DRIVERS AND BARRIERS FOR INLAND WATERWAY TRANSPORTATION–LESSONS LEARNT

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ABSTRACT

Inland waterway (IWW) transportation in Sweden could be a substitute for road transports with the prospects of improving the environmental performance. For a successful modal shift it is important to understand the drivers and barriers for the shift and develop strategies to leverage the drivers and mitigate the barriers. This study aims to identify drivers and barriers for IWW transportation based on successful benchmark cases in the Netherlands. Furthermore, based on the learning from these benchmarks the study aims to point out strategic actions for Sweden regarding IWW. The results showed that main drivers for IWW are congestion relief, cost reduction and lower environmental impact. On the other hand, main barriers are slow pace of development, high investment costs and poor hinterland connectivity. For a successful modal shift in Sweden, it is crucial to prepare governmental support, a change in stakeholders' mindset, decisive attitude to modal shift process and a strong long-term perspective.

Keywords: inland waterway transportation, intermodal transportation, modal shift, drivers, barriers, Sweden.

1. INTRODUCTION

German, Belgium and the Netherlands were accountable for more than 93% of the total EU flow of full containers on inland waterways (Eurostat, 2018). A modal shift from road to inland waterways (IWW) and coastal shipping is a prioritized strategy outlined in national strategies in Nordic countries as well as part of EU goals. Main motivation for this modal shift derives from the need to use more energy efficient transport modes, and consequently reducing green house gas emissions, as well as congestion on roads, local pollution and noise from trucks. IWW in Sweden is underutilized (Garberg, 2016), less than 1% of the goods are transported by IWW, which is a contrast to the Netherlands' figures of almost 20% (Eurostat, 2018). Even though Netherlands' figures are high in comparison to Swedish, there is a challenge of competing with attractive road solutions, and a negative modal shift to road is a trend to reverse. Thereby, there is a potential in both increasing the usage of IWW as well as preventing a negative modal shift to road, while also contributing to reach long-term national sustainability goals. However, to achieve a modal shift from current flexible road solutions to IWW is a challenging task, which requires several actors to take action. Therefore the purpose of this paper is to identify drivers and barriers for IWW transportation based on benchmark cases in the Netherlands and based on those findings the study aims to point out strategic actions for Sweden regarding IWW.

2. INLAND WATERWAY TRANSPORT IN SWEDEN vs THE NETHERLANDS

The share of Inland Waterway Transportation (IWT) in Sweden is very low; in 2014 the share of coastal maritime transports was 3%, compared to 88% for road transports with heavy-duty trucks and 9% for rail (Garberg, 2016). The types of cargo mainly transported by IWT are liquid fuels, forestry and mining goods. The Swedish shipping fleet in 2016 was the smallest it had been since 1970 (Regeringskansliet, 2018a). However, the Swedish government has started to take action towards increasing the share of IWT. These actions include dialogues with municipalities, ports and other actors that might become involved and the objective is to find incentives and opportunities to find a collaborative way of integrating IWT in the transport chains instead of land transports. The efforts are also aimed towards informing and motivating single actors to take more responsibility of their own climate effects as well as evaluate how they could increase their share of sea transports. One of the obstacles for IWT development is the poor coordination between the business sector and governmental authorities, resulting in conflicting objectives and contradicting actions (Garberg, 2016).

In Rotterdam, the largest port in Europe in terms of both handled TEUs and cargo gross weight, the modal split for hinterland container transport is 54% road transport, 35% inland navigation and 11% rail transport (BVB, 2017). Konings (2009) describes that even though the IWT share is lower then for road transports, IWT by barge has still grown by 10-15% in the Netherlands over the past decades. When starting with scheduled departures and deliveries as well as extended service offerings at terminals, such as container storage, IWT became a more interesting option for transport buyers. By also adapting vessel and barge sizes to containers and required volumes the competitiveness increased. The ongoing barge transports are mainly line network operations, where the seaport terminals are connected to barge terminals along the river Rhine (ibid.). The total share of IWT during 2017 in the Netherlands was 44.6% and the different kinds of goods were transported; with bulk (ore, sand, mineral oil) being the most represented type of goods 50%, while containers share was 14% (CCNR, 2018). In 2013 the share of IWT for hinterland container transports from Rotterdam was 35% (BVB, 2017). In the Netherlands the institutional financial aid of terminal investments is 25% (Wiegmans & Konings, 2015).

