

Cargo Consolidation: Canada-Caribbean Trade

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Trade between Canada and the Caribbean has traditionally moved through eastern Canadian ports. Recently, advances in continental intermodal services have led to a diversion of Canadian-Caribbean traffic to southern U.S. ports. A market niche study of the feasibility of developing a consolidation center in the port of Saint John, New Brunswick for the Caribbean trade is the subject of this paper. The analysis includes an in-depth evaluation of trade between eastern Canada and seven Caribbean countries, a review of each Caribbean country's economy and Canada's share of their markets, an identification of opportunities for enhancing Canadian exports; a review of the transportation systems connecting Canada to the Caribbean; and the requirements for developing and operating a consolidation center in Saint John. It was concluded that a consolidation center is feasible, particularly if additional traffic to and from other Central and South American countries can be attracted through Saint John. The essential ingredient for success of the consolidation center is the effective marketing of Saint John as Canada's and the New England states' primary Caribbean-South American connection.

The port of Saint John, New Brunswick has traditionally served as a major Canadian point of entry and exit for Caribbean and other Central and South American trade. In recent years, an increasing amount of Caribbean-bound general cargo has been diverted through southern U.S. ports as improved intermodal systems have resulted in decreased freight rates and enhanced service levels. These improvements in this competitive alternative have eroded the viability of the all-water route from Canada to the Caribbean.

In an attempt to reduce the U.S. diversion of Caribbean-bound commodities, a consolidation center for this trade in the port of Saint John was proposed. Such a facility would enable reasonable-sized volumes of general cargo and other commodities to be easily assembled for shipment. Consolidation could make the port of Saint John attractive to Caribbean-bound carriers using larger vessels (resulting in economies of scale and lower freight rates) with improved service frequency.

The University of New Brunswick Transportation Group was asked to undertake this market niche study to evaluate the feasibility of developing a Caribbean consolidation center in Saint John. The sponsoring agencies included External Affairs Canada, Saint John Port Development Commission, Saint John Port Corporation, New Brunswick Department of Commerce and Technology, and the Atlantic Canada Opportunities Agency.

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This analysis was limited to the examination of commodity movements to and from eastern Canada (the four Atlantic provinces of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland as well as Quebec and Ontario) and seven Caribbean countries (Bahamas, Barbados, Cuba, Dominican Republic, Jamaica, Puerto Rico, and Trinidad and Tobago). The consolidation center evaluation included consideration of Canada-Caribbean trade movements, potential opportunities for enhanced Canadian export trade, transportation system needs including all relevant modes, eastern Canadian shippers' perspectives on trade with the Caribbean, and consolidation center operational requirements and options.

CONCEPT

An effective consolidation center depends on efficient intermodal transportation. Arriving individual freight packages can be consolidated into full container loads (FCL) for shipment to the Caribbean. Similarly, import shipments can either be transported inland as FCLs and full truck loads (FTL) or stripped into less than truck load (LTL) size for delivery to nearby destinations.

A review of several existing intermodal terminals (in Canada, the United States, and Sweden) revealed that few, if any, serve in the same capacity as that proposed for the Saint John facility. That is, consolidating a wide range of commodities for a specific geographic destination. Normally, consolidation facilities limit the range of goods handled (for example, specializing in neobulk forest products) and distribute them globally. However, existing consolidation facilities provided the study team with effective standards relating to minimum sizes of consolidation centers, appropriate throughput levels, and the types of facilities and equipment required.

In the Canadian context, inland consolidation facilities play a significant role in the operation of port consolidation centers. These inland facilities enable containers to be stuffed or stripped at a location closest to their point of origin or destination.

As Slack (1) has suggested, inland consolidation centers are typically spaced between 800 and 1,400 km apart. Trucks serving a radius of 400 to 700 km are used to deliver goods to and from the inland facility. Unit trains carrying FCLs on flatcars can then be used to transport the consolidated commodities to the port consolidation center.

EASTERN CANADA-CARIBBEAN TRADE ANALYSIS

Published information from Statistics Canada (2,3) along with a special tabulation on exports by water on a tonnage basis (4) was used to determine the extent of commodity movement between Canada and the seven selected Caribbean countries.

