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# Establishing intermodal terminals

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## Abstract

This study examines the development process of intermodal road-rail freight terminals. Of particular interest are factors affecting the development process and the time needed to establish intermodal road-rail terminals. The results are intended not only to be interesting to researchers, but also of practical use to actors developing intermodal terminals. Based on rational choice theory and two Swedish case studies, Falköping/Skaraborg and Nässjö/Jönköping, factors identified and analysed are: profitability, financiers, political entrepreneur, location, large local shippers, and the traffic authorities. Profitability combined with an enthusiastic and committed political entrepreneur are the most vital factors for the success and pace of the development process.

*Key words:* Case study, container, dryport, intermodal transport, public-private collaboration, rational choice theory, terminal.

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## 1. Introduction

The structure of the railway system in the EU is changing. Sweden was one of the first countries to deregulate the railway system and to separate infrastructure (Banverket, the Swedish Rail Administration) from transport operations (SJ) and also later passenger (SJ) from freight transport (Green Cargo). CargoNet, a joint venture between the Green Cargo and Norwegian NSB, is the dominating actor regarding rail transport of unit loads. However, companies such as Intercontainer (Scandinavia), Mid-Cargo, Uddevallapendeln, Svensk Logistikpartner, Tågfrakt, Mälarpendeln, Vänerexpressen, and Green Cargo itself, has challenged this domination by establishing rail shuttles providing transport of maritime containers to and from the main Scandinavian port, Port of Gothenburg (PoG).

These new operators seek new geographic markets and locations for rail-road intermodal terminals. As a result the structure of Swedish intermodal terminals has changed to incorporate regional terminals operated by companies or organisations other than the governmentally controlled rail operator and infrastructure provider.

The purpose of this study is to examine the development process of intermodal terminals. Of particular interest are factors with an impact on the development process and the time needed to establish an intermodal road-rail terminal. Therefore, the primary research question is which factors affect the pace and speed of the development process and how it brings the development process forward. The purpose is treated in the empirical context of two establishments of Swedish intermodal road-rail terminals. The goal is that the results are of practical use to actors involved in the development of rail-road intermodal terminals.

## 2. Theoretical perspective and methodology

We proceed from the assumptions of rational choice theory (RCT) (Hindmoor, 2006; Laver, 1997; Olson, 1965). According to this theory, human actors are rational and try to gain as much utility as possible from available resources. In other words, actors are seen as utility maximisers. On the whole, we assume that actors are guided by self-interest. The kind of self-interest varies—it may be economic gain or power or actors may be ruled by a wish to be admired or to be seen by important others as

effective and competent. Based on our experience with public-private collaboration processes of establishing intermodal road-rail terminals, such a frame of reference is useful to illustrate the rationality of many of the decisions and events based on personal sub-optimisation instead of rational decisions and benefits in a larger context.

In order to ascertain what kind of utility a certain actor is trying to attain, an elementary rule of thumb may be used—“Where you stand depends on where you sit.” The basic thought here is that your specific position in society tells a lot about what kind of value for which you are striving. However, it is not assumed that societal position determines value completely. A couple of simple examples may be used to illustrate the point. If you are a politician in a democratic country, the maximum number of votes in an election is a high priority and if you are a business leader, maximum profits is of key importance.

A central concept within the RCT is incentives. This concept refers to motivations, which are held by actors and linked to the specific utilities that are relevant in a certain case. Simply put, incentives trigger action. What an actor does may sometimes seem irrational. However, a deeper understanding of the actor’s situation and his or her motivation may often change considerably the initial judgment of irrationality.

RCT makes a distinction between collective goods (e.g., clean air) and private goods (e.g., a bicycle). The production of collective goods demands collective action. According to RCT, collective action raises problems of a special kind. One of these problems is free-riding. Free-riding occurs when it is better for all members of a group to act collectively to provide a collective good even though it is in no one’s individual interest to contribute to the collective effort.

RCT theorists have discussed under what circumstances the free-riding problem may be overcome. Mancur Olson, a key RCT theorist, distinguishes between three types of groups. In a latent group, no one individual will be prepared to bear his or her share of the cost of providing a collective good. At least one actor in a privileged group values the good to such an extent that he or she is prepared to bear the total cost of providing it. In a latent group, the collective good will not be provided with all certainty. However, in the privileged group, the reverse result will probably happen. According to Olson, there is a third group—an intermediate group. In this kind of group the members are in a position “to notice whether any other member is or is not helping to provide the collective good” (Olson, 1965). In an intermediate group, it is possible that the collective good will be produced.

Political entrepreneurs are a key category in RCT. Typically political entrepreneurs can play a crucial role in resolving the problems posed by collective action. One important incentive for political entrepreneurs is the private utility they can secure if they succeed in providing collective goods. This is also one reason why RCT was chosen as a frame of reference instead of other concepts and theories such as “value maximisation” (cf. Mentzer, Min and Bobbitt, 2004).

