

Potential of short sea shipping in Brazil

Nayara A.L. de Valois, Afonso Celso Medina & Rui Carlos Botter

University of São Paulo, São Paulo, Brazil

ABSTRACT: Brazil has a transport system with little presence of intermodality and use of Short-Sea Shipping. Nevertheless, these are goals for Brazilian waterborne transportation matrix, which is expected to exceed 13% going to 25% in 2025. Currently, Brazilian transportation matrix isn't balanced surpassing that of other countries in the use of the highway, where approximately 63% of the total cargo is transported. The aim of this paper is to make a diagnosis on the investigative potential use and improvement of Short-Sea Shipping in Brazil. To base this effect, we present a new concept of "fast coastal terminals", its conceptual model and potential gains in an intermodal transportation network.

1 INTRODUCTION

Traditionally, the concept of Brazilian Short-Sea Shipping (SSS) or Coastal Shipping is relieved of the logistics chain and intermodality. The under-representation of intermodality in Brazil exposes the low use of waterways despite of the dissemination and awareness of the benefits to the Brazilian public transport network.

According to Jones *et al.* (2000), intermodal transportation should be generally defined as "the shipment of cargo and the movement of people involving more than one mode of transportation during a single, seamless journey". As Yevdokimov (2000) argued that "intermodal transport requires the physical transfer of cargo between different modes, in a systemic perspective of the transport chain, from collection to distribution, minimizing downtime of goods in their handling between origin and destination". Even with the prospects for growth in cargo handling in Brazilian ports, although some companies have adopted logistics solutions that address the use of waterways, the country is still undergoing political and regulatory reforms, and what it is seen is a slow progress in the dissemination of intermodality, even with a low use of Short-sea Shipping, which represented less than 23% of cargo handling in the country in 2010.

The use of intermodality associated with Coastal or Short-sea Shipping, as featured on Botter *et al.* (2007) "is a necessity for the development of transportation sector in Brazil" and, in a sense, a necessity for achieving the goals of the National Plan of Logistics and Transport—PNLT. The concept also presented on Botter *et al.* (2007) for Short-Sea Shipping is understood as "a freight transport logistics chain that relies on one of its links in the maritime transport between points in the Brazilian

coast". For authors, SSS should not be relieved of its intermodal nature, since it is dependent on the maritime routes between the terminals and the points of origin and destination and could bring great opportunity for companies to become more competitive by reducing logistics costs and generating greater reliability in service.

Thus, it is suggested a new concept in this article, which considers the SSS inserted into an intermodal transport chain for movement of goods. It is also presented the concept of "fast coastal terminal", with some suggestions to make it competitive. This discussion does not yield a simple improvement to the current Brazilian SSS, but can generate an increasing process of workload attraction to the transportation sector.

This article is divided into four main parts: 1) primary diagnosis of Short-sea Shipping in Brazil; 2) the legal, economic and environmental aspects to implement coastal terminals in Brazil; 3) comparative analysis with the experiences of the European Union, mainly with projects such as the Motorways of the Sea (MoS) and 4) recommendations and suggestions.

2 PRIMARY DIAGNOSIS OF SHORT-SEA SHIPPING IN BRAZIL

According to Brazilian law, it is considered as Short-Sea Shipping (Law 10,893/04): "a coasting navigation that is held between Brazilian ports, using exclusively the sea or the sea and the interior". A broader concept, however, is presented by CGEE (2009) for merchant shipping, based on Regulation for Maritime Traffic (RTM, 1992), classifying SSS as:

- Great Cabotage—held at the merchant shipping between Brazilian ports and or harbors of the

Atlantic coast of South America, West Indies (the Caribbean) and the East coast of Central America, excluding the ports of Puerto Rico and the Virgin Islands;

- Small Cabotage—held between Brazilian ports, the vessel not moving away for more than 20 nautical miles from the coast, or 37.04 km and making large-scale ports whose distance does not exceed 400 nautical miles (740.8 km).

Since the early 1930s the SSS in Brazil is stunted by investments in new roads, new types of vehicles for heavy loads and providing direct service to the final customer. The greatest period of industrial growth in Brazil, between 1940 and 1980, was also marked by high growth of road transportation, which now competes strongly with the sea transportation of goods. This growth took place by the technological development of vehicles, maintenance and construction of new roads and fuel subsidies, which were happening successively in those years.