As shown in Figure 1, in 1987, eastern Canada (Ontario, Quebec, and the Atlantic provinces) exported some 30 percent of the total Canadian tonnage to the Caribbean. On a dollar value basis (Figure 2), eastern Canadian exports accounted for almost 70 percent of all the Canadian goods shipped to the Caribbean.

Cuba is the main recipient of Canadian export goods (primarily wheat) in terms of tonnage. In terms of dollar value, Puerto Rico is the main Caribbean trading nation for eastern Canada being the destination for some 38 percent of exported goods (primarily manufactured commodities).

The four Atlantic provinces contributed 79 percent of the eastern Canadian exports to the Caribbean on a tonnage basis and 35 percent on a dollar value basis (Figures 3 and 4). Nova Scotia contributed the greater proportion of export tonnage to the Caribbean at 45 percent of the Atlantic Canada total. New Brunswick provided the highest proportion of exports by value at 43 percent.

The major 1987 exports from the Atlantic provinces to the Caribbean on a tonnage basis included flour and wheat (28 percent), newsprint (16 percent), other chemicals (13 percent), paperboard (10 percent), potatoes (9 percent), and dimensioned stone (9 percent). On a dollar value basis, the major exports included preserved fish (21 percent), newsprint (21 percent), vegetables (13 percent), other food (13 percent), paperboard (11 percent), and flour and wheat (9 percent).

In 1987, total Canadian imports from the Caribbean amounted to \$522 million compared with \$800 million worth of exports (Figures 2 and 5). Puerto Rico was the main Car-

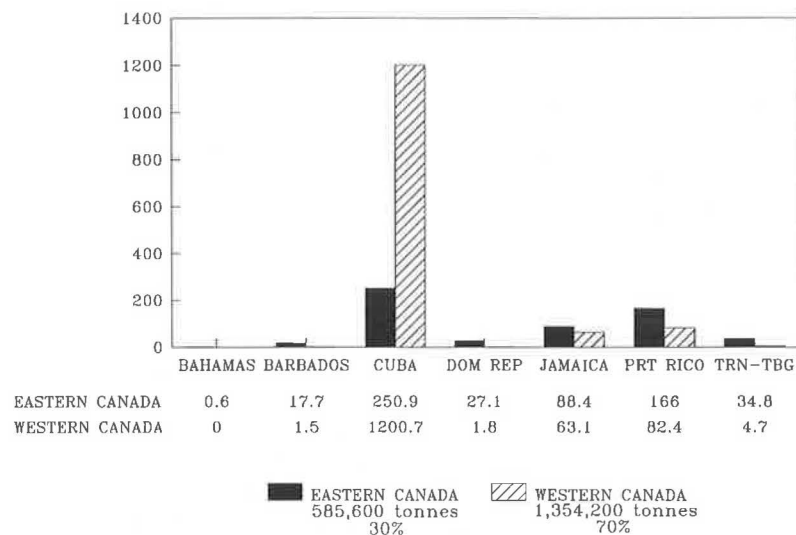


FIGURE 1 Canadian exports to Caribbean (1987 in tonnes \times 1,000).

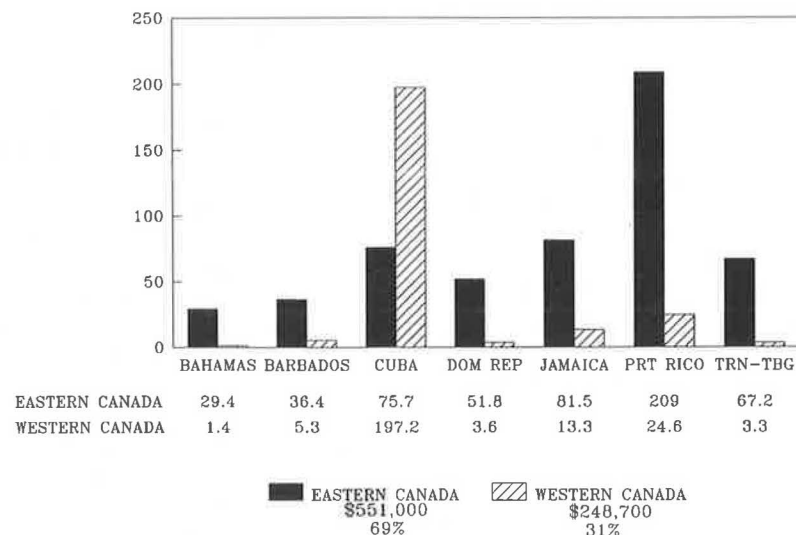


FIGURE 2 Canadian exports to Caribbean (1987 in \$ millions).

