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Management of construction logistics in Stockholm

Identifying ways of improvement for construction
logistics within the inner city of Stockholm

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MANAGEMENT OF CONSTRUCTION LOGISTICS IN STOCKHOLM

**Identifying ways of improvement for
construction logistics within the inner city of
Stockholm**

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Abstract

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Stefan Samuelsson and Mia Ahmetasevic

The construction industry is similar to other manufacturing industries. A production is made up of several small moments and the final product arises when all these steps are completed. Each one of these operations is equally important and increased efficiency is required at all stages. An often forgotten step when discussing efficiency in the construction industry is the logistic process.

The main problems which emerge, when increasing the efficiency of logistics within a city centre, are the location itself, the required close collaboration between different actors and the industry's unwillingness to change its current habits. These problems are relevant as they not only address the concrete problem of a congested inner city but also handle an abstract problem which is the attitudes and relationships within the construction industry. If these problems were tackled, a more structured industry could arise with additional economical benefits for the entire industry.

The aim is to acquire a more efficient and effective logistic process by reducing the number of transports as well as increasing the time efficiency, standard and service of the required transports. The constituent for this report is Skanska AB and Uppsala University.

The study consists of an in depth study of literature, as well as an analysis of previous executed projects and interviews with different actors within the construction industry. The results describe the answers given by each actor and a comparison is made with the literature study.

The main conclusions of the study are that without collaboration and the rightful incentives a development of the logistics process within the industry is not likely to happen. In addition to the conclusion some suggestions for changes towards improvement are recognized.

Keywords: LCCC, logistics, logistics central, management, construction industry, traffic, partnering and cooperation.

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FOREWORD

For this report we would like to thank our mentor Simon Lindholm at Skanska AB and our topic examiner Ivón Hassel at Uppsala University. We would also like to thank Fredrik Bergman (City of Stockholm), Eva Sunnerstedt (City of Stockholm), Marie Stensson (Paroc), Peter Vedin (Södermalms Trä) and Märta Brolinson (City of Stockholm) for participating in our interviews.

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1. INTRODUCTION

1.1 Objectives

The objective of this report is to identify the main problems perceived by each major actor in developing logistics management and to find ways of improvement for the operation of construction logistics within the inner city of Stockholm. The aim is to acquire an efficient and more effective logistic process to reduce the number of transports as well as to increase the delivery-time efficiency. Therefore, the core ambition of this study is to identify the points in need of attention and then suggest possible solutions.

1.2 Background

One of the main obstacles to obtaining a more effective operation of construction logistic in the inner city of Stockholm is the fact that the object itself is Stockholm, a city with dense traffic, narrow streets and a continuously growing population. Achieving a more effective logistic management by the means of reduced number of transports, as well as a greater quality of life for the inhabitants, where air and sound pollution would be reduced, would require an increased collaboration between actors within the business. This is a type of collaboration which studies show that the construction industry lacks. The reasons for this absent collaboration can be linked to the industry's attitudes towards change, mainly that the sector is reluctant towards it. If this reluctance was understood, it could then be processed and eventually appropriate solutions could be introduced. This would then be the initial step towards an improved logistics within the sector.

1.2.1 About logistics

Logistics is a competitive tool that has been used to improve enterprises' economic advantages during modern times. The economic advantages arise from the work efficiency ensued by a developed logistics system. The term logistics referred to in this study is given by the Council of the Supply Chain Management Professionals (CSCMP): "Logistics management is that part of the supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services,

and related information between the point of origin and the point of consumption in order to meet customers' requirements. Logistics management activities typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfilment, logistics network design, inventory management, supply and demand planning, and management of third party logistics service providers. To varying degrees, the logistics function also includes sourcing and procurement, production planning and scheduling, packaging and assembly, and customer service. It is involved in all levels of planning and execution – strategic, operational, and tactical. Logistics management is an integrating function, which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions, including marketing, sales, manufacturing, finance, and information technology.” [1]

1.2.2 Logistics in the construction business

When examining the concept of logistics within the construction industry, a factor which needs to be taken into account is the specific characteristics of the industry. Distinctiveness, immobility and variety are some of the typical qualities of the industry's output, which are a result of the current fragmentation within the construction industry. Due to these characteristics the supply chain has disintegrated and consequently brought increased transaction volumes at lower average values. This has in turn resulted in the creation of a large number of new companies due to the low barriers of entry. Additionally, adversarial relationships and fragmented processes obstruct performance and innovation within the industry.

The construction industry is project-based, which means that the distinctiveness of a particular project determines the necessary resources and thus the most suitable supply chain. The materials and components assembled are often designed and produced by a multitude of suppliers. The suppliers are working in a range of disciplines and technologies, which allow them to produce a product for a specific client. The different product technologies have to be reorganized for each new construction project. The necessary reorganization and discontinuous demands from clients result in the temporary relationships between the demand and supply side of the industry.

To avoid exposing the own company, each company that is a part of the supply chain tries to obtain the highest reward by the lowest risk that is normally achieved by passing the risk down to the next level in the supply chain. This mode of action leads to a conflicted industry with numerous interfaces [2].

1.2.3 Logistics in the dense area of Stockholm

The Swedish capital of Stockholm is the country's largest city. With 900,000 inhabitants it is one of Europe's fastest growing cities. The function of the city transport is clearly linked with the city's attraction. The capital is growing and gaps in the capacity of the region's transportation system are showing. This applies to important parts of the overall road network, but also to the inner city street grid, as well as for public transport and the heavily trafficked bike trails. The road traffic also has a negative effect on the urban environment, particularly in terms of noise, polluted urban air, barriers and an increased carbon footprint [3].

As society's consumption of goods is naturally at its highest in the larger cities, the high consumption of goods results in large and frequent demand for incoming transportation in the central parts of the city. Roughly 20 % of all transported cargo is directly connected to construction sites [3]. These constructions sites are predominantly found in big cities, like Stockholm, where a large amount of goods are being received and discharged. These goods are usually some types of building materials, waste, asphalt, rubble or concrete [4]. The high amount of construction material being transported in to the city, together with main commodities like food, consumer goods, office supplies, returns and waste, gives rise to a need of goods being transported into the city centre.

1.3 Main drawbacks and problems

Due to the large amount of traffic, the city centre is constantly under a lot of pressure. Like many other cities, Stockholm is not fully equipped and designed for an effective management of large distribution vehicles. The streets are too narrow and congested, which leads to many accidents. The overcrowding is a large problem as pedestrians, cyclists, motorists and public transport frequently compete for the same amount of limited space with the freight transports.

The different road-users usually move about at the same time, during the morning and afternoon. This naturally results in more congestion in already crammed roads and consequently leads to a much more time-consuming distribution chain. The time aspect is of great importance when regarding the distributions within the city. Distribution vehicles are often on a tight schedule and obliged to be on time. If the congestion and unloading are too time-consuming, it will make the driver unable to deliver the expected amount of goods that day.