3. THE DRACHTEN CASE

Drachten is a community in the municipality of Smallingerland, which is in the province of Friesland in the northern part of the Netherlands. Several industries are located in an area adjacent to the waterway in Drachten. The waterway is connected to the ports of Amsterdam, Rotterdam, Antwerp and Hamburg, and this connection offers opportunities to reach a wide range of destinations in the world. The harbour in Drachten is included in the Frisian Ports, which is a cooperation between eight small harbours in Friesland. Together they qualify as the third largest inland port in the Netherlands in terms of handled goods volumes. Six companies dealing with different types of goods and customers (for the confidentiality reasons called A, B, C, D, E and F in this study) involved in the project together with the Smallingerland municipality have initiated a pilot project.

4. FINDINGS AND ANALYSIS

Benefits and challenges presented bellow show potential for IWT implementation but the recent trends of changing production principles in combination with flexibility and globalisation imply that freight flows become smaller and deliveries have to be made with increased frequency and over longer distances (Caris et al., 2014). This tends towards road transport since inland navigation in general requires large volumes in order to be profitable (Garberg, 2016). The

challenge then lies in enabling IWT for smaller shippers. All companies involved in the project identified different benefits expected to result from use of IWW that could act as the drivers towards the modal shift to IWT. The findings are summarised in Table 1.

Table 1. Summary of the benefits of IWT identified by the companies/organizations

Company/ Institution	Conge-stion relief	Reli-ability	Fewer accidents	Truck driver shortage	Barge storage	Cost reduction	Consol idation	Sustain-ability
Municipality	X		X			X	X	X
Company A	X		X					X
Company B	X		X	X	X	X		X
Company C	X	X	X			X	X	X
Company D	X						X	X
Company E		X				X		
Company F	X	X		X	X	X	X	X

The companies identified several challenges expected to result from use of IWW; and the same could act as the barriers towards the modal shift to IWT (see Table 2). A general issue raised in a couple of the interviews is that shipping is a conservative business where innovations take more time as opposed to the truck business. This slow pace of development is regarded as a challenge (Rogerson et al, 2018) as well as need for improved resilience (Baroud et al, 2014).

Table 2. Summary of the companies/organizations' expected challenges of IWT.

Company/ Institution	Conserv -ative business	Investm-ent cost	Product characte -ristics	Facilities and capacity	Volumes	Connect -ivity	Delivery time	Weathe r condi-tions
Municipality	X	X	X	X				
Company A			X	X	X		X	
Company B		X	X	X		X	X	X
Company C		X	X		X	X	X	X
Company D		X	X	X	X		X	
Company E	X	X			X	X		X
Company F					X	X	X	X

A modal shift tends to be complicated, which is why BVB has developed a modal shift process that guides companies through their implementation of IWT. BVB views intermodal transportation as a means to collaborate in the transport chain instead of being competitors. The companies presented their key learnings from the preparations of the IWT pilot in Drachten: Be decisive; Change mindset; Evaluate equipment; Have Long-term perspective; Need for Governmental support!

5. CONCLUSION

There are numerous factors influencing implementation of IWT. In order to facilitate the implementation of IWT it is important to have a joint administration system between companies in the transport chain. Coordination and transparency that a joint administration system could bring

to a transport chain could improve efficiency and thereby competitiveness. Efficient logistics require administrative efforts to simplify the process of the otherwise complex intermodal administration (Medda & Trujillo, 2010). The mental shift is one of the most difficult obstacles to overcome. In the modal shift process proposed by BVB, there are some activities that are of the utmost importance. The stakeholder analysis tells the company what actors are required to be closely involved in the process. Their input and encouragement of the process could steer the course of the modal shift. Especially the customers must be approving of the new transport solution and the changes that will follow. The cost-price calculation is a deal breaker as it could show the prosperity of the modal shift, or lack thereof. It could be difficult to realise beforehand what bottlenecks actually occur, which is why the pilot could be carried out before a more thorough bottleneck analysis is conducted. After the pilot the challenges and bottlenecks that occurred can be targeted more specifically.

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