



Alternative transport network designs and their implications for intermodal transshipment technologies

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Abstract

Six principles for operation of the rail part of intermodal rail freight transport systems are described: direct link, corridor, hub-and-spoke, connected hubs, static routes, and dynamic routes. The first part is a theoretical discussion of the characteristics of the transport network designs. The theory is then applied to intermodal freight transport by analysing how each transport network design affects the need for terminal performance. The discussion includes a classification of existing transfer technologies and an analysis of how well developed technologies meet the demands. It is concluded that there is a sufficient supply of technologies, but some need to be taken further than the current blueprint phase and prove their viability in technical and economic terms.

Keywords: Corridor; Hub-and-spoke; Intermodal transport; Terminal; Transshipment technology.

1. Introduction

Policy-makers strongly believe in intermodal road-rail freight transport (IRRFRT) for solving a multitude of problems related to all-road freight transport. Promoting rail freight is thus an integrated part of transport policy in Europe (European Commission, 2001 and 2006) and Japan (Saito *et al.*, 2004), and it has prospects to make its way also into U.S. transport policy (Brown and Hatch, 2002). The stimulating measures are needed, but there is still a significant challenge for intermodal operators to compete with all-road transport, defined by Konings and Kreutzberger (2001) and Trip and Bontekoning (2002) as the need for a quality leap. Danielis *et al.* (2005) also call for significant improvements.

One area allowing for improvements is the choice of how to operate the transport network. This decision is influenced by the geography, supply of infrastructure, character of the transport demand, and, not least significantly, competition with other traffic modes. Although Cardebring *et al.* (2000) found a wide range of production

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