Regional logistics collaboration and regional intermodal road-rail terminals contain significant dynamics since they involve many actors and sectors. Especially interesting is the interplay between public and private actors. The choice of case study research was based on the ambition to analyse the dynamics of the phenomenon from a “why” and “how” perspective (cf. Eisenhardt, 1989; Silverman, 2001; Yin, 1994; Hilmola, Hejazi and Ojala, 2005). For the case study to gain relevance, it required engagement in fieldwork, i.e., studying people in action (Näslund, 2002; Näslund, 1999; Ellram, 1996). Through the use of ethnographically inspired research techniques, activities, actors, and the development of resources can be followed closely over time (e.g., Leijon and Jensen, 1996; Mason, 1996). The ethnographical methods and techniques used in this research include interviews, attending meetings, workshops, and studying statements and actions. Studying statements and expressed opinions have been important parts of the empirical analysis since issues related to the research project, directly and indirectly, have been much debated in the media. Through informal conversations and interviews, individuals were asked to explain events, give examples of actions, and describe the situation in the two case studies. Analysis of archived information is another important source, since decisions and actions can be traced in documents such as minutes of meetings, press releases, marketing materials, and official reports.

### **3. Establishing rail infrastructure in Sweden**

In the early 1950s, the Swedish railways entered a period of severe crisis that lasted until the late 1980s. During this period both the size of the network and the market shares of goods and passengers diminished considerably. However, at the end of the 1980s the situation started to improve. After half a century of suspended construction, new railways were being built again. One important factor in this change was the beginning of a wave of structural reforms.

In 1988 the national railways system (SJ) was separated into two branches as explained by Jensen, Sjöstedt and Woxenius, (1992). The new SJ became an operating company and Banverket was given the responsibility of constructing and maintaining the infrastructure. The operators pay an access fee for using the infrastructure. Banverket is obliged to use socio-economic calculations as a planning instrument for investments in the rail infrastructure.

The decision in 1988 to separate operations and infrastructure opened up opportunities for further liberalisation, privatisation, and intensified competitiveness. Consequently, the operating company was further divided into limited companies for freight (Green Cargo), passengers (SJ), real estate (Jernhusen), information services (SJ Data), and maintenance (Euromaint). At present, open access for freight has been implemented almost completely. As far as passenger traffic is concerned, such a process has been started but much remains to be done. Still, SJ enjoys a monopoly on the long-distance routes they believe have the potential operate profitably, such as Gothenburg-Stockholm.

Banverket is responsible for developing the entire railway sector including furthering intermodal road-rail freight transport jointly with the road administration. Consequently, Banverket is a key player when planning new terminals. Therefore, this authority can be described as a veto-group since its permission is necessary to establish a new facility. Its powerful position is enhanced by the fact that Banverket has substantial sums of money at its disposal for investments. When establishing a new terminal demands a larger branch line, the financial participation of Banverket is necessary due to the size of the investment. However, when a terminal requires a smaller investment, other participants such as municipalities or private companies may bear the financial burden. As a general rule, Banverket focuses on larger projects.

### **4. The context of intermodal transport and the Swedish intermodal transport system**

This section gives a view of the intermodal transport system according to the main activities performed. In January 1995 the Swedish parliament voted for establishing competition on the network, but competition within the intermodal sector was heavily influenced by the weak competition in the railway sector as a whole (cf. Hilmola, Ujvari and Szekely, 2007). This resulted in a strong position for the former freight division of Swedish State Railways (SJ), Green Cargo, including the intermodal road-rail operator Rail Combi, which later merged with the Norwegian freight railways into CargoNet. Since both Green Cargo and CargoNet operate their own intermodal terminal networks with limited third-party access, new establishers must be able to reach the intermodal rail network to guarantee business. Recently, new entrants have established shuttles where there is enough volume for full trains, often with PoG as a principal node. To facilitate fair competition, planning of the timetable and access to terminals has been transferred from SJ to Banverket. There is still no extensive competition although new entrants have focused on competing for direct links with large existing volumes, i.e., the competition mainly regards full train shuttle routes (cf. Woxenius, 2007a and b).

The Swedish network of terminals for intermodal road-rail transport was established in the late 1960s when handling equipment for 40 terminals was bought. The core service offered at the terminals is unit load transshipment between two modes of transport, but related services such as empty storage, inspections, customs clearance, cleaning and minor repairs of unit loads also are offered. The inspections are made to identify damage responsibility, and status checks are performed at the request of shipping agencies. In conjunction with the terminal services, most intermodal operators lease out unit loads and arrange local road haulage. However, most customers are forwarders or hauliers arranging their own local road haulage.

Capacity utilisation is a crucial question for transport operators. The resources must be analysed as a part of a larger system—there is hardly any meaning to discussing the utilisation of a single resource (cf. Jensen, 1990; Jensen, 2008; Woxenius, 1998). If a single intermodal terminal is considered satis-

factorily utilised, it does not mean necessarily that the overall system has a good utilisation and efficiency. Hence, intermodal terminals are supposed to make quick transshipments to enhance good use of surrounding resources such as rail wagons, lorries, and general cargo terminals.

A major barrier for intermodal transport growth has been the large-scale terminals used today. Intermodal transport had difficulty competing for large flows over medium distances of 200 to 500 kilometres as long as the economies of scale limited the number of terminals severely (cf. Jensen, 1990; van Klink and van den Berg, 1998; Roso, 2009a). For shorter distances, all profitability calculations fall if the lorries have to drive too far—or even worse, in the wrong direction—in order to reach an intermodal terminal. Small-scale terminals were required in relatively large numbers, and they have to be intelligently linked if the intermodal transport system will be an attractive alternative to single-mode road transport (Woxenius, *et al.*, 2003; Jensen, 1990).

### *Terminal development and ownership*

The issue of who is to operate terminals is a decisive one in most transport systems. Forwarders have traditionally kept the consolidation of general cargo in-house while contracting out the physical movements between terminals. The national railways originally placed the terminals and station buildings in the train operating part and not in the infrastructure when splitting up, impeding the entrance of new railway companies. Ports, on the other hand, have been regarded generally as public assets in Sweden although there are some privately operated ports and some big shipping lines operate their own container terminals.

Many intermodal road-rail terminals are still operated by the national railways directly or through subsidiaries, and are therefore a public asset by definition. For instance, when SJ was split into Banverket for infrastructure and a “new” SJ for train operations, one of the basic criteria was that facilities and functions directly connected with product design and efficiency of traffic operators should not be included in the infrastructure (Jensen, Sjöstedt and Woxenius, 1992, p. 8). Freight terminals and station buildings were in that category.

It is very risky to invest in terminals without controlling the operations on the links since the demand for transshipment is derived from transport services. Although Swedish road-rail terminals are also operated by hauliers, forwarders, and shippers, CargoNet and Green Cargo are the operators or principals of most terminals. The operators that have entered the Swedish intermodal road-rail transport market during the past few years have decided not to use Green Cargo or CargoNet’s terminals. Instead they use intermodal terminals developed and established mainly by ports and municipalities.

Public involvement in ownership and development of intermodal terminals was addressed in Höltingen's study (1995) of intermodal transport and intermodal terminal development. Höltingen concluded that the public sector should be involved in the terminal planning process, mainly for city planning reasons, but the sector should stay away from the day-to-day operations. Nevertheless, until the traffic modes carry their full social costs, intermodal transport has to be developed using public funds for achieving the politically attractive modal split in favour of rail and sea transport. Then, it is natural to subsidise the terminal function, the main barrier for intermodal growth (Woxenius, *et al.*, 2003). As a result of these market demands for more intermodal terminals with better and more transparent third party access, Scandinavia has seen a remarkable trend in the establishment of dryports (cf. Roso, 2009b, Bergqvist and Woxenius, 2009). #

## **5. The Scandinavian rail-shuttle system and Port of Gothenburg**

The development of dryports and rail shuttle services has been evident in Scandinavia over the past decade. The development originated at PoG, which currently has rail shuttles to 24 different dryports in Scandinavia, offered by ten rail operators (Port of Gothenburg, 2009). A few of the rail-shuttles operate once or twice a week in each direction; however, the majority operate five to seven days a week, and the most frequent, which supports H&M’s central warehouse in Eskilstuna, operates 14 times a week in each direction.

Although some of the shuttles operate over distances that are typically dominated by road transport, most shuttles can be characterised as serving distant dry ports since they are confined to traditional hinterland transport (Bergqvist, 2007; Roso, Woxenius and Lumsden, 2009). However, the shortest

shuttle, about ten kilometres from the port of Gothenburg, serves a stuffing and stripping terminal, and a previous service to Uddevalla, about 100 kilometres from Gothenburg, moved the stuffing and stripping activities out of the port area.

Current container rail shuttle services moved 350.000 20-foot equivalent units (TEUs) in 2008 with a turnover of approximately €55 million (Bergqvist, 2009). In 2007, the PoG handled 841.000 TEUs, which means that the container rail shuttle system handled more than 40 percent of all containers to and from the port. The port also handles 686.000 roll on/roll off (RoRo) units in terminals at both banks of the river Göta (Port of Gothenburg Web site, 2009), which flows through the city. Currently only a few percent of the RoRo units are handled in the rail shuttle system.