The dense and crowded areas that urban constructions sites are often situated within, could lead to a constricted construction area. Existing structures, highly trafficked roads or other construction sites already occupy the surroundings. This leads to a limited area available for deliveries, storage space, waste disposal areas and portable modular cabins. The costs for renting surrounding areas are also something to take into account, as the fees are much higher within the city centre [5].

The limited storage and delivery spaces that a central construction site is subjected to, makes the punctuality of deliveries even more important. The high traffic pressure affects this punctuality. The limited storage and delivery spaces in Stockholm make the just-in-time deliveries fundamental. A just-in-time delivery means that the required material for a process is delivered at the beginning of the particular process.

Ineffective construction logistics has a negative effect on the city's central transportation networks. There are two major aspects to take into consideration when intending to change the current situation. These are the lack of cooperation between construction companies and suppliers, and the attitudes of both parties toward change [6].

1.3.1 Lack of cooperation between participants

Cooperation within an industry results in further technical and social development. It is enabled by consecutive collaborations that aid the different processes concerning technical and structural growth within the sector. The construction industry can be considered to be behind other sectors when it comes to developing partnerships which could lead to long-term collaborations. Short-time solutions, without follow-ups can be regarded as typical for the construction industry.

Human resource development has a deep connection to the type of interaction or cooperation that exists between the different contributors within the industry. Through collaboration between different interest groups, products, services, equipment and processes can be tailored to each company's needs and circumstances. The collaborations also create the potential for an in-depth exchange of knowledge between the companies, while maintaining a transparency during processes that are relevant for the own company. The most beneficial collaborations are the ones that occur over a longer period of time, while temporary relations limit the long-term effect of the collaborations, but they might be advantageous in the pressing moment.

Short-term interactions, in particular, are frequently occurring among the construction industry's collaborations. Short-term solutions are inevitable as well as useful in the construction sector, as they do not confine a company to one particular solution or partner. Additionally, the approach in question can be decisive in a project-based organization. However, it should not be the only type of collaboration between companies.

The negative consequences of short-term collaborations, which are terminated by the end of the project, are many. Skills developments within the sector are inadequate, due to the limited amount of documented and further developed solutions used by the involved parties. The companies in question have restricted opportunities to absorb the knowledge that underlie the derived solutions, which are produced by the creative enterprises. Through such events the companies neglect the opportunity to learn from each other and understand the adjustment part of the learning experience itself.

The construction industry is often characterized by standardized solutions and collaborations which lack a stronger alignment between the companies that deliver solutions and those who tend to them. According to a survey, which deals with renewal within the construction industry, the highest motivation for renewal lies within the internal organization. This suggests that a further development of the member interaction within the industry is relevant for obtaining a knowledge development for the entire sector [6].

Innovation, an increase in competitiveness, and superior customer offerings can be created through the development of cooperation within the

construction sector. However, collaboration can lead to an excessive dependence between the parties. Thus it is very important to build on clear objectives and explicit common requirements for a successful interaction between the competing operators.

1.3.2 Attitudes towards change

The construction industry is often portrayed as conservative when it comes to change. When questioning the overall attitudes that are present within the sector, one often hears the classic “this is how we’ve always done it” reply. Surely the construction industry is not alone in its need for change and the obstacles that come with that change, but the industry is often considered special in its reluctance to embrace and work towards change.

The general unwillingness might originate from several factors. The lack of trust within the industry is one aspect that most likely affects the overall attitudes towards change. It directly enhances the reluctance toward cooperation between different companies, which consequently reduces the ability for innovation within the sector.

As indicated above, the lack of collaboration does affect the overall attitudes toward change as the situation limits the participants to view possible positive effects of change for the entire industry. Though the lack of collaboration does affect the attitudes, it is not the sole factor. Another important aspect when concerning the attitudes is the legal one. In an industry where a lot of money and personal responsibility is at stake, the laws are of great importance.

When solely considering the logistics within the industry, the legal responsibility needs to be taken into account. When dealing with goods that are both expensive and affect the time schedules, the boundaries of the legal responsibilities need to be clearly stated. Otherwise the consequences can be severe if no legal responsibility can be established. And if this ends up being the case, a great deal of companies will be hesitant to explore new angles.

1.4 Review of previous work

1.4.1 Cooperation in the construction business

A study performed by Sobotka et al. [7] shows that some of the factors which characterize the construction industry, are the same factors that complicate long going cooperation between companies. The study is comprised around this cooperation in particular. The study covers the difficulties and obstacles collaborations, within the construction sector, face. Another topic the report handles is what the current trends regarding the subject are.

The first aggravating factor, demonstrated by the study, in today's construction industry is the great differentiation of the construction projects within the industry. The differentiation is reflected in different types of materials used, as well as different technological solutions and methods utilized. A different geographical location for each new project created is also a major influencing change, which consequently leads to a new supply chain for each new project. The second aggravating factor addressed by the study is the large number of participants in a building project. Complicating things further, according to the study, is the selection process of the bidding firms. The selection process is often determined through a bidding system where the main concern, in the selection of participants, is who can offer the lowest price for the required task. The current way of conduct results in an unsystematic selection of participants in a given project. The fourth, and last aggravating factor according to the study is the difficulty which arises when multiple participants with own internal logistics systems- and processes must adapt to the whole project's as well as other participants' logistics systems [7].

According to the study, the four factors mentioned and described above will result in short term cooperation between projects participants who will often indirectly compete against one another to make as much individual profit as possible. And finally, when beginning a new project, the participants will engage in a whole different logistics system without having brought any of the earlier experience with them [7].

However, the study shows that the cooperation between contractors and suppliers has begun to occur to a greater extent. At the same time, the study concludes that an increase of trade between retailers and construction companies has occurred, following a decrease of direct transaction between

the construction companies and the factories. These findings are directly related to the attempts of reducing the own transport and instead utilize an external delivery service. An extended collaboration with a supplier is beneficial as it allows buyers a better negotiating position in terms of price or sales contracts. The study also states that retailers often offer additional services such as storage and delivery of requested parts, on request [7].

1.4.2 Negative effects of present attitudes

One former study that concerns the overall attitudes within the construction industry was conducted by Uppsala University for the Swedish construction industries association. A study by Ingemansson [7], which was based on a survey handed out to Swedish construction companies, revealed a strong correlation between inter-organizational borders within the industry and how renewal occurs. The study mentions how the increased use of sub-contractors, specialist companies and prefabricated materials can have its consequences. One concern is that of the construction firms becoming increasingly dependent on their surroundings. The increasing dependence requires a knowledge development taking place outside the company's internal interactions. This places increasing demands on the construction company's ability to work together as much of the problem solving and knowledge development must take place in the interface between the construction company and other companies [7].

Another great concern, according to the survey, is the lack of cooperation between the universities and the industry. Only one percent of the industry's businesses stated that continuing in-service training is essential. It is surprising when the technical content of the project often is of great significance. Society's investment in research at the technical colleges, with a construction approach, does not reach the equivalent ratio of corporate renewal, which the applied research should be able to do. There are major challenges for higher education institutions as well as for the industry to make this collaboration more efficient [7].

