainable, there are some prerequisites that need to be fulfilled. These prerequisites can be divided into three categories, value for the company, sustainable relationship and operatively possible. These three prerequisites can be divided into more prerequisites, which in different extent are related to each other.

### 5.2.1 Value for the Company

---

One of the prerequisites for collaboration is that it has to provide value for the company. Value for the company requires that the collaboration provides a competitive advantage and that all involved companies are separately profitable.

As for intermodal transport, described in Chapter 5.1.1, a competitive advantage must be offered for a company to react on a possibility. It is the same for collaboration, the companies must achieve a competitive advantage for collaboration to be of interest.

The companies do also have to be profitable, as in Chapter 5.1.1. When it comes to collaborations, the collaboration partners need to be separately profitable for the collaboration to be of interest for all parties (Dacin, Hitt & Levitas, 1997). This is especially important when each member is an independent company and a general optimisation will not be satisfactory for all parties (TFK, 1998). It is important that the companies not receive a smaller share of the profit than the profit they would have had without the collaboration (Frisk et al., 2006). All participants must feel that it is in their best interest to enter the collaboration (Özner, 2008). The collaboration will be sustainable if all companies profit from collaborating.

### 5.2.2 Sustainable Relationship

---

A sustainable relationship requires certain prerequisites to be fulfilled. The collaboration partners must be committed to the collaboration, feel trust for one another, feel that the collaboration is fair and have common goals and strategies.

Commitment refers to the willingness of a collaboration partners to put in effort on behalf of the relationship (Porter et al., 1974 in Mohr & Speakman, 1994). A high level of commitment provides an environment in which both collaboration partners can achieve individual and common goals without being afraid of opportunistic behaviour (Cummings, 1984 in Mohr & Speakman, 1994).

Commitment is closely connected to trust (Cruijessen, Dullaert & Fleuren, 2007). Trust between the collaboration partners is crucial to create a sustainable collaboration. Within collaborations regarding intermodal transport, trust is important since the

collaboration partner is handling the company's customers (Bernal, Burr & Johnsen, 2002).

In a collaborative relationship there is a risk of opportunistic behaviour from the companies, depending on their different objectives and self-interests (Hoyt & Huq, 2000). Horizontal collaboration has a stronger competitive element than other collaborative relationships. This competitive element increases the threat of opportunism and lowers the level of trust because of the risk that one collaboration partner may use information gathered in the collaboration to improve its market position at the expense of other collaboration partners (Cruijessen, Dullaert & Fleuren, 2007).

A fair distribution of responsibilities, cost and profits are important for the trust between the companies. Mistrust about the fairness has caused failures for many horizontal collaborations in the transport industry (Cruijessen, Dullaert & Fleuren 2007). Jap (2001) concludes that inequality is often accepted between collaboration partners but unfairness is always punished.

In a horizontal collaboration, trust and commitment alone might not be enough to protect against opportunism. Common goals and strategies can be helpful to avoid opportunistic behaviour. For the collaborative relationship to be sustainable, it is also important to have common goals within the relationship. It is important that the collaboration partners act together to achieve their common goals and for this to happen, there must be a strong sense of having shared costs, risks and benefits (Cruijessen, Dullaert & Fleuren, 2007). Mohr and Speakman (1994) mean that the participation in the set-up of common strategies to reach the common goals is important for a sustainable relationship. It is necessary to specify the roles, responsibilities and expectations for the collaboration partners to have a sustainable collaboration.

### 5.2.3 Operatively Possible

---

For the collaboration to be sustainable, it must be possible to perform the operative activities. A sustainable collaboration is dependent on coordinated activities directed at fulfilling common goals consistent across the companies. The coordination of activities is affected by the boundaries for the collaboration and the activities that each company is supposed to perform. The willingness to coordinate activities is closely connected to commitment, since commitment refers to the willingness to put in effort on behalf of the relationship (Mohr & Speakman, 1994). Uncoordinated activities result in sub-optimisation of the transport system (Simatupang & Sridharan 2002).

Access to information is important for a sustainable relationship. If collaboration partners do not share enough information, they will lack information about each other's plans and intentions, which will result in uncoordinated activities (Simatupang & Sridharan 2002). In order to achieve the benefits of collaboration, access to information is necessary (Cummings, 1984 in Mohr & Speakman, 1994). Information sharing is important for all aspects of a company's business (Mohr & Nevin, 1990 in Mohr & Speakman, 1994). The quality of the information sends important signals about the level of commitment to the collaboration (Mohr & Speakman, 1994).

### 5.3 RELATIONS BETWEEN THE PREREQUISITES IN NEED OF FULFILLMENT

The different prerequisites for collaboration regarding intermodal transport, identified in the two previous chapters, have internal relations with each other, see Figure 7.

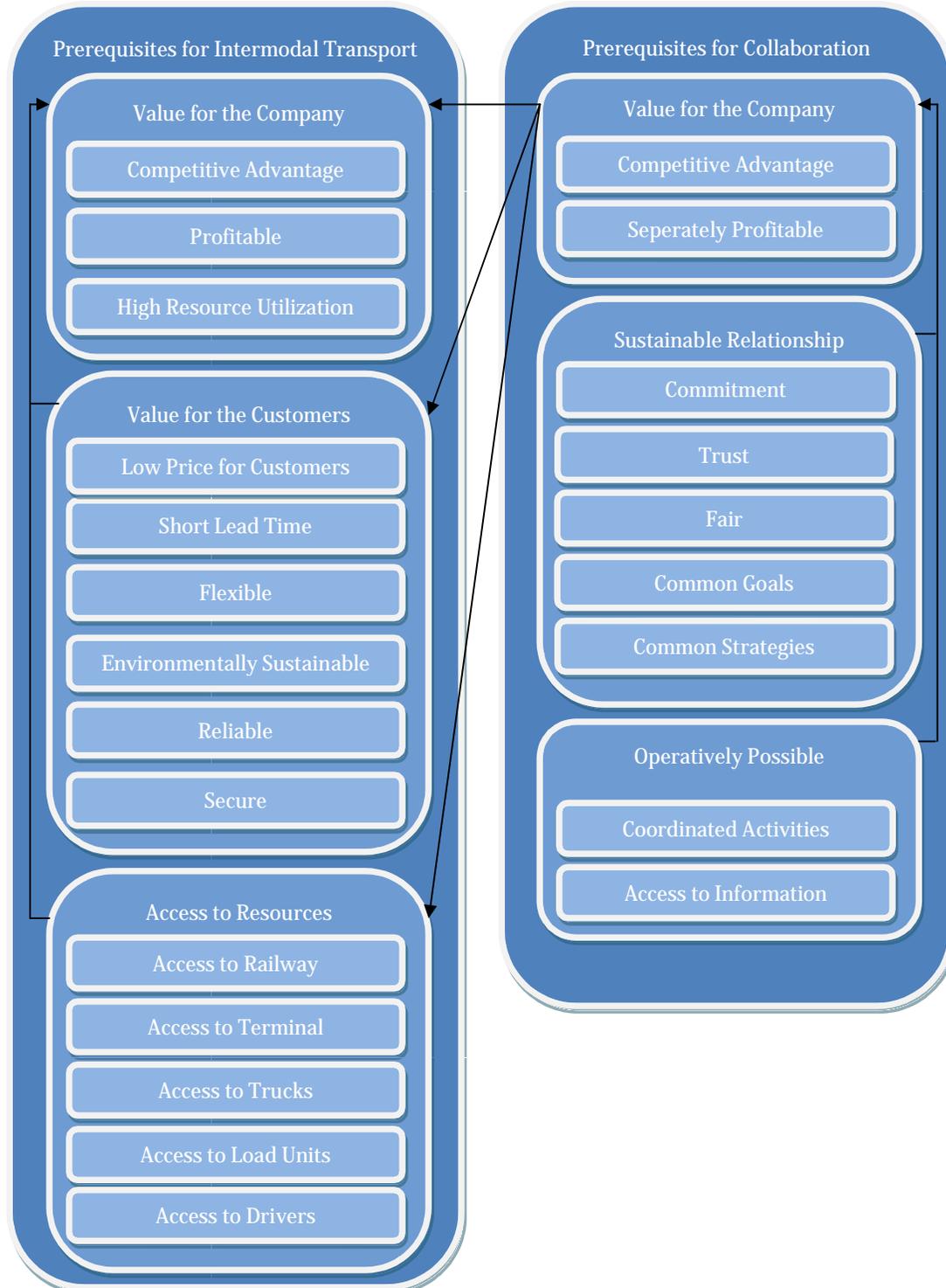


Figure 7 Relations between the Prerequisites for Collaboration regarding Intermodal Transport

There is a strong connection between the three main prerequisites for intermodal transport, where value for the customer and access to resources affect the value for the company. It is possible to increase the value for the customers and the access to resources at the expense of the value for the own company.

The prerequisites for intermodal transport can be fulfilled to different extent. The prerequisites have to reach a minimum level, but above that, the prerequisites can be more or less fulfilled. For some of the prerequisites, it is obvious that the prerequisite can be fulfilled to different extent, for example the customer demand for low price. The price can not only be high or low, it can be different levels of low. For other prerequisites it is not as obvious. It could easily be believed that a company either has access to railway or they do not. But in reality, all companies can have access to railway, the difference is that the distance to it can vary and thereby the cost to access it. Access to railway is thereby an example of how the prerequisite for profitability regarding intermodal transport can be affected by other prerequisites.

If the prerequisites for intermodal transport are not possible to fulfill to a level above the minimum level, the company will not be able to provide intermodal transport by themselves. This means that if a company cannot fulfill the prerequisites for value for the customer and access to resources and still provide a value for the own company, it would not be beneficial for the company to provide intermodal transport. However, the value from collaboration can help the company to increase the level of fulfillment for some of the prerequisites for intermodal transport.

Both the prerequisites for intermodal transport and the prerequisites for collaboration contain value for the own company as one of the main prerequisites. These two prerequisites are strongly connected. It is important that a company benefit from using intermodal transport, regardless of if they provide intermodal transport in a collaboration or not. If the company cannot provide intermodal transport by themselves and cross the minimum limit for value, the value from collaboration is added to the value from intermodal transport. If the total value for the company exceeds the minimum limit for the value, the collaboration will make intermodal transport possible. If the value still is not above the minimum limit, intermodal transport will not be possible, with or without collaboration.

Even though the value for the company is above the minimum level when they provide intermodal transport by themselves, collaboration regarding intermodal transport can still provide a value for the company. However, if collaboration does not provide a value for the company it should not be used. If collaboration is used, the value from collaboration affects the value for intermodal transport and the total value for the company will be the summarized value from intermodal transport and collaboration.

The value from collaboration is also connected to the prerequisites for customer value and access to resources. Collaboration can help meet the customer demands and provide access to resources. But as stated earlier, the three main prerequisites for intermodal transport are internally related, which means that the value for collaboration affects value for intermodal transport in another way than described above.

Regardless if the value for collaboration is used to make intermodal transport possible or to increase the value for intermodal transport, the prerequisites for sustainable relationship and operatively possible have to be fulfilled.

There are internal relations between the prerequisites for collaboration in the same way as the internal relations between the prerequisites for intermodal transport, described in the beginning of this chapter. The prerequisites connected to making the collaboration operatively possible, is directly connected to the value for the company since the operative difficulties are solved by coordination and investments, which are costly and thereby affect the value. The connection between the value for the company and the prerequisites for a sustainable relationship is not as obvious. It is not always possible to create the prerequisites for a sustainable collaboration through decreased value. However, if a company invests in their relationship, they are more likely to achieve a sustainable collaboration.

Just as the prerequisites for intermodal transport, the prerequisites for collaboration can be fulfilled to different extent. The prerequisites do also have a minimum limit for the fulfillment of the prerequisites.

A model has been developed containing the prerequisites that need to be handled for collaboration regarding intermodal transport to be sustainable. Collaboration strategies for handling the prerequisites have to be developed in order to gain a sustainable collaboration regarding intermodal transport. Collaboration strategies to handle the prerequisites for collaboration regarding intermodal transport will be presented in the next chapter.

## 6 COLLABORATION STRATEGIES FOR THE BUSINESS MODEL

This chapter will describe how collaboration regarding intermodal transport should be structured to fulfill the prerequisites for collaboration, identified in the previous chapter. The chapter is based on the requirements for the business model and will highlight the theoretical areas necessary to be able to create a business model. The chapter will end up in a model showing the relations between the collaboration strategies and the prerequisites for collaboration regarding intermodal transport.

### 6.1 RELATION BETWEEN COLLABORATION STRATEGIES AND PREREQUISITES IN NEED OF FULFILLMENT

The strategies for the collaboration are strongly connected to the prerequisites for collaboration presented in the previous chapter. The collaboration strategies are in general aiming at solving the prerequisites for collaboration. The relationship between the collaboration strategies and the prerequisites they fulfill is presented in Table 1.

Table 1 Relation between Collaboration Strategies and Prerequisites in Need of Fulfillment

	Value	Customers	Relationships	Activities	Resources	Profit
Competitive Advantage	X	X	X	X	X	X
Separately Profitable						X
Commitment			X			
Trust			X			
Fair			X	X		X
Common Goals			X	X		
Common Strategies	X	X	X	X	X	X
Coordinated Activities				X	X	
Access to Information				X		

### 6.2 VALUE

For collaboration regarding intermodal transport to be of interest it must provide a value for the company. The collaboration strategy is to capture the value from intermodal transport and collaboration. The value from intermodal transport and collaboration will first be identified and then a collaboration strategy for capturing that value will be presented. The collaboration strategies for capturing value must fulfill the prerequisites for collaboration regarding competitive advantage and common strategies.

#### 6.2.1 Capture the Value from Intermodal Transport

There are different kinds of value created from using intermodal transport and there are different collaboration strategies for capturing this created value. Value is created if either the satisfaction of the customers' needs is improved or if the company satisfies the customer's needs at a lower cost (Bowman & Ambrosini, 2000).

Diversification from road transport to intermodal transport provides the company with access to new markets (Bäckström, 2008). Diversification can create a competitive advantage for a company but can also pose some risks. There are some risks related to changing the company's focus. In a market where the previous experience and accumulated assets are important, companies that have experience from a strategically

related market have benefits over companies that do not, and in these cases it can be risky to lose focus on the company's core competences (Markides & Williamson, 1994).

Intermodal transport also result in an additional product to offer the customers. An augmented product portfolio creates value for the company since it provides opportunities to offer the customers an additional value and thereby provide additional growth opportunities for the company (Kahn, 1998).

Intermodal transport is more environmentally sustainable (Kreutzberger et al., 2003) and more cost efficient than road transport (Jensen, 1990). Intermodal transport can therefore create value for both the company and the customers through both fulfilling the customer need for more environmentally sustainable transport and lower transport cost.

The cost for intermodal transport is often lower than the cost for road transport on long distances, and thus an economic value is created. The lower cost is mainly possible through lower energy consumption and larger scale of rail transport compared to road transport (Cardebring et al., 1996). A lower cost for the transport means increased opportunities to fulfil the customers demand on lower transport costs.

Intermodal transport is an alternative to road transport. The costs for road transport are mainly affected by the price for fuel and are strongly dependent on government regulations since environmental tax is a large part of the cost for fuel (Lumsden, 2006). The prices for fuel have increased during the last years and this trend does not seem to turn (SPI, 2009). The costs for road transport are therefore expected to increase why intermodal transport is becoming a valuable alternative for companies in the transport industry. As previously mentioned, the environmental regulations are constantly tightening and the government is creating incentives to move transport from road to rail (exemplified by Godstransportdelegationen, 2004).

Intermodal transport does create value for the company due to an improved work environment for the hauliers. Since intermodal transport, in contrast to road transport, does not require the hauliers to drive long distance transport the work environment is improved due to less inconvenient working hours (Bäckström, 2008).

The value created through intermodal transport has to be captured by the company. There is a difference between the created value and the capturing of the created value (Madhok & Tallmann, 1998). The economic value is captured by the price paid for the created value, which is realized when the sale takes place (Bowman & Ambrosini, 2000).

The value created through the use of environmentally sustainable activities can be captured through marketing (Polonsky & Mintu-Wimsatt, 1995). The increasing consumer awareness of environmental issue has made it increasingly important for companies to bringing forth environmentally sustainable products and services. Successful companies are those that respond to external and internal changes and adjust in an effective manner (Wu & Dunn, 1995). There are business opportunities for companies to capture the environmental value and the companies that succeed in this will gain a competitive advantage (Cairncross, 1992).

## 6.2.2 Capture the Value from Collaboration

---

There are different kinds of value created from collaboration and there are different collaboration strategies for capturing this created value.

Collaboration regarding intermodal transport automatically leads to that the company has a transport supplier for the local transport at one of the nodes. A regional presence at the other node is necessary to be able to use intermodal transport<sup>16</sup>. This is a valuable contribution to the system. Collaboration is a useful tool to expand the service range, and as a result, to increase the companies opportunities (Bleeke & Ernst, 1995). For transport companies, horizontal collaboration is an approach to improve the offering (Cruijessen, Dullaert & Joro, 2006).

Collaboration can provide access to new markets for the companies within the collaboration (Johnson & Johnson, 1999; Dacin, Hitt & Levitas, 1997; Bleeke & Ernst, 1995). Collaboration is a useful tool to expand the geographic coverage, and, as a result, to increase the companies opportunities (Bleeke & Ernst, 1995).

Large companies often have a competitive advantage compared to small companies due to a powerful position on the market. Collaboration is a mean for small companies to reinforce their market position and achieve a competitive advantage (Kanter, 1994).

For transport companies, horizontal collaboration is an approach to protect the companies' market positions and make it possible to offer the customers a lower price (Cruijessen, Dullaert & Joro, 2006).

Collaboration enables companies to learn from each other and open up opportunities for benchmarking. Collaboration can provide opportunities for information- and knowledge sharing (Johnson & Johnson, 1999; Dacin, Hitt & Levitas, 1997). Collaboration between companies can help companies to gain flexibility and speed of access to new capabilities, gaining the benefits of resources and skills of another company, but without the associated risks and responsibilities that come from ownership (Bernal, Burr & Johnsen, 2002; Kanter, 1994).

A collaboration can lead to that the company get a larger size and thereby becomes more credible to some potential customers (Child, Faulkner & Tallman, 2005). Having a centralized marketing function can increase companies bargaining power in relation to other actors, shows a study by Chipty and Snyder (2006), who also suggests that a horizontal collaboration is especially beneficial for enhancing the bargaining power.

Large companies often have a competitive advantage compared to small companies due to their wider portfolio of resources. Collaboration is a mean for companies to extend their resource portfolio and achieve a competitive advantage (Kanter, 1994) and to increase the company's opportunities (Bleeke & Ernst, 1995) as collaboration provide opportunities for resource sharing (Johnson & Johnson, 1999; Dacin, Hitt & Levitas, 1997). Value for the company can be created in an intermodal transport chain through high utilization of return flows. The imbalances in goods streams between two areas often result in costly, low resource utilization for the return flow (Lumsden, 2007). If

---

<sup>16</sup> Representative for the regional transport companies, 27 January 2009

instead the utilization of resources is maximized regarding return flows (Lumsden, 2006), value can be created.

Collaboration can lead to both economies of scale and economies of scope for horizontal collaborations in the transport industry. Joint planning can for example lead to economies of scale. Economies of scope can be achieved through collaboration due to decreased cost for additional offerings (Cruijessen, Dullaert & Fleuren, 2007).

## 6.3 CUSTOMERS

---

The collaboration strategies regarding the customers must fulfill the prerequisites for competitive advantage and common strategies. The collaboration strategies regarding the customers are connected to customer segmentation.

### 6.3.1 Customer Segmentation

---

A collaboration strategy to handle the customers is segmentation. Segmentation helps the companies to identify segments of customers that are expected to have a similar behavior and similar demands and thereby respond in a similar way to an offering. Segmentation can build on different factors such as organization size, industry, geography and how the service is used. The important issue is to find factors that differentiate the customers from each other through their reaction to a specific offering (Dowling, 2004).

A company can either be a first-tier supplier or a supplier further back in the chain (Östring, 2004). From a transport chain perspective, the customer can either be a consignor or consignee, resulting in that the company is a first-tier supplier, or it can be another transport supplier, making the company a second-tier supplier. These two customer segments use the service differently since, according to Dowling's (2004) logic, their relationship to the service is different and they seek different benefits.

As mentioned in Chapter 6.2.1, fulfilling the customer's needs creates customer value. For the transport customers six important aspects are price, lead time, reliability, environmental sustainability, flexibility and security (e.g. Lundberg, 2006; Jensen, 1990; Karlsson, 2009).

The type of goods can be a determining factor for how the customer value different aspects. Customer with high value goods are more interested in a short lead time than customers with low value goods, due to higher costs for tied-up capital (Lundberg, 2006). A study by Laitila and Westin (2000) shows that companies within the grocery industry are more willing to pay for environmentally friendly transports than companies in other industries.

An approach to customer segmentation is to find a market niche that can be isolated from excessive competition by having high barriers to entry and so can provide a large profit (Faulkner & Campbell, 2003). Heterogenous goods are goods that require special treatment, because it is for example bulky, long or have a different shape (Vägverket, 2004). Handling heterogenous goods is difficult and requires special resources and knowledge and therefore creates barriers to entry for competitors, leading to a competitive advantage for the company and can therefore be an attractive customer segment.

Different types of goods have different demands on the load units, for example temperature sensitive goods, dangerous goods, voluminous goods and so on. Since high resource utilization is an important prerequisite for intermodal transport, see Chapter 5.1.1, it is important to use the load unit as much as possible. To get high resource utilization the load unit have to be carrying goods on the return flow as well (Lumsden, 2006). Since the different kinds of goods have different demands on the load unit it is suitable to transport goods with the same demands in both directions.

Whether to transport full unit loads or less than full unit loads is an issue in a transport system. Less than full unit loads requires an additional handling at a terminal for loading and unloading the load unit. Additional handling makes the system more complex, costs more and is more time consuming. Full unit loads are easier to handle (Lumsden, 2006).

A collaboration strategy to handle the imbalances in goods flow is segmentation of flows. The imbalances in goods flows are described in more detail in Chapter 2.1.3. The segmentation of flows can be based on base and surge demand where base demand can be forecasted on the basis of past history while surge demand typically cannot. Base demand can be met through lean processes to achieve economies of scale whereas surge demand is met through flexible, and probably more costly, processes (Christopher & Towill, 2001).

## 6.4 RELATIONSHIPS

---

The relationship between collaboration partners is important and since a partner relationship creates a number of challenges, collaboration strategies for handling these challenges is crucial (Gadde, 2004). The collaboration strategies for relationships are connected to customer ownership and integration. The collaboration strategies regarding the relationship must fulfill the prerequisites on competitive advantage, commitment, trust, fairness, common goals and common strategies.

### 6.4.1 Customer Ownership

---

The customer ownership is an important issue for many companies in a collaboration and a clear customer ownership is therefore crucial to ensure a sustainable collaboration. In a collaboration the customer ownership can be either individual or joint. In a situation with individual customer ownership the profit is transferred to the collaboration partners in whose region the purchase was made. In a situation with joint customer ownership a fee is paid to the network from where it is distributed among the members. In order to have a clear structure for the collaboration a clear customer ownership is crucial (Nault & Tyagi, 2001).

There are factors that may increase mutual trust in horizontal collaborations, which result in collaboration strategies for a sustainable collaboration. One factor that can increase the trust is the presence of shared customers (Lambert, Emmelhainz & Gardner, 1999).

## 6.4.2 Integration

---

A collaboration strategy for handling the relationship in a collaboration is integration. A collaborative integrated relationship is characterized by an extensive information flow, coordinated activities and shared resources (Gadde, 2004).

Collaborative relationships are not market-dominated relationships. A collaborative relationship can involve different level of integration from being a relationship with very loose ties in the collaboration to a totally integrated relationship where the collaboration partners are almost completely joint with respect to the areas involved in the collaboration (Child, Faulkner & Tallman, 2005). The level of integration partly depends on the deepness of the relationship and partly on the time perspective the relationship has (Özner, 2008).

Interdependence between collaboration partners will result in a loss of independency and flexibility (Das & Teng, 2001). The challenges increase the more integrated the relationship becomes (Özner, 2008). It is necessary to find a good balance in the relationship integration. If a relationship is too restrictive the partners will have difficulties being flexible, but if the relationship is too unrestricted, there is a risk for opportunistic behaviour (Hoyt & Huq, 2000). A relationship that is restricted enough to enable trust and commitment between the collaboration partners is necessary.

It is also necessary to find a balance in the relationship integration because of economical reasons. The costs for the relationship increases the closer the relationship becomes (Gadde, 2004). It is therefore important that the relationship is not deeper than it has to be to satisfy the relationship requirements.

In a relationship with high potential for competition, it can be difficult to be highly integrated. Easton et al. (1993 in Bengtsson & Kock, 1999) argues that the competition within horizontal relationships depends on the geographical distance between the companies. The influence of the difference in geographic focus may result in collaboration partners losing the fear of sharing information and knowledge that in other circumstances might threaten their market position if used to competitors. The competition is thereby lower for companies with a large geographical distance, which increases the possibility for integration within the relationship (Bernal, Burr & Johnsen, 2002).

The possibility of a higher level of integration is also affected by the personal connections between the companies, such as social contacts and associations (Cruijessen, Dullaert & Fleuren, 2007). Companies within the same association will have better information about each other and thus believe that they share the same values and norms. Opportunistic behavior is less likely if the companies belong to the same association because their reputation can be damaged more easily (Das & Teng, 2001).

## 6.5 ACTIVITIES

---

Collaboration strategies connected to activities are related to coordination, planning, administration, information- knowledge- and resource sharing and negotiations and assignment terms. The collaboration strategies regarding the activities must fulfill the

prerequisites for competitive advantage, fairness, common goals, common strategies, coordinated activities and access to information.

### 6.5.1 Coordination

---

Collaboration puts high demands on coordination of activities. The responsibilities and activities each collaboration partner is expected to perform needs to be coordinated in order to achieve an efficient system and achieve mutual goals (Mohr & Speakman, 1994). Pfeffer and Salancik (1987 in Mohr & Speakman, 1994) suggest that stability in an uncertain environment can be achieved through greater coordination. Intermodal transport involves more activities and actors than road transport (Flodén, 2007) making coordination even more crucial.

### 6.5.2 Planning

---

The participation from the collaboration partners in the planning and goal setting process is an important collaboration strategy for a sustainable collaboration. Joint planning helps to specify roles, responsibilities and expectations, while it allows mutual expectations to be established and collaborative efforts to be specified (Mohr & Speakman, 1994).

Joint planning enables the collaboration partners to achieve common strategies and common goals, making it easier to take joint decisions and handle uncertainties. Common strategies also decrease the risk of sub optimization, enabling system optimization and thereby maximize the profit (Simatupang & Sridharan, 2002). Joint planning can result in increased resource utilization and thus lowers costs (Lumsden, 2007).

It is important that the collaboration partners act together to achieve their joint goals (Cruijessen, Dullaert & Fleuren, 2007) and therefore either common or central planning is necessary in a collaboration. Having a centralized planning function can create economies of scale for the companies and increase the efficiency (Simchi-Levi, Kaminsky & Simchi-Levi, 2003). A centralized function increase companies bargaining power in relation to other actors, shows a study by Chipty and Snyder (2006), who also suggests that a horizontal collaboration is especially beneficial for enhancing the bargaining power. Having a centralized function helps to coordinate activities among the companies and makes sure that the division of responsibility is perceived as fair among the collaboration partners. Common planning is an alternative to central planning in a collaboration. Common planning requires much coordination between the companies and companies with conflicting goals can cause problems for the collaboration (Harrison & Huemer, 2005).

### 6.5.3 Administration

---

The activities in the intermodal transport chain include both physical transport of the goods and administration of the transport. Intermodal transport includes many process steps and as Lumsden (2006) explains, the administration gets complex and more costly when the process steps are many. The cost for administration will increase with the number of involved activities and actors. Intermodal transport will require different administrative routines than road transport (Sommar, 2006a) and collaboration between companies puts additionally high demands on coordination of activities (Mohr

& Speakman, 1994). The administration in a collaboration regarding intermodal transport has to be efficient and coordinated.

The complexity of the administration makes it crucial to perform it efficiently to avoid unnecessary costs and quality problems connected to the interfaces. Administration can often be a non-value adding activity, not contributing to satisfying the customer demands. The cost for non-value adding activities should be continuously reduced (Andery, Carvalho & Helman, 1998). Therefore the administrative activities should be minimized and the performance of the remaining activities should be efficient. One collaboration strategy for more efficient administrative routines is automated activities instead of manual (Goldsby & Martichenko, 2005). Another collaboration strategy for more efficient administration is standardization. Standardization is a principle for efficient activities. Standardization is also a facilitator of building in quality and for improving the process. The activities must be standardized before improvements can be made. Other collaboration strategies for administration between the collaboration partners are follow-up and deviation reports to ensure the quality of the collaboration<sup>17</sup>. In order to improve the activities, they has to be controlled and monitored (Liker, 2004).

The administrative activities can be handled either by the collaboration partners separately or through a centralized function. The benefit of decentralization is that the activities can be adapted to local conditions, while the benefits of centralization are higher efficiency through economies of scale and minimized cost of the system (Simchi-Levi, Karminsky & Simchi-Levi, 2003). A problem with decentralization is that the routines at the different companies can be conflicting, causing disruptions in the system (Harrison & Huemer, 2005).

#### 6.5.4 Information Sharing

---

One collaboration strategy to attain access to information is information sharing between the collaboration partners. In order to achieve the possible benefits from collaboration, information sharing is essential (Cummings 1984 in Mohr and Speakman, 1994). Information sharing can reduce unnecessary costs for the transport system (Lee & Whang, 2000). Information sharing facilitates the planning of flows with increased resource utilization and thus lowers costs as a result (Lumsden, 2007).

If partners do not share information, they will lack the required knowledge about each other's plans and intentions, which will lead to failing activities and sub optimizations (Simatupang and Sridharan 2002).

Information must be exchanged frequently and in real time to be usable (McQuiston, 2001). The extent that the information is shared depends on the level of integration in the relationship. According to Huber and Daft (1987 in Mohr & Speakman, 1994) more frequent and more relevant information is exchanged the more integrated the collaboration is. When more integrated collaborations are formed, it is necessary to use integrated or connected information systems to share information efficiently (Lumsden, 2006). A collaboration strategy for information sharing is therefore to attain an information system.

---

<sup>17</sup> Fredrik Bärthel, 23 of February 2009

Common information systems help collaboration partners to agree on routines for their collaboration, decreasing the need for direct negotiations in each transaction. These systems allow collaboration partners to connect their businesses. In this way, they can rationalize the processes in spite of geographic distance, reducing the costs, eliminating manual work and the inefficiencies associated with manual work (Senn, 1996).

#### 6.5.5 Knowledge Sharing

---

Knowledge sharing between collaboration partners is a collaboration strategy for the partners to learn from each other. Collaboration creates learning opportunities, especially if the partners possess somewhat different experiences or capabilities. Learning from a collaboration partner comes about through the knowledge sharing between two or more partners (Child, Faulkner & Tallman, 2005).

Opportunities to learn are generally greater between competitors, but competitors are often wary about sharing knowledge (Child, Faulkner & Tallman, 2005). There is a risk of opportunistic behavior with knowledge sharing between competitors (Hoyt & Huq, 2000) that have to be handled for knowledge sharing to be possible.

#### 6.5.6 Resource Sharing

---

The use of intermodal transport might require access to resources such as trucks and load units (Flodén, 2007). The resources can be acquired either through investments, through leasing or through access to resources from a collaboration partner through resource sharing. Sharing resources is a collaboration strategy to gain access to necessary resources without the risks associated with investments (Cruijessen, Dullaert & Fleuren, 2007). In conclusion, collaboration can provide companies with access to resources that allow them to operate in a way they could not have done alone.

Resource sharing is a collaboration strategy for a company to acquire resources that would not have been available else way (Powell, Koput & Smith-Doerr, 1996). Resource sharing can provide companies with a competitive advantage as access to additional resources can make it possible for the companies to provide a value for its customers that are distinct from the companies' competitors and difficult to imitate (Peteraf, 1993). The companies can thereby provide new offerings to their customers or reduce the cost for the current offering.

For the resource sharing to be beneficial, it is necessary to have equilibrium between the required and available resources. To reach equilibrium, information about the available resources and the customers' demands need to be shared. Sharing information about customer demands and available resources can in this way lead to a competitive advantage (Kopfer & Pankratz, 1999 in Krajewska och Kopfer 2006).

Resource sharing can lead to higher resource utilization. The imbalances in goods streams between two areas often result in costly, low resource utilization for the return flows (Lumsden, 2007). Resource sharing can lead to higher utilization of resources with better filling rates for the return flows (Lumsden, 2006). A study by Cruijessen, Cools and Dullaert (2005) supports this by showing that horizontal collaboration in the transport industry has strong positive effects on the productivity of core activities and decreases the number of empty transport.

### 6.5.7 Negotiation and Assignment Terms

---

A collaboration agreement has to be negotiated, even in cases where it remains an informal arrangement rather than one sealed by contract. Collaboration partners need to feel that they have a fair and reliable agreement on the contributions and benefits they attach to a collaboration, in order for their relationship to be sustainable (Child, Faulkner & Tallman, 2005).

The negotiation in a collaboration seeks to achieve a relationship between collaboration partners that enable them to achieve a successful agreement, without either partner needing to accept loss of independence. In the collaboration, the companies' individual goals have to be balanced against the goals of the collaboration (Child, Faulkner & Tallman, 2005) for conflicts to be avoided (Das & Teng, 2001).

In collaborations where it is difficult or unwanted to rely on trust, more control is a collaboration strategy for lowering the risk (Das & Teng, 2001). Parkhe (1993 in Das & Teng, 2001) found that a perception of a high relational risk leads to the use of contracts or control in collaboration. Trust and control are exchangeable and the more trust there is in a relationship, the lower is the need for control and vice versa (Das & Teng, 2001). In collaborations, there is a risk for unsatisfactory performance from the collaboration partners (Das & Teng, 2001), partially caused by sub optimization (Simatupang & Sridharan, 2002). Contracts are suitable for situations with high performance risk (Das & Teng, 2001).