Many researchers have already developed some studies with the objective of diagnosing the Coastal Shipping in Brazil. Some of these studies, as Moura *et al.* (2008) and CGEE (2009), present major obstacles and difficulties for SSS implementation in Brazil and a diagnosis of the waterway industry and shipbuilding in Brazil, respectively. Year after year, the Brazilian SSS has registered some growth, but in short steps. It may be noted (Fig. 1), as shown by the National Waterborne Transport Agency—ANTAQ statistical report, the small growth in the use of SSS in Brazil, between 1998 and 2010.

In fact, the percentage share of SSS in the cargo movement in Brazil fails to reach the mark of 23%, and by contrast, often show declines, as the 4% between 1999 and 2009 (Fig. 2).

Thus, the barriers of the SSS in the maritime sector may be listed if observed the gaps in regulatory issues, lack of Government incentives, increased rates in ports, fleets with aged vessels, the need for more modern equipment in various Brazilian ports and new investments for the integration of the transport logistics chain.

One of the problems faced by SSS, according to Moura and Botter (2010), is the imbalance that exists in the flow of cargo between the regions of the country. The irregular distribution of goods is also caused by the disparity between modes of transportation, especially because most cargo is transported by road, with roughly 63% stake in array of cargo transportation. Studies for the National Logistics and Transport Plan—PNLT claim that the goal of participation of waterborne transport in Brazil must overcome the mark of 25% in the transport matrix, in 2025. One way to improve this situation would be to provide a different vision for

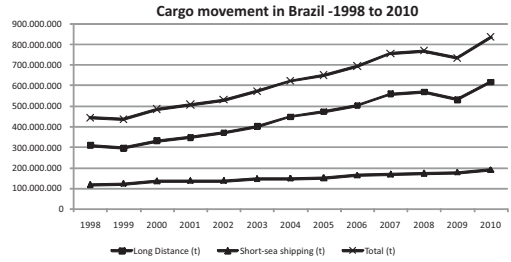


Figure 1. Cargo movement in Brazil between 1998 and 2010.

Source: ANTAQ annual statistical report of ports, 2010.

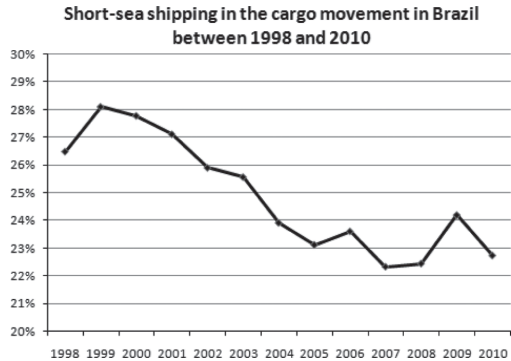


Figure 2. SSS share in the cargo movement in Brazil between 1998 and 2010.

Source: ANTAQ annual statistical report of ports, 2010.

the use of Short-sea Shipping, with appreciation of the various spheres of society and, therefore, a new concept of SSS as part of intermodal transport chains for cargo movement. The concept of SSS can be expanded, not only the one that has its origin and destination within the national territory (Small Cabotage), it can become the integration of transport logistics chain.

Among the main advantages of developing a new model for Brazilian SSS, there are: managing door-to-door cargo integrity, security, agility in customer delivery, competitive cost, integration across all Brazilian regions, using containers, based on a predictable transportation with weekly departures and arrivals. In addition, reduced use of road transportation, reduced congestion in the port access, lower pollutant emissions in port areas and the consequent decrease in the levels of greenhouse gas emissions in the country. Also, with the entry of new vessels to serve domestic market, through the growth of the Brazilian shipbuilding industry, the trend is that the volume of cargo transported (demand) in SSS earns greater impetus in the coming years.

In this context of low competitiveness of Brazilian SSS and low supply of intermodal systems covering coastal shipping on one of its portions, the concept of an *intermodal transport network using "fast" coastal terminals* can expedite the process of transferring cargo between modals, increase speed of operation, making a competitive coastal shipping under the aspect of the service level and enabling the door-to-door carriage.

Knowing this, Figure 3 shows the schematic representation of this new concept (Botter *et al.*, 2007).

So, the *"fast" short-sea terminal* concept is a terminal that is part of an intermodal network, in which the SSS as "a cabotage traditional transport" is the basis of it. It adds the possibility of creating specialized handling for SSS, since the process becomes integrated with other modals and facilitates the transfer of cargo operation at the points of origin and destination. These "fast" terminals for SSS must meet certain proposed criteria, such as:

- To have a different treatment of cargo, with simplified rules for loading, unloading and clearance;
- To own in its surrounding a cargo consolidation center (dry-port) to facilitate the transshipment of containers;
- To facilitate the operation of the Multimodal Transport Operator (OTM);
- To have competitive prices and rates, for better utilization of port infrastructure;
- To have a plan for continuous improvements to modernize equipment, maintenance and control systems;
- To reduce port expenses, travel and operational costs;
- To invest in qualification and training of port operators;
- To schedule regular routes for containers;
- To invest in specialized ships and information technology;

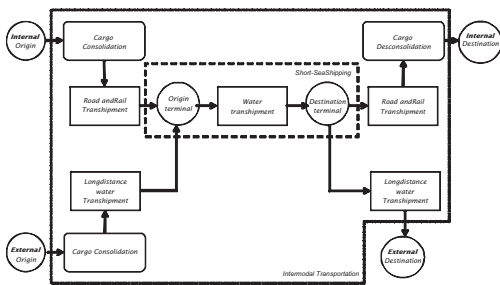


Figure 3. Schematic representation of intermodal transport involving Short-sea Shipping.

- To integrate with other transport modes, with appropriate access to rail and road;
- To improve management of operations, to avoid delays or rescheduling;
- To open market to foreign flagged ships and concessions;
- To adequate legal and regulatory procedures for faster transfers, etc.

The concept of "fast terminals" can turn the Short-Sea Shipping in a most competitive transport of goods in Brazil as it attracts more cargoes to the terminals, in a viable process and with operational, documentary and legal features for the differentiated movement of cargo with the use of exclusive vessels.

3 LEGAL, ECONOMIC AND ENVIRONMENTAL ASPECTS FOR IMPLEMENTING FAST COASTAL TERMINALS

Few studies have been conducted on the potential of SSS cargo attraction in Brazil. An initial estimate can be constructed by the size of the transport market. According to the Brazilian transportation sector in 2010, about 1.2 billion tons of various types of cargo were moved on the Brazilian highways. Excluding bulk handling from this volume, this means that nearly 36 million tons of cargo were handled during the year in trucks, considering flows with scope for Short-sea Shipping, of intrastate and interstate, non-competitive for the maritime. This corresponds to approximately 2.2 million TEUs.

According to CGEE (2009), Brazilian Short-sea Shipping has a great potential to achieve a change in the transportation sector and increase its competitive advantage. "A favorable scenario for Brazil is the development of the port terminals to establish more container operations and consequently coastal lines in the country, complementing long-distance services and *Mercosul*" (CGEE, 2009). It is estimated that companies providing SSS in Brazil handled 348,000 TEUs in 2010, so 23% of the total potential SSS market for the country. This indicates that there is a large market, about three times the current level, not yet met, or yet undeveloped, which presents opportunities to capture market share from road transportation.

However, some improvements should be set out in the maritime transport sector to enable the widespread use of SSS as: adequacy of the national fleet and remodeling in the laws of restrictions on foreign vessels. In recent years, Brazil has seen economic growth and positioning in the ranking of Nations with financial stability and

prospects for increasing income and decreasing social differences. New port laws and actions in the transportation sector have shown positive results with investments in the areas of transportation, energy, sanitation, housing and water resources, for example, PAC—a growth acceleration program designed for Brazil, with infrastructure investments of R\$ 503.9 billion, near US\$ 318 billion, for four years. For the logistics infrastructure, the estimated investments from 2007 to 2010 was R\$ 58.3 billion, near US\$ 37 billion, however in a report of completed actions, one can observe that many of the planned projects for the transport area have not been completed yet, according to the Institute of Applied Researchs—IPEA (2010), forecasted until December, 31st.

In greater detail, the Table 1 shows the status of projects for the transportation—logistic infrastructure in late 2010.

These initiatives still face known deficiencies, including: lack of an appropriate logistics infrastructure for receiving and distributing goods; few investments for re-rigging of port terminals; lack of harmonization for intermodality (terminals for integration between modals); regulation for transport operation with more than one modal; excessive bureaucracy in customs clearance; regulatory, technological and legal bottlenecks; lack of concern with environmental issues; among others.

Other weaknesses are the lack of adequate road access to the port terminals, the need for modernization of loading and unloading equipment at terminals, low technological level on cargo unitization, making it difficult to shift between modals and lack of regular supply transport service.

Some studies, such as Fernandes (2001), Andrade (2003), Botter *et al.* (2007) and Gonçalves (2008), emphasize regulatory aspects that still hamper the development of SSS, among them, for the transport of general cargo, the Merchant Marine Fund—MMF creates bureaucracy affecting the competitiveness of industry and legislation concerning new shipping companies operating in the sector, which shall have a Brazilian vessel or they shall have at least one vessel being built for

operation permit. These and other aspects create barriers for new competitors.

Regarding the navigation itself, it falls into two problems: low operating speed compared to other modes of transportation and few routes supply, as measured by the frequency of trips per week. When adding the excessive port times, arising from tax and customs clearance and port restrictions on coastal accesses, there is a huge loss of competitiveness for the Brazilian Short-Sea Shipping.

Therefore, it is clear the need for change in the Brazilian regulation, with regards to improvements to the terminals. Furthermore, it is known the dependency on other modes for the correct operation of water transportation, evidencing the need for modernization of Brazilian ports, development of new terminals, expansion and refurbishment of railways and roads.

4 COMPARATIVE ANALYSIS WITH THE EXPERIENCES OF THE EUROPEAN UNION, MAINLY PROJECTS AS THE MOTORWAYS OF THE SEA (MOS)

International experience in the field of SSS is fundamental to understanding the situation of Brazil and to conduct a comparative analysis appropriate to the country's needs, in aspects of regulation, economy and incentives. Unlike the concept of Short-Sea Shipping used by the European Community, the greatest divergence of Brazilian SSS is presented in the door-to-door managing, verified in cargo handling operations in these countries, which may also be justified by wide use of railroad to move their goods. Undoubtedly, the European Union (EU) is the economic bloc of countries that have the most developed SSS system. What favors their water transportation is mainly the possibility of network connections between countries, making the system more than 67,000 kilometers of coastline and over 25,000 kilometers of inland waterways, with greater turnover of 430 million tons per year, according to ANTAQ (2007).

Inland direct connections between seaports and interior ports of the European Union gives access to several other ports and still rely on vessels that allow this access, increasing the possibilities of coastal navigation. Moreover, the standards for SSS in the EU facilitate the freedom of services provision between member countries and the adoption of measures which highlight the proposals for simplification of operation with single administrative offices and the integration of the logistics chain between agents (chargers, shipowners, shippers, etc).

Among the measures adopted, the Motorways of the Sea (MoS) are the latest and which

Table 1. Status of the logistic infrastructure projects: 69% running in 2010.

Modal Transportation	Designing, licensing or bidding	Under construction	Number of projects	% Running
Road	253	612	865	70,75%
Rail	9	4	13	30,77%
Ports	17	6	23	26,09%
Waterways	4	39	43	90,70%
Airports	16	10	26	38,46%
Total	299	671	970	69,18%

Source: IPEA, 2010.

strengthen the logistics integration strategies of Short-Sea Shipping. The “Motorways of the Sea” was a project defined between EU countries to help achieve goals such as alleviate the major land bottlenecks of the European transport system (replacing road transport), setting up an efficient intermodal system “where the goods are quickly transferred between modes through optimization of port operations, overcoming natural boundaries and sensitive areas as well as other geographical barriers” (“letter of Naples” of EU Transport Ministers, July 2003). The proposed concept for MoS provides an integrated service and system (BAIRD, 2007).

The four main corridors were planned for the MoS in the Baltic Sea, Western Europe, Southeast and Southwest Europe. One can, for example, use the project PORTMOS (Portuguese Motorways of the Sea) as benchmarking. The concepts developed for Portugal, which provides seamlessly services and operational, administrative, bureaucratic and informational systems, as well as logistical infrastructure, enable door-to-door transport of goods (maritime corridors) as an alternative to road transport, showing an effective, affordable and competitive process (PORTMOS, 2008).

In recent years, the European Commission and other countries have promoted extended research activities within research and development framework programs, such as Motorways of Sea, which focused on making short-sea shipping lanes viable, where it is possible to compete with road transport. Until now the obtained results have identified opportunities and constraints for the development in these countries.

For the Brazilian SSS market it can be observed firstly that the adjustment system suffers bureaucracy in clearance of SSS cargo with high taxes and deficiency to demand and lack of vessels. The standard rules for reserve flag, which guarantees to national flag vessels the right to carry cargo and passengers between domestic ports, do not lead to discussions that can develop the sector. Other differences are the high cost of vessels produced in national shipyards and harbors maintenance fee, seen by operators as a reducer of competitiveness.

5 RECOMMENDATIONS AND SUGGESTIONS FOR IMPROVEMENTS IN BRAZIL SHORT-SEA SHIPPING

Bureaucracy, costs and ports inefficiencies are the most significant factors that affect the attractiveness of SSS in Brazil, according to the vision of industry users. However, some stimulus measures can be developed for larger subsidies for construction and differential tax treatment.