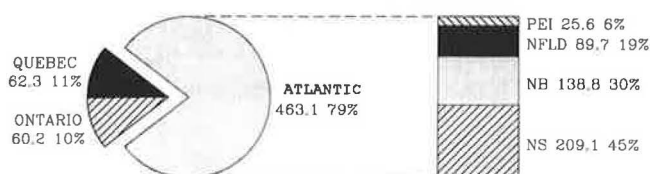


FIGURE 3 Eastern Canada exports to Caribbean (1987 in tonnes \times 1,000).

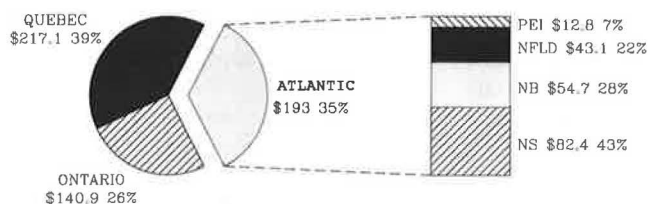


FIGURE 4 Eastern Canada exports to Caribbean (1987 in \$ millions).

ibbean country exporting goods to Canada with its commodities valued at \$217 million or 43 percent of the total Canadian imports. The major commodities imported by Canada were manufactured goods (23 percent), aluminum ores (18 percent) primarily from Jamaica, and other food (17 percent). Eastern Canada accounted for 94 percent of the imported Caribbean commodities, with the Atlantic provinces importing some 11 percent or about \$51 million worth of goods.

The main exports to the Caribbean from the Atlantic provinces were food (including wheat and flour) and paper products supplied primarily by New Brunswick and Nova Scotia. In 1987, some \$193 million worth of exports from the Atlantic provinces were shipped to the Caribbean compared with \$51 million worth of imports.

The vast array of commodities being exported from eastern Canada to the Caribbean were examined to determine the amount that might be diverted from their current trade routes through the United States and other Canadian ports through a Saint John consolidation center to establish the potential

amount of Caribbean-bound throughput such a consolidation center might attract.

CARIBBEAN TRADE ANALYSIS AND COUNTRY PROFILE

Despite the locational advantage of Caribbean countries to Canada, they have often been overlooked relative to other larger export markets (such as Western Europe and the Far East). As individual island nations, each of the Caribbean countries offers little opportunity, but, as shown in Table 1, taken as a whole the Caribbean Basin provides a considerable potential market for Canadian exporters.

The data used to examine the Caribbean countries came from the International Monetary Fund's *Direction of Trade Statistics* (4) and individual country profiles provided by External Affairs Canada. Tonnage data were unavailable on a country-by-country basis, thus only dollar value commodity movements were used in this analysis.

There are inherent difficulties in relying only on monetary value information. These difficulties include: change in the world price of a good may result in changes in the value shipped while tonnage remains constant; currency fluctuations affect the value of imports and exports; and countries supplying raw materials may be underrepresented even if their shipped tonnage is large.

Potential export opportunities for Canada and the United States in the Caribbean were identified by examining the current market share of Canadian exporters within each sector of the local market, economic trends and structure of each country, and specific country projections provided by External Affairs Canada. Detailed country-by-country analyses of specific Canadian export opportunities were undertaken.

The Caribbean countries examined have initiated national value-added policies such as the establishment of import quotas and tariffs along with currency devaluations to stabilize and enhance their local economies. The primary objective of these policies is to shift these Caribbean nations from a single commodity-based economy to a more diversified structure.