It is important in a collaboration that the collaboration partners have common strategies according to Cruijessen, Dullaert and Fleuren (2007). In order to reach common strategies, the companies need to negotiate the terms for the collaboration. The more important a collaboration and the more integrated a relationship is, the more important is negotiation. The development of centrally agreed terms for the collaboration enables trust between the collaboration partners because mutual understanding reduces the sense of uncertainty which collaboration partners experience about each other (Child, Faulkner & Tallmann, 2005). In a less integrated relationship, it can be a solution to agree on the assignment terms for every assignment. The developed of a central framework requires negotiation and can lead to more costs than it is worth.

## 6.6 RESOURCES

---

Collaboration strategies for resources are connected to the network structure and brand. The collaboration strategies regarding resources must fulfill the prerequisites for competitive advantage, common strategies and common goals.

### 6.6.1 Network Structure

---

In the field of manufacturing, most product quality and cost factors can be directly attributed to product and process design. Get the design right will make most problems take care of themselves. Design plays an equally important role in the sustainability of collaboration (Doz & Hamel, 1998).

A collaboration regarding intermodal transport can be structured in different ways. Either it can be structured as a network with all the involved companies together or it can be structured as individual collaborations between two collaboration partners. The

most simple transport structure is a transport between the nodes without any connection to other transports. Another structure is a network of flows between terminals (Jonsson & Matsson, 2005).

A transport can be performed either between two nodes or as a larger network involving several nodes in the transport chain. A network is a more complex system since the more operations that are involved, the more complex the system gets (Lumsden, 2006). Woxenius and Bärthel (2008) exemplify hierarchic network, direct connections and hub and spoke network as different opportunities for intermodal transport networks structures. The imbalances in the flows, described in Chapter 2.1.3, might be able to be reduced from transport in a network of nodes. If there are imbalances between three nodes for example it might be possible to improve the balance in the flows by going in a triangle, although this solution requires a very specific situation with even flows between the three nodes, to be useful.

## 6.6.2 Brand

---

A brand is an intangible resource that has a great importance for the customers' perception of the service. There is a strong positive relation between profitability and a strong brand (Randall, 2000).

There are limits to what a single brand can achieve. Each brand is targeted. A collaboration strategy for a company to grow and increase market shares is to create new brands that can meet the demand that existing brands cannot satisfy (Kapferer, 2008). Many companies have a number of functionally similar offerings in the same category, but each offering have something unique that appeal to different customers (Dowling, 2004). There is a risk of cannibalization with a multi-brand collaboration strategy but Kapferer (2008) shows that companies using a multi-brand strategy get larger market shares than they could have with fewer brands, even though one of their brands may cannibalize on the other brands or services.

## 6.7 PROFIT

---

The collaboration strategies regarding profit to be satisfactory there are four prerequisites that need to be satisfied, and these are that the companies must have a competitive advantage, the allocation have to be separately profitable for the companies, allocation need to be perceived as fair among the collaboration partners and that the companies have common strategies for the profit allocation.

### 6.7.1 Profit Allocation

---

How the profit is distributed among the companies working together is an important issue. Depending on the relationship between the companies, one of the companies either buys a service from the other company, or the companies collaborate which require an allocation of profits among the companies.

The allocation of profits must be fair for the companies to be satisfied (Cruijessen, Dullaert & Fleuren, 2007). For the companies to consider the allocation as fair none of the companies should receive a disproportionately small or large share of the profit since this will negatively affect the perception of fairness of the allocation (Jap, 2001).

There are two possible collaboration strategies for profit allocation. Depending on the relationship between the companies inputs, the profit should be allocated either equally or equity.

The profit should be equally allocated between the companies if their input is equal or the division of input is vague and difficult to measure. An equal share of the profit facilitates close collaboration between the companies. This method for sharing profit is especially suitable when the collaboration requires specific investments and when the companies value the pay-off of the collaboration equally. However, using an equal allocation when one company's input is greater than the counterpart's input, has a negative effect on the relationship because it does not ensure a fair share (Jap, 2001).

The profit should be allocated equity if there are large differences between the companies' inputs. The greater the participant's contribution to the collaboration is, the greater the profit share will be. The outcome is judged as fair when the ratio of the company's input and its output equals the ratio of the other company's input and output (Jap, 2001).

The distribution according to given weights can be based on different variables (Frisk et al., 2006). The weights can be determined in relation to the responsibilities of the company (Jap, 2001), related to for example risk taking and customer ownership.

To be able to allocate the profit between the collaboration partners, the cost must first be handled. The total cost of the transport can be divided into two parts: the separable and the non-separable costs. Each company normally handles their own separable costs and the non-separable costs are distributed among the companies, either equally or according weights, in the same way as the profit allocation (Frisk et al., 2006).

Some allocation methods can result in that some collaboration partners receive a profit that is less than their stand alone profit. If this situation is considered undesirable it is possible to implement restrictions. With a minimum liability restriction, the collaboration partners receive at least their stand alone profit (Özner, 2008).

## 6.8 MODEL FOR COLLABORATION STRATEGIES FULFILLMENT OF PREREQUISITES

---

In this chapter the prerequisites affected by collaboration strategies will first be presented to be able to develop a model for the collaboration strategies' affect on the prerequisites.

### 6.8.1 Prerequisites Affected by Collaboration Strategies

---

As described in Chapter 5, there are two types of prerequisites, one type connected to intermodal transport and one type connected to collaboration. The chapter also described that the collaboration strategies are developed to handle the prerequisites for collaboration regarding intermodal transport. However, not all prerequisites can be handled by collaboration strategies. All prerequisites for collaboration will naturally be affected by the collaboration strategies. On the other hand, all prerequisites for intermodal transport cannot be affected by the collaboration strategies. The collaboration strategies can affect the possibility to fulfill some of the prerequisites for intermodal transport, even though they are not mainly created for that purpose. However, there are prerequisites for intermodal transport that are possible to affect by

collaboration strategies and there are other that are not possible to affect, see the crossed out prerequisites in Figure 8.

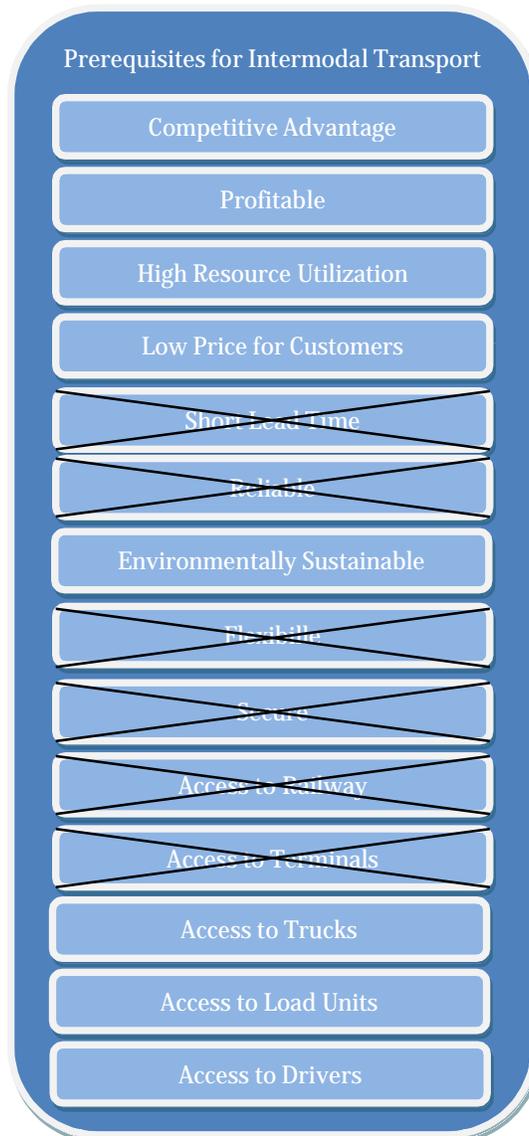


Figure 8 Prerequisites for Intermodal Transport Affected by Collaboration Strategies

The crossed out prerequisites for intermodal transport in the figure above are defined as primary prerequisites. The primary prerequisites need to be fulfilled before collaboration can be beneficial. Intermodal transport cannot be used at all if the primary prerequisites are not fulfilled, regardless if collaboration is used or not.

The collaboration strategies cannot provide the regional transport companies with access to railway or terminals. These resources are fixed and have to be available within the regional area for intermodal transport to be possible, as explained in Chapter 5.1.3.

The collaboration strategies cannot facilitate for the regional transport companies to meet some of the customer demands. Short lead time, flexibility, reliability and security

do all depend on the characteristics of intermodal transport, as described in Chapter 2.2.2.

The uncrossed prerequisites for intermodal transport can however be affected by collaboration strategies. These prerequisites do not have to be fulfilled before the collaboration can be beneficial, if the collaboration strategies immediately help to fulfil the unfulfilled prerequisites.

### 6.8.2 Collaboration Strategies Fulfilling the Prerequisites for Collaboration Regarding Intermodal Transport

---

In the theoretical framework, two theoretical areas were presented, prerequisites for collaboration regarding intermodal transport and collaboration strategies. The prerequisites for collaboration regarding intermodal transport were summarized in Figure 7, in Chapter 5.3. The connections between the summarized prerequisites to the collaboration strategies will be analyzed in this chapter.

There are three main collaboration strategies that need to be adopted for the regional transport companies to succeed in a collaboration regarding intermodal transport. The three main collaboration strategies are: use of intermodal transport, use of collaboration and use of a common business model in the collaboration.

The value from intermodal transport is captured by using intermodal transport. Both the economic and the environmental value created from intermodal transport provide a competitive advantage, as described in Chapter 6.2.1. The economic value is directly connected to the profitability while the environmental value is transformed to economic value through environmental branding.

The use of collaboration can help increase the competitive advantage and the profitability by providing value for the transport chain as described in Chapter 6.2.2. The competitive advantage of collaboration is achieved through an increased competitive advantage for intermodal transport.

The use of a common business model will make the involved parties use common strategies in the collaboration. The business model includes all collaboration strategies, why the competitive advantage and the profitability are more or less increased by all collaboration strategies.

The collaboration strategies are developed to fulfill the prerequisites for collaboration but also fulfill the secondary prerequisites for intermodal transport. What prerequisites that will be affected by each collaboration strategy, identified in Chapters 6.2-7, are presented in Table 2.

Table 2 Relation between Collaboration Strategies and Prerequisites in Need of Fulfillment

		Use Business Model															
		Use Intermodal Transport			Use Collaboration			Use Business Model									
		Use Intermodal Transport	Use Collaboration	Segment Customers	Clarify Customer Ownership	Integrate Relationship	Coordinate Activities	Plan Jointly	Coordinate Administration	Improve Administration	Share Information	Share Knowledge	Share Resources	Agree on Assignment Terms	Agree on Network Structure	Brand Environmentally	Share Profit Fairly
Prerequisites for Intermodal Transport	Competitive Advantage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Profitable	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	High Resource Utilization												X				
	Low Price for Customers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Environmentally Sustainable	X											X			X	
	Access to Trucks												X				
	Access to Load Units												X				
	Access to Drivers												X				
Prerequisites for Collaboration	Competitive Advantage	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Separately Profitable																X
	Commitment					X											
	Trust					X											
	Fair				X								X	X			X
	Common Goals					X		X			X			X			
	Common Strategies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Coordinate Activities						X	X	X		X	X	X	X	X		
Access to Information										X	X						

There are different reasons for the connections between the prerequisites and the collaboration strategies. Common for them all is that the collaboration strategies help fulfil the prerequisites they are connected to.

The competitive advantage and the profitability from collaborations regarding intermodal transport depend on all the three main collaboration strategies, use intermodal transport, use collaboration and use business model, and thereby also depend on all collaboration strategies in the business model.

The customer demands for low price and environmentally sustainable transport will mainly be fulfilled by the use of intermodal transport for the right segments of customers, as intermodal transport are both cost efficient and environmentally sustainable as Kreutzberger et al. (2003) and Jensen (1990) states in Chapter 6.2.1. Since collaboration can make intermodal transport possible, even when the company cannot fulfil the prerequisites for intermodal transport by themselves, as described in Chapter 5.3, collaboration can help satisfy the customer demands as described above. Collaboration can increase the value for the customers by making the transport more cost efficient or by an increased environmental branding that make the customers aware of the environmental sustainability.

Resource sharing can have different implications in a collaboration regarding intermodal transport. One implication is that resource sharing can help satisfy a company's need for resources, as stated by Cruijessen, Dullaert and Fleuren (2007) in Chapter 6.5.6. For the regional transport companies, resource sharing can provide access to trucks and drivers at the opposite region, which they can have difficulties with accessing in another way, as stated by Powell, Koput and Smith-Doerr (1996) in Chapter 6.5.6. Sharing resources can thereby facilitate the use of intermodal transport for companies who do not have access to all necessary resources. In this way, regional transport companies can avoid unnecessary investments, which could be a risk for them, according to Cruijessen, Dullaert and Fleuren (2007). Resource sharing can also increase the resource utilization and thereby also decrease the costs for the regional transport companies, as described by Lumsden (2007) in Chapter 6.5.6. Sharing load units do not only decrease the investment need for load units. It also increases the filling rate in the existing load units when the same load units are used for the return flows, stated by Lumsden (2006) in Chapter 6.5.6, which decreases the environmental impact.

The competitive advantage for collaboration is affected by all collaboration strategies used within the business model, just as the competitive advantage for collaboration, described in Chapter 5.3. In collaborations, the companies do not just have to be profitable, as described by Dacin, Hitt & Levitas (1997) in Chapter 5.2.1, the regional transport companies have to be separately profitable. The most important aspect for the separate profitability is a fair profit allocation (Chapter 6.7.1). The fair profit allocation also affects the perceived fairness in the collaboration according to Cruijessen, Dullaert and Fleuren (2007) as stated in Chapter 5.2.2. It is also necessary that the customer ownership, shared resources and agreement terms are fairly allocated for the regional transport companies to perceive the collaboration as fair.

According to Cruijessen, Dullaert and Fleuren (2007) trust and commitment are closely related. Trust and commitment depend on the integration level of the collaboration. Commonly agreed assignment terms also facilitate the prerequisite for common goals within the collaboration. To achieve common goals, joint planning might help according to Mohr and Speakman (1994) in Chapter 6.5.2. Common goals and common strategies are in some extent related since the common goals are a part of the common strategies. However, the common strategies are achieved when the companies share the same business model, which means that all collaboration strategies are shared.

For the activities to be coordinated it is necessary that all activities described in Chapter 6.5 are coordinated. This includes planning, administration, information-, knowledge- and resource sharing and agreements. It is also necessary that the agreement of the network structure facilitates coordinated activities.

Access to information is achieved by information- and knowledge sharing as described by Cummings (1984 in Mohr and Speakman, 1994) and Child, Faulkner and Tallman (2005) in Chapters 6.5.4 and 6.5.5.

All the above mentioned collaboration strategies are important to facilitate or increase the value from intermodal transport.

# PART III

---

## 7 ANALYTICAL MODELS DEVELOPED FROM THE THEORETICAL FRAMEWORK

---

The theoretical framework provided a lot of information that in different ways will be useful for the development of the business model. To be able to use the information, it is necessary to know how the information can be used. This chapter will develop analytical models that are based on the theoretical framework and that will be used in the process to develop a business model which will be done in part five in this report. It is important that the theoretical framework is analyzed before the empirical study is presented, because it is necessary to know the foundation for the analysis to better understand the empirical study.

### 7.1 DIFFERENT TYPES OF COLLABORATION STRATEGIES

---

The collaboration strategies, presented in Table 2, in the previous chapter, are not perfectly suitable for all types of collaboration regarding intermodal transport between regional transport companies. The usefulness of the collaboration strategies is dependent on the type of collaboration. There can be different levels of collaboration. Some of the collaboration strategies will only be applicable on some of the collaboration levels and therefore be dependent on the level of collaboration while some collaboration strategies will be independent on the level of collaboration.

The collaboration strategies can have both dependent and independent implications. All collaboration strategies presented in Table 2 are dependent collaboration strategies but some of them are also connected to independent collaboration strategies. The collaboration strategies, presented in the previous chapter, are divided into sub-strategies where some sub-strategies are dependent and some independent on the level of collaboration.

The dependent collaboration strategies are, as explained, suitable for different levels of collaboration. Some of the dependent collaboration strategies have two or more sub-strategies that are suitable for different levels of collaborations. The fact that the same main collaboration strategy can be suitable for different levels of collaboration is connected to the fact that all prerequisites for collaboration regarding intermodal transport can be fulfilled at different extent, as described in Chapter 4.1. For example, information sharing can be performed in different ways from a manual telephone call to through a common information system. It is likely that these two sub-strategies are used at different levels of collaboration, where the manual telephone call are likely to be used in a less extensive collaboration while the common information system are likely to be used in a more extensive collaboration. Both sub-strategies fulfil the prerequisite for information sharing, but the information shared through a common information system is likely to be used at a more integrated level of collaboration.

The independent collaboration strategies can also be performed in different ways, but for the independent collaboration strategies, a decision has to be made for what collaboration strategy that is most suitable for collaboration regarding intermodal transport. The decision is based on the deciding companies' perceived situation and thoughts about the future. The difference between the independent and the dependent collaboration strategies is that the independent collaboration strategies cannot be performed in different extent, only in different ways.

The dependent and the independent collaboration strategies will be presented in the following chapters. First, the dependent collaboration strategies will be presented and then the independent collaboration strategies.

## 7.2 COLLABORATION STRATEGIES DEPENDENT ON LEVEL OF COLLABORATION

---

As described in the previous chapter, some of the collaboration strategies are dependent on the level of collaboration. There are two types of dependent collaboration strategies, the ones that are suitable for one or more levels of collaboration but cannot be divided into sub-strategies and the ones that can be divided into sub-strategies that fulfill the prerequisites for collaboration regarding intermodal transport to different extent for different levels of collaboration. The second of these two types of dependent collaboration strategies will be presented in this chapter, where the sub-strategies will be described for every collaboration strategy. The collaboration strategies that are not brought up in this chapter cannot be divided into sub-strategies.

### 7.2.1 Segment Customers

---

Customers can be segmented in several different ways, as described in Chapter 6.3.1. Two ways to segment customers are identified to be dependent on the level of collaboration.

The first way to segment the customers is according to their size and geographical coverage, as described by Dowling (2004) in the theoretical framework. For the regional transport companies, the collaboration strategy is to handle regional or national customers, see Figure 9. It can be difficult for the regional transport companies to offer a large national customer a total transport solution since they do not have a large market coverage, why they often handle regional customers or parts of national customers flows on a regional level. In a collaboration however, it becomes possible for the regional transport companies to offer a complete transport solution to national customers. How easy it is to handle a large national customer depends on how integrated the relationship is. Since a more integrated relationship is characterized by extensive information sharing, coordinated activities and shared resources, according to Gadde (2004) in Chapter 6.4.2, a more integrated relationship is more likely to be able to handle a large national customer compared to a less integrated relationship.

The second way to segment the customers, dependent on the level of collaboration, is according to whether the company is a first-tier supplier or a second-tier supplier to the transport user, described by Östring (2004) in Chapter 6.3.1, see Figure 9. For the regional transport companies, the difference is whether they have a consignor or a consignee as their customer or if they have another transport supplier as their customer. In this report, the second option is not considered to be usage of intermodal transport

since the regional transport company only performs a local road transport, just like their current core business. If a company have a transport supplier as their customer, they are not responsible for handling the entire transport chain, which means that the regional transport company is not in need for a horizontal collaboration with another regional transport company.

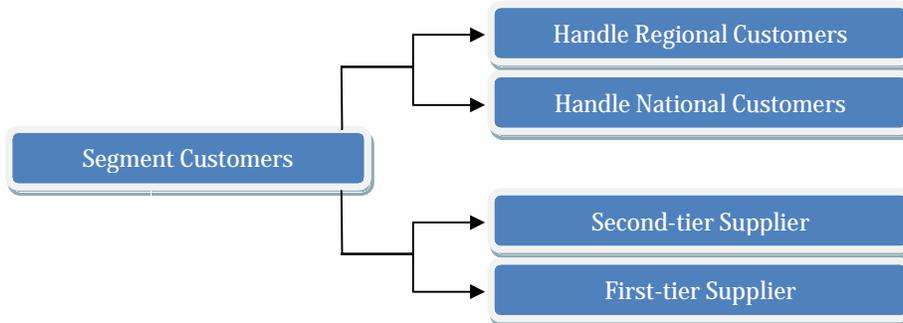


Figure 9 Dependent Sub-strategies for Customer Segmentation

### 7.2.2 Clarify Customer Ownership

---

Another collaboration strategy that can differ depending on the level of collaboration is the customer ownership. The customers can either be individually owned or owned by the companies together, as described by Nault and Tyagi (2001) in Chapter 6.4.1, see Figure 10. According to Lambert et al. (1999, in Chapter 6.4.2), shared customers increases trust in the relationship but naturally it requires a more integrated relationship.

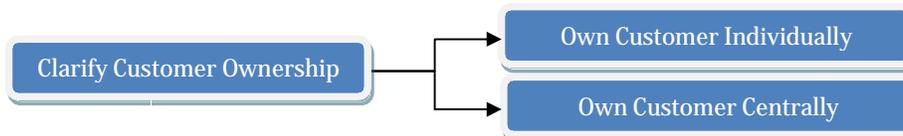


Figure 10 Dependent Sub-strategies for Customer Ownership

### 7.2.3 Integrate Relationship

---

The regional transport companies can be integrated to different levels depending on the level of collaboration. According to Child, Faulkner and Tallman (2005) the integration can be everything from loose to totally integrated, described in Chapter 6.4.2. In this report, the integration is divided into three different levels, presented in Figure 11, but in reality there are an immeasurable number of levels, since there are no fixed standards.

It is important for the regional transport companies to not be more integrated than they have to be to achieve the required benefits from the collaboration. According to Özner (2008) the challenges increases when the relationship becomes more integrated, described in Chapter 6.4.2. According to Hoyt and Huq (2000), the relationship becomes less flexible in a more integrated relationship and according to Gadde (2004) the costs for the relationship increases when more integrated. However, if the benefits from the increased relationship exceed the drawbacks from it, the regional transport companies are likely to get involved in the relationship.

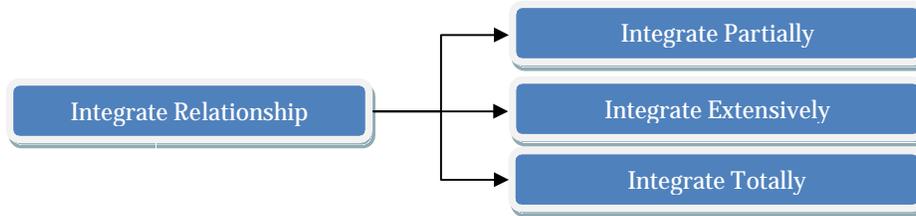


Figure 11 Dependent Sub-strategies for Integration

#### 7.2.4 Plan Jointly

The joint planning can also be divided into two different levels, described in Chapter 6.5.2. Either, the companies can have common planning or central planning, see Figure 12. Common planning requires coordination between the companies and can be threatened by conflicting goals, as described by Harrison and Huemer (2005 in Chapter 6.5.2). Central planning is easier to coordinate and helps create fair allocation of responsibilities between the partners (Harrison & Huemer, 2005) but it requires a higher level of integration between the regional transport companies.

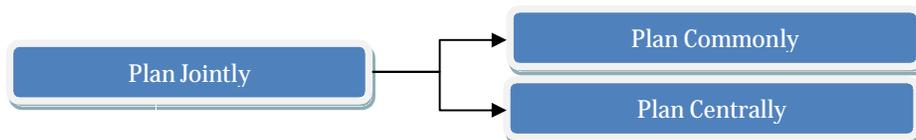


Figure 12 Dependent Sub-strategies for Joint Planning

#### 7.2.5 Coordinate Administration

In the same way as joint planning, administration can be coordinated in two different ways, either commonly or centrally, see Figure 13. Common administrative routines are individually controlled and can easier be adapted to local conditions, described by Simchi-Levi, Karminsky and Simchi-Levi (2003) in Chapter 6.5.3. Simchi-Levi, Karminsky and Simchi-Levi (2003) also described that the efficiency can be higher for central control of administrative routines. Just as for joint planning, common administrative routines can include conflicting routines which can cause disruptions, explained by Harrison and Huemer (2005) while central administrative routines requires a more integrated relationship.

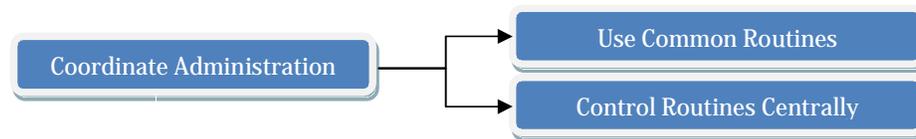


Figure 13 Dependent Sub-strategies for Coordinated Administration

#### 7.2.6 Share Information

As the example described in the previous chapter, information sharing can be performed at two different levels, either it can be done through manual communication or it can be done through a common information system, see Figure 14. A common information system requires investments in software but it is necessary to share information efficiently for more integrated collaborations, according to Lumsden (2006) in Chapter 6.5.4. According to Huber and Daft (1987 in Mohr & Speakman, 1994) more frequent

and more relevant information is exchanged the more integrated the collaboration is, which increases the need for a common information system.

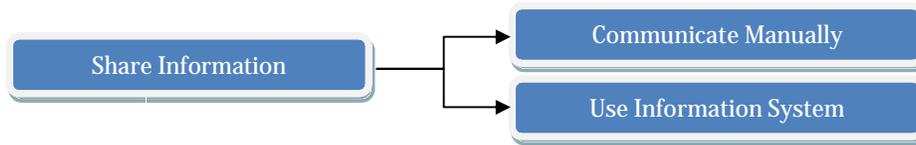


Figure 14 Dependent Sub-strategies for Information Sharing

### 7.2.7 Agree on Assignment Terms

The assignment terms can be agreed in two different ways which will be dependent on the level of collaboration, either agreed for every assignment or the assignment terms can be agreed centrally, see Figure 15. Centrally agreed terms is connected to a higher level of integration compared to agreed levels for every assignment, since centrally agreed terms requires more coordination. Centrally agreed terms also enables trust between the collaboration partners, according to Child, Faulkner & Tallmann (2005), which is important in a more integrated relationship,

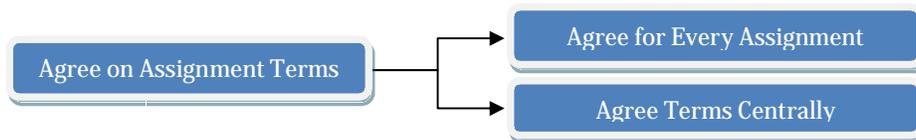


Figure 15 Dependent Sub-Strategies for Agreed Assignment Terms

### 7.2.8 Brand Environmentally

The environmental branding can either be performed individually or centrally, see Figure 16. How the companies choose to perform their environmental branding is an important decision as there is a connection between brand and profitability, according to Randall (2000) in Chapter 6.6.2. According to Kapferer (2008) a company can grow by creating a new brand which satisfies a larger market segment. A common brand for the regional transport companies may thereby provide competitive advantage, but it requires a more integrated relationship for the companies to share brand.

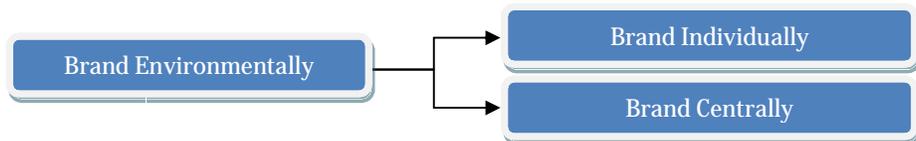


Figure 16 Dependent Sub-strategies for Environmental Branding

### 7.2.9 Share Profit Fairly

There are two ways for companies to share the profit in a fair way. Either, one of the companies buys the local transport at the opposite region for the market price, or the companies use a fair profit allocation, see Figure 17. A fully market-dominated relationship is not seen as collaboration, according to Child, Faulkner and Tallman (2005) in Chapter 6.4.2, why the first alternative to buy the transport is not seen as collaboration.

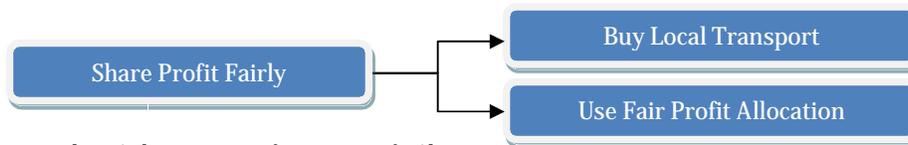


Figure 17 Dependent Sub-strategies for Fair Profit Sharing

### 7.3 USAGE OF DEPENDENT COLLABORATION STRATEGIES AT DIFFERENT LEVELS OF COLLABORATION

The sub-strategies presented in the previous chapter will together with the undividable collaboration strategies from Chapter 6.8.2 create a base of collaboration strategies, which will be connected to different levels of collaboration. A model will be developed to show how the dependent collaboration strategies are combined to suit different levels of collaboration. A discussion will take place about how these levels of collaboration are connected to the fulfillment of the prerequisites for collaboration regarding intermodal transport.

#### 7.3.1 Model for Different Levels of Collaboration

The dependent collaboration strategies can be combined into four different levels of collaboration. The first level is no collaboration. The second level is partial collaboration. The third level is extensive collaboration. The last level is a joint company. In the reality there can be infinite numbers of levels, but the four presented levels are furthest developed, ending up in the smallest number of separable collaboration levels. These four levels of collaboration are illustrated in a staircase model where each level in the staircase represent one level of collaboration, see Figure 18. All collaboration strategies in Table 2, including the sub-strategies in Chapter 6.8.2, are connected to the different levels of collaboration.

A company can be located at any level in the staircase model, which symbolizes that they are interested in the type of collaboration that they are located at. Besides the four levels of collaboration, a company can also be located at the ground level in the staircase model. A company that is located on the ground level will neither collaborate nor provide intermodal transport. On the ground level, the companies are traditional regional transport companies.

The first level in the staircase is not seen as an actual collaboration although some contact between the companies is necessary. At this level, the company sells intermodal transport services and buys the local transport from a transport supplier at the opposite region. The company on this level sells the intermodal transport services to consignors or consignees within the own region. The company sells the intermodal transport services through their own brand and they also own the customer by themselves.

The second level is a partial collaboration regarding intermodal transport where the companies are partially integrated. The largest difference between this level and the previous level is that the companies at level two share resources to enable return transports. This requires the companies' activities to be coordinated and they have to share the profit fairly between them. The contract terms are agreed for every assignment and the contact between the companies is manual. They also have to agree about the network structure in the collaboration.

The third level is an extensive collaboration where the companies are integrated to a larger extent. They have common planning, the administration is handled through common routines and the assignment terms are centrally agreed upon. The companies have a common information system, which is one way to improve an otherwise complex administration. At this level, the companies can also manage larger national customers besides the regional customers.

The fourth level is a joint company where the relationship between the companies is totally integrated. The companies own the customers together and they sell the intermodal transport services through a common brand. Both planning and administration is carried out centrally. The companies do also share knowledge with each other.

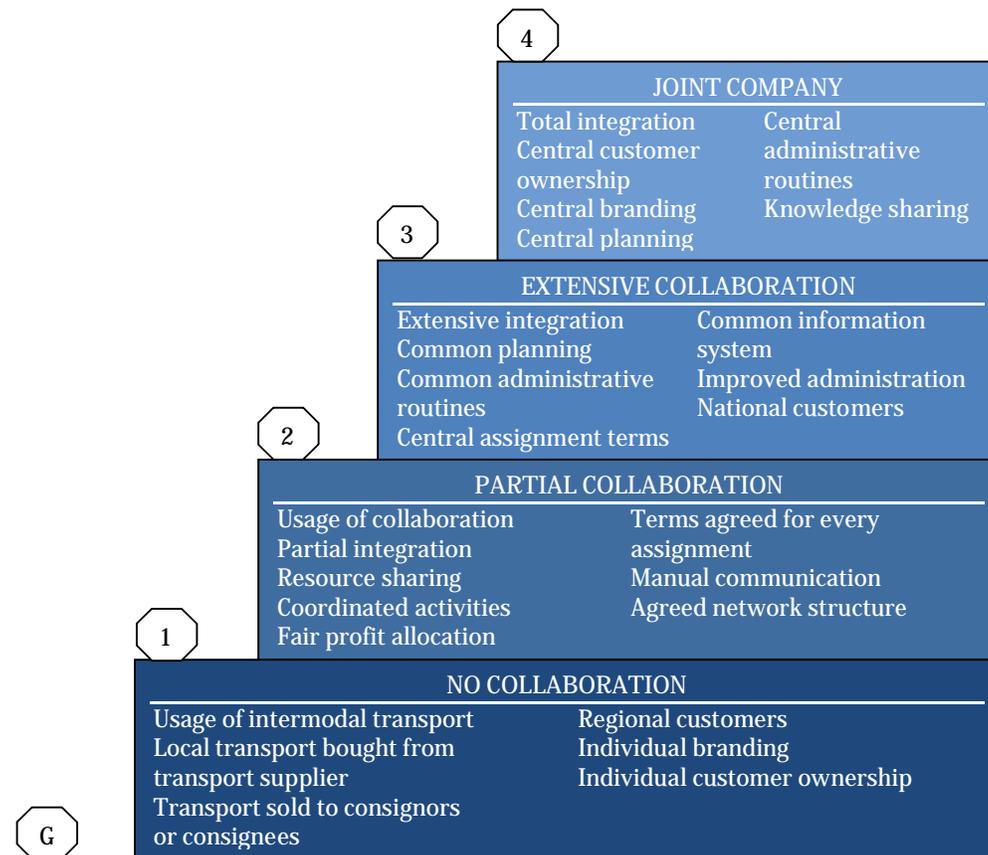


Figure 18 Different Levels of Collaboration

All collaboration levels include the collaboration strategies for the underlying levels as well, as long as the collaboration strategies are not directly exchanged at the new level. For example will the individual customer ownership, presented at the first level, be individual at level two and level three as well, until it is exchanged to central customer ownership at level four.

### 7.3.2 Prerequisites Fulfillment at Different Levels of Collaboration

What prerequisites a company has to fulfill depend on what level in the staircase they are located at. At the ground level, no prerequisites have to be fulfilled. At the first level,

where no collaboration between the companies exists, it is enough for the company to fulfill the prerequisites for intermodal transport. For the remaining levels of collaboration, both the prerequisites for intermodal transport and the prerequisites for collaboration has to be fulfilled for collaboration regarding intermodal transport to be sustainable, see Figure 19.