One important aspect for SSS in Brazil is the increase of transport supply and cargo demand, which does not necessarily depend on public funding, but access to foreign vessels at an affordable price. Decisions to use tax incentives—additional freight for renewal of the Merchant Navy—and a special Brazilian registry for ships could have been effective, but not to become a general rule for all fleets of ships and craft. Another important aspect is the freight of imported and exported cargo which can improve competitiveness, but needs to be evaluated as a reduction of freight charges.

The development of a conceptual model for the intermodal network with participation of Short-Sea Shipping can open the discussions for the establishment of “fast” terminals with characteristics to leverage the change in structure of intermodal transportation, particularly in the transport of containers in the country. With these terminals, cargo transfer process would be facilitated, also ensuring fast port processes, allowing the door-to-door service and attracting new players to the water transportation network.

REFERENCES

- ANTAQ—Agência Nacional de Transportes Aquaviários. 2007. Relatório Final do projeto “Diagnóstico da navegação de cabotagem visando à regulação do setor”. Universidade de São Paulo—USP. Apoio FINEP—Financiadora de Estudos e Projetos. 185p.
- BAIRD, A.J. (2007) The economics of Motorways of the Sea. *Maritime Policy & Management*, 34(4), 287–310.
- BARAT, Josef (org.). *Logística e transporte no processo de globalização: oportunidades para o Brasil*. São Paulo: Editora UNESP: IEI, 2007. ISBN 978-85-7139-758-3.
- BOTTER, R.C.; MOURA, D.; LOBO, G.; MEDINA, A.C. *Diagnóstico da navegação de cabotagem visando à regulação do setor*. Relatório Final Projeto FINEP/ANTAQ/USP. 2007.
- CGEE—Centro de Gestão e Estudos Estratégicos. *Tópicos estratégicos para investimentos em CT&I nos setores de transporte aquaviário e de construção naval*. Brasília—DF. 2009. 190 p. ISBN 978-85-60755-17-2.
- FERNANDEZ, Enrique L., J. and J. Manuel Fernández N., 1998, Privatization of Ports in Developing countries. The case of container terminals, Paper presented at the 8WCTR, Antwerp, July, 1998.
- JONES, W. Brad; CASSADY, C. Richard; BOWDEN, Royce O. Jr. Developing a Standard Definition of Intermodal Transportation Symposium on Intermodal Transportation. 2000. *Transportation Law Journal*. v. 27. no. 3. p. 8 (345 to 352). Available on <<http://heinonline.org/HOL/Page?handle=hein.journals/tportl27&id=447&collection=journals&index=>>>.

- MOURA, D.A.; BOTTER, R.C.; MEDINA, A.C. Diagnosis of Brazilian short-sea shipping and its main obstacles. In: The 12th International Congress of the International Maritime Association of Mediterranean- IMAM: Taylor & Francis, v. 1. p. 593-592, Varna, Bulgaria, 2007. ISBN 978-0-415-45523-7.
- NAZÁRIO, Paulo. Intermodalidade: Importância para a Logística e Estágio Atual no Brasil. Artigo logística ILOS. 2000. Disponível em http://www.ilos.com.br/site/index.php?option=com_content&task=view&id=1012&Itemid=74.
- PAIXÃO, A.C. and MARLOW, P.B. (2002) Strengths and weaknesses of short sea shipping. *Marine Policy*, 26(3), 167–178.
- PAIXÃO, A.C. and MARLOW, P.B. (2005) The competitiveness of short sea shipping in multimodal logistics chains: Service attributes. *Maritime Policy & Management*, 34(2), 363–382.
- PERAKIS, A.N. and DENISIS, A. (2008) A survey of short sea shipping and its prospects in the USA. *Maritime Policy & Management*, 35(6), 591–614.
- PORTMOS—Integração do sistema marítimo-portuário nas auto-estradas do mar. 2008. Available on <http://www.planotecnologico.pt/InnerPage.aspx?idCat=73&idMasterCat=30&idLang=1&idContent=1519&idLayout=4&site=planotecnologico>.
- YEVDOKIMOV, Yuri V. Measuring Economic Benefits of Intermodal Transportation. 2000. *Transportation Law Journal*. v. 27. no. 3. p. 14 (439 to 452). Available on <http://heinonline.org/HOL/Page?handle=hein.journals/tportl27&id=447&collection=journals&index=>>.