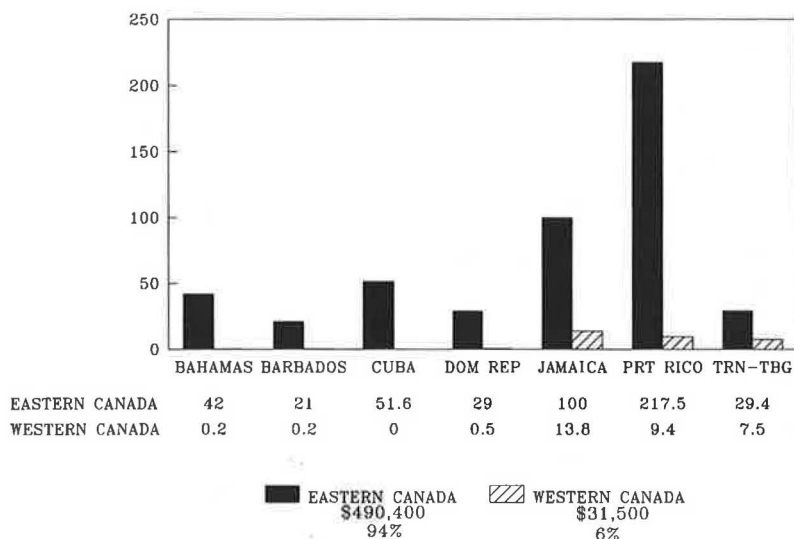


FIGURE 5 Canadian exports to Caribbean (1987 in \$ millions).

TABLE 1 CARIBBEAN MARKET SIZE

Country	Population	GNP (1983) \$US billions
Bahamas	255,000 (87)	1.1
Barbados	254,000 (87)	1.0
Cuba	10,246,000 (86)	10.0
Dominican Republic	6,600,000 (86)	6.7
Jamaica	2,410,000 (87)	2.7
Puerto Rico	3,200,000 (87)	12.7
Trinidad & Tobago	1,195,000 (87)	8.4
TOTAL	24,160,000	42.6

The Caribbean countries' value-added policies provide opportunities for Canadian exporters and others (such as those in the United States) as the major shipments to the region are raw/unprocessed commodities and machinery equipment—both designed to bolster the development of indigenous local economies. In addition, as tourism expands and the growth of the Caribbean countries' younger population continues, the need for construction materials and food will also increase. Canada is in a good position to supply this growing demand from the Caribbean.

Other potential Canadian exports to the Caribbean include semiprocessed and finished goods such as textiles, pharmaceuticals, electronics, and transportation equipment. Enhanced Canadian and U.S. (particularly from the New England states) export trade to the Caribbean would further increase potential traffic flow through a proposed Saint John consolidation center.

POTENTIAL EXPORT TRAFFIC THROUGH SAINT JOHN

To determine the range of potential export traffic through the port of Saint John, optimistic and conservative scenarios were developed on the basis of existing and potential traffic to the Caribbean. The optimistic scenario assumes that the Saint John consolidation center could capture 100 percent of the Caribbean-bound bulk commodities from all of eastern Canada (primarily grain). The conservative scenario limits the potential capture of bulk commodities to 50 percent. The recent deletion of the "At and East" grain subsidy by the Federal government may make this differentiation meaningless as western grain shipments through the port of Saint John will likely decrease because of the absence of this rail subsidy.

Each of the 1987 exported commodities from eastern Canada through all ports (including the United States) were evaluated to determine whether or not they could be diverted through Saint John. Based on this analysis, the potential increase in existing export traffic (including general cargo in the form of containers, neobulk forest products and dry/liquid bulk) in the port of Saint John varied from 104,000 tonnes to 170,000 tonnes dependent upon the scenario used.

In addition, the potential growth in the Caribbean market on the basis of opportunities identified for Canadian exporters increased the potential amount of total additional exports

through Saint John from 140,000 to 207,000 tonnes. This represents an increase of between 86 and 127 percent of the current Caribbean-bound exports through the port.

TRANSPORTATION SYSTEM ANALYSIS

Five transportation system alternatives for the movement of commodities to the Caribbean were evaluated. These included inland transportation from Toronto-Montreal to each of five major ports (Montreal, Saint John, Halifax, New York, and Miami) and the subsequent ocean carriage from each port to the Caribbean.

The estimated average transit time for the inland transportation leg to each of these ports is as follows: Saint John-Halifax, 1 to 2 days (rail); New York, 1 day (truck); and Florida, 3 to 5 days (rail/truck). The ocean leg of the journey involves the additional time to destination in the Caribbean. A variety of ocean shipping services are currently available to the Caribbean. The total transportation time for central Canadian commodities to the Caribbean from Montreal on currently scheduled services is 7 to 8 days; Saint John, 6 to 10 days; Halifax, 7 to 10 days; New York, 6 days; and Florida 4 to 8 days (5). Thus Saint John-Halifax is 1 to 2 days closer to the Caribbean than Montreal, and roughly competitive with New York and Florida.