The cost savings for the industry include a 5 to 10 percent decrease in its transport costs, implying that the current rail shuttle system saves approximately €5 million in business costs annually. The system also relieves the congestion on the streets of Gothenburg and decreases the carbon dioxide (CO<sub>2</sub>) emissions by nearly 42.000 tons every year.

The growth has been driven by a systematic process that started with a decision by the board of directors at PoG stating that half of the growth in the container segment should enter or leave the port by rail. The rail shuttle system has surpassed this goal and has achieved an annual growth of approximately 15 percent over the past seven to eight years.

The rail-shuttles have demonstrated a very stable and impressive growth in terms of the number of shuttles and transported volumes. However, this is related to a period of extraordinary growth in container liner shipping. In late 2008, the growth in container volumes stopped due to the economic recession. However, at the end of 2009, the Scandinavian rail shuttle system had increased its market share to 50 percent, up from 40 percent in 2008, and PoG expects this share to grow even further. Nevertheless, with a wider and denser geographical coverage of the hinterland, the Scandinavian dryport concept is running out of potential destinations.

## **6. The case of Falköping/Skaraborg**

Due to the complexity of the collaborative phenomenon and nature of the research itself, it is regarded suitable for a case study approach. This and the following sections present and analyse the cases of establishing intermodal terminals in Falköping/Skaraborg and Jönköping/Nässjö respectively with emphasis on interesting courses of events.

Historically, many of the municipalities in Skaraborg have set strategic goals concerning the establishment of intermodal road-rail terminals. However, the size of the region (approximately 270.000 inhabitants) made it financially unsound and indefensible for the national rail infrastructure authority, i.e., Banverket, to finance all desired terminals. In early 2000, Banverket supported Skaraborg's involvement in a research project at the School of Business, Economics and Law at University of Gothenburg since it could help to identify potential terminal locations and help the Skaraborg region to decide on a single favourable location. Banverket implied that such a procedure would facilitate the financial opportunities of a terminal location in the region. Furthermore, local businesses started to press local municipalities concerning the development and use of intermodal road-rail transport services.



Figure 1. The Skaraborg region (Source: Multimap.com).

As the research process progressed, it highlighted logistics opportunities in Skaraborg associated with the development of a terminal and an intermodal road-rail transport service, and there was interest from the local rail operator Tågfrakt because the research indicated an opportunity to create efficient intermodal road-rail transport services for distances down to 120 km. Generally, breakeven between direct road haulage and intermodal road-rail transport is believed to be approximately 300 km (see e.g. Jensen, 1990; van Klink and van den Berg, 1998). Since Skaraborg is located only 130 km from its most important and nearby logistics gateway, Gothenburg, these results were somewhat surprising.

These results indicated a “collective good” for businesses in Skaraborg based on the terminology of RCT and the results accelerated the logistics collaboration in the region, especially among municipalities that would like to be associated with this “collective good.” The incentive for that was for the representatives of municipalities in charge of business development to be associated with any such acidity connected to possible local business development. The idea of intermodal transport also supported the goals of cost-efficiency, environmental friendliness, and attracting business to the region. Early on, public actors had to work to get attention and interest from private actors. As the benefits of logistics collaboration were identified and clearly defined, private actors became more interested as their incentive to engage became more transparent, but the private sector can be described best as a “latent group.”

Since no physical terminal was established in Skaraborg and since the research aims at investigating opportunities of intermodal road-rail transport services, it was necessary to depart from an imaginary terminal location. Consequently, it also was necessary to determine a realistic and cost efficient position of an intermodal road-rail terminal in the region. According to public actors, several terminal locations were, not surprisingly, perceived as suitable since several politicians had explicit strategic ambitions to establish an intermodal road-rail terminal in their municipality. However, the regional logistics system of Skaraborg is not sufficient enough to allow, from a cost efficiency perspective, all municipalities to establish their own intermodal road-rail terminal. After some initial debate and discussion, municipalities agreed verbally to support the suggested location that the research within the project “Regional Logistics Systems” would produce. As a consequence, the municipalities had a motive to improve the analysis by facilitating the data collection process and ensuring a high data coverage and quality. Municipalities provided data material such as databases of workplaces and used their vast network of regional contacts to help distribute and convince workplaces to answer a “mapping

questionnaire” of their logistics situation in order to map the regional logistics system. This was conducted during the autumn of 2004.

Until this point, the collaborative efforts had paid off and it looked as if actors in the region had created a common ground for understanding based on the “common good.” Then, as the results of the analysis of a cost efficient and environmentally friendly location were completed, tension started building up as the “common goods” were connected to a much more apparent “private good.” The results were published and presented to the municipalities of Falköping and Skövde at a meeting in April 2005 at Falköping’s town hall. The results indicated a favourable location in Falköping, which surprised some, since Skövde has a larger population. However, Falköping had an advantage in the distance necessary to travel by rail, because 80 percent of the goods in the region were transhipped in a western direction and Falköping is situated approximately 30 km west of Skövde. The distance travelled by road to and from the terminal was not enough to counterbalance this advantage in rail transport in terms of costs. The cost advantage for Falköping was nearly 8,5 percent when compared to the cost mass of transport services related to a terminal in Skövde.

