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Shipping - Canada
International trade - Caribbean
CANADA-CARIBBEAN CARGO CONSOLIDATION 119
Ports - Inland
John (U.S.)

Canada-Caribbean Cargo Consolidation

by M. C. Ircha*, J. S. Christie*

INTRODUCTION

The Transportation Group was retained to examine the feasibility of developing a consolidation centre in Saint John for the Canadian-Caribbean trade. Saint John was selected for investigation in this market niche study as it has served as a major point of entry/exit for Caribbean and other Latin American trade. In recent years, an increasing amount of Caribbean-bound general cargo has been diverted through Southern U.S. ports as improved inter-modal systems resulted in decreased freight rates and enhanced service levels. These competitive improvements eroded the viability of an all-water route from Canada to the Caribbean.

A consolidation centre to offset Caribbean traffic diversion through U.S. ports was considered for Saint John. Such a facility would enable reasonable sized volumes of general cargo and other commodities to be assembled for shipment. Such 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) and improved service frequency.

The scope of this analysis was limited to commodity movements to and from Eastern Canada and seven Caribbean countries (Bahamas, Barbados, Cuba, Dominican Republic, Jamaica, Puerto Rico, and Trinidad and Tobago). The analysis included Canada-Caribbean trade movements, the identification of potential opportunities for enhanced Canadian export trade, transportation system needs including all relevant modes, the consideration of Eastern Canadian shippers' perspectives on trade with the Caribbean, and consolidation centre requirements and options.

CONSOLIDATION CENTRE CONCEPT

The conceptual design of a Caribbean consolidation centre involves inter-modal transportation. Arriving freight packages could be consolidated into full container loads (FCL) for shipment to the Caribbean. Similarly, import shipments could 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 inter-modal terminals (in Canada, U.S., and Sweden) revealed that few, if any, serve the proposed role of the Saint John facility: that is, consolidating a wide range of commodities for a specific geographic destination. Normally, such facilities limit the range of goods handled and distribute them globally. However, these existing facilities did define the minimum size of consolidation centres, throughput levels, and facilities required.

Inland consolidation facilities play a significant role in the design of a port consolidation centre in the Canadian context. These inland facilities permit containers to be stuffed or stripped at a location closest to their point of origin or destination.

Typically, inland consolidation centres are spaced between 800 and 1400 kilometres apart (Slack, 1988). Trucks serving a radius of 400 to 700 kilometres 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 centre.

EASTERN CANADA - CARIBBEAN TRADE ANALYSIS

Published information from Statistics Canada (1988) along with a special tabulation on exports on a tonnage basis (Statistics Canada, 1987) 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 Canadian tonnage to the Caribbean. On a dollar value basis (Figure 2), Eastern Canadian exports accounted for almost 70 percent of all the 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

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FIGURE 1
Canadian Exports To Caribbean
(1987 in tonnes)

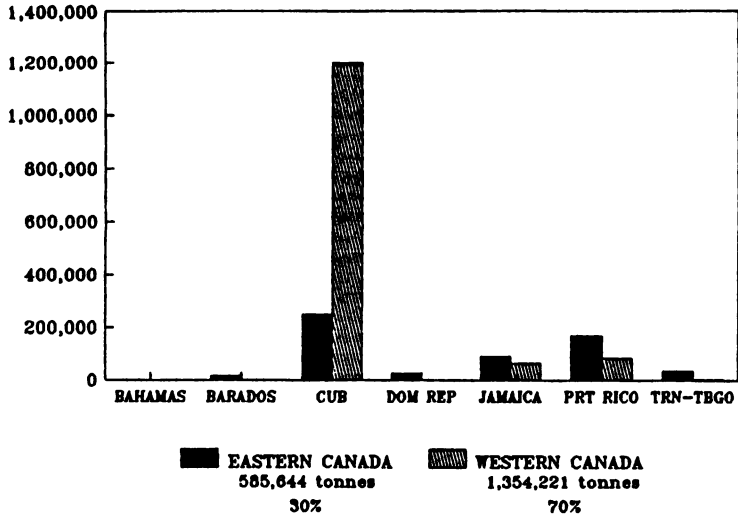
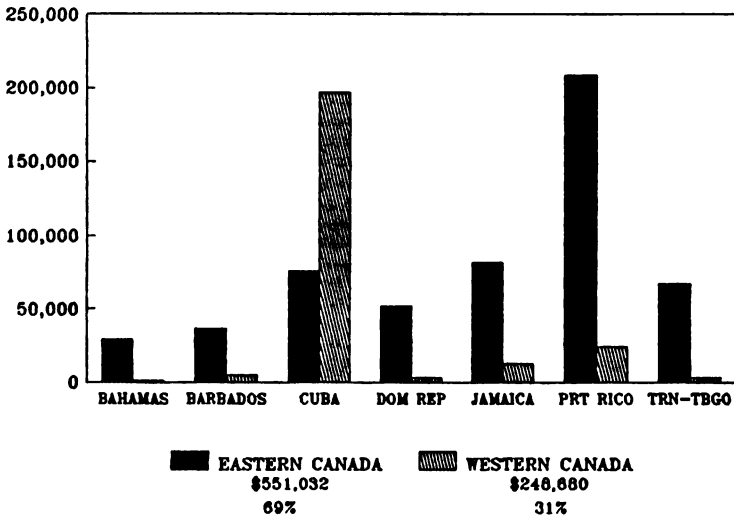