Throughout the study period, attempts were made to determine the actual costs involved in shipping commodities from central Canada to the Caribbean via alternative trade routings. Owing to the confidential nature of current freight contracts both in Canada and the United States, these cost data were unavailable. Thus, time of total transit from central Canada to the Caribbean was used as a proxy for the costs.

Improvements to the ocean transit service may be achieved if increased Caribbean-bound commodity flowed through a designated consolidation center. Increased tonnage could attract larger vessels with improved service frequency. The recently inaugurated North American-Caribbean Line connecting Saint John to Miami and Jamaica with sailings every two weeks represents improved service. This service, coupled with the revamped Kent Line service from Saint John to the Caribbean bimonthly, provides a strong transportation base for the development of a Saint John consolidation center. In addition, the recent announcement by the port that the Cuban shipping service will commence a container service between Saint John and Havana in September 1990, further reinforces the role of the port as Canada's Caribbean connection.

In addition to these improved ocean connections to the Caribbean, there are currently initiatives underway to establish a consolidation/distribution center in Kingston, Jamaica to complement the proposed facility in Saint John. The Kingston facility involves the use of Kingston Container Terminals, the port's Free Trade Zone, and the enhancement of regional shipping services from Kingston to various Caribbean and Central and Latin American ports.

SHIPPERS' PERSPECTIVES ON CANADA-CARIBBEAN TRADE

A 1989 survey of eastern Canadian shippers to the Caribbean sought information on their preference of port of export and

why Saint John was not being used. As shown in Table 2, Saint John, Halifax, and Miami were roughly equivalent in terms of preference, attracting about a third of the shippers. Montreal was the clear port of choice with 65 percent of the respondents using it for their Caribbean exports. When considering the average tonnage of Caribbean-bound exports shipped through each of these ports, their relative positions changed. Montreal remained the dominant port of choice with 37 percent, followed by Halifax and Miami with 16 percent, New York with 13 percent, and Saint John with 6 percent.

Many shippers indicated Montreal was used because of convenience, minimum ground transportation, and frequent sailings. The major reasons for not using Saint John were the cost of inland transport to the port, freight forwarders determining optimal routings, and limited service in the port. In terms of shipping service, most exporters desired weekly sailings to the Caribbean. More than half of the exporters surveyed (59 percent) used FCLs for their shipments to the Caribbean and a further 37 percent exported part loads in LCL shipments.

To change the current perceptions of eastern Canadian shippers, the port of Saint John will have to aggressively market its function as a Caribbean consolidation center and establish itself as the primary Canadian-Caribbean and Latin American connection. The port should also seek additional Caribbean-bound shipments from the nearby New England states. The recent improvements of shipping services from Saint John to the Caribbean should serve to reinforce the port's image as the natural Caribbean connection.

CONSOLIDATION CENTER REQUIREMENTS

Using operating data from existing consolidation centers and inland facilities to determine minimum viable throughputs, the current cargo handling infrastructure at the port of Saint John was found to be more than adequate to handle the additional traffic which might be generated for the Caribbean trade.

The annual traffic volumes required for a viable inland load center and port consolidation center are 20,000 and 6,000 twenty-foot equivalent (TEU) containers, respectively. Using the conservative scenario for the current and potential Caribbean container and neobulk exports through the port of

Saint John, the traffic through the consolidation center could amount to 3,800 TEUs from Ontario and Quebec and 17,500 TEUs from the Maritime provinces. Only a small portion of these containers will require consolidation as many shippers would use FCLs from their factory gate.

Using distance criteria between consolidation centers, one inland center located in central Canada (either Montreal or Toronto) is required to support the port consolidation center in Saint John. Obviously, the estimated 3,800 TEUs from central Canada for the Caribbean falls short of the minimum inland center throughput requirement of 20,000 TEUs for economic viability. Hence, a stand-alone facility designed exclusively for the Caribbean trade would not be feasible, rather an existing general inland center handling a range of commodities should be used. A variety of general consolidation facilities are available in central Canada serving rail and trucking systems.