It is necessary to understand that all prerequisites for collaboration have to be fulfilled at each level of collaboration, but the prerequisites can be fulfilled to different extent. The prerequisites for collaboration are fulfilled to different extent between the levels of collaboration, but from level two they have to be fulfilled to a minimum level.

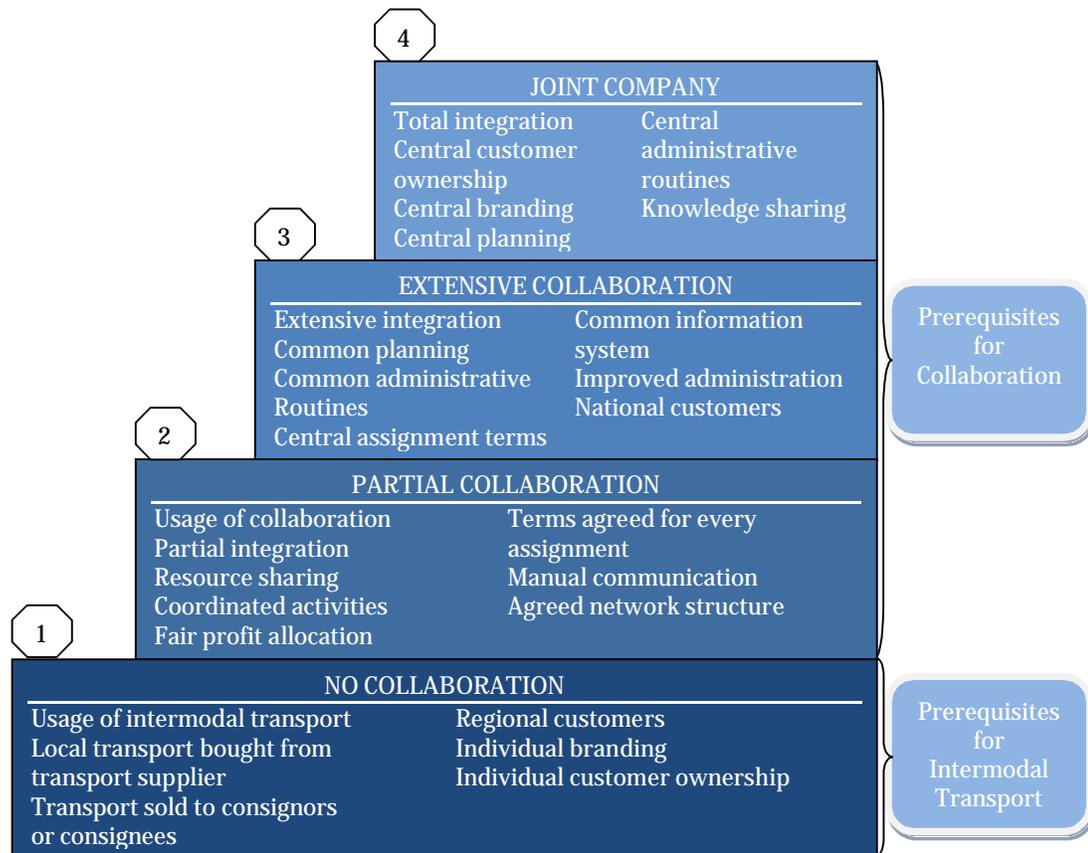


Figure 19 Prerequisites Fulfillment at Different Levels of Collaboration

Either, the collaboration strategies are on a low level in the staircase or, if the collaboration strategy involves sub-strategies, one of the sub-strategies are located on a low level in the staircase. However, there are some exceptions. Joint planning is introduced at level three, along with coordinated administration and improved administration. Sharing knowledge is introduced first on level four. None of these four collaboration strategies do solely correspond to a prerequisite for the collaboration regarding intermodal transport. It is possible to fulfill all prerequisites at a lower level in the staircase, even though these collaboration strategies are not used. The four collaboration strategies introduced at higher levels in the staircase increases the extent to which the connected prerequisites are fulfilled.

One identified collaboration strategy is not present in the staircase at all: intermodal transport sold to transport supplier. As explained in Chapter 7.3.1, this collaboration

strategy does not correspond to the use of intermodal transport and the collaboration strategy is therefore located on the ground level.

## 7.4 COLLABORATION STRATEGIES INDEPENDENT ON LEVEL OF COLLABORATION

---

As explained in Chapter 7.1, there are also collaboration strategies that are independent of the level of collaboration. These independent collaboration strategies are just as important for the business model as the dependent collaboration strategies. In this chapter, all independent collaboration strategies that are connected to a decision between two or more sub-strategies are presented. The collaboration strategies that do not have any alternatives or those who have innumerable alternatives depending on the regional transport companies will be discussed directly in the analysis and do not need any intermediate explanations.

### 7.4.1 Segment Customers

---

There are more ways to segment customers than the two ways dependent on collaboration level, as explained in Chapter 6.3.1. Two ways to segment customers are identified, from the theoretical framework, to be a choice between two independent sub-strategies.

First, it is possible to choose whether to transport only full unit loads or less than full unit loads as well, by intermodal transport, see Figure 20. Full unit loads are less time consuming since it is easier to handle, according to Lumsden (2006) in Chapter 6.3.1. However, it is easier to secure high resource utilization when allowing less than full unit loads to go by intermodal transport. To be able to increase the resource utilization, less than full unit loads require additional handling, which is complex, costly and time consuming according to Lumsden (2006). Since less than full unit loads are more complex to handle also makes it a segment with high barriers to entry and it can therefore be beneficial to be placed in this segment, as stated by Faulkner and Campbell (2003).

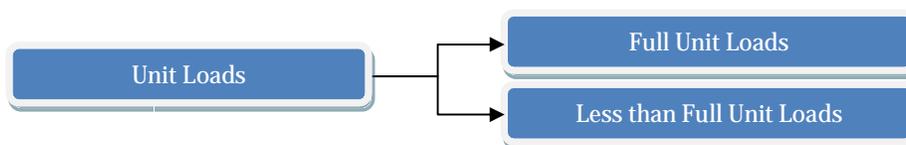


Figure 20 Independent Sub-strategies for Customer Segmentation regarding Unit Loads

Second, it is possible to choose to only transport parts of a customer's goods flows or to transport all the goods flows from one customer, see Figure 21. An example of transporting parts of the goods flow is to differentiate the base and the surge flow as described by Christopher and Towill (2001) in Chapter 6.3.1. If all goods flows are transported by intermodal transport, the value from intermodal transport can be captured for larger flows. However, it can be difficult to handle the uncertainties in goods flows by intermodal transport, as rail transport are not as flexible as road transport, as described by Sommar (2006b, in Chapter 2.2.2). By only transport parts of the goods flows, the imbalances in goods flows can be handled, as described in Chapter 6.3.1. Intermodal transport often handles only the base demand, described in Chapter 2.2.2.

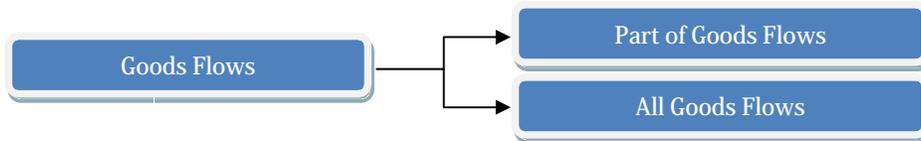


Figure 21 Independent Sub-strategies for Customer Segmentation regarding Goods Flows

### 7.4.2 Agree on Assignment Terms

The agreement on assignment terms does not only have dependent sub-strategies. As explained in Chapter 6.5.7, the assignment terms can either be formal contracts or informal agreements, see Figure 22. Formal contracts are related to control of the collaboration that according to Das and Teng (2001) is lowering the risk in the collaboration, described in Chapter 6.5.7. Informal agreements are instead based on trust within the collaboration.

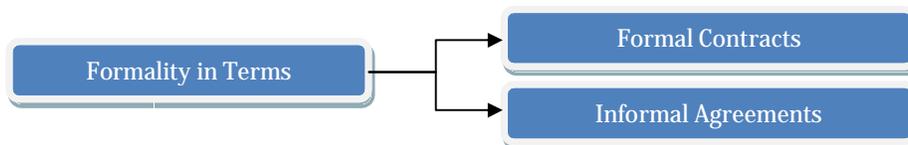


Figure 22 Independent Sub-strategies for Agreed Assignment Terms regarding Formality in Terms

### 7.4.3 Agree on Network Structure

There are two independent collaboration strategies for the network structure that requires a decision between two different sub-strategies.

The network can either be structured as individual transport lines or as a network of transport lines as described by Jonsson and Mattsson (2005) in Chapter 6.6.1, see Figure 23. In a network of transport lines the companies can provide an entire transport solution for large national customers, but the system can be complex to handle. Individual lines are simpler to handle, as the collaboration only include two collaboration partners (Jonsson & Mattsson, 2005).

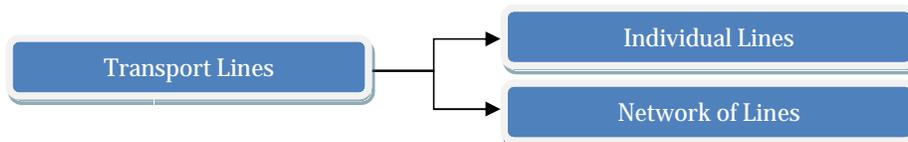


Figure 23 Independent Sub-strategies for Agreed Network Structure regarding Transport Lines

Another aspect is the flow structure in the network. The flow structure is partly related to the transport lines. If the collaboration is built up as individual lines, the flow will be focused on transport back and forth between two nodes. But if the collaboration is built up as a network of lines it is possible to choose whether the flows should be transported between two nodes or in a network of nodes, described in Chapter 6.6.1 by Lumsden, 2006, see Figure 24. In a network of nodes, a transport may cover more than two nodes, for example go in a triangle. According to Woxenius and Bärthel (2008), the imbalances of goods flows can be reduced from a network of nodes. However, the system becomes more complex, according to Lumsden (2006).

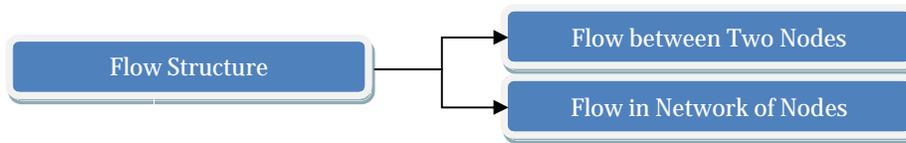


Figure 24 Independent Sub-strategies for Agreed Network Structure regarding Flow Structure

#### 7.4.4 Share Profit Fairly

As Jap (2001) describes in Chapter 6.7.1, the profit can be allocated either equally or equity. If the profit should be allocated according to equity, it is possible to use different variables as weights, as described in Chapter 6.7.1. For the regional transport companies, it could be possible to allocate the profit according to workload or customer ownership, see Figure 25, as they are interesting variables.

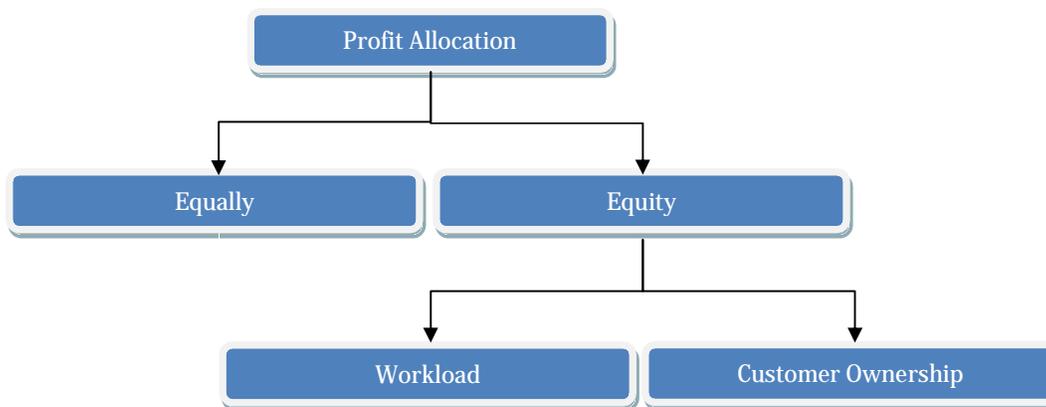


Figure 25 Independent Sub-strategies for Fair Profit Sharing regarding Profit Allocation

### 7.5 MODIFIED BUSINESS MODEL FRAMEWORK

A business model framework was presented in Chapter 4.3.2 to be the foundation for the developed business model in this report. However, the collaboration strategies presented in the theoretical framework do not exactly fit the presented business model framework. The business model framework, presented in Chapter 4.3.2 was not developed for collaborations regarding intermodal transport. For that reason, it is necessary for the business model framework to be modified and updated according to the future content of it, namely the identified collaboration strategies.

For the business model framework to be suitable for the presentation of the identified collaboration strategies, the original building blocks have been adapted to the content of the collaboration strategies from the theoretical framework. Figure 26 presents how the business model is developed to better fit collaboration regarding intermodal transport.

As shown in Figure 26 below, the business model framework is adapted to the prerequisites for intermodal transport and the prerequisites for collaboration for the business model framework to fit the collaboration strategies. It is the prerequisites for collaboration regarding intermodal transport that create the collaboration strategies. For that reason, the business model framework should be adapted to the prerequisites to suit the content of the concluded collaboration strategies.

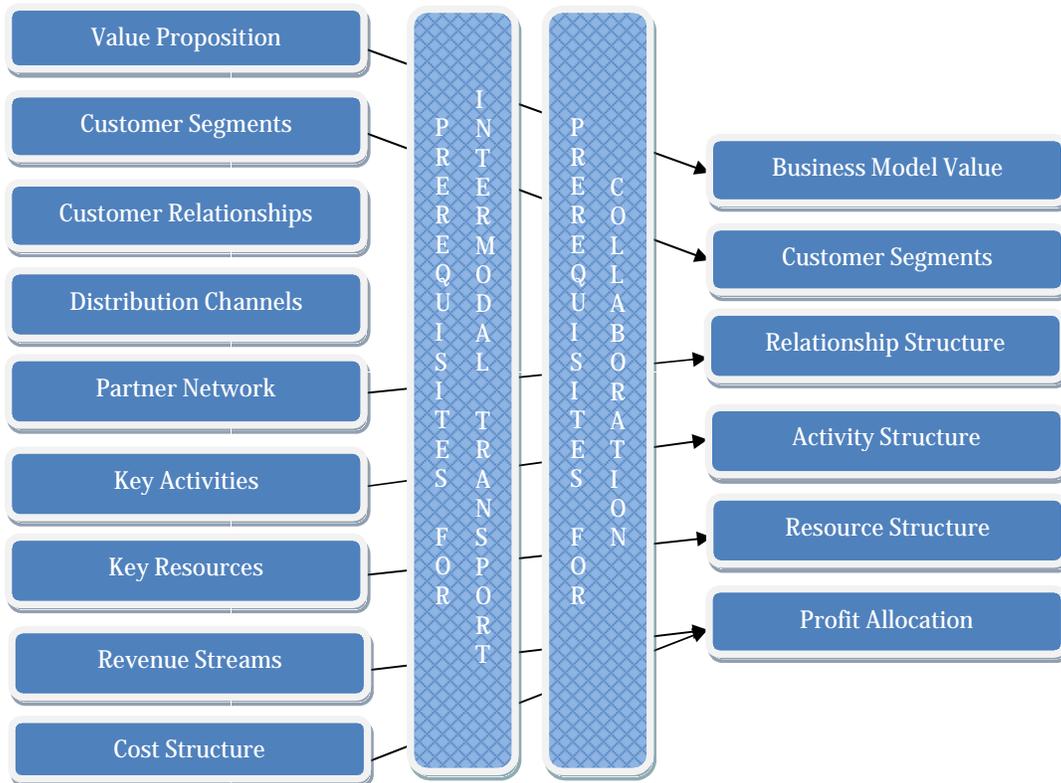


Figure 26 Development of the Business Model Framework

The most important part of the value proposition for the regional transport companies is the value of the business model, both for the companies and for the customers. It is essential for the regional transport companies to capture the value from collaboration regarding intermodal transport, as explained in Chapter 6.2.

The customer segments are also an important part of the business model, since it is important for the regional transport companies to know to which customers they should offer intermodal transport, as described in Chapter 6.3.1. The customer segments will therefore be a part of the created business model.

The customer relationship and the distribution channels, on the other hand, do not contribute to the business model for the collaboration. These parts are handled by the companies individually and not as parts of the collaboration. The report is limited to only concern the aspects that are connected to the collaboration, as described in Chapter 1.6.

The most important parts of the partner network, the key activities and the key resources are the structure. It is not relevant to look into exactly which relationships, activities and resources that exist, since that will not help answering the research questions in Chapter 1.5. It is important to know how these three aspects should be structured in the collaboration.

The revenue streams and the cost structure are not interesting in themselves, since they are not part of any collaboration strategies, but only collaboration strategies for the own company, which is not considered in this report as described in Chapter 1.6. However the allocation of the revenues and the costs are highly important for the collaboration, why it is important to describe the profit allocation between the companies.

The concluded collaboration strategies will in the end of this report, Chapter 12.1, be presented in the adapted business model framework.

# PART IV

---

## 8 REGIONAL TRANSPORT COMPANIES' RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT

---

In this chapter the studied regional transport companies' relation to collaboration regarding intermodal transport will be presented, one by one. All information in this chapter comes from interviews with the regional transport companies. The chapter ends with a comparison between the regional transport companies' views and how their individual situations affect their views. Since the studied regional transport companies have chosen to be anonymous, they will be called, RTC (Regional Transport Company) A-E in the report.

### 8.1 RTC A'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT

---

This chapter will show RTC A's relation to collaboration regarding intermodal transport. The interview was made with one representative from the company. The interviewee has a top position in the company since a few years back and the interviewee has long experience from the transport industry with top positions in other companies.

#### 8.1.1 Characteristics of RTC A

---

RTC A is a large regional transport company working with transports in Sweden without any previous intermodal experience. However, RTC A will start working as a sub-supplier to a rail operator in the near future and they have access to a fully equipped intermodal terminal, which they will operate. The rail capacity in the region is limited and it is not possible to increase the rail transports to any greater extent due to limited slot times. RTC A has manual contact with their customers since they think that it is necessary because of their large part of special transport.

#### 8.1.2 Problem Areas Connected to Intermodal Transport

---

RTC A perceives that the profitability for intermodal transport can sometimes be a limiting aspect since the profitability is strongly dependent on that the long distance transport is long enough. They mean that a minimum distance of 200-250 kilometres is necessary for intermodal transport to be profitable.

They also perceive the fulfilment of customer demands as problematic with intermodal transport because of the limited flexibility, especially during nights and weekends. RTC A perceives that the longer lead time for intermodal transport often cause problems for fulfilling the customer demands. RTC A has experienced that the customers are requesting intermodal transport and that the customers have an interest in environmentally sustainable transport or have demands on lower cost.

Access to railway can also be problematic for RTC A due to lack of infrastructure resulting in a lack of slot times on rail.

### 8.1.3 Problem Areas Connected to Collaboration

---

During the interview, RTC A stated that they were afraid that collaboration would result in lack of flexibility, which they find is extremely important. RTC A wants to be independent and only have short term collaborations that are focused on specific assignments for customers. They believe that it is important in a collaboration to have an open and honest relationship, where the collaboration partners can trust each other.

### 8.1.4 Business Model Value

---

RTC A's expectations of intermodal transport are that they will meet the increased customer demands on intermodal transport, environmentally sustainable transport and lower costs for transport. RTC A has experienced a high demand for intermodal transport from their customers and finds that the interest will increase in the future. The customers have expressed an interest in environmentally sustainable transports and RTC A also finds that for some customers, lower costs would result in customers that would be willing to lower their demands on lead time. RTC A also expects intermodal transport to improve the work environment for the hauliers.

### 8.1.5 Customers Segments

---

RTC A's only customer will be a rail operator. RTC A has identified several goods types they find are of interest for intermodal transports where the most important ones is groceries, consumer goods and forest products. Groceries are a large part of RTC A's business. RTC A says that groceries are composed of a stable flow with very tough demands on lead time, more so when the transport is to the regions and less when it is to the central warehouse. Groceries are the type of goods that RTC A is most interested in using intermodal transports for. Groceries are often temperature sensitive goods.

### 8.1.6 Relationship Structure

---

RTC A does not want to enter an integrated collaboration with strict structures, as they do not want to be tied to a specific collaboration. RTC A wants to be able to have a collaboration with anybody when a specific customer or assignment demands it. In the base of the collaborative relationship there should always be a customer, according to RTC A. The transport industry is constantly changing and RTC A finds that it is important to be flexible and be able to make changes in capacity at short notice.

### 8.1.7 Activity Structure

---

RTC A has much manual administrative handling of orders. The company prefers that the customers call and discuss an assignment. RTC A does not find that the administrative routines would be changed due to a change to intermodal transport.

In any kind of collaboration RTC A wants to negotiate the terms for the collaboration for every assignment. RTC A prefers informal agreements rather than strict contracts. The regional transport companies have an open relationship built on trust.

### 8.1.8 Resource Structure

---

RTC A finds that there is not large investment need to start using intermodal transport but there might require some adoptions of the existing resources.

### 8.1.9 Profit Allocation

---

One solution for profit allocation according to RTC A is to split the profits equally among the collaboration partners. RTC A believe that the important thing to focus on is to have a good collaboration rather than focus on who owns the customer.

### 8.1.10 Thoughts about the Future

---

RTC A has a lot of thoughts about the future development of intermodal transport. The recession in the economy have resulted in decreasing goods flows. RTC A thinks that several of the newly established rail operators and intermodal terminals will disappear as the volumes are decreasing.

RTC A sees that the development of infrastructure also in the future will be progressing slowly. It is necessary with large investment in infrastructure for intermodal transport to be able to increase in the region.

RTC A also sees that the regional transport companies' relationships will change in the future. The regional transport companies have historically been regionally focused and there has not been much competition between them. RTC A believes that a new actor entering the market will change the situation and disturb the balance that has been a trademark for the industry.

RTC A has an interest in taking a large role in the transport chain in the future and provide intermodal transport directly to consignors or consignees, but this is not a priority right now. RTC A might also be interested in the role as rail operator in the future.

## 8.2 RTC B'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT

---

This chapter will show RTC B's relation to collaboration regarding intermodal transport. The interview was made with one representative from the company. The interviewee has a top position in the company.

### 8.2.1 Characteristics of RTC B

---

RTC B is the largest company in this study. RTC B has previous intermodal experience handling the short distance transport but is not presently active within the intermodal transport chain. RTC B used intermodal transport earlier, and then they bought space on a rail operator's trains for the long distance transport and bought the short distance transport in the other node from a local transport supplier.

RTC B has access to a fully equipped intermodal terminal but they are not active as terminal operators. The rail capacity in the region is limited and it is not possible to increase the rail transports to any greater extent due to limited slot times.

The majority of RTC B's administrative routines are automated and the contact with the customers is mainly electronic. RTC B has manual handling of the waybill, which needs to be handled by the haulier and the administrative unit at the company.

### 8.2.2 Problem Areas Connected to Intermodal Transport

---

RTC B has identified three problem areas for intermodal transport, which they think are necessary to solve for intermodal transport to be applicable.

The first problem area is that intermodal transport is not profitable for all distances. RTC B means that the long distance transport has to be long enough for intermodal transport to be profitable and that intermodal transport is only suitable for distances over 400-500 kilometres. The distance between the customer and the intermodal terminal is also an area that can cause problems for intermodal transport since the distance cannot be too long in order for the transport to be profitable.

The second problem area is that the customer demands must be fulfilled and intermodal transport sometimes makes it difficult to do so. One of the largest limitations with intermodal transport is, according to RTC B, the restrictions in time that are connected to the long distance transport. The timetables for the trains and the limited flexibility regarding opening hours at the intermodal terminals are seen as the two largest limitations for intermodal transport.

The third problem area is access to necessary physical resources. There is limited access to railway in the area where RTC B is located, which result in difficulties to use intermodal transport to a larger extent. RTC B means that there is a need for more railway tracks and more nodes where the rail wagons can be attached and detached from the trains. RTC B has also identified the intermodal terminal as a problem area, regarding both localisation of the terminal as well as the necessary equipment at the terminal. The localisation of the intermodal terminal is important because if the distance between the terminal and the consignor or consignee is too long there is a loss of flexibility and the cost for the transport increase, says RTC B. RTC B also means that there is a need for new technical solutions at the terminal to make the transshipment more efficient and flexible. RTC B also sees access to trucks as problematic, since intermodal transport requires different types of trucks than road transport.

### 8.2.3 Problem Areas Connected to Collaboration

---

A sustainable relationship is important for a collaboration to be sustainable means RTC B. They think that companies in the collaboration need to have common goals and strategies and be fully committed to the collaboration, which can be difficult to achieve. RTC B also fears opportunistic behaviour from the collaboration partners and to overcome this fear they say that there has to be strong ties between the collaboration partners. RTC B see that for the collaboration partners also need access to information for the collaboration regarding intermodal transport to work smoothly, which might require investments and adoptions from the companies.

### 8.2.4 Business Model Value

---

RTC B experience that there are much value to be gained from working with intermodal transport. The company sees intermodal transport as an alternative to road transport, which they consider valuable since road transport are exposed to risks such as increased fuel prices.

RTC B finds that intermodal transport can be a way to meet the customer demands. RTC B's customers have not expressed any demands on a special transport mode or on environmentally sustainable transport systems, but the customer has expressed a wish to create a less costly transport system.

However, RTC B finds that the recession in the economy has affected the customers' behaviour and the cost for transport has become their focus. The customers has realised that high demands on lead time and flexibility is costly and are willing to make sacrifices to lower the costs.

Another value that RTC B finds that intermodal transport can bring is a better work environment for the hauliers, since they no longer have to drive as many long distance transports.

Collaboration regarding intermodal transport does also provide value for the company according to RTC B. They believe that collaboration is necessary for them to gain a presence in the opposite region.

#### 8.2.5 Customer Segments

---

RTC B mention three aspects that they find are important with regards to the customers and what kind of customer intermodal transport is suitable for. RTC B finds that it is important for them to own the customer and that they are the first-tier supplier selling intermodal transport to the consignor or consignee. RTC B finds that the base for the collaboration should be around individual regional customers.

Goods types that RTC B has identified as interesting are forest products, groceries and consumer goods. Forest products are the base of several stable flows between the region and other regions. There are large imbalances in flows between north and south in Sweden, depending on that the heavy industry use rail for their goods. If these goods instead could be an intermodal transport, there are some potential to even the flows somewhat.

RTC B does not think it is reasonable to transport less than full unit loads with intermodal transport. They rather think that there has to be large enough volumes to fill a load unit from one customer. RTC B also means that intermodal transport requires stable flows to be applicable. It is difficult to handle large fluctuations with intermodal transport. RTC B therefore finds that it would be suitable to have a base volume on intermodal transport and handle the goods that demand flexibility with road transport.

#### 8.2.6 Relationship Structure

---

RTC B finds that it is necessary to have a stable structure for a collaboration with a deeply integrated relationship. They think that a joint company could be an alternative to handle the collaboration regarding intermodal transport. They say that a structure like that would be preferable to less integrated collaborations since it is necessary to have strong ties to hold such a collaboration together. It is important to RTC B that the companies in the collaboration have strong ties between one another so that no one is tempted to find other alternatives outside the collaboration. They also think central control is important so that there is no sub-optimization of the system and the common goals are prioritised over the individual companies' goals. RTC B says that the joint

company has to own the customers to have the mandate to make decisions. In a less integrated relationship structure, the customer ownership can be individual.

### 8.2.7 Activity Structure

---

RTC B focuses on the activities connected to planning, administration and information sharing but also on strategies for negotiation and assignment terms. They say that the planning in a collaboration should be handled either with common planning or central planning. They say that it is possible that central planning is necessary in order to prioritize the common goals over the individual. RTC B say that it is important in a collaboration to have a common platform that everybody in the collaboration is in agreement on. The company does not find that intermodal transport would have a negative impact on the administrative routing but they realise that intermodal transport requires more information sharing since more actors are involved in the transport chain. Most of RTC B's administrative routines are automated and the order system is electronic today and will continue to be so for intermodal transport as well. They think that administration should be handled centrally in a joint company.

The strategies for negotiation and risk reduction should according to RTC B be centrally controlled. They find that it is important to have a developed specification, agreements and contracts for how priorities and prices should look so decisions regarding these are not arbitrary. RTC B think the most important thing is that there are robust contracts that protect the companies from opportunistic behaviour.

### 8.2.8 Resource Structure

---

The network for the collaboration should, according to RTC B, be created around a flow between two nodes, rather than in a network of several nodes. They think that road transport is a stronger alternative for a network of three or more nodes.

For RTC B to be able to use intermodal transport, the company needs to make investments in resources. However, the company does not consider the access to resources to be a problem in a transition toward intermodal transport. They mean that in a collaboration, it is necessary to have a common information system that can communicate without any disruptions and that is connected to the order system.

### 8.2.9 Profit Allocation

---

RTC B thinks that the profit should not be allocated among the collaboration partners but that the company that is the customer owner should get the whole profit. They mean that both companies are responsible for filling the volumes from one's own region. RTC B's reasoning behind this system is that it encourages the collaboration partners to be active in creating business.

### 8.2.10 Thoughts about the Future

---

RTC B thinks that intermodal transport will become more important in the future. They think that the cost for road transport will increase due to taxes and higher fuel prices, while the cost for rail transport will stay the same. They also think that there will be a technical development that will facilitate the use of intermodal transport and that the Swedish government will continue the development of the railway infrastructure.

## 8.3 RTC C'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT

---

This chapter will show RTC C's relation to collaboration regarding intermodal transport. The interview was made with five representatives from the company. The first interviewee has a top position in the company since many years back. The group also included area commanders from relevant areas and the CEO and project leader from a daughter company.

### 8.3.1 Characteristics of RTC C

---

RTC C is a large company working with transports in Sweden with no previous intermodal experience. RTC C is not active as an intermodal transport supplier. RTC C is a supplier of the short distance transport to different forwarders and rail operators. RTC C has access to a fully equipped intermodal terminal. The rail capacity in the region is limited and it is not possible to increase the rail transports to any greater extent due to limited slot times. The majority of RTC C's administrative routines are automated although the handling of waybills is still performed manually.

### 8.3.2 Problem Areas Connected to Intermodal Transport

---

There are several factors that limit the use of intermodal transport according to RTC C, who has identified the four most important problem areas as a difficulty to make intermodal transport profitable, the importance to have high resource utilization for the company's resources, the customer demands and the lack of physical resources.

RTC C think it is difficult to have profitability in intermodal transport since the cost for transshipment is such a large part of the cost in both time and money for an intermodal transport. They also find that transshipments also increase the risk for damages on the goods and increase the number of reclamations. The transshipment also creates a need for administration that is costly, according to RTC C. RTC C uses a long distance transport of at least 400 km as a limit for when it can be profitable to use intermodal transport. They mean that the trend is that this distance is increasing over time rather than decreasing. The rules for cabotage makes it difficult for the Swedish hauliers to be competitive due to downward pressure on prices, which decreases the use of intermodal transport according to RTC C. RTC C experience that the distance between the terminal and the customers can cause problems for intermodal transport, due to limited access to intermodal terminals.

The most important reason for RTC C not to use intermodal transport is that the customers are not interested in using it. The time is often the deciding factor when it comes to the choice of transport mode for RTC C. Most of the transports are made under strict time limits both regarding lead time but also flexibility, making it difficult to use intermodal transport. Intermodal transport also has problems with security, says RTC C.

Another important problem area, that RTC C perceives, is that there are limited possibilities to use intermodal transport due to the limitations in infrastructure since there is a lack of infrastructure for rail in RTC C's region. They experience that it is difficult to get slot times and the capacity of the railway is limited and cannot handle more goods. It can take months to have a slot time approved and after that there can be changes that makes the time useless due to the time limitations the customer has. They

find that the limited infrastructure also makes intermodal transport less reliable since if a train misses its slot time it can be delayed for hours. Another problem that RTC C experience with intermodal transport is that the access to railway is limited to certain areas and can result in a long detour in comparison to road transport. RTC C also experience that there is limited accessibility to intermodal terminals in some regions, which limits the possibilities to use intermodal transport for these destinations. Intermodal transport also requires access to trucks, which can cause problems for RTC C.

### 8.3.3 Problem Areas Connected to Collaboration

---

A problem, that RTC C sees, is that in collaboration is that it is easy to turn the focus inward toward the collaboration rather than focusing on the customer. The collaboration partners can easily start focusing more on the fairness of the division of transport and profit. RTC C finds that a solution to this problem is to start a collaboration around new customers so that no one feels that they are losing a customer to the collaboration and avoid conflicts. According to them, it is important that the collaboration partners can trust each other since they are sharing the business with a collaboration partner, which can pose a risk for the company.

### 8.3.4 Business Model Value

---

RTC C is interested in intermodal transport because they find that intermodal transport can offer them a competitive advantage if they start using intermodal transport at an early stage and thereby gain a leading edge over their competitors. That intermodal transport is an environmentally sustainable option does also draw the attention of RTC C.

Since RTC C want to be able to provide their customers with a whole concept solution they want to be able to offer them intermodal transport. Intermodal transport is an alternative to road transport and will therefore be a good complement in RTC C's product portfolio. Although RTC C wants to offer their customers intermodal transport, none of the customers have made any requests for intermodal transport. RTC C finds that even though their customers take the environmental impact of the transport into account this is not an important factor for the choice of transport mode. RTC C's customer's main interest is a low cost, which intermodal transport can be a solution to.

Intermodal transport can increase the work environment for the hauliers when long distance transport over night is decreased, something that RTC C perceive as positive.

They also think that a value that a collaboration regarding intermodal transport can provide is high resource utilization. RTC C sees that intermodal transport can counteract the imbalances in the flows in the region and create higher resource utilization by using the same transport mode for transports in both directions instead of goods in one direction being transported on rail in the other direction on road.

