

# **OPPORTUNITIES AND CHALLENGES FACING CANADIAN PORTS**

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## **Introduction**

Canadian container ports operate within the global economy. It outlines international trade trends and the opportunities and challenges they offer to North American ports. The operating environment of Canadian ports is described leading to an outline of attributes needed for port success in North America's competitive continental transportation and logistics system.

The paper reviews the growth of the world's maritime fleet. The current development of gateways and trade corridors is considered along with the impact of container trade growth on ports. Opportunities for Canadian ports to serve the North American container trade are outlined and the paper concludes with the key elements crucial for the success of Canadian ports.

## **Global Maritime Fleet**

As would be expected with continued world trade growth, the global maritime fleet has increased as shown in table 1. By 2007, the fleet size increased by 58 percent in dead weight tonnage over a 17-year period. Table 1 also shows a decline in general cargo (break-bulk) vessels being offset by a significant increase of 392 percent in container ship tonnage. The growth of the world fleet was driven by:

- Increases in energy and mineral cargoes (liquid and dry bulks) derived from a growing demand for these raw materials from North America, Europe, Japan and more recently, China.
- Economic globalization and enhanced trade liberalization.
- Technical improvements in ships and terminals facilitating productivity and lower freight costs (e.g. containerization).

- Economies of scale being achieved by use of larger ships to reduce the cost of moving goods.

**Table 1: World Fleet by Principle Vessel Types (dwt x 1,000)<sup>1</sup>**

<b>Year</b>	<b>Oil tanker</b>	<b>Dry bulk</b>	<b>General cargo</b>	<b>Container</b>	<b>Other</b>	<b>Total</b>
<b>1990</b>	246	235	103	26	49	659
<b>2000</b>	285	265	100	75	74	799
<b>2007</b>	383	368	101	128	63	1043
<b>% Chg 90-07</b>	55%	57%	-2%	392%	29%	58%

### **Trade Corridors and Gateways**

As a result of the earlier Free Trade Agreement (FTA) with the US and the subsequent NAFTA agreement that included Mexico, Canada's international trade tended to shift north south. By the mid-1990's north-south intermodal railway traffic surpassed east-west movements. CN Rail's US acquisitions in the 1990's reflected this shift in trade in obtaining rail access through the central parts of the US into northern Mexico.<sup>2</sup> The north-side trade shift led to the development of numerous trade corridor promotion organizations across the continent. Trade corridors have been defined as "streams of products, services and information moving within and through communities in geographic patterns."<sup>3</sup>

During the past decade governments paid considerable attention to trade corridors seeking to provide public investment in designated areas to facilitate trade. Most of the proposed north-south trade corridors link US Interstate Highways with their Canadian

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<sup>1</sup> UNCTAD, *Review of Maritime Transport 2007*, Table 5, pp. 24.

<sup>2</sup> C. McMillan, *Embracing the Future: The Atlantic Gateway and Canada's Trade Corridor*, Asia Pacific Foundation of Canada, Vancouver BC, November 2006, p. 7.

<sup>3</sup> M. Van Pelt, "Moving Trade: An Introduction to Trade Corridors", Work Research Foundation, Hamilton ON, 2003.

counterparts. However, other than some improvements in selected border crossings, little has been achieved. A coherent, rational integrated North American highway system has yet to be developed.<sup>4</sup>

By the turn of the century, Canadian trade was increasingly global reflecting a growing trend of outsourcing manufacturing components and products to other countries, particularly in Asia. Such outsourcing led trade corridor proponents to consider ports as “gateways” connecting proposed corridors to the global marketplace.

In the Canadian context, the first gateway is the Asia-Pacific Gateway and Corridor Initiative focused on the lower BC mainland, Prince Rupert and the ports’ hinterlands. The Asia-Pacific Gateway Initiative in the Vancouver region received \$591 million in federal funding to supplement provincial, municipal and private support to develop and enhance essential transportation infrastructure. The aim of the Initiative is to reduce congestion and ease the flow of goods in and out of the major ports of Vancouver and Prince Rupert. Recently, as part of the continued Asia-Pacific Gateway Initiative, the federal government took the further step of amending the Port Authorities Management Regulations to enable the three Vancouver area port authorities (Vancouver, Fraser River and North Fraser River) to amalgamate into one unit – the Vancouver Fraser Port Authority.<sup>5</sup>

The Halifax Gateway Council was established in 2004. Part of its objective is to tap into the growing container trade from/to Asia being diverted through the Suez to the East Coast due to congestion concerns in West Coast ports. Recently, Nova Scotia’s Premier touted the benefits of developing a new private sector \$300 million container terminal on a green field site in the Canso Strait area as part of the

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<sup>4</sup> S. Blank and S. Golob, “A North American Transportation Infrastructure Strategy”, *CTRF 2007 Proceedings*, Winnipeg, June 2007, pp. 709-723.