FIGURE 2
Canadian Exports to Caribbean
(1987 in \$000)



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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 total. New Brunswick provided the highest proportion of exports by value at 43 percent.

The major exports from the Atlantic provinces to the Caribbean on a tonnage basis in 1987 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 to \$800 million worth of exports (Figures 2 and 5). Puerto Rico was the main Caribbean 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 to \$61 million worth of imports.

The vast array of commodities exported from Eastern Canada were examined to determine the amount which might be divertible through a Saint John consolidation centre to establish the potential Caribbean-bound throughput.

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. As individual island nations, each of the Caribbean countries offers little opportunity, but, taken as a whole the Caribbean Basin provides a considerable potential market for Canadian exporters, as shown in Table 1.

The data used to examine the Caribbean countries came from the International Monetary Fund's, *Direction of Trade Statistics* (reflecting 1987 information) and individual country profiles provided by External Affairs Canada. Tonnage data was unavailable, 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: changes 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 under-represented even if their shipped tonnage is large.

Potential export opportunities for Canadians in the Caribbean were identified by examining the current position of Canadian exporters within each sector of the

FIGURE 3

Eastern Canada Exports to Caribbean (1987 in tonnes)

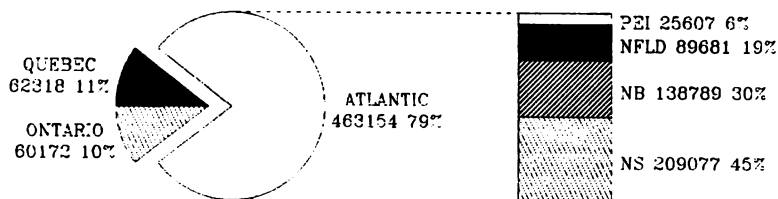
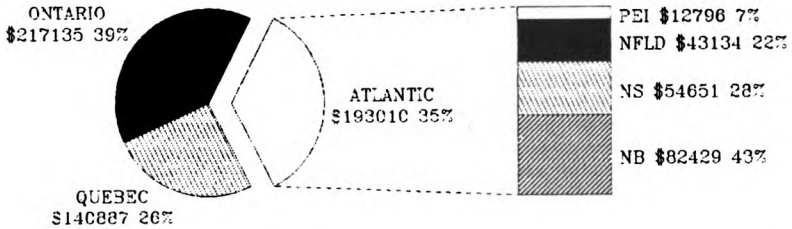


FIGURE 4

**Eastern Canada Exports to Caribbean
(1987 in \$000)**



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.