The volume of goods shipped from the Maritime provinces may be sufficient to justify a consolidation center at the port of Saint John. If one-third of the volume required consolidation, the annual throughput in the center at Saint John would be 5,800 TEUs, close to the 6,000 TEUs estimated to be required for economic viability.

This analysis considered only Canadian exports to the Caribbean. Imports from the Caribbean to the Atlantic provinces amounted to about one third of the region's exports to the Caribbean, hence, adding import data (if it were available on a tonnage basis) would further enhance the overall viability of the proposed consolidation center. Similarly, if additional traffic destined to other Caribbean and Central-South American countries was to be consolidated in Saint John, this would further ensure viability of the operation. In addition, if further Caribbean exports and imports from-to the United States (particularly to in the nearby New England states) could be solicited by the port of Saint John, this traffic would further reinforce the viability of its Caribbean consolidation center.

CONSOLIDATION SYSTEM OPTIONS

The efficiency and viability of a consolidation center requires that it be located in a densely populated market area to ensure that LCLs and LTLs can be readily consolidated into FCLs

TABLE 2 EXPORTERS' USE OF SELECTED EAST COAST PORTS

	Ports				
	<u>St John</u>	<u>H'fax</u>	<u>Montreal</u>	<u>New York</u>	<u>Miami</u>
No. of respondents using port for portion of exports (max. - 43)	14	15	28	9	14
Percentage of respondents using port (max. - 43)	33%	35%	65%	21%	33%
Mean percentage of export tonnage through each port	6%	16%	37%	13%	16%

for economic handling. Toronto and Montreal are major markets and are thus prime candidates for an inland load center consolidating Caribbean-bound traffic for Saint John.

Several options were considered in this study including (a) Option I: developing a stand-alone consolidation center in Saint John; (b) Option II: adding an inland load center in Montreal and a smaller consolidation facility in Bangor Maine (for potential trade to and from northeastern United States, in particular, the nearby New England states of Maine, New Hampshire, and Massachusetts); and (c) Option III: adding a further inland load center in Toronto. It was concluded from the analysis that Option II and possibly Option III appear most feasible for the development of a viable consolidation center in Saint John. Figure 6 outlines Option II.

The establishment of the Montreal facility (shown in Option II) enables unit trains to operate from Montreal to Saint John, reducing freight rates and possibly resulting in competitive pricing with the all-water route from Montreal to the Caribbean. Toronto is within 500 km of Montreal, thus goods could be trucked to the Montreal inland consolidation center. Similarly, a consolidation center in Bangor, Maine would serve to consolidate Caribbean-bound commodities shipped from the New England states through Saint John. The facility at Saint John would consolidate goods originating in the Maritimes as well as processing FCLs from Montreal and Bangor.

Because of the minimum traffic flows anticipated through the Saint John consolidation center, it is apparent that other traffic would be required to ensure economic viability. Although outside the scope of this market niche study, if Canadian exports to other Central-South American countries were to be consolidated in the facility, the additional volumes would further warrant its development.

The actual management of a Caribbean consolidation center in Saint John depends upon the selection of an appropriate

agency to oversee the overall network. Freight forwarders and shipping lines often establish consolidation facilities to reduce freight charges or to improve service to their customers. Freight forwarders are generally aggressive marketers and maintain close contact with shippers in various market niches. They usually have the ability and capacity to establish and operate an efficient consolidation center system. Shipping lines, on the other hand, typically manage load centers within a port and often do not become involved with inland intermodal carriers.

A further advantage is that freight forwarders normally seek to maximize the amount of freight moved regardless of its nature. Freight forwarders are often in the best position to coordinate transportation services from the point of inland origin to the final inland point of destination (from factory gate to customer's door). They bargain and make volume discount deals among shippers and receivers, inland transportation companies, port terminal operators, and shipping lines.

Overall, the successful management of a Caribbean consolidation center in Saint John will likely require the services of a freight forwarder or a consortium of forwarders.

CONCLUSIONS

Atlantic Canada exports many commodities to the Caribbean. The main exports are food and paper products. Bulk wheat-flour movements normally are shipped from Halifax and neo-bulk paper products from Saint John. Quebec and Ontario tend to ship manufactured goods to the Caribbean. The Atlantic region ships 79 percent of the export tonnage to the Caribbean—much of this being low value commodities. Quebec and Ontario ship 65 percent of the exports by value.