Another surprising result the survey gave rise to, was the low regard for the information provided by government agencies and research institutions. Research and education obviously plays only a marginal role in the industry's development of knowledge and innovation [7].

The companies are mostly driven to change by the internal organization, accompanied by the clients' demands and views. Subcontractors, consultants, architects, material suppliers, and above all suppliers of machinery's views are not taken into larger account. This is a clear sign of the lack of renewal within the collaboration between the construction companies and suppliers of goods and services. This is also surprising as this interaction precisely is the crucial driving force for renewal within other industries [7].

The construction industry can be viewed as a short-term oriented industry that only solves emerging problems. It is an approach that has great benefits for project implementation, but there is also a built-in long-term problem. More significant renewal requires, in most cases, a long-term perspective and an influx of new knowledge that challenges the current establishment [7].

Although the results show that two key barriers to innovation is the lack of resources and a strong focus on price competition, the lack of synergy can be considered a serious obstacle for innovation [7].

The construction industry has limited ability to absorb the knowledge that underlies the new solutions, which are held by the companies that create them. Companies are learning thus not from each other like in long-term collaboration where adaptation becomes part of the learning experience. Although exceptions can be found, standardized solutions and forms of cooperation, which do not require any deeper alignment between those who deliver the solutions and those who use them, in general characterize the industry [7].

The study has clearly demonstrated that the internal organization and the internal competence, is the main driving force for change. This in turn points to the potential of a more developed interaction with other actors in the construction process [7].

Collaborations for longer periods of time are the very core of renewal. Such collaborations create opportunities to learn from each other by adapting activities and activities to increase customer benefit. Short-term interaction usually results in excellent solutions for the moment but the long-term benefits will be limited [7].

In the construction industry the short-term solutions are necessary and beneficial as they provide a high flexibility in terms of switching easily between different counterparties and solutions. This is often crucial in project-based activities. But if that's the only type of interaction that occurs, firms risk missing out on a longer-term knowledge creation that provides needed reformation. This is something completely different than creating the necessary temporary solutions for on-going projects [7].

1.5 Previous case studies

1.5.1 The use of a construction consolidation centre in London

A demonstration project called London Construction Consolidation Centre (LCCC) was conducted in London during two years. The project involved a consolidation centre established on the outskirts of London. The centre was to supply four major construction sites with construction materials on a just-in-time basis, in the city centre. The four construction sites were of similar size and all of them were being developed into office space buildings [8].

The project's main objective was to reduce the number of deliveries going directly to the construction sites, thereby reducing traffic congestion and vehicle emissions. At the same time the initiative provided a broad independently proven set of data regarding the distribution of construction materials in an urban area. The collected data could lead to an understanding of the commercial business case and viability of the consolidation centre [8].

The operational function of the project was the following, the contractors on the construction sites ordered the required material from their suppliers the old fashioned way, but convinced the suppliers to deliver to the centre instead of the construction site, as described in Figure 1.1. The contractors then received notification from the centre, when these orders had arrived. Then the contractors placed a delivery order with the consolidation centre for the needed materials. The material was then sent from the centre in goods vehicles with integrated vehicle tracking and tracing systems. The system gave the necessary information for further analysis of the efficiency of the project [8].

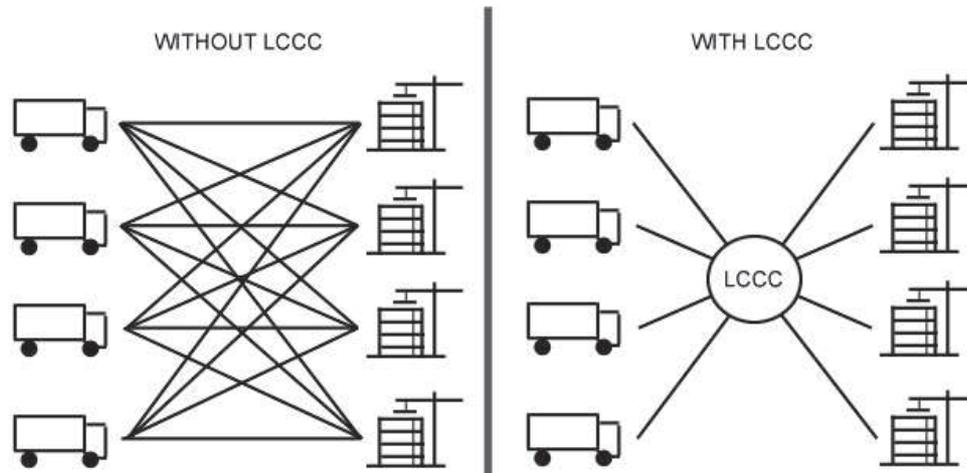


Figure 1.1 – The difference between the logistic system without and with a LCCC.

The project cost 3.2 million pounds and engaged a partnership between Stanhope PLC, Bovis Lend Lease, Wilson James and Transport for London. Transport for London funded 1.85 pounds, while the others financed the other 1.35 million. The economic goal of the project was to conclude the commercial viability for the prospective use of consolidation centres in the construction industry. The main ambition was to determine where costs had been saved in the supply chain and how this could benefit a construction project [8].

The results presented a 40% reduction of journeys to central London had been made, which lead to a reduction of congestion in the inner city. Consequently a reduction in carbon and noise emissions had been achieved. The smoothing of traffic and increasing network capacity were other improved environment factors. A major improvement in the delivery reliability was made which was beneficial for the contractors. The reliability here indicates the correct type and quantity delivered within 15 minutes of the scheduled time. The investigation conducted under the two year period showed an uprising in reliability, from the industry's standard of 39% to 97% when using the consolidation centre. Other benefits were an improved efficiency when concerning the time spent receiving deliveries and the management of materials on-site and a reduction in the over-ordering of materials. It was concluded that each on-site trade contractor saved 25 minutes per day and the over-ordering fell 14% [8].

Problems did occur during the project and suggested methods to prevent these problems were given. The main concern of the city was the financial

self-sustainment of the centre. It had hoped that the private actors would recognize the benefits of the consolidation centre and thus continue to use and develop it. In order for this to happen, the construction companies need to be convinced, which could be difficult. The concerns of the construction companies were many. One of the major concerns was the legal no-man's-land that occurred when the trade contractors had liability for materials held at the centre, which they did not have sole control over. The responsibility for lost or damaged goods was difficult to determine between the several organizations that had been involved in the delivery process. Another concern was the time consuming process of placing an order with the supplier and the arrival of the order to the construction site. Lastly, the construction companies felt that the personnel at the centres lacked the appropriate knowledge of the goods that they were handling, which led to easily avoidable mistakes made when handling the goods [8].

Conclusively, the report states a number of means to avoid the problems stated above. To be able to convince construction companies to invest in consolidation centres, substantial economic calculations need to be made, to prove the economic benefits of operating a consolidation centre. In order for this to happen, the material suppliers will need to initiate transparent pricing that divides the cost of the materials from the cost of delivery. When this is done, calculations on historical data by quantity surveyors when pricing jobs can be done and then presented to the construction companies. The legal responsibilities need to be précised when forming legal agreements concerning the handling of materials in different delivery stages [8].

1.5.2 Hammarby Sjöstad

A study performed by the European project Trendsetter in Hammarby Sjöstad in Stockholm was performed within the European project CIVITAS. The project was performed with the objective to improve the mobility, to reduce noise and traffic congestion and enhance the quality of life and air within the big cities of Europe. The study was carried out during the construction of Hammarby Sjöstad, a new city district, with 8,000 apartments, in the Swedish capital of Stockholm [9].

One of the major problems, regarding the construction of Hammarby Sjöstad, was the traffic jam that would occur. There were two aspects that needed to be taken into account. The first concern involved the obstruction

of the continued production. The second concerned the disturbance the people moving into the area would feel during the continuous construction. Therefore it was essential to reduce the traffic in the area [9].

A logistics centre was introduced at the entrance to the big building site. The logistics centre received all smaller shipments (less than four EUR-pallets) and stored these materials temporarily. These goods were consolidated and the deliveries were then made with specially designated vehicles to various construction sites in Hammarby Sjöstad following the various projects' construction schedules [9].

Several positive aspects could be noted thanks to the logistics centre. Among other things, the number of times the noise level exceeded 55 dB (A), which is the target value appointed by the Swedish Riksdag when regarding construction within residential areas, was reduced by 27%, which is a critical factor in reducing the disruptive element of construction [10]. The fill ratio, the percentage of trucks, which were filled, was observed to be 85%. This showed an increase of 35% when comparing to the industry average of 50%. The efficiency was also improved when regarding the queue and stop time per trip, which was calculated to be 6 minutes when using the logistics centre. When compared to the industry's' normal, which is around an hour, this result is astonishing [9].

Nevertheless, the study shows that there was a great scepticism to the utilization of a logistics centre, which corresponds to the fact that the City of Stockholm stood for 95% of the project budget in the beginning. The contractors became more aware of the benefits obtained by the new method, which led to a possible price increase. Consequently, in the end, the City only stood for 40% of the project budget. The study underlines the prospect of the City being accountable for 0% of the budget in the future. According to the study, several participants eventually admitted that if it had been for the logistics centre, the deadlines of the construction projects would not have been reached [9].

1.6 Scope

In order to improve the current logistics management, it could be argued that the construction companies need to improve their collaborations with other actors within the industry as well as their attitudes toward change. To develop their current collaborations, the contractors most likely need to

revalue their present attitudes and behaviour. How this study is going to contribute to improve these particular problems will be explained below.

Based on the literature study, the concept of LCCC, the case studies such as Hammarby Sjöstad and the performed interviews, this work provides an analysis about the concrete problems a city like Stockholm is challenged with, regarding its construction logistics. Therefore, a profound understanding of the problems concerning construction logistics in the inner city of Stockholm is provided here.

The interviews are important as they highlight the main problems each actor experiences regarding a change in the management of construction logistics, as well as the additional collaborations and attitudes. Main drawbacks are identified, and possible solutions for these problems are provided. These suggested solutions could be a first step in the improvement of the industry's present logistics management, its collaboration and its attitudes towards change.

Due to the study's time limit some restrictions were made. The main restriction was the number of interviewees and the sectors within the industry they represented. The actors with the most influence regarding the industry's logistics management were selected for an interview.

2. METHOD OF INVESTIGATION

This investigation was conducted by combining two research methods, a literature review and interviews. The literature review was conducted by research on the Internet and at library databases. This was mainly done to obtain a suitable overview of the subject area and its problems.

The literature review also worked as a knowledgebase for the upcoming semi structured questions used during the interviews. The interviews were made to acquire an understanding of the problems the inner city of Stockholm is challenged with. The problems studied concerned the current situation of the handling and delivery of construction materials within the city centre. The existing approach was, in other words, questioned. Six interviewees were carefully selected aiming to gather representative data, concerning not only construction companies but also the management of the city's construction logistics.

Three of the key participants were representatives of the city of Stockholm. They worked within separate areas of the city's management although they often worked together on issues involving the city's logistics. Fredrik Bergman represented the Development Administration, Eva Sunnerstedt the Environment and Health Administration, and finally Märta Brolinson represented the Traffic Administration of Stockholm.

The other interviewees represented three separate parts of the industry. The first, Simon Lindholm, a production manager in the inner city at Skanska; secondly Peter Vedin a sales manager who represented Södermalms Trä, a major retailer active in the Stockholm area; and Marie Stensson, a Delivery Service team leader at Paroc, a major producer of construction materials.

The questions included in the interviews differed slightly depending on the person being interviewed, and can be found in Appendix 1. The main focus was set on the current situation of construction logistics within the city and possible improvements of the situation. Another focus was to question the general attitudes towards the management change of logistics within the industry, and to identify the obstacles standing its way.

When interviewing the representatives of the city, the focus was on previous and current projects initiated by the city to improve the construction logistics

within it. Questions about the active willingness and participation of the different actors from the industry were also posed.

The interview conducted with the production manager at Skanska focused on previous experiences of the logistics management within the industry and the attitudes towards a change of perspective regarding the management of logistics. The sales manager for Södermalms Trä was asked about the company's perspective on the current logistics management of the major construction companies they serve. The interview also focused on the present situation of the cooperation, involving logistics, within the industry.

Similar questions were posed to the Delivery Service Team Leader at Paroc. The focus lied on the producer's perspective on the logistics management conducted by the construction companies. The cooperation between the construction companies and their producers was also emphasized during the interview.

3. RESULTS AND DISCUSSION

3.1 Logistics in a dense urban Stockholm

3.1.1 Logistic Centrals

The use of a logistics centre reoccurred in the topics discussed with the interviewees when regarding the methods that could be used in the development of the logistics management within the city centre. A logistics centre is according to Fredrik Bergman a large warehouse where material is first brought, consolidated and then coordinated before delivering it to the actual construction site.

When asked about the possibility of establishing a permanent logistics centre in the outskirts of Stockholm many recipients were sceptical. Their scepticism was based on the current size of the capital and the number of current construction projects, and future ones. According to Skanska's production manager, Simon Lindholm, the use of a logistics centre would evidently happen if a number of projects were of the same type and in a near range of each other. Eva Sunnerstedt, at the Environment and Health Department in Stockholm, and Peter Vedin, at Södermalms Trä, agree. In conclusion, it can be argued that this is not the case today. The city cannot be compared to the likes of London, or any another metropolis – yet. Therefore it may not be appropriate to apply a similar version of LCCC in Stockholm.