At the time of the meeting, it seemed as if all representatives welcomed the results without much scepticism and there was a sense of motivation to carry on and establish the transport service and terminal. Naturally, Falköping had to take a larger part in the development process since the suggested location was in Falköping; representatives of Falköping took the role of “privileged group” with great enthusiasm. After the meeting, the development accelerated, and Falköping carried out ground investigations and discussed possible layouts and infrastructure connections with Banverket, the authority for Sweden’s rail infrastructure, and The Swedish Road Administration, Sweden’s authority for road infrastructure. PoG and possible train operators also were involved. PoG was a natural partner since it is the major logistics hub in Scandinavia. The municipality of Falköping also started its own investigation to identify actors interested in committing to an intermodal road-rail transport service.

At a workshop on 21 February 2006, the situation changed dramatically. Interested parties were invited to Falköping to discuss planning for the terminal and the development of an intermodal road-rail transport service. As before, the discussions were based on the fact that Falköping was the intended location for the terminal. At the end of the workshop, the chairman of the municipality of Skövde questioned the location in Falköping. The position of mayor does not exist in Sweden, but the position of chairman is very similar to that of a mayor in a general international perspective. The reason given by the chairman was that more attention should be given to commercial interests. The chairman of Skövde alluded to the two large Volvo manufacturing plants in Skövde. Furthermore, he pointed out the existence of an international military taskforce in Skövde. The reactions by the participants were strong and people were frustrated. The likelihood that containers with disaster relief equipment should be transported by rail is low. Road or air transport would surely be much more suitable in such occasional cases. However, the major contributory cause was the issue of Volvo, the fact that the Volvo plants in the region were included in the research, and that Volvo never officially stated any preferences regarding the location of the terminal.

The next few days were turbulent and the situation deteriorated as the chairman of Skövde talked to the media and aired his opinion. He accused Falköping of financing the research program and doubted its impartiality. This continued until the journalists’ interest faded a few weeks later, largely when it was explained to them in detail how the research was conducted and financed, what data was included, and that there was no truth in the accusations. The ambition was to conduct action based on the program’s research, but getting involved in the conflict and media was something that was unfavourable for the region, since the outcome would be a negative image and context of the terminal. Therefore, explanations were made “off the record” with journalists to avoid unnecessary simplification and misunderstandings. If the accusations toward the research program should have been repeated, an official statement would have been necessary. Fortunately, this was never the case since the journalists realised that there was no substance in the allegations.

By May 2006, very little progress had been made. Falköping tried to convince private actors and public actors such as the rail and road administrations to go ahead with the plans despite Skövde’s disapproval. To convince doubtful actors, Falköping requested and received a letter from Volvo Logistics head office that clarified that Volvo did not take any stand in the terminal location conflict. However, Volvo supports the idea of an intermodal road-rail terminal and service. At that time, Banverket persistently announced that they were neutral in the conflict. Since both municipalities agreed early on



that a terminal establishment in the region was more important than arguing about where to locate it, maybe one of the municipalities was ready to accept the conflicting location to break the deadlock. When asked, the municipality representative in Falköping stated that they were ready take political actions in order to stall a process in which an intermodal road-rail terminal would be established in Skövde in collaboration with Banverket. The status quo remained.

In July 2006, another attempt to solve the problem was made when actors from Banverket, Falköping, and Skövde decided to put together a small team of members from each organisation to formulate a proposal that was agreed upon by all actors. However, the meeting never took place.

In September, Stora Enso, a large integrated paper, packaging, and forest product company, announced their interest in building a 40.000-50.000 m<sup>2</sup> terminal for round timber in Falköping in 2007. From an intermodal road-rail terminal perspective, and according to sources at Banverket, there are few synergies between the different terminals. However, the decision illustrated that others saw Falköping as an efficient location. Stora Enso has had very little or no activities in either Falköping or Skövde prior to this decision.

In early November 2006, Banverket requested another presentation of and hearing on the research produced in 2005 concerning terminal locations. The presentation was scheduled to take place on 30 November. Furthermore, the chairmen of Falköping and Skövde were invited to a private meeting on 1 December. It is remarkable that these two meetings were so close in time. However, at the meeting in November, it was clear that Banverket had made a decision and the presentation and hearing were meant to update Banverket on the research.