### 8.3.5 Customer Segments

---

In a collaboration regarding intermodal transport, RTC C finds that it is important for them to own the customer and that they are the first-tier supplier selling intermodal transport to the consignor or consignee. Besides that there are several other aspects that

RTC C thinks are important for choosing what customers are suitable for a collaboration regarding intermodal transport, such as size, industry, goods and geographic location.

RTC C believes a collaboration regarding intermodal transport should focus on large, nationwide customers but finds that regional transport customers also can be interesting for a collaboration regarding intermodal transport. Interesting industries and goods types for RTC C is national chains selling consumer goods, such as electronics, appliances and other consumer goods. The reason for that RTC C think that consumer goods are interesting is that consumer goods is often not time sensitive and is therefore suitable for intermodal transport. RTC C also suggests forest products as an interesting type of goods for intermodal transport, since this could help even out the imbalances in goods flows. RTC C finds that groceries could be an interesting goods type as well, although there are some difficulties involved in this due to the time restrictions connected to groceries. Bio fuels could also be an interesting goods type for a collaboration regarding intermodal transport.

RTC C thinks that it might be possible to use less than full unit loads in a collaboration regarding intermodal transport although it is much easier to use full unit loads. RTC C think that to only use intermodal transport for less than full unit loads would possibly result in problems with return flows because some goods is not suitable for the same load units that is used for less than unit load goods, for example forest products.

Dependant on the economic situation and the time flexibility RTC C thinks that it can be possible to transport an entire goods flow on intermodal transport but if this is not possible, only selected parts of the flow can be transported with intermodal transport.

### 8.3.6 Relationship Structure

---

The relationships between the collaboration partners in a collaboration regarding intermodal transport should according to RTC C involve little integration. They think that the customer ownership should be individual and the customer owner buys the local transport at the node from a collaboration partner. RTC C finds that the price for the transport will be kept down with this set-up. For the collaboration to be successful there has to be a coordinating factor but the coordinating factor will play a very small role in the collaboration set-up. RTC C, who finds that it is important to be the customer owner, prefers individual customer ownership.

### 8.3.7 Activity Structure

---

In a collaboration regarding intermodal transport there has to be some kind of coordination of activities between the collaboration partners, according to RTC C. They want the coordination of activities to be limited to the development of a common framework for the agreements between the collaboration partners. The main concept around the agreements can be formed at meetings a couple of times per year in RTC C's opinion. The division of activities and responsibilities among the collaboration partners is not problematic according to RTC C.

The administration for the transport at RTC C will be affected by a change of transport mode from road transport to intermodal transport. The most RTC C's administration is handled through automated standardised systems, but since intermodal transport include several changes of transport mode there will be more manual handling

connected to intermodal transport. A system that can handle intermodal transport automatically would be expensive to build and handle, think RTC C.

RTC C advocate an informal process for negotiating the transport contracts and the division of responsibilities and mean that it can be done over the telephone or if there are longer assignments there could be some form of contract. RTC C does not want to have any central bureaucracy regarding the agreements although they want a common framework for the agreements.

### 8.3.8 Resource Structure

---

RTC C wants the collaboration to focus on a flow between two nodes. RTC C thinks that it is preferable to use the companies' own brands in the marketing of the intermodal transport.

RTC C does not find that access to resources such as trucks and load units is a limiting factor for using intermodal transport. Therefore there is not much need for investments in a collaboration regarding intermodal transport, although RTC C finds that if there was something that might require investments it is load units and trucks. RTC C says that the regional transport companies have access to an integrated information system and that it therefore would not be problematic to share information between the companies.

### 8.3.9 Profit Allocation

---

RTC C finds that in a collaboration where the profit needs to be allocated some difficulties will appear. RTC C thinks that the profit should be allocated according to each collaboration partner's workload. They find that there can otherwise be a danger that the customer owner wants to make more money and therefore increase the price and creates a sub-optimized system.

### 8.3.10 Thoughts about the Future

---

RTC C thinks that in the future road transport will decrease due to a transfer of goods to other transport modes. The regulation from the EU, the Swedish government and the municipalities will force goods to be transferred from road to other transport modes and other incentive structures also will lead to a modal shift. Another factor that RTC C finds will affect the development of intermodal transport in the future is the technical development. RTC C thinks that a new container with sidewalls that can be opened will reach that market in a few years and that this will change what kind of goods that can be transported with intermodal transport. The development of fuel and electricity prices will also affect the future development.

## 8.4 RTC D'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT

---

This chapter will show RTC D's relation to collaboration regarding intermodal transport. The interview was made with three representatives from the company. The first interviewee has a top position in the company since many years back. The group also included an area commander from a relevant area and the CEO from a daughter company.

#### 8.4.1 Characteristics of RTC D

---

RTC D is a large transport company in Sweden. RTC D has previous intermodal experience through a daughter company. During this previous experience the company have rented space on the train and transported both containers and trailers. On the receiving node they have had a relationship with a transport supplier who handled the short distance transport at the node or they have bought the transport from the rail operator. RTC D is active in the transport chain handling short distance transport and as a terminal operator. RTC D has access to a fully equipped intermodal terminal. The rail capacity in the area is good and there is room for an increase of intermodal transport. The administrative routines at RTC D are a mix between manual and automated activities, but are constantly changing towards more and more automated activities.

#### 8.4.2 Problem Areas Connected to Intermodal Transport

---

There are problems and limitations with intermodal transport that sometimes makes them unsuitable according to RTC D. RTC D identifies three important problem areas: the profitability of intermodal transport, the possibility to fulfil the customer demands and the lack of physical resources.

One problem area for intermodal transport is the profitability according to RTC C. They believe that the long distance transport has to be at least 280-300 kilometres to be profitable. If the distance is shorter than that there has to be very large volumes involved for the flow to be profitable. RTC D has experienced much downward pressure on transport prices from the customers, which makes it difficult to be profitable. High resource utilization is also important for the profitability, which RTC D find difficult to fulfil for intermodal transport since the imbalances in the goods flows are high and a large percentage of the trains are transported empty in one direction.

RTC D believe that intermodal transport is a complete solution for the customers and the company has to be able to handle the entire transport chain to satisfy the customer demands. Time is often a limitation to using intermodal transport, according to RTC D. They experience that the customers have high demands on lead time, flexibility and reliability and the transport often have to be an overnight transport. Other customers have demands concerning the security of the goods, why intermodal transport would be a less suitable transport mode due to higher risks for damages means RTC D. Due to these demands it is not possible to use intermodal transport for several of RTC D's customer's flows.

In order for intermodal transport to be an alternative transport mode there has to be available infrastructure, says RTC D. They do not experience that there is a lack of railway infrastructure in the region but access to trucks and drivers can cause problems for intermodal transport according to RTC D. They experience that there are long queues for new trucks and difficult to find drivers presently.

#### 8.4.3 Problem Areas Connected to Collaboration

---

RTC D thinks that a problem area connected to collaboration is that in a collaboration there is a risk that the collaboration partners are focused on their own goals and agenda. It is important to have common goals in a collaboration and an open communication is therefore necessary, mean RTC D.

As a collaboration partner the company is a part of a project and has a certain responsibility and according to RTC D it is therefore important that the companies consider the implication of entering into a collaboration before the contracts are signed. They find that it is important that the collaboration partners are willing to give and take in the relationship and it is important that the collaboration partners have an open and honest relationship so that they can trust each other as there always is a risk of opportunistic behaviour in a collaboration.

RTC D find that a collaboration partner has to be able to fulfil the performance demands and therefore it can be suitable to have a collaboration partner that is on the same level as the own company.

Another problem that can appear in a collaboration, RTC D thinks, is that there are conflicts about who should do what, which can result in that the customer turns to someone else. A collaboration need to stand for go-ahead and new thinking and the company that is the most suited to perform the task should be the one doing it, says RTC D.

#### 8.4.4 Business Model Value

---

Intermodal transport provide much value according to RTC D. RTC D find that intermodal transport can provide them with a competitive advantage as an environmentally sustainable option. Environmental sustainability is an important question for RTC D and they work hard with being an environmentally sustainable option for their customers. The company experience that the customers choose them because of their image as an environmentally sustainable transport company.

Intermodal transport also provides an alternative to road transport which RTC D finds is valuable since they think it is necessary to find an alternative to road transport because of the problems connected to road transport: congestion, lack of drivers, high costs for fuel and long waiting time for buying new trucks.

RTC D have experienced that the customers are requesting intermodal transport. Their customers have a strong environmental interest and several of the customers request RTC D to declare the emissions for the transport. Despite their customer's interest in environmentally sustainable transport, the cost and lead time for the transport is still the most important demands and that can make intermodal transport difficult to use sometimes. RTC D finds that the customers are willing to make some adjustments to be able to use intermodal transport regarding for example the lead time, if RTC D can offer them some extra services such as warehousing.

RTC D also thinks that intermodal transport can provide value through an increased work environment for the hauliers. If the long distance transport overnight decreases the hauliers work environment is increased. It can also increase the work environment due to fewer accidents, which is an important question for RTC D.

The first and foremost reason for RTC D's interest in collaboration is that it can lead to better resource utilization of the return flows. In case more companies collaborated

regarding intermodal transport the balances in the flows could be evened out and better transport solutions could be created.

#### 8.4.5 Customer Segments

---

RTC D mentions several different aspects that they find are aspects that the customer segmentation should be based on. RTC D finds that it is important for them to own the customers and that they are the first-tier supplier selling intermodal transport to the consignor or the consignee.

The way RTC D can use intermodal transport is dependent on the customers' needs. These needs are dependent on the type of goods the customer transport but also on the customers' geographic location. Forest products are a goods type that RTC D finds is well suited for intermodal transport since the customer demands regarding time is often low for forest products and they are therefore suitable for intermodal transport. How sensitive the goods are to limitation in time is related to the value of the goods according to RTC D. For capital intense goods and goods that are necessary for the production at the customer it is crucial that the transport works and the goods is delivered on time. For other types of goods the lead time and reliability is less important. RTC D finds that intermodal transport is therefore more suited for low value than high value goods. RTC D also experience that customers that are close to the end consumer in the supply chain is more interested in environmentally friendly options, why consumer goods can be suitable for intermodal transport. RTC D transports a lot of groceries that often are temperature sensitive goods. Groceries might be interesting to transport with intermodal transport but it can be difficult to guarantee the right temperature.

To create economy in the intermodal transport it is possible that it is necessary to coordinate the goods from several customers in less than full unit loads, why RTC D sees this as an opportunity for intermodal transport.

#### 8.4.6 Relationship Structure

---

RTC D does not want the relationship structure of the collaboration to be deeply integrated but is satisfied with a less integrated relationship. RTC D finds that an individual customer ownership would be preferable in a collaboration regarding intermodal transport.

#### 8.4.7 Activity Structure

---

RTC D focuses on the activity structure connected to administration and information sharing. The administration should develop towards more and more automatic systems. One of RTC D's plans is that the customers should be able to get their waybill electronically. They find it important to have common administrative routines in a collaboration regarding intermodal transport in order to be efficient. They see that collaboration regarding intermodal transport requires a large network of actors that are dependent on each other, which puts higher demands on information sharing on the collaboration partners.

Regarding negotiation and assignment terms, RTC D wants to negotiate the framework for the collaboration for every assignment. The company does not think that a common framework for the assignment would work.

#### 8.4.8 Resource Structure

---

RTC D wants the collaboration to be built around a customer, rather than a network. They find that it is important to create the collaboration regarding intermodal transport from the real world and the goods flows that exist and not from a collaboration or network. The primary concern for RTC D in such a collaboration is to satisfy the customers' demands and a collaboration should be created when there is a need for it.

RTC D are ready to make investments in intermodal transport. Although it is not possible to predict what kind of investments that will be necessary for RTC D.

For a collaboration regarding intermodal transport to work it is necessary to invest in a common information system, so that the different companies can communicate on a common platform, according to RTC D.

RTC D thinks that is preferable to use the companies' own brands in the marketing of the intermodal transport.

#### 8.4.9 Profit Allocation

---

RTC D finds that one important aspect when it comes to profit allocation is that the company that owns the customer takes the risk and should therefore make the money. They think that profit therefore should be allocated according to customer ownership.

#### 8.4.10 Thoughts about the Future

---

RTC D thinks that intermodal transport will be increasingly important in the future. The prerequisites for intermodal transport have changed during the last years RTC D has experienced, with the deregulation of rail that has caused more rail operators to establish. RTC D thinks that the increased competition will increase the reliability of rail transport as rail will become an important complement to road transport. They think that there probably will be more regulations and fees for road transport, even though it is difficult to tell how the development will be since it is important to keep the countries competitiveness as well. RTC D also thinks that there will be large investments in the development of infrastructure.

RTC D believe that much can happen in the future. New business trends will affect the development just like Just-in-Time made it difficult for rail transport to compete with road transport, other trends will change the direction in some other way.

RTC D believes that when intermodal transport increases the short distance transports will naturally increase as well.

### 8.5 RTC E'S RELATION TO COLLABORATION REGARDING INTERMODAL TRANSPORT

---

This chapter will show RTC E's relation to collaboration regarding intermodal transport. The interview was made with one representative from the company. The interviewee has a top position in the company.

### 8.5.1 Characteristics of RTC E

---

RTC E is a large company working with transports in Sweden. RTC E has previous intermodal experience both through a daughter company and by themselves. RTC E is active in the transport chain by handling short distance transport, as a terminal operator and as operator of a railway shuttle through a daughter company. RTC E has access to a fully equipped intermodal terminal. The rail capacity in the area is limited and it is not possible to increase the rail transports to any greater extent due to limited slot times. There are plans to make investments in infrastructure in the area but it takes a long time before this gives effect. The administrative routines at RTC E are totally automated.

### 8.5.2 Problem Areas Connected to Intermodal Transport

---

RTC E has identified three problem areas for intermodal transport where they find it necessary to find a solution to handle the problems.

The first problem area is the profitability for the transport, according to RTC E, and the largest cost for intermodal transport is at the intersection between different transport modes. Intermodal transport is not profitable for distances shorter than 230 kilometres, according to RTC E. The short distance transport between the customer and the terminal must also be short enough for the intermodal transport to be profitable, which RTC E sometimes experience as problematic because of the localisation of the terminals in relation to the customers. RTC E mentions that there is also a fee system and regulations disfavours intermodal transport. Examples of this is the main railway line fees and that only Green Cargo is allowed to switch, meaning that everybody has to buy the switching from them. Few actors in the industry make the negotiations more difficult and the costs are harder to control for intermodal transport than for road transport. It is important to control and make the whole transport chain efficient in order to decrease these costs and in that way make intermodal transport interesting for other distances, thinks RTC E.

The second problem area, mentioned by RTC E, is that it can be difficult to fulfil the customer demands regarding flexibility because intermodal transport is less flexible than road transport due to limitations in the railway system.

RTC E's third problem area is that intermodal transport requires access to certain resources. A big problem, they think, is that there is a lack of capacity on the railway and it is both expensive and time consuming to increase the infrastructure capacity. There also has to be a terminal located in close proximity to the customers since the access to terminals is decisive for the use of intermodal transport says RTC E. They also see that access to load units can be problematic for intermodal transport.

### 8.5.3 Problem Areas Connected to Collaboration

---

RTC D's area where problem can appear in a collaboration is connected to customer ownership. RTC E point out that it is significant to have a clear customer ownership so that everybody knows where the lines are drawn. The customer wants to have contact with one collaboration partner and make their business with that company, says RTC E.

The company think that since collaboration are difficult to control there has to be a strong hand controlling the structure for the collaboration, otherwise there will be

conflicts of interest among the collaboration partners. Too loose collaborations have proven to fail in the past, reflects RTC E.

A sustainable relationship is important for a collaboration to be sustainable, indicates RTC E, and this is also an area where problems can appear. According to them, the focus of the collaboration has to be on the customer and this is crucial for a sustainable collaboration. The companies in the collaboration need to have an open and honest relationship built on trust where they are clear with why the collaboration takes place according to RTC E. They also think that it is important that the collaboration partners are committed to the collaboration and is working against a common goal and have common strategies. It is also important to discuss how the collaboration should work so that all collaboration partners have the same view, RTC E point out. For a sustainable collaboration the companies need to have similar cultures since RTC E find it difficult to over bridge large differences between collaboration partners. The regional transport companies are similar in many ways and RTC D finds that there are good fundamentals for a sustainable relationship between them.

#### 8.5.4 Business Model Value

---

RTC E indicates that there is much value to be gained from working with intermodal transport. The most important value that they see from intermodal transport is that it provides economic opportunities, an augmented product portfolio and opportunities to fulfil the customer demands. Intermodal transport is an opportunity for RTC E to develop and become better and more efficient. They see that intermodal transport can provide the company with economic opportunities to become more profitable. RTC E wants to be a complete logistics partner to their customers and offer complete transport solutions. Intermodal transport is a tool for RTC E to increase their product portfolio and offer the customer an even more complete solution. Intermodal transport can provide value by fulfilling the customers' demands, according to RTC E. They have experienced that the customer request intermodal transport in a greater extent today than before, foremost for environmental reasons. The recession in the economy have made RTC E's customer request more cost efficient transport and intermodal transport can be a solution for that and the customers are willing to make sacrifices regarding time and reliability in order to decrease the cost for transport. It can be compensated with a long planning horizon and RTC E can for example increase their offering with a concept solution including warehousing as an alternative.

Collaboration can also provide value for RTC E. In order for them to be able to offer a complete solution to their customers they need a collaboration partners at the other node to handle the short distance transport. Collaboration is a way to solve this and thus provide a value according to RTC E. They also see that collaboration can lead to better possibilities to handle large, national customers and large flows that could be difficult otherwise and collaboration regarding intermodal transport can therefore open up new markets for the company.

#### 8.5.5 Customer Segments

---

RTC E finds that it is important for them to be the first-tier supplier selling intermodal transport to the consignor or consignee in a collaboration regarding intermodal transport. Beside this, RTC E mentions several other aspects that they find are important

for choosing what customers are suitable for a collaboration regarding intermodal transport, size and goods type.

A collaboration regarding intermodal transport could handle a large, national customer, an opportunity RTC E finds that it is important to take advantage of, although regional customers should also be a part of the network. Interesting goods types for intermodal transport is heterogenous goods, as for example chemicals and hydrogen peroxide. These transports require special vehicles and are more complex to handle, and are therefore interesting according to RTC E. RTC E gets a lot of requests for intermodal transport for this type of goods. Other interesting goods type is bio fuels and forest products, which are important goods types for RTC E that are transported long distances. Another opportunity RTC E sees is that intermodal transport of trailers is not a developed market and there are opportunities to create new business in this area.

RTC E finds that it would be suitable to have a base volume on intermodal transport and handle the goods that demand flexibility with road transport. RTC E never says no to a customer, and if there is no more room on the train, the transport has to be complemented with road transport.

#### 8.5.6 Relationship Structure

---

A deeply integrated relationship is the most suitable relationship for a collaboration regarding intermodal transport, according to RTC E. They find that the most important is that the relationship is based on a customer perspective and that the collaboration partners are in agreement. A clear customer ownership is important for a collaboration, but RTC E can imagine either an individual or a joint customer ownership.

#### 8.5.7 Activity Structure

---

RTC E focuses on the activity structure connected to planning, administration, information sharing and negotiation and control. They think that the planning should be handled either through common planning or through central planning depending on whether there is a joint company or not. The administration should be handled automatically to be efficient, believes RTC E, and information sharing can be handled to manual communication.

RTC E believes that to control the collaboration it is necessary to have formal rules, procedures and policies. Too loose collaborations have proven to fail in the past due to a lack of clear policies and procedures, making it difficult to collaborate, in RTC E's experience. It is necessary to have a common framework for assignments in the collaboration so that all collaboration partners are clear on what is expected, reflects RTC E.

#### 8.5.8 Resource Structure

---

RTC E think that intermodal transport requires access to resources and it is up to each company to decide how much of the resources that they need to invest in and how much that can be rented. RTC E does not see any need for investments in a common information system. There is already much collaboration between regional transport companies and RTC E cannot see the need for a common system for a collaboration regarding intermodal transport to be sustainable.

### 8.5.9 Profit Allocation

---

RTC E think that a critical factor regarding the allocation of profit is the customer ownership and the allocation should be in accordance to customer ownership.

### 8.5.10 Thoughts about the future

---

RTC E's thoughts about the future are that intermodal transport will become more important in the future. They already experience that the customers are requesting intermodal transport more and more and finds like this is a trend that will continue. In the future, RTC E thinks that an additional deregulation of the railway will be made and take away Green Cargo's monopoly on switching. RTC E also believes that there will be new technical solutions that will make the transshipments more efficient.

## 8.6 COMPARISON BETWEEN THE REGIONAL TRANSPORT COMPANIES

---

The regional transport companies within this study have many similarities, as they are all regional transport companies working within the same type of businesses. The organizational structure is similar between the companies, with regards to for example business areas and functions. The companies are working within the same types of transports. All the regional transport companies in this study are member owned companies, jointly owned by the hauliers operating for them.

The companies are all large companies. The regional transport companies' yearly turnover and their number of hauliers are presented in Table 3, with RTC A as index 100. The figure indicates the size of the companies in comparison to each other. From Table 3, it can be seen that the companies' yearly turnover is similar and none of the companies stands out in extreme. The number of hauliers varies between the companies. This can depend on that the hauliers in the regional transport companies have different sizes, rather than that the companies vary in size.

Table 3 Regional Transport Companies' Yearly Turnover and Number of Hauliers (expressed as an index)

	RTC A	RTC B	RTC C	RTC D	RTC E
Turnover	100	139	101	109	100
Hauliers	100	311	244	189	111

The regional transport companies are similar in many ways but there are also some differences between them. The companies in the study are located in different regions in Sweden, all with different regional characteristics. The regions have different infrastructure, which is an important issue for the applicability of intermodal transport. The customers also vary between the regions, as certain industries are more common in some areas than others due to the regional characteristics.

Some of the companies have experience of intermodal transport while some of the companies have not. The companies have also different positions in the intermodal transport chain, varying between providing short distance transport to the customers to operating a terminal or a rail line. Being positioned in different positions in the intermodal transport chain gives them different experience of intermodal transport.

The regional transport companies in this study can represent a larger group of regional transport companies, since the companies have the characteristics that are representative for the network of regional transport companies. Their different

locations represent the situation in different regions in Sweden. The companies also have an even spread in their experience of intermodal transport. The regional transport companies have similar thoughts about the future although they might express their thoughts differently. They all agree that intermodal transport will become more important in the future, for one or the other reason, and this perception will color their view on other aspects. The difference in the studied regional transport companies' opinions are therefore likely to depend on their experience and situation, since they are the differentiating factors between the companies.

## 8.7 REGIONAL TRANSPORT COMPANIES' POSITION IN THE STAIRCASE MODEL

---

The regional transport companies' previous experience from intermodal transport is decisive for their current position in the staircase model, presented in Chapter 7.3.1. The regional transport companies' current position in the staircase shows how much experience the studied companies have, of intermodal transport and of collaboration regarding intermodal transport.

The studied regional transport companies' current position in the staircase model is evident when their current situation is analyzed. Neither RTC A nor RTC C have experience of intermodal transport as it is defined in this report and they are thereby located on the ground level, see Figure 27.

RTC B, RTC D and RTC E have experience from providing intermodal transport services to their customers, either on their own or through a daughter company. However, none of the studied regional transport companies have experience from collaborating regarding intermodal transport. All three companies that provide intermodal transport buy the local transport from a transport supplier at the opposite region. These three companies are therefore located at level one, where no collaboration regarding intermodal transport takes place, see Figure 27.

There are no regional transport companies in the network that are on a higher level of collaboration than the companies studied in this project.

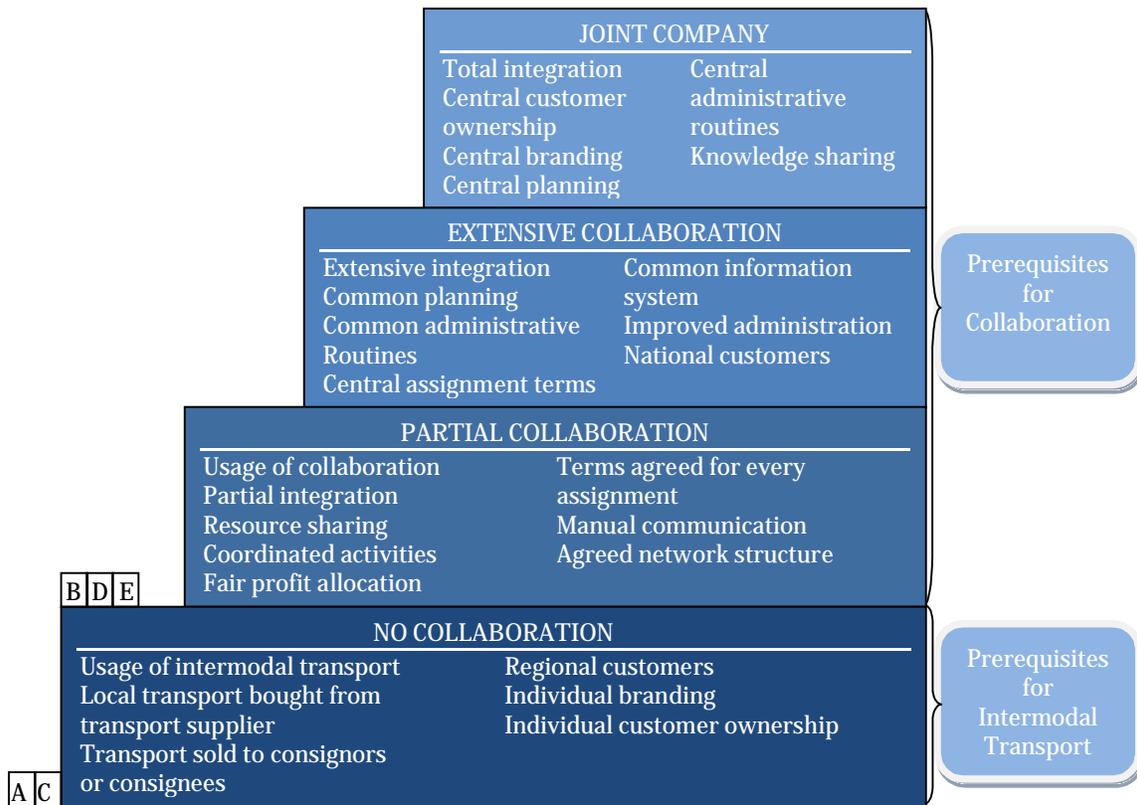


Figure 27 Studied Regional Transport Companies' Current Position in the Staircase Model

At the ground level, neither the prerequisites for intermodal transport nor the prerequisites for collaboration have to be fulfilled. At the first level, only the prerequisites for intermodal transport have to be fulfilled. For the other levels, all collaboration strategies have to be fulfilled, as described in Chapter 7.3.2.

Since none of the studied regional transport companies have any experience from collaboration regarding intermodal transport, none of them have had to consider the prerequisites for collaboration. RTC A and RTC C have not had to consider the prerequisites for intermodal transport either.

# PART V

---

## 9 DECISION ON WHEN TO COLLABORATE REGARDING INTERMODAL TRANSPORT

---

To decide when collaboration regarding intermodal transport is applicable an analysis is made to confirm the prerequisites identified from the theoretical framework with empirical data. To know how the regional transport companies' perceptions should be interpreted, an analysis is made to show the relevance of the regional transport companies' opinions. In the theoretical framework, several prerequisites for intermodal transport and collaboration were identified. In this chapter, these prerequisites will be compared to- and analyzed in relation to the problems the regional transport companies have mentioned in the empirical study. The regional transport companies perceived problems will also be compared to their experience of intermodal transport to investigate whether the regional transport companies' experience affect their perception about their situation.

### 9.1 REGIONAL TRANSPORT COMPANIES' PERCEIVED PROBLEMS WITH COLLABORATION REGARDING INTERMODAL TRANSPORT

---

This chapter will show how well the regional transport companies' perception about problem areas corresponds to the identified prerequisites for collaboration regarding intermodal transport.

#### 9.1.1 Perceived Problems with Intermodal Transport

---

Three types of prerequisites for intermodal transport were identified in the theoretical framework: value for the company, value for the customer and access to resources, see Chapter 5.1.

From the empirical study, in Chapter 8, the studied regional transport companies' statements of problem areas connected to the prerequisites for intermodal transport is summarized in Table 4.

All the regional transport companies in the study have mentioned the three main prerequisites for intermodal transport that was identified in the literature. They all believe that these three aspects affect the applicability of intermodal transport. However, the regional transport companies do not fully agree on how these aspects affect the applicability of intermodal transport.

Table 4 Perceived Problems with Intermodal Transport

	RTC A	RTC B	RTC C	RTC D	RTC E
Value for the Company	X	X	X	X	X
Competitive Advantage					
Profitable	X	X	X	X	X
Long Distance	X	X	X	X	X
Short Distance to Terminal		X	X		X
High Resource Utilization			X	X	
Value for the Customers	X	X	X	X	X
Low Price for Customers					
Environmental Sustainable					
Short Lead time	X	X	X	X	
Flexible	X	X	X	X	X
Reliable				X	
Secure				X	
Access to Resources	X	X	X	X	X
Access to Railway	X	X	X		X
Access to Terminal		X			X
Access to Load units			(X)		X
Access to Trucks		X		X	
Access to Drivers				X	

Regarding value for the company, the five studied regional transport companies perceive almost the same aspects as problematic. All companies agree that profitability is one of the most important prerequisites for intermodal transport. None of the companies would like to use intermodal transport in the longer run if it would not provide an economical value. This is in line with the theory which identifies the profitability and the competitive advantage as important aspects for the applicability of intermodal transport. The reason for why none of the regional transport companies has identified competitive advantage as a prerequisite for intermodal transport is likely that they indirectly think that they achieve competitive advantage if they are profitable and meet the customer demands, rather than that they do not consider it as important.

All regional transport companies also identify the long distance between the terminals as an aspect that has a great impact on the profitability. All companies agree that the distance has to be long enough to provide an economical value, for intermodal transport to be of interest, but they do not agree on how long this distance has to be. The minimum distance which the companies require for intermodal transport to be profitable, is summarized in

Table 5.

Table 5 Minimum Distance for Profitable Intermodal Transport

	RTC A	RTC B	RTC C	RTC D	RTC E
Long Distance (kilometers)	200-250	400-500	400	280-300	230

As seen in the table above, the perceived minimum distances for the regional transport companies vary a lot. The reasons for this difference can depend on that the companies are differently efficient in the transport chain, as described by Flodén (2007) or that the shorter distances to and from the terminals differ, as explained by Woxenius (2006 in Zrinscak, 2006) in Chapter 5.1.1. The regional transport companies' opinions correspond to the limit of 250-500 kilometers that was mentioned in the theoretical

framework. The situations for the five regional transport companies differ, why they have different requirements for intermodal transport.

Some of the regional transport companies have also mentioned the short distance transport to and from the terminal as an aspect affecting the profitability. It is not possible to know why these companies stated the short distance as important while the other companies did not. However, it is likely to depend on the companies' previous experience of intermodal transport. The three companies that have stated the short distance as important have worked more with intermodal transport in the past, compared to the other two companies. As described by Burgoyne and Hodgson (1983 in Cope & Watts, 2000) in Chapter 3.6.2, it is possible that RTC B, RTC C and RTC E has learned another affecting aspect through their previous experience, while RTC A and RTC D might have problems to identify this kind of limitation from outside the intermodal transport chain. Since none of the three companies, that identified the short distance as a problem, was able to estimate the maximum distance, this aspect might have been harder to identify, compared to the long distance transport.

Regarding value for the customers, the five studied companies do more or less agree about which aspects that are most problematic. Almost all companies have pointed out the lead time and the flexibility as prerequisites that are hard to fulfill. This is in line with the literature, since long lead time and limited flexibility are two common drawbacks with intermodal transport as described in Chapter 2.2.2 and Chapter 5.1.2 by Lumsden (2006) and Sommar (2006b). It is neither surprising that the companies do not identify the low price for customers and the environmental sustainability as problematic aspects, since they are described by for example Kreutzberger et al. (2003) and Jensen (1990) in Chapter 2.2.2 and Chapter 6.2.1 to be the main advantages with intermodal transport. However, it is more surprising that the companies do not identify reliability and security as problematic areas since these aspects are brought up as problematic areas for intermodal transport by Sommar and Woxenius (2005) and as important aspects for the customers by Lundberg (2006), Jensen (1990) and Karlsson (2009) in Chapter 5.1.2. This could depend on that the companies do not perceive it as a problem or because they do not have experienced it.

Regarding access to resources the companies do not agree about which resources that are the largest problems, which is not surprising. The five companies are located in five different regions and they thereby have access to different resources. Many of the companies experience problems with access to railway, as the railway infrastructure do not correspond to the demand for rail in large parts of Sweden today, as described by Lumsden (2006) in Chapter 2.2.3. Regarding access to terminals, trucks, load units and drivers there are no larger problems. The problems vary between different companies and their different locations and the companies therefore have different requirements.

Access to trucks, load units and drivers can be solved by the companies easily, by investments (Cruijessen, Dullaert & Fleuren, 2007) or leasing (Woxenius & Bärthel, 2002). The experienced need for investments in physical resources is described in Table 6, below. All companies experience some kind of need for investments in resources, except for RTC A. The result of this table goes in line with the experiences prerequisites for resources in Table 4.

Table 6 Investments in Physical Resources

	RTC A	RTC B	RTC C	RTC D	RTC E
Physical Resources		X	(X)	(X)	X

### 9.1.2 Perceived Problems with Collaboration

In the theoretical framework, three types of prerequisites for collaboration were identified: value for the company, sustainable relationship and operatively possible.

In Table 7, the studied regional transport companies' perception about problem areas has been summarized. In the empirical study, Chapter 8, the regional transport companies have stated which prerequisites for collaboration they have problems to fulfil.

Table 7 Perceived Problems with Collaboration

	RTC A	RTC B	RTC C	RTC D	RTC E
Value for the Company					
Competitive Advantage					
Separately Profitable					
Sustainable Relationship	X	X	X	X	X
Commitment		X			X
Trust	X		X	X	X
Fair					
Common Goals		X		X	X
Common Strategies		X			X
Operatively Possible		X		X	
Coordinated Activities					
Access to Information		X		X	
Access to Knowledge					

The regional transport companies do not seem to consider the prerequisites for collaboration to be as problematic as the prerequisites for intermodal transport since they do not identify as many problem areas for collaborations. The five studied regional transport companies only agree that one of the main prerequisites, identified from the theoretical framework, is problematic, see Chapter 5.2.