Although the interviewees were sceptical towards a permanent logistics centre many of them saw the benefits of conducting temporary local centres at different larger scale projects, as Norra Djurgårdsstaden and Hammarby Sjöstad. Fredrik Bergman, at the city's Office of Development, was also doubtful about a permanent logistics centre. He claimed that some of the coordination occurring at local centres would be lost. He went on to state that at Norra Djurgårdsstaden the logistics management has become a part of the everyday process of building, which differs from the previous view of logistics management as only being a method of transportation.

When taking a closer look on the current project in Norra Djurgårdsstaden, which was initiated by the city and is somewhat of a modified version of the project in Hammarby Sjöstad, it can be argued by analysis that the overall impression of the project is good. The number of transports coming into the

sites has been reduced by 30-40 %. And the centre offers a temporary storage place during two weeks for early deliveries. It also offers additional services, which are often required at construction sites. Amongst those services are; snow removal, waste disposal, coordination and in carriage of goods to the site. This, in turn, has improved the overall working environment within the dense area. The deliveries arrive at the precise time and with the right material directly from the local logistics centre. The concept brings structure and certainty to the management of the logistics at the construction sites.

One of the main concerns with the use of any logistics centre regardless if local and temporary or permanent and outside of the city, was the question of who is going to administrate and finance it. When regarding the administration, all of the questioned agreed that the centre should be administrated and run by a private actor. In other words neither the city's representatives nor the questioned from the private sector believed that the city should have any responsibility for the centre in the long run. Although the interviewees agreed on this, Eva Sunnerstedt did point out that the market itself had been reluctant to initiate any similar project, and that was the reason the city introduced the idea.

An additional factor that the construction companies found problematic was the concept of joint loading that occurred in the logistic centre. According to both Skanska's and Södermalms Trä's representatives the concept would be difficult to implement as differing products were going to different projects. This is actually not the case, according to Fredrik Bergman. The different materials all have specific article numbers, which are scanned. It is therefore very easy to identify what object is going where.

Although the benefits are many, according to Fredrik Bergman, the construction companies still see some negative consequences with this way of handling the logistics. One of the major problems, according to them, is the need to act ahead when ordering materials. The centre requires the production managers to order a pass for the deliveries four days before arrival at the latest. When ordering materials from the actual centre, the order must come one day ahead. When analysing this problem it can be claimed that it inevitably shows the industry's lack of will to plan ahead and prepare for common work activities in a structured way.

When evaluating the private market's hesitancy to try the concept, three factors that hold back progress arise. The first, being the lack of renewal in the industry. As the construction companies often are unwilling to try something that they only see as an additional cost, other possible initiators of concepts like a logistics centre see a large risk in investing in the idea. This consequently leads to the second factor, price calculations.

In order to convince the sceptical clients, in this case the construction companies, price calculations and comparisons should be done. The calculations should, among other things, involve the actual price setting of materials coming directly from the suppliers. This would provide an insight of the cost of the actual material, versus the transportation costs. For this to happen, the suppliers would need to make their price settings more transparent to the rest of the industry. The current situation is clearly explained by Marie Stensson at Paroc. She states that not even she, a company employee, is allowed a window into the price setting process.

It is not only the price setting process of the suppliers that should be calculated. Effective time loss of construction workers, when waiting for late deliveries, is another aspect, which should have real statistics. According to Fredrik Bergman, two of a construction worker's five working days are spent on effective work. This implies that the rest of their time is spent on waiting for late deliveries, and moving wrongfully placed material, amongst other things.

Finally, the cost of the number of material lost due to theft, movement, and badly placed storage, should be recorded. If this were to be done, the construction companies would have clear price statistics to compare with when viewing the idea of using a logistics central.

When it comes to developing new methods to improve the overall efficiency of the industry, the construction sectors seems to have fallen a bit behind. This leads to the third and final factor, which affects the private market's hesitance towards a logistics central or an overall development of the logistics management, which is the lack of cooperation between the industry's actors. The different companies within the sector are usually very unaware of each other's production processes. They have a shallow understanding of each other's procedures and are often oblivious to the reasons why their associates require a certain order of business. Both Paroc's

representative and Skanska's mention the problems that occur when you operate with standard agreements. The suppliers are often unaware of the logistics operations of specific construction sites, which often result in inadequate deliveries, which become more time and money consuming than necessary.

3.1.2 Alternative construction logistics

An evident concept within the industry is the focus on the morning hours. Both Fredrik Bergman and Märta Brolinson, from the city, mentioned that they had noticed a tendency, by the suppliers, of preferring to deliver in the morning hours. Even though the centre's opening hours were between, 6:00 in the morning and 20:00 in the evening [11]. When asked why they thought the suppliers favoured morning deliveries, Fredrik stated that he did not know and Märta believed it simply was due to the suppliers growing accustomed to morning deliveries.

Due to the focus on morning hours, an alternative method would be shifting that focus towards evenings and nights. Simon at Skanska points out that they have been looking into such alternatives when it comes to important deliveries. The alternative enables important deliveries to avoid traffic congestion, thereby lead to an effective and safe transportation. This is also something the city is reviewing. The main drawbacks when it comes to establishing these deliveries are how to implement them without disturbing the closest residents. This becomes a question of legislation and innovation.

The project group, in which Märta Brolinson is working with, has only recently entered upon the subject. She affirmed that the current legislation, which states that it is forbidden to deliver goods during the hours in between 22:00 and 6:00, could be considered a bit old fashioned. They will be looking into present research on the subject to determine if a change in legislation is suitable. She continues by stating that higher noise factors should become acceptable within the city the way limited parking spaces have become.

Another aspect to take into consideration when evaluating alternative methods is the use of just-in-time delivery. According to Fredrik, five out of ten deliveries, within the industry, are not on time. This automatically calls for something that offers a solution. The suppliers have taken note of this and now offer to deliver on the right time, for an extra fee. Although this is a

solution, it could be argued that charging the construction companies extra, for something that might be considered a matter of course, gives a wrongful incitement in an already late industry.

3.2 Cooperation in the construction industry

3.2.1 Cooperation between the contractor and the supplier

The collaboration between the main contractors and suppliers within the industry is rather important for the logistics management. When asked about the current situation of their collaboration with construction companies, Paroc's Marie Stensson answers that it could be better. She also states that the initiative should come from them. When inquired if a contractor ever proposed a further collaboration, she expresses a disbelief of that ever having occurred.

Together, Paroc and Skanska affirm that they do not conduct any present long-term follow-ups that reach over a number of projects during a longer period of time. Although both companies mention certain methods of conducting follow-ups in a shorter-term perspective, when asked about how the respective companies handle feedback in situations where they operate with standard agreements. As declared earlier, the suppliers are often unaware of the logistics operations of specific construction sites, which often result in inadequate deliveries, which consequently become more time and money consuming than necessary. Simon Lindholm at Skanska answered that they unofficially send the information internally upwards to the supply managers who are responsible for the transactions. What they then chose to do with the information he did not know. On the other side, Marie Stensson at Paroc answered that any complaints concerning the logistics should be reported by DHL, the transportation company they hire to deliver their goods, to them. Thereafter an official discrepancy report is filed. Consequently no direct interference happens between the construction projects themselves and the suppliers.