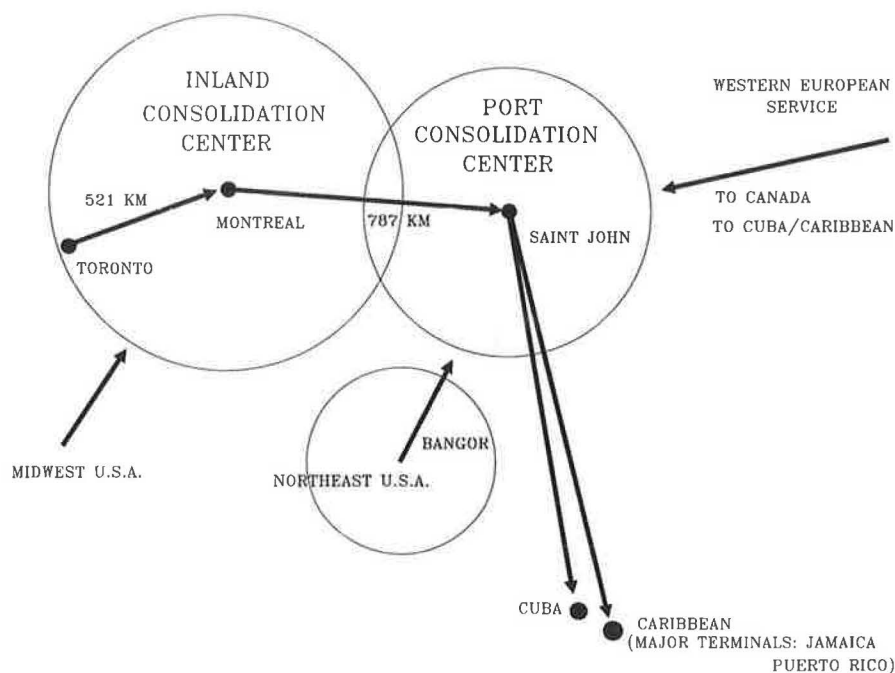


FIGURE 6 Option II consolidation system options.

In 1987, eastern Canada exported 12 percent more products by value to the Caribbean than it imported with a net trade balance of \$61 million. The Atlantic region exported more than three times the amount it imported by value with a net trade balance of \$141 million.

Significant opportunities for eastern Canadian and New England exporters exist in the Caribbean market as the major exports to the region are raw/unprocessed commodities and machinery equipment (desirable for the value-added policies of the Caribbean countries). To successfully tap this considerable market composed of many small countries, Canadian and U.S. exporters will have to thoroughly understand the nature of each individual market within the Caribbean Basin. Many of these nations require small, but frequent, shipments of commodity. A consolidation center in Saint John will aid in meeting some of this demand. The development of a complementary consolidation-distribution facility in the Caribbean (as is being proposed in Kingston) will aid in reinforcing and developing the Canadian-Caribbean trade.

It is estimated that a consolidation center in Saint John could attract an additional 104,000 to 207,000 tonnes of commodities destined for the seven Caribbean countries through the port. This additional amount of commodity flow marginally justifies the establishment of a designated consolidation facility. However, if additional traffic between eastern Canada, the New England states, and Central-South America could be attracted through the Saint John consolidation center and data could be obtained on import movements from the Caribbean to Canada through Saint John, then the overall concept should be economically viable.

The existing cargo handling infrastructure in Saint John has sufficient spare capacity to enable the port to absorb additional traffic generated by an increase in Caribbean-bound throughput. Thus, no additional major capital facilities are required to implement a Canadian-Caribbean consolidation center in Saint John.

What is required, however, is the appropriate marketing of the port as Canada's consolidation facility for Caribbean

and Central-South America commodities. Aggressive marketing to reinforce Saint John's image as Canada's Caribbean-South American connection is necessary to change the current perceptions of eastern Canadian shippers and to develop appropriate commodity throughput. The current complementary initiatives by the ports of Saint John and Kingston, Jamaica to develop and expand the Canadian-Caribbean trade will further enhance Saint John's image as Canada's Caribbean-South American connection.

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