Regarding value for the company, none of the studied companies has identified any important aspect relating to value for the company as problematic. This can have two reasons, either the companies do not believe that there exist a need for value for the company or they do not believe that it is a problem to achieve value for the company from collaboration. It is not likely that the companies would consider collaboration if it did not created any value, why the first explanation can be abandoned. It is more likely that the companies do not perceive the value as problematic. The profit sharing is introduced first at level two in the staircase, and none of the companies has reached that step yet, which means that they do not have any experience about the problems that might exist when sharing the profit between collaboration partners that all have to be separately profitable.

A sustainable relationship seems to be the most important prerequisite for the regional transport companies. All studied companies perceive the sustainable relationship as a

problematic area. Most of the companies identify trust as a problematic aspect. The rest of the aspects connected to the sustainable relationship are less covered by the companies.

Only a few of the studied companies have identified the possibility to manage the collaboration operatively, collaboration operatively, as a problem. These two companies agree on that the information sharing is the information sharing is the problematic area. This is connected to the identified need for investments in the investments in the collaboration. The same companies that have identified information sharing as a problem sharing as a problem has also requested an investment in an information system, see

Table 8.

Table 8 Investment of Information System

	RTC A	RTC B	RTC C	RTC D	RTC E
Information System		X		X	

## 9.2 EXPERIENCE AFFECT ON THE REGIONAL TRANSPORT COMPANIES' PERCEIVED PROBLEMS

To be able to analyze what affect the regional transport companies' experience has on their perceived problem areas it is necessary to know how they perceive the problem areas and how much experience they have from intermodal transport.

### 9.2.1 Experience Affect on the Perception of Problem Areas

From the previous chapters, it is obvious that the regional transport companies do not believe that collaboration is the limiting factor for a collaboration regarding intermodal transport. All regional transport companies percieve a lot of problems with intermodal transport but not as many problems with collaborations. This result can have two reasons. The first possible reason is that the prerequisites for collaboration are not as important as the prerequisites for intermodal transport. It is possible that the prerequisites for collaboration are easier to fulfill and the regional transport companies therefore do not experience the prerequisites as problems. The other possible reason is that the regional transport companies do not see the prerequisites for collaboration yet, since they are having problems with fulfilling the prerequisites for intermodal transport. As described in Chapter 4.2, the prerequisites for intermodal transport have to be fulfilled before the prerequisites for collaboration can be considered. It is therefore possible that the regional transport companies, at this stage in time, do not consider the prerequisites for collaboration. None of the regional transport companies have collaborated regarding intermodal transport, as shown in Chapter 8.7 and they have therefore not had to consider the prerequisites for collaboration yet, as described in Chapter 7.3.2.

As the theoretical framework presents the prerequisites for collaboration as areas in need of collaboration strategies, see Chapter 5.3, these prerequisites should not be neglected. Therefore, the second identified reason that the regional transport companies are still not aware of the prerequisites for collaboration, is adopted. This explanation also goes in line with what is described by Burgoyne and Hodgson (1983 in Cope & Watts, 2000) in Chapter 3.6.2, that the identified prerequisites for the regional transport companies might depend on their level of experience. Since none of the regional transport companies has experienced collaboration regarding intermodal transport, none of them have learned from it and for that reason, they do not see all problems with it.

According to Burgoyne and Hodgson (1983 in Cope & Watts, 2000) there is a difference between the learning that is achieved from experience and the learning that can be achieved from an outside reflection of a situation. However, there is no major difference between the perceived problem areas for intermodal transport between the companies, even though RTC A and RTC C have not had to consider the prerequisites for intermodal transport. But when the perceived problem areas for collaboration is analyzed, it shows that the regional transport companies that have experience from intermodal transport see more problems with collaboration compared to the companies that do not have any experience from intermodal transport. This insight confirms Burgoyne and Hodgson's theory and it also show that experience does not only create learning for the specific area of usage but also for future implications of it.

### **9.3 APPLICABILITY OF THE BUSINESS MODEL**

---

The applicability of the business model depends on the fulfillment of the prerequisites for collaboration regarding intermodal transport. All of the prerequisites for collaboration regarding intermodal transport have to be fulfilled before the business model is applicable. The collaboration strategies are aiming at fulfilling the prerequisites for collaboration regarding intermodal transport and the implementation of the business model will therefore fulfill all the prerequisites for collaboration. The prerequisites for intermodal transport can be fulfilled with the help of collaboration or the prerequisites have to be fulfilled completely by the company itself, as explained in Chapter 5.3. If the prerequisites that cannot be fulfilled with the help of collaboration is not fulfilled from the beginning, collaboration regarding intermodal transport is not applicable.

There are two prerequisites that are especially important to fulfill in order to reach a sustainable collaboration regarding intermodal transport. These two prerequisites are common goals and common strategies.

The reason that common goals is considered to be especially important is that for the regional transport companies to be able to use the business model they have to be on the same level of collaboration in the staircase model to be able have similar roles within the collaboration. The reason that common strategies are considered to be especially important is that for the companies in a collaboration regarding intermodal transport to be able to work together they have to agree on the collaboration strategies in the business model and work after the same collaboration strategies.

## **10 DECISION OF DEPENDENT COLLABORATION STRATEGIES**

---

As described in Chapter 7.1, the business model includes collaboration strategies that are both dependent- and independent on the level of collaboration. In this chapter, the decision about which dependent collaboration strategies that should be included in the final business model will be made. To be able to decide which collaboration strategies that should be included in the business model, the different levels of collaboration and their connection to the collaboration strategies, will be analyzed.

### **10.1 DIFFERENT BUSINESS MODELS AT DIFFERENT LEVELS OF COLLABORATION**

---

The different levels of collaboration, described in Chapter 7.3.1, are characterized by different collaboration strategies. The business model the regional transport companies should use should therefore be dependent on which level in the staircase model they would like to be located on. Osterwalder (2004) argues that a company should have one business model for every business opportunity, as described in Chapter 4.3.1 and since the different levels of collaboration create different business opportunities, there should be different business models for the different levels of collaboration, see Figure 28.

The different business models will build on the same business model framework. However, the content of the different business models will vary between different levels of collaboration. The dependent collaboration strategies that will be included in the business model will be based on the characteristics for each level of collaboration, described in 7.3.1, while the independent collaboration strategies will be the same for all levels of collaboration.

The decision about which dependent collaboration strategies that should be included in the business model should therefore depend on what level of collaboration the business model is designed for. A choice of level of collaboration needs to be made to decide the dependent collaboration strategies. Since this report deals with collaboration regarding intermodal transport, it is necessary that the companies provide intermodal transport services for the business model to be created. A potential business model at the ground level can therefore not be chosen.

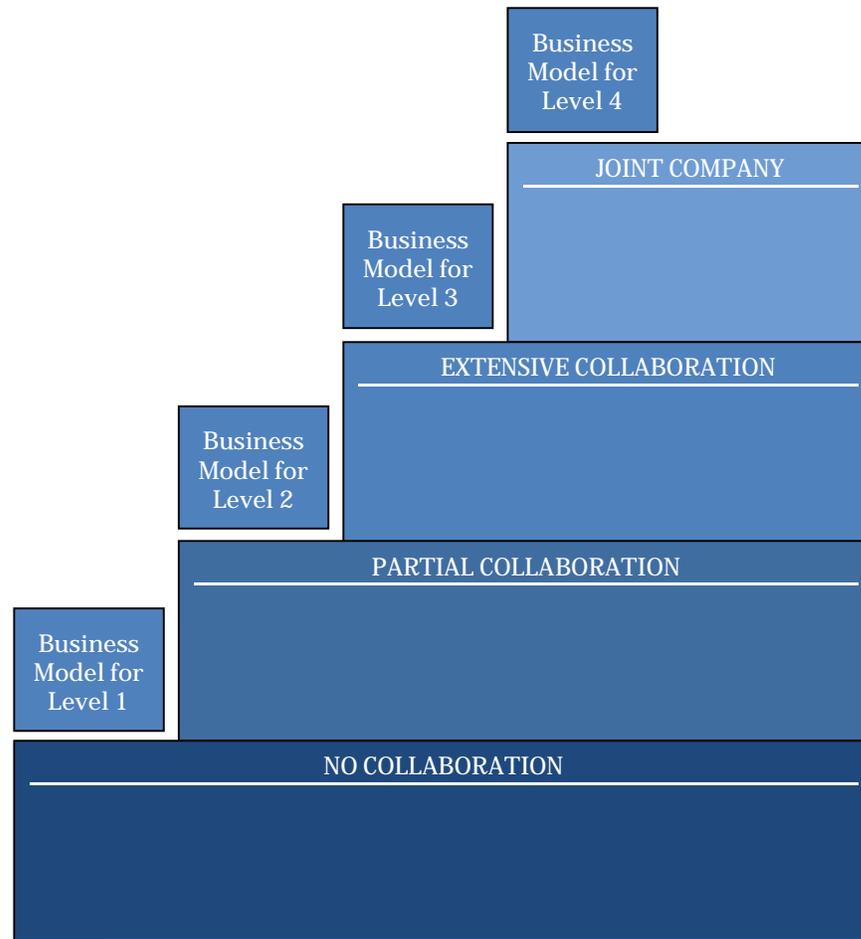


Figure 28 Different Business Models at Different Levels of Collaboration

## 10.2 DECISIVE PARAMETERS

---

The decision of what level of collaboration the business model should be made for depends on two aspects, what the theoretical framework recommends as the most appropriate level of collaboration and what the regional transport companies have as their vision for the collaboration regarding intermodal transport.

## 10.3 SWOT ANALYSES FOR DIFFERENT LEVELS OF COLLABORATION

---

To be able to know what the theoretical framework recommends as the most appropriate level of collaboration, a SWOT analysis for each level of collaboration will be made and the different SWOT analyses will then be compared. The content of the SWOT analyses is solely based on the theoretical framework. The collaborations strategies at respective level in the staircase are the foundation for the analysis where the conclusion about the parameters is based on the characteristics for every level of collaboration.

### 10.3.1 SWOT Analysis for the Ground Level without Intermodal Transport

---

At the ground level, neither collaboration nor intermodal transport is being used. The company at the ground level continues to be a traditional regional transport company who performs road transports. The SWOT analysis for the ground level is seen in Figure 29.

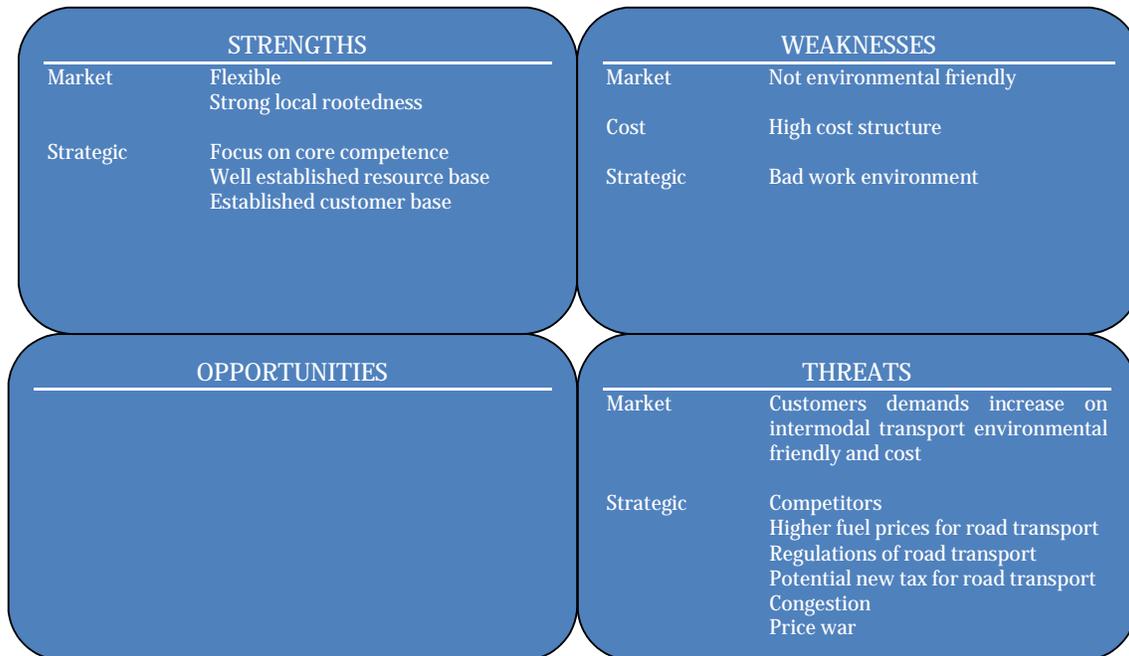


Figure 29 SWOT Analysis for the Ground Level without Intermodal Transport

A strength that can be found on this level is the flexibility of road transport compared to rail transport, as described by Sommar (2006b) in Chapter 2.2.2. A company at this level also has a strong local rootedness through their regional connection, which can be utilized. These two aspects provide customer value and are therefore seen as market strengths. The company can also focus on its core competence, which is a good collaboration strategy according to Markides and Williamsson (1994, described in Chapter 6.2.1). The resource base and the customer base are already well established since the company has already worked within the area for a long period of time, which are strategic strengths.

The weaknesses are that the transport is not as environmentally sustainable as with rail transport, as explained in Chapter 2.2.2 (by Kreutzenberger et al., 2003). This weakness is connected to a decreased customer value, which affects the market negatively. Jensen (1990) explains that the costs for road transport are high. The long distances transported by road also create a bad work environment for the truck drivers, which become a strategic issue for the company.

A negative aspect is also that this level does not have any opportunities for the regional transport companies. However, there are many threats. Customer demands for intermodal transport increase because it is more environmentally friendly and have lower costs (stated by Lundberg, 2006 in Chapter 5.1.2). That is a threat for the company's market segment. The competitors that meet this increased customer demands become a larger threat to the company. There are also strategic threats for road transport as higher fuel prices, regulations, potential new taxes and congestion, as described in Chapter 2.2.2, that threaten the localisation on the ground level. The fierce competition for road transport has resulted in a price war, which decreases the profit margins for the companies, as explained by Flodén (2007) in Chapter 2.1.2.

### 10.3.2 SWOT Analysis for Level One without Collaboration

At level one the company is selling intermodal transport services without collaboration. The company is buying the local transport from a transport supplier. The SWOT analysis for level one is seen in Figure 30.

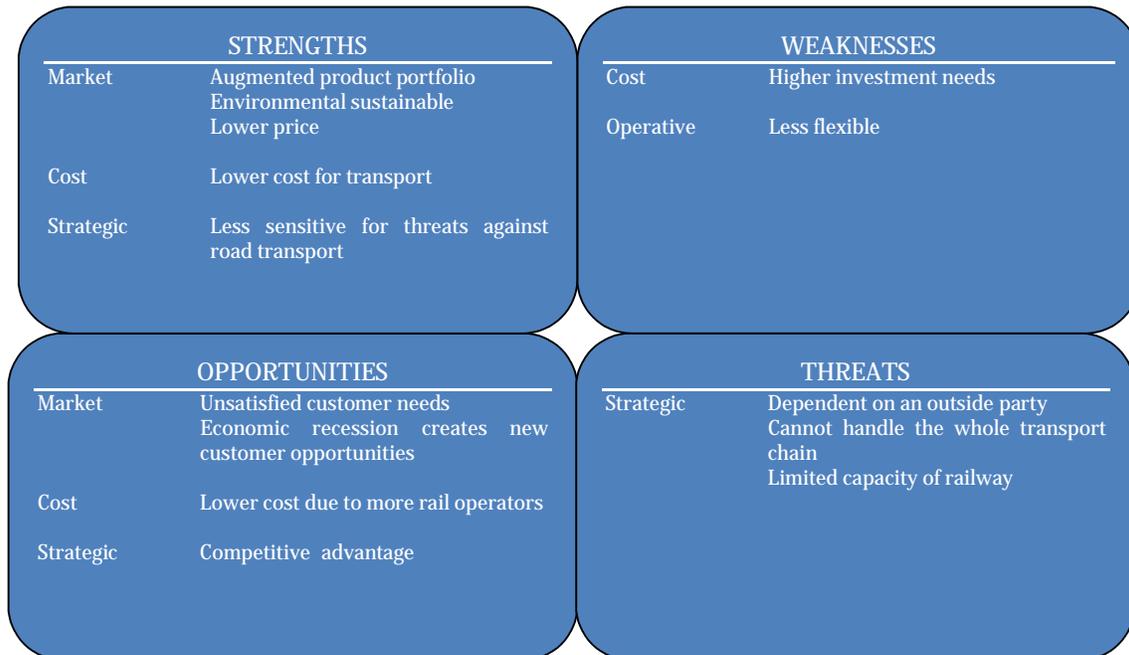


Figure 30 SWOT Analysis for Level One without Collaboration

The strengths for a company who is located at this level are partly connected to the company's market share since the company has achieved an increased product portfolio (described by Kahn, 1998 in Chapter 6.2.1). The company can also offer environmentally sustainable transport at a lower cost for the customers, opposite of the previous level since intermodal transport is cost efficient and environmentally sustainable. The cost for transport becomes lower which can increase the profitability. Strategically, the company at this level is also less sensitive to threats against road transport that existed at the previous level.

One weakness are that the company might needs to make investments to be able to perform the intermodal transport, which is costly. The company also becomes less flexible, in relation to the previous level.

There are a lot of opportunities at level one. On the market there are unsatisfied customer demands for intermodal transport which the company now can meet. The recent economic recession creates new customer opportunities since customers have higher demands on their transports. Strategically, the company can achieve a competitive advantage by meeting the unsatisfied customer demands. Since more rail operators are entering the market, as described by Bergqvist and Woxenius (2008 in Chapter 2.2.1), there is also an opportunity for lower costs for rail transports due to increased competition.

The threats at this level are all strategic. The company becomes dependent on an outside collaboration partner. They cannot handle the entire transport chain by themselves as they could when they only performed road transport. The limited capacity on the railway is also a threat, as described by Lumsden (2006 in Chapter 2.2.3).

### 10.3.3 SWOT Analysis for Level Two with Partial Collaboration

At level two, the company has started to collaborate partially with a collaboration partner. The SWOT analysis for level two is seen in Figure 31.

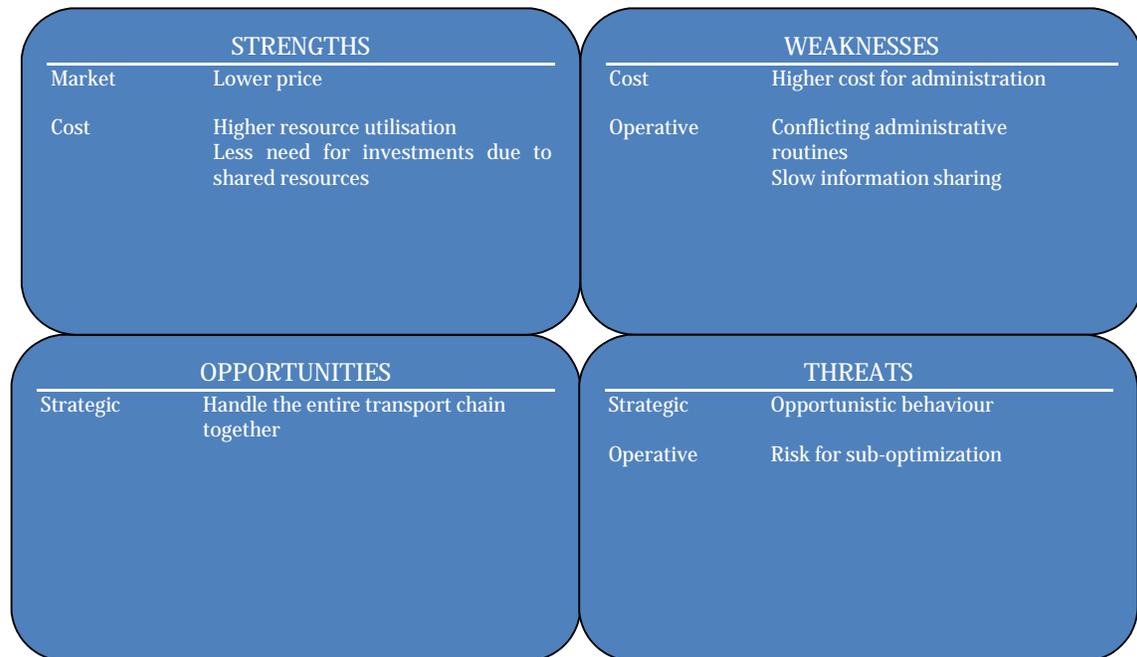


Figure 31 SWOT Analysis for Level Two with Partial Collaboration

The strengths for a company to be positioned at this level are connected to market and cost. On the market, the company can offer lower prices for the transport, as described in Chapter 6.2.2 by Cruijessen, Dullaert and Joro (2006). The cost for the transport can be held low because the resource sharing makes it possible to have high resource utilization and less need for investments.

In contrary, the costs for administration become higher at this level, as Lumsden (2006) argues in Chapter 6.5.3 that the cost increase as administration becomes more complex. Operatively the companies can have problems with conflicting routines (described by Harrison & Huemer, 2005 in Chapter 6.5.3) and slow information sharing as the companies are only partially integrated. According to Huber and Daft (1987 in Mohr & Speakman, 1994, described in Chapter 6.5.4), the shared information are more relevant and more frequently exchanged in a more integrated relationship.

The existing opportunity at this level is strategic since it is possible for the companies together to handle the entire transport chain.

At this level it exist strategic threats of opportunistic behavior (described by Das & Teng, 2001 in Chapter 6.4.2) and operative risks for sub-optimization (described by Simatupang & Sridharan, 2002 in Chapter 6.5.7).

### 10.3.4 SWOT Analysis for Level Three with Extensive Collaboration

At level three, the companies have a more extensive collaboration regarding intermodal transport than in level two. The SWOT analysis for level three is seen in Figure 32.

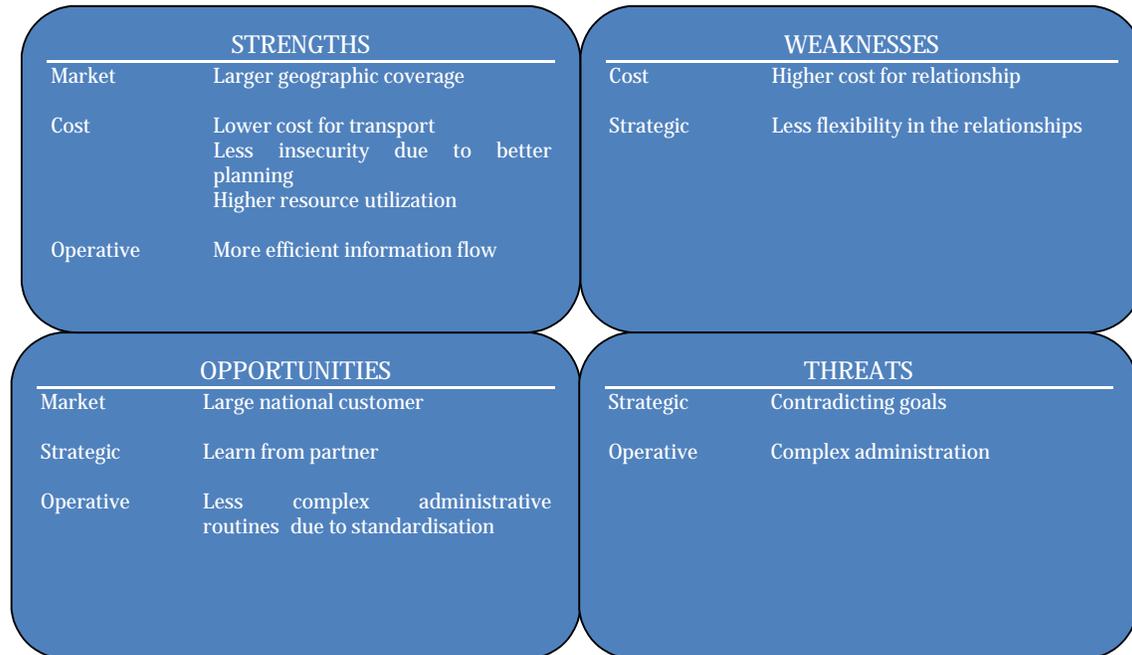


Figure 32 SWOT Analysis for Level Three with Extensive Collaboration

At this level, there are market-, cost- and operative strengths. The market share can be increased because of a larger geographical coverage, as explained by Bleeke and Ernst (1995 in Chapter 6.2.2). As in the previous level, the costs for transport can be reduced further. The joint planning makes it easier to handle uncertainties (explained by Simatupang and Sridharan, 2002) and increase the resource utilization (explained by Lumsden, 2007 in Chapter 6.5.2). Operatively the information sharing becomes more efficient because of the usage of a common information system.

The cost for the relationship increases as the relationship becomes more integrated, as described by Gadde (2004 in Chapter 6.4.2). Strategically, the company becomes less flexible because they become more dependent on the integrated relationship (described by Hoyt & Huq, 2000, in Chapter 6.4.2).

On the market, it becomes possible for the companies to handle larger national customers, as shown in the staircase. Strategically, the companies can also learn from each other because of the more efficient information flow. It becomes possible to operatively handle the complex administrative routines by standardization of administration, described in Chapter 6.5.3.

If the complex administrative routines are not improved it would be a threat for the extensive collaboration. Another more strategic threat is the conflicting goals between the companies (shown in Chapter 6.4.2 by Das & Teng, 2001).

### 10.3.5 SWOT Analysis for Level Four with Joint Company

At the last level, level four, the companies have formed a joint company together. In the joint company, everything is centrally controlled. The SWOT analysis for level four is seen in Figure 33.

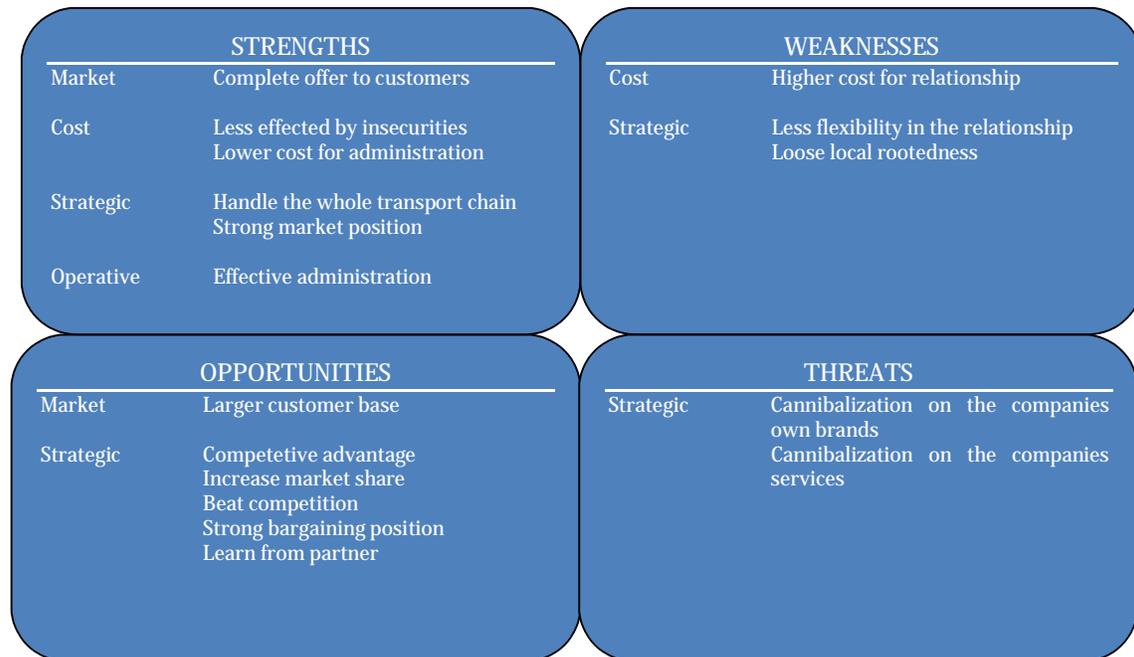


Figure 33 SWOT Analysis for Level Four with Joint Company

The strengths with a joint company are that the companies can provide the customers with a complete transport offer, as they can handle the entire transport chain. The cost can also be reduced further compared to the previous level, as the insecurities in the relationship decreases and also requires less administration which thereby can be more effective. A strategic strength is that the joint company gets a strong market position as large companies often have competitive advantages compared to smaller companies, as described by Kanter (1994) in Chapter 6.2.2.

The weaknesses for this level are the same as for the previous level, but at this level they become even worse. At this level the company has lost its local rootedness. This has been a continuous process but it is at this level it becomes apparent.

The opportunities are connected to the market and to strategic opportunities. The market provides a large customer base which easier can be handled by the joint company. Because of that, it becomes possible for the joint company to increase the market share. Larger companies often have a competitive advantage, according to Kanter (1994, in Chapter 6.2.2) and the joint company can beat competitors. The joint company also increases their bargaining position on the market, as described by Chipty

and Snyder (2006) in Chapter 6.2.2 and as at the previous level, the learning between the companies can increase.

There are also strategic threats at this level, connected to cannibalization on the own companies brand and services (discussed by Kapferer, 2008 in Chapter 6.6.2).

### 10.3.6 SWOT Analyses at Each Collaboration Level

To be able to conclude which level of collaboration that is the most appropriate one, the different SWOT analyses are compared. Figure 34 below show the strengths and weaknesses and the opportunities and threats that exist for every level of collaboration. It is not precluded that the ground level is not the most appropriate level of collaboration, why the SWOT analysis for the ground level is just as important as for the other levels. However, as stated in Chapter 10.3.6, no business model will be created for the ground level, if it would be concluded to be the most appropriate level.

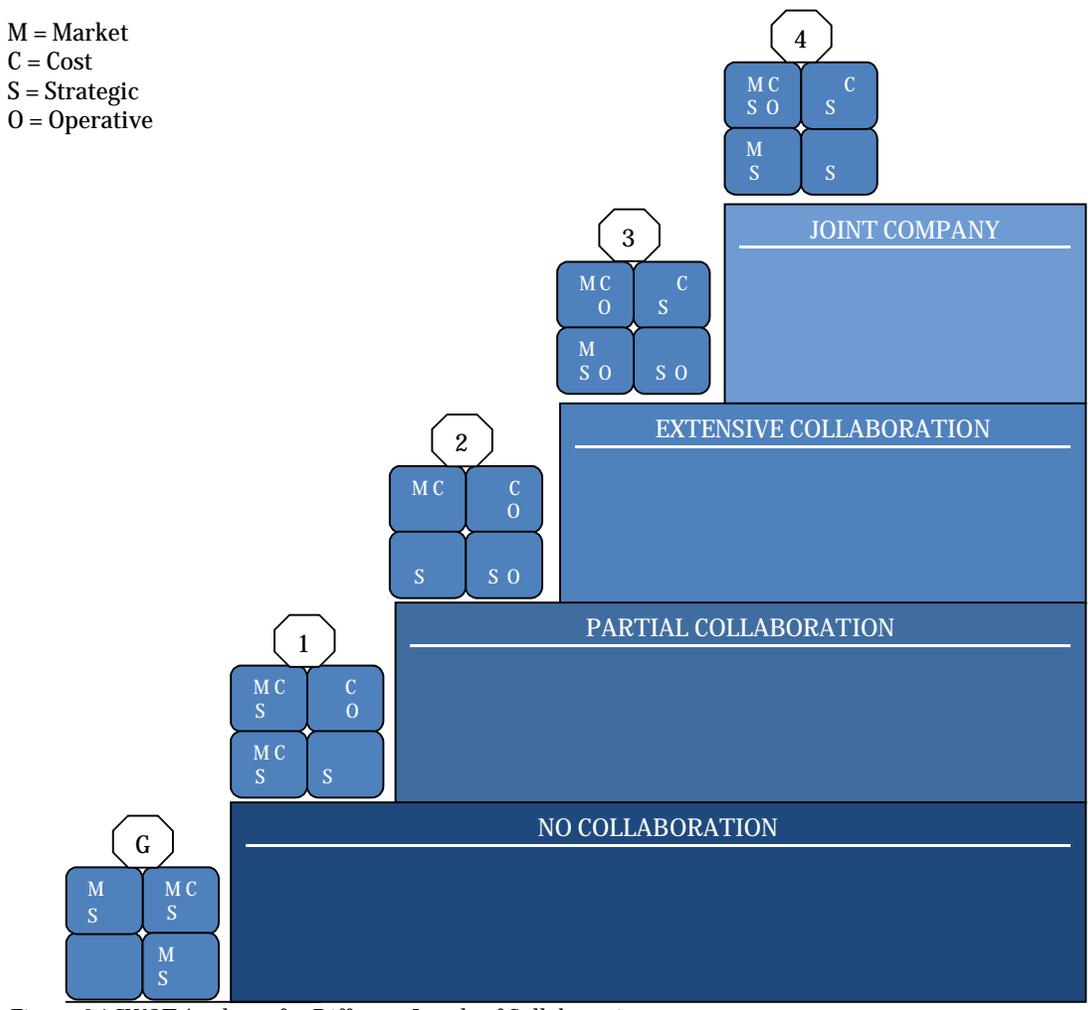


Figure 34 SWOT Analyses for Different Levels of Collaboration

Figure 34 can help evaluate the different parameters and decide which level of collaboration that is the most appropriate to be located on. Some conclusions about the collaboration levels can be drawn by looking at the figure. The parameters at the ground

level differs the most from the rest of the collaboration levels. That goes in line with what could be expected, since it is a large difference between road transport and intermodal transport while the differences within collaboration regarding intermodal transport are not as extensive.

First, it can be seen that the cost always are both a strength and a weakness, except for at the ground level where it only is a weakness. It is not obvious if the total cost becomes higher or lower at another level in the staircase. Instead it depends on the relation between the different cost components, which might differ between companies.

It can also be concluded that the market strength increases for every collaboration level. The possibility to meet the customer demands increase since the company can provide an extended product portfolio at a higher level of collaboration. The relation between the increased market possibilities and the total cost for the different levels might also differ between companies. Different companies can also evaluate the increased market segment differently.