The next day, both municipalities were informed of Banverket's decision to support a terminal location in Falköping. At the same time, a press release announced that Banverket was to investigate the development of a terminal in Falköping for intermodal road-rail traffic toward PoG during the first half of 2007. From a RCT theory perspective there was one major influencing factor that greatly amplified the private good from the beginning of the process until late 2006, namely public elections on the municipality level, among others, which required municipality representatives to focus on municipality priorities to improve their position in the upcoming elections. Since an establishing process of an intermodal terminal is long-term this factor is important to recognise as a possible source of turbulence and friction.

The prospects for 2009/2010 are good. A newly founded company started an intermodal road-rail transport service to PoG. The service had five weekly departures in 2009 to and from PoG and there is a newly appointed terminal operator that won a tender related to the terminal operations.

## **7. Jönköping/Nässjö**

The Jönköping and Nässjö regions are located in the southern mainland of Sweden. Nässjö is a small region with approximately 30.000 inhabitants and Jönköping has nearly 125.000 inhabitants.



Figure 2. Geographical location of Nässjö and Jönköping (Source: Multimap.com).

Jönköping is situated in the middle of southern Sweden and it is a popular location for distribution centres and logistics hubs. IKEA and El-Giganten are examples of companies operating Scandinavian distribution centres in the area.

One reason for its popularity is that both Jönköping and Nässjö have a well developed infrastructure, especially for road and rail transportation services. In 2005, the trade journal “Inköp & Logistik” ranked the 20 best logistics locations in Sweden, and Nässjö combined with the nearby region of Jönköping was stated as the 7<sup>th</sup> best location (Inköp & Logistik, 2005). The motivation was:

*“A large population in the logistics catchment area. Good infrastructure. Good access to land for establishment. An academic level education in logistics at Jönköping International Business School. An intermodal transport terminal. An active logistics network” (Translated from an article in Inköp & Logistik, 2005:3).*

Forwarders DB Schenker and DHL have large terminals in Jönköping, and the third largest, DSV, uses Jönköping as a hub in its consolidation network.

CargoNet operates an older intermodal terminal in the Ljungarum industrial area close to the city centre. The poor terminal infrastructure has been a bottleneck for CargoNet for increased traffic to and from Jönköping. The Ljungarum terminal was built before the establishment of the logistics centre at Torsvik, 13 kilometres from central Jönköping. Most new logistics establishments have been located there, notably the very large distribution centres for IKEA and El-Giganten.

A group of interested parties was formed to investigate the possibilities for establishing an intermodal road-rail terminal in Torsvik. The group was led by the Municipality of Jönköping and included representatives from shippers, transport operators, municipalities, and other public bodies as well as infrastructure authorities.

The initiative in the group was taken by a strongly committed development manager, a former town planning manager. The group commissioned studies and public workshops and seminars, adding to an elaborate vision of the need for, the consequences of, and the technical design of the terminal and its connections. Calculations of social economic profitability also were made. The development has not followed a specific schedule or plan. Nevertheless, as many of the participants are experienced in infrastructure development, it has aimed at following the formal steps stipulated for the infrastructure administrations, i.e., idea study, preliminary study, rail track investigation, rail track plan and construction documentation.

The main issue has not been the possibility of building the terminal as such, but the rail connection to Torsvik. The area has a rail connection and both IKEA and El-Giganten use conventional wagon loads for inbound flows. However, the track via Månsarp is of poor quality and crosses densely populated and nature-sensitive areas and an increase in commuter trains make it a less viable solution for large scale intermodal transport. An option is to build a track parallel to the highway E4 from the cen-

tre of Jönköping, following long-time plans for a high-speed passenger line from Stockholm to Helsingborg. For freight trains, however, a more gentle inclination is required, which adds to the costs significantly. It would also imply a significant intrusion in the landscape since the inclination would require that the slope starts with a viaduct directly in the city centre. A cost estimate of 1 billion SEK for the option along the E4 was made in 2002 by the consultancy firm SWECO. Since any investment in Swedish rail infrastructure should show a positive return on capital according to social economic costs, the extra costs for the gentle slope have to be carried by freight trains.

The option of building a new line to Tenhult on the line Jönköping-Nässjö (where the southern trunk line is) was favoured. The altitude of Tenhult is comparable to that of Torsvik but the proposed rail link goes through tough terrain that adds to construction costs.

The options and their pros and cons are explained by the figure below.

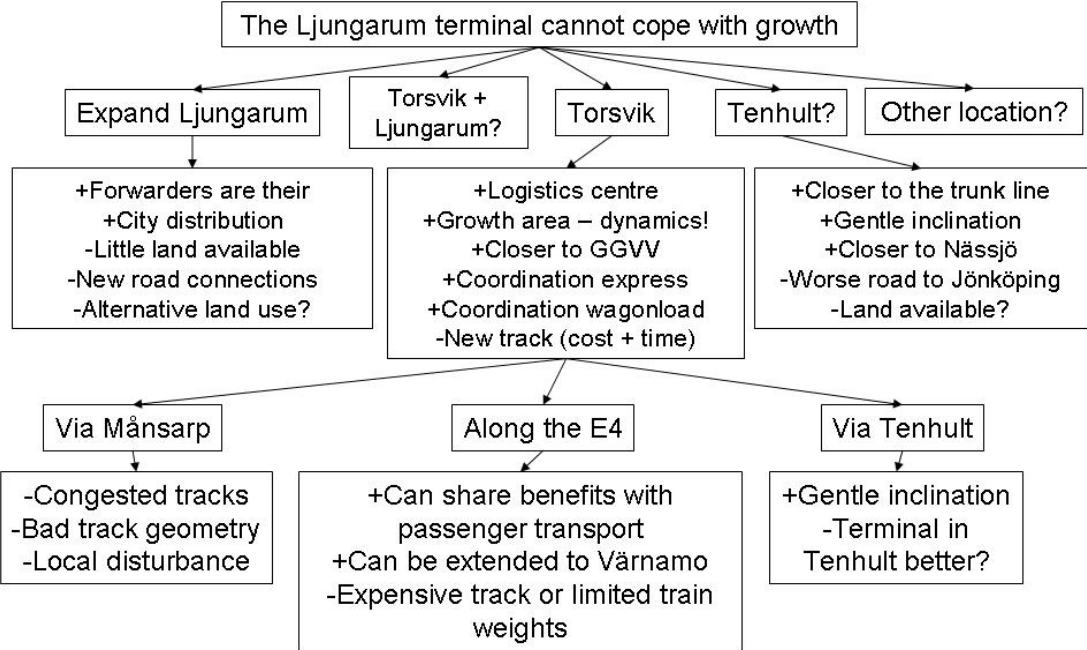


Figure 3. Problem definition regarding an intermodal terminal in Jönköping.

Jönköping is listed as a future national intermodal terminal, recognised by a government initiated investigation (SOU, 2007).

Currently, the group favours a location to Torsvik and the terminal would probably already be built if it was not for the substantial costs for the new track to Tenhult. In this context it is important to recognise the “private good” of the project manager to favour a location that is in line with his former employee and financier of the development project, i.e., the municipality of Jönköping. This is also the situation for many of the members of the project group. That cost has to be carried by Banverket in combination with other public and private actors. The project group has suggested a step-wise development.

Notable from this case study is that the issue of who is to own and operate the terminal was deliberately left aside in order to avoid a gridlock of conflicting interests. The common goal has been to establish a terminal for its role in a wider context rather than for its own sake. Of the current terminal developments in Sweden, this one seems to include one of the most ambitious planning phases.

Meanwhile, in the neighbouring town of Nässjö—which has a much smaller population than Jönköping and does not have the same advantage regarding highway access—the region has a great connection to the southern trunk line of the rail network. However, Nässjö’s ability to interest business has attracted much attention from other regions, researchers, and business people. The municipality has established a number of networks that offer services to new and existing businesses. The local government focuses on cooperation between the academic community, local government, and industries in the region. One example of a large establishment in the region was the construction of a Nordic distribution centre by the Danish company Jysk. According to regional representatives, one of the reasons for establishing a distribution centre in the region is its relative closeness to the major cities in

Scandinavia. Travelling time is less than two and one half hours to the centre of Copenhagen, and two hours to Gothenburg and Stockholm. In promotional materials, Nässjö often stresses its proximity to major cities and logistics hubs and the existence of a well-functioning infrastructure, such as the connection to the national railway network. In a historical perspective, Nässjö and its function as a hub for rail transport have been much talked about.

The local government has taken the initiative to establish a professorship in logistics at Jönköping International Business School to investigate logistics issues related to the region and how the competitiveness and attractiveness of the regional logistics can be improved. NNAB (Nässjö Näringsliv AB), originally a municipality initiative, manages contacts with interested parties. The company was established in 1987 and has 225 local companies as shareholders with a share of 95 percent. The remaining 5 percent is owned by the local government. NNAB was initiated through a field trip in the region, where each company had an opportunity to influence the company's strategic approach. In turn, the strategy was regionally anchored and many companies became shareholders. The purpose was to investigate regional logistics opportunities to increase the region's competitiveness and attractiveness.

As a result of these activities, the local government has earmarked the Gamlarp area, north of Nässjö and close to the southern trunk line, for the establishment of logistics related facilities. The area has a well-developed and successful intermodal terminal with a daily intermodal railway connection to PoG.