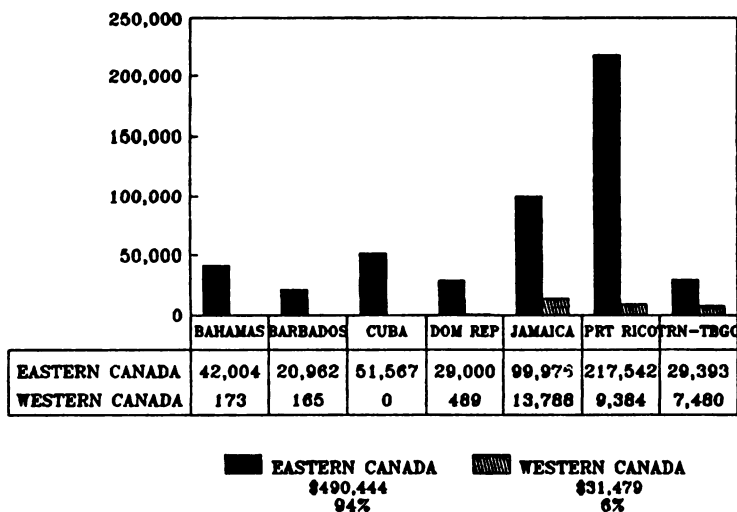
The Caribbean countries examined have initiated "value-added" policies such as the establishment of import quotas, import tariffs, and currency devaluations to stabilize and enhance their local economies. The primary objective of these policies is to shift from a single commodity based economy to a more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

The Caribbean countries' "value-added" policies provide opportunities for Canadian exporters as our 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 rising demand from the Caribbean.

**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

FIGURE 5

Canadian Imports From Caribbean
(1987 in \$000)

Other potential Canadian exports to the Caribbean include semi-processed and finished goods such as textiles, pharmaceuticals, electronics, and transportation equipment.

Enhanced Canadian export trade to the Caribbean would further increase potential traffic through a Saint John consolidation centre.

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 based on existing and potential traffic to the Caribbean.

The optimistic scenario assumes that the Saint John consolidation centre 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.

Each of the 1987 exported commodities from Eastern Canada through all ports (including U.S.) were evaluated to determine whether or not they could be diverted

through Saint John. Based on this evaluation, 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, potential growth in the Caribbean market based on identified opportunities for Canadian exporters increased the range of total additional exports through Saint John from 140,000 to 207,000 tonnes. This represents an increase of between 86 - 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 subsequent ocean carriage to the Caribbean.

The transit time for the inland transportation leg to these ports is: 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 (AGB, 1989). 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. Thus Saint John/Halifax is 1 to 2 days closer to the Caribbean than Montreal, and roughly competitive with New York and Florida.

Improvements to the ocean transit service may be achieved if increased Caribbean-bound commodity flowed through a designated consolidation centre. Increased tonnage could attract larger vessels with improved service frequency.

SHIPPERS' PERSPECTIVES ON THE CANADIAN - CARIBBEAN TRADE

A 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 remains the dominant port of choice with 37 percent; followed by Halifax and Miami with 16 percent; New York, 13 percent; and Saint John, 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. Over half of the exporters surveyed (59 percent) used FCLs for their shipments to the Caribbean, a further 37 percent exported part loads in LCL shipments.

In order 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 centre and establish itself as the primary Canadian - Latin American connection.

CONSOLIDATION CENTRE REQUIREMENTS

Using operating data from existing consolidation centres and inland facilities, 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. Conservative estimates of annual traffic volumes for a viable inland load centre and consolidation centre are 20,000 TEU and 6,000 TEU (twenty foot equivalent containers) respectively (Slack, 1988). 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 centre could amount to 3800 TEU from Ontario and Quebec and 17,500 TEU 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 centres, one inland centre located in Central Canada (either Montreal or Toronto) is needed to support a facility in Saint John. Obviously, the estimated 3800 TEU from Central Canada for the Caribbean falls short of the minimum inland centre throughput requirement of 20,000 TEU for economic viability. Hence, a stand-alone facility designed exclusively for the Caribbean trade would not be feasible, rather an existing general inland centre handling a range of commodities should be used.

The volume of goods shipped from the Maritime provinces may be sufficient to justify a consolidation centre at the port of Saint John. If one-third of the volume required consolidation, the annual throughput in the centre at Saint John would be 5800 TEU, close to the 6000 TEU required for viability.

This analysis considers only export traffic to the Caribbean. Imports from the Caribbean to the Atlantic provinces amounted to about one third of the exports, hence, adding import data (if it were available on a tonnage basis) would further enhance the overall viability of the proposed consolidation centre.

CONSOLIDATION SYSTEM OPTIONS

The efficiency and viability of a consolidation centre requires that it be located in a dense population market area to ensure that LCLs and LTLs can be readily consolidated into FCLs for economic handling. Toronto and Montreal are major markets and are thus prime candidates for an inland load centre consolidating Caribbean-bound traffic for Saint John.