When a company interacts with another company, from level one, operative weaknesses is created. These operative weaknesses can be solved by having an extensive collaboration. However, an extensive collaboration creates strategic weaknesses connected to the dependence and decreased flexibility that exist in an extensive collaboration. Companies might experience operative or strategic weaknesses differently and whether one or the other is worse is up to the company to decide.

From the figure, it can also be concluded that there are both strategic opportunities and at the same time strategic threats at each level of collaboration except for at the ground level. The strategic opportunities and the strategic threats can be differently evaluated by different companies.

The final conclusion from Figure 34 is that it is not possible to make a general conclusion about which level in the staircase that is the most appropriate to be located on. This depends on that it is not possible to conclude which of the parameters in the SWOT analyses that affect the result the most. Since it is impossible to make a general decision about the most appropriate level, all companies have to find their own best location. It is up to every company to evaluate the parameters explained in the SWOT analyses to be able to decide which level that is the most appropriate for them.

In conclusion, none of the collaboration levels are theoretically better to be located on, than the other levels of collaboration in the staircase. For that reason, there is no right choice for a company when deciding on which level of collaboration they should be located on. The most important aspect when companies should decide on which level they should be located on is what suits their company best. It is also important that a company is not located on a higher level of the staircase than necessary to satisfy their own and their customer needs. The decision about appropriate level of collaboration is likely affected by the company's perceived situation and their thoughts about the future.

## 10.4 REGIONAL TRANSPORT COMPANIES' PERCEPTION OF DEPENDENT COLLABORATION STRATEGIES

To be able to know which level of collaboration the regional transport companies think is the most appropriate for them, their opinion about the dependent collaboration strategies will be analyzed.

### 10.4.1 Segment Customers

In Chapter 7.2.1, it is described that the regional transport companies could offer their intermodal transport services to regional- or national customers. RTC A does not want to offer the intermodal transport service direct to any consignor or consignee yet and RTC B and RTC D think it is difficult to be able to offer a total transport solution to a national customer, see Table 9, as explained in Chapter 7.2.1. RTC C, however, would like to focus on national customer but they do not want to exclude regional customers either. RTC E can also imagine selling intermodal transport services to national customers when possible. To be able to offer intermodal transport services to a national company, it is necessary to have a higher level of integration, seen in Figure 18 in Chapter 7.3.1.

Table 9 Dependent Sub-strategies for Customer Segmentation

	RTC A	RTC B	RTC C	RTC D	RTC E
Regional Customers		X	X	X	X
National Customers			X		X

Regarding the companies' relation to the transport user, the companies can either have a transport supplier as their customer or a consignor or a consignee, as described in Chapter 7.2.1. All regional transport companies agree that they should have consignors or consignees as their customers, see Table 10. RTC A, who does not have any experience from intermodal transport say that they would like to have transport suppliers as customers, but their goal is to have consignors or consignees as their customers at a later point in time. This goes in line with their unwillingness to handle both regional and national customers, as showed in the last table. Even RTC C, who does not have any experience from intermodal transport, could accept being a second-tier supplier, while the rest of the companies only would like to have consignors or consignees as customers.

Being a first-tier supplier is connected to the customer ownership which is an important aspect for most of the regional transport companies and the reason for why they would like to have consignors or consignees as their customers. As stated in Chapter 7.2.1, the first alternative in the table is not seen as intermodal transport and can thereby not be handled in a collaboration.

Table 10 Dependent Sub-strategies for Customer Segmentation

	RTC A	RTC B	RTC C	RTC D	RTC E
Rail Operators/Forwarders	X		X		
Consignors/Consignees	(X)	X	X	X	X

### 10.4.2 Clarify Customer Ownership

Customer ownership is an important issue for the regional transport companies, as stated earlier. According to Chapter 7.2.2 can the customer ownership either be individual or joint. All studied regional transport companies agree that individual

customer ownership is an appropriate way of handling the customers, see Table 11. But RTC B and RTC E can also see benefits from a joint customer ownership. Individual customer ownership is the most common way to handle the customers while joint customer ownership only exist in a joint company, see Figure 18 in Chapter 7.3.1.

Table 11 Dependent Sub-strategies for Customer Ownership

	RTC A	RTC B	RTC C	RTC D	RTC E
Individual Customer Ownership	X	X	X	X	X
Joint Customer Ownership		X			X

### 10.4.3 Integrate Relationship

In Chapter 7.2.3, the integration was divided into three different levels, partial-, extensive- and total integration. The five studied regional transport companies have totally different views on how integrated the collaboration regarding intermodal transport should be, see Table 12. RTC A is not interested in an integrated collaboration at all. As described in Chapter 7.2.3, an integrated relationship can lead to less flexibility. RTC A has expressed a fear of losing their flexibility and they therefore feel discouraged from integrated collaborations. In Chapter 7.2.3, it is also described that there are higher costs for a more integrated collaboration than for a less integrated collaboration. An increased cost for collaboration could also be a reason for RTC A to reject the idea of collaboration.

RTC C and RTC D are interested in a partially integrated collaboration and do thereby perceive the benefits from the relationship to exceed the drawbacks. However, as explained in Chapter 7.2.3 there are economical reasons for not integrate the relationship more than it has to be to satisfy the relationship requirements. RTC C and RTC D feel that they can achieve all benefits from a partially integrated relationship and then there are no reason for having a more integrated relationship.

RTC B and RTC E do however see benefits with a more integrated relationship, regardless of the increased cost for it. RTC B and RTC E do thereby have to believe that there are more benefits with collaboration compared to the other regional transport companies. Noticeable is that RTC B and RTC E also were the two companies that were interested in a joint customer ownership, in the previous table, which confirm the relation between customer ownership and integration, discussed in Chapter 7.2.2.

The table shows that the companies have different goals with the collaboration and evaluate it differently. The optimal balance between the cost and the benefits of an integrated relationship is different for the regional transport companies.

Table 12 Dependent Sub-strategies for Integration

	RTC A	RTC B	RTC C	RTC D	RTC E
Partial Integration			X	X	
Extensive Integration		X			X
Total Integration		X			X

### 10.4.4 Plan Jointly

In Chapter 7.2.4 it was described that joint planning can be done either commonly or centrally. Only RTC B and RTC E would like common or central planning, and they could accept any of them, see Table 13. The remaining regional transport companies do not

want to have either common or central planning. As seen in Figure 18 in Chapter 7.3.1, both common and central planning is located on higher levels in the staircase. It can also be seen that RTC B and RTC E in the previous table were the ones that were interested in a more integrated relationship, which goes in line with the position of joint planning in the staircase.

Table 13 Dependent Sub-strategies for Joint Planning

	RTC A	RTC B	RTC C	RTC D	RTC E
Common Planning		X			X
Central Planning		X			X

#### 10.4.5 Coordinate Administration

As for joint planning, the administrative routines can also be performed commonly or centrally, as described in Chapter 7.2.5, and are also located at higher positions in the staircase, in Figure 18. In Table 14, the regional transport companies' opinion about coordinated administration is showed. Important to know is that RTC E has not commented the subject at all and differ therefore from RTC A and RTC C who have stated that they do want neither common- nor centrally controlled administrative routines. RTC B, however, would like centrally controlled administrative routines while RTC D wants common administrative routines. The noticeable in this table is that RTC C and RTC D have different opinions even though they are interested in the same level of integration.

Table 14 Dependent Sub-strategies for Administration

	RTC A	RTC B	RTC C	RTC D	RTC E
Common Administrative Routines				X	
Centrally Controlled Administrative Routines		X			

#### 10.4.6 Share Information

In Chapter 7.2.6 it was described that the information sharing either can be done manually or through a common information system. RTC A, RTC C and RTC E would like manual communication rather than a common information system, as seen in Table 15. They have all commented that they do not see a need for a common information system. RTC B and RTC D do see a need for an information system and would like the collaboration to use that. What is obvious in this table is that the opinions from the companies do not relate to the level of integration, as many of the other tables. Instead, the table presents the regional transport companies' perception about what method of information sharing is needed to handle the type of collaboration they are striving for.

Table 15 Dependent Sub-strategies for Information Sharing

	RTC A	RTC B	RTC C	RTC D	RTC E
Manual Communication	X		X		X
Information System		X		X	

#### 10.4.7 Agree on Assignment Terms

In Chapter 7.2.7, it is described that the assignment terms either can be negotiated for every assignment or a common framework can be used for all assignments. RTC A and RTC D prefer to negotiate the assignment terms for every assignment while RTC B, RTC C and RTC E prefer to have a common framework for the assignments, see Table 16. Compared to the level of integration, almost all regional transport companies answered

as expected. However, RTC C and RTC D do not agree even though they are interested in the same level of integration.

Table 16 Dependent Sub-strategies for Agreed Assignment Terms

	RTC A	RTC B	RTC C	RTC D	RTC E
Negotiate Terms for every Assignment	X			X	
Common Framework for Assignments		X	X		X

#### 10.4.8 Brand Environmentally

The environmental branding can either be done individually or through a common brand, as described in Chapter 7.2.8. However, it is somewhat problematic to draw any conclusions of the regional transport companies' opinion on environmental branding to customers since neither RTC A, RTC B nor RTC E has commented the branding. However RTC C and RTC E agree that branding should be taken care of on an individual level, see Table 17. This could go in line with the level of integration since the same companies are interested in the same level as in the table for integration.

Table 17 Dependent Sub-strategies for Environmental Branding

	RTC A	RTC B	RTC C	RTC D	RTC E
Through Individual Brands			X	X	
Through Common Brand					

#### 10.4.9 Share Profit Fairly

According to Chapter 7.2.9, there are two ways for the regional transport companies to share the profit fairly, either one company buy the transport service from the other company for the market price or the profit is fairly allocated. RTC A would not like to collaborate regarding intermodal transport. Instead they would like to buy the local transport at the opposite region from a transport supplier. The other regional transport companies would like to collaborate and then the alternative is to use a fair profit allocation to share the profit, see Table 18. The result of the table goes in line with the table for integration since the same companies that would like an integrated relationship would like to fairly allocate the profit.

Table 18 Dependent Sub-strategies for Fair Profit Sharing

	RTC A	RTC B	RTC C	RTC D	RTC E
Buy Transport	X				
Fair Profit Allocation		X	X	X	X

#### 10.4.10 Studied Regional Transport Companies' Vision for the Collaboration Regarding Intermodal Transport

As seen in the previous chapters, the level of integration is strongly connected to the level of collaboration. Many of the choices in the previous chapters is connected to the level of collaboration and thereby also to the level of integration. Companies that have chosen the more integrated alternative for one collaboration strategy has tended to do so for other collaboration strategies as well, which is why they are defined as dependent collaboration strategies.

The regional transport companies have different ideas about the level of integration and thereby also about at which level the collaboration regarding intermodal transport should be located in the staircase. The regional transport companies agree upon some of

the collaboration strategies, but not all of them. How the regional transport companies evaluate the different collaboration strategy alternatives determine which level they want the collaboration to be on. When all tables presented in the previous chapters are analyzed vertically, the visions that the studied regional transport companies strive for is visualized, see Appendix B.

It is clear that RTC A is not interested in collaborations regarding intermodal transport at all. The only aspects that can make RTC A appear to want some kind of collaboration is their interest in manual communication between companies and agreed terms for every assignment. But these two aspects can in some extent be necessary at level one as well, since some kind of communication and agreement is necessary when the local transport is bought from a transport supplier. The two above mentioned aspects are not as important as the two aspects that convince that RTC A do not want any collaboration, namely their lack of interest in integration and their interest in buying transport from a transport supplier rather than collaborating and sharing profit. These two aspects are strong indicators on the fact that regional transport companies strive to be on level one in the staircase. It is more likely that a company successfully adapt collaboration strategies from a higher level of collaboration than the other way around. If the company would be on a level of collaboration were they did not want to adapt all collaboration strategies, they are more likely to fail.

When analyzing RTC B's opinions regarding the dependent collaboration strategies it is obvious that they strive to be on level four in the staircase. The only aspect that speaks against this is that RTC B has not expressed any interest for larger national customers. However, what is said at level three is only that a company at this level of collaboration can handle larger national customers. They do not necessarily have any explicit interest of it but it is still possible for them to do so.

RTC C's vision is not as obvious as RTC B's but it is still possible to make a conclusion. The company is interested in larger national customers, which they cannot handle at level two. They also would like to have a common framework for assignment terms which is characteristics of level three in the staircase. However, they have explicitly expressed that they are not interested in any common planning or administration, they do not want a common information system and they have explained that they only are interested in a partial integration with the other companies. These are all aspects that indicate a resistance against being on level three. As explained for RTC A, it is more likely that the company is interested to be on the lower of the two possible levels of collaboration. RTC C has also expressed that they are interested in a lower form of collaboration where the companies can share resources that verify level two as their vision.

Just as RTC C, RTC D's vision is less obvious than RTC B's. As an opposite of RTC C, RTC D are interested in common administrative routines and a common information system. Instead they are not interested in a common framework for assignment terms but would like to negotiate terms for every assignment. Neither, RTC D is interested in common planning and they have no explicit interest in larger national customers. Just as RTC C, RTC D has also expressed an interest for a partially integrated relationship which decides that it is level two that RTC D is striving for, just as RTC C.

All aspects indicate a desire from RTC E to be located at level four in the staircase model except that they are not interested in a common information system. Since RTC E is not interested in all aspects of level four, this could be an indication that they would like to be located at level three. However, RTC E has explained their unwillingness to invest in an information system with that they do not think it is necessary. In this case that statement is interpreted that they could have been interested in an information system if they thought it was essential for the collaboration. The information system is thereby not a determining aspect and since all other aspects show their interest for level four, they are likely striving towards that level.

In Figure 35 below, both the current positions of the regional transport companies as well as their vision for the future collaboration are shown.

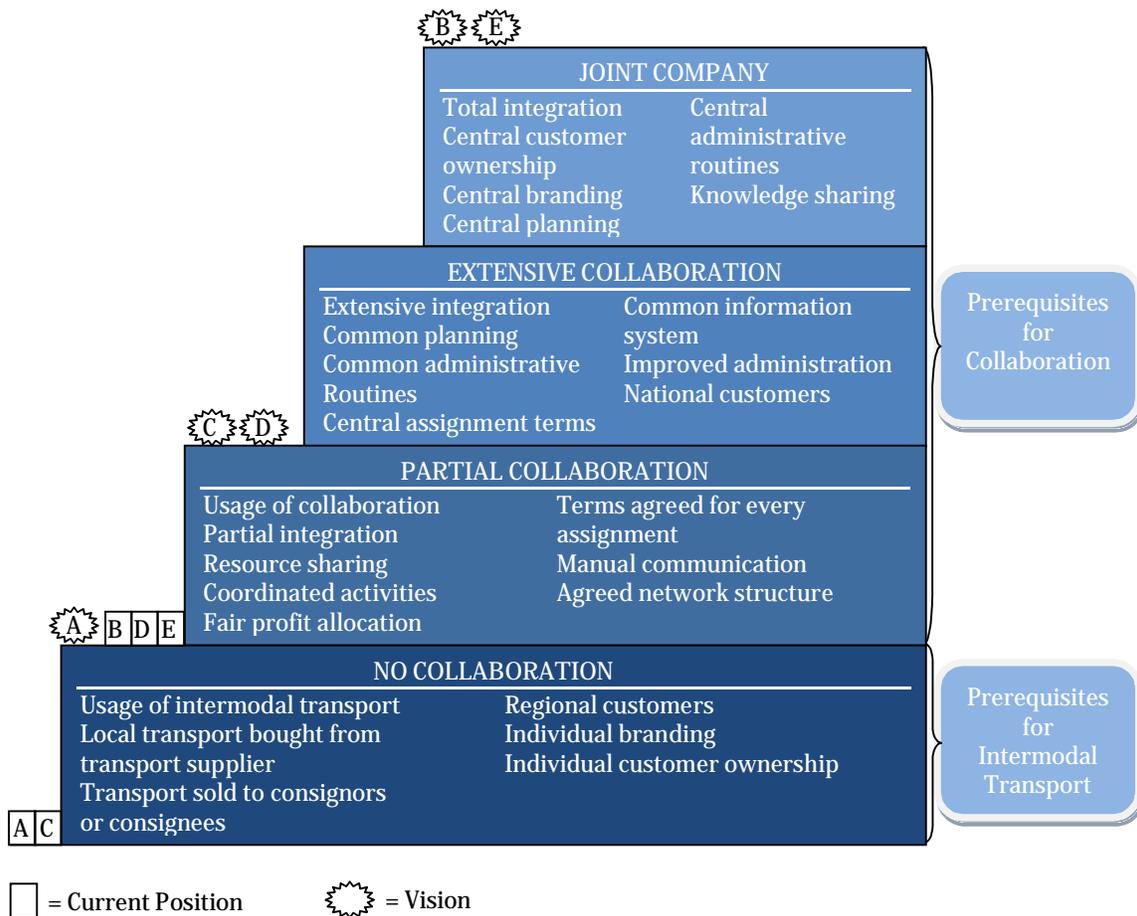


Figure 35 Studied Regional Transport Companies' Vision in the Staircase Model

Since the regional transport companies have different visions about what level of collaboration they would like to be involved in, the interpretation can be made that they evaluate the parameters in the SWOT analyses differently. There can be several reasons for why the regional transport companies evaluate the parameters differently, but as explained in Chapter 10.3.6, the evaluations are likely to be affected by the company's perceived situation and their thoughts about the future. How the companies perceive their situation and what they think about the future is affected by their experience from

collaboration regarding intermodal transport. How experience affect the regional transport companies' visions will be discussed further in the next chapter.

#### 10.4.11 Experience Affect on the Regional Transport Companies' Vision for the Collaboration regarding Intermodal Transport

---

An aspect that affects the regional transport companies' vision is the companies experience when the evaluation is made. When the companies get experience from something, they change their attitude against it, as explained by Burgoyne and Hodgson (1983 in Cope & Watts, 2000). As concluded in Chapter 9.2.1, the regional transport companies cannot accurately perceive their situation without experience from it. The regional transport companies' perceived visions in the previous chapter are thereby likely to depend on the problems and possibilities that the companies have perceived so far.

This reasoning is enhanced when the regional transport companies' current positions as well as their visions for the collaboration regarding intermodal transport are analyzed. The regional transport companies that have not experienced intermodal transport, namely RTC A and RTC C, do not have as high visions as the companies that have experienced intermodal transport, with the exception of RTC D who does not either have a high vision. However, RTC D's vision for a lower level in the staircase does not mean that they have not learned as much from their experience as RTC B and RTC E have. As stated in Chapter 10.3.6, no level of collaboration is better than the other levels and it is possible that RTC D evaluate the different parameters in the SWOT analyses different from RTC B and RTC E for other reasons.

The fact that the regional transport companies with experience from intermodal transport have visions located at higher levels in the staircase does not mean that all regional transport company with experience would like to be located at a higher level in the staircase. However, a regional transport company with experience is more likely to have appropriate visions according to their actual situation. Since learning is a continuous process, as described by Cope and Watts (2000), it is possible all regional transport companies will change their opinion about the different levels of collaboration, when they get more experienced. It is, however, more likely that RTC A and RTC C, who do not have any experience from neither intermodal transport nor collaboration, exchange their evaluation of the parameters in the SWOT analyses, compared to the more experienced regional transport companies.

When the regional transport companies change their opinion, they will evaluate the different parameters in the SWOT analysis in a different way. A need for moving between the different levels of collaboration may thereby arise. How movement in the staircase can be done is described in the next Chapter.

#### 10.4.12 Movement between Different Levels of Collaboration

---

It is possible for a company to move both up and down in the staircase, see Figure 36. However, it is not recommended to move in the staircase before the company is sure that they would like to be at another level. Especially moving up in the staircase is both costly and time consuming. At a higher level in the staircase, it requires a more integrated relationship, which is expensive according to Gadde (2004, discussed in

Chapter 6.4.2). For that reason, it is important that the company evaluate the alternatives before moving upwards in the staircase.

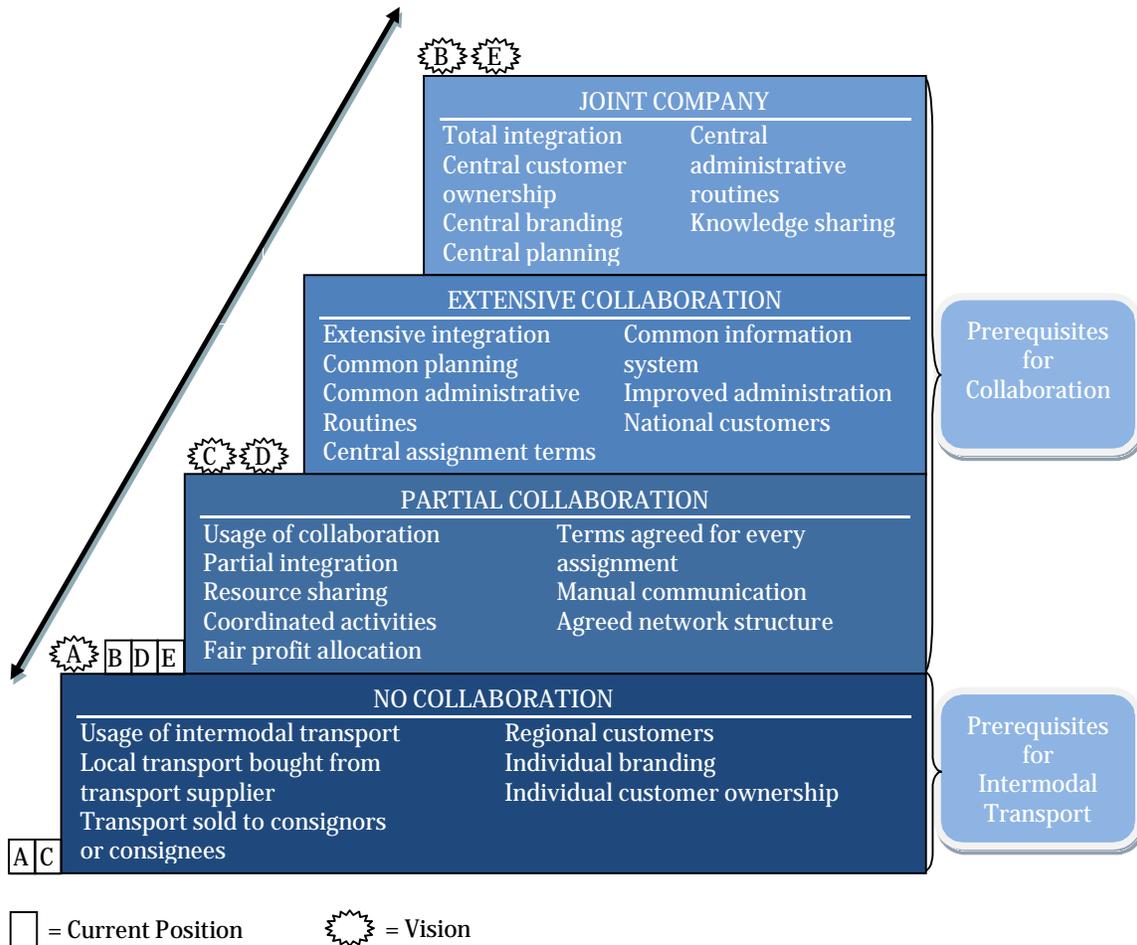


Figure 36 Movement between Different Levels of Collaboration

Even though companies should evaluate the situation before moving up in the staircase, there can still be reasons for why companies would like to take a step down. As described in Chapter 3.6.2, it is possible that the regional transport companies' perceived situation and thoughts about the future change over time, either from experience or because of a changed situation, and the evaluation about the parameters in the SWOT analyses will thereby also change.

When a company has evaluated or re-evaluated the parameters in the SWOT analysis they can make the decision on whether they would like to stay at the level where they are, if they would like to take a further step up in the staircase or if they would like to take a step down in the staircase.

As a regional transport company moves in the staircase, their experience will increase and when their experience increase, the company's perception about the reality may change and it might become necessary to re-evaluate the parameters in the SWOT analyses once more.

## 10.5 DEPENDENT COLLABORATION STRATEGIES FOR THE BUSINESS MODEL

---

The chosen dependent collaboration strategies depend on the decision of level of collaboration. To be able to conclude which dependent collaboration strategies that should be included in the business model it is necessary to first decide for what level the business model should be made.

### 10.5.1 Decision on Creating Business Model for Joint Company

---

The presented business model in this report will be performed for the highest level of collaboration, namely the joint company. This decision is based on the opinions from the studied regional transport companies and the usefulness the business model will create for them.

In Chapter 10.3.6, it was concluded that the theoretical framework could not show which level of collaboration that is the most appropriate one. Instead that chapter concluded that the most appropriate level of collaboration depend on the companies. Both RTC B and RTC E are interested in a joint company, which means that there is a demand for a business model for joint company. The business model for joint company might also have implications for the other regional transport companies, for two reasons.

First, as stated in Chapter 10.4.11, it is more likely that RTC A and RTC C change their visions for the collaboration regarding intermodal transport when they get more experienced. It is impossible to say to where their vision might change, as no level is better than another, but a joint company is as likely as any of the other levels of collaboration. If RTC A or RTC C would change their vision to joint company, they could also benefit from the created business model.

Second, the business model for joint company is the most complex business model and it includes collaboration strategies from all levels of collaboration. It is easier for the regional transport companies to adapt the business model for joint company to a lower level of collaboration, compared to the other way around, since it is easier to remove collaboration strategies compare to adding new ones.

### 10.5.2 Dependent Collaboration Strategies for Joint Company

---

Since it is decided that the created business model should suit the regional transport companies that are on the highest level in the staircase model, the dependent collaboration strategies should be connected to the characteristics of that level of collaboration. This means that all characteristics described in the upper level in the staircase model should be included in this chapter. All characteristics further down in the staircase model that are not exchanged at an upper level will also be included, see Figure 37.

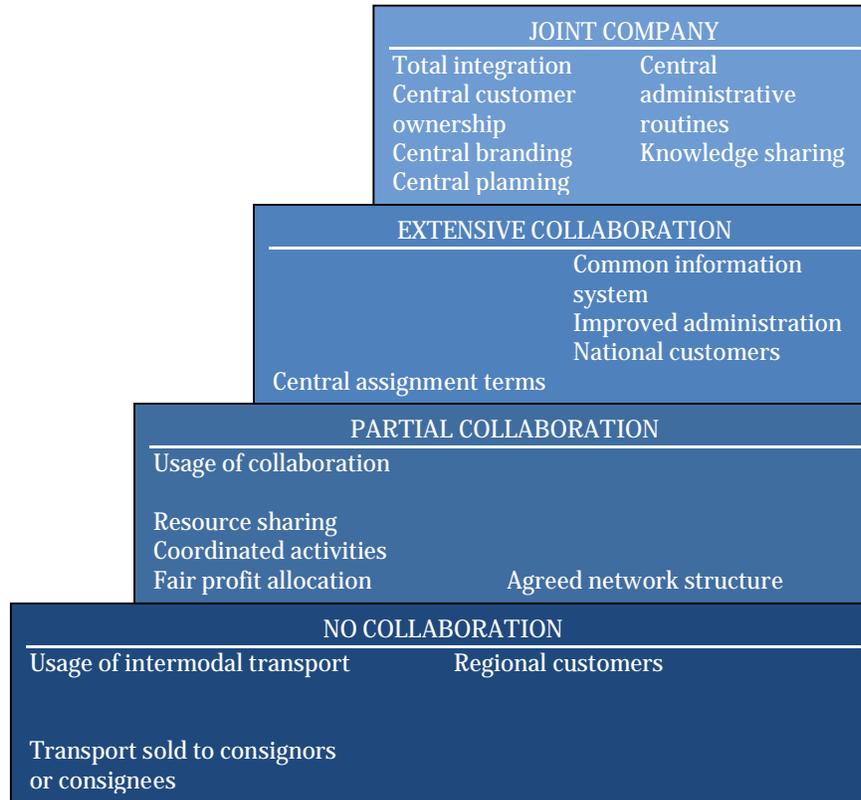


Figure 37 Collaboration Strategies for Joint Company

### 10.5.3 Business Model Value

To capture the value from intermodal transport, the regional transport companies should use intermodal transport, as described in Chapter 6.2.1. In the same way, the regional transport companies should capture the value from collaboration by collaborating with each other (Chapter 6.2.2). For the collaboration to be sustainable, the regional transport companies should use a common business model containing collaboration strategies for the collaboration.

### 10.5.4 Customer Segments

A more integrated relationship will make it possible for the regional transport companies to handle both regional and national customers by increasing the possibility to fulfill the customers' demands. The regional customers are the companies' current customers whom are easy to convert to intermodal transport and are therefore always possible to include in the intermodal transport chain. The national customers are however a possibility for the regional transport companies to get access to new markets, which increases the companies opportunities, according to Bleeke and Ernst (1995 in Chapter 6.2.2).

As explained in Chapter 7.3.1, a company that only has another transport supplier as their customer is not defined as an intermodal transport supplier in this report. It is therefore necessary that the regional transport company provide intermodal transport to consignors or consignees.

### 10.5.5 Relationship Structure

---

In a joint company, the customers have to be centrally owned as shared customers increases the trust in the relationship, according to Lambert et al. The companies also have to be totally integrated in a joint company, as there are a direct relationship between level of collaboration and level of integration.

### 10.5.6 Activity Structure

---

The activities have to be coordinated, as explained by Mohr and Speakman (1994) in Chapter 6.5.1, for the collaboration to be efficient. For a joint company, it is also necessary that the planning, the administrative routines and the assignment terms are centrally handled by the joint company, for the activities to be coordinated and to have common goals, which according to Das and Teng (2001) can help avoid opportunistic behavior (see Chapter 6.4.2). It also becomes easier for the companies to coordinate their activities if it is centralized (Harrison & Huemer, 2005). It is also important that the administrative routines are improved since they are complex in a more integrated relationship (Lumsden, 2006). How the administration can be improved is not dependent on the level of collaboration, and will thereby be discussed in Chapter 11 later in this report.

According to Cummings (1984 in Mohr and Speakman, 1994) described in Chapter 6.5.4, information sharing is essential for the companies to achieve the benefits connected to collaboration. In a more integrated relationship, more frequent and more relevant information is exchanged. (Huber & Daft, 1987 in Mohr and Speakman, 1994) and as explained by Lumsden (2006) it is necessary to use a common information system to be able to share the information efficiently.

For the regional transport companies to be able to learn from each other, it is necessary to share knowledge, as discussed by Child, Faulkner and Tallman (2005) in Chapter 6.5.5. Child, Faulkner and Tallman also explain that companies can learn more from their competitors. Normally, competitors are not generally interested in sharing knowledge but for the regional transport companies in this study, it would not result in a great risk, since the companies act on different geographical markets.

For the regional transport companies to decrease their need of investments and at the same time increase their resource utilization, resource sharing is an important collaboration strategy (Powell, Koput & Smith-Doerr, 1996; Lumsden, 2007) in Chapter 6.5.6). For the resource sharing to be beneficial, information about customer demands and available resources has to be shared between the companies, according to Kopfer and Pankratz (1999 in Krajewska och Kopfer 2006).

### 10.5.7 Resource Structure

---

For the regional transport companies to be able to collaborate at all, it is necessary that they agree on the set-up of the network structure, concluded in Chapter 6.6.1. A dependent collaboration strategy is to agree about a common network structure, although the structure itself can be designed in many ways. The different ways the regional transport companies can choose to design the network structure is not dependent on the level of collaboration. These different collaboration strategies will therefore be described in the next chapter for interdependent collaboration strategies.

In a joint company, it is beneficial for the involved companies to have central branding. As described by Kapferer (2008) in Chapter 6.6.2, a new brand can meet customer demands that could not have been met by a single brand. This leads to that a multi-brand company acquire greater market share than it could have with fewer brands. According to Dowling (2004), different brands appeal to different customers, and since the regional transport companies will provide a new type of transport service, it can be beneficial for them to have a new brand which can appeal to customers interested in intermodal transport. A specific brand connected to intermodal transport can make these products easily distinguishable for the customers.

#### 10.5.8 Profit Allocation

---

Since the regional transport companies should collaborate through a joint company, it is not enough for them to buy the transport service from each other. Instead it will require the profit to be allocated between the companies, as explained in Chapter 6.7.1. It is important that the profit allocation is perceived as fair by all involved companies, as described in Chapter 6.7.1. How the profit can be allocated fairly will be discussed in Chapter 11 as it does not depend on the level of collaboration.

## 11 DECISION OF INDEPENDENT COLLABORATION STRATEGIES

It is not only the collaboration strategies in the staircase model that is important, as described in Chapter 7.4. In this chapter, the decision about which independent collaboration strategies that should be included in the final business model will be made.

### 11.1 DECISIVE PARAMETERS

The decision for what parameters to include in the business model needs to have theoretical support in order to assure the reliability, as explained by Wallén (1996) in Chapter 3.2, and be supported both by the regional transport companies in order for the business model to be useful for them.

### 11.2 INDEPENDENT COLLABORATION STRATEGIES FOR THE BUSINESS MODEL

The independent collaboration strategies will be decided with regard to the theoretical framework and how well the collaboration strategies fit the regional transport companies' opinions about collaboration regarding intermodal transport and are supported by the regional transport companies.

#### 11.2.1 Business Model Value

There are two different types of value expected to come from collaboration regarding intermodal transport, as described in Chapter 6.2.1. The first type of value is connected to the use of intermodal transport and the second is connected to the use of collaboration. The values marked in the tables are the values that the companies have mentioned as the ones they considered to be the most important.

The collaboration strategy connected to Table 19, below, is the use of intermodal transport. Since all studied regional transport companies see some kind of value for with intermodal transport they are likely to be willing to use intermodal transport.

Table 19 Perceived Value for the Company from Intermodal Transport

	RTC A	RTC B	RTC C	RTC D	RTC E
Alternative to Road Transport		X	X	X	
Augmented Product Portfolio			X	X	X
Competitive Advantage from being Early Mover			X	X	
Meet Customer Demands	X	X	X	X	X
Work Environment Improvement	X	X	X	X	

The companies' expectations on the value created from intermodal transport are partly influenced by the companies' expectations on the future development of the transport industry. The companies that expect road transport to become a less favourable option, due to either regulations or increased costs, see the value provided from intermodal transport as an alternative to road transport. This is RTC B, RTC C and RTC D. RTC C and

RTC D also see a great advantage with being an early mover as a response to the increasing importance of intermodal transport in the future.