In conclusion the existing structure of the cooperation between the suppliers and construction companies can be regarded as hasty. Mistakes do happen, but when they occur more frequently and are at times considered the rule rather than the exception, it may be relevant to consider restructuring that particular relationship. The relationship, as it is today, could very well be one of the reasons for the common late deliveries the industry is faced with.

If a deeper relationship was established, and the construction companies clearly stating the importance different factors have on the project, a higher standard could be reached within the industry.

Marie stated that they would gladly receive additional information, from the contractors, about the particular project in question, in order to get a better understanding of their role in the construction process. For this to be done, the construction companies need to integrate the management of logistics already in the projection process, which they according to Simon do not do today.

3.2.2 Cooperation between the contractor and the city

The relationship between the construction companies and the city of Stockholm is by all means complex. By forcing the contractors to use the logistics centre at Norra Djurgårdsstaden, the city was not highly regarded by the construction companies, according to Fredrik. But the attitudes changed after the benefits were felt. After Hammarby Sjöstad, Eva recalls that many contractors said that the time schedule would not have been met if it were not for the centre and the city's initiative. The cooperation was only made possible by the fact that the city owned the property on which the contractors built, and could therefore force them to collaborate. But for a collaboration to be forced each time is not an optimal solution. The best solution would in fact be a joint effort from both sides, according to Eva.

When the three representatives of the city were asked if a construction company ever had approached them with an idea for a study of certain factors of the industry, they all said no. Märta thought that one contributing factor for this could be the lack of knowledge of the city's power, the contractors had. These answers and reflections go hand in hand with the study done by Ingemansson [5] where only 13 % of the questioned replied that information from authorities were an important factor for development.

3.2.3 Cooperation between two contractors

The problems with non-cooperation between contractors can indirectly affect the own project. In Norra Djurgårdsstaden, a coordinator was appointed at the logistics centre. The coordinator's main objective was to synchronize the cargo and crane loads so no double bookings would occur, as well as to make sure that in- and outward deliveries did not clash. The coordinator

helped give structure to the whole area and the efforts were appreciated, according to Fredrik.

In the case of Norra Djurgårdsstaden, the coordination was done for the contractors, as it was a service offered by the construction companies. When analysing the result it becomes clear that had the concept not been forced on them, they probably would not have done it on their own. The fact that the contractors in particular do not want to cooperate at their fullest can be partially understandable. After all, they are competitors and giving an opponent an insight in your own processes can be damaging, although not always. If a fine balance of cooperation between the parties would be established, the results could be beneficial for both parts. It could mean that unnecessary clashes, when utilizing the same constricted space are avoided, as well as gaining other overall advantages.

Convincing the companies to collaborate could be difficult as they can be frightened by the negative consequences that could emerge. The fear often comes from the lack of control the companies feel over the situation. One example, given by Simon, is the fear of having to deal with the economic consequences caused by a collaborator. When collaborating by joint loading, he stated, all construction companies could suffer due to only one being badly planned. There is a danger, but it can be handled by simply developing a strong and trustful relationship, with clear stated objectives.

3.3 Attitudes towards change

When discussing the industry's overall attitude towards change, a majority of the questioned described a certain passivity originating from the construction companies. Peter Vedin at Södermalms Trä, mentioned that they collaborated with the University of Norrköping, to enhance and develop the current thoughts and management of construction logistics within the industry. When asked how their clients, the construction companies, made use of the information given, the response was that they were not quite ready for change yet.

Eva Sunnerstedt recalls the first attitudes towards the logistics centre that was established at Hammarby Sjöstad. Some of the companies choose to carry the goods over the fence, to avoid the entrance fee of the logistics centre. Another example of an unwillingness to comply happened at Norra Djurgårdsstaden. As a truck filled with five EUR-pallets or less is required to

be reloaded at the centre to reach the trucks required fill rate some companies thought they could avoid the reloading, and go straight to the construction site, by placing an item on an empty pallet, and by that reaching the required fill level. It can be argued that while these are distinct examples they give a comprehension of a certain attitude, which exists within the industry.

When it comes to initiating investigations, with the city in particular, the construction industry has an under representation in comparison to other sectors, Märta confirms. When examining this it can be concluded that there are probably many explanations to why the industry is unwilling to cooperate, but two could stand out in particular. The first explanation could be that the industry is not as exposed to competition as other sectors, which Simon pointed out. Although the industry has low barriers of entry, for the construction companies, it can be assumed that only a few large companies actually dominate the industry. The other explanation, which a majority of the interviewees agreed on, was the extreme price focus in the industry. The companies are assumed to be very narrow minded when they consider costs in their budgets. Additional expenses for something which could pay off after a few projects, not the current one, are often seen as unaffordable at the moment. The statement corresponds to the report commissioned by Sveriges Byggindustrier, in which price focus is concluded to be the number one hindrance [5].

One solution for changing these conceptions is a continuing education of the industry's actors. The city is expecting to educate ten thousand employees, within the industry, at their project in Norra Djurgårdsstaden. At Södermalms Trä, they are continuing their cooperation with universities, regarding the development of the logistics management. But the real education should most likely come from the contractors themselves, as they are the ones directly affected by the management of their materials. Maybe change is on its way, as Märta points out that a lot of property owners like Jernhusen and Vasakronan have just recently realized the benefits of a structured logistics management, and as the construction companies value the customers opinion the most, a change in attitudes towards logistics could happen.

4. CONCLUSIONS

The main drawbacks were identified early on to be the location itself, the lack of collaboration within the industry and the industry's reluctance towards change.

One possible solution for the problems could be an elaboration and consequent display of new trial-projects. Another solution could be the creation and further application of legislation that could result in an increased cooperation within the sector. Finally the implementation of continuous education within the industry could be a solution.

There were different approaches to the use of a logistics centre. Initially, with the LCCC project close in mind, the focus of the report lied in the possibility of establishing a permanent logistics centre located just outside the city centre. During the interviews it became clear that Stockholm does not have the intense need of a permanent centre, due to the lack of uniform construction projects within the inner city. Although a permanent logistics centre seemed to be out of the picture, a local temporary centre is and can be of much more need in the future. The city has established an effective logistics centre located at the boarder to the new city district, Norra Djurgårdsstaden, which is currently in construction.

The city coercing the contractors to be a part of the logistics centre seems to be an effective way to change the ways of the logistics management. If the city's initiative was assisted by further legislation, forcing companies to evaluate their logistics organisation, companies within the sector would have no other choice than to work together in order to follow the rules.

The ultimate solution for the current situation would be if it came from a genuine change of attitudes from the construction industry itself. This could be done by education. By explaining the positive outcomes of a better-planned management of construction logistics as well as backing it up with actual numbers the industry could come to modify its current negative attitudes towards change.