<sup>5</sup> “Ottawa takes next step to integrate B.C. Lower Mainland port authorities”, *Canadian Sailings*, July 2, 2007, p. 27.

Atlantic Gateway initiative.<sup>6</sup> Sydney and Searsport Maine have joined the queue, seeking container terminals for their ports.<sup>7</sup> Meanwhile, Halifax and Saint John continue to seek additional container throughput for their existing under-used container terminals.

The Halifax and Nova Scotia focus on their own container terminals in the Atlantic Gateway initiative does not appear to fit the federal government's criteria of an integrated system. Al Soppitt, CEO of the Saint John Port Authority called for a broader, more inclusive approach to Gateway development: "We need cooperation and everybody pulling together to make it work. It's not about drawing container traffic out of Halifax or vice versa. If this growth is coming, we're going to need all those facilities, and how do we maximize all of those assets in the region?"<sup>8</sup> This lack of integration was reflected in a recent Asia-Pacific Foundation study of the Atlantic Gateway: "the region does not see itself as global hub-and-spoke to the global economy. Each province views opportunities as event driven, driven by provincial concerns, usually with a short-term political advantage. The region rarely looks at global advantages, where cooperation and coordination are required."<sup>9</sup>

Merely focusing on ports and terminal improvements as a gateway strategy may not be the most effective approach. A more comprehensive model is needed that addresses congested highways and intermodal rail systems in addition to ports and terminals. For example, Brian Gerrior of Canada's Retail Shipper's Association

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<sup>6</sup> T. Peters, "New Investment in planned Melford container terminal", *Canadian Sailings*, December 10, 2007, p. 32-33.

<sup>7</sup> T. Peters, "Port of Sydney investigates broader opportunities", *Canadian Sailings*, December 3, 2007, p. 41; C. Williams, "Proposed container terminal in Maine raises eyebrows", *Canadian Sailings*, December 24, 2007, p. 25.

<sup>8</sup> A. Soppitt cited in K. Horbie, "Corridors, gateways essential to compete in global economy, forum told", *Canadian Sailings*, July 9, 2007, pp. 12-16; see also, A. Soppitt, "Diversity continues to make Saint John an Atlantic Gateway", *Canadian Sailings*, June 11, 2007.

<sup>9</sup> C. McMillan, *op. cit*, p. 9.

claimed: “Vancouver as a port doesn’t have a problem. It’s the intermodal highway when you start to leave Vancouver that creates the bottlenecks. That’s where the issue is.”<sup>10</sup>

### **Container Trade**

Container traffic continues to grow worldwide. A 2005 forecast of container trade growth found that global containerization should almost double in the coming decade.<sup>11</sup> The study found that container throughput in North America is expected to increase by 75 percent in the next ten years from 41.1 million TEU in 2004 to 72 million TEU in 2015. Much of the anticipated growth comes from increased trade with China and other Asian nations. A 2006 container traffic growth forecast upheld this earlier estimate by predicting a 41 percent growth in world container trade from 2005 to 2010.<sup>12</sup> A more recent forecast suggests that the Asia-Pacific container traffic will triple over the next 15 to 20 years.<sup>13</sup>

Although a significant proportion of this increase will flow through West Coast ports in Canada and the US, there will also be growth in Asian traffic to/from Eastern North America via the Suez Canal as well as growth in the North America – European trade. In 2004, some 22 percent of Asia-US traffic moved through East Coast ports compared to 78 percent via the West Coast. But in the same period, Asian trade to the East Coast increased at almost twice the rate of growth of the West Coast due to delays in West Coast ports.<sup>14</sup> Changes in US West Coast port operating environments including environmental restrictions and increased rail freight rates for

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<sup>10</sup> B. Gerrior, cited in K. Horbie, *op. cit.*

<sup>11</sup> Ocean Shipping Consultants Ltd., cited in *Canadian Sailings*, March 7, 2005, p. 15.

<sup>12</sup> B. Clancy and D. Hoppin, “Growing Gloom”, *American Shipper*, 48:7, July 2006, pp. 38-72.

