



Contents lists available at ScienceDirect

Case Studies on Transport Policy

journal homepage: www.elsevier.com/locate/cstp



The role of intermodal terminals in the development of non-bulk rail freight market in Australia[☆]

Hadi Ghaderi^{a,b,*}, Stephen Cahoon^a, Hong-Oanh Nguyen^a

^a Department of Maritime and Logistics Management, National Centre for Ports and Shipping, Australian Maritime College, Launceston, Tasmania, Australia

^b Department of Business Technology and Entrepreneurship, Swinburne Business School, Swinburne University of Technology, Hawthorn, Victoria, Australia

ARTICLE INFO

Article history:

Received 25 June 2015

Received in revised form 27 May 2016

Accepted 24 September 2016

Available online xxx

Keywords:

Rail freight

Intermodal

Terminal

ABSTRACT

The Australian domestic freight activity has doubled in size over the past 20 years, averaging growth of 3.5% per annum with the intermodal sector measuring the fastest growth rate. Thus, as the movement of freight by a variety of modes becomes a dominant model and pressure mounts to ensure that the integration of these modes is efficient and effective the role of intermodal terminals in sustaining the distribution systems becomes more prominent. Using both primary and secondary data, this paper provides an analysis of the trends in the Australian rail freight task and evaluates the current infrastructure in terms of capacity and efficiency to accommodate this trend, particularly in different sub-markets. This detailed understanding is a key facilitator for policy makers and freight operators to better utilise the available resources, as well as informed planning decisions for sustainable infrastructure developments.

© 2016 World Conference on Transport Research Society. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Australia is a large nation far from its international markets. The ability to efficiently and effectively undertake the freight task substantially determines its international competitiveness and national sustainability. The Australian domestic freight activity has doubled in size over the past 20 years, averaging growth of 3.5 percent per annum with the non-bulk (intermodal) sector measuring the fastest growth rate (BITRE, 2014a).

Thus, as the movement of freight by a variety of modes becomes a dominant model, and pressure mounts to ensure that the integration of these modes is efficient and effective (Rodrigue and Notteboom, 2009; Regmi and Hanaoka, 2015), the role of intermodal terminals in the distribution systems becomes more prominent (Bontekoning and Priemus, 2004; Meyrick and Associates, 2006).

Woodburn (2012) states that the development of intermodal freight is regarded as a key mechanism for rail achieving a greater share of the freight markets. Since the introduction of the AusLink Green Paper in November 2002, Australia has been recognising the importance of rail transport in terms of relieving capacity

constraints on roads, whilst lowering freight transport costs and reducing the environmental impacts of freight sector as evidenced by recent government policy documents (NTC, 2009; BITRE, 2010; Infrastructure Australia, 2011).

Despite the growing attention being given to the intermodal transport and the infrastructure planning, the nexus between the intermodal infrastructure provision and intermodal rail market is an under-researched topic. In other words, it is not clear under what conditions provision of intermodal infrastructure attracts freight activity and/or when the increasing freight demand stimulates the need for developing additional infrastructure capacity.

While many authors have already investigated the impact of freight activity on justifying additional infrastructure capacity and vice versa separately (Guy and Marvin, 1996; Lord, 2009; Tsamboulas et al., 2013), dedicated investigation on understanding their relationship is an under-researched area. The provision of transport infrastructure results in trade facilitation, regional development and economic growth (Mathys, 2012; Ghaderi et al., 2015c), while increased freight activity in a region justifies investment, provides economic opportunity and enhanced supply chain connectivity (Ghaderi et al., 2015a).

Understanding this complex relationship will assist policy makers and industry to recognize the economic situations where there is a need for additional freight activity to justify the investment cost of infrastructure and where development of

[☆] A short version of this paper was presented in 2015 International Symposium for Next Generation Infrastructure in Washington, USA (Ghaderi et al., 2015b).

* Corresponding author.

E-mail address: hghaderi@amc.edu.au (H. Ghaderi).

<http://dx.doi.org/10.1016/j.cstp.2016.09.003>

2213-624X/© 2016 World Conference on Transport Research Society. Published by Elsevier Ltd. All rights reserved.

infrastructure will attract extra freight. This is beneficial to create a supply-demand equilibrium and avoid over or/and under supply of infrastructure in a market. This in turn will enhance productivity and competition. Fig. 1 demonstrates the conceptualisation of the relationship between infrastructure provision and freight activity.

Constructed on the above theoretical approach, this research aims to develop a more in-depth understanding of the role of intermodal terminals in the development of the non-bulk rail freight market in Australia by using various published and original data sources. To meet this objective, a review of the international literature on intermodal rail transport including rail is presented first. Then, the Australian rail freight activity and policy is discussed, focusing on the non-bulk task and the changes that occurred since the development of Australian Rail Track Corporation (ARTC). The next section discusses the system of intermodal terminals in Australia in relation to rail activity and evaluates the current challenges faced by the rail sector. This is followed by detailed explanation of the role in the non-bulk freight market as a whole and their contribution in generating freight volumes for rail in different subsystems and the methodology applied. Using both primary and secondary data, this paper provides an analysis of the trends in the Australian rail freight task and evaluates the current infrastructure in terms of capacity and efficiency to accommodate this trend, particularly in different sub-markets. This detailed understanding is a key facilitator for policy makers and freight operators to better utilise the available resources, as well as informed planning decisions for future infrastructure developments. The key findings of this research and implications for managerial practice are presented in Section 6. Finally, the theoretical contributions of this paper with relevant implications for policy makers and industry are outlined in Section 7.

2. Overview of intermodal freight transport research in relation to rail freight activity

In the last two decades, intermodal transport has become a substantial sector of the transport industry (Frémont and Franc, 2010). At the same time, academic literature on intermodal terminals has increased including the promotion of an active role for rail in the non-bulk freight markets. This is mainly due to the increasing challenges created by road congestion, environmental concerns and traffic safety (Caris et al., 2008). Bontekoning et al. (2004) support that intermodal transport research is emerging and there is a need for further research into methods and techniques to address the challenges inherent in this field. In this paper, the European Union's definition of intermodality is applied which is

'the movement of goods in one and the same loading unit (e.g. a container) or vehicle which uses successively several modes of transport without handling the goods while changing modes' (OECD, 2002, p. 77)

As earlier indicated by Woodburn (2008), two research streams can be observed from the available body of academic interest on intermodal terminals. First, there are studies with a theoretical basis that examine the physical development of terminals by applying modelling to optimize the number and location of facilities across the transport networks. This includes research dealing with simulating the terminal design for the efficient operation of freight trains. Secondly, there are studies that are associated with governance and planning frameworks that promote rail in the non-bulk freight markets. The emphasis of this paper is linked with the second research stream which principally focuses on the different policies on infrastructure planning and investment decisions, and competition policies. This area of research is particularly important as any decision on terminal development and location requires a higher level of policy approval (Bergqvist, 2008). However, there is limited and fragmented literature available in this area (Caris et al., 2008). The following discussion briefly presents the relevant literature on intermodal transport in relation to rail activity.

By identifying recent trends in the British non-bulk rail freight market, Woodburn (2007) indicates that intermodal markets (especially to and from ports) are potentially better to capture the premium logistics traffic for rail in the less-than-trainload (LTL) markets. In the same year, Tsamboulas et al. (2007) developed a methodology to assess the potential of a specific policy measure to produce a modal shift in favour of intermodal transport. Their proposed methodology is a valuable tool for policy makers to assess whether a specific transport policy positively affects intermodal transport (Tsamboulas et al., 2007). This is achieved by increasing its mode share and assessing the competitiveness of intermodal transport to and from a specific region. This approach can also be potentially beneficial to assess suitability of a particular policy to promote rail in regions where different intermodal markets exist.

A key element for non-bulk rail freight transport to achieve a greater share is the extent to which intermodal terminals meet the requirements of the system. In Woodburn's (2008) investigation of the relationship between the development of intermodal terminals and service provision in Britain, he concludes that effective land-use planning for the development of rail terminals is essential to attract regional cargo and increase efficiency. Roso et al. (2009) took a different perspective by examining the concept of dry ports in relation to rail operations. Their contribution suggests that distant dry ports assist rail become more competitive, which results in a greater modal shift from road. This is potentially beneficial for rail operators as a distant terminal offers exponential economies of scale.

In Dablanc's (2009) investigation of the regional policies for intermodal rail freight services, she focuses on the reluctant role of the local governments to promote rail in France. The reluctance was explained due to the conditions of limited infrastructure capacity, low productivity levels, and a high cost of labour. The operation of intermodal terminals is a labour intensive task. This is especially true in the case of Australia where low regional volumes plus high labour costs are considered as key barriers to a commercially viable rail freight system. The intermodal sector has also gained significant attention in Europe over the last two decades. A recent study conducted by Woodburn (2012) examines the evolution of the intermodal sector in Britain by focusing on the contribution of different sub-markets to the overall growth trend. The findings of this study reveal that most of the recent intermodal rail growth in Britain has resulted from greater volumes carried

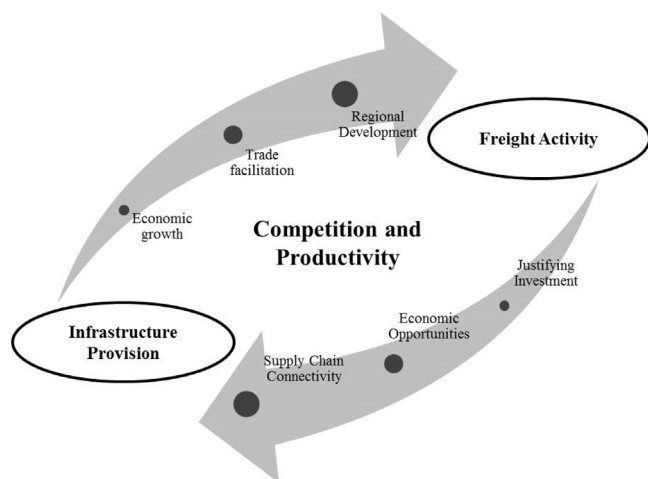


Fig. 1. Conceptual framework.

Download English Version:

<https://daneshyari.com/en/article/4911685>

Download Persian Version:

<https://daneshyari.com/article/4911685>

[Daneshyari.com](https://daneshyari.com)