5. RECOMMENDATIONS

In order for an improvement of the construction industry's logistics to happen, the industry must find a way to integrate the logistics management into the everyday process of building. Establishing a structured and systematic work procedure for transportation and logistics could accomplish this. For this to occur the logistics should be addressed in the planning stage of a construction project.

Furthermore, indicators and key figures should be generated in order to monitor the logistic processes continuously. The city is currently doing so at their project in Norra Djurgårdsstaden, where they cooperate with three larger universities. The collaboration hopes to deliver former non-existent statistics to the industry. The earlier stated passive construction companies could play their part in these investigations. This would be a first step towards understanding the actual cost of goods and services within the industry.

A collaboration regarding night deliveries between the city and the construction companies, could lead to results in the near future. The project is in its beginning stages and could very well be influenced and improved with the help of contractors. It is time for the contractors, as well as the industry, to understand the power the city has on influencing politicians and thereby delivering the industry's desired solutions.

Another collaboration which would be fortunate for the industry as a whole is that of the suppliers and investigators from authorities or universities. If researchers were allowed to look into the price setting process of material a distinction of material and transportation costs could be made. Although this might seem unbeneficial for the suppliers at first, the overall profit for the industry as a whole would most likely increase. The responsibility the suppliers would need to take is the same for each actor of the industry. In order to streamline the entire industry, the industry should put more focus on the entire profits which could be made, instead of only focusing on their own.

Finally, one of the industry's most influential actors could be solution for change. The property developers have a great amount of influence over the industry as a whole, and especially over the contractors. If the initiative came

from the developers, the industry as a whole could be indirectly forced to change their ways. By means of economical incentives and clear demands on the conduct of the logistics management, the developers could make an effort.

6. FURTHER STUDIES

When discussing further studies it is important to state that the first and foremost study, which should be done, is an in-depth study of the current report. This means that the present restrictions of this report should be dismantled, resulting in more actors within the industry who would be interviewed and thereby giving a broader perspective on matters.

Furthermore a study focusing on the current situation of the economical market of the suppliers would be relevant. If this were to be done, a greater understanding of the suppliers influence on important matters within the industry would be attained. Thereafter a revision of the supplier's price setting processes could give a broader understanding of the respective cost of materials and transport.

Finally, it could be useful to investigate how the habitants of the inner city of Stockholm would be affected by night deliveries. If a study with this focus was conducted, a first step towards an alternative legislation, regarding night deliveries, could be made.

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8. APPENDIX

8.1 Appendix 1 - Interviews

Eva Sunnerstedt - Office of Environment - City of Stockholm - Authority

Date: 23/4 - 2014

1. Hur många logistikprojekt har ni som berör byggnadsmaterial just nu?
2. Vi gör detta arbete åt Skanska som bygger om Klara C. Klara C angränsar till Strabags bygge av Station Stockholm City. Skulle ett logistikprojekt kunna vara aktuellt där?
3. Skulle man kunna låta aktörer få rabatterat pris när man hyr gatemark vid byggprojekt om man t.ex. använder sig av en logistikcentral?
4. Känner du till LCCC? London stad finansierade hälften av projektet där.
5. Om staden initierar ett LC kan man då senare låta det övergå till en privat aktör?
6. Hur ser ekonomin ut för Norra Djurgårdsstaden?
7. Gjordes det några framsteg i Hammarby Sjöstad efter tid?
8. Förklara hur LC vid Hammarby Sjöstad fungerade. Hur såg systemet ut?
9. Var det flera olika BE som byggde, eller var det en och samma?
10. Erbjöds det extra tjänster utöver leveranserna? Hur mottogs dessa av BE?
11. Skiljer sig projektet i Hammarby Sjöstad och Norra Djurgårdsstaden åt?
12. Vi har även pratat med trafikkontoret. Hur fungerar ert samarbete däremellan?
13. Om vi till exempel tar projektet O-Centralen i Gamla Stan. Andra branscher har varit mer positiva till en utveckling av logistikbranschen. Håller du med om det?
14. Hur pass ekonomiskt involverade var Stockholms stad?
15. Skulle Stockholm Stad kunna initiera någon blandning mellan konceptet O-Centralen och projektet i Hammarby Sjöstad och Norra Djurgårdsstaden?

16. Vad skulle vara det optimala för er? Om alla regelverk tillät det, tror du staden skulle vara intresserad av att ni initierade LC?
17. Är detta något som skulle förbättra stadsmiljön? Skulle man kunna ändra regelverket för att främja LC?
18. Vad tänker du angående byggbranschens ibland påstådda svårigheter att samarbeta?

Peter Vedin - Södermalms Trä - Marketing manager - Construction material supplier

Date: 25/4 - 2014

1. Hur är byggtreprenörers inställning? Hur skulle man kunna förbättra?
2. Om kund vill ha något inte ni har kan ni då införskaffa detta?
3. Skulle ni kunna tänka er att köra ut era varor till ett Logistikcenter?
4. Ett LC skulle innebära mindre väntetid, kortare sträckor. Hur ställer ni er till detta?
5. I Norra Djurgårdsstaden används ett LC. Vad tycker ni om den?
6. Skulle inte ni kunna agera LC när det behövs?
7. Om dem som använder sig utav ett LC och ser fördelarna skulle detta då vara aktuellt?
8. Varför tror du inte att entreprenörerna ser fördelarna med det?
9. Tror du ett LC skulle hjälpa vid ett centralt bygge?
10. Du säger att leveranser inte går att samordna. Är inte detta det ni gör i viss mån?
11. Vi har pratat med Stockholm Stad. Er verksamhet liknar på många sätt logistikmodellerna som dem tar fram. Har ni varit i kontakt?
12. Tror du användandet av LC skulle främjas om Stockholm Stad skulle ha krav på fyllnadsgrad i centrala Stockholm?
13. Har ni någonsin fått bidrag av EU för att samlasta?
14. Finns ett stort intresse från EU-håll att konsolidera varor och samlasta. Finns stora pengar som går åt att främja detta. Är det informationsglapp? Har ni fått ta del av någon information angående detta?
15. Skulle ett LC vara aktuellt om det främjades från Stockholm Stad?
16. Om ni skulle bygga till på er verksamhet med bidrag från EU, så kan ni få med er mer fabriker och kunder. Är det något ni skulle kunna tänka er?

17. Vad anser du om konceptet i London, LCCC?
18. Vad är det bästa sättet att se till att direktköp mellan fabrik och BE inte sker då du anser att detta är något dåligt?
19. Det finns många BE som beställer t.ex. gips som dessa vill ha direkt levererat, så kommer det fyra timmar för sent. Varför vill dem köpa direkt?
20. Hur mycket skiljer sig priset från fabriken och er?
21. Hur gör ni för att uppmärksamma er? Vad är det ni betonar?
22. Använder ni er av er tideffektivitet för att marknadsföra er själva?
23. Byggbranschen anses ofta som dålig på tidseffektivisering. Varför är det så?
24. Vilka tidsmarginaler har ni på era leveranser? Vad räknar ni som att vara i tid?
25. Marknadsför ni er tidseffektivitet hårt till BE?
26. Har ni fått någon feedback över hur avtalen angående leveranser fungerat?
27. Anser du att BE har en ovilja till att arbeta kring sin logistik?
28. Vissa anser att de inte har varit särskilt progressiva i den fronten. Vad anser du?
29. Vad är BEs största problem kring logistik?
30. BE har inte haft några data om kostnaden på papper. Tror du detta kan vara ett bra incitament?
31. Är det era killar som kör ut materialen till byggarbetsplatserna?
32. Har åkerierna extra tjänster, bär de in varorna?
33. Gör ni något och i så fall vad för att förbättra samarbetet mellan parter?
34. Stämmer ni även av efter ett antal projekt, mer fortlöpande?

Simon Lindholm - Production Manager - Skanska - Construction contractor

Date: 2/5 - 2014

1. Vad skulle krävas för att utveckla ett logistiksamarbete med samlastning?
2. Blir det svårare när det är projektbaserat?
3. Vid Uppsala universitet så gjordes en studie om förnyelse i byggbranschen. Största faktorn för förnyelse var den interna organisationen och kund. Minsta faktorerna var materialleverantörer,

myndigheter, och sist forskning. Den visade på en brist på samarbete. Vad tycker du om det? Stämmer det?

4. Om Stockholm Stad hade det övervägande ansvaret för ett LC, tror du det skulle finnas intresse för detta från privata aktörer?
5. När ni använder er av leverans direkt från fabrik, hur går det då? Blir det mycket spill? Får hantverkarna hantera materialet?
6. Hur skötte de sig med tider?
7. Var det någon gång det hände att ni inte kunde ta emot några varor?
8. Vad gjorde ni när ni inte kunde ta emot varor?
9. Hur tycker du då att bygglogistiken ser ut idag?
10. Hur ser projekteringen ut inom logistiken? Tycker du att den är mindre om man jämför med andra delar?
11. Vad är de största problemen med logistiken?
12. Kommer ni använda er av någon mellanlagring?
13. Tror du att en LC skulle vara hjälpsam att ha?
14. Om Stockholms stad har huvudansvar vid en LC som brukas av exempelvis Strabag, Skanska, PEAB, NCC. Hur skulle detta fungera?
15. Betona de ekonomiska vinsterna? Om man reklamerar fördelarna.
16. Har du vart med i något projekt där man utvecklat logistikverksamheten med andra aktörer?
17. Fick materialleverantörerna höra er kritik?
18. Hände det någonting av er kritik?

Fredrik Bergman - Office of Development - City of Stockholm - Authority

Date: 9/5 - 2014

1. Kan du förklara logistikprojektet i Norra Djurgårdsstaden?
2. Externlagerna, vem är dem till för? Och hur länge får man lagra där?
3. Är det materialleverantörerna som bokar dessa tider?
4. Är det tillfälliga logistikcentralen som är aktuella, eller rör det sig även om permanenta?
5. Vid LCCC var det lika typer av byggen och inte i en och samma stadsdel. Tror du ett liknande koncept är aktuellt här i Stockholm?
6. Vad hade blivit problemet och vad hade försvunnit om man lagt lagret och samordningen längre bort?
7. Var detta för att uppfylla era tre viktiga punkter för projektet, ekonomi, ekologi och social hållbarhet?
8. Är det mer aktuellt med en logistikcentral på plats?

9. Hur ska man få byggare att använda sig utav detta system?
10. Hur ser intresset ut från privata aktörer?
11. Vad är det svåraste problemet med att fånga entreprenörernas intresse?
12. Har det varit aktuellt för leverantörer att kapa sina priser på material då deras leveransprocess skulle bli enklare?
13. Har det blivit enklare för dem?
14. Vid LCCC så var problematiken att man inte kunde göra beräkningar, inge jämförelser på vad som går förlorat vid ett bygge och vad man vinner vid att använda sig av ett logistiksystem. Leverantörer ville heller inte visa vilken del av kostnaden som var material, resp. transport. Finns samma problem i Sverige?
15. Vi var på en byggvaruhandel. Dem var inte så nöjda med att leverera till BLC. Varför tror du det är så?
16. Tror du det kan vara ett framtidskoncept med LC?
17. Branschen är ganska konservativ. Hur skulle man kunna övertyga branschen?
18. Tror du det är aktuellt att t.ex. ha ett krav på en fyllnadsgrad inom t.ex. centrala Stockholm?
19. I LCCC-rapporten så klagade byggtreprenörerna på att logistikpersonalen inte hade kunskap om hantering. Har ni tänkt på detta?

Marie Stensson - Logistic Manager - Paroc - Supplier

Date: 9/5 - 2014

1. Hur ser standardavtalet ut med Skanska? Vad specificeras?
2. Vilket leveranssätt föredrar ni som leverantörer? Direkt till byggen eller via en logistikcentral?
3. Hur stor andel material skickas till byggnadsentreprenörer respektive återförsäljare?
4. Hur mycket anpassar ni er efter byggnadsentreprenörernas önskemål, gällande leveranser?
5. Använder ni er utav nattliga leveranser?
6. Kör ni enbart fyllda bilar?
7. Utför ni förberedning av varor?
8. Erbjuder ni extra tjänster, exempelvis inbärning?

9. Faller logistikansvaret på er eller samarbetar ni med återförsäljare eller byggnadsentreprenörer?
10. Har byggnadsentreprenörerna försökt engagera er i sådana frågor gällande logistik?
11. Hur betydande är informationsutbytet, gällande materielleveranser, mellan Paroc och dess kunder?
12. Arbetar ni vidare på uppgifter ni får av era kunder för att förbättra ert logistikarbete?
13. Arbetar era kunder vidare med information de fått av er för att förbättra logistiken?
14. Sker något uppföljningsarbete med kunden, efter en längre tid?
15. Är det möjligt att separera priset för materialet respektive leveransen, vid användandet av exempelvis en logistikcentral, eller annat medel som skulle förkorta transportsträckan?
16. Har undersökare (som exempelvis vill räkna på materialkostnad) tillgång till era prissättningsprocesser eller är dessa svåråtkomliga?

Märta Brolinson - Freight Program Manager - City of Stockholm - Authority

Date: 15/5 - 2014

1. Vilka typer av logistiklösningar undersöker ni för tillfället? Hur har dessa undersökningar gått till?
2. Utöver nattleveranser, har ni andra projekt som berör bygglogistiken?
3. Varför var materialleverantörerna negativt inställda till LC, tror du?
4. Har ni haft kontakt/samarbete med byggnadsentreprenörer när ni undersökt bygglogistik?
5. Tror ni att ett utökat samarbete med byggnadsentreprenörer eller materialleverantörer skulle underlätta problemlösningen av central bygglogistik?
6. Finns initiativ från byggbranschens aktörer att hjälpa till och delta i era undersökningar?
7. Om vi jämför med andra branscher, hur framstår byggbranschen när det kommer till initiativ till undersökningar och dylikt med Staden?