<sup>13</sup> Cited in L. Ryan, “West Coast mega-port approaches reality”, *Maritime Magazine*, No. 46, Fall 2007, p. 41.

<sup>14</sup> P. Damas, “Pacific on the brink of crisis”, *American Shipper*, 46:12, December 2004, pp. 80-88.

intermodal services encourage a shift to all-water routes favouring East Coast ports.<sup>15</sup>

Such optimistic forecasts now need to be tempered by the anticipated economic recession in the US. In recent months, US West Coast ports noted a decline in container throughput due to the problems in the US housing market and the associated loss in consumer confidence. As Richard Steinke of the Port of Long Beach put it: “as the U.S. economy cooled over the course of 2007, we saw a corresponding drop in the growth of containerized imports.”<sup>16</sup> Jonathan Gold, of the National Retail Federation stated, “retailers are carefully managing their inventories so they won’t be forced into unplanned discounts....”<sup>17</sup>

In recent years, containerization growth has impacted Vancouver and other major US West Coast ports. Port congestion and subsequent delays in moving containers occurred in intermodal road and rail connections in Vancouver and almost reached crisis proportions in major US West Coast ports. In Vancouver, intermodal congestion led CN and CP to take the unprecedented step of cooperating with each other in sharing regional rail line capacity to move containers and other freight more efficiently. In the US, major investments were made to improve intermodal movements through congested urban areas, such as the Alameda Corridor in Los Angeles/Long Beach. These steps had an impact as a recent analysis of US ports rated their congestion as “low” due to improved efficiencies and throughput decline.<sup>18</sup>

A forecast of US container port utilization showed that Los Angeles and Long Beach were operating at almost full capacity in 2006 (at 88

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<sup>15</sup> P. Tirschwell, “East vs. West”, *The Journal of Commerce*, 8:50, December 17, 2007, p. 46.

<sup>16</sup> R.D. Steinke, Executive Director, Port of Long Beach, *AAPA Advisory*, 43:2, January 21, 2008, pp. 5-6.

<sup>17</sup> Jonathan Gold, NRF VP, *AAPA Advisory*, 43:1, January 14, 2008.

<sup>18</sup> “Port Trends”, *AAPA Advisory*, 42:43, December 10, 2007, p. 2.

percent and 91 percent respectively).<sup>19</sup> It is expected that these ports will be unable to handle anticipated container throughput growth. Other US West Coast ports are also reaching capacity. Thus, without further investment in significant container terminal expansion, future congestion and subsequent diversion of Asian containers to East Coast ports will be a certainty.

Much of the container trade growth comes from the rapid emergence of China as a major manufacturing and trading nation. The trans-Pacific pendulum trade from Asia to the West Coast of North America is booming. The alternative pendulum routing from Asia via the Suez Canal and the Mediterranean to the East Coast is experiencing moderate trade growth. Various East Coast ports including Halifax and New York are promoting the Suez routing (the so-called 'Suez Express'). It is this alternative route from India, Asia and China that is driving the development of proposed major container terminals in the Atlantic Gateway initiative.

However, the opportunity offered by the Suez route may be short lived due to the development of a larger Panama Canal. A recent Panamanian referendum supported the construction of a \$5.25 billion enlarged canal to serve container ships too large for the existing facility. The new canal locks are designed to serve the larger mega-size 12,000 TEU container ships. The threat to Canada's East Coast ports is that, "the new canal will allow more cargo to be carried on big ships from the Far East to ports along the US East and Gulf coasts. That could help ease congestion on the US West Coast and still allow carriers and shippers to reap the benefits of the economies of scale big ships provide."<sup>20</sup> Southern US ports are already gearing up to meet the challenge of additional container ships from the enlarged Panama Canal.<sup>21</sup>

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<sup>19</sup> MergeGlobal Forecasting, "Project Peak", *American Shipper*, 49:7, July 2007, pp. 52-62.

<sup>20</sup> C. Dupin, "The post-Panamax Canal", *American Shipper*, 48:12, December 2006, pp. 50-53.

<sup>21</sup> J. Dow, "Jacksonville builds for Asian Boom", *American Shipper*, 49:6, June 2007, p. 83.

## Larger Container Ships

Over the years, container ships have continued to increase in size as shipping companies sought economies of scale in a highly competitive market. As container ships get larger, there are limits to the ports they can serve due to physical constraints of water depth, channel widths and size of turning basins as well as the capacity of the ports' cargo handling equipment and their productivity. In the future, mega-sized container ships of 12,000+ TEU capacities will likely serve a small number of designated ports in North America as the termini for their eastern and western pendulum swings from Asia.