The business idea for the regional transport companies is to offer a wide variety of products. With this idea in mind it is not surprising that several of the companies have mentioned an augmented product portfolio as a value from intermodal transport. All of the companies have experienced some kind of customer interest in intermodal transport, whether it stems from their customers wish to be more environmental sustainability or to have a more cost efficient transport system.

The regional transport companies, except for RTC E, also agree that intermodal transport could have a positive effect on the work environment since the use of long distance road transports can be decreased. This could be an effect of that the companies are member owned companies and that the hauliers have great power in the companies as they are the owners.

As described above, all regional transport companies see a value in meeting customers demand. Intermodal transport would, according to all studied regional transport companies, also provide a value for the customers, see Table 20. RTC A, RTC D and RTC E have experienced that customers request intermodal transport. Most of them have also experienced that the customers have asked for more environmentally sustainable transport solutions or transport solutions with lower costs. All the regional transport companies agree that intermodal transport can be a solution for that increased demand as well.

Table 20 Perceived Value for the Customers

	RTC A	RTC B	RTC C	RTC D	RTC E
Meet Customer Demand on Intermodal Transport	X			X	X
Meet Customer Demand on Environmental Sustainability	X		X	X	(X)
Meet Customer Demand on Lower Costs	X	X	X		X

The perceived value from usage of collaboration is presented in Table 21. The table presents the values that the companies have mentioned as the ones that, besides the use of intermodal transport, positively improve the companies' business performance.

Table 21 Perceived Value for the Company from Collaboration

	RTC A	RTC B	RTC C	RTC D	RTC E
Access to Local Transport Supplier		X	X	X	X
Access to New Markets					
Benefits from a Large Company					
Lower Costs					
Learn from Each Other					
Bargaining Power					
Access to Resources					
Utilization of Return Flows				X	

Out of all identified values of collaborations from Chapter 6.2.2, the regional transport companies have only identified two as important. The regional transport companies, except for RTC A, see the value in getting access to local transport in the opposite region. Since RTC A explicitly has stated that they have no interest in collaboration, there lack of

perceived value is expected. Beyond this, RTC D also perceives that increased resource utilization because of return flows will result in value for the company. Other than this, none of the regional transport companies see any value with collaboration.

The regional transport companies are less keen to mention value from collaboration compared to value from intermodal transport. This could depend on the lack of experience of collaboration compared to the experience of intermodal transport, as explained in Chapter 8.7. The regional transport companies might find it easier to identify the value from intermodal transport if they have experience of intermodal transport.

It is noticeable that all regional transport companies, except from RTC A, are interested in some type of collaboration, as shown in the staircase model in Chapter 10.4.10.

### 11.2.2 Customer Segments

---

The customers should be segmented for the regional transport companies to offer intermodal transport services to those customers for whose demand match the characteristics of intermodal transport, described in Chapter 2.2. As described by e.g. Lundberg (2006), Jensen (1990) and Karlsson (2009) in Chapter 6.3.1, the intermodal transport has to meet the customers demand on price, lead time, reliability, environmental sustainability, flexibility and security. Since the characteristics of intermodal transport and the customer demands can easily be conflicting it is important to find the right customer segment for intermodal transport. In the right customer segment, on the other hand, the characteristics of intermodal transport can provide superior value for the customer.

For the regional transport companies to be competitive in the intermodal transport market it is important to provide a value to the customers that it is difficult for other actors in the market to do. Therefore, the regional transport companies need to use their strengths to provide a unique value for the customers. The strengths of the regional transport companies are that they are regional transport companies with strong local rootedness, are located all over Sweden and are able to handle many different types of transports, as described in Chapter 2.1.1.

Intermodal transport is very cost efficient on long distances and is an environmental sustainable option, as explained in Chapter 2.2.2. To find a customer segment that values these characteristics is important. To find goods segment that is suitable for a collaboration regarding intermodal transport for the regional transport companies a table with the goods segments that the companies mentioned as the most interesting goods for intermodal transport is presented, see Table 22.

The regional transport companies should be in agreement about the type of goods that should be transported in a collaboration regarding intermodal transport. Since different types of goods have different demands on load units, explained in Chapter 6.3.1 by Lumsden (2006), it is beneficial to transport goods with the same demands on load units, to achieve high resource utilization. The type of goods that is transported in the intermodal transport network is much more significant if the collaboration regarding intermodal transport is handling a large national customer. Then, the type of goods transported has to fit all regional transport companies.

One way to find a customer segment that is suitable for intermodal transport is to segment the customers according to type of goods. Customers with different types of goods have different requirements on the transport. Laitila and Westin (2000) identified in Chapter 6.3.1, that companies within the grocery industry value environmental friendly transport higher than companies within other industries. The business trend toward centralized instead of decentralized warehouses in the regions have resulted in that goods have to be transported longer distances. Groceries would therefore be an interesting type of goods for a collaboration regarding intermodal transport. Groceries are a popular type of goods for the regional transport companies and are mentioned as an interesting type of goods by all of them, except RTC E. The reasons for the regional transport companies' interest in groceries for a collaboration regarding intermodal transport have rather been that groceries are transported throughout the whole country to reach all customers, and therefore are especially suitable for a nationwide collaboration regarding intermodal transport between regional transport companies. In a collaboration regarding intermodal transport for groceries the regional transport companies can use that they are located all over the country to their advantage.

Consumer goods and forest products are two other goods types that are of interest for intermodal transport. Consumer goods and forest products are both types of goods are connected to large, national flows that are transported long distances. Both these goods segments are large parts of the transported goods for long distances, according to SIKA (2008, in Chapter 2.1.3). As explained by e.g. Flodén (2007) in Chapter 5.1.1, intermodal transport is especially suitable for long distances. Large flows can help increase the resource utilization, which is an important factor for the applicability of intermodal transport, described by Lumsden (2006). RTC A, RTC B, RTC C and RTC D have all defined consumer goods and forest products as suitable goods types for collaboration regarding intermodal transport. RTC E also agrees on forest products as an interesting type of goods for collaboration regarding intermodal transport. Forest products are a large industry in Sweden and large parts of the transport work in Sweden is focused on forest products. RTC E has in contrast to the other regional transport companies not mentioned consumer goods and groceries as interesting, but that does not mean that they not are interested in it, rather that they find the other goods types more interesting. The regional transport companies mention the same reason for their interesting in collaboration regarding intermodal transport for consumer goods, as for groceries.

Heterogenous goods are another type of goods that can be suitable for a collaboration regarding intermodal transport, not because of the characteristics of intermodal transport but rather because of the characteristics of the regional transport companies. Heterogenous goods requires special treatment, as explained in Chapter 6.3.1, and as regional transport companies are used to handle all types of goods and are very flexible with regards to this it can be beneficial to enter this market as high barriers to entry make it a competitive position with opportunities for a large profit. Both RTC C and RTC E have identified bio fuels as interesting for intermodal transport. RTC E has also mentioned dangerous goods as interesting. The companies have mentioned a desire to focus on goods that need special attention since this is more difficult to handle and thereby there are higher barriers to entry for competitors, as explained in Chapter 6.3.1 (Faulkner & Campbell, 2003; Vägverket, 2004).

The identified goods types, presented in Table 22, are all very suitable for a collaboration regarding intermodal transport between regional transport companies. To segment customers according to these four interesting goods groups will therefore be a collaboration strategy for customers.

Table 22 Independent Sub-strategies for Customer Segmentation regarding Suitable Goods for Intermodal Transport

	RTC A	RTC B	RTC C	RTC D	RTC E
Consumer Goods	X	X	X	X	
Groceries	X	X	X	X	
Forest Products	X	X	X	X	X
Bio Fuels			X		X
Dangerous Goods					X

Whether the intermodal transport only should consider full unit loads or even less than full unit loads is an important decision. Full unit loads needs less handling and is therefore easier and faster to transport with intermodal transport while less than full unit loads are more time consuming. Instead less than full unit loads can help increase the resource utilization, as described in Chapter 7.3.1.

The regional transport companies agree that it is important to transport full unit loads in the highest possible extent since they believe it is too complex and takes too much time to split assignments, see Table 23. However, RTC A and RTC D consider an entire transport solution for the customers to be very important and would therefore like to offer to split assignments as well, even though the lead time becomes longer and the complexity of the system increase. According to Chapter 5.1.2, the customers are generally very time sensitive. It is therefore not possible to transport less than full unit loads for all customers. However, it might be possible to combine several customers in one container if all customers agree with the characteristics of the transport. Another argument for less than full unit loads is the same as the reason against it, that it is more complex, and thereby more difficult for other companies to do. If the regional transport companies could handle a less than full unit load network it could provide a strong market position. Despite the arguments for less than full unit load network, the arguments against are overpowering and it is considered too complex to handle anything other than full unit loads in a collaboration regarding intermodal transport.

Table 23 Independent Sub-strategies for Customer Segmentation regarding Unit Loads

	RTC A	RTC B	RTC C	RTC D	RTC E
Full Unit Loads	X	X	X	X	
Less than Full Unit Loads	X			X	

Another way to segment the customers is according to the goods flows, as described in Chapter 7.4.1. If the goods is suitable for intermodal transport in general but a part of it is not, for some reason, the parts of the goods flow that is suitable can be transported by intermodal transport and the rest can be transported on road. Since intermodal transport is cheaper but less flexible than road transport, it would be suitable to choose intermodal transport for the base demand and use road transport to handle the surge demand of the goods flows, as described by Christopher and Towill (2001).

The majority of the companies find that it would not be possible to transport all their goods flows with intermodal transport, for a specific customer, see Table 24. They say

that it is impossible to totally avoid road transports since it is necessary to handle variations in the goods flows. It can be harder to transport varying goods flows on intermodal transport as intermodal transport is less flexible than road transport, as described by Sommar (2006b) in Chapter 2.2.2. Fluctuations can therefore be hard to handle. RTC C explains that they would like to transport all goods flows from one customer with intermodal transport if it is possible is of course the most optimal solution, but it is rarely possible because it would require extremely stable goods flows. Since all transport companies are in agreement, and the literature explains that it is very difficult to handle fluctuating volumes with intermodal transport, the strategies for the collaboration will be to only handle the base part of the volumes with intermodal transport.

Table 24 Independent Sub-strategies for Customer Segmentation regarding Goods Flows

	RTC A	RTC B	RTC C	RTC D	RTC E
Parts of Goods Flows	X	X	X	X	X
All Goods Flows			X		

### 11.2.3 Relationship Structure

There are several reasons for why a collaboration regarding intermodal transport would be especially suitable for regional transport companies. Horizontal collaborations are exposed to risks of opportunistic behaviour from the collaboration partners. But, companies within a horizontal collaboration located in different geographical regions are less prone to opportunistic behaviour and more likely to be committed to the collaboration, according to Bernal, Burr and Fleuren (2007, described in Chapter 6.4.2). The regional transport companies are located in different regions in Sweden, which is an advantage for a collaboration regarding intermodal transport since they are likely to have sustainable collaboration.

Other factors that speak for the success of a collaboration regarding intermodal transport between regional transport companies are that there are personal connections between the companies as the companies are members of the same trade association and have social contacts with each other. These factors make a sustainable collaboration regarding intermodal transport, in accordance Crusijessen, Dullaert and Fleuren's (2007) arguments. These aspects speaks for that a collaboration regarding intermodal transport between regional transport companies have better chances of success than a collaboration regarding intermodal transport between other companies in the industry.

The relationship within the collaboration should be different dependent on the requirements on the relationship. The companies should have an active, more integrated relationship with the collaboration partners with a flow between the regions, and less integrated relationship with other collaboration partners. It is important to not have a more integrated relationship than necessary within a collaboration since integration has negative side effects, as described by Hoyt and Huq (2000) and Gadde (2004) in Chapter 6.4.2.

### 11.2.4 Activity Structure

It is important to have an efficient administration in a collaboration regarding intermodal transport, according to Lumsden (2006) in Chapter 6.5.3, as administration becomes more complex in collaborations. Collaboration regarding intermodal transport

involves many actors and operations putting high demands on the administration. In order for the collaboration regarding intermodal transport to be efficient and not waste resources on non-value adding activities collaboration strategies to avoid this is necessary. Collaboration strategies for an efficient administration are identified by Goldsby and Martichenko (2005) and Liker (2004) in Chapter 6.5.3. Automation, standardization and follow-up and deviation reports are collaboration strategies that they mention for efficient administration. Standardisation is especially important when several different companies are working together since they all will have different administrative routines and in order for the administration to be efficient all collaboration partners need to be following the same routines. Follow-up and deviation reports will ensure the quality of the service and ensure that the customers' demands are fulfilled and that the agreements between the collaboration partners are followed. It is important that deviation reports are in real time, since real time information sharing is crucial for efficient activities according to McQuinston (2001) in Chapter 6.5.4. These four collaboration strategies for an efficient administration will be used for the business model.

Another way to ensure the quality of the intermodal transport is the agreed assignment terms in the collaboration. As described in Chapter 7.4.2, the assignment terms can either be handled in formal contracts or by informal agreements. Formal contracts will reduce the performance risk according to Das and Teng (2001) and ensure that the operations are handled in accordance to the agreement but it can also decrease the trust in the relationship with too much control. The companies are not in agreement about the requirements on formality of the agreement terms.

RTC A prefers informal agreements in front of formal contracts, seen in Table 25. RTC C can imagine having some parts covered by informal agreements and the rest covered in formal contracts. The companies that prefer informal agreements rather than formal contracts have expressed that there is a very high level trust in the relationship between regional transport companies. In a relationship with a high level of trust there is less need for a control, according to Das and Teng (2001). The other regional transport companies value the control with formal contracts since they find it difficult and unwanted to rely totally on trust for such important part of their business. In conclusion, formal contracts is perceived to be the most suitable collaboration strategy for a collaboration regarding intermodal transport since it involves a high performance risk that is reduced with formal contracts, according to Das and Teng (2001) in Chapter 6.5.7, and several companies are reluctant to rely on trust for such important aspects of their business.

Table 25 Independent Sub-strategies for Agreed Assignment Terms regarding Formality in Terms

	RTC A	RTC B	RTC C	RTC D	RTC E
Formal Contracts		X	X	X	X
Informal Agreements	X		X		

### 11.2.5 Resource Structure

A collaboration regarding intermodal transport requires some consideration regarding the set-up of the collaboration, since it can be structured in different ways, which give different effects. The design of the collaboration will, according to Doz and Hamel (1998) in Chapter 6.6.1, have a considerable effect on the have successful the collaboration will be.

In order to reach the full opportunities with a collaboration regarding intermodal transport between regional transport companies it has to be able to provide a complete transport solution to large, national customers. A network does, in addition to the opportunity to offer nationwide solution, give the regional transport companies the benefits of being a large actor on the market described by Kanter (1994) in Chapter 6.2.2 and provides access to new markets by offering a large geographical coverage, as explained by Bleeke and Ernst (1995). In order to offer within a network offer a national customer a complete transport solution it is also necessary to have commonly framed contracts, for a regional transport company to provide the customer with the information about total transport price etcetera. The regional transport companies do want to offer the customers a network of nodes to be able to offer an entire transport solution for their customers, see Table 26, compared to individual lines as described in Chapter 7.4.3. This is especially important for the regional transport companies that are interested to provide transport services for large national customers.

Table 26 Independent Sub-strategies for Agreed Network Structure regarding Transport Lines

	RTC A	RTC B	RTC C	RTC D	RTC E
Individual Lines					
Network of Nodes			X	X	X

According to Lumsden (2006) it is complex to have a transport flow that include more than two transport nodes, see Chapter 7.4.3. A system involving more than two nodes with involves additional transshipments and as mentioned before, each additional step increases the cost and decreases the transport quality. RTC B and RTC C, who also believe that a system involving several nodes would be too complex to handle, support the reasoning, shown in Table 27. RTC C explain, that in their experience, a system with two nodes is efficient to handle with intermodal transport but for a system with more nodes road transport is the most efficient transport mode.

Table 27 Independent Sub-strategies for Agreed Network Structure regarding Flow Structure

	RTC A	RTC B	RTC C	RTC D	RTC E
Flow between Two Nodes		X	X		
Flow in Network of Nodes					

### 11.2.6 Profit Allocation

As described in Chapter 7.4.4, there are two ways to allocate profits between companies, either equally or equity. An equity profit sharing method is suitable when there are large differences between the companies input. An equal profit sharing method is suitable when the collaboration requires specific investments and when the companies value the benefits of the collaboration equally. The regional transport companies would probably not value the benefits of the collaboration equally and neither is their input to the collaboration equal. Therefore an equity profit allocation method should be most suitable. This is supported by the regional transport companies, that are striving for collaboration regarding intermodal transport, who believes that allocate the profit according to equity is more fair, as seen in Table 28. Deviating from the other is RTC A, who would like to share the profit equally if they would have to share profits at all. Since RTC A is striving for level one in the staircase without any collaboration, they would not be in need of a profit allocation model.

Table 28 Independent Sub-strategies for Fair Profit Sharing regarding Profit Allocation

	RTC A	RTC B	RTC C	RTC D	RTC E
Equally	X				
Equity		X	X	X	X

If the profit should be allocated according to equity, the profit allocation can be made according to a number of different weights, as described by Frisk et al. (2006) and Jap (2001) in Chapter 6.7.1. The most important issue with the profit allocation is to ensure that the regional transport companies are satisfied with the allocation, to ensure the sustainability of the collaboration, as described in Chapter 5. Therefore, the regional transport companies' opinions about how a fair profit allocation should be structured weigh heavily in the decision of collaboration strategy. The regional transport companies think that the profit allocation should be strongly connected to two weights, the workload and the customer ownership. The companies presented allocation methods that they feel is fair for the profit allocation in a collaboration regarding intermodal transport, is presented in Table 29, below. RTC B, RTC D and RTC E have similar ideas about the weights for the profit allocation, where the customer ownership is heavily important. They suggest that the customer owner should get the whole or the major part of the profit. RTC C on the other hand suggests a profit allocation based on workload. These two weights are two of the weights also mentioned in the literature. The collaboration strategy for profit allocation will therefore be in accordance to customer ownership and workload.

Table 29 Independent Sub-strategies for Fair Profit Sharing regarding Profit Allocation Weights

	RTC A	RTC B	RTC C	RTC D	RTC E
According to Workload			X		
Customer Owner gets Most Profit				X	X
Customer Owner gets Whole Profit		X			

It is possible to allocate the profit according to more than one weight. The most important aspect in a collaboration regarding intermodal transport is that all companies become separately profitable. For the profit allocation to be fair, it is also important that the companies earn more than their stand-alone profit.

An example of profit allocation is developed to suit the above mentioned criteria. This example is explained in Appendix C.

### 11.2.7 Experience Affect on the Regional Transport Companies' View on Collaboration Strategies

As seen in the chapters above the regional transport companies have more similar opinions about the independent collaboration strategies compared to the dependent ones. For example the regional transport companies experience does not seem to have an effect of how they view the network set-up or their view on a fair profit allocation. All companies that have contributed with their view on the network set-up have been in agreement. Regarding the profit allocation on the other hand the majority agrees on an equity profit method but none are in agreement about how this equity profit allocation should be allocated. There are probably other factors that affect their view on these aspects than their experience of intermodal transport.

Experience does not appear to have an effect on the regional transport companies' view on independent collaboration strategies. It is therefore less likely that the regional transport companies will change their opinions about the independent collaboration strategies compared to the dependent collaboration strategies. The regional transport companies are not likely to change their opinion about the independent collaboration strategies as they move in the staircase. This is important since the independent collaboration strategies will not change for different levels of collaboration but stay the same.

# PART VI

---

## 12 BUSINESS MODEL FOR THE COLLABORATION REGARDING INTERMODAL TRANSPORT IN A JOINT COMPANY

---

This chapter presents the result of the report in form of a business model for collaboration regarding intermodal transport in a joint company. The chapter will also present when the presented business model is applicable. This chapter summarizes the result of the project. The result in this chapter builds on the analysis why no explanations for the selected collaboration strategies and the applicability are discussed.

### 12.1 BUSINESS MODEL FOR JOINT COMPANY

---

The business model for collaboration regarding intermodal transport in a joint company presents those collaboration strategies that are used in the business model to enable a sustainable collaboration regarding intermodal transport. The presented business model offers a unique value for the regional transport companies' customers by an increased product portfolio. The business model also creates barriers to entry and it is difficult to imitate by other competitors since the network of regional transport companies has a unique structure. At last, the business model is grounded in reality, through the confirmation by the regional transport companies. This is according to Linder and Cantrell (2001) the characteristics of a successful business model, described in Chapter 4.3.1. The collaboration strategies presented in the business model are the ones that have been chosen according to the analysis. The regional transport companies are recommended to use all the collaboration strategies in the business model and not select a number of them why no decisions have to be made by the regional transport companies.

#### 12.1.1 Business Model Value

---

For value to be captured from collaboration (see RQ2A in Chapter 1.5), three collaboration strategies need to be used, as can be seen in Table 30.

Table 30 Collaboration Strategies for Business Model Value in Joint Company

Use Intermodal Transport
Use Collaboration
Use Business Model

#### 12.1.2 Customer Segments

---

To provide a suitable customer base for collaboration regarding intermodal transport the customers should be segmented according to a number of different parameters (see RQ2B in Chapter 1.5), presented in Table 31.

Table 31 Collaboration Strategies for Customer Segments in Joint Company

Segment Customers	Provide intermodal transport to Consignor/Consignee
	Provide intermodal transport to National Customers
	Provide intermodal transport to Regional Customers
	Use Collaboration regarding Intermodal Transport for Consumer Goods
	Use Collaboration regarding Intermodal Transport for Groceries
	Use Collaboration regarding Intermodal Transport for Forest Products
	Use Collaboration regarding Intermodal Transport for Heterogenous goods
	Use Collaboration regarding Intermodal Transport for Full Unit Loads
	Use Collaboration regarding Intermodal Transport for Base Demand

### 12.1.3 Relationship Structure

For the collaboration regarding intermodal transport to be sustainable the collaboration should be structured (see RQ2C in Chapter 1.5) according to collaboration strategies focused around customer ownership and level of integration, as presented in Table 32.

Table 32 Collaboration Strategies for Relationship Structure in Joint Company

Clarify Customer Ownership	Have Central Customer Ownership
Integrate relationship	Integration Relationship Totally
	Have Active Relationship with Collaboration Partners with Flow
	Have Passive Relationship with other Collaboration Partners

### 12.1.4 Activity Structure

The activities in a collaboration regarding intermodal transport should be structured according to several collaboration strategies for the activity structure (see RQ2D), which are presented in Table 33.

Table 33 Collaboration Strategies for Activity Structure in Joint Company

Coordinate Activities	
Plan Jointly	Plan Centrally
Coordinate Administration	Administrate Centrally
Improve Administration	Automate Administrative Activities
	Standardize Administration Routines
	Follow-up on the Collaboration
	Use Real Time Deviation Reports
Share Information	Implement Common Information system
Share Knowledge	
Share Resources	
Agree on Assignment Terms	Develop Assignment Terms Centrally
	Formalize Contracts

### 12.1.5 Resource Structure

The resources in a collaboration regarding intermodal transport should be structured according to three collaboration strategies (see RQ2E in Chapter 1.5). The collaboration strategies for resource structure handle the network structure and the branding of the offering, see Table 34.

Table 34 Collaboration Strategies for Resource Structure in Joint Company

Agree on Network Structure	Develop a Network of Nodes
	Focus of Flow Between Two Nodes
Brand Environmentally	Use Central Brand

### 12.1.6 Profit Allocation

The profits in a collaboration regarding intermodal transport should be allocated fairly (see RQ2F in Chapter 1.5). A fair profit allocation is reached by the collaboration strategies presented in Table 35.

Table 35 Collaboration Strategies for Profit Allocation in Joint Company'

Share Profit Fairly	Share Profit Equity
	Share Profit According to Customer Ownership and Workload
	Allocate each Collaboration Partner at Least it's Stand Alone Profit

## 12.2 APPLICABILITY OF THE BUSINESS MODEL

The applicability of the business model is dependent on the fulfillment of three factors. First, all the prerequisites for collaboration regarding intermodal transport have to be fulfilled, see Table 36. Second, the regional transport companies have to have the same goal with the collaboration, and be interested in a joint company. Last, the regional transport companies need to have common strategies and agree with all the collaboration strategies in the business model to be able to use it. When all these three factors are fulfilled, the business model is applicable. If a company would try to use the business model without fulfilling the three factors, the collaboration is more likely to fail.

Table 36 Prerequisites for Collaboration regarding Intermodal Transport

Prerequisites for Intermodal Transport (see RQ1A in Chapter 1.5)	Value for the Company	Competitive Advantage
		Profitable
		High Resource Utilization
	Value for the Customers	Low Price for Customers
		Short Lead Time
		Flexible
		Environmentally Sustainable
		Reliable
		Secure
	Access to Resources	Access to Railway
		Access to Terminal
		Access to Trucks
Access to Load Units		
Access to Drivers		
Prerequisites for Collaboration (see RQ1B in Chapter 1.5)	Value for the Company	Competitive Advantage
		Separately Profitable
	Sustainable Relationship	Commitment
		Trust
		Fair
		Common Goals
		Common Strategies
	Operatively Possible	Coordinated Activities
		Access to Information

## 13 DISCUSSION ABOUT THE RESULT OF THE REPORT

---

In this chapter a discussion about the business model will be performed to investigate the implications of the result. First the business model's implication for the regional transport companies and how the result can be adjusted to other levels of collaboration will be presented. Thereafter a discussion about other implication of the business model and the validity and reliability of this report will be done. After that, the authors will discuss the future development's affect on the result. Last some suggestions for further research are presented.

### 13.1 IMPLICATIONS OF THE RESULT FOR THE REGIONAL TRANSPORT COMPANIES

---

The business model will enable collaboration regarding intermodal transport and provide value for the intermodal transport chain, as described in Chapter 5. The business model will not only affect the area that are directly connected to the collaboration regarding intermodal transport but will also have other implications for the regional transport companies.

There are great learning opportunities connected to the collaboration regarding intermodal transport. A closely integrated relationship gives opportunities for information and knowledge sharing that otherwise is not accessible. The knowledge that is learned from the collaboration partners can be used to develop both the collaboration but also the regional transport companies other business areas.

The development of the administrative routines to be more efficient, including automated activities and real time deviation reports can be developed for the other areas of the business as well and the company can gain the benefits of more efficient administration in the entire company.

The new market with large, national customers that a collaboration regarding intermodal transport make possible can also create opportunities for the regional transport companies to increase their own customer base and possibly handle these customers road transport as well. Having an established contact with a customer makes it easier to develop the relationship further and handle more of their transports. A trend in business is to decrease the number of suppliers to make the handling more efficient, and it is therefore beneficial to be able to provide a more complete solution and handle more of the customer's transports.

A joint company makes the regional transport companies a more powerful actor on the market. Being a more powerful actor can give the companies a better negotiation position against suppliers and customers. It can also open up for new opportunities for lobbyism to affect the government and how the future development will proceed.

The business model for collaboration regarding intermodal transport can also open up for other collaborations between the regional transport companies, with a similar set-up. Other types of collaboration can take advantage of the finished set-up and the established relationships between the collaboration partners.

## 13.2 BUSINESS MODEL ADJUSTABILITY TO OTHER LEVELS OF COLLABORATION

---

This chapter will explain how the business model needs to be adjusted when the regional transport company changes level in the staircase model, Figure 36. The adjustments of the business model were interpreted from the collaboration strategies at each level in the staircase model. The independent collaboration strategies will be similar for every level of collaboration and not change between the different levels in the staircase model. They will therefore not be included in this chapter.

### 13.2.1 Business Model Value

---

The value is transformed during the different levels in the staircase model. At the first level the value from intermodal transport is realized. After that, value from collaboration is increasing for every level in the staircase model.

### 13.2.2 Customer Segments

---

The customer segments vary between the different levels of collaboration. Before level one, the company does not use intermodal transport. They can however be involved in the intermodal transport chain as a sub-supplier to a forwarder or a rail operator. In this way, the company is second-tier suppliers in the intermodal transport chain. From level one and onward the customers are always consignors or consignees.

At level one and two the company can only handle regional customers that transport goods between their own region and another region. From level three the companies in the collaboration can handle national customers as well.

### 13.2.3 Relationship Structure

---

The relationship structure will also vary between the different levels of collaboration. From level one to level three the customer is owned by each individual company. At level four there will be a joint customer ownership by the joint company.

The relationship structure also transforms from no collaboration where local transport is bought from a supplier to partial collaboration at level two, extensive collaboration at level three and a joint company at the final level. The integration level increases in relation to the collaboration level.

### 13.2.4 Activity Structure

---

The companies' activities have to be coordinated within the collaboration from level two and forward. The communication between the companies is performed manually at level two. From level three there is a need for a common information system. At level four the companies will also share knowledge.

At level three, both the planning and the administrative routines are commonly handled between the companies. At level four, the planning and administrative routines are instead centrally handled. The administration also has to be improved by for example automated activities and deviation reports from level three. From level two the companies also share resources between each other.

The companies agree terms for every assignment at level two but from level three the terms for assignments are agreed through common frameworks for every assignment.

### 13.2.5 Resource Structure

---

At level two, the involved companies have to agree on a network structure. The content of the network structure may vary but it is independent on the level of collaboration.

From level one to level three the companies will use individual brands for the intermodal transport while the joint company, at level four, will use a central brand for the joint companies' transports.

### 13.2.6 Profit Allocation

---

At level one the company buys the local transport from a transport supplier. Then there is no need for a profit allocation. However, from level two there have to exist a fair profit allocation principle.

### 13.2.7 When to Use the Business Model

---

At level one, all prerequisites for intermodal transport have to be fulfilled for the business model to be useful. At the levels above, the prerequisites for collaboration also have to be fulfilled.

The different levels of collaboration require different business models, as described in Chapter 10.1, and it is necessary to use the business model connected to the respective level. For that reason, it is important that the companies involved in the collaboration are located on the same level of collaboration. For every level in the staircase model the business model has to be updated.

## 13.3 OTHER IMPLICATIONS OF THE BUSINESS MODEL

---

Intermodal transport for rail-road and intermodal transport for sea-road, sea-rail or sea-rail-road have many similarities and the main concepts for these are the same. The business model developed in this report is therefore applicable for a collaboration regarding intermodal transport on any transport mode, with some modifications.

The result of this report also show the interest for intermodal transport by regional transport companies, which can be used by other actors as infrastructure developers.

Companies that have interest in collaborations could also find value from the business model. It could for example benefit smaller companies that are interested in a collaboration in order to establish themselves on a new market or gain the advantages of information-, knowledge- or resource sharing.

## 13.4 VALIDATION AND RELIABILITY

---

The method for assessing the validity and reliability of the report was described in Chapter 3.2. The result of the report is valid and reliable. The result of the report has been confirmed by the regional transport companies and lives up to the theoretical demands for being assessed as valid and reliable. The business model will continue to be valid and reliable in the future but it is not clear how much it can contribute at that time since there is so much insecurity about the future development, as described in Chapter 13.4.

### 13.5 AUTHERS' THOUGHTS ABOUT THE DEVELOPMENT'S EFFECT ON THE RESULT

---

The authors feel that there are several factors in the development that can affect the result of the report. The authors thereby believe that it is important to think about how the development might affect the result. The factors discussed below do not provide a complete view of the situation. Instead it is intended to show that it is not clear what the future will bring and how it might affect the usefulness of this report.

Even though there are heavy promotions on moving goods from road transport to intermodal transport, the capacity on the railway is limited. If the railway is overburden the problems connected to time, reliability and flexibility will increase. Investments in infrastructure are a long-term project and it is not possible to develop the railway much faster when the need arises. The goods transport on rail has to compete with the passenger transport, a competition that the passenger transport most often wins. There is a trend toward more passenger transport on rail, due to the environmental debate that has been important lately. An increase of passenger transport would leave less room for goods transport on rail. The development of intermodal transport is dependent on the development of the infrastructure for railway.

The interest for intermodal transport has increased in the last years in the transport industry and there has been an increase of intermodal transport suppliers on specific markets, which can be interpreted as a trend toward a more competitive situation on the market.

The development of intermodal transport is dependent on the development for road transport, since intermodal transport and road transport is exchangeable systems. The reason for the high interest in intermodal transport is partly that the development of road transport is considered to be unsustainable. A technical development can change this situation. An important issue regarding road transport is the emissions of carbon dioxide. A technical development that reduces or eliminates the emissions of carbon dioxide from road transport would change the situation.

The cost for fuel is an important factor for road transport. If the cost for fuel decreased, with for example the development of alternative sources, the cost for road transport would decrease and intermodal transport could have a difficult time competing. Finding profitability in intermodal transport is a problem area for the regional transport companies today and if the cost for road transport decreased this would be even more significant. However, the research for alternative fuels is going slowly.

A suggestion that is on the agenda today is to allow longer trucks. The suggestion is that the new trucks should be allowed to be longer and thereby increase the transported volume. The suggestion would change the economy of road transport at the same time as the environmental impact from the transport is decreased.

Road transport is threatened with increased fees and taxes. The Swedish government has considered implementing a kilometer tax for goods transport on road. The implementation of such a tax or the removal of the threat would have implications for intermodal transport, either positive or negative. Some of the interest for intermodal transport is dependent on the threat of more regulations and fees for road transport. If a

part of that threat would disappear interest for intermodal transport might also change. If the threat on the other hand is realized the cost for road transport would increase and the applicability of intermodal transport would increase as well.

Another question is about the competitive neutrality among the different transport modes. There are large difference between the transport modes and how much of their cost they carry. Road transport is financed with infrastructure by the government, and so is rail transport while sea transport carries the cost for their own infrastructural needs. If this situation is changed, the competitive situation between the transport modes would also change.

Intermodal transport has been attractive lately due to much discussion about environmental sustainability in the media. The discussion has faded a little bit and the recent recession in the economy has changed the focus from environmental interests to economic ones. The total transport work has also decreased in response to the economic recession and with less total transport work, less transport is available for intermodal transport. There is a risk connected to intermodal transport if there is a decrease in transport demand the regional transport companies' total resource utilization will decrease and the companies might feel tempted to move transports from intermodal transport to road transport to fill their trucks. The regional transport companies are member owned companies and have higher pressure to keep the hauliers occupied than a regular transport company. The problem for the regional transport companies can increase further if they have made investments in resources for intermodal transport that are not optimal for other use.

Business trends can change the structure of the industry and change the transport needs drastically. It is not possible to say what structural change that new business trends can create within the coming years. In the past there have been some trends that have had major influence of the development of the transport industry.