Several options were considered in this study including: (i) developing a stand alone consolidation centre in Saint John, (ii) adding an inland load centre in Montreal and a smaller consolidation facility in Bangor Maine, and (iii) adding a further inland load

TABLE 2
Exporters' Use of Selected East Coast Ports

	<u>Ports</u>				
	<u>St. John</u>	<u>Halifax</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%

centre in Toronto. It was concluded from the analysis that option (ii) and possibly (iii) appear most feasible for the development of a viable consolidation centre 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 consolidation centre. Similarly, a consolidation centre in Bangor, Maine would serve to consolidate Caribbean-bound commodities shipped from the North East U.S. through Saint John. The facility at Saint John would consolidate goods originating in the Maritimes as well as processing FCLs from Montreal and Bangor.

Given the minimum traffic flows anticipated through the Saint John consolidation centre, 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 Latin American countries were to be consolidated in the facility, the additional volumes would further warrant its development.

The actual management of a Caribbean consolidation centre 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 centre system. Shipping lines, on the other hand, typically manage load centres within a port.

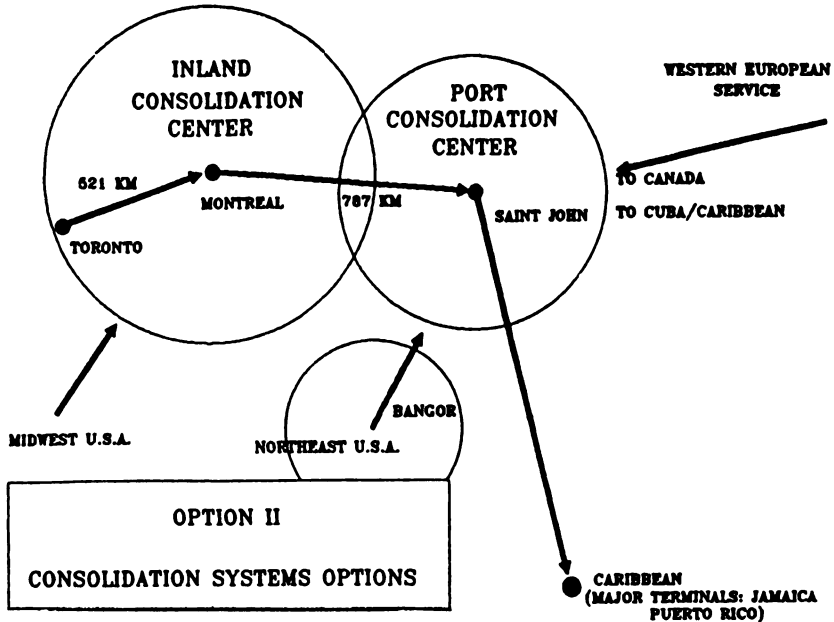
A further advantage is that freight forwarders normally seek to maximize the amount of freight moved regardless of its nature. Freight forwarders are often in the best position to coordinate transportation services from the point of inland origin to the final inland point of destination (from factory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

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

CONCLUSIONS

Atlantic Canada exports a number of commodities to the Caribbean. The main exports are food and paper products. Bulk wheat/flour movements normally are shipped from Halifax and neobulk 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

FIGURE 6



and Ontario ship 65 percent of the exports by value.

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 exporters exist in the Caribbean market as our 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 comprised of many small countries, Canadian 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 centre in Saint John will aid in meeting some of this demand. The development of a complementary facility in the Caribbean would be beneficial in reinforcing and developing Canadian-Caribbean trade.

It is estimated that a consolidation centre in Saint John could attract an additional

104,000 to 207,000 tonnes through the port destined for the seven Caribbean countries evaluated in this study. The amount of commodity flow generated marginally justifies the establishment of a designated consolidation facility. However, if additional traffic between Eastern Canada and Latin America could be attracted through the Saint John consolidation centre, then the overall concept would likely 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 centre in Saint John.

What is required, however, is the appropriate marketing of the port as Canada's consolidation facility for Caribbean and Latin America commodities. Aggressive marketing to reinforce Saint John's image as Canada's Caribbean - Latin American connection is necessary to change the current perceptions of Eastern Canadian shippers and to develop appropriate commodity throughput.

ACKNOWLEDGEMENTS

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ENDNOTE

* UNB Transportation Group