Container ships continue to grow larger. Post-Panamax sized 6,000+ TEU vessels are now commonplace in major trade routes serving Asia. Recent orders for new container ships reflect significant size increases. In August 2007, COSCO announced their order for eight 13,100 TEU vessels for delivery in 2011 with Zim Line soon following with an announcement of their order for eight 12,600 TEU ships for 2012.<sup>22</sup> Currently, the largest container ship afloat is the *Emma Maersk*, the first of a series of eight "PS-class" ships. She was christened in September 2006. The *Emma Maersk*, at nearly 400 meters long, 56 meters wide and with a draft of 15.5 meters can carry 14,800 TEU, although Maersk Lines rates her as an 11,000 TEU vessel.<sup>23</sup> With a beam of 56 meters, the *Emma Maersk* and her PS-class counterparts are too wide for even the enlarged Panama Canal.

Building larger ships is becoming commonplace. But there are industry concerns that economies of scale may not be available unless ports improve their container handling productivity to turn these mega-size container ships around fast.<sup>24</sup> In addition, some shipping

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<sup>22</sup> C. Gillis, "Too much of a big thing?", *American Shipper*, 49:10, October 2007, p. 80.

<sup>23</sup> F.E. Phillips, "Make way for *Emma Maersk*", *American Shipper*, 48:11, November 2006.

<sup>24</sup> P. Damas, Drewry Shipping Consultants, cited in S. Heaney, "Orchestrating Evergreen's careful course", *American Shipper*, 49:10, October 2007, pp. 54-57.



lines are becoming concerned that projected new build capacity will outstrip container traffic growth. A recent estimate showed that the global containership fleet capacity is expected to grow by 76 percent from 2005 to 2010 compared to an anticipated container traffic growth of 41 percent.<sup>25</sup> In this same period, the percentage of the global containership fleet of 7,500 TEU+ is expected to expand from 5.3 percent in 2005 to 17 percent in 2010. More than 36 percent of the new build container ships will be larger than 7,500 TEU.<sup>26</sup>

A key question is which container ports can handle such mega-sized ships? An earlier study suggested that a global fleet of 15,000 TEU vessels would likely need only four major hub ports to serve them – one in South-East Asia (likely Singapore or Malaysia), one in the Mediterranean and one on each of North America’s east and west coasts.<sup>27</sup> Feeder vessels and intermodal systems would distribute containers to/from these four major transshipment hub ports. The study went further to propose the construction of an offshore island on the US East Coast as a major transshipment facility. Subsequently, the container terminal in Freeport in the Bahamas has sought to position itself as the southern US “off shore island” container hub port by adding deep-water container ship handling capacity. Freeport’s container throughput increased from about 11,000 TEU in the mid-1990’s to over 1.1 million in 2005.<sup>28</sup>

In response to de Monie’s proposed off shore island terminals, another study suggested there are sufficient suitable deep-water ports in Canada to readily serve North American container movements.<sup>29</sup> These ports include: Vancouver and Prince Rupert on the West Coast

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<sup>25</sup> B. Clancy, 2006, *op. cit.*

<sup>26</sup> R. Mottley, “Bruner speaks his mind”, *American Shipper*, 47:1, January 2005, pp. 70-76.

<sup>27</sup> G. de Monie, “Container Shipping: Trends and Threats”, 23<sup>rd</sup> ICHCA International Biennial Conference, Jerusalem Israel, 1996.

<sup>28</sup> Caribbean Shipping Association, July 2007.

<sup>29</sup> M.C. Ircha, “Serving Tomorrow’s Mega-Size Container Ships”, 2001, *op. cit.*

and Halifax, Saint John, the Strait of Canso area, Sydney and Sept Îles on the East Coast.

During the past two decades, the “hub and spoke” model for container transshipment was the generally accepted approach. However, an analysis of ship routing suggests this model has not fully evolved. Instead, ship routing has become increasingly complex. The number of ports having direct calls from top-tier container liner services increased from 1992 to 2002 with 22 new ports being added including 18 located in Asia.<sup>30</sup> The complexity of ship routing and the addition of new ports rather than port consolidation arose from several factors including: operating costs, the need for cargo balance, container repositioning, transit time, and service frequency between major centers.

In today’s increasingly security conscious world, the use of non-urban, more isolated container transshipment ports may become tomorrow’s norm. Locating such hub ports outside urban areas would allow for container inspections to occur in more secure and less populated areas. Hence, Canada’s more remote deep-water ports may well serve North America’s need for new container hub ports.

Recent terminal congestion problems and other difficulties relating to labour relations and inland intermodal services in North American ports have led many shippers and shipping lines to diversify their port options in choosing to use more than one hub port. Richard Larabee, New York’s port commerce director stated: “we now have 24 strings of all-water services calling in our port. That’s happened because shippers are saying to ocean carriers, ‘I don’t want all my cargo going through one place. I need to be much more comfortable as far as redundancy and reliability are concerned.’”<sup>31</sup>

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<sup>30</sup> S. Meyrick, “Structural changes bring new challenges”, *Portstrategy*, July/August 2004.

<sup>31</sup> R. Mottley, “North American Views”, *American Shipper*, 47:5, May 2005, pp. 74-82.

In the future, we will likely see more rather than fewer major container terminals along both coasts providing container security in non-urban, more isolated locations and offering port diversity to shipping lines to ensure delivery reliability. These trends offer significant opportunities for Canadian ports.

### **Impact on Ports**

Major shifts in the container trade impacted container terminals around the world. Some ports retained and expanded their hub port status, while others were relegated to feeder or niche roles. Some of the key elements impacting Canadian container ports include: port congestion, security, urban development, environmental concerns and sustainability. These are all factors that can impede port expansion.

As discussed above, in recent years Vancouver experienced congestion. The port and its intermodal system did not have sufficient spare capacity to cope with a rapid increase in container throughput. To address this issue Vancouver is developing a third berth and seeking a private partner to build a second container terminal at Deltaport. These new facilities will increase the port's annual container throughput to 2 million TEU by 2012.<sup>32</sup> In addition, Vancouver's Burrard Inlet container terminals acquired new equipment to increase throughput (shifting from straddle carriers to rubber tired gantry cranes to achieve higher container stacking densities).

Prince Rupert recently opened a new 500,000 TEU container terminal.<sup>33</sup> The port is actively pursuing a second phase terminal, to increase throughput capacity to 2 million TEU by 2010. Prince Rupert's container terminal contributes needed capacity in its unique isolated, non-urban setting in handling the growing trans-Pacific container trade.

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<sup>32</sup> E. Kulisch, "Canada tries tri-port merger", *American Shipper*, 49:5, May 2007, pp. 84-89.

<sup>33</sup> "Prince Rupert Container Terminal", *Canadian Sailings*, October 15, 2007. Pp. 12-15.

## **Urban, Environmental and Sustainability Constraints**

A major trend impacting port facilities located in urban areas is the public's growing demands to access and use waterfront lands for purposes other than marine cargo handling. In ports around the world, politicians, municipal officials and citizen groups seek to convert port lands to alternative, urban-oriented uses. Part of this trend comes from shifts in waterfront uses from the former industrial era to today's "post-industrial" society.

Post-industrial society tends to demand waterfront condominiums, walking trails, cafés and boutique shopping areas to replace under-used, industrial port lands.<sup>34</sup> Initially the proponents of such urban oriented waterfront development welcome the presence of busy terminals and an active harbour area. But often, they soon tire of the ongoing noise (particularly in the evening and night time hours), dust, air emissions from port equipment and ships, light spillage from the terminal, truck and rail traffic and other detrimental aspects of major commercial cargo-handling operations. This leads to pressure being mounted to constrain commercial terminals by limiting their hours of operation, reorienting dockside lighting, and restricting truck traffic. In the extreme, marine terminals are forced to shut down and move their operations to other, more remote locations. This phenomenon can be seen in Sydney Australia where, over the years, many port operations have been curtailed and relocated to nearby Botany Bay.<sup>35</sup> This post-industrial trend for the conversion of waterfront land to urban oriented uses is occurring in many of the world's major ports.

To accommodate post-industrial demands, many ports are incorporating sustainability as a key goal. Sustainability in terms of

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<sup>34</sup> M.C. Ircha, "Port Privatisation: Commerce and Recreation", *Proceedings*, Annual Conference of the International Association of Maritime Economists, Panama City, November 2002.

<sup>35</sup> M.C. Ircha, "Global port reform: an Australian focus", *Proceedings* of the Annual Conference of the Association of Canadian Port Authorities, Charlottetown PEI, August 2000.

“balancing the financial, social and environmental needs... and integrating that balance into day-to-day business activities.”<sup>36</sup> This reflects the ports’ recognition that their role goes beyond marine cargo handling to being good corporate citizens focusing on “people, planet and profits”.<sup>37</sup> As an example, the Vancouver Fraser Port Authority is reinforcing their sustainability initiatives in environmental and community relations with the recent appointment of a Chief Sustainability Officer.

### **Attributes of Container Hubs**

A successful container hub port reflects several key attributes. In the past a major attribute was having a significant volume of captive traffic in nearby major metropolitan areas (e.g. Los Angeles/Long Beach, New York, Rotterdam, Singapore). However, as discussed above, today’s security concerns may mean future hub ports and terminals are located in more remote areas. Other key attributes of container hub terminals include:

- being located close to main shipping routes and feeder ports,
- being accessible to mega-sized container ships,
- offering appropriate infra- and super-structure including good intermodal linkages and appropriate container lift equipment,
- having a reputation for continued high productivity (number of container moves per ship per 24 hours),
- competitive rates and tariffs, and
- being reliable and trouble-free from labour strife.

North American ports need to be able to meet most of these key attributes in seeking to achieve hub port status. For example, the 2005 truckers’ strike in Vancouver and the truckers’ one-day walkout in

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<sup>36</sup> K. Nagel, “Public ports seize the challenge at turning point for industry”, *AAPA Seaports Magazine*, vol.12, Winter 2007/08, pp. 8-9.

<sup>37</sup> P. Scott, “Ports move to implement sustainability objectives”, *AAPA Seaports Magazine*, Vol. 12, Winter 2007/08, pp. 17-20.

Los Angeles and Long Beach did not convey a sense of port reliability to the world's major shipping lines.

### **Conclusion**

The growth of the global economy was underpinned by the lower freight rates generated by containerization.<sup>38</sup> Competition led to the development of ever-larger ships seeking economies of scale. This is particularly evident in the container trades with the recent development of mega-sized container ships of 12,000+ TEU capacity.

NAFTA led to an interest in north-south trade corridors. As corridor discussions matured, it was evident that ports on or near these major trade corridors play a key role as gateways connecting North American markets to the global economy. The focus of trade corridors and gateways evolved into a fully integrated intermodal transport system as part of a comprehensive logistics chain.

There are opportunities for Canadian ports to serve as hub container ports on both coasts. Ongoing congestion and capacity constraints in major US ports could lead to the development of remote Canadian alternatives – Prince Rupert's container terminal initiative offers a prime example of this approach. Other Canadian ports could serve continental container trade such as terminal expansions at Vancouver, Halifax, Saint John and new container terminal projects in the Strait of Canso, Sydney and Sept Îles.

There are several key elements required for a port's success in the container trade. The first is geographic location. Ports seeking to grow to hub terminal status must be located on or near the main shipping routes and connected to trade corridors. Few shipping lines can afford to divert their ships to serve isolated ports, unless these ports act as the terminus of the pendulum swing from Asia to North America (on either the West or East Coasts). However, as the growing need for port reliability is causing shipping lines to diversify

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<sup>38</sup> M. Levinson, *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger*, Princeton University Press, Princeton and Oxford, 2006.

their ports of call, there will likely be more than a single hub terminal on either coast's port range.

Secondly, ports seeking to serve mega-sized container ships must be accessible to them. This means they must have water depths of 15 meters or more along with appropriately sized turning basins and navigation channels to serve such ships.

Thirdly, container hub ports must have and maintain a reputation for continued high productivity in terms of ship turn-around time and truck/rail car turn-around time. Such productivity implies having spare capacity in terms of container yard storage and lifting equipment, including ship-to-shore gantry cranes and terminal equipment along with a stable and reliable labour force working 24/7. Productivity also implies port flexibility – the ability to rapidly adopt new and changing technology to maintain high throughput levels. Flexibility also means coping effectively with landside pressures to constrain terminal operations and to convert underused port lands to other urban oriented uses. Dealing with the community and environmental consequences of a major container terminal requires tact, diplomacy and compromises from terminal operators and port officials as part of the port's overall sustainability initiative.

Fourthly, container hub ports need efficient intermodal linkages (road, rail and short sea shipping) to ensure containers are moved through the terminal quickly to their final inland destinations.

Finally, these key elements must be achieved economically such that the rates and tariffs charged for container moves through the port remain competitive. Achieving these key elements is not an easy task, but they are essential if Canadian container ports wish to remain key players in the continued development of the North American economy.