### 13.6 FUTURE RESEARCH

---

There are a number of aspects within this area that could be interesting for future research. An aspect to investigate is the physical processes connected to intermodal transport such as transshipment, rail transport and short distance transport and the opportunities for collaboration between the regional transport companies in operating a railway line or a terminal. The investigation could also include the relationships with other actors in the transport chain, for example the rail operator and the terminal operator.

Another opportunity is to make a market analysis of possible customers for the regional transport companies. This is especially interesting for finding a large, national customer that they all could collaborate around. This market analysis could include a study of how to market the offering towards customers.

A thorough study of the development of the infrastructure connected to intermodal transport could also be an interesting area. The regional transport companies experience the infrastructure as a limiting factor for a collaboration regarding intermodal transport. A collaboration strategy for strategic placement of important terminals and flows can be the result of such investigation. It could be interesting to

make an overview of technical development that could make the transshipments more efficient, since this would have great impact on the system.

## 14 CONCLUSIONS

---

The presented business model enables collaboration regarding intermodal transport between regional transport companies. The business model enables collaboration regarding intermodal transport by using collaboration strategies, which handle the identified prerequisites for collaboration regarding intermodal transport. The collaboration strategies are connected to the six developed building blocks, which all deal with issues necessary to handle for collaboration regarding intermodal transport to be enabled, namely business model value, customer segments, relationship-, activity- and resource structure and profit allocation.

The business model is applicable when three basic requirements are satisfied. The first requirement is that all prerequisites for collaboration regarding intermodal transport are fulfilled. The second requirement is that all involved companies are positioned at the highest level in the staircase model. The third requirement is that the involved companies have to be in agreements on all collaboration strategies in the business model.

At the moment, the presented business model is only valid for the regional transport companies whose vision is to be located at the highest level of collaboration. Since it is possible to move in the staircase, the business model might be applicable for other regional transport companies in the future.

## LIST OF REFERENCES

---

Anand, K. & Mendelson, H. (1995) Information and organization for horizontal multimarket cooperation. Stanford, Stanford University Report.

Andersen, E. & Schwencke, E. (1998) Projektarbete – en vägledning för studenter (Project work, guidance for students). Lund, Studentlitteratur.

Andery, P., Carvalho, A.N. & Helman, H. (1998) Looking for what could be wrong: an approach to lean thinking. Proceeding IGLC 1998. Escola de Engenharia da Universidade Federal de Minas Gerais.

Bengtsson, M. & Kock, S. (1999) Cooperation and competition in relationships between competitors in business networks. *Journal of Business & Industrial Marketing*, 14(3), 178-94.

Banverket (2004) Åtgärder i Framtidsplan för järnvägen 2004–2015 – Sammanfattning (Measurement in the future plan for the railway 2004-2015 – Summary). Borlänge, Banverket Report.

Banverket (2007) Strategiskt nät av kombiterminaler - intermodala noder i det svenska godstransportsystemet (Strategic net of combiterminals – intermodal nodes in the Swedish goods transport system). Borlänge, Banverket Report.

Bark, P., Jonsson, R. & Nelldal, B.-L. (2008) Temastudie: Intermodala komponenter - system, utrustning, metoder och miljö (Theme Study: Intermodal Components – system, equipment and environment). Göteborg, Sir-C Report.

Bergqvist, R. & Woxenius, J. (2008) Varuflödesundersökning i Jönköpingsregionen – Godsunderlag för kombinerade transporter (Goods flow investigation in the Jönköping areas – Goods for combined transports). Torsvik, Logpoint South Sweden Report.

Bernal, S.M.H., Burr, C. & Johnsen, R.E. (2002) Competitor networks: International competitiveness through collaboration – The case of small freight forwarders in the High-Tech Forwarder Network. *International Journal of Entrepreneurial Behaviour & Research*, 8(5), 239-53.

Bleeke, J. & Ernst, D. (1995) Is your strategic alliance really a sale? *Harvard Business Review*, 3(1), 97–105.

Bontekoning, Y., Macharis, C. & Trip, J.J. (2004) Is a new applied transportation research field emerging - A review of intermodal rail-truck freight transport literature. *Transportation Research Part A*, 38(1), 1-34.

Bowman, C. & Ambrosini, V. (2000) Value Creation Versus Value Capture: Towards a Coherent Definition of Value in Strategy. *British Journal of Management*, 11, 1-15.

- Bryman, A. & Bell, E. (2003) *Business Research Methods*. Oxford, Oxford University Press.
- Burton, S. & Steane, P. (2004) *Surviving your Thesis*. London, Routledge.
- Bäckström, S. (2008) Lastbilsforsling och terminalfunktioner ur åkeriets synvinkel som delar av en intermodal transportkedja (Road haulage and terminal functions from a hauliers perspective as parts of an intermodal transport chain ). Göteborg, SiR-C Report.
- Bärthel, F. (2009a) Branschstruktur intermodala transporter – delrapport i projektet MINT (Industry structure for intermodal transport – a partial report in the project MINT), Göteborg, SiR-C Report.
- Bärthel, F. (2009b) Kartläggning och probleminventering med avseende på intermodala terminaler (Mapping and problem inventory with regards to intermodal terminals). Stockholm, TFK Report.
- Cairncross, F. (1992) *Costing the Earth: the challenge of governments, the opportunities for business*. Boston, Harvard Business School Press.
- Caramia, M. & Guerriero F. (2009) A heuristic approach to long-haul freight transportation with multiple objective functions. *Omega*. 37(3), 600-14.
- Cardebring, P.W. Fiedler, R., Reynard, C. & Weaver, P. (1996) Summary Report of the IQ Project. Hamburg, TFK Transportforschung GmbH Report.
- Chalmers Lindholmen (2002) Fackspråklig kommunikation i tal och skrift – en handledning för Chalmersstuderande (Scientific communication in speech and writing – a guide for students at Chalmers University of Technology). [Compendium]. Göteborg, Institutionen för fackspråk och kommunikation.
- Chesbrough, H. & Rosenbloom, R.S. (2002) The role of business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, 11(3), 529-55.
- Child, J., Faulkner D. & Tallman S.B. (2005) *Cooperative strategy: managing alliances, networks and joint ventures*. Oxford, Oxford Press.
- Chipty, T. & Snyder, C.M. (2006) The Role of Firm Size in Bilateral Bargaining: A Study of the Cable Television Industry. *The Review of Economics and Statistics*, 81(2), 326-340.
- Christopher, M. & Towill, D. (2001) An integrated model for the design of agile supply chains. *International Journal of Physical Distribution & Logistics Management*, 31(4), 235-246
- Cope, J. & Watts, G. (2000) Learning by doing: an exploration of experience, critical incidents and reflection in entrepreneurial learning. *International Journal of Entrepreneurial Behaviour & Research*, 6(3), 104-24.

- Crujessen, F., Cools, M. & Dullaert, W. (2005) Horizontal cooperation in logistics: Opportunities and impediments. *Transport Research Part E*, 43(2), 129–142.
- Crujessen, F., Dullaert, W. & Joro, T. (2006) Logistics efficiency through horizontal cooperation: the case of Flemish road transportation companies. Discussion paper 2006-14, Tilburg University.
- Crujessen, F., Dullaert, W. & Fleuren, H. (2007) Horizontal cooperation in transport and logistics: a literature review. *Transportation Journal*, 46(3), 22-39.
- Cullinane, K. & Toy, N. (2000) Identifying influential attributes in freight route/mode choice decisions: a content analysis. *Transport Research Part E*, 36, 41-53.
- Cunningham, M. & Culligan, K. (2000) Competitiveness through networks of relationships in information technology product markets - Understanding Business Markets. 2<sup>nd</sup> edition. London, Dryden.
- Dacin, M.T., Hitt, M.A. & Levitas, E. (1997) Selecting partners for successful international alliances: Examination of U.S. and Korean firms. *Journal of Business World*, 32(1), 3-16.
- Danielsson, A. (1983) *Företagsekonomi – en översikt* (Business administration – an overview). Lund, Studentlitteratur.
- Das, T.K. & Teng, B.S. (2001) Trust, Control and Risk in strategic alliances: An integrated framework. *Organization Studies*, 22(2), 251-283.
- Dowling, G. (2004) *The Art and Science of Marketing: Marketing for Marketing Managers*. Oxford, Oxford University Press.
- Doz, Y.L. & Hamel, G. *Alliance Advantage: The Art of Creating Value through Partnering*. Harvard, Harvard Business Press.
- Drewes Nielsen, L., Homann Jespersen, P., Petersen, T. & Gjesing Hansen, L. (2003) Freight transport growth – a theoretical and methodological framework. *European Journal of Operational Research*, 144, 295-305.
- European Commission (2001) *European transport policy for 2010: time to decide*. White paper. Brussels, Commission of the European Communities.
- Faulkner, D.O. & Campbell, A. (2003). *Oxford Handbook of Strategy, Volume I: A Strategy Overview and Competitive Strategy*. Oxford, Oxford University Press.
- Flodén, J. (2007) *Modelling Intermodal Freight Transport – The potential of Combined Transport in Sweden*. Dissertation. University of Gothenburg.
- Flodén, J. (2009) *Business Models for Intermodal Transports – Intermodal road-rail transport in Europe*. Working paper. University of Gothenburg.

Frisk, M., Gothe-Lundgren, M., Jornsten, K. & Ronnqvist, M. (2006) Cost Allocation in Collaborative Forest Transportation. Bergen, Norwegian School of Economics and Business Administration Report.

Gadde, L-E. (2004) Activity coordination and resource combining in distribution networks – Implications for relationship involvement and the relationship atmosphere. *Journal of Marketing Management*, 20, 157-84.

Gillham, B. (2008) Forskningsintervjun – Tekniker och genomförande (Research Interviewing – The range of techniques). Malmö, Studentlitteratur.

Godstransportdelegationen (2004) Godstransporter – noder och länkar i samspel (Goods transport – nodes and links in cooperation). Stockholm, Fritzes. (SOU 2004:76).

Goldsby, T. & Martichenko, R. (2005) Lean Six Sigma Logistics: Strategic Development to Operational Success. Fort Lauderdale, J. Ross Publishing

Harris, G. (1998) Evaluating Internet Research Sources. [Online] (Updated 15 June 2007). Accessed at <<http://www.virtualsalt.com/evalu8it.htm>>. [Accessed 23 February 2009].

Harrison, D. & Huemer, L. (2005) Boundaries, inter-organisational routines and change. Proceeding 21st International Marketing and Purchasing Conference. Rotterdam, Erasmus Business School.

Hart, C. (1998) Doing a Literature Review – Releasing the Social Science Research Imagination. London, Sage Publications.

Hart, C. (2001) Doing a Literature Search – A Comprehensive Guide for the Social Sciences. London, Sage Publications.

Hoyt, J. & Huq, F. (2000) From arms-length to collaborative relationships in the supply chain – An evolutionary process. *International Journal of Physical Distribution and Logistics*, 30(9), 750-64.

Hultén, L. (1997) Container logistics and its management. Dissertation. Chalmers University of Technology. Göteborg.

Häger, B. (2007) Intervjuteknik (Interview techniques). Stockholm, Liber AB.

Jap, S.D. (2001) Pie Sharing in Complex Collaboration Contexts. *Journal of Marketing Research*, 38, 86-99.

Jensen, A. (1990) Combined transport - Systems, economics and strategies. Stockholm, Swedish Transport Research Board Report.

Johnson, M.W., Christiansen, C.M. & Kagerman, H. (2008) Reinventing Your Business Model. *Harvard Business Review*, December. 1-11.

- Johnson, R.E. & Johnson, T.E. (1999) International market development through networks: the case of the Ayshire knitwear sector. *International Journal of Entrepreneurial Behaviour Research*, 5(6), 297-312.
- Jonsson, P. & Mattsson, S.-A. (2005) *Logistik – Läran of effektiva materialflöden (Logistics – The science of efficient material flows)*. Lund, Studentlitteratur.
- Kahn, B.E. (1998) Dynamic Relationships with Customer: High-variety strategies. *Journal of Academy of Marketing Science*. 26(1), 45-53.
- Kanter, R.M. (1994) Collaboration – The Art of Alliances. *Harvard Business Review*, July-August, 96-108.
- Kapferer, J.-N. (2008) *The New Strategic Brand Management: Creating and Sustaining Brand Equity Long Term*. London, Kogan Page.
- Karlsson, E. (2009) *Transportköparnas värderingar, attityder och inköpsbeteende (The transport buyers values, attitudes and buying behaviours)*. Göteborg, Sir-C Report.
- Kong, W., Zhang, Q. & Song, H. (2008) Joint cost allocation among supply chain enterprises – based on cooperative game. *Proceeding of Chinese Control and Decision Conference 2008*. Beijing, Beijing School of Management and Economics.
- Krajewska, M.A. & Kopfer, H. (2006) Profit sharing approaches for freight forwarders: An overview. In *Proceeding of the 5<sup>th</sup> international conference on modern trends in logistics*. 157-161.
- Kreutzberger, E., Macharis, C., Vereecken, L. & Woxenius, J. (2003) Is intermodal freight transport more environmentally friendly than all-road freight transport? A review. *Proceeding of 7th NECTAR Conference*. Umeå, Umeå University of Technology.
- Laitila, T. & Westin, K. (2000) *Miljöhänsyn vid val av godstransportör (Environmental consideration in the choice of goods transporter companies)*. Umeå, Umeå universitet Transportforskningsenheten Report.
- Lambert, D.M. Emmelhainz, M. & Gardner J. (1999) Building successful logistics partnerships. *Journal of Business Logistics*. 20 (1), 165-181.
- Lantz, A. (2007) *Intervjumethodik (Interview methodology)*. Pozkal, Studentlitteratur.
- Lee, H. & Whang, S. (2000) Information Sharing in a Supply Chain. *International Journal of Technology Management*, 20(3/4), 373-87.
- Liker, J.K. (2004) *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. New York, McGraw-Hill.
- Linder J.C. & Cantrell, S. (2001) Business-model myths that hold companies back, *Strategic Leadship*. MCB University Press, 13-16.

- Litman, T. (2004) London Congestion Pricing: Implications of Other Cities. Victoria, London. Victoria Transport Policy Institute Report.
- Lumsden, K., Hultén, L. & Waidringer, J. (1998) Outline for a conceptual framework on complexity in logistics systems. Göteborg, Chalmers University of Technology Report.
- Lumsden, K. (2006) Logistikens grunder (Fundamentals of logistics). 2<sup>nd</sup> edition. Lund, Studentlitteratur.
- Lumsden, K. (2007) Transport Economics. [Compendium] Göteborg, Chalmers University of Technology.
- Lundberg, S. (2006) Godskunders värderingar av faktorer som har betydelse på transportmarknaden (Goods customers' valuations of factors that influence the transport market). Licentiate thesis. Royal Institute of Technology.
- Madhok, A. & Tallman, S.B. (1998) Transactions and Rents: Managing Value Through Interfirm Collaborative Relationships. *Organization Science*. 9(3), 326-339.
- Markides, C.C. & Williamson, P.J. (1994) Related Diversification, Core Competencies and Corporate Performance. *Strategic Management Journal*. 15, 149-165.
- Marshall, C. & Rossman, G. (1999) *Designing Qualitative Research*. 3<sup>rd</sup> edition. London, Sage Publications.
- McQuiston, D. (2001) A conceptual model for building and maintaining relationships between manufacturers' representatives and their principals. *Industrial Marketing Management*, 30, 165-81.
- McDonald, M. (2008) *Malcolm McDonald on Marketing Planning: Understanding Marketing Plans and Strategy*. New York, Kogan Page.
- Miljödepartementet (2008) Miljöanpassade fordon (Environmentally compliant vehicles). [Online] (Updated 1 July 2008). Accessed at <<http://www.regeringen.se/sb/d/4264>> [Accessed 17 May 17 2009].
- Mohr, J. & Speakman, R. (1994) Characteristics of partnership success: partnerships attributes, communication behaviour, and conflict resolution techniques. *Strategic Management Journal*, 15(2), 135-152.
- Nault, B.R. & Tyagi, R.K. (2001) Implementable Mechanisms to Coordinate Horizontal Alliances. *Management Science*, 47(6), 787-799
- Näringsdepartementet (2008) Framtidens resor och transporter – Infrastruktur för hållbar tillväxt. Stockholm, Fritzes. Regeringens proposition 2008/09:35.
- Osterwalder, A., Lagha, S.B. & Pigneur, Y. (2002) E-business models. Proceeding of 15th Bled Electronic Commerce Conference e-Reality: Constructing the e-Economy. Bled, Universitet Koblenz Landau.

- Osterwalder, A. (2004) The business model ontology – A proposition in a design science approach. Dissertation. l'Université de Lausanne. Lausanne.
- Osterwalder, A. (2008) How to Describe and Improve your Business Model to Compete Better. Working paper. La Trobe University.
- Peteraf, M. A. (1993) The cornerstones of competitive advantage: A Resource-Based View. *Strategic Management Journal*, 14(3), 179-91.
- Polonsky, M.J. & Mintu-Wimsatt, A.T. (1995) *Environmental Marketing: Strategies, Practice, Theory and Research*. Philadelphia, Haworth Press.
- Porter, M. (1985) *Competitive Advantage – Creating and Sustaining Superior Performance*. New York, Free Press.
- Powell, W.W., Koput, K. & Smith-Doerr, L. (1996) Interorganizational collaboration and the locus of innovation - Networks of learning in biotechnology. *Administrative Science Quarterly*, 41, 116-45.
- Randall, G. (2000) *Branding - A Practical Guide to Planning Your Strategy*, 2<sup>nd</sup> Edition. London, Kogan Page.
- Senn, J.A. (1996) Capitalizing on electronic commerce: The role of the Internet in electronic markets. *Information Systems Management*. 13(3), 15-24
- SIKA (2007) Kilometerskatt för lastbilar – kompletterande analyser (Kilometer tax for trucks – completing analyses). Östersund, SIKA Report.
- SIKA (2008) Inrikes och utrikes trafik med svenska lastbilar (Domestic and international transport with Swedish trucks), Östersund, SIKA Report.
- SIKA (2009) Transportbranschen – hur står det till? Statistik om transportbranschen och sex delbranscher 1997–2007 (The transport industry – how is it going? Statistics from the transport industry and six sub-industries 1997-2007). Östersund, SIKA Report.
- Simatupang, T.M. & Sridharan, R. (2002) The Collaborative Supply Chain. *The International Journal of Logistics Management*, 13(3), 15-30.
- Simchi-Levi, D., Kaminsky, P. & Simchi-Levi, E. (2003) *Designing and managing the supply chain: concept, strategies and case studies*. New York, McGraw-Hill/Irwin.
- Sommar, R. & Woxenius, J. (2005) Time perspective on Intermodal Transport of Consolidated Cargo. Proceeding of the NECTAR conference No.8. Las Palmas, Las Palmas G.C.
- Sommar, R. (2006a) Organization of LTL networks – Consequences for intermodal transport. Göteborg, Chalmers University of Technology Report.
- Sommar, R. (2006b), Intermodal Transport in Less-than-Truckload Networks. Göteborg, Chalmers University of Technology Report.

Speakman, R.E., Kamauff, J.W. Jr & Myhr, N. (1998) An empirical investigation into supply chain management: A perspective on partnerships, *International Journal of Physical Distribution & Logistics Management*, 28(8), 630-50.

SPI (2009) Svenska Petroleum Institutet Statistik Sverige (Statistics Sweden). [Online] Accessed at: <<http://www.spi.se/statistik.asp?omr=1&kat=1>> [Accessed 20 May 2009]

TFK (1998) Environmental Handbook for Transport Purchasing – Goods transportation, Stockholm, TFK Report.

Thompson, G., Frances, J., Levacic, R. & Mitchell, J. (1991) *Markets, Hierarchies & Networks – The coordination of social life*. London, Sage Publications.

Zrinscak, K. (2006) *Intermodal Road-Rail Transport within Long-distance Transport at ARLA – Suggestions and Identified Obstacles*. Master thesis. Göteborg, Chalmers University of Technology.

UNECE (2001) *Terminology of Combined Transport*. New York and Geneva, Economic Commission for Europe Report.

Vägverket (2004) *Vägar och gators utformning – Dimensioneringsgrunder (Roads and streets layout – grounds for dimensioning)*. Stockholm, Vägverket Report.

Vägverket (2005) *Nulägesbeskrivning av tillståndet inom godstransportnäringen (Description of the present situation within the goods transport industry)*. Borlänge, Vägverket Report.

Wallén, G. (1996) *Vetenskapsteori och forskningsmetodik (Scientific theory and research methodology)*. 2nd edition. Lund, Studentlitteratur.

Woxenius, J. (1998) *Development of small-scale intermodal freight transportation in a system context*. Dissertation. Chalmers University of Technology.

Woxenius, J. & Bärthel, F. (2002) *The organization of the European Intermodal road/rail freight Transport Industry*. Proceeding of International Congress on Freight Transport Automation and Multimodality. Delft, OTB Research Institute for Housing, Urban and Mobility Studies and TRAIL Research School.

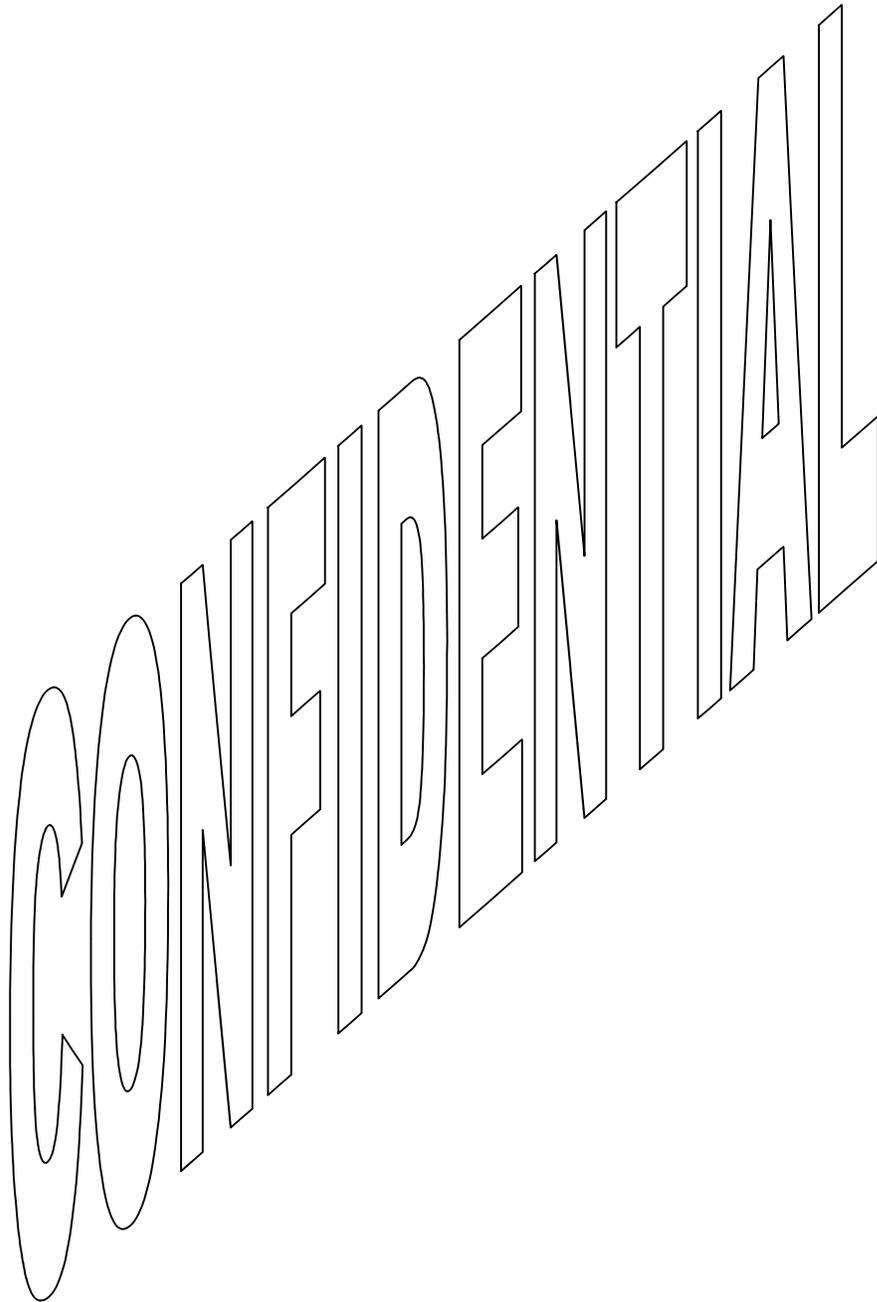
Woxenius, J. & Bärthel, F. (2008) *Intermodal Road-Rail Transport in the European Union*. In Konings, R., Priemus H. & Nijkamp P, ed. *The future of intermodal freight transport : operations, design and policy*. Cheltenham: Edward Elgar. 13-33.

Wu, H.-J. & Dunn, S.C. (1995) *Environmentally responsible logistics systems*. *International Journal of Physical Distribution & Logistics Management*. 25(2), 22-38.

Östring, P. (2004) *Profit Focused Supplier Management: How to Identify Risks and Recognize Opportunities*. New York, Amacom Books.

Özner, O.Ö. (2008) Collaboration in Transportation. Working paper. H. Milton Stewart School of Industrial and Systems Engineering.

**APPENDIX A – STUDIED REGIONAL TRANSPORT COMPANIES**



## APPENDIX B – REGIONAL TRANSPORT COMPANIES LEVEL OF COLLABORATIONS

The following tables summarize what the regional transport companies think about the collaboration strategies that are dependent on the level of collaboration. In the tables it can be seen which levels of collaboration the companies would like to go to and which levels of collaboration they do not want to go to. When the columns are compared, it will give an indication for to which level of collaboration the companies are striving.

### RTC A

Strategy	Strategy Choices	Would like to go to level	Would not like to go to level
Type of Customer	Rail operator/Forwarder	0	
	Consigner/Consignee	1	
Type of Customer	Regional Customers		
	National Customers		
Customer Ownership	Individual customer ownership	1	
	Joint customer ownership		4
Integration level	Partial integration		2
	Extensive integration		3
	Total integration		4
Plan Jointly	Common planning		3
	Central planning		4
Administrative Routines	Common Administrative Routines		3
	Centrally Controlled Administration		4
Information Sharing	Manual Information Sharing	2	
	Information System		3
Terms for Assignments	Negotiate terms for every assignment	2	
	Common framework for assignments		3
Marketing to Customers	Through individual brands		
	Through common brand		
Profit Sharing	Buy Transport	1	
	Fair Profit Allocation		2

## RTC B

Strategy	Strategy Choices	Would like to go to level	Would not like to go to level
Type of Customer	Rail operator/Forwarder		
	Consigner/Consignee	1	
Type of Customer	Regional Customers	1	
	National Customers		3
Customer Ownership	Individual customer ownership	1	
	Joint customer ownership	4	
Integration level	Partial integration		
	Extensive integration	3	
	Total integration	4	
Plan Jointly	Common planning	3	
	Central planning	4	
Administrative Routines	Common Administrative Routines		
	Centrally Controlled Administration	4	
Information Sharing	Manual Information Sharing		
	Information System	3	
Terms for Assignments	Negotiate terms for every assignment		
	Common framework for assignments	3	
Marketing to Customers	Through individual brands		
	Through common brand		
Profit Sharing	Buy Transport		
	Fair Profit Allocation	2	

## RTC C

Strategy	Strategy Choices	Would like to go to level	Would not like to go to level
Type of Customer	Rail operator/Forwarder	0	
	Consigner/Consignee	1	
Type of Customer	Regional Customers		
	National Customers	3	
Customer Ownership	Individual customer ownership	1	
	Joint customer ownership		4
Integration level	Partial integration	2	
	Extensive integration		3
	Total integration		4
Plan Jointly	Common planning		3
	Central planning		4
Administrative Routines	Common Administrative Routines		3
	Centrally Controlled Administration		4
Information Sharing	Manual Information Sharing	2	
	Information System		3
Terms for Assignments	Negotiate terms for every assignment		
	Common framework for assignments	3	
Marketing to Customers	Through individual brands	1	
	Through common brand		4
Profit Sharing	Buy Transport		
	Fair Profit Allocation	2	

## RTC D

Strategy	Strategy Choices	Would like to go to level	Would not like to go to level
Type of Customer	Rail operator/Forwarder		
	Consigner/Consignee	1	
Type of Customer	Regional Customers	1	
	National Customers		3
Customer Ownership	Individual customer ownership	1	
	Joint customer ownership		4
Integration level	Partial integration	2	
	Extensive integration		3
	Total integration		4
Plan Jointly	Common planning		3
	Central planning		4
Administrative Routines	Common Administrative Routines	3	
	Centrally Controlled Administration		4
Information Sharing	Manual Information Sharing		
	Information System	3	
Terms for Assignments	Negotiate terms for every assignment	2	
	Common framework for assignments		3
Marketing to Customers	Through individual brands	1	
	Through common brand		4
Profit Sharing	Buy Transport		
	Fair Profit Allocation	2	

## RTC E

Strategy	Strategy Choices	Would like to go to level	Would not like to go to level
Type of Customer	Rail operator/Forwarder		
	Consigner/Consignee	1	
Type of Customers	Regional Customers	1	
	National Customers	3	
Customer Ownership	Individual customer ownership	1	
	Joint customer ownership	4	
Integration level	Partial integration		
	Extensive integration	3	
	Total integration	4	
Plan Jointly	Common planning	3	
	Central planning	4	
Administrative Routines	Common Administrative Routines		
	Centrally Controlled Administration		
Information Sharing	Manual Information Sharing	2	
	Information System		3
Terms for Assignments	Negotiate terms for every assignment		
	Common framework for assignments	3	
Marketing to Customers	Through individual brands		
	Through common brand		
Profit Sharing	Buy Transport		
	Fair Profit Allocation	2	

## APPENDIX C – EXAMPLE OF PROFIT ALLOCATION

---

An example for how a profit allocation with the mentioned decided rules is presented in this appendix.

### Formula for the Profit Allocation

---

Company X = customer owner

Company Y = not customer owner

$C_1$  = cost for short distance transport handled by Company X

$C_2$  = cost for terminal handling according to market price

$C_3$  = cost for rail transport according to market price

$C_4$  = cost for terminal handling according to market price

$C_5$  = cost for short distance transport according to market price

$C_{N1}$  = cost for short distance transport handled by Company X

$C_{N2}$  = cost for terminal handling according to market price

$C_{N3}$  = cost for rail transport according to market price

$C_{N4}$  = cost for terminal handling according to market price

$C_{N5}$  = cost for short distance transport handled by Company Y

$R_x$  = revenue from customer

$P_x$  = Profit for Company X

$P_y$  = Profit for Company Y

$P_t$  = Total profit

$P_{sx}$  = Stand alone profit for Company X

The profit can be allocated according to the following equations:

$$P_{sx} = R_x - (C_1 + C_2 + C_3 + C_4 + C_5)$$

$$P_t = P_x + P_y = R_x - (C_{N1} + C_{N2} + C_{N3} + C_{N4} + C_{N5})$$

$$P_x = P_{sx} + \frac{C_1}{C_1 + C_5} (P_t - P_{sx})$$

$$P_y = \frac{C_5}{C_1 + C_5} (P_t - P_{sx})$$

### Calculation Example without Collaboration

---

Here is an example of Company X profit for the transport without collaboration where the transport is bought from a transport supplier on the other node.

$$P_{sx} = R_x - (C_1 + C_2 + C_3 + C_4 + C_5) = 200 - (20 + 20 + 20 + 20 + 30) = 90$$

$$P_{sy} = C_5 - C_{N5} = 30 - 20 = 10$$

$$P_{sx} = R_{x1} - (C_1 + C_2 + C_3 + C_4 + C_5) = 120 - (20 + 20 + 20 + 20 + 30) = 10$$

$$P_{sy} = C_5 - C_{N5} = 30 - 20 = 10$$

$$P_{sx} = Rx1 - (C1 + C2 + C3 + C4 + C5) = 120 - (20 + 20 + 20 + 20 + 30) = 0$$

$$P_{sy} = C5 - CN5 = 30 - 20 = 10$$

### Calculation Example without Return Flow

---

Here is two examples of the profit allocation without return flow, the first one with a higher price to the customer and one with a lower price. The example shows that if the company that owns the customer lowers the price for the customer this does not affect the collaboration partner.

$$Pt = Px + Py = Rx2 - (CN1 + CN2 + CN3 + CN4 + CN5) = 200 - (20 + 20 + 20 + 20 + 20) = 100$$

$$Px = P_{sx} + (C1/(C1 + C5))(Pt - P_{sx}) = 90 + \frac{20}{20 + 20}(100 - 90) = 95$$

$$Py = (C5/(C1 + C5))(Pt - P_{sx}) = \frac{10}{20 + 20}(100 - 90) = 5$$

$$Pt = Px + Py = Rx2 - (CN1 + CN2 + CN3 + CN4 + CN5) = 110 - (20 + 20 + 20 + 20 + 20) = 10$$

$$Px = P_{sx} + (C1/(C1 + C5))(Pt - P_{sx}) = 0 + \frac{20}{20 + 20}(10 - 0) = 5$$

$$Py = (C5/(C1 + C5))(Pt - P_{sx}) = \frac{20}{20 + 20}(10 - 0) = 5$$

### Calculation Example with Return Flow

---

Here is an example of the profit allocation with a return flow. With a return flow the profit is  $P_y + P_x$  for the companies respectively, if the profit from the customer is constant.

$$Pt = Px + Py = Rx2 - (CN1 + CN2 + CN3 + CN4 + CN5) = 200 - (10 + 10 + 10 + 10 + 10) = 150$$

$$Px = P_{sx} + (C1/(C1 + C5))(Pt - P_{sx}) = 90 + \frac{20}{20 + 20}(150 - 90) = 120$$

$$Py = (C5/(C1 + C5))(Pt - P_{sx}) = \frac{20}{20 + 20}(150 - 90) = 30$$

Detta examensarbete är utfört på uppdrag av TFK – Transportforskningsgruppen i Borlänge och WSP Analys & Strategi inom ramen för SIR-C ([www.sir-c.se](http://www.sir-c.se))



**SIR-C** Swedish Intermodal Transport  
Research Centre

Finansiärer:

