



A strategic appraisal of the attractiveness of seaport-based transport corridors: the Southern African case



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ABSTRACT

The past decade has brought significant growth at, and competition between regional gateway ports and intermediate hub container ports in Southern Africa. Corridors are the essential link between these ports and continental hinterlands. Capacity expansions of seaport and corridor networks (resources), in conjunction with efficient transport services/operations (capabilities) are important to guarantee the attractiveness of a port–corridor combination. This paper focuses on the attractiveness of three Southern African container gateway port corridors (Southcor, Natcor, and Trans-Kalahari Corridors), all contesting the same continental hinterland, namely, Gauteng. By means of a corridor stakeholder survey, this study merges the corporate strategy concept of resource and capability appraisal, with various theoretical principles of corridor attractiveness. The resultant adapted resource and capability corridor appraisal model is then applied to the three corridor cases in question. Consequently, this study presents an empirical framework which identifies each corridor's key strengths, key weaknesses and the extent to which each corridor is deemed 'attractive' by its stakeholders. Furthermore, this study reconciles theoretical assumptions of corridor attractiveness against actual perceptions of corridor attractiveness from surveyed stakeholders.

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1. Introduction

Containerization is a key driver of competition and cooperation between regional container gateway ports and hub ports. Capacity developments in new and existing ports are intensifying competitive dynamics and act as catalyst for an increased focus on hinterland corridors in a given port system. Existing literature provides conceptual approaches on corridors for example with respect to corridor strategies (Notteboom, 2012), corridor best practices (Arnold et al., 2005), corridor co-ordination (Van Der Horst and De Langen, 2008) and the integration of gateway ports and corridors (Notteboom and Rodrigue, 2005). However, methodological and empirical approaches for assessing the attractiveness of corridors in a given port system are to some extent lacking.

The objective of this paper is to provide a sound methodology which determines the attractiveness of a freight corridor to its stakeholders in a given port system. Principles of competitive analysis as found in management sciences are adapted and applied to

the study of transport corridors for containerized cargo between seaports and inland ports. The corporate strategy concept of resource and capability appraisal is used in relation to a theoretical framework of corridor attractiveness. Importantly, corridor attractiveness in this study is viewed as a corridor's inherent/internal value proposition to stakeholders. This appraised 'attractiveness' is a precursor towards achieving corridor competitiveness (Ng, 2006). The paper presents an empirical framework which first, appraises the corridors which link various seaports in the same container system to one contestable hinterland. Secondly the framework provides a clear representation of each corridor's key strengths and key weaknesses as determined by the main stakeholders (suppliers and users of services). The outcome is a quantified internal corridor appraisal which identifies each corridor's attractiveness in relation to a given port system and which highlights key areas requiring intervention.

The paper is arranged as follows; first a theoretical framework of container port hubs, intermediate hubs and freight corridors grounds the study. This is followed by a discussion of the dimensions of corridor attractiveness from three perspectives (infrastructure, logistics and management). Third, the corporate strategy model of resource and capability appraisal is introduced and adapted to the port and corridor perspective. Fourth, a five step

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methodology for the appraisal of corridors in a given port system is outlined and a case for its application is put forward. Finally, the methodology is applied to three port corridors in Southern Africa namely the Natcor, Southcor and Trans Kalahari (TKC) corridors.

2. Theoretical background on corridors, gateways, hubs and hinterlands

The literature reviewed for the purpose of this research is focused on theoretical views on corridor strategies, container hubs and their integration into contestable continental hinterlands. Hubs are facilities that serve as transshipment or switching points (e.g. in telecommunications), functioning as connection centers among several origins and destinations (Aversa et al., 2005). Rodrigue (2012) describes intermediacy as a focus on the terminal as an intermediate point in the flows of passengers or freight. Hayuth and Fleming (1994) pointed out that intermediate locations can emerge between origins and destinations. Intermediate nodes are added to a network when considered appropriate by the network operators in view of overall performance of the network. Intermediacy, specifically port hubs have become increasingly prevalent in container liner shipping. Containers from intermediate hubs are further forwarded (fed) with smaller vessels to other ports or delivered into the continental hinterland via rail, road or barge.

Gateway ports service mainly captive but also contestable gateway cargo and act as nodal points where intercontinental transport flows are shipped onto continental axes/corridors and vice versa (Van Klink and Van den Berg, 1998; De Langen, 2007). Gateway ports are in a unique position to stimulate intermodal transport and use intermodal systems as a tool to enlarge their hinterlands. According to Notteboom and Rodrigue (2005) and Rodrigue and Notteboom (2010), in the sixth phase of the spatial development of port systems (the so-called port regionalization phase), gateways achieve a higher level of synchronization with their hinterlands through specialized high capacity corridors of circulation serviced by rail or barges. In relation to corridors, Arnold et al. (2005) stipulates that activity at the end of an international gateway can be increased through the development of a corridor.

A corridor is the main paradigm of inland accessibility as it is through major axes that port terminals gain access to the inland distribution systems (Notteboom and Rodrigue, 2005). Rodrigue (2012) defines a corridor as a linear orientation of transport routes and flows, connecting important locations that act as origins, destinations or points of transshipment. Corridors are multi-scalar entities depending on what types of flows is being investigated. Thus, they can be composed of streets, highways, transit routes, rail lines, maritime lines, or air paths. A freight corridor is a linear orientation of freight flows supported by an accumulation of transport infrastructures and activities servicing these flows. Flows can be divided by mode and by the infrastructure servicing them. Table 1 provides an overview of four types of corridors in terms of the corridors role and service catchment area. The categorization

of a corridor into a specific 'type' is largely based on geographical location. Proximity to a gateway port, border crossing or a major production/consumption hinterland serves as the primary boundary line for these corridor categorizations. Specific corridors can be subject to a change in terms of 'type' (domestic, transit and foreign). Trade liberalization (regional and international) as an economic growth strategy in developing economies, for example, can result in a change in derived demand for international shipping and consequently change the destination of freight moved along the corridor. In effect, a domestic corridor could become more transit, foreign or hybrid by virtue of a trade policy change as opposed to just the geographical location. Corridors have become the object of intense modal competition with the growth of movements of passengers and freight. Freight corridors are the dominant convergence paradigm of urbanization integrating global, regional and local transportation and economic processes in a geography of distribution (Rodrigue, 2004).

3. Attributes of corridor attractiveness

In the previous section we defined corridors in the context of ports. This section identifies the main attributes and dimensions of a corridor which make it attractive and competitive. Corridor attractiveness in this study's context is viewed as a corridor's inherent/internal value proposition to stakeholders. This appraised 'attractiveness' is a precursor towards achieving corridor competitiveness (Ng, 2006).

In a benchmarking study on African corridors, Pelletier and Alix (2011) apply an adapted logistics capability index (LOCALI) of seven factors in order to evaluate each corridor. These seven factors include, distance from gateway to market, transit time in days, logistics performance index, political stability, security issues, environmental conditions and gateway to market costs. In doing so, the authors indicate that these factors can be adjusted according to the diverse requirements of changing operational conditions. Arnold et al. (2005) evaluates a corridor's performance from three perspectives. Firstly, the corridor's physical infrastructure i.e. the physical capacity of the links and nodes including the level of utilization of the corridor. Secondly, the quality of services provided for the goods moving along the corridor. The performance at the level of the quality of service has time and cost dimensions linked to specific links and nodes. The third performance perspective is the movement of goods in the corridor. This similarly has a time and cost perspective. However, these variables are disaggregated for transport services on the links and the processing services at the nodes of the corridor.

Fig. 1 combines insights from various scholarly studies on corridors and hinterlands from Arnold et al. (2005), Rodrigue and Notteboom (2010), Rodrigue (2004), Havenga et al. (2012) and Van Der Horst and De Langen (2008) in order to determine the three dimensions of a corridor which make it attractive. Each author's theoretical contribution towards every dimension of our

Table 1
Types of corridors.

Type corridor	Service area	Example
Domestic	Designated route within the national transport network	Primarily used to distribute goods within a country
Transit	Transport the cargo of other countries. Bounded by border crossings	Promote regional integration and economic cooperation between neighboring states
Foreign	Primarily to transport the imports and exports of a country	Either an endpoint at a gateway/border crossing or internal facility for clearing cargo
Hybrid	A combination of the three	

Source: Adapted from Arnold et al. (2005).

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