The investment costs for the terminal, including connection to the main line and the side-tracks, amounted to 58 MSEK and was split between the municipality (11,6 MSEK), Banverket, the EU, and the Swedish Post Office (Posten). The terminal is operated as a limited company, Höglandsterminalen AB, owned by the Municipality of Nässjö and Nå-ETB, a constellation of local hauliers. The distance from Nässjö to central Jönköping is 42 kilometres and 53 kilometres to Torsvik. The rail shuttle to PoG was an immediate success and the train was full from the start although the intended main shipper, Jysk, did not use the shuttle in the beginning. The shuttle primarily serves the distribution centres in Nässjö, but some of IKEA's containers to Torsvik imported through PoG also have been transported by the shuttle despite the detour via Nässjö.

The success of the intermodal terminal and rail shuttle in Nässjö has gained much attention from foreign actors. However, Nässjö has the "problem" of being situated close to a larger nearby region that has similar logistics prerequisites. To avoid conflicts and confusion, statements are formulated to combine the two regions a give the sense of a "collective good."

*"Jönköping/Nässjö = Position Scandinavia". (Translated from NNAB's home page)*

However, this situation becomes complex when close collaboration with nearby regions is formulated as an advantage. Nässjö copes with this sensitive issue by avoiding comparisons with nearby regions. Furthermore, Nässjö uses arguments that balance the risk of upsetting nearby regional interests by putting forward the image of Nässjö as a better logistics location for establishments.

*"What is good for Nässjö, is good for us, said the head of Jönköping business development department". (Translated from NNAB's home page)*

The argument sounds like a guarantee that there is no hostility between the neighbouring regions even if they are close competitors. Nässjö formulates this argument to imply that potential establishers can enjoy Jönköping's advantages without hesitation or opposition from the Jönköping region if they establish in Nässjö. This approach to neighbouring regions illustrates the friction between an administrative region and a functional region. The functional region, from a logistics perspective, incorporates both Jönköping and Nässjö; however, the two regions are administratively separate. The separation imposes a demand for positioning since the people responsible represent one particular region. This conflict and balance often can explain what can be perceived as strange behaviour, i.e., the delicate task of collaborating (collective good) on one hand and positioning on the other hand (private good).

Also, the prospects are good for the development of intermodal transport services related to Jönköping and Nässjö. The terminal in Torsvik has entered a concrete planning phase incorporating issues such as financing, prospecting design, forecasts, etc. For Nässjö, the success of the rail shuttle continues and the volumes continue to increase in combination with more establishments at the Gamlarp area. Together, the Nässjö and Jönköping regions continue to develop their logistics competitiveness

and attractiveness and are one of the most logistically attractive and active regions in Scandinavia at the moment.

## 8. Conclusions

The purpose of this study was to examine the development process of intermodal terminals. Of particular interest were factors with a substantial impact on the development process and pace. Based on rational choice theory and the case study, the following factors were identified as important contributors to the success, pace, and speed of the development processes in Falköping/Skaraborg and Nässjö/Jönköping:

*Profitability. The higher the private business profitability, the greater the possibilities that there are actors interested in financing and operating the terminal.*

Direct profitable investment for the private actors is more likely to be implemented and there are probably many actors interested in a quick development and decision process.

*Location. Terminals need a critical catchment area for efficient operations and the intermodal service. Consequently, conflicts and disagreements between municipalities can delay greatly the development process.*

The issue of where to locate an intermodal terminal can delay the establishment process especially if there are many possible locations in administrative areas such as different municipalities. The case study of Falköping/Skövde illustrates the importance of dealing with this issue with a structural tool and recognising the influence external factors such as elections may have on the priorities between “collective good” and “private good.”

*Political entrepreneur. An entrepreneur, often a municipality representative, is very important for the status of the development process.*

Based on the case study, an enthusiastic and committed political entrepreneur is vital to push the development further when decisions, financial problems, and interests have put the process into a standstill. It is unlikely that private actors take any active part in the development process of the intermodal terminal until the commercial parts of the process begin; until then, private actors are best described as a “latent group” from a RCT perspective.

*Large local shippers. Strong and large shippers can provide credibility to the development and, as a result, carriers, terminal operators, and Banverket feel secure.*

In both cases it is possible that the representative of the municipalities where dominating companies are located use the companies as strong arguments for shifting the focus from the “collective good” to the “private good” since there is a clearer connection to and closer relationship with these companies than with smaller businesses. Local shippers may have a bigger role as opinion shaper than smaller businesses that need to coordinate to have the same power, impact, and influence.

Profitability is the strongest factor, but once the profitability for businesses and society has been determined the role of the political entrepreneur becomes stronger. Based on the case studies, an enthusiastic and committed political entrepreneur is vital. The political entrepreneur also needs to deal with other factors to a large extent because he or she can push development even when decisions, financial problems, and interests have put the process into a standstill. From a RCT perspective one of the most important roles of the political entrepreneur is to maintain and cope with the balance between “collective good” and “private good”, i.e., balancing the interests of public and private actors. The other factors are subordinate and more difficult to place in order of importance.

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