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Stakeholder analysis in intermodal urban freight transport

Behzad Kordnejad*

PhD candidate, Department of Transport Science, Royal Institute of Technology (KTH), Teknikringen 72, SE 100 44, Stockholm, Sweden

Abstract

This study aims to evaluate the feasibility of rail based intermodal transportation in urban regions. The feasibility is evaluated in a bi-sectional manner; first a quantitative assessment is carried out where costs and CO2 emission are estimated for a set of transport alternatives in the greater Stockholm region, Sweden. The most critical parameters are the train's loading space utilization and the transhipment. Second, an analysis is made based on the principles of the 'Delphi' method i.e. experts involved in in-depth interviews, workshops and a survey; regarding stakeholders' perspectives for utilizing such systems. The system must satisfy broader policy objectives of local authorities and commercial corporate interests in order to be adopted.

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Keywords: Intermodal transport;Transhipment Interface; Urban freight transport; Road-Rail

1. Introduction

For other modes to be competitive alternatives for road haulage in urban freight, they have to achieve this despite the fact that the logistical patterns of many industries are adapted to road transportation. Accessibility and flexibility are two areas where road is superior to other modes. On short and medium distances, speed and costs are also favorable for road haulage. Reis et al. (2013). Regarding rail based intermodal transportation; improvement of the cost-quality ratio is needed due to factors such as lack of reliability and punctuality, long lead times, low frequencies

* Corresponding author. Tel.: +46-8-790 88 17; fax: +46-8-21 28 99.
E-mail address: behzad.kordnejad@abe.kth.se

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and limited slots in the timetable. Bontekoning and Trip (2002). Principle strategies for making intermodal rail more competitive cost-wise towards road haulage are:

1. Reducing transhipment cost
2. Reducing the cost for pre- and post-haulage on road
3. Reducing train transport cost
4. Increasing costs for road haulage

Conventional rail freight is commonly competitive on long distances and in line-haul relations between two nodes. However, an intermodal line train, as a transport system for freight differs from conventional rail freight systems, as it similar to a passenger train makes stops along the route for loading and unloading. Due to the frequent stops made at intermediate stations it enables a larger market area being covered by rail in a combined transport system. For intra- and inter-regional relations, the concept has the potential of reducing drayage by trucks to and from intermodal terminals, strategy number (2), and making rail freight competitive also over medium and short distances. Complex bundling concepts for freight e.g. hub-and-spoke or the line network, are considered to have longer average distances and times. However, this disadvantage could be compensated by the additional network links. Thus they can be competitive with unimodal road transport, at least for medium to long distances. Kreutzberger (2008).

The intermodal line train could in theory enable rail freight transport to enter new market segments and to gain further market shares. However, as the transhipment cost in an intermodal transport chain is not proportional to the transported distance; time and cost-efficient transhipment is a prerequisite, strategy (1). Kordnejad (2011); Behrends and Flodén (2012). Transhipment is however a sensitive matter, as it is also required to be reliable and uncomplicated in order to reduce the disturbance sensitivity of the intermodal chain.

Regarding strategy (4), there are factors in favor of non-road modes transport within urban areas aside from societal factors i.e. congestion on the road network and the high environmental impact of road haulage. There are also operational restrictions affecting road haulage in urban freight mainly regarding: vehicle size, loading/unloading procedures and operating hours. Limited vehicle sizes within urban areas implies that unimodal road transhipment is required when entering these areas or alternatively having a low capacity from the start. Other situations where land modes are competing on more equal terms are maritime flows connected to land transports, as the cost of transhipment inflicts both road and rail at ports. “Hinterland” and “Dryport” concepts connecting port terminals with inland terminals through the means of rail shuttles have proved to be successful.

Moreover, the need of reducing greenhouse gas (GHG) emissions from transportation is evident and there is a demand for developing more sustainable transport systems. When sustainability is an objective of ‘combined transport’, the principle should be that the freight should be transported as far as possible with rail and then distributed by road as short distances as possible. EC (2001). However, intermodal rail transport suffers from a number of problems that restrict its competitiveness over short and medium distances. Several intermodal researchers have made contributions in finding the minimum distance that intermodal rail–road transport can compete with unimodal road services. The European results are found in the range 400-600 km. Klink and van den Berg, (1998); Nelldal et al. (2008). Intermodal transport must be able to serve more transport flows, also small flows and on relatively short distances, which can be achieved through implementing higher frequencies and serving more destinations. An intermodal line train making intermediate stops along its route could be a feasible solution for achieving this if it is operated efficiently.

The research project ‘Regional Combined Transport’, which has been funded by Swedish Transport Administration through the virtual research centre SiR-C (Swedish Intermodal Research Centre), has had the main objective of evaluating the feasibility of creating a regional rail based intermodal transport system in the greater Stockholm region. It is one of Europe’s financially strongest regions where a number of consumption intensive and also some production intensive cities are located in proximity to each other. Accomplishing the main objective of the project implies describing the current market for regional combined transport and try to identify existing needs of connections in the freight market as well as evaluating the operational efficiency of the proposed system, mainly regarding cost and CO_2 emission. Three specific research questions directed the methodological design and the execution of the feasibility study: